

# A Guide to Significant Wildlife Habitat and Natural Areas of Door County, Wisconsin



**A Review of the County's  
Natural Areas and the  
Plants and Animals That  
They Support**



### ***Cover Photographs***

- **Top:** Dwarf Lake Iris (*Iris lacustris*) - Courtesy Gary Emmerlich
- **Middle:** Hines Emerald Dragonfly (*Somatochlora hineana*) - Courtesy Paul Burton
- **Bottom:** Mink River, on the Upper Peninsula, looking west. - Courtesy Mike Grimm
- **Cover Design:** Pat Robinson, UWEX Lakeshore Basin Educator for Natural Resources

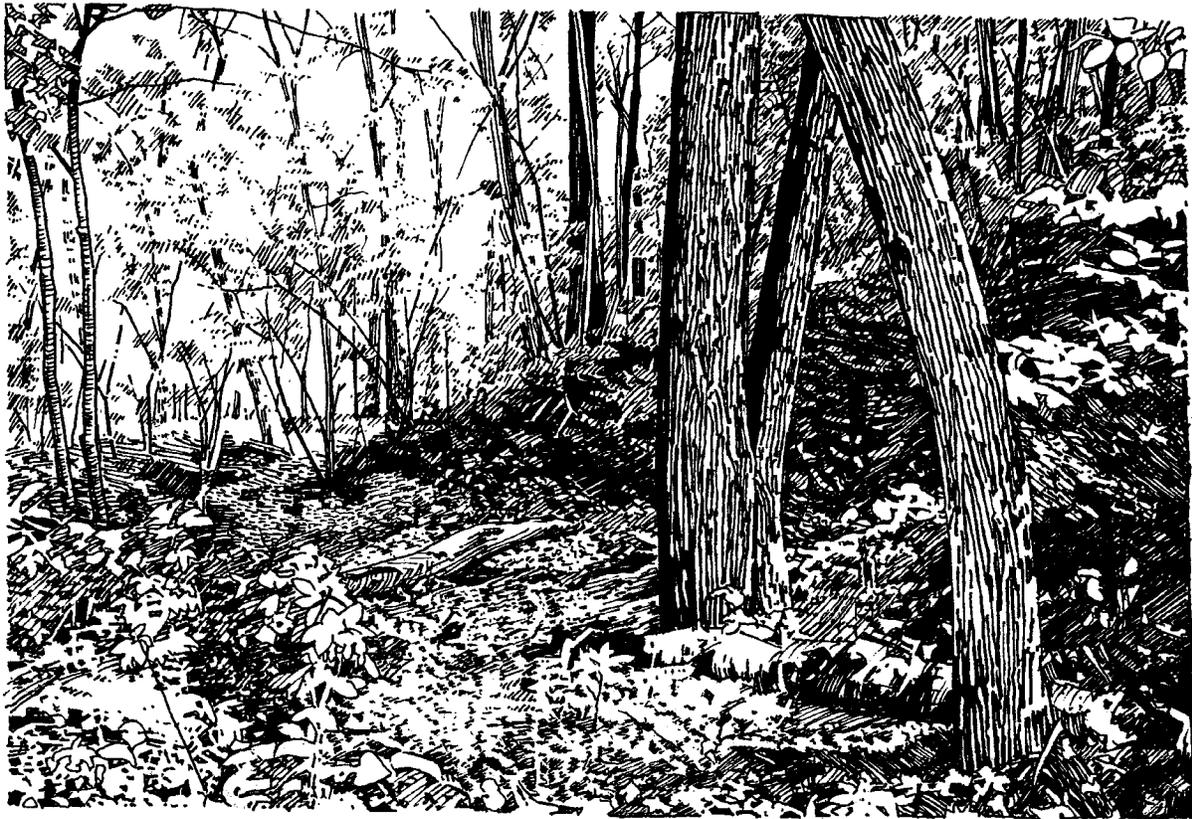
A Guide to Significant Wildlife Habitat and Natural Areas  
Of  
Door County, Wisconsin

*March, 2003*

*First Edition*

*A Collaborative Community Project*

Copies of this document can be obtained from the  
Wisconsin Department of Natural Resources  
Sturgeon Bay Service Center  
110 S. Neenah Avenue  
Sturgeon Bay, WI 54235



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## – Foreword –

by Nina Leopold Bradley  
*The Highest and Best Uses of Land*

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History tells us that our native surroundings provide our fundamental identity and sense of place. They provide the foothold for understanding who we are as a people. Our natural heritage has helped to shape our cultural heritage.

In Door County the splendor of its natural surrounding has played an important role in shaping and nurturing community values. Fifty years ago Aldo Leopold urged Americans to adopt a more caring attitude toward the land. He wrote, “Quit thinking about decent land use as solely an economic problem ... examine each question in terms of what is ethically and esthetically right, as well as what is economically expedient.”

This guidebook on natural areas allows us to examine the maps and descriptions of the uncommon natural wonders that are the precious heritage of Door County. Leopold’s thoughts lead us to think about what is esthetically right as well as economically expedient. To achieve a balanced economy, in harmony with the natural environment and its preservation, will require strong leadership and a broad ethical vision.

It has been written that the future of our public lands will be determined by the strength of our leadership on environmental issues. Our own Wisconsin environmental ecologists have articulated such a commitment over the last century. From Sig Olson to Aldo Leopold to John Muir, we have abundant inspiration to protect our wildest places, balancing the increasing demand for development.

Conservation, as Aldo Leopold understood it, is a matter not just of technical skills, but of social development, which in turn is a matter of changing mores, customs, laws, incentives and community standards.

As we care for this special part of Wisconsin we may be able to implement an elevation of community standards, a fresh understanding of the dynamic interrelationship between public and private interests, and public and private lands.

Leopold wrote: “Now we face the question whether a still higher standard of living is worth its cost in things natural, wild and free.”



The Leopold Shack — A symbol of the Land Ethic

Photo by Roy Lukes

This volume indicates that Door County still retains some of these “things natural, wild and free”. Let us value them as we study these carefully constructed maps and descriptions, and consider the highest and best use of the unspoiled lands.

With all of its appeal, Door County is going to attract growth whether we actively seek it or not. The future of the county’s remaining undeveloped landscape is contingent upon how we determine their highest and best use. This guide will facilitate our learning about the county’s remaining natural areas as we contemplate their future.

***Nina Leopold Bradley***

September, 2002

*Aldo Leopold’s eldest daughter Nina Leopold Bradley lives in Baraboo, Wisconsin where she continues to deepen her father’s legacy through her work in supporting the mission of the Aldo Leopold Foundation. The Foundation promotes the care of natural resources by fostering an ethical relationship between people and land.*

***Aldo Leopold’s Land Ethic***

*“When we see land as a community to which we belong, we may begin to use it with love and respect. That land is a community is the basic concept of ecology, but that land is to be loved and respected is an extension of ethics”.*

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## — Preface —

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This publication represents the collective efforts of a group of individuals whose intent is to help preserve Door County's communities of plants and animals and their habitats. Many people acknowledge that most of the remaining natural landscapes and open space are seriously threatened by continued commercial and residential development. Concerned about the problem, this initiative was organized to examine this threat and formulate a strategy to help minimize the consequences.

One could conclude that the way of life we experience in Door County is in many respects dependent upon its open spaces and undeveloped natural landscapes. Considered a special place, Door County can be characterized by its numerous and diverse natural areas. These places are home to a variety of plant and animal species and geographical features, the likes of which are found nowhere else.

The fact that some of these natural areas are already protected as state parks, nature preserves and wildlife areas is a testament to the high quality of natural ecosystems to be found in Door County. Door County has a total of 22 designated State Natural Areas, which is more than any other county. Five state parks encompassing over 9000 acres are found here, which is also more than in any other county, and two state wildlife areas contain an additional 3000 acres. The Ridges Sanctuary, The Nature Conservancy, The Door County Land Trust and the University of Wisconsin collectively own or manage more than 5000 acres for purposes of natural area protection. Seventeen county parks and numerous town and municipal parks provide varying levels of protection for other sites.

Although significant areas of Door County have been set aside for conservation and recreation, large expanses of undeveloped natural ecosystems remain unprotected. The rush of daily life makes it easy to take these unprotected areas, and the benefits we derive from them, for granted. Yet many of these natural landscapes will eventually be lost or degraded if preventive action isn't taken. Losing these special areas would have a significant and noticeable adverse affect on adjacent properties. Even those areas that are preserved are threatened by over use or invasive species.

***Our purpose has been to provide practical information that might assist citizens and civic and political leaders in supporting natural area preservation and protection activities in and around their communities.***

This guide is designed for people at all levels of government. Hopefully, others will find it useful, including natural resource professionals and interested citizens. Our purpose has been to provide practical information that might assist citizens and civic and political leaders in supporting natural area preservation and protection activities in and around their communities.

Seventeen areas have been identified as the most critical in maintaining the ecological integrity of Door County's natural environment, and hence one of the keys to the county's way of life. While this list of areas is certainly not exhaustive and could be debated, it does represent the best identification effort of a very diverse group of interested parties with knowledge of Door County and its natural areas. Each area holds significant value for recreation, aesthetics, clean air and water, and local biodiversity.

Even though efforts were made to gather information about available land preservation and protection programs, it has not been included as part of this publication. Future editions will explore and catalogue the variety of programs and strategies that can be used to preserve and protect wildlife habitat and natural areas.

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## — Acknowledgement —

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This publication has been an evolving and collaborative effort since its early beginning in July of 1997. The result represents many generously given volunteer hours, numerous regularly scheduled meetings and considerable give and take by everyone involved. No one individual or organization was in control, rather the process can best be characterized in the spirit of shared leadership and shared responsibility. Many of those participating have affiliations with local, state and federal agencies and conservation organizations but have given of their energies and time as individuals concerned about the future of wildlife habitat and natural landscapes on the Door Peninsula. Their professional association should not be perceived as an endorsement by those agencies or organizations of the work presented here.

Roy Aiken	Roy Lukes
Dan Burke	Patrick Robinson
Jaime Corbiser	Bill Ruff
Ron Fassbender	Carl Scholz
Coleen Feucht	William Schuster
Robert Florence	Mary Standish
Terry Gardon	Ron Stieglitz
Mike Grimm	Joel Trick
Robert Howe	Jerry Viste

Others who have occasionally participated to offer timely information and advice are recognized and appreciated for their contribution:

Guenevere Abernathy	Charlotte Lukes
David Allen	Paul Mahlberg
Jim Bunning	Robert Merline
Laddie Chapman	Pat Miller
Ray Drake	Paul Regnier
George Evenson	Jon Renner
Mariah Goode	Bob Ryan
Vinnie Hancock	Phil Saperstein
Bill Laatsch	Larry Smith
Arnie Lindauer	Mike Toney

## Special Recognition

Since its early beginnings these individuals have given many hours to this project. Their agencies, institutions and organizations are each recognized for having allowed them to work on this important project:

Bay Lake Regional Planning Commission	The Door County Land Use Forum
Door County Environment Council	The Nature Conservancy
Door Property Owners, Inc.	United States Fish & Wildlife Service
Door County Planning Department	University of Wisconsin-Extension
Door County Soil & Water Conservation Department	University of Wisconsin Green Bay
The Door County Land Trust	Wisconsin Department of Natural Resources

Bay Lake Regional Planning Commission has provided natural area site maps and the many seemingly unending revisions as the project unfolded. The Bureau of Endangered Resources of the Department of Natural Resources has provided considerable assistance in the inventory of plants and animals in many parts of the county.

The Wisconsin Department of Natural Resources has been especially helpful in seeking out and securing the financial resources provided by Peterson Builders, Inc. to employ a project coordinator during the past year to pull everything together for this publication. UW-Extension and the Wisconsin Department of Natural Resources have helped underwrite printing expenses.

The pen and ink drawings that are found throughout this publication are the works of nature artist Chris Baird, of Minneapolis MN. Charles Bradley, Sr., husband of Nina Leopold Bradley drew the sketch of the Leopold Shack shown on page 17.

Richard Follmer piloted his flying machine and allowed us to take many of the aerial photographs you'll see in this guide and his generosity is very much appreciated. Numerous photographers are recognized with credits along side their work and we thank them collectively for their contribution.

A very special thanks to Ms. Coleen Feucht, a graduate student at the University of Wisconsin Green Bay Campus, who has acted as the project coordinator. She has been a tremendous asset in helping to finalize the guide. Serigraph, Inc., of West Bend, Wisconsin generously contributed the printing of the front and back cover pages. Roy Aiken, coordinated the final revisions, edited, and prepared the publication for printing.



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## — Introduction —

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Natural landscapes and wildlife matter to people in Wisconsin and Door County. Nature and its seasonal patterns marked by fall colors, the annual migration of waterfowl and songbirds, and the spring explosion of budding trees and wildflowers are so much a part of people's everyday lives that we can not imagine being without them.

But as the pressures of growth and a tourism economy accelerate, what will it take to protect these natural resources distributed across the county? Practically speaking, we must consider the economic aspects. We want communities to prosper. Can we afford to protect significant parcels of land and leave them in a wild and natural condition? Our first response is we can't afford not to, however, easy answers or single solutions are not possible. Most likely solutions will have to be tailored to the uniqueness of the landscape and the specific needs of each landowner.

Economic vitality may be one of the best reasons for maintaining undeveloped lands in and around our communities. Natural areas have a positive impact on property values of adjacent lands, and when kept in their natural or native state serve many practical functions, including moderation of stormwater runoff, abatement of surface and groundwater pollution, erosion control and air quality enhancement. There are many tangible economic benefits that are associated with natural areas. Local businesses in many communities rely on revenues generated by tourism related activities from the public enjoyment of wildlife, natural areas and open space.

Natural areas improve the overall livability of a community, offering not only quality air and drinking water, but also scenic beauty and opportunities for low-impact recreation, such as birdwatching, fishing and hiking, which can be enjoyed by local residents and visitors alike. Communities with generous natural areas and open spaces are considered by many as good places for children, and offer a high quality of life for everyone in the community.

Any serious cost to benefit analysis will look beyond the simplistic notion that development equals an increased tax base, and will tell us that we quite literally can't afford not to protect natural areas. To a great degree, the reason most of us live in or visit Door County is for the pleasures we derive from these undeveloped and natural landscapes. If we lose them and the benefits they offer — the quality of our lives and our children's lives will have been diminished. Even for those who do not derive direct pleasures from the enjoyment of natural areas, the local economy is largely dependent upon their existence, by virtue of the tourists that they attract.

The preservation of significant areas of undeveloped landscape can result in a host of benefits to the local community. However, some of these are not generally recognized, and others tend to be taken for granted. Below, are some of the advantages of leaving these landscapes in an undeveloped condition.

### ***Storehouse of biological diversity***

Among the many things that make Door County attractive to residents and tourists alike, are the widespread natural habitats, and the wildlife they support. It is the high quality of these ecosystems that make them so appealing, due in large part to their high level of ecological integrity. Among the factors contributing to Door County's unique and rare environments is its location as a major peninsula of the Lake Michigan coast and the effects of the dolostone bedrock on surface drainage and water chemistry.

These and other factors, combined with relatively low levels of development, help to support habitats for numerous species of rare plants and animals, some of which are found nowhere else in the state.

As notable as the county is as a site for rare species, it is also recognized for its diversity of more common and widespread species. The diversity of the local ecosystems is a result of their relatively large sizes, undisturbed nature, and connections with each other. As landscapes become more developed the remaining patches of habitat become smaller, more degraded, and less connected with each other. This lack of connection then prevents many plant and animal species from interacting with other members of the same species, a process that is essential to maintain healthy populations. It also makes it more difficult for a species to re-colonize an area following a local extinction or natural population decline. Therefore, this connection of habitats is critical to retain existing levels of biodiversity in Door County.

### ***Community's appeal to families, new residents and visitors***

The benefits we derive from existing natural areas in the county - green vistas, clean water and air, abundant wildlife and natural beauty - are among the many reasons for its popularity as a tourist attraction. These are also the very reasons that many people choose to live and work in Door County. They are a major attractant to people wanting to purchase or build retirement or vacation homes. As tourism is a primary force in our local economy, the economic vitality of the region depends upon the attractiveness of our county to both visitors and new residents.

### ***Low-cost stormwater management and flood control***

Natural areas can be highly efficient at moderating the passage of rainfall over the landscape. They help to reduce large pulses of surface waters and slow the passage of water over the land, by soaking up rainfall and releasing it slowly. Thus, the variety of natural landscapes help to prevent erosion of stream banks and lake shores in developed areas, where streams and rivers tend to be more "flashy" and affected by extreme precipitation events.

### ***Purification system for drinking water and surface waters***

A healthy, functioning ecosystem does an excellent job of filtering runoff from snowmelt or rainfall and removing sediment and pollutants. These free ecological "services" result in cleaner water being discharged to lakes and streams, as well as to groundwater.

### ***Contribution to air quality***

The trees, shrubs and other vegetation of natural areas act as effective and efficient filters of atmospheric gases, absorbing many airborne pollutants. Living vegetation produces abundant oxygen, essential to all animal life, including humans.

### ***Increased property values***

Door County property values are higher than in many other areas of the state. One reason for this is the attractiveness of the area due to its scenic and natural beauty. There is little doubt that individual property values are also influenced by the surrounding land use, with greater value given to a scenic and natural landscape. Retaining these special places throughout the county will enhance long-term property values in Door County.

### ***Tourism dollars***

Natural areas are important wildlife habitat, serving to support the hunting and fishing, skiing, snowmobiling, hiking, biking, birding and boating activities that attract so many visitors. Even for those visitors who do not partake in active recreation, natural areas are important to their Door County experience, providing the rural character and scenic vistas that many people value.

Former Astronaut Kathryn Sullivan, the first woman to walk in space, relates with clarity how she became a citizen of the planet in a recent special issue of Time Magazine. She confesses that as you circle the planet at intervals of 90 minutes you cannot help but acquire a very different perspective of the world.

*“All the colors and patterns you see – the visible evidence of the complex working of the natural systems that make our planet habitable – seem both vast and precise, powerful and yet somehow fragile. You see volcanoes spewing smoke, hurricanes roiling the oceans and even fine tendrils of Saharan dust reaching across the Atlantic. You also see the big, gray smudges of fields, paddies and pastures, and at night you marvel at the lights, like brilliant diamonds, that reveal a mosaic of cities, roads and coastlines — impressive signs of the hand of humanity.*

*Scientists tell us that our hand is heavy, that we are wiping out other species at an unprecedented rate and probably transforming our climate. Will the immense power of global systems withstand the impact of humanity? Or is it possible that our collective actions will change the nature of our planet enough to cripple its ability to support life?*

*I no longer believe that we can wait for all the scientific data needed to answer these questions conclusively. We must recognize immediately what it means to be citizens for this planet. It means accepting our obligation to be stewards of the earth’s life-giving capacities. As homeowners, we wouldn’t neglect or damage our houses until they weren’t fit to live in. Why would we do that with our planet?”*

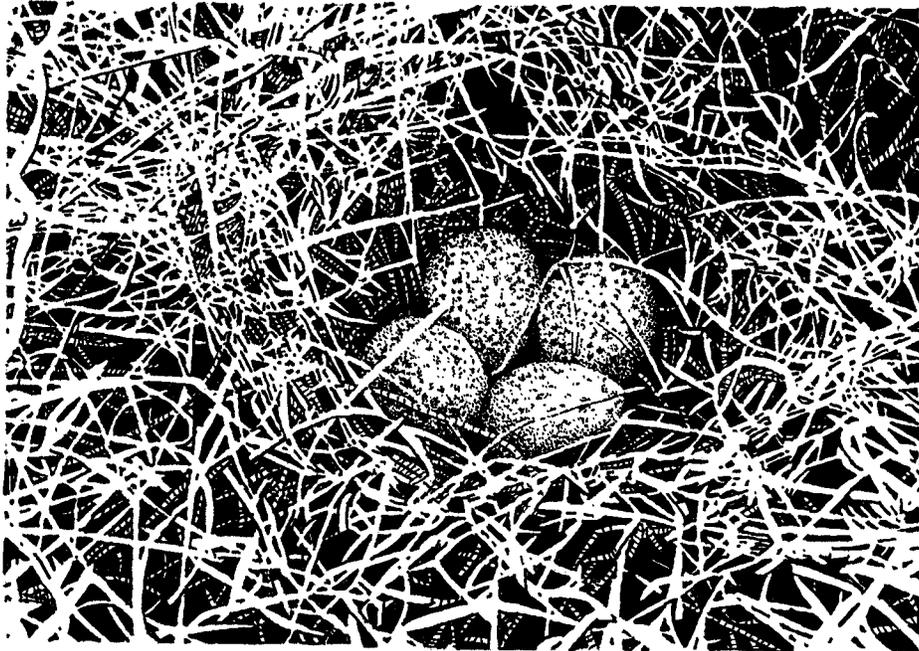
©2002 TIME, INC. reprinted by permission.

Kathryn Sullivan, who as a Navy Reserve captain, flew three space shuttle missions now resides in Columbus Ohio where she is president of the Center of Science & Industry. ([www.cosi.org](http://www.cosi.org))

It’s interesting that Aldo Leopold’s vision of stewardship and a land ethic resonate from miles above the earth. The phrase “*think global – act local*” offers a perspective from which each of us can be citizens of the planet as stewards of the natural communities in our neighborhood. Stewardship can take many forms, from increased local efforts to eliminate pollution from streams and creeks, to seeing nature’s landscapes as community assets.

The hope for this publication is that it helps to generate increased interest for preserving the remaining wildlife habitat and natural areas in each of the communities described in the following seventeen sections. Collaboration among local, state and federal agencies, citizens and landowners will be essential in developing new and creative methods to accomplish what will, at best, be a difficult task.

It is not our purpose to identify how or when these places should be protected or who should help to protect them. Many organizations and citizens will need to be involved in evaluating more precisely where protection efforts can best be focused and which preservation or protection strategies are most appropriate. Successful efforts will most likely depend on the area’s landowners. Their vision of the future will play a major role in determining if, when and how these places are protected.



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# A (very) Short Course in Ecology & Related Land Use Philosophy

## Chapter 1

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At the root of every discussion and decision related to natural area protection are qualitative judgements.

- What qualities are desirable in a natural area?
- What level and type of impacts resulting from a development, new home or management practice will be considered acceptable?
- What exactly is one is trying to protect?

In any genuine initiative aiming to sustain the health of local natural areas, the answers to questions such as these must be grounded in the basic principles of ecology.

Ecology is about relationships—relationships among living things, and between living things and their non-living environment. As a scientific discipline, ecology pays attention to how things interact. This discipline assumes that it is both impractical and misguided to look at individual living things in isolation, because living things depend for their survival on the set of elements that surround them and the processes that sustain their population over time. It considers natural areas to be intricate and interacting systems that operate at many scales. Ecologists assess the condition of natural areas by looking at three primary elements: *composition, structure, and function*.

*Composition* is a measure of the plant and animal species present, their relative abundance, and the differing characteristics of individuals that make up populations, such as age, ability to reproduce, and relative vigor.

*Structure* refers to the physical organization of natural elements across a landscape - that is, awareness of patterns evident in the distribution of living things and how those patterns change naturally over time. Elements of structure include the varying heights of vegetation, the degree to which a community is open or unshaded, and the mosaic of natural community types across a defined area, as well as the presence of nonliving elements such as waterways, rocks, logs and woody debris on the forest floor.

*Function* refers to the processes and relationships that sustain a system. Such as the flow of nutrients moving through an ecosystem, the natural disturbance regimes that determine site conditions, such as wind events, fire, seasonal water level changes, and the movement of animals to find food and appropriate sites for breeding and reproduction. There are many ways that the needs of plants and animals are met through interactions with each other and with their physical non-living surroundings, and many roles that each individual or population plays in the operation of the system as a whole.

A site with ecological integrity contains populations of native species in naturally occurring patterns as determined by the unique physical characteristics, climate, and history of the site. Natural processes will drive changes and fluctuations in structure and composition over time.

**An ecosystem is a dynamic complex of plant, animal, fungal and microorganism communities and their associated nonliving environment interacting as an ecological unit.**

An appreciation of the complexity of ecosystems is at the very root of ecology. It is not uncommon for ecologists who have devoted their lives to researching a particular species or natural process to insist that they have only scratched the surface of understanding. Ecologists hold to this position in part because natural systems are ever changing, and in part because our ability to get the right answers is limited by our ability to ask the right questions.

Yet the fact that our study of the natural world will always be a work in progress does not mean that we cannot make decisions based upon what knowledge we have already acquired. Just as the equally inexact science of medicine is routinely used to guide the decisions we make about our health care, we must actively use the understandings gained by ecological research to guide our land use decisions. What has the study of ecology taught us? A few generally accepted concepts include:

*Having a diversity of native species* - many different kinds of naturally occurring plants and animals - tends to make an ecosystem more stable and better able to handle stress, and may be used as one of the indicators of health. It is therefore desirable to maintain the biological diversity that is naturally characteristic of a site, with the understanding that some areas are naturally lower in diversity, as well as some are naturally higher, as in a rain forest.

*Plants and animals do not occur randomly over the landscape; they occur in identifiable and recurring groupings of species known as "natural communities."* Populations that comprise a community may live in proximity because of interdependent relationships (predator/prey), or similar habitat requirements and physical tolerances, such as fish species that share a need for high oxygen waters or insects that require high humidity environments, or plants that can thrive in dry climates. [Note: For a listing of Door County's natural communities see Appendix "A" and for a description of these areas see Appendix "C"].

*Energy moves through natural systems in complex ways, so that each organism plays a role in determining the conditions for other organisms.* For a system to be sustained, nutrients must be transferred from one species to another, and dead and decaying materials must be allowed to break down or decompose and reenter the system to support the development of new life.

*There are limits to the adaptability of species and ecosystems.* Change is inherent in natural systems and occurs when species expand their range into new territories, or when populations fluctuate in response to food availability and climate changes, or when one plant community is gradually supplanted by another through the process of succession. Accelerated rates of change can produce conditions that cause populations of species and even entire natural systems to collapse. Declines are not always gradual; species may decline to critical threshold level and then crash. Worldwide, 99% of modern-day, post-1600 species extinctions are considered attributable to human activity. (Primack 1995)

Obviously, these are broad concepts, which are not immediately applicable to given land use decisions. Nevertheless, it is with such principles that we can begin to build the philosophical foundation that determines the way in which we approach discussions about land use issues. Strategic ways of thinking that may reasonably arise from the principles would include:

***Assumption of value***

The willingness to work under the assumption that each element of a natural system has an important role to play in the health of the system, as a whole, even if the specific contribution of the species is unknown. Accordingly, a threat to one component of a system is treated as a threat to the system as a whole.

***Thinking system — thinking forever***

A shift away from planning and managing for the benefit of a few species and toward planning and management at an ecosystem level, in which an effort is made to preserve the structure and function of natural communities over the long term.

***Erring on the side of caution***

Acceptance of a certain degree of humility regarding the limits of our knowledge about natural areas, and accordingly, the desire to err on the side of caution when evaluating whether a given land use practice will have a negative affect on a species or community. If the structure of a natural community is unduly compromised, there is a point, at which it can be expected to fail, after which it will no longer serve valued ecological functions, such as water quality enhancement or habitat for native species.

***Protection over restoration***

A heightened emphasis on proactive planning to protect natural sites rather than an emphasis on restoration or mitigation, given the understanding that "created" or "built" environments seldom achieve the same degree of complexity and diversity found in communities of natural origins and that even modest restoration efforts are extremely costly.

***A new aesthetic***

A new aesthetic view of natural areas, in which system health and ecological integrity are assigned greater value than purely scenic or recreational considerations.



Illustration of the Leopold Shack by Charles C. Bradley, Sr., with permission of The Aldo Leopold Foundation



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# Significant Wildlife Habitat & Natural Areas

## Chapter 2

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The wildlife habitat and natural areas identified in this chapter are arranged beginning in the southern part of the county and continuing to the north. Information pertaining to each of the sites has been organized using the following headings:

***Location:*** The generalized location of the site indicates the area of the county, section and town within which the site is located. The area identified on the site map is not precisely defined and is only intended to draw attention to the general area that is known to contain one or more significant natural communities.

***General Site Description:*** The site description points out pertinent natural characteristics and highlight recognizable features in the area. Other information such as the status of land use planning that applies to the entire area may be covered.

***Ecological Significance:*** This section gives more detailed information about the ecological features of the site that make it worthy of consideration for preservation.

***Noteworthy Cultural & Historical Features:*** Some of the more interesting features of the area's history and how it has evolved since settlement began are highlighted in this section.

***Site Features:*** Each of the area's identifiable locations is addressed in greater detail, including plant and animal species known to be in the area. Also covered are natural features such as types of soils, vegetation, and other attributes, that help to identify the area's contribution as a community asset.

***Conservation Goals:*** Several general conservation goals are listed for each natural area. These goals are intended to provide some broad guidance to future conservation efforts. It is important to note that the goals are only representative of what may be appropriate for maintaining the natural characteristics of a given site.

***Threats:*** The threats identified are not all-inclusive, but rather bring out the general or more obvious threats to the health of the ecosystems and natural communities that exist on the site. Specific strategies or tactics needed to eliminate or minimize these threats are not covered in this publication.

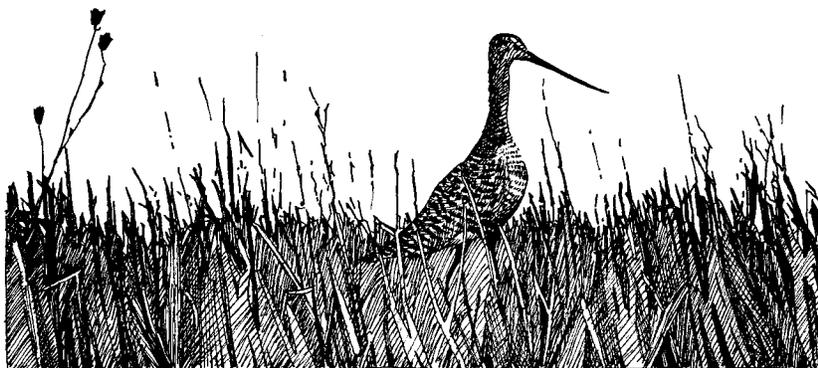
***Information Needs & Gaps:*** Since this is a work in progress, additional research and data collection needed is listed for some of the sites.

***Additional References:*** In several cases, important reference materials for the site should not be overlooked, although they are not specifically addressed in the site's text. These references are listed in this section.

***Site Map and Photos:*** A map of the general boundary for the project area is shown in green with adjacent natural areas identified in yellow, or brown for state-owned lands or dark green for private conservation areas. Photographs are included for each site and show some of the dominant features as well as surrounding habitat you would expect to see in the area.

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# AHNAPEE RIVER CORRIDOR

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## **LOCATION:**

The Ahnapee River Corridor is located in southern Door County (T25-26N, R24E) in the Towns of Brussels and Forestville. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Ahnapee River Corridor is approximately 5,200 acres in size. Much of the surrounding land adjacent to the river is composed of woodlots and farmland. Idle land comprises much of the area categorized as farmland. Therefore, a potential exists to purchase lands not currently utilized for agriculture or residential purposes for ecological restoration. One significant attribute of the Ahnapee River is the length of its reaches. The longest river trip via canoe in Door County exists between County Road H and the Kewaunee County line.

## **ECOLOGICAL SIGNIFICANCE:**

The Ahnapee River Corridor and Kayes Creek/Brussels Hill/Gardner Swamp Complex provide a continuous habitat passage that stretches from the Kewaunee County line north to the waters of Green Bay. The overall length of the Ahnapee River Corridor and the land-water interface provided through its connection to the river and its secondary connection to the bay make the corridor an ecologically significant area for Door County. Additionally, the river corridor is relatively intact, thereby providing important habitat for a variety of riparian wildlife.

The Ahnapee River Corridor begins in wetlands north of the river and is a valuable fishing and boating resource (Zimmerman 1989). The miles of open to shrubby wetland habitat and upland woodlots along the river corridor form a landscape pattern suitable for a large number of bird species. Birds commonly seen or heard in the moist meadows of grasses, dogwood and green ash south of Forestville include Sedge Wren (*Cistothorus platensis*), Swamp Sparrow (*Melospiza georgiana*), Yellow Warbler (*Dendroica petechia*), Sandhill Crane (*Grus canadensis*), Red-wing Blackbird (*Agelaius phoeniceus*), Common Yellowthroat (*Geothlypis trichas*), and Song Sparrow (*Melospiza melodia*). The adjoining upland woodlots and fields contain Northern Cardinal (*Cardinalis cardinalis*), American Redstart (*Setophaga ruticilla*), Eastern Meadowlark (*Sturnella magna*), Brown Thrasher (*Toxostoma rufum*), American Robin (*Turdus migratorius*), Red-eyed Vireo (*Vireo olivaceus*), Gray Catbird (*Dumetella carolinensis*), and House Wren (*Troglodytes aedon*). This north-south tending corridor of natural lands probably also serves as an important spring and fall migration corridor for passerine songbirds.

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

The Ahnapee River, formerly known as the Wolf, played a major role in the settlement of the area and particularly the town of Forestville, which was the third town to be organized (1857) in the county. Mainly people of Irish and German descent settled the area. The Ahnapee was at one time a deep river and for more than 20 years steamboats and heavily laden barges navigated its waters (Holand 1917). In later years after much of the surrounding land had been cleared, the river became too shallow for commercial use. The river drains much of the southern portion of the county and sedimentation resulting from timber harvesting, land clearing and the fire of 1871 were contributing factors leading to its loss of depth.

The Ahnapee River State Recreation Trail is one of the oldest segments of the Ice Age Trail in Wisconsin and is excellent for hiking, biking, snowmobiling, and horse back riding. The 28-mile long trail starts at the ship canal in the City of Sturgeon Bay and heads south through Door County and eventually ends in Kewaunee County. Visitors can view a combination of farmland and natural areas ranging from cedar swamps to hardwood forests. The marshes along the Ahnapee River offer excellent viewing opportunities for many waterfowl, mammals, and annual salmon spawning runs (WDNR 2000).

## **SITE FEATURES:**

### **Ahnapee River Corridor**

The portion of the Ahnapee River within Door County is 8.5 miles in length and averages 25 feet in width, with a low gradient of 7.7 feet per mile. The headwaters of the Ahnapee lie north of Highway 42 near Tornado Memorial County Park. A major tributary, Silver Creek, joins the Ahnapee just south of the highway. The river eventually empties into Lake Michigan within the City of Algoma.

- The Town of Brussels recently adopted a town-zoning ordinance and in 2002 was in the public hearing phase for implementing a comprehensive land use plan. The plan is expected to be complete early in 2003. The Town of Forestville has not adopted a county or town-zoning ordinance although numerous discussions regarding ordinances have taken place over the past few years.
- In the Town of Brussels land use surrounding the Ahnapee River Corridor is predominantly woodland with lesser amounts of cropland, idle farmland, natural lands, recreational area, and residential lots. In the Town of Forestville land use near the river corridor consists of cropland with lesser amounts of idle farmland, recreational public, and non-farm residential.
- Soils are deep, well drained to poorly drained, and level to sloping. Loamy sand to silt loam subsoil overlays sandy loam or loam till (USDA SCS 1978).
- A county dam impounds the river in Forestville forming the Forestville Millpond. The river is adversely impacted by non-point source pollution from local agriculture practices and overall, the river receives only a fair quality ranking. The Ahnapee River is listed for PCB contamination, and as recently as 2000 there was an advisory on smallmouth bass and carp consumption (Corbisier 2000).
- Pre-settlement vegetation of the Ahnapee River Corridor was predominantly of two types; upland areas dominated by a northern mesic forest composed of maple (*Acer spp.*), hemlock (*Tsuga canadensis*), and yellow birch (*Betula allgheniensis*); and lowland forests dominated by swamps of black spruce (*Picea mariana*), tamarack (*Larix laricina*), and cedar (*Thuja occidentalis*) (Finley 1976).
- Trout and salmon are stocked annually, and the river sustains annual fish runs in spring and fall below the dam (Corbisier 2000).
- Osprey (*Pandion haliaetus*), a fish-eating raptor, is a state-threatened species known to use this stream corridor.

## **CONSERVATION GOALS:**

- Maintain ecological integrity of the Ahnapee Rive Corridor, including associated upland forest habitat and wetlands.
- Enhance and protect the water quality of river and its tributaries.
- Maintain large blocks of undisturbed habitat to promote natural interactions among plant and animal communities.

**THREATS:**

- Non-point source pollution from agricultural practices is degrading stream quality.
- Increasing development pressure is a threat to both the Ahnapee River floodplain and the relatively contiguous habitat corridor that surrounds the Ahnapee River.
- The proposed four-lane expansion of Highway 42-57 will have a serious impact on this watershed and many of the source streams will be entirely relocated at the crossings.

**INFORMATION NEEDS / GAPS:**

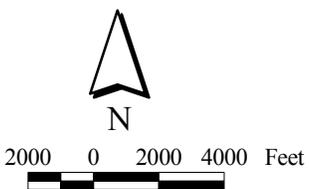
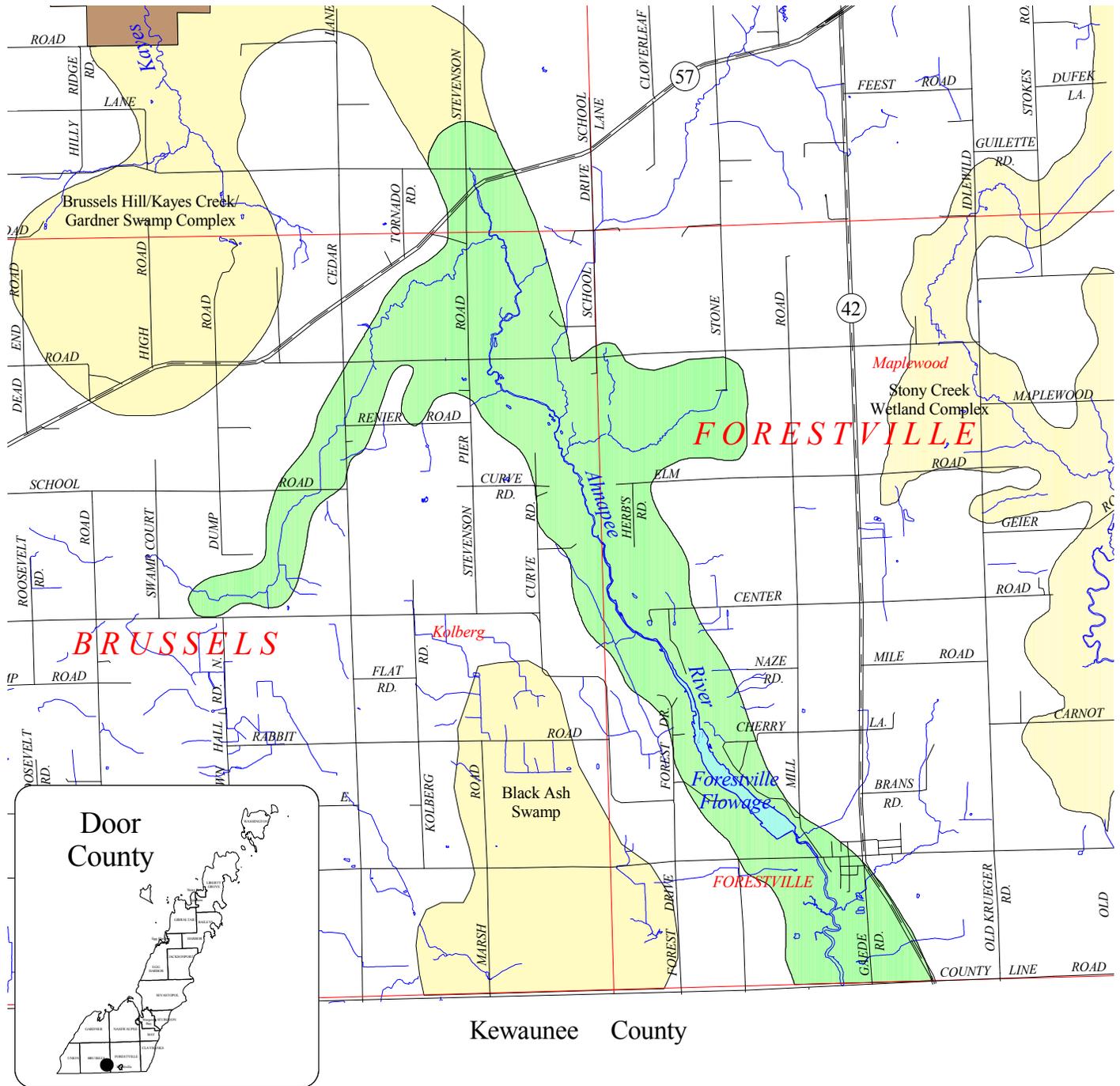
- Vegetation and animal inventories
- Names of supportive groups and individuals in this site



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# Ahnapee River Corridor

## Door County, Wisconsin



- Ahnapee River Corridor
- Adjacent Project Areas
- State Owned Lands/Parks

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

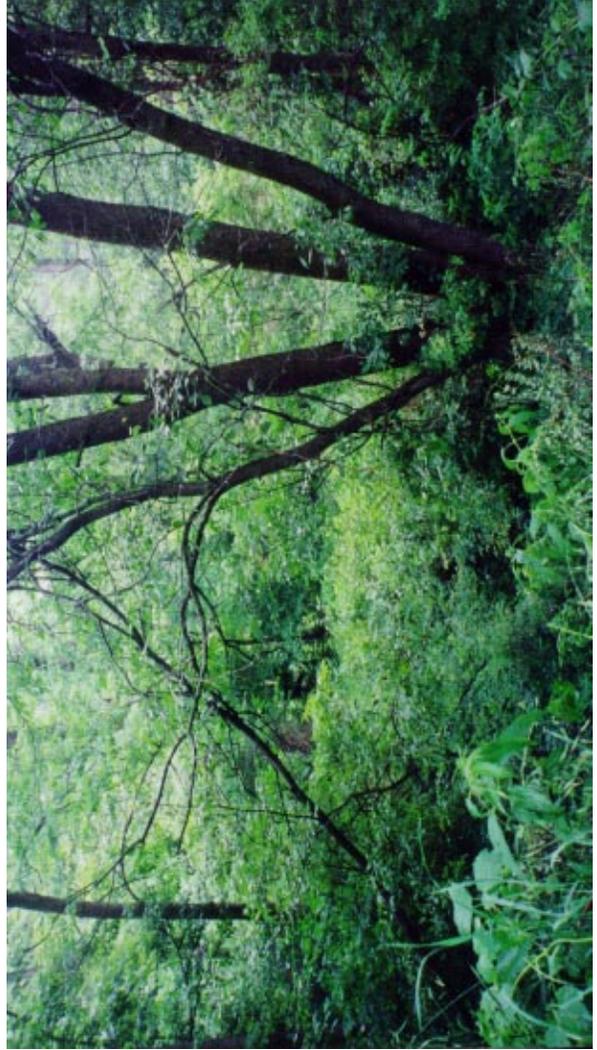
# Ahnapee River Corridor



Forestville Mill Pond



Ahnapee River



Wetland / lowland area

ALL PHOTOS BY COLEEN FEUCHT

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# BLACK ASH SWAMP

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## **LOCATION:**

The Black Ash Swamp, located in the Towns of Brussels and Forestville encompasses approximately 2100 acres in southeastern Door County (T25N, R25E). As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

Although the largest portion of the Black Ash Swamp lies in Kewaunee County, a significant section of the swamp is located in Door County. Within close proximity and directly to the north of the Black Ash Swamp is the Ahnapee River Corridor.

The Town of Brussels recently adopted a town-zoning ordinance and in 2002 was in the public hearing phase of implementing a comprehensive land use plan. The plan is expected to be complete early in 2003. The Town of Forestville has not as yet adopted a county or a town-zoning ordinance although discussions have continued for the past few years.

## **ECOLOGICAL SIGNIFICANCE:**

The Black Ash Swamp is the largest contiguous forest in southern Door County (Zimmerman, 1989), and continues into Kewaunee County where it forms, by far, the largest block of forested land in Kewaunee County. The swamp covers approximately 5000 acres in total and 2100 acres in Door County. This 2 mile-wide and 6-mile long habitat is extremely significant ecologically as it represents the largest contiguous block of habitat in this subregion. Numerous species of wildlife are known to utilize the mix of lowland forest, shrub carr, sedge meadow, emergent marsh and open water habitats that this area provides. In addition, the Black Ash Swamp is known to harbor the state-threatened Red-shouldered Hawk (*Buteo lineatus*) and the federally protected and the endangered Hines Emerald dragonfly (*Somatochlora hineana*). Lowland forests of this size are regionally rare in Wisconsin and the Black Ash Swamp represents an opportunity to protect such a forest.

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

The swamp is 2 miles wide (east-west) and 6 miles long (north-south), three quarters of which is located in Kewaunee County and for generations has been a favored hunting spot for local sportsman.

## **SITE FEATURES:**

### **Black Ash Swamp**

The Black Ash Swamp is the northern tip of a large block of lowland forest and swamp extending into Door County from Kewaunee County. It is drained by Silver Creek into the lower Ahnapee River. The swamp has diverse wildlife habitat used by many plants and animals.

- The surrounding land use is mostly agricultural with lesser amounts of woodland, other natural area, and idle cropland.
- Soils are mostly very poorly drained to poorly drained, nearly level organic soils (USDA SCS 1978).
- The primary surface water body is Silver Creek, which discharges into the Ahnapee River near the city of Algoma.

- Dominant tree species of this forested wetland include silver maple (*Acer saccharinum*), red maple (*Acer rubrum*), and green ash (*Fraxinus pennsylvanica*). Associated species are white cedar (*Thuja occidentalis*), balsam fir (*Abies balsamea*), paper birch (*Betula papyrifera*), yellow birch (*Betula alleghaniensis*) balsam poplar (*Populus balsamifera*), willow (*Salix spp.*) and black ash (*Fraxinus nigra*).
- Fishers (*Martes pennanti*) have been reported but are not typical inhabitants. Birds known to the Black Ash Swamp include Pileated Woodpeckers (*Dryocopus pileatus*), Least Flycatchers (*Empidonax minimus*) and various ducks and other waterfowl.
- The state threatened Red-shouldered Hawk is found in this habitat. In addition the federally protected and endangered Hines Emerald dragonfly has been documented at this site, near the Door-Kewaunee County line.

#### **CONSERVATION GOALS:**

- Maintain ecological integrity of the Black Ash Swamp, as part of one of the largest forested wetland tracts in Northeast Wisconsin.
- Enhance and maintain the surface and groundwater quality of the site.
- Restore the quality of and protect the water sources of the tributaries supporting this large wetland.

#### **THREATS:**

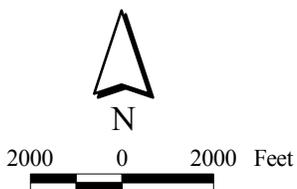
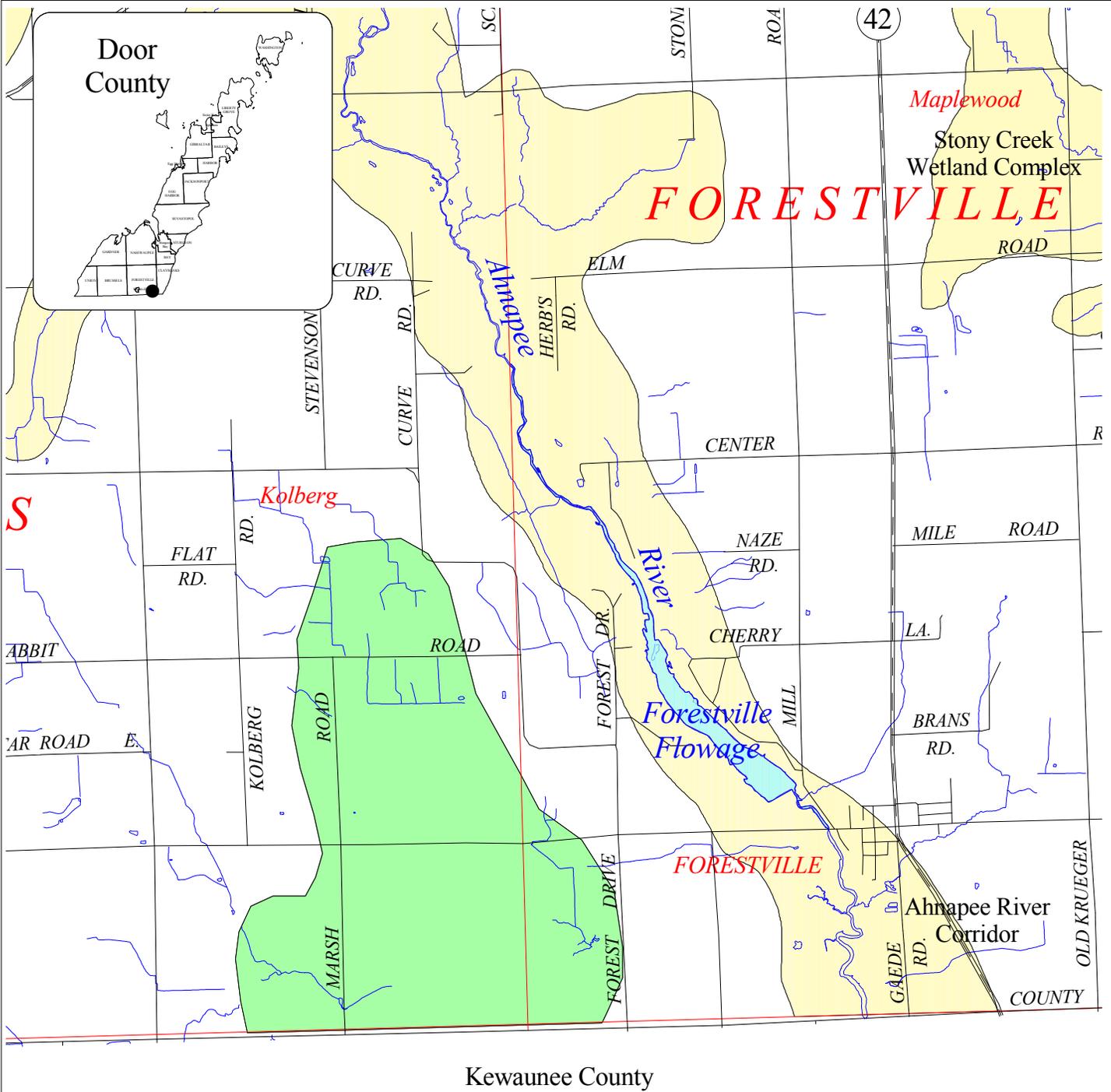
- Poor logging practices could threaten the ecological value of the swamp, however sustainable forestry may preserve the integrity of the swamp.
- An increasing population of Gypsy Moth has been recently observed and may pose a threat.
- Poor agricultural practices could threaten this watershed and other nearby wetlands.

#### **INFORMATION NEEDS / GAPS:**

- Plant and animal inventories
- List of individuals and organizations interested in land conservation

# Black Ash Swamp

## Door County, Wisconsin



- Black Ash Swamp
- Adjacent Project Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Black Ash Swamp



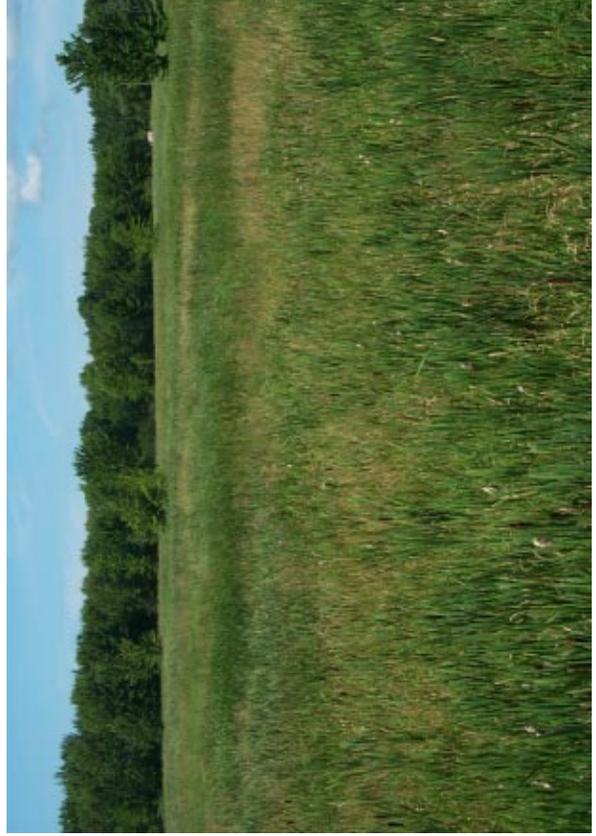
Eastern edge of Black Ash Swamp



Wet meadow & lowland hardwood forest



Swamp Interior



Emergent Marsh

ALL PHOTOS BY PAT ROBINSON

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# DELWICHE – SAND HILL PINERIES & FABRY CREEK COMPLEX

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## **LOCATION:**

Delwiche-Sand Hill Pineries & Fabry Creek Complex covers approximately 930 acres in southwestern Door County (T25N, R23E) in the Town of Union. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The forest cover of this site ranges from dry xeric on top of the escarpment to wet-mesic across the west-facing slope near Highway 57. This area is known for its large diameter native red pine (*Pinus resinosa*) and white pine (*Pinus strobs*) trees. Fabry Creek, a 3.7-mile long stream runs through this complex. The western edge of the Niagara Escarpment can be seen as ridges or small bluffs in the interior portion of the Pinery. A major wildlife corridor runs north and south paralleling the edge of the wooded bluff (Lukes 2001).

The Union community has been working to develop a local zoning ordinance. The town board has been gathering information, conducting community surveys and holding public meetings to help define a workable ordinance. Adoption of an ordinance is anticipated in 2003. State-mandated zoning applies to land use along shorelines and navigable streams.

## **ECOLOGICAL SIGNIFICANCE:**

Several features of the Delwiche-Sand Hill Pineries & Fabry Creek Complex make this area ecologically significant, including the presence of dry xeric forests (which are relatively uncommon in Door County), large diameter native red pine and white pine, the Niagara Escarpment, and Fabry Creek. The south forty of Delwiche Woods contains one of the most pristine stands of native trees and shrubs in eastern Wisconsin (Lukes 2001).

The pinery thrives along the top western edge of the Niagara Escarpment with stands of predominantly white pines and red pines of at least 100 years old. This parcel has been enrolled in the Managed Forest Law Program since the mid 1990's and only recently has timber been selectively harvested. As far as the owners can tell, up until this time, the forest has not been logged since the Peshtigo Fire of October 1871. The pinery remains a good example of uninterrupted succession over the past 125 years.

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

Belgian immigrants were attracted to this area of the county between 1853 and 1857 from their homes, primarily in the south central provinces of Brabant, Hanant and Namur. Extensive mixed forests provided logs for the first structures erected by the Belgians. Few of these buildings exist today. Most were leveled in early October 1871 by extensive and intense fires (exactly contemporaneous with, but unrelated to, the Great Chicago Fire), which destroyed buildings, crops, livestock, timber and took more than 200 lives. The fire partially cleared thousands of acres, and land was thus more readily available for farming (Laatsch and Calkins 1992).

## **SITE FEATURES:**

### **Delwiche – Sand Hill Pineries Area**

- The complex is predominantly natural forest area, intermixed with cropland, pasture and selectively logged woodlots.

- A small man-made spring fed pond located at the interior portion of the woods supports a diversity of aquatic plant and animal life, including amphibians and waterfowl.
- Soils are deep, well drained to moderately well drained, and gently sloping to sloping. A fine sand or sandy loam subsoil overlays sand or sand and gravel outwash, and very poorly drained nearly level organic soils (USDA SCS 1978).
- Large white and red pine dominate the xeric forest. Other tree species include pin oak (*Quercus ellipsoidalis*), northern red oak (*Quercus rubra*), white oak (*Quercus alba*), bitternut hickory (*Carya cordiformis*), butternut (*Juglans cinerea*), shagbark hickory (*Carya ovata*), blue beech (*Carpinus caroliniana*), sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red maple (*Acer rubrum*), ironwood (*Ostrya virginiana*), Canada hemlock (*Tsuga canadensis*), eastern cottonwood (*Populus deltoides*), hawthorn (*Crataegus spp.*), large-toothed aspen (*Populus grandidentata*), paper birch (*Betula papyrifera*), white cedar (*Thuja occidentalis*), and wild black cherry (*Prunus serotina*).
- Common shrubs include red-berried elder (*Sambucus pubens*), choke cherry (*Prunus virginiana*), witch hazel (*Hamamelis virginiana*), red-osier dogwood (*Cornus stolonifera*), round-leaved dogwood (*Cornus rugosa*), maple-leaf viburnum (*Viburnum acerifolium*), nannyberry viburnum (*Viburnum lentago*), and blueberry (*Vaccinium spp.*) Wildflowers are commonly found blooming in the spring. Door County's official wildflower, the large yellow lady's-slipper orchid (*Cypripedium pubescens*), is among them (Lukes 2001).
- Wildlife include typical species of this region such as white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), songbirds, red and gray squirrel (*Tamiasciurus hudsonicus* and *Sciurus carolinensis*), eastern cottontail (*Sylvilagus floridanus*), raccoon (*Procyon lotor*), and striped skunk (*Mephitis mephitis*) (Lukes 2001).
- Delwiche Pinery is an unusual forest type in Door County and therefore has high aesthetic value. The pine forest is associated with the Southern Door County Pineries and the western edge of the Niagara Escarpment. Delwiche Woods still exists because of the land stewardship approach of the Roy Delwiche family.

### **Fabry Creek**

Fabry Creek is a 3.7-mile long high gradient stream with approximately 2.7 miles of the stream within Door County. Headwaters originate mainly in a wooded wetland, and the stream empties into Green Bay.

- The surrounding land use is mainly mid-successional wooded and agricultural areas.
- Soils are of Rousseau-Kiva-Markey association, similar to Delwiche Pinery (USDA SCS 1978).
- Fabry Creek is a high gradient stream with a fair ranking supporting a limited community of forage fish and aquatic life (Corbisier 2000).

**CONSERVATION GOALS:**

- Maintain and enhance connectivity between remnant tracts of pine forest.
- Protect the natural features and characteristics of this mature forest of pines.

**THREATS:**

- The most immediate threat to Delwiche Pinery is the possibility that a portion of the older growth pine woods, would be included in the expansion of State Hwy 57.
- Agricultural practices lack stream buffers to protect water quality within Fabry Creek.
- Fabry Creek receives considerable amounts of nutrients, sediments, and bacteria according to water samples. Portions of the creek have been ditched, pastured, or have feed lots next to the creek (Sweeney et al. 1996).

**INFORMATION NEEDS / GAPS:**

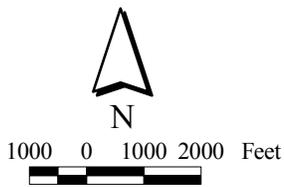
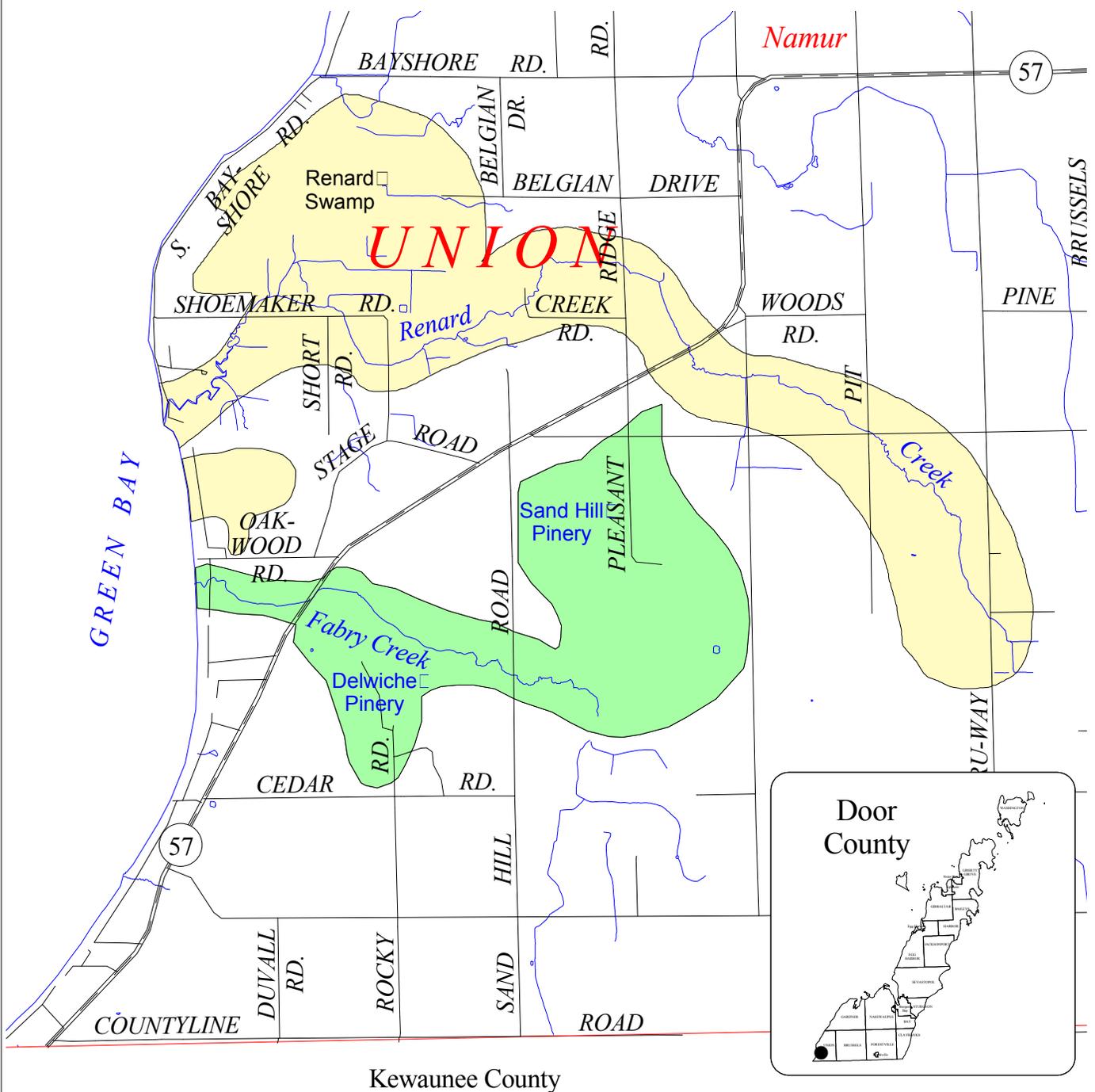
- Plant and animal inventories have not been completed and are needed to determine if threatened or endangered species are in the area of this site.
- Fish and invertebrate inventories in Fabry Creek



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# Delwiche - Sand Hill Pineries & Fabry Creek Complex

Door County, Wisconsin



- Delwiche - Sand Hill Pineries & Fabry Creek Complex
- Adjacent Project Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Delwiche Pinery / Sand Hill Pinery & Fabry Creek Complex



Red Pines

JERRY VISTE



COLEEN FEUCHT

Flowering shrubs



COLEEN FEUCHT

Forested portion of North Escarpment

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# RENARD SWAMP

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## **LOCATION:**

Renard Swamp is located in the Town of Union along the southwestern shoreline of Door County (T26N, R23E). The area contains approximately 1,570 acres of wetland habitat near the bay of Green Bay. As this report represents general areas of concern, exact location of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Renard Swamp area contains three significant habitats: southern hardwood swamp, mesic-wet beach ridges, and Renard Creek. The creek is a portion of the Red River & Sturgeon Bay Priority Watershed Program. The YMCA owns a small portion of the site.

The Town of Union community has been working to develop a local zoning ordinance. The town board has been gathering information, conducting community surveys and holding public meetings to help define a workable ordinance. Adoption of an ordinance is anticipated in 2003. State-mandated zoning applies to land use along shorelines and navigable streams.

## **ECOLOGICAL SIGNIFICANCE:**

This wetland area is significant in that it represents an intact example of a significant sized stand of southern hardwood forest, and associated drainage corridor, in a relatively undisturbed condition. The Renard Creek Corridor is mainly blocks of scenic, mixed upland forest and pineries associated with several creeks, drainage ways, escarpments, terraces, and shores (Zimmerman 1989). The value of the hardwood swamp and creek is as a large contiguous block of natural habitat for a variety of plant and animal species.

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

J. P. Schumacher explored the areas around Shoemakers Point and Renard Creek in the early 1900's in search of Indian village sites and burial places. He found evidence of Potawatomi campsites and other indications of aboriginal residence (Schumacher 1918). Many of the artifacts he unearthed are located at the Neville Museum in Green Bay.

The area attracted Belgian immigrants primarily coming from the south central provinces of Brabant, Hanant and Namur. Extensive mixed forests provided logs for the first structures erected between 1853 and 1857. Few of these buildings exist today. Most were leveled in early October 1871 by extensive and intense fires (exactly contemporaneous with, but unrelated to, the Great Chicago Fire), which destroyed buildings, crops, livestock, timber and took more than 200 lives. The fire partially cleared thousands of acres, and land was thus more readily available for farming (Laatsch and Calkins 1992).

## **SITE FEATURES:**

### **Hardwood Swamp**

This portion of the site is a large (200 acres) wooded area and contains at least 110 acres of wetlands, including a significant southern hardwood swamp, with wet-mesic beach ridges. Preliminary surveys show a high diversity of plant and animal species (SWIS 1992).

- The surrounding land use is primarily woodlots and lesser amounts of cropland, recreational private and idle farmland.
- Soils underlying the hardwood swamp are poorly drained and nearly level to sloping.

- Near the Green Bay shoreline, soils are deep, poorly drained, nearly level and underlain by fine sand outwash or silt loam subsoil over stratified lake sediments (USDA SCS 1978).
- Renard Creek and portions of Silver Creek provide a drainage function for the swamp and hardwood areas.
- Vegetation consists of silver maple (*Acer saccharinum*), green ash (*Fraxinus pennsylvanica*), willow (*Salix spp.*), wood nettle (*Laportea canadensis*), ferns, sedges (*Carex spp.*) and dense stands of Canada yew (*Taxus canadensis*) on the edge of the swamp and on adjacent ridges. The habitat is considered high quality and diverse (SWIS 1992). Numerous standing dead trees are present affording good wildlife habitat.
- Renard Swamp is a good breeding habitat for frogs. Songbirds, woodpeckers, nuthatches, finches, orioles, and waterfowl use the wet woodland during the summer months. White-tailed deer, wild turkey (*Meleagris gallopavo*), coyote (*Canis latrans*), and red fox (*Vulpes vulpes*) have been known to reside in this area.
- Plant and animal inventories have not been completed and are needed to determine if threatened or endangered species are in the area.

### **Renard Creek**

Renard Creek is approximately 6 miles in length, and is part of the 11.5 square mile Renard Creek subwatershed. This perennial stream is a warm water forage fishery. The upper section of the stream flows intermittently and floods easily; the lower reach flows continuously and is more stable. Renard Creek flows into Green Bay about 3 miles north of the Door County line (Sweeney et al., 1996). The fair to poor habitat ranking of the stream is possibly due to the many small dairy farms along the length of the stream (Corbisier 2000).

- The surrounding land use is primarily pastured or cropped with very little buffering along the stream course. At the point where the two branches converge and extending to where Renard Creek empties into the waters of Green Bay, the primary land use is wooded residential.
- Soils are deep, moderately well drained, and nearly level to sloping soils with a loamy sand to silt loam subsoil over sandy loam or loam till (USDA SCS 1978).
- Renard Creek is considered a warm water forage fish community, indicating that waters are capable of supporting an abundant diverse community of forage fish and other aquatic life (Sweeney et al. 1996).
- Vegetation has not been documented, however filamentous algae has been seen in the creek (Corbisier 2000).
- Spring runs of suckers (*Catostomus spp.*) occur annually along with intermittent use of the stream by smelt (*Osmerus mordax*) and occasionally northern pike (*Esox lucious*). Otters (*Lutra canadensis*) have been seen near the mouth of Renard Creek and the Bay of Green Bay (Corbisier 2000).
- It is unknown if threatened or endangered plant and animal species are present, as biological inventories are incomplete.

### **South Renard Swamp**

Another section of the Renard Swamp Complex is referred to as South Renard Swamp. The area contains 70 acres of wetland occupied by both upland and lowland species (SWIS 1992).

- The surrounding land use is mainly woodlots with a lesser amount of cropland, residential, and other natural area.
- Fine sand or sandy loam sub-soil overlays sand or sand and gravel outwash that is poorly drained, nearly level, and organic (USDA SCS 1978).
- The lower reaches of Renard Creek flow near South Renard Swamp.
- Vegetation consists of green ash, silver maple, swamp white oak (*Quercus bicolor*), elm (*Ulmus americana*), sensitive fern (*Onoclea sensibilis*), marsh marigold (*Caltha palustris*), sedges, Iris (*Iris spp.*), and a mix of upland and lowland species. There has been some past cutting; however, the wetland remains relatively undisturbed (SWIS 1992).
- It is unknown if any threatened or endangered plant and animal species are present, as biological inventories have not been completed.

### **CONSERVATION GOALS:**

- Maintain the exceptional quality of natural communities in and around the hardwood swamp (i.e., the sand beach ridges and silver maple stands and wetlands).
- Improve and maintain water quality in Renard Creek.

### **THREATS:**

- Poor logging practices
- Renard Creek has a fair to poor habitat rating for quality of aquatic life. The habitat is being degraded by outside sources. Limiting factors contributing to poor stream quality include sedimentation, excessive plant growth, and pasturing of stream banks, especially in the headwaters of the creek. A potential source of these problems is cropland erosion (Sweeney et al., 1996).
- The exotic plant, common reed grass (*Phragmites australis*) and reed canary grass (*Phalaris arundinacea*), has been found in the area. The spread of these exotic plants could threaten native plant species (Corbisier 2000).
- Renard Creek has a fair to poor habitat ranking possibly due to organic pollution from area farming operations.

### **INFORMATION NEEDS / GAPS:**

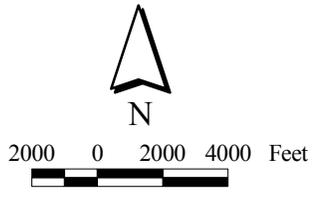
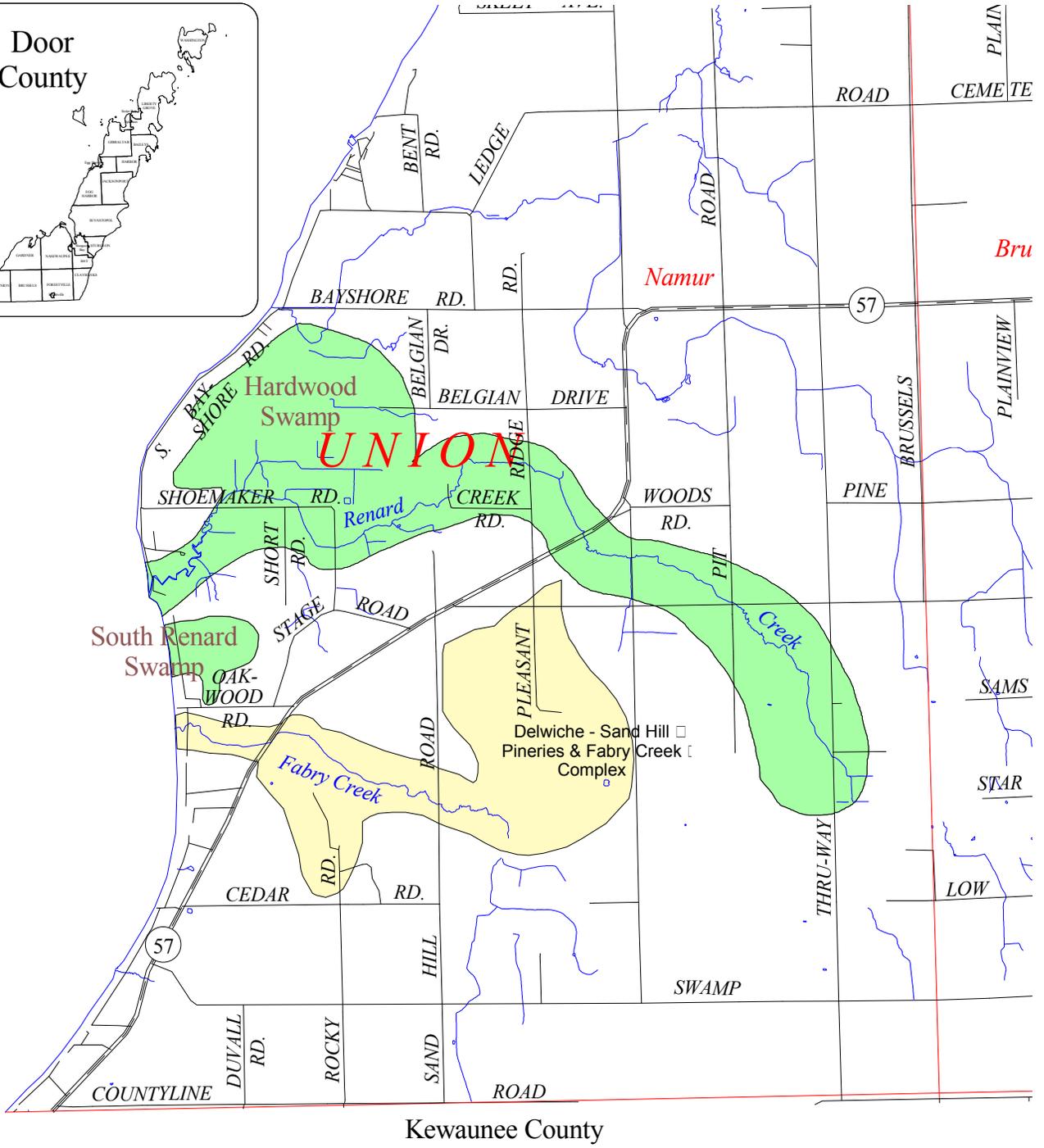
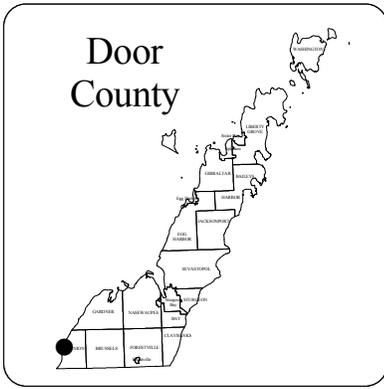
- Plant and animal inventories for the entire site
- List of individuals and organizations interested in land conservation



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# Renard Swamp

## Door County, Wisconsin



- Renard Swamp
- Adjacent Project Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

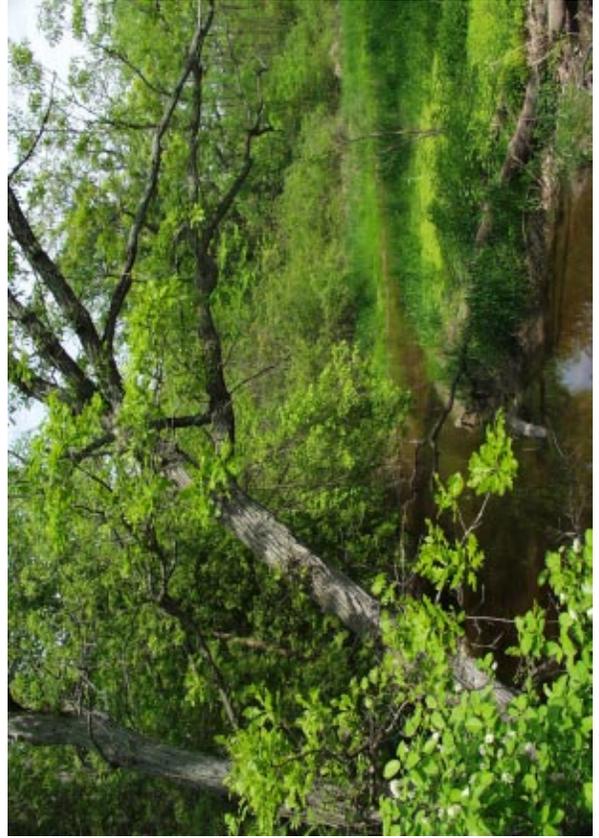
# Renard Swamp



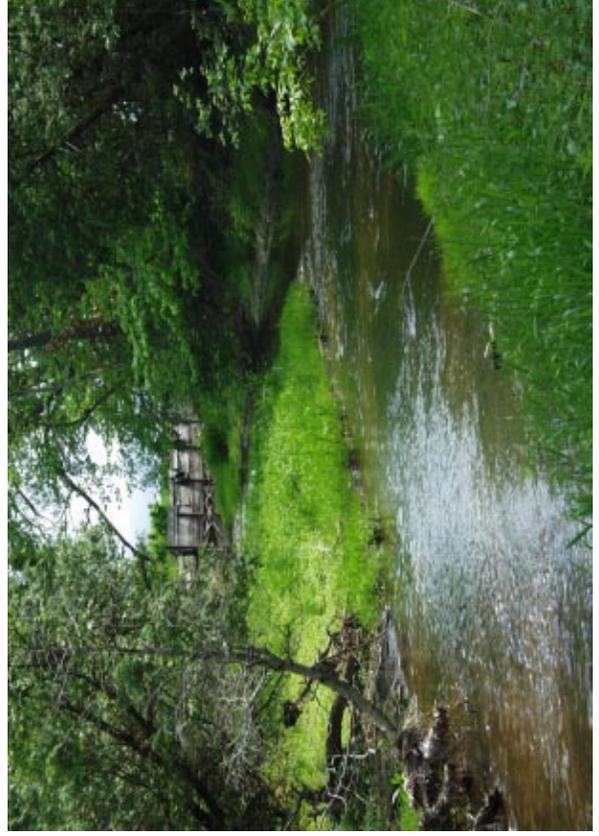
Lowland Area



Lowland area Renard Swamp



Renard Creek



Renard Creek

ALL PHOTOS BY COLEEN FEUCHT

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# STONY CREEK WETLANDS COMPLEX

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## LOCATION:

The Stony Creek Wetlands Complex covers approximately 6,370 acres and lies in southeastern Door County (T25-26N, R25E) in the Towns of Forestville and Nasewaupee. As this report represents general areas of concern, exact location of boundary lines have not been designated.

## GENERAL SITE DESCRIPTION:

Stony Creek Wetlands Complex is situated north of the Ahnapee River Corridor and connects with the Sawyer Harbor/Lost Creek & Larson Creek Watershed Complex and the Hungry Settlement Marsh to the north.

As of 2002, the Town of Forestville had not adopted a county or a town-zoning ordinance, however numerous discussions have taken place over the past few years. The Town of Nasewaupee does not currently utilize land use regulation or zoning, except for state-mandated zoning of shorelines and navigable streams; however, a planning initiative was started in the summer of 1997. Numerous public meetings, surveys, informational forums have taken place and along with professional land use planning services are being used to develop a comprehensive land use plan. Considerable information has been gathered, all leading toward a land use framework that reflects the public's wishes and intentions. Many community members are volunteering substantial time and energy at various levels to develop the town's comprehensive land use plan, which is scheduled for completion in the summer of 2003.

## ECOLOGICAL SIGNIFICANCE:

The "Heritage Areas of Door County" publication lists wetlands in this complex among the three most important inland wetland resources of southern Door County (Emmerich 1978). Also, this wetland complex is regarded as the second most important wildlife heritage area of southern Door County (Zimmerman 1989).

The Stony Creek Wetland Complex is the largest creek system in the southern portion of the county and the extensive lowland and upland areas provide habitat for fish, animals and plants. In addition to being home to an ecologically significant wetland system, this complex joins with the Sawyer Harbor/Lost Creek & Larson Creek Watersheds Complex and the Hungry Settlement Marsh to form a contiguous 10,000-acre corridor extending from the Door County line north to Sawyer Harbor.

Preliminary summer bird surveys for this site found Sora (*Porzana carolina*), Virginia Rail (*Rallus limicola*), Swamp Sparrow (*Melospiza georgiana*), Common Yellowthroat (*Geothlypis trichas*), Red-winged Blackbird (*Agelaius phoeniceus*) (one of North America's most seriously declining songbirds), Green Heron (*Butorides virescens*), Golden-winged Warbler (*Vermivora chrysoptera*), Black-billed Cuckoo (*Coccyzus erythrophthalmus*), Sandhill Crane (*Grus canadensis*), Hooded Merganser (*Lophodytes cucullatus*), Sedge Wren (*Cistothorus platensis*), and Alder Flycatcher (*Empidonax alnorum*) in the open shrub-filled wetlands along the stream north of Carnot.

## NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:

Along the shoreline around and north of Stony Creek were at one time, several villages – Foscoro, Clay Banks, and Horns Pier. Each of these villages had a post office and telegraph station. Some time in the 1860's, three men picked a favorable spot, where Stony Creek rambles down among its rocks to the lake, to construct a mill and pier for shipping of forest products. Their names were Foster, Coe and Rowe, hence one of the village names was a combination of the first syllables of their surnames "Fos-co-ro" (Holand 1917).

A description of Foscoro was written in 1871 and appeared in the Milwaukee News of March 15, 1871. “ To the north of the village plat, about a quarter of a mile, a high bluff at the lake recedes some forty or fifty rods and diminishes to a gentle hill, which extends southeasterly about the same distance from the lake for some miles and then returns to the shore again. Within this amphitheater is in the future, the sweetest village that the waves of Lake Michigan shall kiss. . . . . One other feature I must tell you. Into this amphitheater comes a stream, nearly as large as Cedar Creek in Ozaukee County, bounding along as if glad to get there, and then stops in a quiet estuary at the lake and smiles upon the scene.

The Indian name of this stream I understand to be *Sensippi*, which I am informed means “stream of rocks”, a name very appropriate, as its bed is filled with the freight of some former glacier” (Holand 1917). The small villages of Clay Banks, and Horns Pier are discussed later in the section “Southern Lake Michigan Shoreline” found on page 61.

## **SITE FEATURES:**

### **Stony Creek Wetland Complex**

Stony Creek begins in a series of low seasonally flooded hardwood swamps and perennial wetlands north of Maplewood and south of Highway 57. Upstream of Geier Road the small streams that drain these wetlands unite to form the main stem of Stony Creek. From Geier Road to Carnot the stream flows through a wide wetland of open emergent marshes that are interspersed with banks of willow, dogwood, nanny berry (*Viburnum lentago*), sweet gale (*Myrica gale*), meadow sweet (*Spiraea alba*), and alder or small patches of lowland forest. In this section the stream, at times, becomes wide enough to take on the appearance of a small river.

Below County Road J the character of the stream changes again. The riparian wetlands disappear and the current of the water increases until just upstream of County Road U. Stony Creek becomes a rushing creek bounded by a narrow damp forest terrace and steep forested banks. The stream empties into Lake Michigan just south of the Door County line. Throughout its length the Stony Creek complex is a landscape of second growth forest patches, active farmlands, and extensive wetlands of various types.

- Soils are of two types. The area is primarily composed of deep, well drained to poorly drained nearly level to sloping soils. A loamy sand to silt loam subsoil overlies sandy loam or loam till. The second type is very poorly drained, nearly level organic soils (USDA SCS 1978).
- Stony Creek is 13.6 miles long and approximately 16 feet at its widest point. It has a low gradient of 8.5 feet/mile. The upper reaches of the stream are classified as a warm water forage fishery and the lower 5 miles are classified as Cold Class II Water. A variation of water quality occurs between the upper and lower reaches of the stream. Upper portions have been ditched and are slow moving (Corbisier 2000).
- The forests comprising this landscape are generally second growth with silver maple, green ash and elm dominating the hardwood swamps in the headwaters of the stream. In the center section of the complex the forest types include lowland white cedar and a mix of hardwoods and cedar. The dominant plant of the open emergent wetlands above Carnot is reed canary grass (*Phalaris arundinacea*). Mixed with this aggressive grass are coarse sedges (e.g., *Carex aquatilis*), and large wetland forbs (e.g., *Solidago spp.*, *Eupatorium spp.*). Common aquatic macrophytes in this stretch include coontail (*Ceratophyllum demersum*), yellow pond lily (*Nuphar variegata*), and (*Spirodela polyrrhiza*).
- Stony Creek is stocked annually with rainbow trout (*Oncorhynchus mykiss*). Other species of fish present include suckers (*Catostomus spp.*), rainbow smelt (*Osmerus mordax*), and Chinook salmon (*Oncorhynchus kisutch*).

- It is unknown if any threatened or endangered plant and animal species exist in the area, as biological inventories are incomplete.

#### **CONSERVATION GOALS:**

- Increase the width of the riparian forest throughout the Stony Creek Wetlands Complex, including upland forests as well as lowland forests throughout the tributaries of Stony Creek.
- Remove and prevent further barriers to fish passage and protect or restore water flow dynamics within the wetlands complex and Stony Creek.

#### **THREATS:**

- Samples taken near the mouth of Stony Creek show occasional elevated concentrations of phosphorus, ammonia, and bacteria (Corbisier 2000). Contamination of the stream and wetlands is possibly occurring from non-point source pollution. (Watermolen and Bougie 1995).
- Residential and agricultural encroachment.
- Groundwater is susceptible to water quality problems due to shallow soils and exposed fractured bedrock. Recent monitoring showed a number of wells with elevated nitrate and bacteria concentrations (Watermolen and Bougie 1995).
- Aggressive exotic species, especially reed canary grass (*Phalaris arundinacea*).

#### **INFORMATION NEEDS / GAPS:**

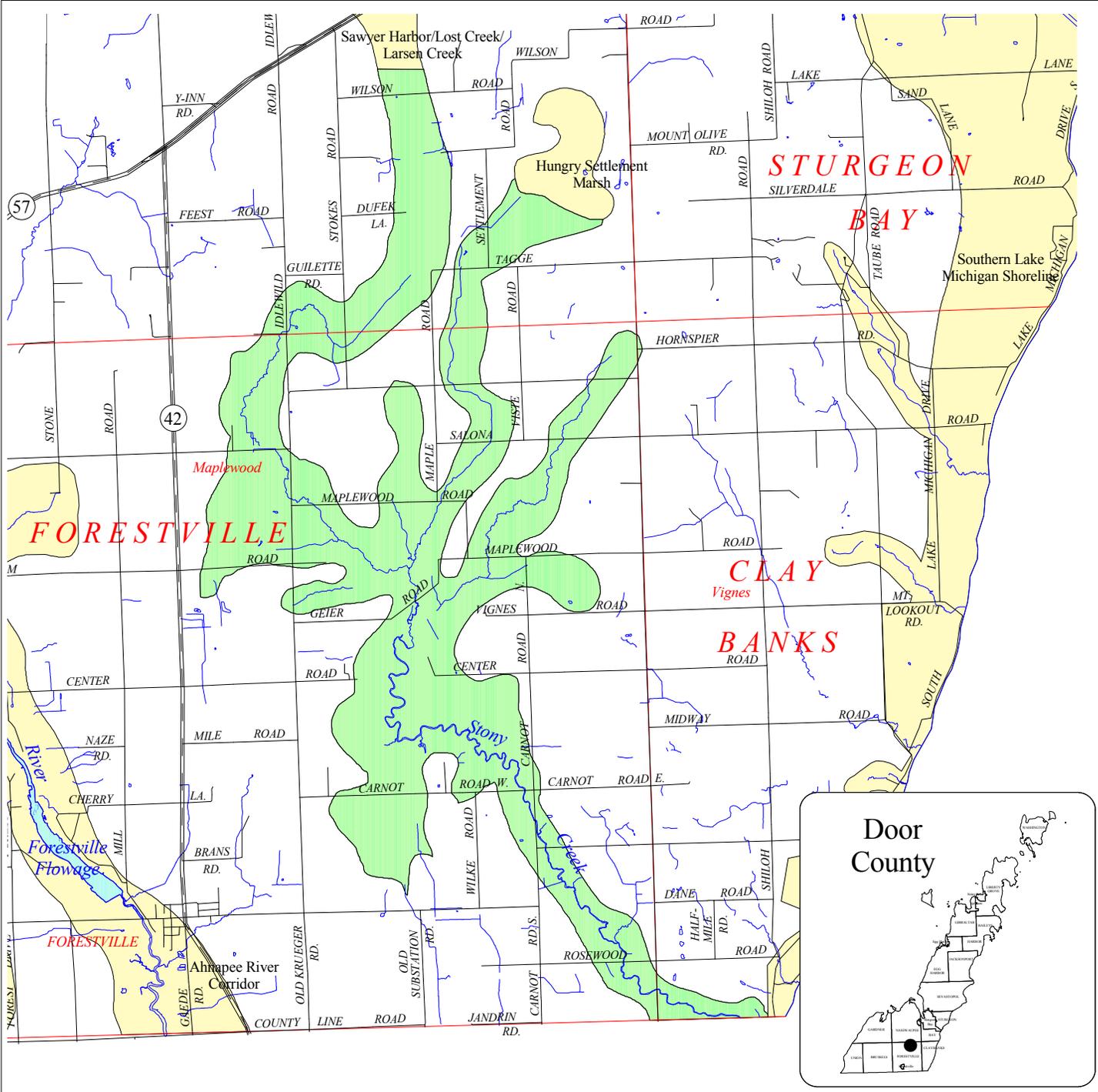
- Plant and animal inventories, especially birds, fish, and amphibians
- Names of supportive groups and individuals within this site



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# Stony Creek Wetlands Complex

## Door County, Wisconsin



2000 0 2000 4000 Feet



- Stony Creek Wetlands Complex
- Adjacent Project Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

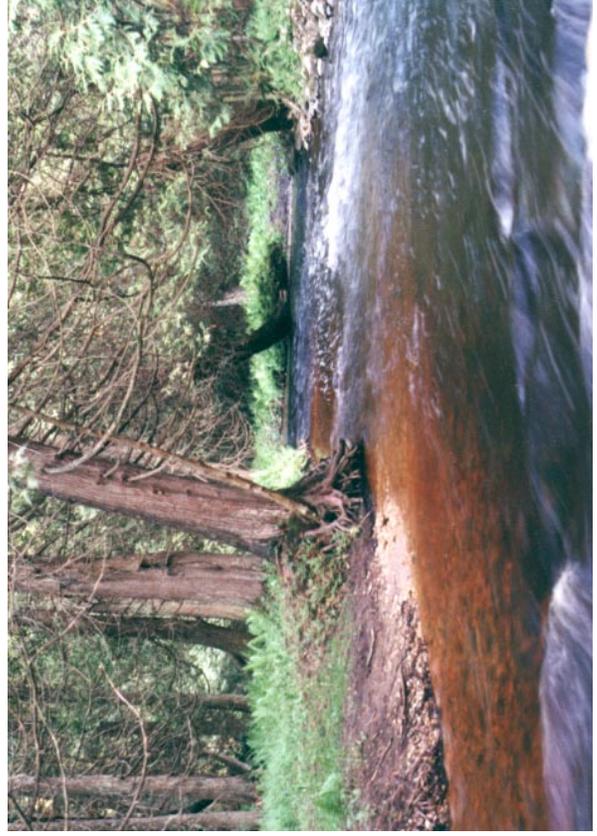
# Stony Creek Wetlands Complex



Stony Creek, upstream of Carnot



Stony Creek, upstream of Carnot



Lower reaches of Stony Creek, near Lake Michigan

All photos by Mike Grimm

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# BRUSSELS HILL / KAYES CREEK GARDNER SWAMP COMPLEX

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## **LOCATION:**

This site is located in southwestern Door County between Brussels Hill and Little Sturgeon Bay (T26-27N, R24E) in the Towns of Brussels and Gardner. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The "Heritage Areas of Door County" publication recognizes Brussels Hill as a scenic and recreational area (Emmerich 1978). The area's caves also have historic importance (Zimmerman 1989). Brussels Hill is listed as a scenic vista because it offers a panoramic view from the Niagara Escarpment. Shale, shaley dolostone and limestone of the Upper Ordovician Maquoketa Formation underlie the Silurian dolostone that form the escarpment. That formation is relatively weak, easily deformed and erodible (Kasprzak and Walter 2001). Sinkholes, caves, and dry valleys make the area unsuitable for development. The complex and its associated wetland areas (i.e., Kayes Creek and Gardner Swamp) contain a number of rare plants, animals and invertebrates (See Appendix B). Fish spawning, bird nesting, and amphibian habitat are all important ecological functions of the area. The Town of Brussels has recently adopted a town-zoning ordinance and is currently in the public hearing phase for implementing a comprehensive land use plan. The plan is expected to be complete early in 2003. The Town of Gardner has conducted preliminary discussions about land use planning and has decided not to take any action at this time. However, state-mandated zoning regulations apply to shorelines and navigable streams.

## **ECOLOGICAL SIGNIFICANCE:**

The Brussels Hill/ Kayes Creek/ Gardner Swamp Complex covers approximately 7,125 acres. This region has large contiguous tracts of forests, wetlands, and dolostone karst features. Brussels Hill is the largest of several dolostone hills in southern Door County and it is located immediately adjacent to the Gardner Swamp. A large, contiguous block of hardwood forest dominated by sugar maple (*Acer saccharum*), basswood (*Tilia americana*), red oak (*Quercus rubra*), hemlock (*Tsuga canadensis*), aspen (*Populus tremuloides*), beech (*Fagus grandifolia*), paper birch (*Betula papyrifera*), and white cedar (*Thuja occidentalis*) characterizes the tree species at Brussels Hill (Clark 1999). One of the primary reasons that the hill is considered to be ecologically important to the area is the unique assemblage of animals supported by the dolostone rock formations. Two rare plant species, state threatened handsome sedge (*Carex formosa*) and the Wisconsin special concern species long-spurred violet (*Viola rostrata*), are found on Brussels Hill (Clark 1999). Three globally rare snails, including *Succinea bakeri*, *Catinella gelida*, and *Vertigo hubrichtii* (Kirk 1999), and the state threatened Red-shoulder Hawk are also found here (Clark 1999). The Gardner Swamp Area encompasses over 5 square miles, and contains a variety of ecologically important habitats including wetlands, sugar maple dominated forests, Kayes Creek, upland islands, and lowland forests.

A Wisconsin special concern species, long-spurred violet (*Viola rostrata*) has been found at Gardner Swamp (Clark 1999). The swamp also provides an important function as a filter for local groundwater and surface water resources. Kayes Creek flows through Gardner Swamp and empties into Little Sturgeon Bay, which is one of the most important shallow aquatic habitats in the Green Bay ecosystem. Gardner Swamp helps to protect the water quality of Kayes Creek, and subsequently the health of the Green Bay ecosystem.

## NOTEWORTHY HISTORICAL AND CULTURAL FEATURES:

In 1835, Increase Claflin built the first white man's house on the peninsula in the area at the mouth of Little Sturgeon Bay. A village of Menominee Indians, with whom Claflin got along well, was located on the opposite side of the bay on what is now called Squaw Point. Several years later Claflin left and traveled up the peninsula to settle in an area north of the present village of Fish Creek (Holand 1925).

Construction of lime kilns in the area began in the mid 1860's. These were furnaces used to reduce limestone to lime. E. B. Gardner was a major supplier of lime into the Chicago area as part of the rebuilding effort after the Great Chicago Fire of 1871. For many years vessels made weekly trips to Chicago carrying much of his kilns daily capacity of 160 barrels (Holand 1925). Several kiln sites remain and can be seen along the shoreline of the bay of Green Bay. Gardner was among the first shipbuilders on a large scale in the county and for a long period employed around 100 ship carpenters. Little Sturgeon was a very active place for many years, with at least one vessel per day leaving with lumber, lime or other products. When Joseph Harris started the Door County Advocate, in 1862, it was seriously debated whether the printing place should be located at Little Sturgeon Bay or at the county seat (Holand 1925).

## SITE FEATURES:

### Brussels Hill

Brussels Hill, located in the Town of Brussels, is a prominent scenic and natural area located 10 miles southwest of Sturgeon Bay and approximately 2 miles northeast of Brussels. Brussels Hill covers 2,194 acres, and is a two square mile dolostone outcrop extending 200 feet above the surrounding lowlands.

- Land use surrounding the hill consists primarily of agriculture, with lesser amounts of woodlots, residential area, roads (Hwy 57 and Hwy K), a radio tower, and a town dump.
- The Niagara Escarpment extends from New York State and Canada to central Wisconsin. Brussels Hill forms a dolostone outcrop of this escarpment in Door County. Fissures, sinkholes, outcrops and pit caves are characteristic karst formations found at Brussels Hill. Karst formations were formed by solution processes and modified by glacial activity (Kirk 1999).
- The state's deepest pit cave is located on private property near the southern portion of Brussels Hill. This cave was found to contain the remains of animals ranging in size from land snails to black bear. Analysis of the skeletal remains reveals a variety of species ranging in age from modern times to pre-settlement fauna of 600 – 1200 BP (Kox et al. 1986).
- Soils are generally shallow to deep, well drained, and nearly level to moderately steep slopes. A sandy loam or loam subsoil covers sandy loam or fine sandy loam till or in the case of Brussels Hill dolostone bedrock (USDA SCS 1978). Springs are located throughout the area.
- A large, contiguous block of hardwood forest dominated by sugar maple (*Acer saccharum*), basswood (*Tilia americana*), red oak (*Quercus rubra*), hemlock (*Tsuga canadensis*), aspen (*Populus tremuloides*), beech (*Fagus grandifolia*), paper birch (*Betula papyrifera*), and white cedar (*Thuja occidentalis*) characterizes the tree species at Brussels Hill (Clark 1999).
- A unique assemblage of animals is supported by ancient rock formations including several species of snails. Upland forest birds and mammals are found in the area (Zimmerman 1989).
- Two rare plant species include state threatened handsome sedge (*Carex formosa*) and the Wisconsin special concern species long-spurred violet (*Viola rostrata*) (Clark 1999). There are three globally rare snails including *Succinea bakeri*, *Catinella gelida*, and *Vertigo hubrichtii* (Kirk 1999). The state threatened Red-shoulder Hawk is also found at Brussels Hill (Clark 1999).

## Kayes Creek

Kayes Creek, located within both the Towns of Brussels and Gardner, is a perennial stream approximately 7 miles in length, with an average width of 4 feet and a gradient of 8 feet per mile.

- A variety of vegetation occurs adjacent to Kayes Creek. Upland forests contain sugar maple, basswood, hemlock, beech, red oak (*Quercus rubra*), aspen, and paper birch.
- Kayes Creek supports three aquatic community types: coldwater, warmwater sport fish, and warm water forage fish. Cold water communities contain surface water capable of supporting cold-water fish and aquatic life, as well as providing cold water spawning habitats. Warm water sport fish communities support sport fish and their spawning habitats, and warm water forage fish communities support an abundance of warm water forage fish and aquatic life (Corbisier 2000).
- Soils are of two types. The northern section of Kayes Creek, which flows into Little Sturgeon Bay, consists of deep, well to poorly drained, level to sloping soils. A loamy sand to silt loam subsoil covers sandy loam to loam till. The second type found near the headwaters of Kayes Creek is poorly drained, nearly level, and organic (USDA SCS 1978).
- Kayes Creek is the primary surface water body associated with the Gardner Swamp and arises in lowlands west of the north face of Brussels Hill. Two separate branches flow northward and later join. The creek continues north through Gardner Swamp until it enters Little Sturgeon Bay between Squaw Island Point and the mainland.
- Coastal wetlands bordering the mouth of the creek are important spawning locations for fish and are used extensively by breeding and migratory birds. Spring fish runs have been documented, including suckers (*Catostomus commersoni*), northern pike (*Esox lucious*), walleye (*Stizostedion vitreum*), and large bowfin (*Amia calva*) (Corbisier 2000).

## Gardner Swamp

The Gardner Swamp Area encompasses over 5 square miles, and contains a variety of habitats including wetlands, sugar maple dominated forests, Kayes Creek, upland islands, and lowland forests. The Gardner Swamp is located directly north of Brussels Hill in southern Door County approximately 10 miles west– southwest of Sturgeon Bay. Of the 5 square miles comprising Gardner Swamp, only 1.5 square miles are part of the Gardner Marsh State Wildlife Area. The remaining portion is privately owned.

- Land use consists predominantly of agriculture with lesser amounts of woodlots, residential, and commercial. Past and present disturbances in the Gardner Swamp include logging, quarrying, and clearings for campgrounds, recreation, and residential development (Clark 1999).
- Soils consist mainly of deep to moderately deep, well to poorly drained, and nearly level to moderately steep soils. Silty clay subsoil overlays silty clay or dolostone bedrock (USDA SCS 1978).
- Vegetation consists mainly of open to semi-open wetland. Wetland species include sedge (*Carex spp.*), cattail (*Typha spp.*), bulrush (*Scirpus spp.*), blue-joint grass (*Calamagrostis canadensis*), willow (*Salix spp.*), dogwood (*Cornus spp.*), black ash (*Fraxinus nigra*), green ash (*Fraxinus pennsylvanica*), white cedar, elm (*Ulmus americana*), aspen, paper birch and tamarack (*Larix laricina*). Sugar maple, basswood, hemlock, beech, red oak, aspen, and paper birch dominate upland forest areas (Clark 1999).

- The main surface water body of Gardner Swamp is Kayes Creek.
- A Wisconsin special concern species, long-spurred violet (*Viola rostrata*) is found at Gardner Swamp (Clark 1999). It is unknown if any additional threatened or endangered plants and animals are present, as biological inventories have not been completed.

#### **CONSERVATION GOALS:**

- Protect the remaining upland forest habitat throughout the Brussels Hill area and limit further fragmentation of the landscape.
- Restore and maintain the water quality and landscapes buffers along the Kayes Creek corridor to protect the fish-spawning habitat.
- Eliminate or prevent the introduction of exotic invasive species within the site (e.g., garlic mustard in the Brussels Hill area).
- Enhance the ecological integrity and landscape connectivity within the corridor of Brussels Hill, Gardner Swamp and Kayes Creek.

#### **THREATS:**

- Escalating numbers of residential and commercial developments, seasonal housing and recreational facilities threaten the ecological health of the area. Because of close proximity of this area to Sturgeon Bay and Green Bay, people find it convenient to live in this outlying area and commute to work in the city. This tendency is expected to increase with the upgrade of Highway 57 to a divided 4-lane road in the near future.
- Water quality is threatened in some areas by unsuitable septic system uses.
- Pesticide use and agricultural runoff from inadequately monitored/managed farms also contribute to water quality degradation. This is especially problematic in Door County because of shallow soils and fractured bedrock. Fractures act as pathways for polluted water to directly enter underground aquifers (Stieglitz and Schuster 1985), and contaminants are often not filtered by adequate soil amounts before contact is made with groundwater (Grimm et al. 1999).
- Water quality in Kayes Creek is threatened by low dissolved oxygen content and abundant algae growth. Sources of these threats are cropland erosion, stream bank pasturing, and barnyard or exercise lot runoff (Corbisier 2000).
- Agricultural lands and other open spaces are declining due to residential development. The average age of farmers is increasing as land prices are escalating, supporting an incentive to sell.

#### **INFORMATION NEEDS / GAPS:**

- Biological and habitat inventory for Brussels Hill and Kayes Creek

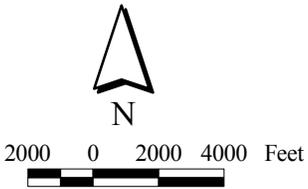
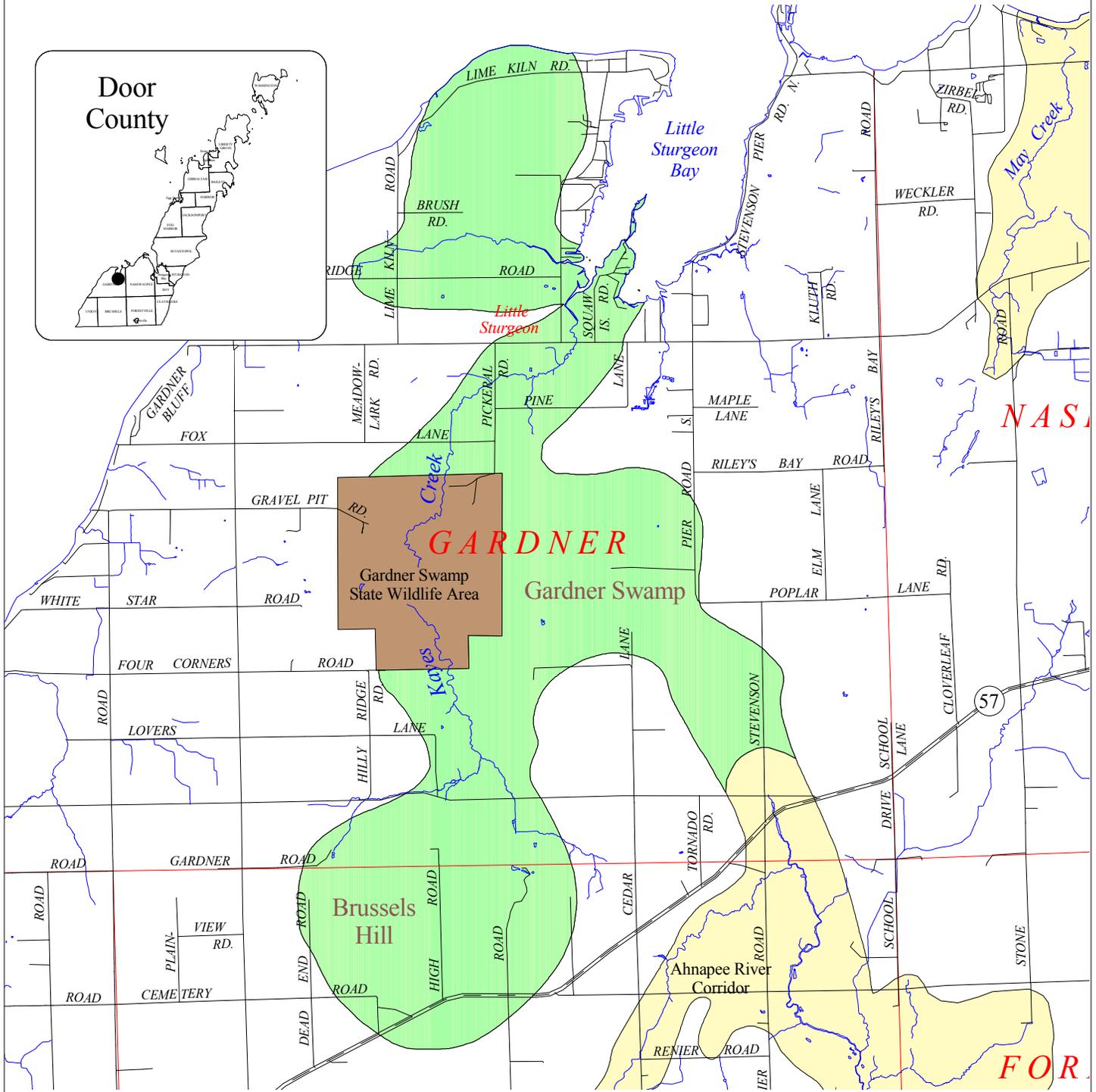
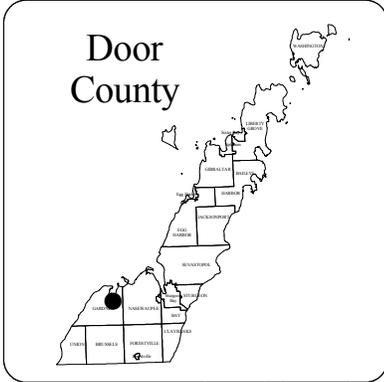
#### **ADDITIONAL REFERENCES:**

*Planning for Natural Areas in Door County, Wisconsin*, May 1995, by Laura E. Hewitt

*Glaciokarst Depressions in the Door Peninsula, Wisconsin, Physical Geology* 1987, by Carol Rosen and Michael Day

# Brussels Hill / Kayes Creek Gardner Swamp Complex

## Door County, Wisconsin



- Brussels Hill/Kayes Creek/  
Gardner Swamp Complex
- Adjacent Project Areas
- State Owned Lands/Parks

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Brussels Hill / Kayes Creek / Gardner Swamp Complex



Gardner Swamp



Kayes Creek



View of Brussels Hill from the south, looking north

ALL PHOTOS BY COLEEN FEUCHT

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# HUNGRY SETTLEMENT MARSH

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## **LOCATION:**

Hungry Settlement Marsh encompasses approximately 375 acres located south of Sturgeon Bay in east central Door County (T26N, R25E) in the Town of Nasewaupee. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

Hungry Settlement Marsh lies adjacent to the Ahnapee State Trail. The site contains an acid bog, a vegetation type that is rare in this area. Because current property owners are amenable to protection there is currently minimal threat to the marsh at this writing.

The Town of Nasewaupee does not currently utilize land use regulation or zoning, except for state-mandated zoning of shorelines and navigable streams. However, a planning initiative started in the summer of 1997 has spawned numerous public meetings, surveys, informational forums and professional land use planning services that are being used to develop a comprehensive land use plan. Considerable information has been gathered, all leading toward a land use framework that reflects the public's wishes and intentions. Many community members are volunteering substantial time and energy at various levels to develop the town's comprehensive land use plan, which is scheduled for completion in the summer of 2003.

## **ECOLOGICAL SIGNIFICANCE:**

This large wetland complex contains areas of bog, alder thicket, and tamarack swamp and is mostly surrounded with upland forest. The bog community found here comprises only a portion of the site but represents the key ecological feature of the site. The bog holds well developed sphagnum hummocks, and typical bog species like bog laurel, leatherleaf and bog rosemary. This unusual occurrence appears stable, free of aggressive non-native species, well buffered by surrounding forest and wetland communities with little evidence of human disturbance.

The Hungry Settlement Marsh contributes water to Stony Creek via a small tributary. Wetlands of this type are very rare in Door County. Bogs of this nature are more common in the northern sandy regions of Wisconsin. This is one of the few environments in the county where the bog laurel grows in great quantity and other plants typical of bogs are also found here. Alder thicket, open bog and shrub carr are three natural community types found within the marsh. (Refer to Appendix C for a more detailed description of these natural community types).

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

This is an area of the town of Nasewaupee that has large wetland parcels intermingled with higher lands more suited for farming. However, it has historically been a marginal farming region in comparison with other parts of the Town, resulting in references being made through the years to the "Hungry Settlement".

The present Ahnapee Recreational Trail utilizes the former Ahnapee and Western Railroad right-of-way. The marsh was centered in the chosen route for the railroad and proved to be a challenge for its entire life, with this section of the railway finally being stabilized after many years of annual rebuilding and costly fill with any material available. The impact to the marsh could have been avoided had the route of the railroad been moved only a half mile south.

## **SITE FEATURES:**

### **Hungry Settlement Marsh**

- The surrounding land use is predominantly cropland and rural residential, with lesser amounts of idle cropland.
- Soils are mainly deep to moderately deep, well drained to somewhat poorly drained and nearly level to moderately steep. Silty clay subsoil overlays silty clay till or dolostone bedrock (USDA SCS 1978).
- When viewing the bog from a distance it appears to be relatively dry, however when walking through it especially in the spring, the area can be quite wet. There is surface water bordering the length of the old railroad bed in what is more or less a drainage ditch (Lukes 2001).
- Vegetation consists of a locally unique plant assemblage which features, pink lady's slipper (*Cypripedium acaule*), bog laurel (*Kalmia polifolia*), leather leaf (*Chamaedaphne calyculata*), labrador tea (*Ledum groenlandicum*), wild cranberry (*Vaccinium spp.*), wintergreen (*Gaultheria procumbens*), bog rosemary (*Andromeda glaucophylla*), chokeberry (*Aronia spp.*), cotton sedge (*Carex spp.*), nannyberry (*Viburnum lentago*), tamarack (*Larix laricina*), black spruce (*Picea mariana*), and paper birch (*Betula papyrifera*) (Lukes 2001).
- Few birds or wildlife have been recorded from this site. In the northern portion of this site there is clear evidence of white-tailed deer (*Odocoileus virginianus*) damage to vegetation (Lukes 2001).
- It is unknown if any threatened or endangered plant and animal species are present, as biological inventories have not been completed.
- This is a well-hidden, incredibly beautiful bog. One of the best times to visit is late spring to early summer when many plants are in bloom, like the bog laurel that blooms in late May.

## **CONSERVATION GOALS:**

- Maintain the unique characteristics of the Hungry Settlement wetland community, and increase the size of the upland forest surrounding the wetland.

## **THREATS:**

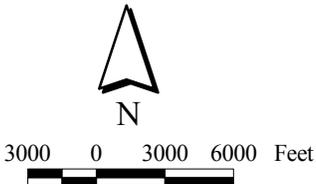
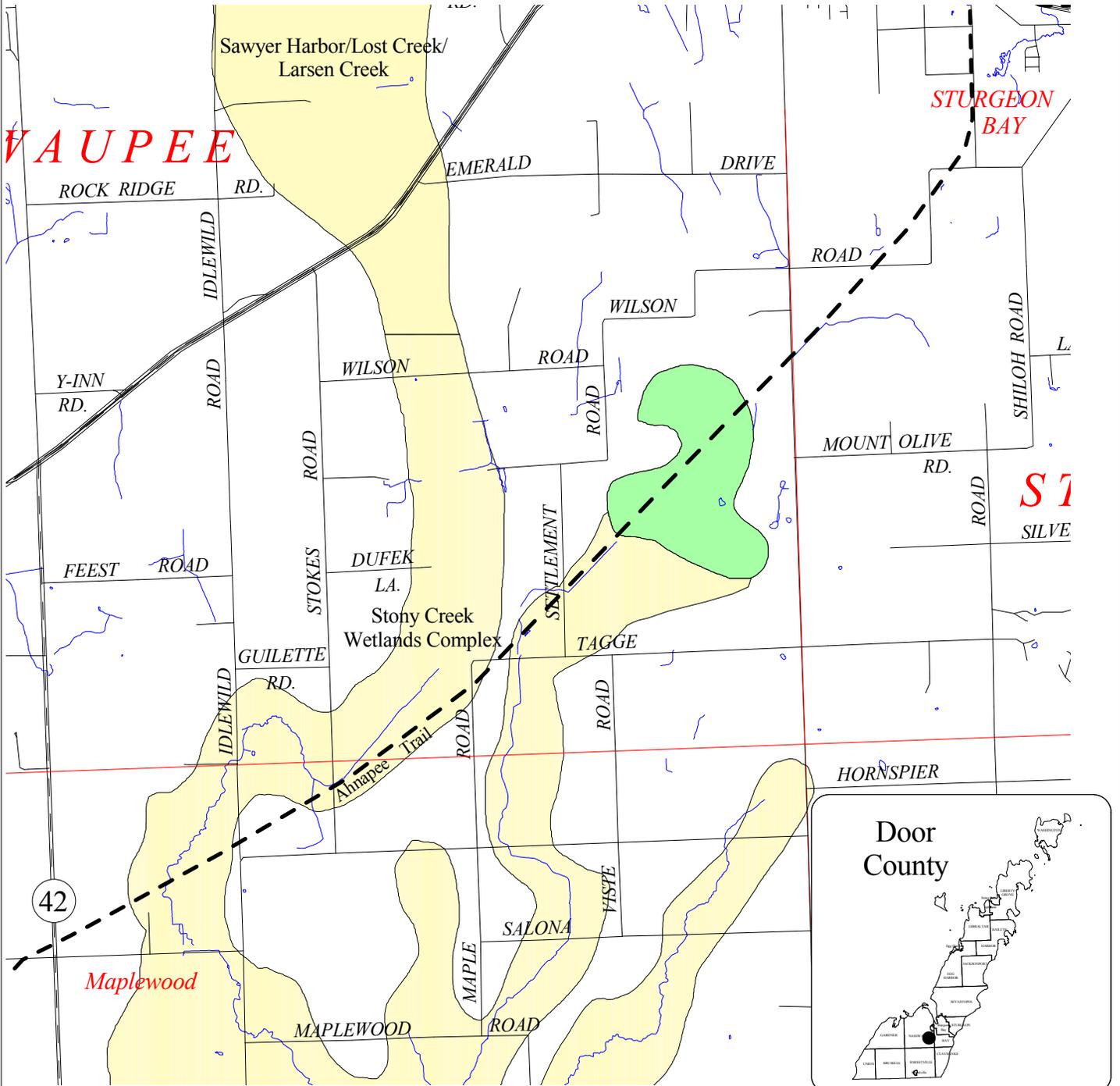
There is virtually no threat of this area being developed or roads built through it. Because of its soil type and wetland properties the bog could never be farmed. Even though the Ahnapee Trail passes within feet of the marsh, there is a thick zone of small trees and shrubs that hides it from the view of bikers and others using the trail. In addition to having a visual obstacle, the wet ditch along the north side of the bike trail also deters people from entering the marsh.

## **INFORMATION NEEDS / GAPS:**

- Completed inventory of plant and animal species
- List of individuals and organizations interested in site conservation

# Hungry Settlement Marsh

## Door County, Wisconsin



- Hungry Settlement Marsh
- Adjacent Project Areas

NOTE: Sites boundaries are approximations.



Source: Bay-Lake Regional Planning Commission, 2003.

# Hungry Settlement Marsh



ROY LUKES

Cotton grass



ROY LUKES

Bog Laurel and Labrador Tea



COLEEN FEUCHT

Hungry Settlement Marsh



ROY LUKES

Bog Laurel

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# SOUTHERN LAKE MICHIGAN SHORELINE

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## **LOCATION:**

This landscape encompasses approximately 16,200 acres along the Lake Michigan shoreline from Whitefish Dunes State Park south to the Town of Clay Banks (T26-28N, R26E). The Southern Lake Michigan Shoreline is located in the most eastern portions of the Towns of Sevastopol, Sturgeon Bay and Clay Banks. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

Stretching for approximately 16 miles along the Lake Michigan shore of Door County this site encompasses a diverse assemblage of sand dunes and swale forests, open to forested wetlands, and upland mixed conifer hardwood forests.

The Niagara Escarpment is represented as outcrops lying deep in the evergreen forests or shallow protruding rock that supports a conifer-birch forest near the lakeshore. Dolostone bedrock can also be seen as it extends beneath the shallow shoreline waters of Lake Michigan, in such places as Whitefish Point and Portage Point.

The Shivering Sands area, at the north end of this site is composed of many geologic and natural elements that form a landscape of high natural complexity. The natural communities here include forest types grading from tracts of lowland conifer to patches of upland mixed northern hardwood/conifer forest. Wetland communities ranging in structure from emergent herbaceous to shrub-carr and fen-like to boggy ring the three undeveloped lakes within the site.

The fen communities found at the lakes this site may contain tufted club-rush (*Scirpus cespitosus*), and coast sedge (*Carex exilis*) (both plants are state threatened). The federally endangered Hine's emerald dragonfly (*Somatochlora hinaea*) has been observed at Arbter Lake. Small streams, varying from slow and deep to quick and rippling, thread through the landscape both feeding and draining the site. A complex hydrologic pattern is characterized by numerous springs which discharge from the dolostone bedrock into several of the streams, and into Dunes Lake, and the draining of at least two streams directly into the bedrock via fissures in the east central portion of the site.

## **ECOLOGICAL SIGNIFICANCE:**

This extensive landscape of forest, lakes, streams and Great Lakes shoreline holds an irreplaceable array of biological diversity and natural landforms. Only the lands surrounding the Mud Lake – Ridges Sanctuary – North Bay area, rival the list of rare plants, birds and invertebrates found in this site. The ecological significance of this landscape has been noted for some time and several natural areas have already been established within the boundaries of this site (e.g., Whitefish Dunes State Park, the Nature Conservancy's Shivering Sands project).

The ecological patterns of this landscape persist despite the cut of the ship canal, shoreline development, and secondary roads. Several opportunities to preserve large intact tracts of undisturbed natural lands still exist. A notable feature of this landscape is the presence in the southern portion of the site of nearly 1 and ½ miles of undeveloped Lake Michigan shoreline. Such a stretch of uninhabited shoreline is a feature otherwise rarely found within the county outside of State parks, and the opportunity for preservation is not likely to be available for long.

The linear – roughly north-south – orientation of this lakeside forest contributes to its function as a corridor for migrating birds. Each spring thousands of north bound neotropical migrant species feed on the emerging lake midges that rest in the shoreline white cedars and balsam firs. The area also functions as a ground water recharge and discharge region emphasizing its importance to ground and surface water quality.

The Wisconsin Natural Heritage Inventory has documented 41 species of rare plants, invertebrates and animals and 12 natural community types within the boundaries of this shoreline complex. See the Natural Communities Cross Reference, Appendix "A", and the Wisconsin's Natural Heritage Inventory Listing, Appendix "B".

#### **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

The east side of the Peninsula is low and sandy in numerous places along the Lake Michigan shoreline. This condition very probably accounts for the fact that all of the larger Indian villages were located along this side. Most reliable traditions and information indicate that the Potawatomi inhabited the northern part of the Peninsula, while their brothers, the Chippewa, occupied the southern part (Schumacher 1918). Numerous archeological sites have been documented along the entire shoreline from the Door-Kewaunee County line northward.

Two early villages along the shore, long since having disappeared, were Clay Banks and Horns Pier. The village of Clay Banks was only two miles north of Foscoro, located at the mouth of Stony Creek. According to the Ahnapee Record in 1874, Clay Banks was "doing more shipping than any other port in Door County". Two large piers supported the area's chief industry of forest products. During peak production the sawmill was cutting 100,000 shingles daily in addition to large quantities of lumber. One of the piers was 1600 ft. long making it the longest in the waters surrounding Door County. Constantly in need of repair it was finally carried away in the great storm of March 1886 (Holand 1917).

The fires of 1871 almost completely destroyed the village, but it was quickly rebuilt. Another pier in the northeast corner of the village was built by W. H. Horn and was another focal point for shipping of lumber and a regular stopping place for lake steamers (Holand 1917). When the timber cutting came to an end in the latter 1880's Foscoro, Clay Banks, and Horns Pier as well as St. Joseph (Lily Bay) ceased to be shipping points and the villages soon faded into the history books.

Lily Bay's original name was St. Joseph, named for V. Joseph, an early partner of William Horn. The name was later changed to Lily, in honor of Horn's daughter by that name. Before the completion of the Sturgeon Bay Ship Canal, Lily Bay was the only harbor in the immediate vicinity and served as the transfer point for freight and passengers whose destination was the village of Sturgeon Bay. A complete saw mill operation including blacksmith shop, boarding house and a number of other houses were in the area. In its earliest times as many as 500 men were employed in Horn's businesses and the Goodrich ships made scheduled stops (Lotz 1994).

Horn and one of his partners bought up nearly 2000 acres of wooded Whitefish Bay property. In 1888 they successfully added the harvesting and shipping of hemlock bark to their list of wood products. That same year a million feet of lumber was shipped from the facilities at Lily Bay (Lotz 1994). Once the Sturgeon Bay Ship Canal was open, in 1879, Lily Bay's importance began to fade.

#### **SITE FEATURES:**

##### **Shivering Sands**

This landscape is approximately 4000 acres in size, and contains several major habitat types, such as: Lake Michigan shoreline; sand ridge/dune and swale forests; northern lowland conifer and conifer/hardwood forests; upland conifer "boreal" forest; herbaceous to shrubby fens; marshes; bog-like wetlands; open water lakes and streams; and dolostone shaded cliff environments.

- Substrates of peat, marl, sand, loam and dolostone bedrock underlie the mosaic of forest, marsh, ponds, lakes and stream communities. Small discrete habitats like dolostone outcrops, springs and marl fens are imbedded within the larger forest and add measurably to the kinds of plants and animals that inhabit the landscape. The bedrock underlying the Shivering Sands area is mostly Silurian dolostone, overlain by sandy lakeshore deposits and organic soils. Scattered bedrock outcrops are present near Lake Michigan, particularly in the hemlock-dominated forest south and west of Glidden Lodge, and northwest of Dunes Lake.

- One important soil characteristic that deserves further investigation is the claim by Wilde et al. (1949) that the white cedar forests in Door County occur on a unique soil type found in only a few other places in the world. This soil results from the accumulation of organic matter (wood) over an alkaline substrate high in carbonates.
- Three undeveloped lakes and associated wetlands occur within the Shivering Sands area. The largest of the lakes, Dunes, (also known as Gurlack or Mud Lake) is 81 acres in size and receives surface water from Geisel Creek to the north and several springs on the northwest and northeast edges of the marsh. This wetland drains to Lake Michigan via the swift flowing Shivering Sands Creek. Schwartz Lake (28 acres) and Arbter (Schmoke) Lake (16 acres) are shallow embayment lakes to the north of Dunes Lake.
- An ill-defined stream which threads through the lowland conifer forest between the lakes connects Arbter to Schwartz Lake in the north central portion of the site. The outlet of Schwartz Lake flows south and eventually disappears into the bedrock upland southeast of the lake. Besides Shivering Sands Creek, several other permanent to ephemeral streams drain the site to Lake Michigan.
- An extensive white cedar, alder, and balsam fir lowland forest surround the three lakes within the site. The lowland conifer forest forms the core forest of the site and hundreds of acres of puddles, pools, and ponds saturate this forest providing habitat for frogs, salamanders, and aquatic insects. A large sand dune (and ridge) and swale formation lies between the lowland forest and Lake Michigan in the south central portion of the site. The forest covering this landform holds white birch, red maple, beech, balsam fir, hemlock, and white pine on the uplands and white cedar, black ash and alder in the wetter depressions between the dunes or ridges.
- The close intermixing of dry upland forests with wet lowland forest types greatly increases overall habitat diversity. A white birch, balsam fir, white spruce, hemlock, white cedar, white pine forest occurs on the rocky uplands in the east portion of the site and contains many species found in a more northerly or boreal climate. Dwarf lake iris (*Iris lacustris*), a federally-threatened listed plant is found in this dolostone based upland forest.
- Lake dunes found along the shoreline of Lake Michigan typically hold beach grass (*Ammophila breviligulata*), common juniper (*Juniperus communis*), Canada wild-rye (*Elymus canadensis*), false-heather (*Hudsonia tomentosa*), beach-pea (*Lathyrus japonicus*), beach wormwood (*Artemisia campestris*), sand cherry (*Prunus pumila*), and various willows (*Salix spp.*).
- The large contiguous forest of the site furnishes the areal extent required by fauna rarely found elsewhere on the more highly fragmented Door Peninsula. An impressive suite of mammals including fisher, beaver, otter, black bear, snowshoe hare, porcupine, mink, coyote and possibly bobcat have been recorded from the site.
- A similarly impressive list of breeding birds has been recorded from the area. Black Terns (*Chlidonias niger*) as well as Sandhill Cranes are regular breeders on Dune's Lake. The ridge/swale forest is home to abundant numbers of Canada Warblers (*Wilsonia canadensis*) and Northern Waterthrushes (*Seiurus noveboracensis*) among many others. In total over 110 species of birds have been recorded on June bird surveys from the site between 1987 and 1999. In 2001 a pair of Bald Eagles (*Haliaeetus leucocephalus*) nested at Dune's Lake.

### **Lily Bay and Lily Bay Creek**

Lily Bay area refers to the land near the County Park boat ramp on Lake Michigan at the east end of County Road T. Lily Bay County Park is located along the interior portion and serves as a boat launch to Lake Michigan. Lily Bay Creek is a 7 mile, 5 foot wide stream with a gradient of 19.1 feet per mile, draining a watershed of 13 square miles. The creek is located in the Towns of Sturgeon Bay and Sevastopol, both of which have adopted the county's zoning ordinance. This area contains low-forested swamps and upland sandy ridges that drain into Lily Bay Creek. This creek begins near the center of the Town of Sevastopol, far to the northwest of the coastal forest and drains a landscape of dairy farms, fields of row crops and small woodland patches. As this portion of the overall site contains similar soils and topography to the Shivering Sands area, the upland and lowland forests are dominated by similar tree species.

- Shoreline development consists of residential homes with wooded lots. The surrounding land use is primarily agriculture, natural area, and residential area.
- Lily Bay Creek is classified as Cold Class II for 1.6 miles and cold water for 1.4 miles, with a fair ranking. Flow is intermittent for upper reaches, and becomes continuous in the lower reaches. The creek empties into Lily Bay through a ridge and swale system.
- Various small fish are found in Lily Bay Creek. Brook trout were last stocked in 1956 (Corbisier 2000).
- The federal and state endangered Piping Plover (*Charadrius melodus*) is historically known from the Lake Michigan shoreline at this site.
- Lily Bay Creek is a natural corridor providing wildlife habitat that connects the land shore with interior portions of the peninsula.

### **Kellner Fen**

Kellner Fen is located about 3 miles east of the City of Sturgeon Bay. Although descriptions vary, the total area of the open fen is between 60-80 acres. This open wetland is bounded by a sand ridge or dune and swale complex to the southeast, a white cedar (*Thuja occidentalis*) swamp to the north and a second growth mesic to wet mesic conifer hardwood forest to the west.

- The Town of Sturgeon Bay, where the fen is located, has adopted the county's zoning ordinance.
- Land cover surrounding Kellner Fen is predominantly woodlots, other natural lands, orchards, old fields, a landscape nursery, and residential development along the Lake Michigan shoreline.
- Soils are very poorly drained, nearly level, and organic (USDA SCS 1978). Fens are typically comprised of a soil called muck, made up of accumulating organic matter.
- Vegetation of the fen consists of several sedge species, including woolly-fruit sedge (*Carex lasiocarpa*), tussock sedge (*Carex stricta*), water sedge (*Carex aquatilis*), yellow-green sedge (*Carex flava*), Wisconsin special concern species brown beak sedge (*Rhynchospora fusca*), and twig rush (*Cladium mariscoides*).

- The wettest portion of the fen contains hardstem bulrush (*Scirpus acutus*). Pitcher plant (*Sarracenia purpurea*) is abundant and widespread. The aggressive exotic tree glossy buckthorn (*Rhamnus frangula*) bounds the fen on the west. This species is typical of wet soils and is prominent in and around adjacent swamps reaching maximum density in the area between fen and swamp (Fewless 1999).
- Migratory birds, especially waterfowl use the fen for nesting. Reptiles and amphibians are likely inhabitants of this wet habitat.
- Significant species known to Kellner Fen include two Wisconsin special concern species, white bog orchid (*Platanthera dilatata*), and extensive concentrations of brown beak sedge (*Cyperaceae phynchospora fuaca*). Tussock bulrush (*Scirpus cespitosus*) is a Wisconsin threatened species found at the outer edge of Kellner Fen (Fewless 1999).

### **Sturgeon Bay Ship Canal**

This unit of the Southern Lake Michigan Shoreline site lies north and south of the Sturgeon Bay Ship Canal, extending west from Lake Michigan to near the urban edge of the city of Sturgeon Bay. The ship canal, which bisects this unit, was built in the 1870's through an extensive ridge and swale landscape, the remnants of which still exist north and south of the canal. The land here is primarily forested with a mix of pine, hemlock and birch on the drier sites and cedar, green ash, and alder in the lowlands between the ridges and in extensive poorly drained wetlands west of the ridge and swale system. These poorly drained wetlands are similar in composition to the forested wetlands in the previously mentioned units of this site. This landscape requires a biological inventory to assess its contribution to the overall significance of the site.

- Land use in the vicinity of the ship canal itself is largely recreational. Both north and south of the canal, extensive forested areas occur near the shore, with land use largely agricultural away from the shore. A balance between wildlife habitat and tourist needs is required to maintain the intrinsic value of the area.
- Soils are of two types. The first soil type found near the Lake Michigan shoreline is deep, well to moderately well drained and gently sloping to sloping. The second type is found further inland. These are deep, poorly drained, organic, nearly level soils underlain by fine sand outwash or outwash with silt loam subsoil over stratified lake sediments (USDA SCS 1978).
- Surface water resources in this area are restricted to the flooded interdunal wetlands within the beach complex along the shore.
- Limited shore and dune communities occur along Lake Michigan, with plant species typical of this type of habitat. Forested vegetation is similar to that found north of the canal.
- The area south of the canal extending to Clay Banks consists of a series of upland forest ridges and lowland forest swales. The dunes provide a protective barrier to nearby wetlands (i.e., swamps, small lakes, interdunal permanent and ephemeral ponds).
- Vegetation consists of white cedar, white birch (*Betula papyrifera*), red maple (*Acer rubrum*), and balsam fir (*Abies balsamea*) on the upland sand ridges, and a mix of white cedar, black ash (*Fraxinus nigra*) and alder (*Alnus incana*) in wetter sites.

- Rare species include the state and federally listed endangered dune thistle (*Cirsium pitcheri*), which grows along the Lake Michigan shore, and Wisconsin special concern species showy lady slipper orchid (*Cypripedium reginae*).
- Many migratory birds rely on the shoreline for breeding and stopover habitat.
- It is unknown if other rare plant or animal species are present, as biological inventories are incomplete.

### **Clay Banks**

While covering several patches of mostly lowland conifer forest, the Clay Banks section of this area also includes about 1 and ½ miles of relatively undeveloped Lake Michigan shoreline. Wetlands in lowland areas provide drain via several creeks and streams between Kewaunee County and the Sturgeon Bay ship canal.

- The area is in the Town of Clay Banks, which has adopted the county's zoning ordinance, with an exclusive agriculture overlay.
- Land cover along the shoreline is wooded with lesser amounts of other natural area. Along the shoreline are a few scattered residential homes and limited areas of recreational public land. Inland areas are composed of farmlands and scattered farm residences.
- Soils are deep, well to moderately well drained and gently sloping to sloping. A fine sand or sandy loam overlays sand or sand and gravely outwash that is very poorly drained and nearly level. Organic soils are often found in lowland conifer swamps (USDA SCS 1978).
- Surface water resources in this area include Schuylers Creek, Bear Creek, and Woodard Creek. All of these waters are classified fair to good in habitat quality, support limited in-stream fish populations, and receive some use by spawning suckers, smelt and trout (Corbisier 2000)
- Vegetation is second growth mixed cedar and hardwood uplands and lowlands. White cedar, aspen (*Populus tremuloides*), and white birch are prominent tree species. Other tree species include balsam fir, red maple, green ash (*Fraxinus pennsylvanica*) and balsam poplar (*Populus balsamifera*).
- Common animal species include White-tail deer (*Odocoileus virginianus*), raccoon (*Procyon lotor*), fox (*Vulpes vulpes*), Virginia opossum (*Didelphis virginiana*), mink (*Mustela vison*), muskrat (*Ondatra zibethicus*), waterfowl, and Ruffed Grouse (*Bonasa umbellus*).
- State listed endangered species known from the Clay Banks area include the endangered moonwort grape fern (*Botrychium lunaria*) and the threatened heart-leaved foam-flower (*Tiarella cordifolia*). It is unknown if other rare plant or animal species are present, as biological inventories have not been completed.

**CONSERVATION GOALS:**

- Protect the coastal areas (i.e., sand, cobble and rock beaches) and shallow near shore areas.
- Restore contiguous forest cover throughout the upland portions of the site and create a less fragmented forest corridor from Whitefish Dunes to Clay Banks.
- Enhance or maintain surface and groundwater quality of streams and springs that feed the wetland complexes of this landscape.
- Maintain or enhance the ecological composition, structure and functions of the several core natural areas of the site (e.g., Shivering Sands forest and lakes, Kellner Fen, forests of the ship canal area and Clay Banks forests).

**THREATS:**

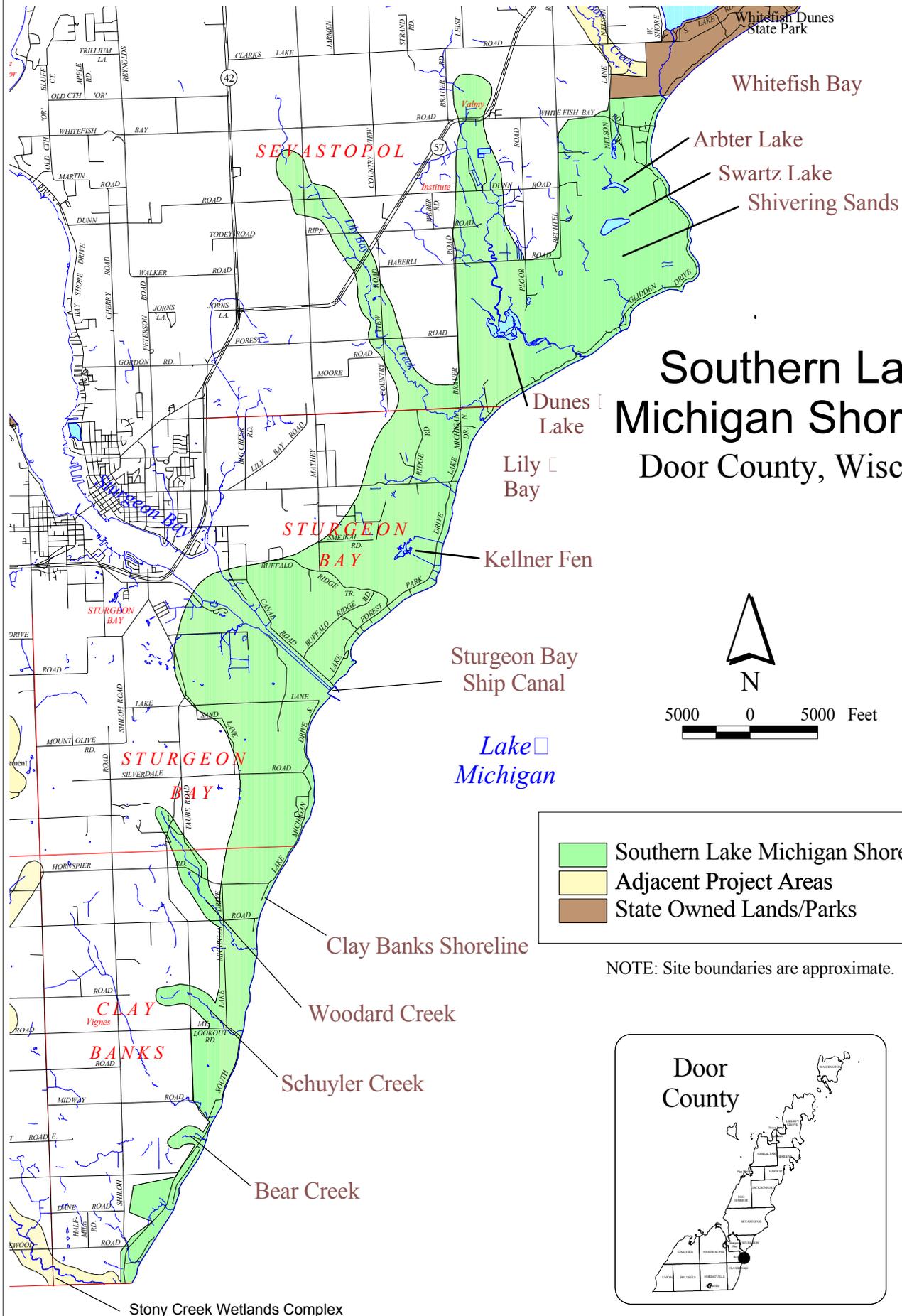
- The Southern Lake Michigan Shore is experiencing development pressures. The shoreline is particularly vulnerable to development because of scenic and recreational attributes.
- Exotic species such as glossy buckthorn (*Rhamnus frangula*) and honeysuckle (*Lonicera spp.*) are invading the area.
- Poor logging practices could cause local ecological degradation.
- Poor agriculture practices could threaten wetland and surface water areas including fens, lakes, and Lake Michigan.

**INFORMATION NEEDS / GAPS:**

- Complete plant and animals inventories
- Develop list of individuals and supportive groups interested in conservation activities



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# Southern Lake Michigan Shoreline



MIKE GRIMM

Lower Dunes Lake



MIKE GRIMM

Kellner Fen



COLEEN FEUCHT

Adjoining upland forest



COLEEN FEUCHT

Lake Michigan shoreline south of ship canal

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# SAWYER HARBOR / LOST CREEK & LARSON CREEK WATERSHEDS COMPLEX

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## **LOCATION:**

Sawyer Harbor/ Lost Creek & Larson Creek Watersheds Complex is approximately 4,590 acres located in west central Door County south of Sturgeon Bay (T27N, R25E) in the Town of Nasewaupsee. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Sawyer Harbor/ Lost Creek & Larson Creek Watershed Complex forms the northern portion of a contiguous corridor extending southeast through the Stony Creek Wetlands Complex and into Stony Creek which empties into Lake Michigan at a point south of the Door & Kewaunee County line. Sawyer Harbor has long been recognized for its recreational, historic, and scenic features, and the Larson Creek Watershed is considered an important wetland resource (Emmerich 1978).

The Town of Nasewaupsee does not currently utilize land use regulation or zoning, except for state-mandated zoning of shorelines and navigable streams. However, a planning initiative started in the summer of 1997 has spawned numerous public meetings, surveys, informational forums and professional land use planning services that are being used to develop a comprehensive land use plan. Considerable information has been gathered, all leading toward a land use framework that reflects the public's wishes and intentions. Many community members are volunteering substantial time and energy at various levels to develop the town's comprehensive land use plan, which is scheduled for completion in the summer of 2003.

## **ECOLOGICAL SIGNIFICANCE:**

The Sawyer Harbor/ Lost Creek & Larson Creek Watershed Complex creates a contiguous corridor from the Bay of Green Bay inland to other important watersheds. The area is large enough to provide important habitat corridors and aid in protecting surface and groundwater quality and quantity. Sawyer Harbor is an ecologically important fish spawning area for Green Bay and provides important shallow water habitat. This complex also contains unique, large lowland cedar and ash swamps (i.e., May and Cunningham Swamps) that provide important terrestrial habitat. Preliminary natural heritage inventories in the area have documented rare species of animals, invertebrates and plants, such as the federally threatened dwarf lake iris and state-threatened long-eared sunfish. See the Natural Community Cross Reference, Appendix "A" and Wisconsin's Natural Heritage Inventory Listing, Appendix "B" for more additional information.

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

Peter Sherwood was among the early residents, in this part of the county, building his cabin in 1838. The first summer hotel in Door County was built on the north shore of Sawyer Harbor, now commonly referred to as Idlewild. The hotel was constructed in 1879 by J. T. Wright and was about 125 feet long, could accommodate about 40 guests and was generally filled to capacity (Holand 1917). Although much of the southern portion of the county was affected by the great fires of 1871 (Peshtigo Fire) the area around Sawyer Harbor escaped.

## **SITE FEATURES:**

### **Sawyer Harbor**

- Sawyer Harbor is a heavily used recreational area with three access points. Boaters, skiers, and fisherman use this harbor because of its sheltered nature and proximity to Potawatomi State Park. The harbor opens to the east into Sturgeon Bay's outer channel.

- Two small islands are located near the State Park shoreline. The harbor is a shallow bay of 362 acres with nearly six miles of shoreline.
- The surrounding land use is predominately recreational (Potawatomi State Park) and single family residential with lesser amounts of idle cropland.
- Along the north and south shore rubble and cobble make up the shoreline, while the west shore is coastal wetland. The bottom substrate is predominantly sand or sand/rock mix. The rock scarps and estuary offer habitat for plant and animal species.
- Vegetation includes upland hardwoods, lowland pines and white cedar (*Thuja occidentalis*). Other plant species include dwarf lake iris, balsam (*Abies balsamea*), and spruce (*Picea spp.*).
- Fish known to inhabit the harbor include northern pike (*Esox lucius*), smallmouth bass (*Micropterus dolomieu*), yellow perch (*Perca flavescens*), rock bass (*Ambloplites rupestris*), brown trout (*Salmo trutta*), and long-eared sunfish (*Lepomis megalotis*).
- Dwarf lake iris is listed as a federally threatened plant and the long-eared sunfish is in the state-threatened category.
- The aesthetic value of Sawyer Harbor is as a sheltered inlet that houses several impressive land features such as rock terraces, shoals, wetlands, intermittent streams, ponds, and scenic views of two islands and Potawatomi State Park.

### **Lost Creek Watershed**

Lost Creek is a 2.5 mile long stream with a 2.2 square-mile watershed.

- The surrounding land use is mainly cropland with lesser amounts of idle cropland. A golf course and county landfill are located near the stream
- Soils are deep, moderate to poorly drained, and almost level to moderately steep. Silty clay subsoil overlays silty clay till or dolostone bedrock (USDA SCS 1978).
- The stream is classified as a limited forage fishery because it is only capable of supporting a limited community of forage fish and aquatic life. Limited forage fisheries tend to have poor habitat quality.
- White cedar is the dominant tree species in lowland areas.
- Fish known to seasonally utilize the stream include walleye (*Stizostedion vitreum*), northern pike, rainbow trout (*Oncorhynchus mykiss*), and white suckers (*Catostomus commersoni*) (Corbisier 2000).
- It is unknown if any threatened or endangered plant and animal species are present, as biological inventories have not been completed.

### **Larson Creek Watershed**

Larson Creek is a 4-mile long intermittent stream originating in Cunningham Swamp. The stream flows through rural areas and pastures before emptying into Sand Bay. Larson Creek is part of an 8.9 square mile watershed.

- The surrounding land use is predominantly cropland with lesser amounts of idle cropland, other natural area, and single family residential.
- Soils are shallow to deep, well drained, and almost level to moderately steep. A sandy loam or loam subsoil overlies sandy loam or fine sandy loam till or dolostone bedrock. (USDA SCS 1978).
- Larson Creek is classified as a warm water forage fishery, with a fair habitat ranking.
- Fish known to use the stream include walleye, northern pike, and white sucker. Snapping turtle (*Chelydra serpentina*) are also known to live in the stream.
- It is unknown if any threatened or endangered plant and animal species are present, as biological inventories have not been completed.

### **CONSERVATION GOALS:**

- Enhance and maintain the integrity of the large lowland cedar and ash swamps (i.e., May and Cunningham Swamps).
- Restore and maintain the water quality and landscape buffers along the stream corridors to protect the fish spawning areas of Lost Creek and Larson Creek.

### **THREATS:**

- Possible threats to this large wetland complex include the effects of nearby agriculture and future residential growth.
- There are major sinkholes and solution features receiving non-point source pollution, creating the potential for water quality problems.
- Sedimentation threatens wetlands in this complex.
- Carp in the harbor and surrounding wetlands stir-up low-lying sediment disturbing native plant and animal growth.

### **INFORMATION NEEDS / GAPS:**

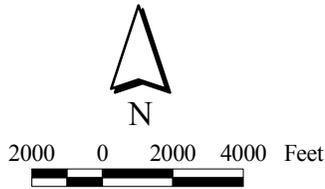
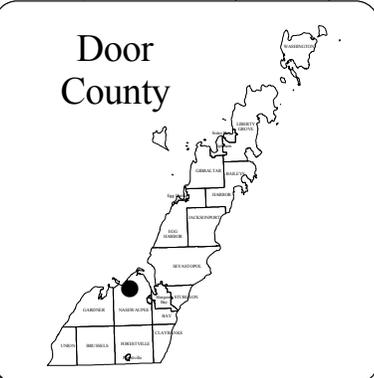
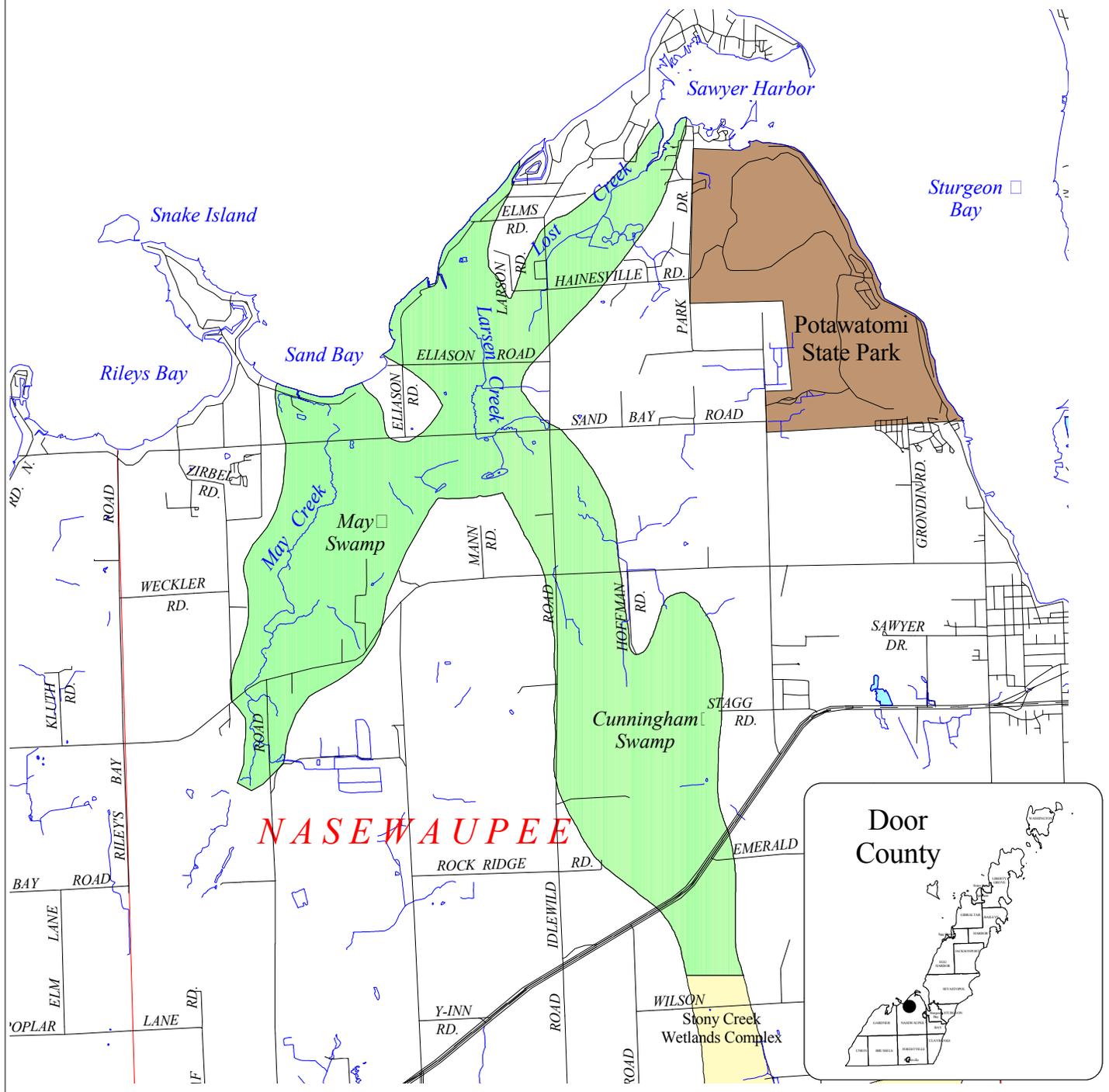
- Plant and animal inventories are needed
- Develop a list of individuals and organizations interested in conservation efforts



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# Sawyer Harbor / Lost Creek & Larson Creek Watersheds Complex

## Door County, Wisconsin



- Sawyer Harbor/ Lost Creek Watershed/ Larson Creek Watershed
- Adjacent Project Areas
- State Owned Lands/Parks

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Sawyer Harbor / Lost Creek & Larson Creek Watersheds Complex



Sawyer Harbor



Sawyer Harbor wetlands



Larson Creek



Lost Creek

ALL PHOTOS BY COLEEN FEUCHT

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# WEST BRANCH WHITEFISH BAY CREEK CORRIDOR

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## **LOCATION:**

The West Branch Whitefish Bay Creek Corridor covers approximately 2,150 acres in central Door County (T28N, R26E) in the Towns of Egg Harbor, Jacksonport, and Sevastopol. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **SITE DESCRIPTION:**

The West Branch Whitefish Bay Creek Corridor, locally known as Maple Creek, begins east of a small pond in the Town of Egg Harbor. The corridor extends southeast to the West Branch of Whitefish Bay Creek, then it follows the creek to Whitefish Dunes State Park. South of Whitefish Dunes State Park is the proposed conservation project Shivering Sands, partially owned by the Nature Conservancy.

## **ECOLOGICAL SIGNIFICANCE:**

Factors contributing to the ecological significance of this site include the unroaded mosaic of forest types at the headwaters of the stream, the contiguous nature of the riparian habitat, and the structural quality and ecological function of several individual forest and wetland tracts within the site. The lack of roads through the headwater forests of this stream represent an opportunity to protect habitat for those species requiring large forested tracts. While the quality of the habitat structure throughout the forest varies the overall size and integrity of the forest is impressive for this portion of Door County.

The riparian habitat carried by this stream stretches through an agricultural landscape in portions of three townships in the south central northern Door County, and connects the large forest block near Lake Michigan at Whitefish Dunes State Park with the large forest block at the headwaters of this stream. This important landscape connection while impaired by road crossings and a constriction of the riparian corridor at County Road WD is for the most part intact and could be enhanced.

Several individual locations within this site bear special note for their significance. The open semi-permanent marsh on the south side of County Road I at the extreme south west end of this site is annually used by large numbers of waterfowl and shorebirds during spring migration. The diversity of species is equally impressive, as it is not uncommon to see 10 or more species of waterfowl at one time at this wetland. Elsewhere, within the headwater forest, good quality upland tracts of mature hemlock, sugar maple and beech grow on the rolling glacial moraine formations along the stream. Several tracts show little evidence of recent cutting and hold a diverse native ground flora.

A complete account of the ecological significance of this area is dependent on further biological inventories of the site. However, several rare plants and invertebrates have been cataloged; refer to the Natural Community Cross Reference, Appendix "A" and Wisconsin's Natural Heritage Inventory, Appendix "B".

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

The area has a rich cultural history. Artifacts found near the mouth of the creek may date as early as 1100 BC. Archaeological excavations carried out prior to the construction of the Whitefish Dunes Visitor Center revealed eight occupations, beginning with the North Bay people about 100 BC, followed by the descendants, the Heins Creek people (Dirst 1993). Certain key environmental attractants, abundant fish, wild plant food, wildlife and easy beach access to mention a few, brought people to this locality time and time again.

Around AD 900 the Oneota people arrived. They continued to visit Whitefish Dunes through at least AD1400. Then, around 1640 the Potawatomis and Indian refugees from other eastern tribes moved into the area. The Potawatomis were still here when Euro-Americans arrived in the 1800's.

## **SITE FEATURES:**

### **West Branch Whitefish Bay Creek**

The West Branch of Whitefish Bay Creek is 4.8 miles in length. The West Branch Whitefish Bay Creek Corridor includes approximately 1,200 acres of upland forest and 950 acres of swamp and lowland forest.

- The West Branch Whitefish Bay Creek is within the Towns of Sevastopol and Jacksonport. Both towns have adopted the county zoning ordinance.
- The surrounding land use is predominately cropland with lesser amounts of woodland, and plantation forests.
- Soils are shallow to deep, well drained, and nearly level to moderately steep. A sandy loam or loam subsoil overlays sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- Uplands are primarily sugar maple (*Acer saccharum*) and hemlock (*Tsuga canadensis*). Lowland areas are comprised of white cedar (*Thuja occidentalis*), birch (*Betula spp.*), poplar (*Populus alba*), white spruce (*Picea glauca*), and a Wisconsin special concern broad-leaf sedge (*Carex platyphylla*). Colonies of sensitive fern (*Onoclea sensibilis*) and northern maidenhair fern (*Adiantum pedatum*) are widely dispersed. The main tree species in the open marsh area is green ash (*Fraxinus pennsylvanica*). A colony of small yellow lady's-slipper (*Cypripedium calceolus var. parviflorum*) is known to exist on the site.
- Populations of rainbow trout (*Oncorhynchus mykiss*) and native brook trout exist in the stream.
- The West Branch Whitefish Bay Creek is as a natural wetland corridor connecting to several other natural areas. A diverse assemblage of plants and animals depend on this creek.

### **Marsh Area**

The view from the lowland marsh is rolling farmland and trees. A small upland ephemeral pond is located just north of this area. Natural springs are located in the lower portion of the marsh.

- The marsh is located in the Town of Egg Harbor. A county zoning map exists for Egg Harbor however, county zoning is not in effect. Egg Harbor utilizes an independent planning commission with a sub-division ordinance. The surrounding land use is predominately cropland with lesser amounts of woodland, and plantation forests.
- Soils are shallow to deep, well drained, and nearly level to moderately steep. A sandy loam or loam subsoil overlays sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- Vegetation within the marsh is primarily reed canary grass (*Phalaris arundinacea*), bulrushes (*Schoenoplectus spp.*), and iris (*Iris spp.*). Cardinal flowers (*Lobelia cardinalis*) are also located near the marsh.
- Many species of waterfowl use this creek corridor. Nesting Northern Harriers (*Circus cyaneus*) are known to the marsh.
- It is unknown if any threatened or endangered plant or animal species are present, as biological inventories have not been completed.

**CONSERVATION GOALS:**

- Enhance and maintain adequate upland buffers throughout the West Branch Whitefish Bay Creek Corridor.
- Protect and maintain the undeveloped landscape of the headwaters of the marsh area and glacial moraines.

**THREATS:**

- The primary threat to this corridor is poor agricultural practices and contamination of the stream corridor.
- Residential subdivisions could also threaten the wildlife corridor.

**INFORMATION NEEDS / GAPS:**

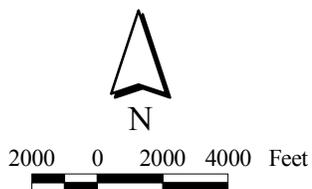
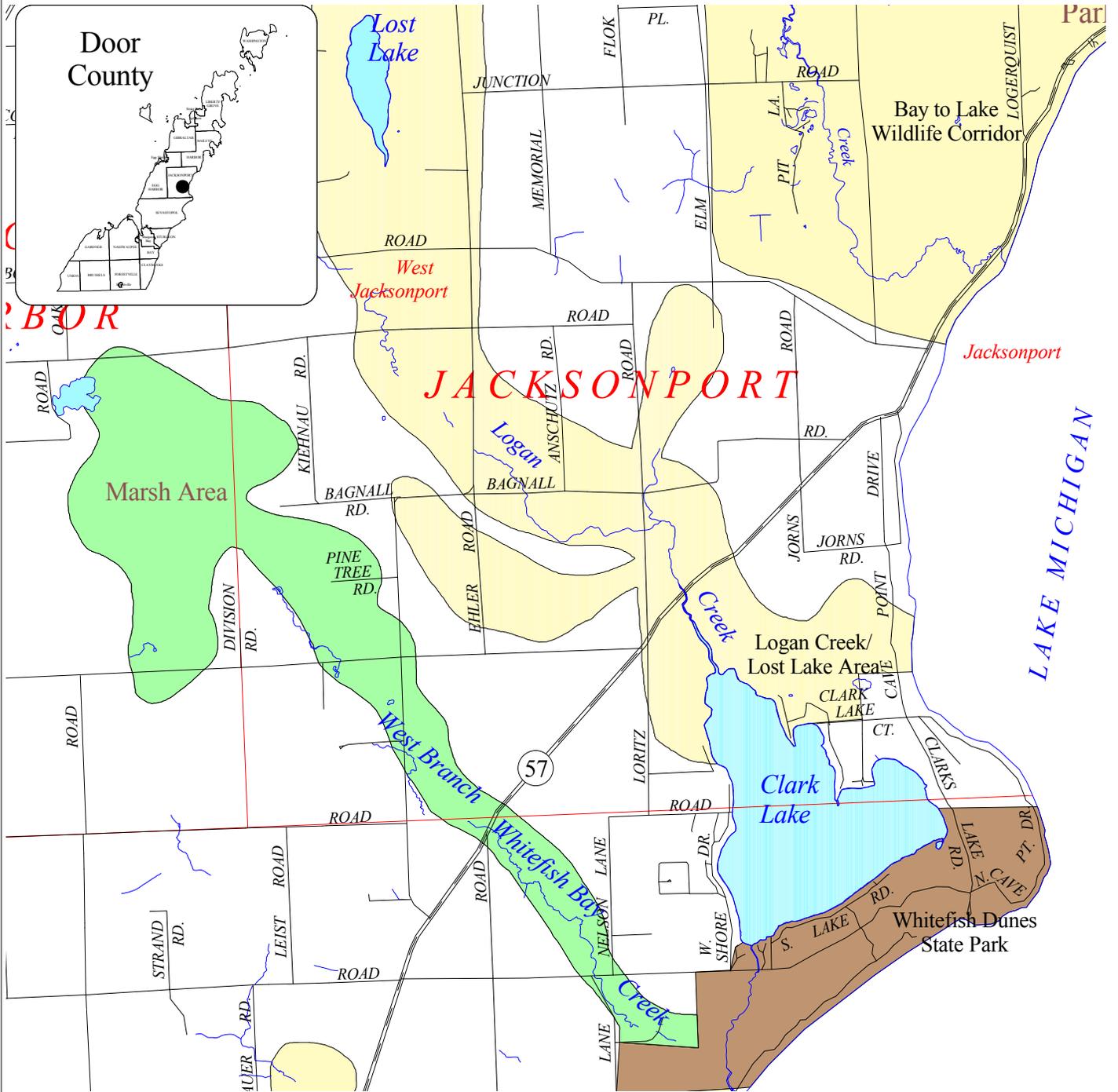
- Complete plant and animal inventories
- Develop a list of individuals and organizations interested in conservation activities.



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# West Branch Whitefish Bay Creek Corridor

## Door County, Wisconsin



- West Branch Whitefish Bay Creek Corridor
- State Owned Lands / Parks
- Adjacent Project Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# West Branch Whitefish Bay Creek Corridor



West Branch Whitefish Bay Creek



Whitefish Dunes State Park



Whitefish Bay Creek



West Branch marsh area

ALL PHOTOS BY COLEEN FEUCHT

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# BAY SHORE BLUFF LANDS

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## **LOCATION:**

The Bay Shore Bluff Lands cover approximately 3,250 acres located north of Sturgeon Bay in western Door County near the shoreline of Green Bay (T29N, R26E) in the Town of Egg Harbor. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Bay Shore Bluff Lands extend from an area south of Carlsville Road along the western shore of the peninsula north to Horseshoe Point. The Niagara Escarpment is an important topographic feature of this natural area; karst features such as caves and sinkholes are prevalent throughout this region.

## **ECOLOGICAL SIGNIFICANCE:**

Several groups have recognized the Bay Shore Bluff Lands (Carlsville Bluff) as a significant natural habitat in the last 20 years. In 1976, the Door County Natural Heritage Program ranked the area as an important scenic wetland and forest resource area. In this study the forest was ranked 5<sup>th</sup> among 15 Door County areas. Again in 1976, the Natural Areas Inventory of Wisconsin's Great Lakes coastline listed the Carlsville Bluff as a significant natural area. In 1977, the Wisconsin Coastal Atlas rated the area as high quality wildlife habitat. In 1981, a U.S. Fish and Wildlife conducted inventory of the Great Lakes coastal wetlands identified and classified the forested wetlands of this site. In 1988, Dr. Jim Zimmerman in his natural features inventory of Door County concluded the Carlsville forest, escarpment, and terraced wetlands were deserving of WDNR Natural Area status. A 124-acre tract of these bluff lands was recently purchased by the Door County Land Trust and was designated as a State Natural Area in 2002, (see Appendix "D" for further information).

The site's natural diversity with habitat types ranging from open cliff faces to hardwood swamps to dry mesic forest supports an impressive number of rare or uncommon species. At least a dozen orchid species, a number of rare land snails, and many birds requiring large forests are found at this site. Over a hundred blooming and numerous non-blooming plant species have been counted in the recent past. As the site rests along the west exposure of the Niagara Escarpment, karst features are abundant. These features often allow rapid movement of surface water into the bedrock, which is why this site is also important for the protection of ground water resources of the region.

Rare animals, invertebrates and plants have been inventoried in this area, including a large population of state threatened Ram's head orchid. Other plants worth noting are the long-spurred violet (*Viola rostrata*) and allegheny vine (*Adlumia fungosa*), both are listed as state special concern. For additional information refer to the Natural Communities Cross-Reference, Appendix "A" and Wisconsin's Natural Heritage Inventory Listing, Appendix "B".

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

Like many of the coastal communities in the late 1800's this area was a shipping point for lumber and shingle products. Three major piers were in use between Carlsville Road at the southern end of the site and what is now Murphy Park at the northern end. By 1937 the southern and northern piers were gone.

The earliest aerial photos of the site, June 1938, show a solid forest block along the shore of Green Bay from Carlsville Road to Murphy Park. The configuration of this forest coverage is generally similar to present coverage. Agricultural land use, at least row cropping and haying, appears to have always been confined to land above the bluff in the deeper clay-loam soils.

However, aerial photos in 1961 show explosive growth of shoreline homes and cottages since 1938. The next aerial photos were taken in 1974 and indicate a continual increase in home building along the shore and road building activity above the bluff areas. Some of the previously tilled agricultural fields have been abandoned and "old field" succession has begun.

## SITE FEATURES:

### Bay Shore Bluff Lands & Woods

The Bay Shore Bluff Lands are located from Horseshoe Point south to Carlsville Road. The Bay Shore Bluff Lands' escarpment is one section of the Niagara Escarpment and is approximately 6 miles in length.

- Upland sand ridges and lowland forest swale features sustain a diversity of woodland plant species. Several forest types exist both above and below the escarpment. Many seeps are found along the base of much of the talus slopes. Along the escarpment face the type and amount of rock exposure is highly variable (Grimm 2001).
- The bluff lands and woods are mostly within the Town of Egg Harbor, with a small portion in the Town of Seavastopol. A county zoning map exists for Egg Harbor, however, zoning is not in effect. An independent Town Board using its own sub-division ordinance governs the Town. The Egg Harbor Town Board enacted a moratorium on commercial development from January 1998 to March 1999. Under the Town Plan wetlands, forests, the Niagara Escarpment and open space should be protected. The Nature Conservancy is working with the town to identify high quality natural resources in Egg Harbor.
- Land use surrounding this area is predominantly that of cropland, woodlots, idle cropland, residential lots, orchards, and recreational land under private ownership.
- Soils are shallow to deep, well drained, and nearly level to moderately steep. A sandy loam or loam subsoil overlays sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- The area including the base of the escarpment is characterized by seeps. Across Carlsville road to the north lies springs and ponds that serve as breeding grounds for northern pike (*Esox lucius*).
- Herbaceous plants include wood betony (*Pedicularis canadensis*), American hog-peanut (*Amphicarpa bracteata*), sweet cicely (*Osmorhiza claytonii*), black snakeroot (*Sanicula marilandica*), wood anemone (*Anemone quinquefolia*), white baneberry (*Actaea pachypoda*), red baneberry (*Actaea rubra*), and zig-zag goldenrod (*Solidago flexicaulis*), Canada Mayflower (*Maianthemum canadense*), rosy twisted-stalk (*Streptopus roseus*), large-leaved aster (*Aster macrophyllus*), New Jersey tea (*Ceanothus americanus*), rattlesnake fern (*Botrychium virginianum*), wild sarsaparilla (*Aralia nudicaulis*), Large-flowered trillium (*Trillium grandiflorum*), and spreading dogbane (*Apocynum androsaemifolium*), sharp-lobed hepatica (*Hepatica acutiloba*), long-spurred violet (*Viola rostrata*), bladder fern (*Cystopteris bulbifera*), common polypody (*Polypodium virginianum*), walking fern (*Camptosorus rhizophyllus*), northern fragile fern (*Cystopteris fragilis*), American bittersweet (*Celastrus scandens*), climbing fumitory (*Adlumia fungosa*), and two-leaf miterwort (*Mitella diphylla*).
- Several types of vegetation are consistent with various habitat types found here. Canopy species include hemlock (*Tsuga canadensis*), white pine (*Pinus strobus*), red pine (*Pinus resinosa*), big-toothed aspen (*Populus grandidentata*), northern white-cedar (*Thuja occidentalis*), beech (*Fagus grandifolia*), and basswood (*Tilia americana*). Understory plants include mountain maple (*Acer spicatum*), chokecherry (*Prunus virginiana*), and ironwood (*Ostrya virginia*).

- Below the escarpment are several types of forests. A seasonally spring-fed wet forest is dominated by silver maple (*Acer saccharinum*), and green ash (*Fraxinus pennsylvanica*). Several species are present which are more common to southern regions, such as: swamp white oak (*Quercus bicolor*); American bladdernut (*Staphylea trifolia*); and great water-leaf (*Hydrophyllum appendiculatum*). Sugar maple (*Acer saccharum*), American beech (*Fagus grandifolia*), red oak (*Quercus rubra*) and hemlock dominate a mesic northern hardwood forest. Another northern forest type is comprised of white cedar, white spruce (*Picea glauca*), and balsam fir (*Abies balsamea*). A wetland near Carlsville Road is fed by springs and contains open sedge, dogwood, willow shrubs, and tamarack (*Larix laricina*) (Grimm 2001).
- Terrace communities include canopy species such as white birch, white cedar, white pine, and trembling aspen (*Populus tremuloides*), large-toothed aspen, northern red oak, sugar maple, American beech, white ash (*Fraxinus americana*) and hemlock congregate on old beach ridges. Understory plants include chokecherry, red osier dogwood (*Cornus stolonifera*), round-leaved dogwood (*Cornus rugosa*), and balsam fir. Other species include American witch-hazel (*Hamamelis virginiana*), highbush cranberry (*Viburnum trilobum (americanum)*), beaked hazelnut (*Corylus cornuta*), eastern leatherwood (*Dirca palustris*), and russet buffalo-berry (*Shepherdia canadensis*).
- A shrub layer south of Carlsville Road contains pussy willow (*Salix discolor*), grape (*Vitis spp.*), red osier dogwood, willow (*Salix spp.*), and green ash. Herbaceous plants include spotted Joe-Pye-weed (*Eupatorium maculatum*), blue-joint grass (*Calamagrostis canadensis*), panic grass (*Panicum spp.*), monkey-flower (*Mimulus ringens*), paniced aster (*Aster simplex*), goldenrod (*Solidago spp.*), grass-leaved goldenrod (*Solidago graminifolia*), and small yellow lady's-slipper (*Cypripedium calceolus var. parviflorum*) (Standish 2001).
- Wildlife includes upland forest species with many songbirds (Zimmerman, 1989). A large number of breeding birds are known to the area, such as: American Redstart, Scarlet Tanager (*Piranga olivacea*), White-throated Sparrow (*Zonotrichia albicollis*), Great Crested Flycatcher (*Myiarchus crinitus*), Wood Thrush (*Hylocichla mustelina*), Hermit Thrush (*Catharus guttatus*), Black-throated Blue warbler (*Dendroica caerulescens*), Orchard oriole (*Icterus spurius*), Veery (*Catharus fuscescens*), Eastern Phoebe (*Sayornis phoebe*), and Eastern Wood Pewee (*Contopus virens*). Other birds include Northern or Yellow-shafted Flicker (*Colaptes auratus*), Pileated Woodpecker (*Dryocopus pileatus*), Red-bellied Woodpecker (*Melanerpes carolinus*), Yellow-bellied Sapsucker (*Sphyrapicus varius*), Northern Saw-whet Owl (*Aegolius acadicus*), Barred Owl (*Strix varia*), Great Horned Owl (*Bubo virginianus*), Whip-poor-will (*Caprimulgus vociferus*), American woodcock (*Scolopax minor*), and Common Raven (*Corvus corax*). Some hawks such as Northern Harrier, Broadwing Hawk (*Buteo platypterus*), Northern Goshawk (*Accipiter gentilis*), Cooper's Hawk (*Accipiter cooperii*), Sharp-shinned Hawk (*Accipiter striatus*), American Kestrel (*Falco sparverius*), Peregrine Falcon (*Falco peregrinus*) during migration and Red-shouldered Hawk have been found in the area (Standish 2001).
- Land snails have been found on rock outcrops north and south of Carlsville Road and at the north end of the bluffs. Nineteen species were recorded in 1995 including 3 rare species and 1 glacial relict species (Grimm 2001). A preliminary list of snails include *Allogona profunda*, *Anguispira alternata*, *Cochlicopa lubrica*, *Columella simplex*, *Discus catkillensis*, *Euconulus fulvus*, *Gastrocopta contracta*, *Gastrocopta pentadon*, *Glyphyalina indentata*, *Hendersonia occulta*, *Mesodon thyroidus*, *Nesovitrea electrina*, *Paravitrea multidentata*, *Punctum minutissium*, *Strobilops aeneas*, *Strobilops labyrinthica*, *Vertigo bollesiana*, *Vertigo gouldii*, *Vertigo hubrichtii*, and *Zonitoides arboreus* (Standish 2001).

### Spring Lane Hardwood Swamp

The Spring Lane Hardwood Swamp covers approximately 15 acres and is located between Monument Point Road north to Horseshoe Point. The swamp was named after the road Spring Lane, which runs the length of the site. This spring fed hardwood swamp is drained by several sinkholes.

- Spring Lane Hardwood Swamp is in the Town of Egg Harbor. Land use is primarily woodlots with lesser amounts of residential, cropland, idle farmland, and orchards.
- Soils are shallow to deep, well drained, and nearly level to moderately steep. A sandy loam or loam subsoil overlies sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- Vegetation within the hardwood swamp canopy is green ash, sugar maple, and swamp white oak. A common understory plant is young green ash. Herbaceous plants include northern blue flag (*Iris versicolor*), common moonseed (*Menispermum canadense*), and blue skullcap (*Scutellaria lateriflora*).
- Upland forest near the swamp contains canopy trees such as red oak, white birch, silver maple, bitternut hickory (*Carya cordiformis*), wild black cherry (*Prunus serotina*), hemlock, large-toothed aspen, and white ash. Understory plants include eastern leatherwood, American yew (*Taxus canadensis*), American bladdernut, wild black currant (*Ribes americanum*), and silver maple. A herbaceous plant layer contains rue-anemone (*Anemonella thalictroides*), blue cohosh (*Caulophyllum thalictroides*), broad-leaf sedge (*Carex platyphylla*), allegheny vine, long-spurred violet, trillium, and American trout-lily (*Erythronium americanum*). Near the edge of swamp vegetation varies. Virginia waterleaf (*Hydrophyllum virginianum*), great water-leaf (*Hydrophyllum appendiculatum*), spring-beauty (*Claytonia virginica*), Dutchman's-breeches (*Dicentra cucullaria*), squirrel-corn (*Dicentra canadensis*), and bloodroot (*Sanguinaria canadensis*) are common species (Standish 2001).
- Wildlife includes several noteworthy bird species. Among these is the state special concern Northern Goshawk, Northern Harrier, Cooper's Hawk, Veery, Wood Thrush, and the state threatened Red-shouldered Hawk. Other significant birds in the area include the Hermit Thrush and the Turkey Vulture (*Cathartes aura*) (Standish 2001).
- State threatened plant species include ram's-head lady's-slipper (*Cypripedium arietinum*) and dwarf lake iris (*Iris lacustris*). State special concern species found in this area are small yellow lady's-slipper (*Cypripedium parviflorum*), showy lady's-slipper (*Cypripedium reginae*), Hooker's orchis (*Platanthera hookeri*), long-spurred violet (*Viola rostrata*), allegheny vine (*Adlumia fungosa*), large white-flowered ground-cherry (*Leucophysalis grandiflora*), broad-leaf sedge (*Carex platyphylla*), Canadian yew (*Taxus canadensis*), and variegated horsetail (*Equisetum variegatum*).
- Other significant plant species include northern green orchid (*Platanthera hyperborea*), striped coralroot (*Corallorhiza striata*), early coralroot (*Corallorhiza trifida*), spotted coral-root (*Corallorhiza maculata*), cancer-root (*Orobanche uniflora*), great water-leaf, Hitchcock's sedge (*Carex hitchcockiana*), swamp white oak, American bladdernut, common moonseed, walking fern, and prickly-ash (*Zanthoxylum americanum*) (Standish 2001).

### **CONSERVATION GOALS:**

- Maintain or enhance the ecological composition, structure and functions of the several core natural areas or features of the site, (e.g., the hardwood swamps below the talus, the escarpment free face and talus slopes, the semi-open wetlands at the south end of the site, and the interior mixed conifer/hardwood forests).
- Maintain the existing forest of the site and reforest abandoned agricultural land adjacent to the existing forest to increase the overall size of the forest.
- Prevent further fragmentation of existing forest by roads.
- Prevent impairment to water quality and flow regime of the springs that feed the sub-talus wetlands at this site.
- Monitor exotic aggressive species, particularly garlic mustard, and control, as necessary.

### **THREATS:**

- Loss of forest cover for homesites and “viewsheds”; bedrock destruction for foundation and sewer construction; erosion during construction; filling of wetlands and karst features for roads, driveways and lawns; increased impervious surfaces that promote runoff of oils and salts; and increased human activity (Grimm 2001C).
- Poor logging practices could disturb karst features, especially when snow cover is unavailable to protect the ground surface (Grimm 2001C).
- Exotic plants and animals like the gypsy moth, butternut canker, and garlic mustard increase when forest interior decreases. Non-native species could thrive on human disturbed habitat with increased forest edge (Grimm 2001C).
- Deer herbivory is expected to increase as subdivisions decrease hunting lands. The forest mosaic could be compromised because of the removal of low woody and herbaceous vegetation by deer (Grimm 2001C).
- Changes in surface or shallow groundwater movement due to surface disturbance associated with development could decrease water/groundwater quality (Standish 2001).

### **INFORMATION NEEDS / GAPS:**

- Complete plant and animal inventories
- Develop list of individuals and landowners interested in conservation activities

### **ADDITIONAL REFERENCES:**

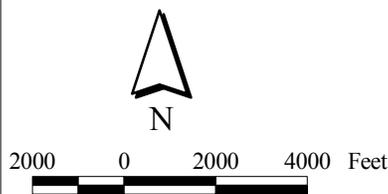
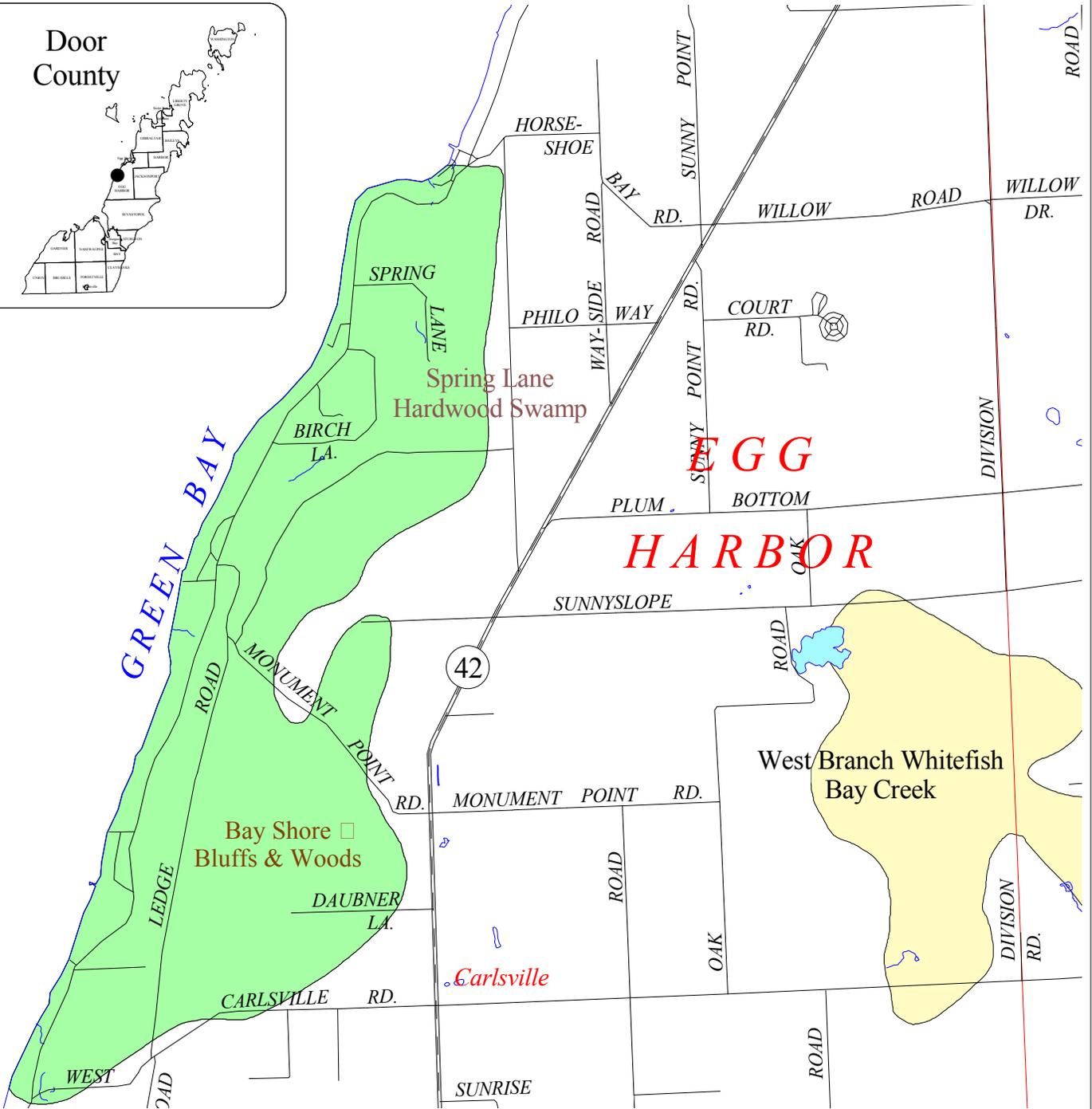
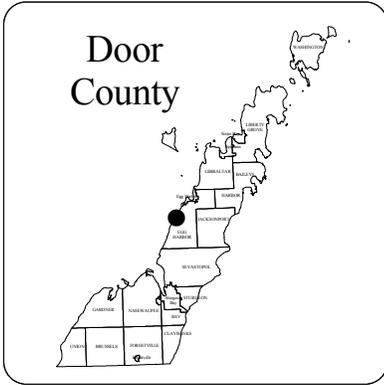
Johnson, S.B. & Stieglitz, R.D., 1990. *Karst features of a glaciated dolostone peninsula, Door County, Wisconsin*: *Geomorphology*, 4:437-454.



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# Bay Shore Bluff Lands

## Door County, Wisconsin



- Bay Shore Bluffs & Woods
- Adjacent Project Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Bay Shore Bluff Lands



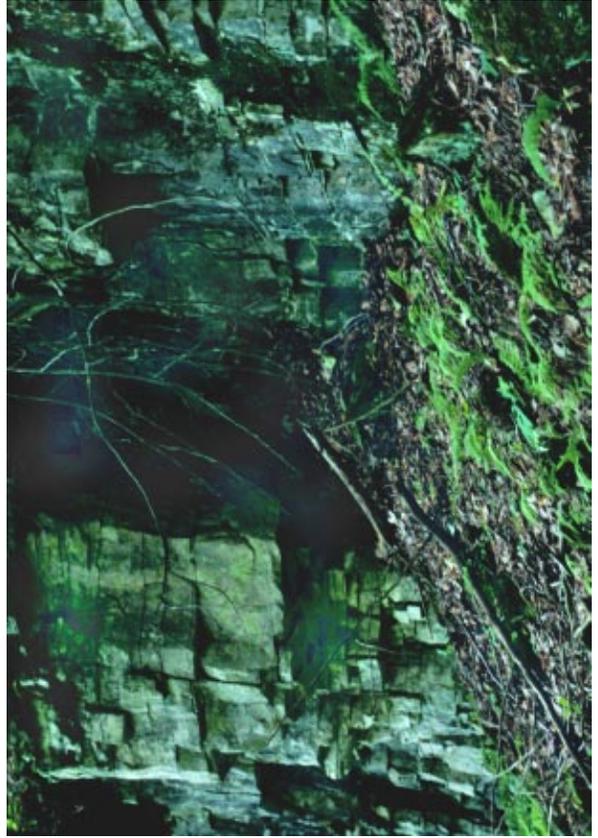
GERALD H. ENMERICH, JR.

Lady's Slipper at Bay Shore Bluff Lands



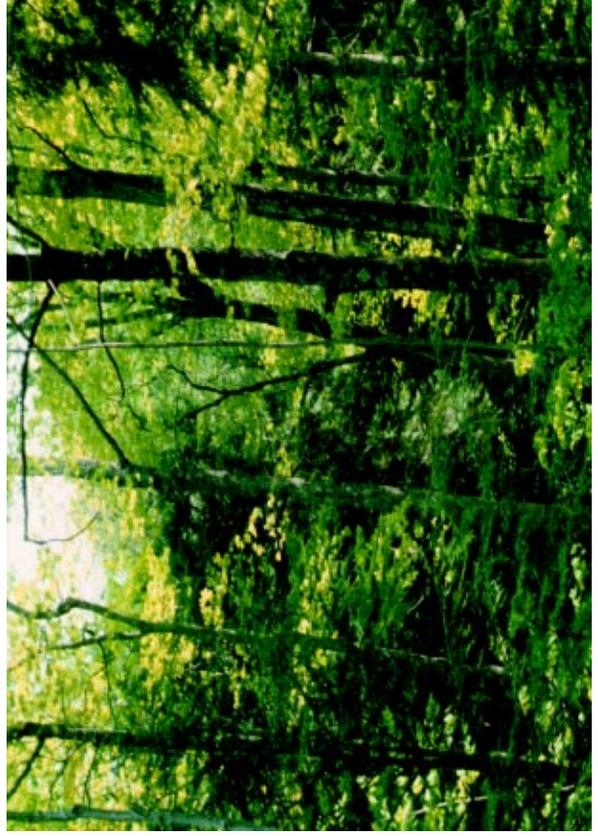
MIKE GRIMM

Bay Shore Bluff looking north along west shore of peninsula



MIKE GRIMM

Bay Shore Bluff



MIKE GRIMM

Upland forest

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# LOGAN CREEK / LOST LAKE CORRIDOR

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## LOCATION:

The Logan Creek / Lost Lake Corridor is approximately 4,950 acres located in the Town of Jacksonport in the central portion of Door County (T28-29N, R26-27E). As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## GENERAL SITE DESCRIPTION:

The Logan Creek / Lost Lake Corridor encompasses the natural habitat associated with this wetland corridor. The southern edge borders Clark Lake, Whitefish Dunes State Park and Whitefish Dune State Natural Area. This is an important wetland habitat for fish and wildlife. Scenery, water quality, and forest resources are all of high quality (Zimmerman 1989). The Town of Jacksonport has adopted the county's zoning ordinance.

## ECOLOGICAL SIGNIFICANCE:

The ecological significance of this site is defined by the condition of Lost Lake, the presence of several species of state significance, a large diverse wetland complex north of Lost Lake, and extensive riparian conifer forest along Logan Creek south of Lost Lake. Other attributes that contribute to the areas significance are several tracts of old growth forest, especially north of Lost Lake and at the mouth of Logan Creek at Clark Lake, and the high volume springs which feed Logan Creek south of Lost Lake and near Highway 57.

Lost Lake, with an almost completely undeveloped shoreline, represents a rare opportunity to preserve a large lake-wetland system nearly intact. While its shallow nature precludes a diverse fish population; perch, northern pike, and black bullheads are present, and lake and wetland associated birds and aquatic insects (esp. odonates) are abundant. Except for a narrow lawn on the west shore the entire shoreline of the lake holds natural vegetation. A wide buffer of forest borders the lake on the north, southwest and south, with a narrow buffer on the east shore.

Based on a very limited inventory, species of state significance observed at the lake and surrounding forest include, Osprey (feeding), Caspian Tern (*Sterna caspia*) (feeding), Red-shouldered Hawk (possibly nesting), and the white adder's mouth orchid (*Malaxis brachypoda*). Other natural communities and rare plant and animal species have been documented in the area. Refer to the Natural Communities Cross Reference, Appendix "A" and Wisconsin's Natural Heritage Inventory Listing, Appendix "B" for further information.

## NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:

A settlement located on the shores of Lake Michigan in the vicinity of Clark Lake was started around 1838. Originally it was a fishing village and a project of John P. Clark, who was the first white settler in this area of the county. The inland lake was named for him and nearby Whitefish Bay was named for the large amounts of fish that were being caught there. He packed his tremendous catches in salt barrels and shipped them to markets on the Great Lakes in his own schooners. Clark bought up 2,500 acres of land that included 9 miles of shore land. Much of the time he had as many as 30 fisherman and a number of coopers, including several Native Americans, who made barrels in his employ (Lotz 1994)

## SITE FEATURES:

### Logan Creek

Logan Creek is 5.4 miles in length, approximately 8 feet wide with a gradient of 17.7 feet per mile, and flows southeast from Lost Lake until it empties into Clark Lake. The creek is designated as a Wisconsin Outstanding Water Resource, a distinction given by the Outstanding Resource Waters portion of the Wisconsin Administrative Codes.

- The surrounding land use is a combination of cleared cropland, stump pasture, pasture, and orchards (Corbisier 2000). One quarry is in the southeast section of this site (Grimm, Hewitt, & Holtz 1999).
- Soils are shallow to deep, well drained, and nearly level to moderately steep. A sandy loam or loam subsoil lies over sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- The stream habitat ranking is fair; most of the stream is a warm water forage fish community. For 0.4 miles the stream is classified Class I, and for 0.25 miles the stream is classified Class II (Corbisier 2000).
- Vegetation within the stream corridor is primarily lowland cedar (*Thuja occidentalis*) and black ash forest (*Fraxinus nigra*), with lesser amounts of yellow birch (*Betula alleghaniensis*), balsam fir (*Abies balsamea*), hemlock (*Tsuga canadensis*), and white pine (*Pinus strobus*). Ground species throughout most of the stream corridor are of one of two types, hummocked or pools. Hummock species include dewberry (*Rubus flagellaris*), starflower (*Trientalis borealis*), gold-thread (*Coptis trifolia*), bunchberry (*Cornus canadensis*), Labrador-tea (*Ledum groenlandicum*), wintergreen (*Gaultheria procumbens*), and naked miterwort (*Mitella nuda*). Common pool species are marsh-marigold (*Caltha palustris*), bittersweet nightshade (*Solanum dulcamara*), and sensitive fern (*Onoclea sensibilis*) (Grimm, Hewitt, & Holtz 1999).
- Southern portions of Logan Creek contain second growth mesic woodlands comprised of sugar maple (*Acer saccharum*), beech (*Fagus grandifolia*), hemlock, white cedar, yellow birch and black cherry (*Prunus serotina*). The understory typically consists of Canadian yew (*Taxus canadensis*), beech, and sugar maple. Common herbaceous plants are wild Canada mayflower (*Maianthemum canadense*), starflower, wild sarsaparilla (*Aralia nudicaulis*), wood fern (*Dryopteris carthusiana*), blue-bead lily (*Clintonia borealis*), wild onion (*Allium canadense*), blue cohosh (*Caulophyllum thalictroides*), yellow trout-lily (*Erythronium americanum*), Pennsylvania sedge (*Carex pensylvanica*), sharp-lobed hepatica (*Anemone acutiloba*), and beech drops (*Monotropa hypopithys*). The state endangered small yellow crowfoot (*Ranunculus gmelinii*) has been sighted within wetland areas of the creek.
- This has been one of the few creeks in the county known to have a self-sustaining population of brook trout. However, none have been noticed in the past 5 years when random surveys were conducted. Common bird species found along the creek include Ovenbird (*Seiurus aurocapillus*), Red-eyed Vireo, Black-throated Green Warbler (*Dendroica virens*), Eastern Wood-Pewee, Great Crested Flycatcher, Rose-breasted Grosbeak (*Pheucticus ludovicianus*), and Hermit Thrush.

### Lost Lake

Lost Lake is spring-fed, shallow, marl-bottomed, and a seepage lake. The maximum depth is 5.5 feet. There is relatively little development along the shoreline and it's considered the largest undeveloped lake in the county. The surrounding land use is cleared cropland, stump pasture, pasture, and orchards.

- Soils underlying the lake are marl-bottomed. That is, they are soft, calcium carbonate mixed with clay (Corbisier 2000).
- Shallow water emergents along the shoreline of the lake include cattail, hardstem bulrush, twig rush (*Cladium mariscoides*), reed canary grass (*Phalaris arundinacea*), red osier dogwood (*Cornus stolonifera*), speckled alder (*Alnus incana*), joe-pye-weed (*Eupatorium maculatum*), marsh bellflower (*Campanula aparinoides*), water dock (*Rumex altissimus*), rush aster (*Aster borealis*), willow (*Salix spp.*), and tamarack (*Larix laricina*). The northwest portion of the lake contains yellow-water lilies.

- The northern shore of Lost Lake contains a seasonally flooded basin. Plants typically found here are herbaceous grasses and sedges. Hardwood swamps are located at the north end of the site. Canopy species include red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), and silver maple (*Acer saccharinum*). Understory is comprised of white cedar and green ash saplings. Groundcover plants are nettles (*Urtica spp.*), ostrich fern (*Matteuccia struthiopteris*), royal fern (*Osmunda regalis*), and some grass and sedge species (Grimm, Hewitt, & Holtz 1999).
- Conifer swamps comprised of white cedar and tamarack surround the rest of the lake (Corbisier 2000.) An area of shrub/carr of approximately five acres is located just north of Lost Lake. This unique natural community is dominated by one species, winterberry (*Ilex verticillata*). Growth is extremely dense with occasional green ash.
- Fish found in the lake include carp (*Cyprinus carpio*), bullhead (*Ictalurus spp.*), northern pike (*Esox lucious*), and yellow perch (*Perca flavescens*). Animals found near the lake include northern water snake, snapping turtle, painted turtle, Canada Goose (*Branta canadensis*), Wood Duck (*Aix sponsa*), and Mallard (*Anas platyrhynchos*) (Corbisier 2000). Other birds include the Sandhill Crane, Green Heron, Pied-billed Grebe (*Podilymbus podiceps*), Red-winged Blackbird, Common Yellowthroat, Swamp Sparrow, and Song Sparrow, the state special concern Great Blue Heron (*Ardea herodias*) and the state protected and threatened Osprey (Grimm, Hewitt, & Holtz 1999).

#### **CONSERVATION GOALS:**

- Maintain an unobstructed watercourse between Lost Lake and Clark Lake.
- Protect the undeveloped characteristic of Lost Lake and its shoreline.
- Maintain water quality of the small tributaries connecting to Logan Creek.
- Maintain and expand the riparian buffer along the Logan Creek corridor.

#### **THREATS:**

- Little development is occurring presently, however future residential expansion could threaten the integrity of this wetland complex.
- Runoff from agricultural practices could threaten water quality and plant and animal communities within the site.
- Cattle grazing in or near the complex could also threaten water quality and plant and animal communities (Grimm, Hewitt, & Holtz 1999).

#### **INFORMATION NEEDS / GAPS:**

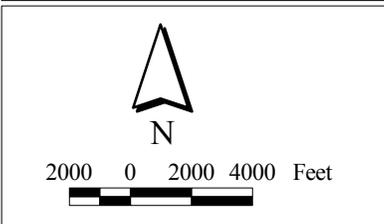
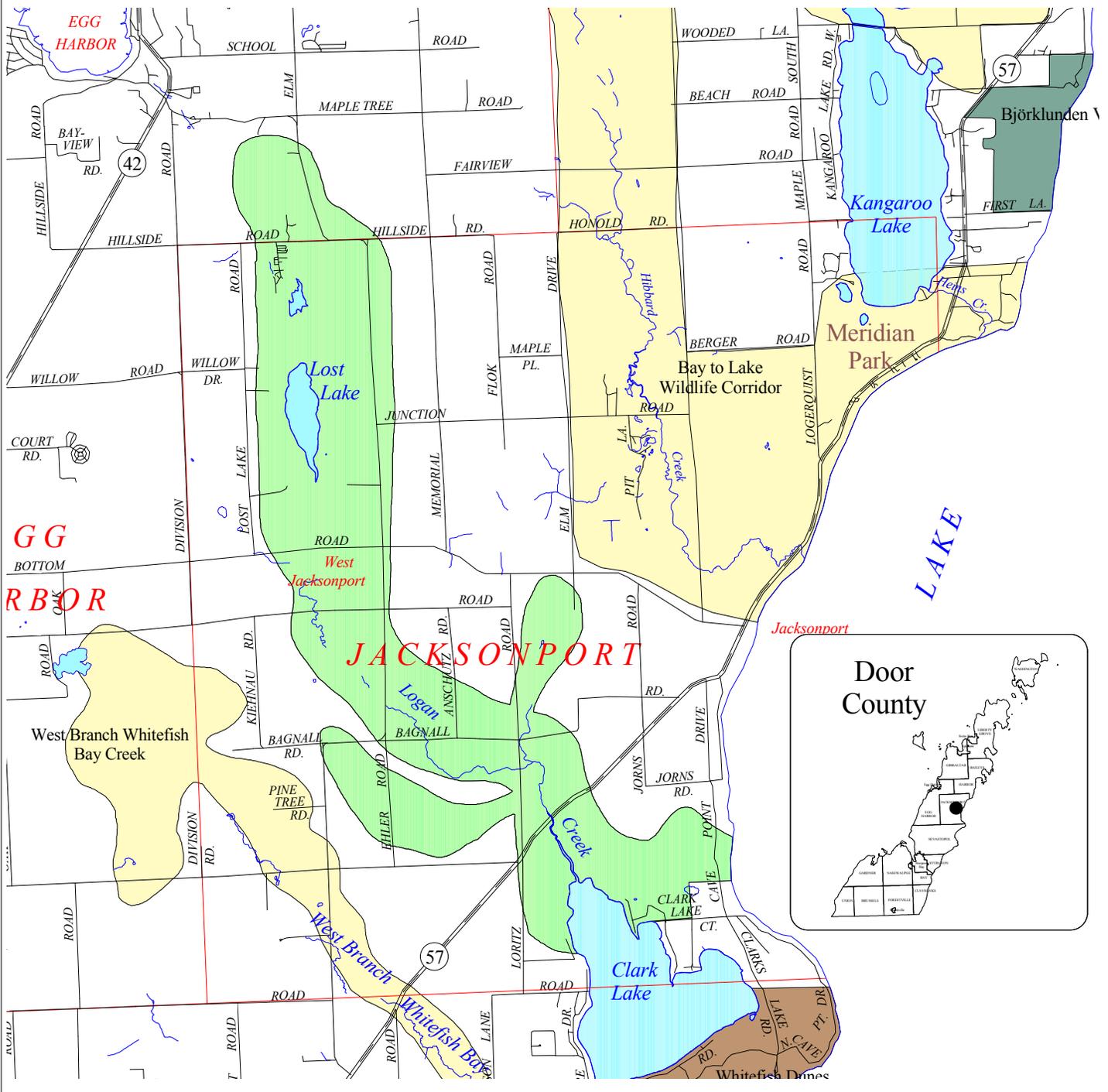
- Complete plant and animal inventories
- Develop list of individuals and supportive groups interested in conservation activities



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# Logan Creek / Lost Lake

## Door County, Wisconsin



- Logan Creek/Lost Lake Area
- Adjacent Project Areas
- State Owned Lands/Parks
- Private Conservation Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Logan Creek / Lost Lake Corridor

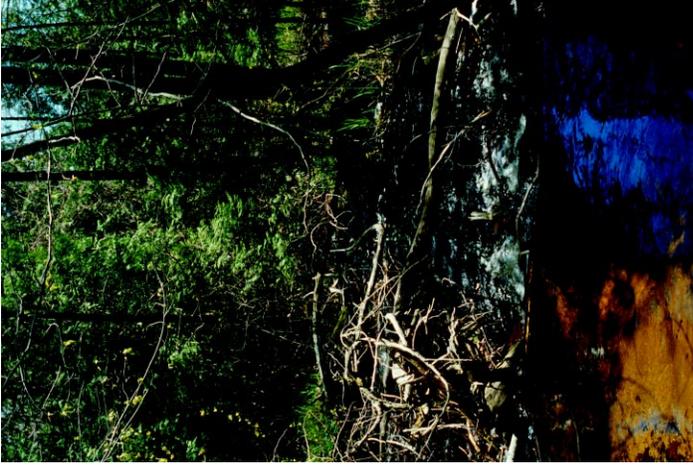


Lost Lake, west shore



ROY AIKEN

Lost Lake



ALL PHOTOS BY MIKE GRIMM, (EXCEPT AS NOTED)

Middle reaches of  
Logan Creek



Lowland forest of  
Logan Creek Corridor



Wet-mesic forest ground cover  
around Lost Lake

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# BAY TO LAKE WILDLIFE CORRIDOR

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## **LOCATION:**

The Bay to Lake Wildlife Corridor covers approximately 15,200 acres in north central Door County. The corridor extends in two branches south of Peninsula State Park to the shore of Lake Michigan in eastern Door County (T29-30N, R28E). This area is in the Towns of Gibraltar, Egg Harbor, Jacksonport and Bailey's Harbor. As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Bay to Lake Wildlife Corridor is adjacent to and contiguous with Peninsula State Park. The Fish Creek Watershed begins on the western shore of Door County along the Niagara Escarpment, a prominent ridge of dolostone bedrock. Thorp Pond and its associated wetlands are connected to the Fish Creek Watershed. Both upland forest and lowland hardwood and conifer swamps are ecological features of this portion of the corridor. Hibbards Creek originates southeast of Thorp Pond and flows through wet and dry mesic woodlands, a conifer swamp, shrub-carr, and ridge and swale complex before draining into Lake Michigan. As a continuous corridor, Hibbards Creek, Fish Creek and Thorp Pond connect the bay side of the county with the lakeside.

The second branch of the Bay to Lake Wildlife Corridor encompasses the shoreline of the north end of Kangaroo Lake, the Piel Creek Corridor, adjoining lowland and lowland forests, and several tracts of old fields that buffer the site. Piel Creek is the major surface water source for Kangaroo Lake. Connecting the southern portion of Kangaroo Lake and the Lake Michigan Shore is Meridian Park, an area with intact lakeshore ridge and swale communities.

## **ECOLOGICAL SIGNIFICANCE:**

The site encompasses a major natural corridor between Green Bay and Lake Michigan. This corridor not only holds many rare species and significant natural areas it also provides a major ecological connection across the Peninsula, despite the fragmentation by roads, agricultural land and residential development. Places like Thorp Pond, Hibbards Creek, Piel Creek, the north basin of Kangaroo Lake, and Meridian Park which lie within this site contain numerous state listed species and high quality natural communities. Three designated State Natural Areas are contiguous with this corridor: Peninsula Park Beech Forest; Peninsula Park White Cedar Forest; and Kangaroo Lake.

The corridor is rich in diverse habitat types including a fen with boreal elements, alkaline sedge marshes, open water wetlands and small lakes, perennial and intermittent streams (both warm and cold water), lowland conifer forests, swamp hardwood forests, stands of northern conifer/hardwoods on clay loams and sand. There are several exposures of dolostone especially in the Fish Creek / Peninsula Park landscape and in Meridian Park. Ridge and swale formations exist in Meridian Park and near the outlet of Hibbards Creek.

The highest quality forest communities in this corridor hold mature to near old growth conditions with large diameter shade tolerant trees, an uneven age forest structure, and large fallen trees. These conditions are most common in the wet-mesic forests south of Kangaroo Lake and in the hardwood / conifer swamps near Thorp Pond and the upper Fish Creek watershed. These old-growth patches lie in a matrix of younger aged forests of varying species composition and often-simpler structure.

Local areas of high species diversity and rarity include Thorp Pond, Meridian Park, the north end of Kangaroo Lake, and the upper Fish Creek forest and escarpment landscape. The presence of non-native aggressive species is currently minimal, however troublesome species like Japanese knotweed, barberry, exotic honeysuckle, and Scotch pine are present in scattered locations.

Presettlement ecological processes have been disturbed by roads, residential development, poor logging practices, and past forest grazing. Roads and residential development constitute the clearest and most damaging change in this landscape. However, despite the fragmentation by roads, agricultural land and residential development, a practical ecological corridor for many species and processes is already present and restoration opportunities exist throughout the site on abandoned agricultural fields. The condition of the surrounding landscape is typical for northern Door County, being a mix of open fields (abandoned or under cultivation), small woodlots and wetlands and scattered residential buildings.

While this site constitutes a major ecological pathway across the peninsula it should also be noted that it also links natural landscapes on both coasts of the peninsula. The Hibbards Creek and Meridian Park forests provide the link from the Bjorklund forest to the Cave Point/Whitefish Dunes forest. On the Green Bay coast the forests of Peninsula Park and the Fish Creek watershed protect exposed bluffs of the Niagara Escarpment that represent several of the best in a series of outcrops that run the length of the peninsula (i.e., Boyer's Bluff, Door Bluff, Ellison Bluff, Sister Bay Bluffs, White Cliff Road Bluffs, Bay Shore Blufflands, and Potawatomi Bluffs).

Overall, the species richness of the site is very good with state and federally listed species present. Wisconsin's Natural Heritage Inventory has documented 57 rare animals, invertebrates, plants and natural community types within this proposed conservation area. Refer to Appendices "A", "B" and "C" for further information.

#### **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

After the last survivors of the Winnebago Indians fled to an area around Lake Winnebago, the Peninsula became the domain of the Potawatomi. Their largest village was Mechingan, at the mouth of Hibbards Creek, just north of present day Jacksonport, which was the last district to be settled in the county. The Potawatomi were very hospitable and liked nothing more than to be praised for their generosity. It was in the early 1650's that a great war was raging in Lower Ontario and the adjoining regions.

The Iroquois, perhaps the most warlike of the Indian tribes, came to the peninsula's shores of Lake Michigan hunting the remnants of several tribes, among many, they had been seeking to destroy. These fleeing tribes sought refuge from the Iroquois, at the Potawatomi village of Mechingan, swelling its population from around 1500 to 4000. It was here that the Iroquois met defeat. This was one of the most important events in the history of western Indians (Holand 1925). The Hibbards Creek area has been one of the more significant archeological sites in the state. Many of the relics found there can be seen at the Neville Public Museum in Green Bay.

#### **SITE FEATURES:**

##### **Fish Creek Watershed**

Fish Creek is a small 1 and ½ mile long, 8-foot wide stream with a moderate gradient of 15 feet per mile. The headwaters of the stream are spring fed. Button Marsh is a large forested wetland associated with Fish Creek. The creek runs the length of the Niagara Escarpment until a pooling area occurs at a small dam. From that point the creek flows through the village of Fish Creek and then into Fish Creek Harbor at the southern boundary of Peninsula State Park.

- Fish Creek is in the Town of Gibraltar. Gibraltar has adopted Door County's zoning ordinance.
- Land use near Fish Creek is predominantly woodlots with lesser amounts of idle farmland, orchards, other natural lands, farmed areas, and scattered single family residences.
- Soils near Fish Creek are shallow to deep, well drained, and almost level to moderately steep. A loamy sandy loam or loam subsoil overlays loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).

- Lowland plant species include cattail (*Typha latifolia*), bluejoint grass (*Calamagrostis canadensis*), various sedges (*Carex spp.*), and rushes (*Juncus spp.*). Upland species include red oak (*Quercus borealis*), sugar maple (*Acer saccharum*), and butternut (*Juglans cinerea*). There has been recent selective cutting in the upland forests.
- Spring spawning runs of longnose (*Catostomus catostomus*) and white suckers (*Catostomus commersoni*) have been documented. Walleye (*Stizostedion vitreum*) are also said to frequent this stream (Corbisier 2000).
- Rare species include the Hooker's orchis (*Platanthera hookeri*) and the Red-shouldered Hawk with known nesting sites around the Redmon, and Heeden properties (Fish Creek lowland forest area). Rare snails are found along the Niagara Escarpment near Hibbards Creek.

### **Thorp Pond**

Thorp Pond is a small, nearly circular 6.4-acre lake with a maximum depth of 2.5 feet, located west of Bailey's Harbor and northeast of Egg Harbor. The Wisconsin Department of Natural Resources classes the lake as a drainage lake, though there is no defined inlet or outlet. High quality upland and lowland forests and wetlands border Thorp Pond. A sensitive boreal rich fen, and a diverse northern sedge meadow are at the north end of the pond. Surrounding the pond and sedge meadow is a lowland forest of tamarack and white cedar, and surrounding uplands are dominated by sugar maple, eastern hemlock American beech, and birch. This upland forest forms a connection to the adjacent Fish Creek watershed.

Thorp Pond is located in the Towns of Gibraltar and Egg Harbor. Gibraltar has adopted the county zoning ordinances. Egg Harbor utilizes an independent planning commission with a sub-division ordinance. The Egg Harbor Town Board enacted a moratorium on commercial development from January 1998 to March 1999. Under the 'master development plan' wetlands, forests, the Niagara Escarpment and open space will be protected. The Nature Conservancy is working with the town to identify high quality natural resources in Egg Harbor.

- Soils under Thorp Pond are predominantly comprised of peat. Surrounding the pond is lowland conifer forest. Ground composition is comprised of wet saturated muck soil in the spring that dries out in the summer. The north side of the pond has an alkaline fen underlain by neutral peat of unknown depth.
- Land use surrounding Thorp Pond include cleared cropland, stump pasture, and orchards.
- The pond is spring fed, shallow, and hard bottomed. An emergent aquatic community surrounds the pond. In the western section is a seasonally flooded basin. The basin floods in the spring and is dry by summer. The water flows from the east draining springs in the western part of the hardwood swamp. There is no outlet from the pond.
- The basin's primary water source is the lowland hardwood swamp located in the southwestern portion of the site. The swamp also floods in the spring and dries by summer. An alkaline fen borders the pond at the northern edge and extends into the lowland conifer forest.
- Two wetland basins are located east of Thorp Pond. It is not known whether there is a groundwater connection between the pond and wetlands. The basins drain south across County Trunk EE toward Hibbards Creek. In times of high water the wetlands serve as a portion of the headwaters of the creek (Grimm 2001B).

- Vegetation in the basin is predominantly reed canary grass (*Phalaris arundinacea*). Other plants found in the basin are willow, green ash (*Fraxinus pennsylvanica*), and marsh fern (*Thelypteris palustris*). Red maple (*Acer rubrum*) and silver maple (*Acer saccharinum*) dominate the lowland swamp, with lesser amounts of green ash and American elm (*Ulmus americana*). Groundcover plants include royal fern (*Osmunda regalis*), blue flag iris (*Iris virginica*), sensitive fern, (*Onoclea sensibilis*), and scattered reed canary grass.
- The upland conifer/hardwood forest has high diversity. Some sections are almost completely cedar and balsam. Other areas are mixed sugar maple, white birch, and big-toothed aspen (*Populus grandidentata*). Understory plants vary from thick to sparse. Dominant plants include sugar maple, cedar, hemlock, and balsam fir (*Abies balsamea*). The herbaceous layer is a combination of old field species such as bracken fern (*Pteridium aquilinum*), red clover (*Trifolium pratense*), hawkweed (*Hieracium lachenalii*), and king devil (*Hieracium piloselloides*), and woodland species such as columbine (*Aquilegia canadensis*), trillium (*Trillium spp.*), thimbleberry (*Rubus parviflorus*), white baneberry (*Actaea pachypoda*), twinflower (*Linnaea borealis*), Canada mayflower (*Maianthemum canadense*), and wood aster (*Aster cordifolius*). The ground layer also has tree seedlings such as sugar maple, white birch, aspen, beech, red oak, black cherry (*Prunus serotina*), balsam, white cedar, red maple, and black locust (*Robinia pseudoacacia*).
- A lowland conifer forest surrounds Thorp Pond. Vegetation is a mix of white cedar, tamarack, balsam fir, red maple, and black ash. Understory is comprised of cedar, balsam, and black spruce (*Picea mariana*). A shrub layer is predominantly ash, willow, alders, labrador-tea (*Ledum groenlandicum*), red osier dogwood, and high bush cranberry (*Viburnum opulus*).
- Groundcover species include dewberry (*Rubus spp.*), sphagnum moss (*Sphagnum cymbifolium*), bluebead (*Clintonia borealis*), gold thread (*Coptis trifolia*), star flower (*Trientalis borealis*), miterwort (*Mitella spp.*), wild sarsaparilla (*Aralia nudicaulis*), and sensitive fern (*Onoclea sensibilis*). Close to the pond, bogbean (*Menyanthes trifoliata*) and three leaved false Solomon's seal (*Smilacina trifolia*) are common.
- Near the fen is a section of taller white cedar and tamarack; less frequent are silver maple and black spruce. Shrubs found within this area are alder, willow, and red osier dogwood. Meadows between sections of trees are comprised of sedges, tussock sedge (*Scirpus cespitosus*), wire sedge (*Carex lasiocarpa*), and twig rush (*Cladium mariscoides*).
- Other area plants include cattail, pitcher plants (*Sarracenia purpurea*), common reed grass (*Phragmites australis*), and young white cedar and tamarack.
- East of Thorp Pond are two small wetland basins dominated by reed canary grass and small green ash. A low ridge lies between the pond and basins. The east and west sides of Thorp Pond contain upland hardwoods. The western hardwoods have been more thoroughly surveyed and contain sugar maple, beech, white ash, white birch, and occasionally hemlock. Groundcover plants include bloodroot (*Sanguinaria canadensis*), sharp-lobed hepatica (*Anemone acutiloba*) Dutchman's-breeches (*Dicentra cucullaria*), wild onion (*Allium canadense*), Canadian white violet (*Viola canadensis*), downy yellow violet (*Viola pubescens*), sweet cicely (*Osmorhiza claytonii*), toothwort (*Cardamine concatenata*), and sedges (*Carex plantaginea* and *Carex pensylvanica*) (Grimm 2001B).

- Waterfowl often visit the area in the spring and fall. Canada Geese (*Branta canadensis*) and Mallard (*Anas platyrhynchos*) are seen nesting along the shore and in the adjacent woods (Corbisier 2000). The basin houses a variety of frogs including spring peepers (*Hyla crucifer*), leopard frogs (*Rana pipiens*), wood frogs (*Rana sylvatica*), and gray tree frogs (*Hyla versicolor*).
- Red-shouldered Hawks have been heard in the lowland swamp. Other birds observed in the upland hardwoods include Scarlet Tanagers, Ovenbirds, Eastern Wood Pewees, and Red-eyed Vireos (Grimm 2001B).
- Rare plants include the state threatened linear-leaved sundew (*Drosera linearis goldie*), sedge (*Carex exilis*) and arrow-grass (*Triglochin maritima*). The Red-shouldered Hawk is state threatened. Bog copper butterflies (*Lycaena epixanthe*), a state special concern species, are also found near the alkaline fen.

### **Hibbards Creek**

Hibbards Creek, upper Door County's longest stream corridor, is 7.4 miles long and varies in width from 10 to 30 feet. It has a low gradient of 7.6 feet per mile and originates southeast of Thorp Pond in a series of springs and emergent wetlands. The creek drains a watershed of 21.9 square miles. Emergent wetlands, conifer swamps, dry-mesic woodlands, and ridge-swale complexes are characteristic of the stream corridor.

Hibbards Creek is the only stream in Door County monitored by the USGS under the National Water Quality Assessment Program (NWQA). Under this program, Hibbards Creek is used to compare other streams with similar physical settings. According to the USGS survey, habitat, algae, benthic invertebrates, and fish scored a fair rating (Corbisier 2000).

- The Hibbards Creek watershed is in the Towns of Jacksonport and Bailey's Harbor. Both towns have adopted the county's zoning ordinance.
- Land use surrounding the creek is primarily agriculture with lesser amounts of woodland and residential area along the lakeshore. A sand and gravel quarry is located adjacent to the stream. Future residential development is planned along the stream corridor off of County Highway A (Grimm 2001).
- Soils are mostly shallow to deep, well drained, and nearly level to moderately steep. A sandy loam or loam subsoil lies over loam, fine sandy loam or dolostone bedrock (USDA SCS 1978).
- Overall, stream habitat is ranked good. Most of the stream is considered a warm water forage fish community, but 2.8 miles of the stream are classified as Class II trout water (Corbisier 2000).
- Vegetation in the northern portion is comprised of wet-mesic and dry-mesic woods. These were traditionally maple (*Acer spp.*), hemlock (*Tsuga canadensis*), and yellow birch (*Betula allgheniensis*). Hibbards Creek flows through conifer swamp and shrub-carr before it passes through a ridge-swale series and empties into Lake Michigan. (Corbisier 2000). In the 1830's, a vegetation survey found that paper birch (*Betula papyrifera*), sugar maple, white cedar (*Thuja occidentalis*), hemlock, quaking aspen (*Populus tremuloides*), willow (*Salix spp.*), beech (*Fagus grandifolia*), basswood (*Tilia americana*), tamarack (*Larix laricina*), and white spruce (*Picea glauca*) were common tree species. Understory is beech, sugar maple, hemlock, pine, cedar, and tamarack (Grimm 2001).

- The stream is annually stocked with rainbow trout (*Oncorhynchus mykiss*). Rainbows and suckers (*Catostomus commersoni*) make spring runs upstream as do Chinook salmon (*Oncorhynchus tshawytscha*) in the fall when water levels and water flow permit (Corbisier 2000).
- State special concern plant species supported by the creek are slender bog arrow grass (*Triglochin palustris*) and marsh horsetail (*Equisetum palustre*).

### North Kangaroo Lake

The Piel Creek-Kangaroo Lake system lies in a shallow trough of the Niagara Escarpment extending from Fish Creek to the north and west, down through the minor valley of Piel Creek through Kangaroo Lake to Lake Michigan. Like similar low areas adjacent to Lake Michigan, this trough was submerged intermittently by higher waters of post-glacial lakes (Lake Algonquin 8,000 BP; and Lake Nipissing 4,000 BP; note BP is abbreviation for “before present”).

Embayment of Kangaroo Lake by sand deposition and dune formation followed the receding lake levels and regional post-glacial land rebound. Today, a small stream, Hine's Creek, flowing from the southeast corner of Kangaroo Lake, links Kangaroo Lake to Lake Michigan.

- North Kangaroo Lake is in the Towns of Gibraltar, Baileys Harbor, and Egg Harbor. Both Gibraltar and Baileys Harbor have adopted the county’s zoning ordinance. Egg Harbor utilizes an independent planning commission with a subdivision ordinance.
- The shoreline of Kangaroo Lake south of the causeway has become highly developed with cottages, homes, resorts and condominiums. Except for one small cluster of cottages at the causeway, the north portion has escaped all shoreline development.
- The forests and marshes of this site are bordered by abandoned or, less commonly, active agricultural lands, and rural single family homes. The typical abandoned field setting consists of low herbaceous vegetation mixed with patches of juniper (*Juniper communis*), raspberries (*Rubus sp.*), and bracken fern. Depending on the time since abandonment, historic use, and soils; saplings and small pole sized trees of black cherry, choke cherry (*Prunus virginiana*), green ash, apple (*Malus spp.*), and sumac *Rhus typhina* may be found invading these fields, often emerging through the shrubby patches of raspberry and juniper.
- Low herbaceous stands of short grasses, ox-eye daisy (*Chrysanthemum leucanthemum*), hawkweed (*Hieracium spp.*), knapweed (*Centaurea maculosa*), Queen Anne’s lace (*Daucus carota*), and St. John’s-wort (*Hypericum perforatum*) characterize other abandoned hayfields or old orchards. These early succession species appear to persist until a full tree canopy has closed over the site. Due to the increasing difficulty of farming in Door County, abandonment of agricultural land can be expected to continue with conversion to single family dwellings the usual outcome.
- Based on an examination of historic aerial photos (1938; black and white, 1:15,840 scale) of the site, several observations can be made. Prior to 1938, much of the presently forested land had been logged to varying degrees of intensity, though complete canopy removal did not occur. Only sparse residual mature trees represented the upland hardwood/conifer forest north of the lowland forest at the north end of the lake in 1938. Today this forest is composed of a mix of even-aged big tooth aspen and dense white cedar/balsam fir sapling stands. The majority of the upland forest block west of the lake appeared intact in 1938, however, recent logging was evident just west of the mouth of Piel Creek. For the most part the forest acreage north of Kangaroo Lake has increased since 1938 by infilling of small interior patches and by expansion out from the forest edge.

- The most noticeable change to the lake edge marsh since 1938 appears to be a slight but clear expansion of the marsh at the mouth of Piel Creek. The wetlands near the lake have received little human disturbance and are largely intact. Today, very light and select logging occurs sporadically throughout the private forests of the site. Largely inactive alfalfa fields or pasture borders the lowland forest corridor of Piel Creek.
- Three large culverts that pass water from the north to the south basin of the lake breach the causeway separating the north end of the lake from the south end. As water flows from north to south in Kangaroo Lake, the impacts of cottage and home development on the south basin shoreline have been confined to the waters south of the causeway.
- Like the other lakes of Door County which were bays of the post glacial lakes, Kangaroo Lake is a shallow, marl bottom basin with high pH, and calcium bicarbonate rich water. The marl of the lake sediments results from past and continuing calcium carbonate precipitation in the basin.
- The landscape relief through the site is generally low with the noted exception of the dolostone plateau west of the lake, which rises to 110 feet above the lake surface. This plateau has a high concentration of bedrock crevices and fracture traces as well as numerous areas of exposed bedrock. Maps created for the Upper Door Watershed Project illustrate these features and are available at the Door County Soil and Water Conservation Department. This dolostone plateau is the probable catchment for the springs of lower Piel Creek and the north end of Kangaroo Lake.
- Small scale relief consists of interesting long low lake edge ridges and the slight surface irregularities associated with a glacial till plain drained by a small low gradient stream. It is thought that the lake edge ridges found at the north end of Kangaroo Lake are ice-shove ridges dating from the post-glacial lake period.
- Piel Creek originates from a series of small springs located in a 40-acre basin about 2.5 miles above Kangaroo Lake. The creek then flows southeast through a wooded corridor before entering Kangaroo Lake. North of Piel Creek and west of Kangaroo Lake are upland hardwoods of sugar maple, red oak, white birch and ash. The upland just west of the lake rises in a series of broad terraces to a plateau, which offers a scenic vantage point of the lake.
- A lowland forest composed of white cedar and black ash is located just north of the lake and borders Piel Creek north to its headwaters. The north basin of the lake is ringed by floating sedge mats, having a maximum water depth of only 4.5 feet with a marly to rocky bottom.
- Rare plant and animal species that have been recorded utilizing this landscape include the showy lady slipper orchid, Hine's emerald dragonfly, dorcas copper butterfly (*Lycaena dorcas*), and three species of land snails. Bald Eagles, Osprey, and Caspian Terns often feed on the lake, and historically, Black Terns have nested in the marshes of the lake. The marshes of the north end are also important breeding and migration staging sites for diving and puddle ducks, and shorebirds.

### **Meridian Park**

The core parcels in the site include the Lyle-Harter-Matter County Park, the Meridian County Park, and Wayside Park. This area incorporates most of the land from Kangaroo Lake to Highway 57, which runs parallel to the Lake Michigan shoreline. The site contains a diverse set of natural features characteristic of Door County such as the ridge-swale complexes that border the Lake Michigan shoreline and the sedge meadows found along the southern shore of Kangaroo Lake.

The site boundaries include some of the privately owned lands along either side of the county park. These areas will serve several purposes; expanding the area of protection and act as a buffer where compatible land use practice may be promoted.

- Meridian Park is in the Town of Jacksonport, which has adopted the county's zoning ordinance.
- The surrounding land use is primarily natural lands.
- The soils are generally of shallow depth overlaying dolostone bedrock that is occasionally exposed. Bedrock, where exposed, is covered with mosses and lichens.
- The area situated between the southwest corner of Kangaroo Lake and the northwest side of the high sand dune of the lake holds two permanently flooded basins. Shallow water emergents dominated by wire sedge and twig rush surround both basins.
- The Meridian Park site lies between the southern shore of Kangaroo Lake and the Lake Michigan shoreline. The site is dominated by wooded sand dunes and ridges along with associated wetlands characteristic of the ridge-swale complexes found in Door County. Here a set of parallel forested ridges are interspersed with low swales of varying wetness. The forest cover on the ridges varies from cedar and balsam fir to a mix of hardwoods and conifers.
- Dry-mesic woodlands are confined to the western side of the site between the agricultural fields along Logerquist Road and the ridge-swale complex. The dominant trees are sugar maple and beech with some scattered white ash and ironwood. The understory is composed of balsam fir, ironwood, sugar maple, beech, maple leaf viburnum (*Viburnum acerifolium*), and hazelnut (*Corylus spp.*).
- The characteristic groundcover species are downy yellow violet (*Viola pubescens*), wild leek (*Allium tricoccum*), trout lily (*Erythronium spp.*), sharp-lobed hepatica (*Anemone acutiloba*), large flowered trillium (*Trillium grandiflorum*), blue cohosh (*Caulophyllum thalictroides*), and big-leaved aster (*Aster macrophyllus*).
- The ancient sand dunes at the southern end of Kangaroo Lake rise up to 60 feet over the level of Kangaroo Lake and hold a mixture of sugar maple, beech, and hemlock with occasional black cherry and white ash. Understory varies from sparse to moderately dense and is composed of sugar maple and beech saplings with scattered balsam fir and hemlock. Groundcover has low diversity but ranges from light to dense coverage. Lowland areas are dominated by Canada yew.
- Adjacent to this high dune is a ridge-swale complex composed of a series of parallel ridges interspersed with swales of varying wetness. The complex follows the contour of the Lake Michigan shoreline and occupies most of the central portion of the site. The ridges are covered with dead or dying white birch mixed with white cedar, sugar maple, and balsam. Characteristic species of the understory include mountain maple, white birch, balsam, and occasional black spruce (*Picea mariana*), and hemlock. There is abundant downed woody material. The groundcover is abundant and dense with such characteristic species as wild sarsaparilla, star flower, bluebead, wintergreen, Canada yew, and Canada mayflower. The major swale within the unit is large and open with standing water most or all of the year.

- A conifer/birch woodland is located in the far southern tip of the site adjacent to Highway 57. The dominant trees include white cedar with scattered hemlock, white spruce, white birch, and white pine. The understory is light and composed of scattered white cedar and balsam fir, and beaked hazelnut. Groundcover is also sparse and consists of Canada yew, thimbleberry, large leaved aster, wild sarsaparilla, and several weedy species including hawkweed and helleborine orchid (*Epipactus helleborine*).
- Common birds surveyed at the site include Ovenbird, Red-eyed Vireo, Eastern Wood Pewee, Veery, Ruffed Grouse (*Bonasa umbellus*), and Great Crested Flycatcher. Black-throated Blue Warblers have been reported as nesting at this site.
- Rare plants that occur in the Meridian Park area include State special concern long-spurred violet (*Viola rostrata*), and State and Federally threatened dune thistle (*Cirsium pitcheri*). Rare plants near Heins Creek include State special concern bog reed grass (*Calamagrostis inexpansa*); State threatened dune goldenrod (*Solidago simplex var. gillmanii*) and State threatened thickspike wheatgrass (*Elymus lanceolatus var. psammophilus*).

#### **CONSERVATION GOALS:**

- Create and maintain a contiguous and natural landscape between Peninsula State Park, Fish Creek, Button Marsh Lowlands, Thorpe Pond and Hibbards Creek.
- Maintain or enhance the ecological composition, structure and functions of the several core natural areas of the site, (e.g., the marsh and lowland conifer forest at the north end of Kangaroo Lake, Piel Creek fen, the open marl ponds south of Kangaroo Lake, and the forested sand dune south of the lake).
- Maintain the existing forest of the site and reforest abandoned agricultural land adjacent to the existing forest to increase the overall size of the forest.
- Monitor and control, as necessary, exotic aggressive species, particularly Japanese knotweed, barberry and garlic mustard along the forested trails west and south of Kangaroo Lake.
- Prevent impairment to water quality and flow regime of Piel Creek, especially the headwater fens.

#### **THREATS:**

- Four major roads intersect Hibbards Creek: County Hwy A, Junction, Honold, and Fairview. The roads threaten the natural corridor by impeding movement of native plants and animals and allow invasive exotic plants to gain access to interior portions of the area. During the winter months creek water quality is impacted by runoff from road salting operations. (Grimm 2001B).
- The Town of Jacksonport owns and operates a sand quarry close to Hibbards Creek. Land has been cleared near the quarry, increasing habitat fragmentation of the stream corridor.
- Quarrying is taking place in the southwest corner of the Thorp Pond wetland area. It does not pose a significant threat to plant, animal, and water quality at this time. If the quarry increased mining efforts it could become a threat to the area (Grimm 2001B).
- Poor agricultural practices threaten Hibbards Creek and the surrounding corridor. In several locations, land is cleared up to the stream's edge and used for agricultural purposes (Grimm 2001B).

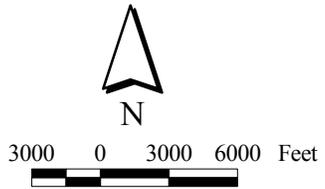
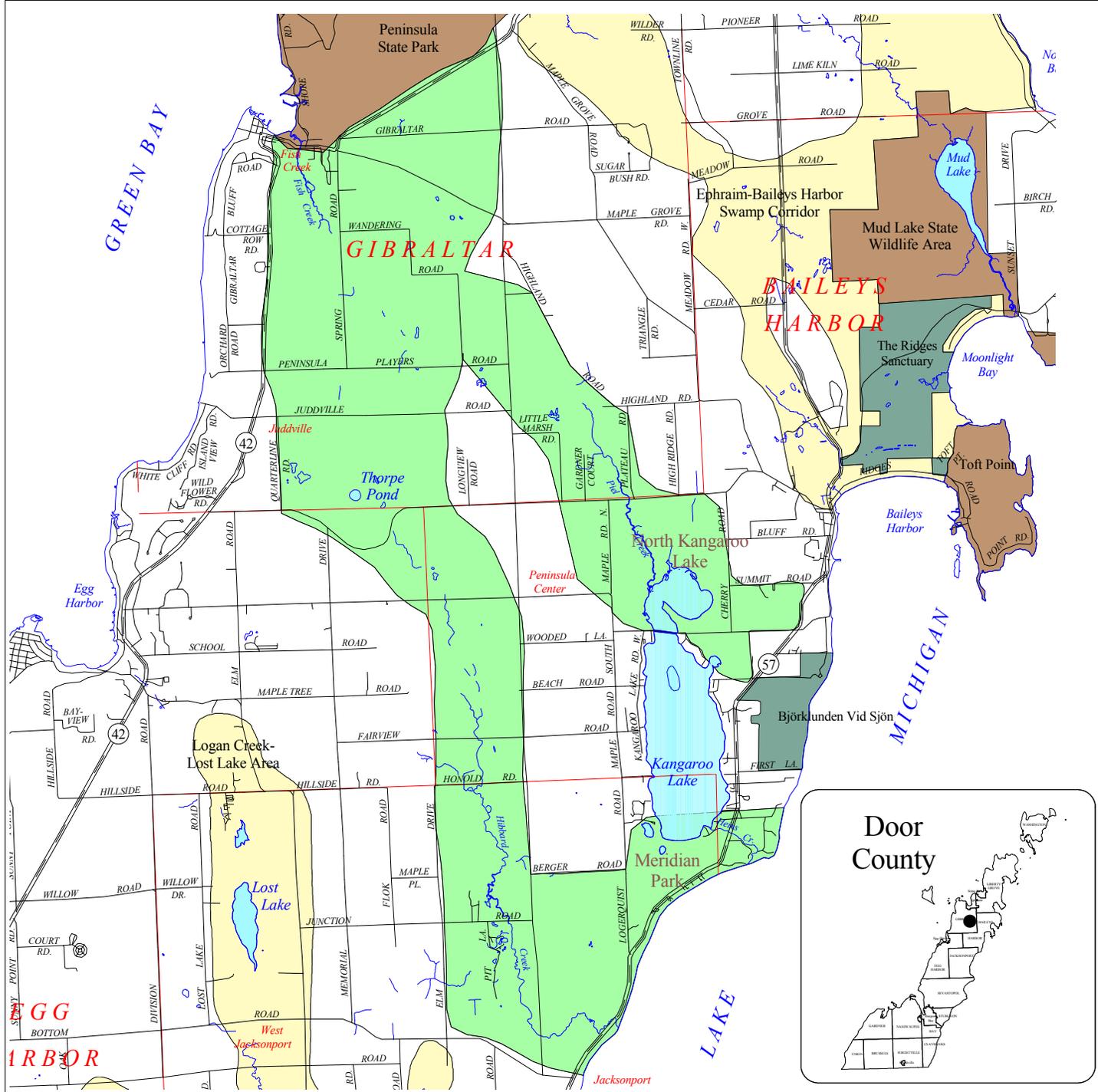
- Agricultural practices including runoff of pesticides and fertilizers are a threat. Grazing of streamside pastures and sedge meadows can result in streambank erosion and direct input of manure into waterways, increasing stream turbidity, phosphates, and coliform bacteria (Grimm 2001B).
- Surrounding Thorp Pond lowland area, agriculture is the primary land use, however, residential development is beginning to appear. The most notable threat from development is seen near Juddville and Quarterline Roads where subdivision is taking place at a rapid rate.
- The viability of the natural communities and species of North Kangaroo Lake area faces its largest threat from the construction of single family units on the developable forest and lakeshore lands within the project site. Residential unit construction with the associated road and utility construction is the major cause of habitat loss, habitat fragmentation and possible alteration to the hydrology of the shallow aquifer in the Piel Creek watershed.
- Inappropriate and poor logging practices are a moderate threat to the natural features of the site, which could alter the plant community and destroy the natural balance of biodiversity in the area. Destruction of forests could open the canopy and create additional forest edge (Grimm, 2001B). While several tracts are under Managed Forest Law contracts with the state, other tracts are not. Currently pressure to log the area is low due to the higher recreational and home development potential of wooded tracts.
- Recreational vehicle use is a threat to discrete areas within the project boundary, especially in the headwater marshes of Piel Creek. Trespass with ATVs has occurred sporadically into this marsh. The landowner continues to have difficulty controlling the problem.
- Note that while the causeway and Kangaroo Lake dam could be listed as threats, their net ecological effect on the site should probably be considered positive. The causeway provides a barrier to motorized boat traffic, restricting such activity to the southern part of the lake. The dam at the outlet, while stabilizing the water level in the lake to some degree also prevents carp from entering the lake from Lake Michigan.
- Exotic plant species invasion is not a major problem at this time as no purple loosestrife (*Lythrum salicaria*), garlic mustard (*Alliaria petiolata*), Japanese knotweed (*Polygonum cuspidatum*), buckthorns (*Rhamnus cathartica*, *R. frangula*), or Eurasian water-milfoil (*Myriophyllum spicatum*) have been found within the project site. These species are in the surrounding landscape however and may become a concern in the future. Eurasian water milfoil has been found in the southern basin of the lake. Efforts by the Kangaroo Lake Association and WDNR to control this population with native herbaceous beetles (*Euhrychiopsis lecontei*) is underway. Exotic honeysuckle (*Lonicera tatarica*, *L. morrowii*, *L. x bella*) are present on the uplands west of the lake.

#### **INFORMATION NEEDS / GAPS:**

- Develop list of individuals and supportive groups interested in land conservation efforts.
- Completed inventories of plant and animals species.

# Bay to Lake Wildlife Corridor

## Door County, Wisconsin



- Bay to Lake Wildlife Corridor
- Adjacent Project Areas
- State Owned Lands/Parks
- Private Conservation Areas

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Bay to Lake Wildlife Corridor



STEVE KELLERMAN

North end of Kangaroo Lake



MIKE GRIMM

Hibbards Creek



MIKE GRIMM

Fish Creek



ROY AIKEN

Thorpe Pond

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# EPHRAIM / BAILEYS HARBOR FOREST CORRIDOR & NORTH BAY LOWLANDS

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## **LOCATION:**

This large complex landscape is located in northeastern Door County in the Towns of Gibraltar, Baileys Harbor and Liberty Grove (T30-31N, R27E). As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Ephraim / Baileys Harbor Forest Corridor & North Bay Lowlands follows the shoreline of Lake Michigan in the Baileys Harbor area then reaches inland across the peninsula to Eagle Harbor. The area contains cedar swamps, a variety of glacial landforms, and a forest corridor with few roads. The North Bay section contains several high quality wetland communities associated with the Lake Michigan shoreline, including emergent aquatic communities; a northern sedge meadow, and a large forested fen community.

Further inland are extensive tracts of northern wet to mesic forest, which intergrades with a forest type having boreal components. Many shallow, cold hard water springs and spring runs also originate with the area. The major spring fed stream, Three Springs (or Nick's Creek) empties into Lake Michigan through a large emergent marsh in the north end of the bay. The northern section adjoins Peninsula State Park and the southern section adjoins The Ridges Sanctuary, Mud Lake State Wildlife Area, Toft Point Natural Area, Baileys Harbor Boreal Forest & Wetlands State Natural Area, Marshall's Point State Natural Area, Moonlight Bay Bedrock Beach State Natural Area, North Bay State Natural Area, and Mink River/Rowley's Bay System.

## **ECOLOGICAL SIGNIFICANCE:**

Approximately 11,100 acres comprise this large complex of natural area projects and preserves. The University of Wisconsin-Green Bay, The Ridges Sanctuary, The Nature Conservancy, the Door County Land Trust and the Wisconsin Department of Natural Resources are already protecting large tracts totaling 4,338 acres. While, the project area identified here contains many unique natural features and species of concern, its importance is magnified when recognized as part of a landscape contiguous with the adjoining sites and natural areas. This site is large enough to furnish habitat for several animals requiring large home ranges or large breeding territories. The contiguous nature of the forest mosaic also allows for the natural recovery from small to medium sized natural disturbances (e.g., windstorms, insect outbreaks).

Old growth conditions occur with the site, along with small to extensive patches of younger early succession forest. Given time this site represents one of the best opportunities on the peninsula to establish a landscape with old growth dynamics and characteristics. Species composition is extremely rich with some of the highest densities of rare, state listed species anywhere in Wisconsin. The diversity of native orchids is especially high within this site.

Ecological processes were disrupted historically through logging, road building and land clearing for orchards and grazing. The impacts of these activities are still visible throughout the site. However important natural ecological processes (surface water movement, forest stand dynamics, food web interactions) appear to have remained intact, to be recovering, to have been only minimally impaired, or to have compensated.

The lands surrounding this site both supports the quality of the site and at the same time may present some of the threats facing the maintenance of the ecological processes and species richness of the site. The ecological connection of this site to the Mink River forests provides additional territory for species movement and genetic interchange. Natural Heritage inventory efforts have identified 36 rare animals, invertebrates, and plants, along with five natural community types. See the Natural communities Cross Reference, Appendix "A" and Wisconsin's Natural Heritage Inventory Listing, Appendix "B".

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

Ephraim was first inhabited by Native Americans, then later by Europeans from Norway. It became the first platted village in Door County. It also had the first public school in the county and the first church, a Moravian congregation begun in 1853 (Holand 1917).

North Bay was yet another of the early 1870's settlements built around a lumber shipping pier. It is one of the two largest harbors along the eastern shore of the Peninsula and has been known for many years by sailors as a refuge in a storm.

The Marshall family moved to the area now called Marshall's Point in 1868. Mary Marshall was the daughter of Increase and Mary Claflin, acknowledged as the first white settlers in the county. The unique boreal forest and wilderness setting of Marshall's Point were factors that led to its becoming a State Natural Area.

## **SITE FEATURES:**

### **Ephraim Swamp**

Ephraim Swamp begins along the shoreline of Eagle Harbor and follows a corridor southeastward to the Town of Baileys Harbor. Two small creeks, Hidden Spring Creek and Ephraim Creek, are located in this area. Hidden Spring Creek originates in Ephraim Swamp. Ephraim Creek originates south of Hidden Spring Creek in a similar habitat. Overlooking the swamp to the west is a wooded section of the Niagara Escarpment.

- Ephraim Swamp is in the Town of Gibraltar. The town has adopted the county's zoning ordinance. Land use is mainly cropland with lesser amounts of woodlots, recreational public, transportation, idle farmland, and other natural areas.
- Soils are shallow to deep, well drained, and moderately steep. A sandy loam or loam subsoil covers sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- Hidden Spring Creek is 1 mile long and 2 feet wide; it has a gradient of 10 feet per mile and is classified as a Class I trout stream for 0.5 miles. Ephraim Creek is 1 mile long and 9 feet wide and has a gradient of 15 feet per mile. It has a good habitat ranking and is also classified as a Class I and II trout stream (Corbisier 2000).
- Vegetation consists of lowland swamp species such as black spruce (*Picea mariana*), tamarack (*Larix laricina*), and white cedar (*Thuja occidentalis*). Upland hardwood portions contain maple (*Acer spp.*), hemlock (*Tsuga canadensis*), and yellow birch (*Betula allgheniensis*).
- Hidden Spring Creek is historically known to have white suckers (*Catostomus commersoni*) and brook trout. However, there is little new information to support the presence of brook trout. Ephraim Creek could attract spring runs of smelt (*Osmerus mordax*), suckers, and occasionally rainbow trout (*Oncorhynchus mykiss*) (Corbisier 2000).
- It is unknown if any threatened or endangered plant or animal species are present, as biological inventories have not been completed.

### **Baileys Harbor Forest Corridor**

This portion is located from the town line of Baileys Harbor southeast to the shoreline of Lake Michigan. There are 2 creeks that flow east into this swamp. Hidden Brook Creek follows a ridge and swale system. An unnamed stream originates in the corridor and flows east into Mud Lake.

- The Baileys Harbor Forest Corridor is in the Town of Baileys Harbor. Baileys Harbor has adopted the county's zoning ordinance.
- Land use is predominantly woodlots with lesser amounts of recreational public, idle cropland, other natural area, and cropland. Soils are mostly deep, poorly drained and nearly level, and organic. A fine sandy outwash or silt loam subsoil over stratified lake sediments underlay the top layer. (USDA SCS 1978).
- Hidden Brook Creek has no documented stream rankings. It has an intermittent flow and is fairly short in length. Originating within the wetland corridor, the creek is supported by surface water runoff and an intermittent spring, and flows into Baileys Harbor (Corbisier 2000). In wet years Hidden Brook Creek can support spawning suckers (*Catostomus commersoni*) from Baileys Harbor (Corbisier 2000). Black bear (*Ursus americanus*) are known from this area.
- Vegetation consists of lowland swamp species such as black spruce (*Picea mariana*), tamarack (*Larix laricina*), and white cedar (*Thuja occidentalis*).

### **North Bay Lowlands / Three Springs**

The North Bay Lowlands / Three Springs site covers approximately 4,700 acres and includes 8,500 feet of frontage along North Bay. The water frontage represents a highly significant length of pristine Lake Michigan shoreline on the Door Peninsula.

- The area contains a significant breeding population of federally endangered Hine's emerald dragonfly (*Stomatochlora hineana*). Four other rare dragonflies inhabit the site as well. Other rare animals include the dorcas copper butterfly (*Lycaena dorcas*) and the Osprey (*Pandion haliaetus*). Important plant species identified from the site include the federally threatened dwarf lake iris (*Iris lacustris*), showy lady's slipper orchid (*Cypripedium reginae*), leafy white orchis (*Platanthera dilatata*) and slender bog arrow grass (*Triglochin palustre*)
- Based on research conducted in the late 1970's, the waters of North Bay are an important spawning site for lake whitefish (*Coregonus clupeaformis*). It is estimated that 1.1 million young are produced annually in the coastal waters from Moonlight Bay to North Bay. North Bay, with its feeder streams, also provides spawning habitat for northern pike, yellow perch, smallmouth bass, rainbow and brown trout, and chinook salmon.
- The major disturbance to lands within the area has been through logging of forests. A small amount of high land from which trees were removed prior to farming are in some stage of succession back to forest. Lowland forest which were logged for cedar posts and lumber, were never cleared completely for farming, and have since returned to full canopy coverage by native species, primarily white cedar (*Thuja occidentalis*), tamarack (*Larix laricina*), balsam fir (*Abies balsamea*), and black ash (*Fraxinus nigra*).
- The sand ridge and swale forest to the west of North Bay has recovered from historic logging to a forest dominated by white birch (*Betula papyrifera*), red maple (*Acer rubrum*), white spruce (*Picea glauca*), white cedar (*Thuja occidentalis*), and mountain maple (*Acer spicatum*).
- Tracts on the periphery of the project area remain unforested, having been most recently under grazing. Farming has ended on most of these tracts, and they are slowly converting to shrubby old fields.

- Sometime prior to 1950, County Trunk Q was routed through the wetland just south of Winding Lane and present day County Q. This road no doubt disrupted hydrologic processes in this coastal wetland. The small stream that drains this wetland to North Bay contains Hine's emerald dragonfly larvae.
- Birds observed in the area suggest that the site supports a significant numbers of species. Characteristic birds of the area include Red-breasted Nuthatch, Golden-crowned Kinglet, Black-throated Green Warbler, Yellow-rumped Warbler, Parula Warbler, Blackburnian Warbler, Ovenbird, Cedar Waxwing and Winter Wren.

#### **CONSERVATION GOALS:**

- Maintain the existing forest of the site and reforest abandoned agricultural land adjacent to the existing forest to increase the overall size of the forest.
- Prevent impairment to water quality and flow regime of the springs and streams that feed or drain the lowland conifer forests, open wetlands, and ponds of the site.
- Enhance the natural forested connections and corridors that link the major blocks of forest and wetlands within this area and also link to adjacent natural areas, (i.e., The Ridges Sanctuary, Baileys Harbor Boreal Forest & Wetlands State Natural Area, Moonlight Bay Bedrock Beach State Natural Area, Mink River Estuary and Marshall's Point).
- Monitor and control, as necessary, exotic aggressive species, particularly Japanese knotweed, and glossy buckthorn.
- Maintain or enhance the ecological composition, structure and functions of the several core natural areas of the site (i.e., Mud Lake and surrounding lowland conifer swamps, Ephraim Swamp, the North Bay/Three Springs forest and wetlands, and the lowland conifer swamp and upland ridges west of Highway 57).

#### **THREATS:**

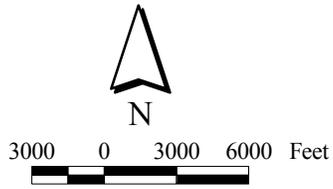
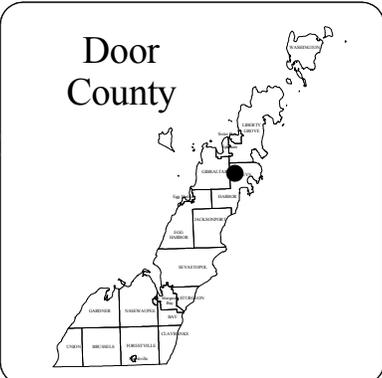
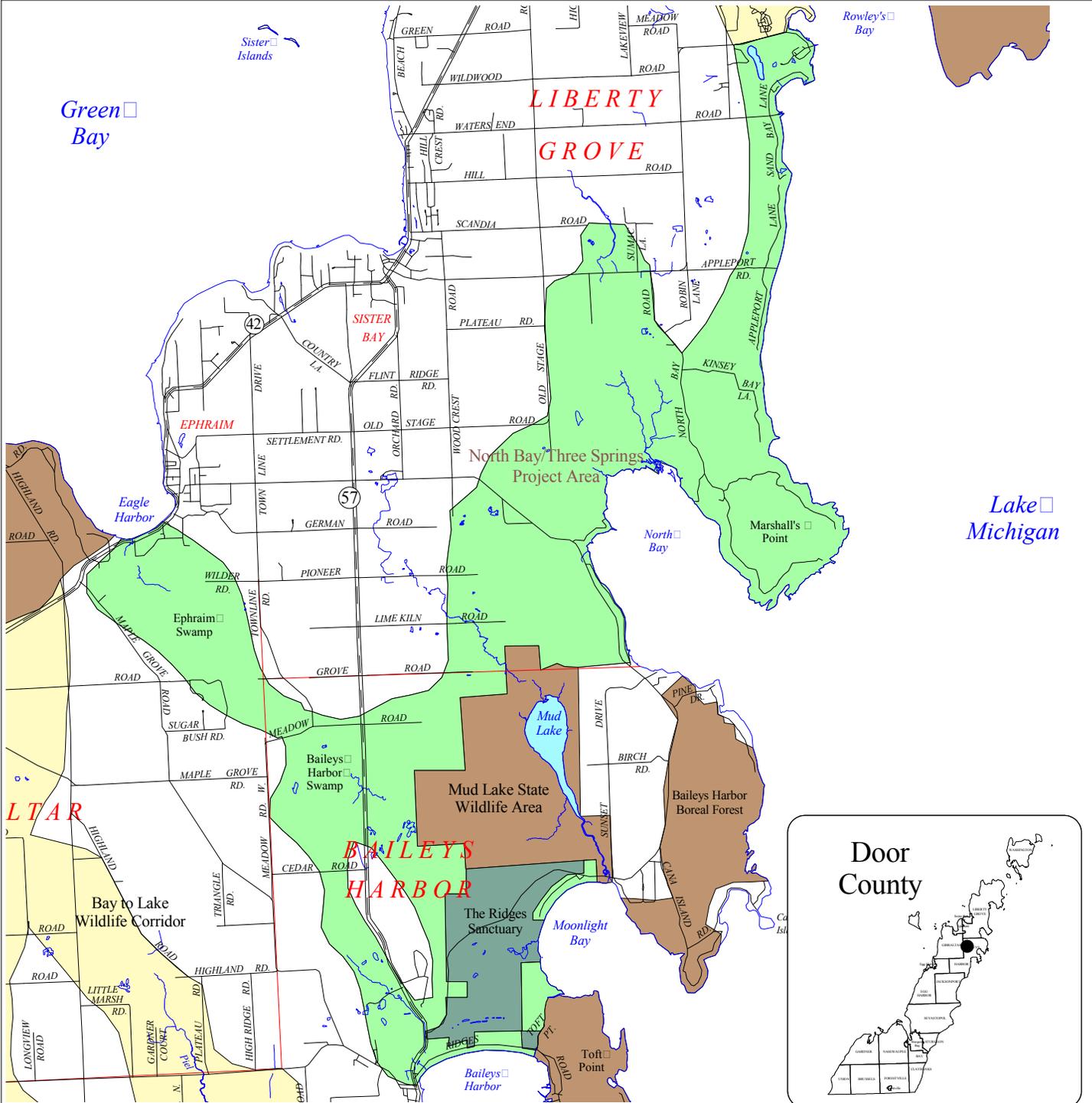
- Habitat fragmentation and disturbance from high and /or low-density residential development in the interior forested areas.
- Disruption of surface water and shallow ground water regimes.
- Motorized vehicle use (4-wheel drive or ATV) of the trails or in the open marsh.
- Poor logging practices.
- Non-point source pollution associated with sewage and road maintenance.
- Poor farming practices that threaten the streams and wetlands associated with this site.

#### **INFORMATION NEEDS / GAPS:**

- Completed inventories of plant and animal species
- Develop list of individuals and supportive groups interested in conservation activities.

# Ephraim / Baileys Harbor Forest Corridor & North Bay Lowlands

## Door County, Wisconsin



- Ephraim/Baileys Harbor Forest Corridor
  - Adjacent Project Areas
  - State Owned Lands / Parks
  - Private Conservation Areas
- NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Ephraim / Baileys Harbor Forest Corridor & North Bay Lowlands



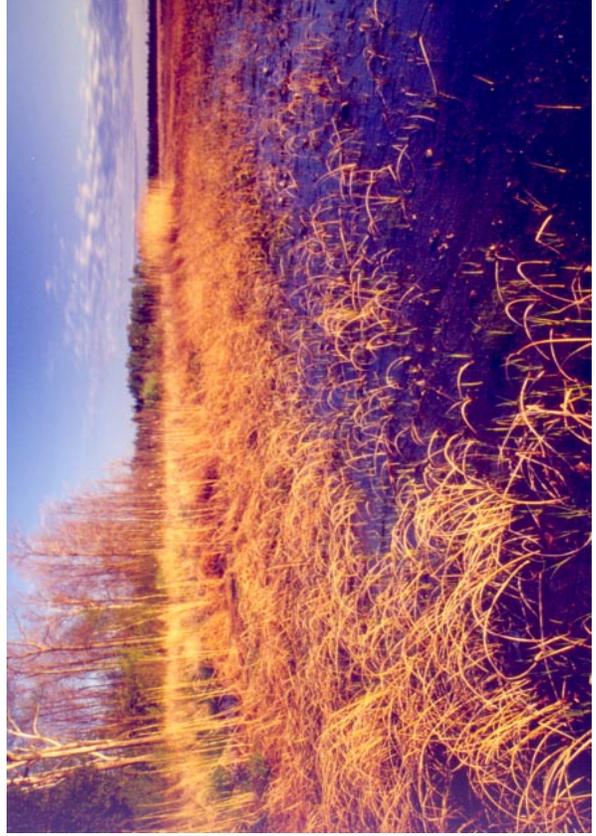
North Bay Conifer forest (Nick's Creek)

RICHARD CARTER



North Bay forest & wetlands

RICHARD CARTER



North Bay coastal marsh

MIKE GRIMM

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# MINK RIVER / ROWLEY'S BAY SYSTEM

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## **LOCATION:**

This area, approximately 2900 acres, is located entirely within Liberty Grove Township at the northern end of the Door Peninsula in Door County. As defined by the conservation planning of The Nature Conservancy, this natural area covers parts or all of Sections 1, 2, 11, 12, 13, 14, 23, 24, 25, and 26 of T.32 N. – R. 28 E.; and part of Section 19 in T. 32 N. – R. 29 E. Several adjoining or nearby significant natural areas are not included in this description, but the contiguous or adjacent position of these sites should be considered when planning for the conservation of the broader landscape around the Mink River. The Mink River Estuary, as a conservation site and State Natural Area, has been an eco-regional priority for the Nature Conservancy since the 1970's when they began buying land in the area. The Conservancy now owns about 1500 acres and continues to acquire land in the area.

## **GENERAL SITE DESCRIPTION:**

The Mink River / Rowley's Bay system is situated in a north-west to south-east oriented bedrock valley crossing the peninsula from Green Bay to Lake Michigan at the northern end of the Door Peninsula and is considered a fresh water estuary. That is, the conductance and alkalinity gradient occurring in the lower and mid-section of the river can shift either upstream or downstream in the river channel dependent on the seiche activity in Rowley's Bay and Lake Michigan.

Within this wetland system, the physical and chemical processes of the estuary impact the function, species composition, and natural community structure of the affected wetlands. As a result of seiche activity the water level in the estuary can fluctuate from 10 to 30 cm in approximately hourly cycles, and considering longer periods, the dynamics of the Mink River hydrologic cycle changes from year to year, affected by the changing levels of Lake Michigan.

Along with the periodic inflow of Lake Michigan water, other sources of water to the wetlands bordering the river include precipitation, overland flow, and a series of groundwater springs found primarily near the upland / marsh transition in the upper parts of the marsh at the head of the Mink River.

Overland flow from the watershed is thought to play a small, seasonal role as a water source to the estuary. The precipitation levels and spring flow varies to a lesser degree throughout the year and from year to year. The watershed boundaries are not well defined but encompass much of the Liberty Grove Township landscape immediately north and south of the Village of Ellison Bay.

Alluvial fine sand, silt and clay and organic material underlie the marsh along the Mink River. More specifically, the soils within the 600-foot contour consist primarily of Carbondale, Markey and Rondeau mucks and soils of the Deford and Yahara series. These soils are typically saturated to depths of a few feet, and while poorly suited for development provides for excellent wildlife habitat.

The upland soils bordering the core wetlands comprise Summerville, Longrie and Omena soil series, and cover large areas in the western and northern portions of the watershed. These are generally considered well-drained loams, and the erosion potential is considered moderate on level areas of this soil but increases with increase in slope.

## **ECOLOGICAL SIGNIFICANCE:**

The Mink River is an unaltered Great Lakes estuarine system and one of two large Lake Michigan coastal marshes in Door County and it is one of the larger coastal wetlands on Lake Michigan. The undisturbed nature of the wetlands and adjoining forests of this landscape and the large number of rare species found here define the high ecological significance of the site.

The near pristine integrity in the plant communities and the lack of human disturbance in the wetland complex has identified the Mink River Estuary as a natural area of statewide or greater significance. Edging the shore of Rowley's Bay north and east of the mouth of the Mink River the beach and the series of sand ridges and swales support a number of rare or uncommon plants and natural community types.

The high quality wetlands that compose the central element of the area contain a variety of rare or endangered species. This includes ten rare plants. Two are listed as federally threatened, the dwarf lake iris and dune thistle. The latter is also listed as a state threatened plant, as is western fescue. Fifteen bird species not commonly found elsewhere in the state nest in the Mink River / Rowley's Bay complex.

Most notably are the Yellow Rail and Black-crowned Night Heron (*Nycticorax nycticorax*). The endangered Caspian Tern also uses the area as foraging habitat. During fall migration waterfowl are attracted to the area for forage on a variety of seed producing plants. Finally, two or more rare invertebrates including the federally endangered Hine's emerald dragonfly thrive in the sedge meadows.

The estuary, where the waters of the river and the lake meet, is the focal point of much of the high quality natural habitat and is an important spawning habitat for fish, particularly northern pike and smallmouth bass. The variety of community types found in this relatively small landscape almost comprises a representative sample of those natural communities found on the Door Peninsula. Newport State Park and the Newport Conifer-Hardwoods State Natural Area as contiguous landscapes enhance the ecological significance of the site.

### **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

The area witnessed significant lumber shipments in 1870, when 1,500 cords of wood, 6,000 railroad ties, 8,000 telegraph poles and 60,000 cedar posts were shipped from Rowley's Bay. The following year shipments included 16,000 telegraph poles, 60,000 cedar posts, 6,000 ties and 15,000 cords of wood (Peterson 1991).

By the 1880's, many sawmills were being moved to places where trees still stood. Many of the large lumber operations had been established in Upper Michigan and Northern Wisconsin. There were many trees left in the inland areas of the Peninsula. However, for most mill owners the problem of getting lumber to the coastal piers made harvesting too costly (Lotz 1994).

All of the lumber business centered in cedar trees, which were large enough to cut. But there were millions of cedars too small to even make fence post. About 1885, J.H. Mathews of Milwaukee, who understood the process of making cedar oil for furniture polish, built a factory on the northeast side of Rowley's Bay. The distillery lasted only two years and closed when the trees were used up (Lotz 1994).

The area's history reflects both Indian settlement and American's pioneer movement. Logging and farming, followed by a burgeoning tourism industry has put its strains on the area over the years. Yet one of the most dramatic influences on the quality of the estuary is the change in lake level. As the marsh goes from exposed sediment to deep water and back again, the mix of vegetation keeps any one natural community from being preeminent.

Despite development and use, changing fortunes and careful local conservation over time helped protect this fresh water estuary in much the same condition as when it was inhabited by the Potawatomi Indians more than a century ago (Peterson 1991).

### **SITE FEATURES:**

#### **Natural Communities of the Mink River / Rowley's Bay area**

- The Mink River landscape comprises a mosaic of wildlife habitats. The uplands of the watershed hold scattered patches of forest, abandoned agricultural fields and orchards interspersed with active agricultural lands and low density residential development. Although most of the upland forest had been removed by the early 1900's and replaced with open agricultural fields and orchards, the low wet forest immediately surrounding the marsh and river, while cut extensively for timber, and significantly altered as a result, was not replaced with a different land use.
- The estuary, where the waters of the river and the lake meet, is an important spawning habitat for fish, particularly northern pike and smallmouth bass. These two species as well as yellow perch and black bullheads make up the bulk of the fishery according to interviews with fishery biologists and

commercial fishermen. Seventeen species of fish have been identified in the river or the adjoining bay. However, no net surveys of non-game fish have been conducted in the Mink River. There has been neither survey of mollusks nor evaluation of the biotic index of the river based on aquatic invertebrates.

- The dynamics of the wetland communities are driven largely by the short and long-term fluctuation in lake level. The wetland communities can be broken into five main categories: The emergent [or deep] marsh along the Mink River; A shallow marsh characterized by an even mixture of the sedges *Carex aquatilis* and *C. prairea* forming extensive sedge meadows that fringe the spring-fed channels upstream; A wet meadow dominated by sedges *Carex stricta* and *Calamagrostis canadensis* that border the entire marsh; The interface between the marsh and the surrounding upland which is inhabited by a mixture of small trees, shrubs, and herbaceous wetland species; And the lowland forest of white cedar, alder, black ash, and tamarack.
- The northern sedge meadow mentioned above is a rare to uncommon community in Wisconsin as many of these sedge meadows have been lost to grazing or drainage. The relatively broad expanse of this meadow area near the headwaters of the Mink River is also significant as most sedge meadows in northern Wisconsin are limited to narrow strips between deeper water marshes and a surrounding shrub carr.
- With water levels near the soil surface fed by alkaline springs, the Mink River sedge meadow is the breeding site of the federally endangered Hine's Emerald dragonfly (*Somatochlora hineana*). Because of the dolostone bedrock below, the sedge meadow area supports species more often associated with fens such as brook lobelia (*Lobelia kalmii*) and marsh-bellflower (*Campanula aparinoides*).
- Mature fruits of the abundant sedge plants are food for some bird species and contribute to the desirability of the Mink River habitat for the rare Yellow Rail, a species considered to be critically imperiled in Wisconsin. The Sedge Wren is a special concern species in the state and appears to be abundant in the sedge meadow area.
- The deep marsh at the Mink River is also valuable to the avian community. Especially during fall migration, waterfowl are attracted to the area to forage on the seeds of wild rice (*Zizania aquatica*), bulrushes (*Scirpus americanus* and *S. validus*), and bur-reeds (*Sparganium spp.*). Common breeding waterfowl include Blue-winged Teal (*Anas discors*), Mallards, and Wood Ducks. While not as common as the preceding species, American Black Duck (*Anas rubripes*), Northern Pintail (*Anas acuta*), and Common Merganser (*Mergus merganser*) have nested in the Mink River wetlands. Other rare birds associated with the Mink River wetlands include Black-crowned Night Herons and Caspian Terns. The terns are listed as endangered in Wisconsin and nest on islands in Lake Michigan and use the river for foraging. American Bitterns (*Botaurus lentiginosus*), Double-crested Cormorants (*Phalacrocorax auritus*), Yellow Rails, and Great Blue Herons also use the wetland area. Northern Harriers, Goshawks, Cooper's Hawk, Red-shouldered Hawks, Osprey and Bald Eagles have all recently nested in the forests surrounding the Mink River.
- The most abundant forest type surrounding the Mink River is the northern wet-mesic forest. Seasonal pooling and an abundance of bryophytes and liverworts characterize the northern wet-mesic forest, dominated by white cedar and balsam fir standing in a swampy substrate. The conifer swamp at the Mink River is the habitat of at least four rare orchids. Three of these orchids: white adder's-mouth (*Malaxis monophyllos* var. *brachypoda*), showy lady's-slipper (*Cypripedium reginae*), and large roundleaf (*Platanthera orbiculata*) are listed as species of special concern in Wisconsin due to rarity.

The fourth rare orchid, the ram's-head lady-slipper orchid (*Cypripedium arietinum*), is listed as threatened in the state. A diversity of warbler species has been observed in this forest type, which include Northern Parula (*Parula americana*), Black-and-white (*Mniotilta varia*), Nashville (*Vermivora ruficapilla*), Canada, and Blackburnian (*Dendroica fusca*) Warblers, and Ovenbird as well as the Northern Waterthrush.

- Surrounding the wetland communities along the river are upland forests of hemlock, sugar maple, white birch, and beech with lesser numbers of yellow birch and white pine. Younger stands hold earlier succession species like quaking and big-tooth aspen. These upland forest stands occur on relatively deep soils, which for Door County may only extend a couple feet at most but are nevertheless usually quite rich in humus. The moist, rich environment is very favorable for fleshy fungi and saprophytic seed plants. Preliminary study of the fungi of the Mink River forest reveals over 35 species of mushrooms present during late summer. These upland forests contain the habitats of many northern songbirds. The Chestnut-sided Warbler (*Dendroica pensylvanica*), Nashville Warbler, and Black-throated Green Warbler are common in the mesic stands. The Blackburnian Warbler, Canada Warbler, and Pine Warbler (*Dendroica pinus*) may be found on the drier sites with pines in the forest canopy. Most recently 69 species of birds have been confirmed using the area for breeding habitat.
- Edging the shore of Rowley's Bay north and east of the mouth of the Mink River, the beach and the adjacent series of sand ridges and swales support a number of rare or uncommon plants and natural community types. Along the shore, fractures in the exposed bedrock allow pockets of soil to collect and support a number of plant species adapted to the extremes of moisture and heat created by a dynamic system of periodic flooding. The small grass, parnassus (*Parnassia parviflora*), the lesser fringed gentian (*Gentianopsis procera*), and (*Satureja sp.*) are uncommon species which occur here.
- The rare Crawe's sedge, (*Carex crawei*), has been found along the sandy shoreline and western fescue (*Festuca occidentalis*), and the federal and state threatened dune thistle (*Cirsium pitcheri*), inhabit the open sandy fore dunes. On the ridges behind the beach, the federally threatened dwarf lake iris (*Iris lacustris*), is found in small scattered patches in openings between the white cedars.

#### **CONSERVATION GOALS:**

- Maintain the existing forest of the site and reforest abandoned agricultural land adjacent to the existing forest to increase the overall size of the forest.
- Enhance the natural forested connections and corridors that link the major blocks of forest and wetlands within this area to adjacent natural areas (i.e., Door Bluff County Park to the north, Newport State Park to the east, and the North Bay area to the south).
- Prevent impairment to water quality and flow regime of the springs and upper reaches of the Mink River that feed the marsh and open water of the Mink River estuary.
- Monitor and control, as necessary, exotic aggressive species, particularly Japanese knotweed, glossy buckthorn and garlic mustard in the forests adjoining the Mink River.
- Maintain or enhance the ecological composition, structure and functions of the core natural areas of the site (i.e., the open marsh and adjoining lowland and upland forests of the Mink River, the undeveloped shoreline of Rowley's Bay, and the riparian forest of the Mink River north of Hwy 42).

## THREATS:

- As the quality of the groundwater that supplies a large portion of the water of the Mink River is critical to the health of this wetland dominated system, any contamination of this groundwater would degrade the quality of this site. Possible sources of contamination to this groundwater could include leaking or failing septic systems in the watershed, or increased nutrient loading of the groundwater from poor fertilizer management in the watershed.
- Surface water runoff also may contribute degrading influences to the system. Sources of contaminants would likely be runoff from paved or impervious surfaces within the watershed. This could be of particular concern where Highway 42 crosses the Mink River and further upstream.
- Another threat to the health of the Mink River landscape is the presence of a number of non-native species of plants and animals. Carp in particular have invaded the shallow waters of the river negatively affecting the water quality. Zebra mussels have also been found in nearby Rowley's Bay, although in low numbers.
- Invasive plant species also pose a threat to this site. Purple loosestrife has been seen occasionally in the marsh, but has been controlled by pulling. Garlic mustard has recently been found along the shore of Rowley's Bay. Other species such as Vinca, bitter sweet nightshade, autumn olive, Japanese knotweed and others are present in the landscape and if not controlled could prove damaging to the integrity of the natural communities of the site.
- Dispersed home development in the woods of the Mink River landscape also pose a threat to the integrity of the site. Impacts such as direct habitat loss, forest fragmentation, groundwater contamination, and exotic species introduction often follow home development in intact forest settings.

## INFORMATION NEEDS / GAPS:

- Groundwater recharge areas for the springs of the Mink River.
- Location and abundance information on exotic species in the landscape.

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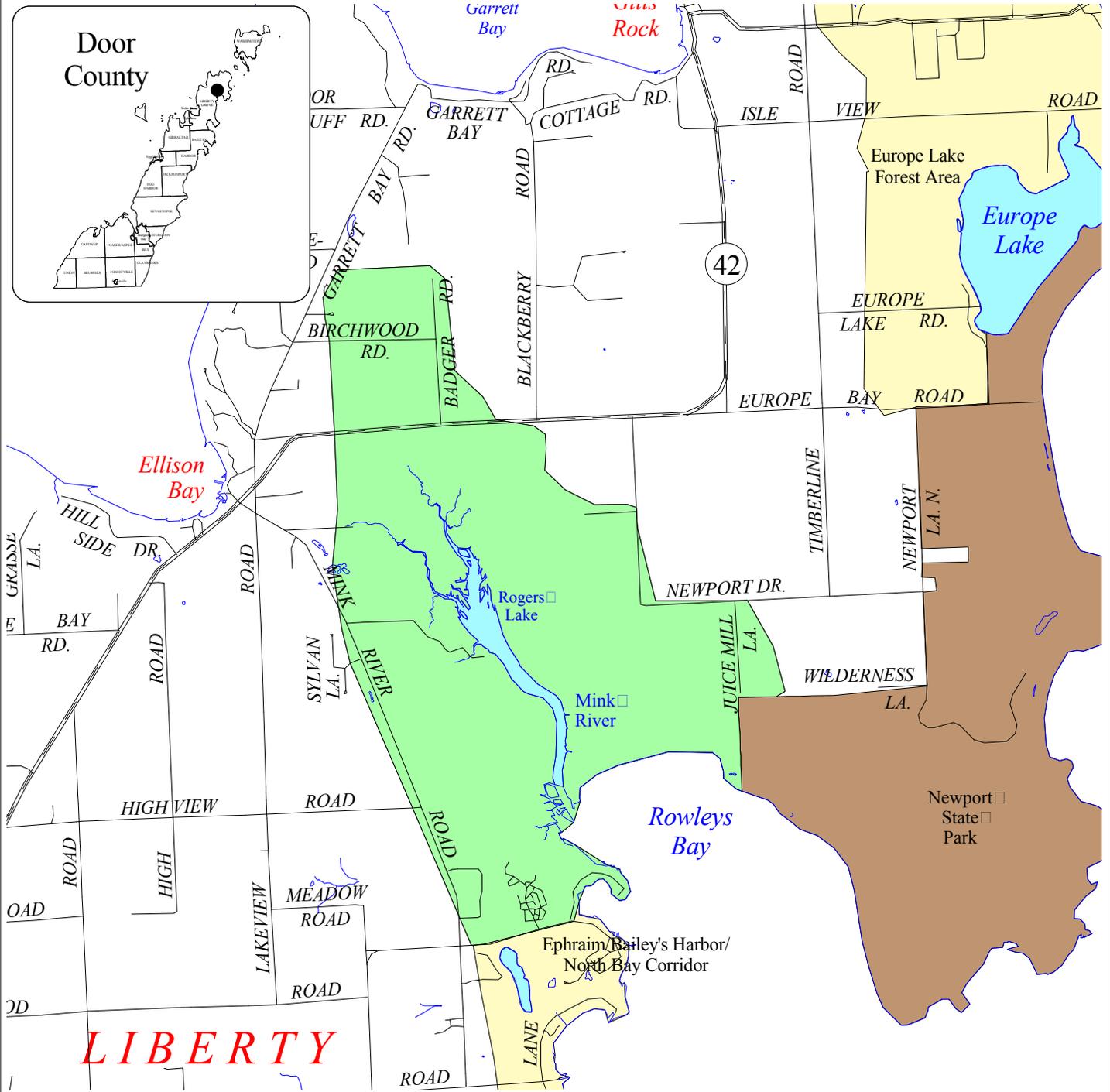
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# Mink River / Rowley's Bay System

Door County, Wisconsin



**LIBERTY**



2000 0 2000 4000 Feet

- Mink River / Rowley's Bay System
- Adjacent Project Areas
- State Owned Lands / Parks

NOTE: Site boundaries are approximations.



Source: Bay-Lake Regional Planning Commission, 2003.

# Mink River / Rowleys Bay System



RICHARD CARTER

Rowley's Bay - Mink River Estuary



STEVE KELLNERMAN

Mink River



RICHARD CARTER

Headwaters (Rogers Lake) of Mink River

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# EUROPE LAKE FOREST AREA

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## **LOCATION:**

The Europe Lake Forest Area is composed of approximately 1700 acres located immediately north of Europe Lake in the northern most portion of Door County, in the Town of Liberty Grove (T32N, R28E). As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## **GENERAL SITE DESCRIPTION:**

The Europe Lake Forest Area is an extensive forested landscape at the northern most point of the Door Peninsula. Included in this natural area are Europe Lake, Wisconsin Bay, and Table Bluff. Europe Lake is separated from the Lake Michigan shoreline by a dolostone ledge and sand dune topography (Watermolen and Bougie 1995). Newport State Park adjoins the southern boundary of the forest area and Europe Lake. The lake, once a bay of Lake Michigan, was created by wave action forming a sand and gravel bar across the mouth of the embayment (Merryfield 2000).

## **ECOLOGICAL SIGNIFICANCE:**

Northern mesic forest dominates the area, and sections east of Europe Lake support what appear as good representations of “boreal” forest. Near the shoreline are dolostone outcrops of the Niagara Escarpment and sand dunes created by wave action of Lake Michigan.

The site holds a diverse array of forest, wetland, and shoreline habitats and its ecological significance is enhanced by Newport State Park to the south, a portion of which is designated as Europe Bay Woods State Natural Area. As the northern most series of Lake Michigan coastal landscapes, along the Door Peninsula, the Europe Lake forest block represents the last migratory staging habitat for northward migrating birds in the spring, before they begin their crossing of the Grand Traverse Islands into northern Michigan. The landscape is equally important for birds migrating south from Michigan in the fall. The mosaic of habitat types, especially the near shore forest, provides essential resources to these migrants.

Exotic species do not appear to be prevalent in the area. Perhaps the most significant feature of the site is the shoreline of Europe Lake. While cottages have been built on the lake, there are opportunities to preserve portions of the shore. Protection of the remaining shoreline would compliment the already protected portion of the lake in Newport State Park. The species composition is rich, and partial inventories conducted in the area have documented twenty rare species of animals, invertebrates, and plants. Four natural community types are found in the area. (See Appendices “A”, “B” and “C” for specifics.)

## **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

Early settlement of this area was like a roller coaster in the county’s history. First, the village of Newport was created in the 1870’s, primarily to support the wood cutting business of a Dane named Hans Johnson. He specialized in selling cordwood to fire kilns in Milwaukee, which had become well known for their “Cream City” bricks. His enterprises built an entire village, including sawmill, pier, store, horse barn, home and post office. Later, the area’s woodland was harvested for cedar juice used in making furniture polish. The village became a ghost town at the turn of the century, but was revived for a brief period by the Christmas tree business. Thousands of trees were shipped to larger cities around Lake Michigan. The community was deserted once more around 1904 when the trees were gone (Lotz 1994).

In the decade of the 1920’s, a large area around Europe Lake became a kind of public park owned by Ferdinand Hotz, a Chicago diamond broker. Hotz acquired 2200 acres and built a summer lodge. He opened his land to visitors and late in the decade offered it to the State Conservation Commission to be maintained as a wildlife refuge. The commission accepted the land and eventually it became Newport State Park (Lotz 1994).

## **SITE FEATURES:**

### **Europe Lake Forest Area**

- Europe Lake Forest Area is in the Town of Liberty Grove. Liberty Grove has adopted the county's zoning ordinance. The surrounding land use is primarily natural area with lesser amounts of idle cropland, cropland, orchards, and residential lots.
- Soils are shallow to deep, well drained, and level to moderately steep. A sandy loam or loam subsoil overlays sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- The shoreline of Wisconsin Bay is comprised of rubble, cobble, and gravel with small portions of shelving bedrock, and is the northern most bay on the tip of the peninsula.
- Europe Lake is a 273-acre seepage lake with an average depth of 6 feet and maximum depth of 10 feet. Lake classification is oligotrophic, meaning it is generally unproductive and nutrient poor. Water quality of the lake is considered very good, however increased boating pressures could intensify turbidity within the lake (Corbisier 2000).
- Common vegetation includes butternut (*Juglans cinerea*), oak (*Quercus spp.*), hemlock (*Tsuga canadensis*), sugar maple (*Acer saccharum*), and pine (*Pinus spp.*). Vegetation surrounding the lake is birch (*Betula spp.*), northern white cedar (*Thuja occidentalis*), and pine species with a marsh at the northern end. A red pine (*Pinus resinosa*), eastern white pine (*Pinus strobus*) and old-growth beech-sugar maple mesic forest is located between Europe Lake and Lake Michigan. Swampy sections of boreal forest occur east of the lake and support many rare plants.
- The site provides good habitat for many species of migratory birds. Fish species present in Europe Lake include walleye (*Stizostedion vitreum*), smallmouth bass (*Micropterus dolomieu*), northern pike (*Esox luciosus*), rock bass (*Ambloplites rupestris*), yellow perch (*Perca flavescens*), and pumpkinseed (*Lepomis macrochirus*).
- In Wisconsin Bay, smallmouth bass are present along with Chinook salmon (*Onchorynkus tshawytscha*) and brown trout (*Salmo trutta*), which are annually stocked for fishing purposes

## **CONSERVATION GOALS:**

- Integrate and maintain an ecological connectivity with Newport State Park.
- Protect the remaining ecological integrity of the Lake Michigan shoreline including the upland forest and hydrology supporting the coastal areas.

## **THREATS:**

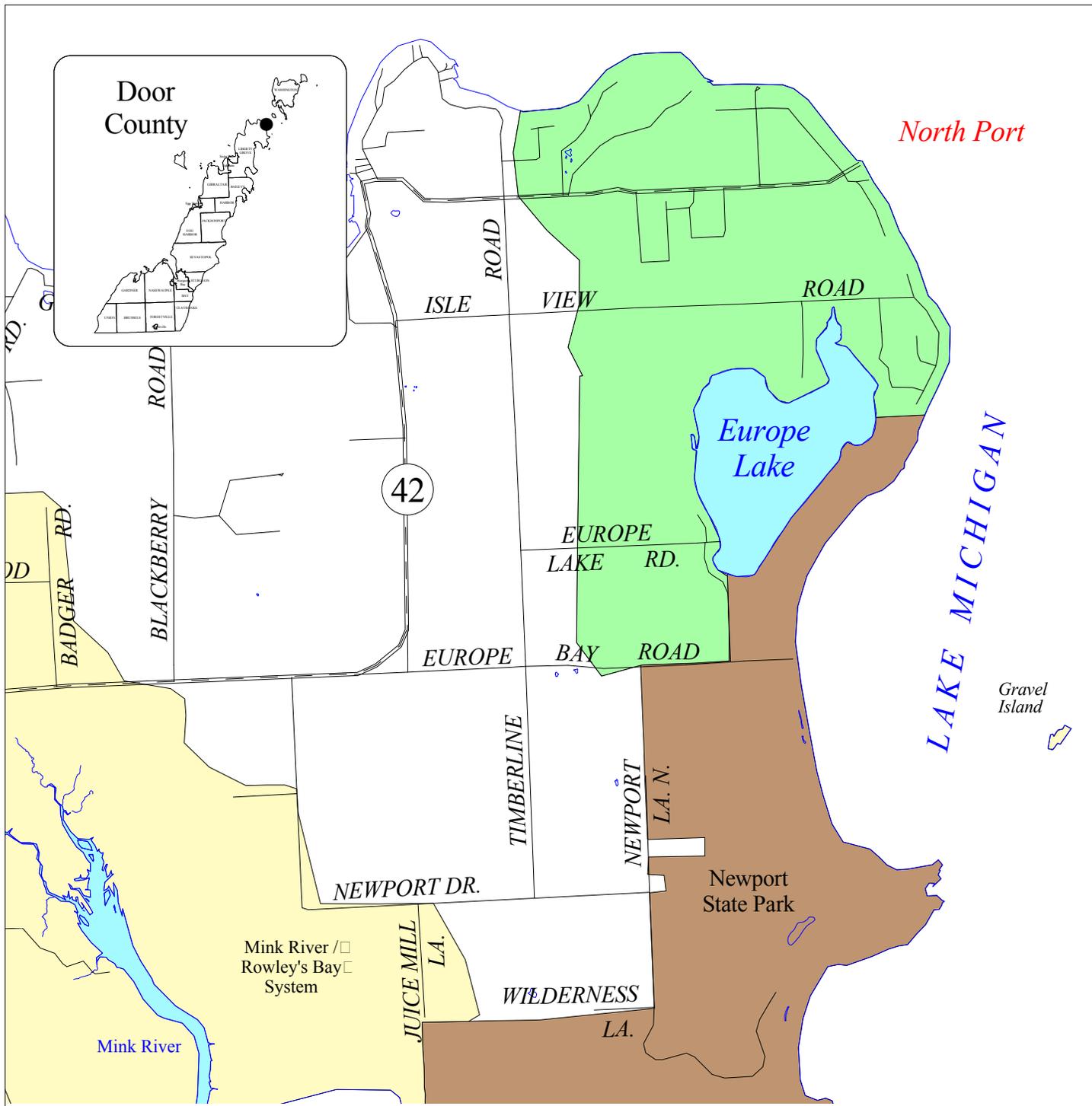
- Residential development is the main threat to northern Door County.
- The major threat to this area is fragmentation of the ridge and swale topography, dolostone escarpment, shoreline of Europe Lake, mesic hardwood forest and lowland boreal forests of areas west of Europe Lake.

## **INFORMATION NEEDS / GAPS:**

- Completed inventories of plant and animal species
- Develop list of individuals and supportive groups interested in conservation efforts

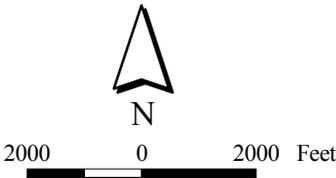
# Europe Lake Forest Area

Door County, Wisconsin



*North Port*

Gravel Island



- Europe Lake Forest Area
- Adjacent Project Areas
- State Owned Lands/Parks

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Europe Lake Forest Area



Europe Lake



Wisconsin Bay

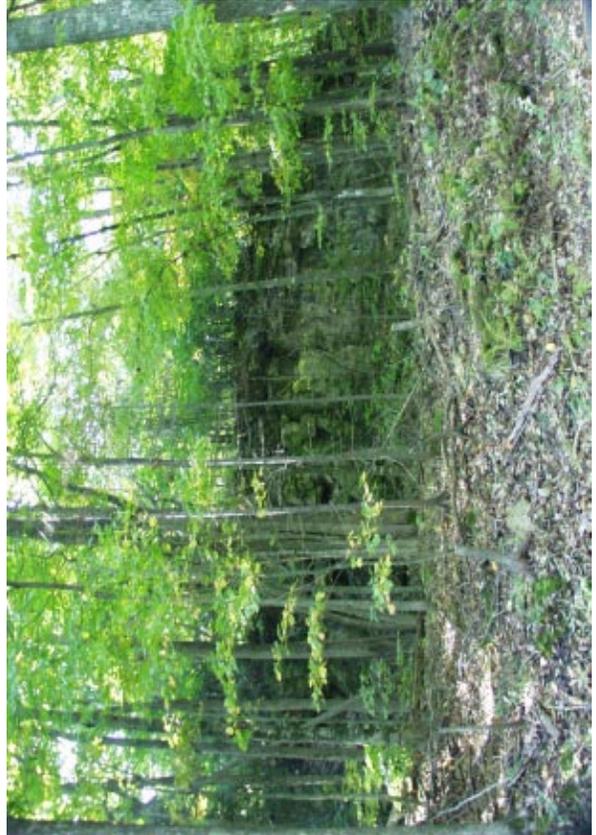
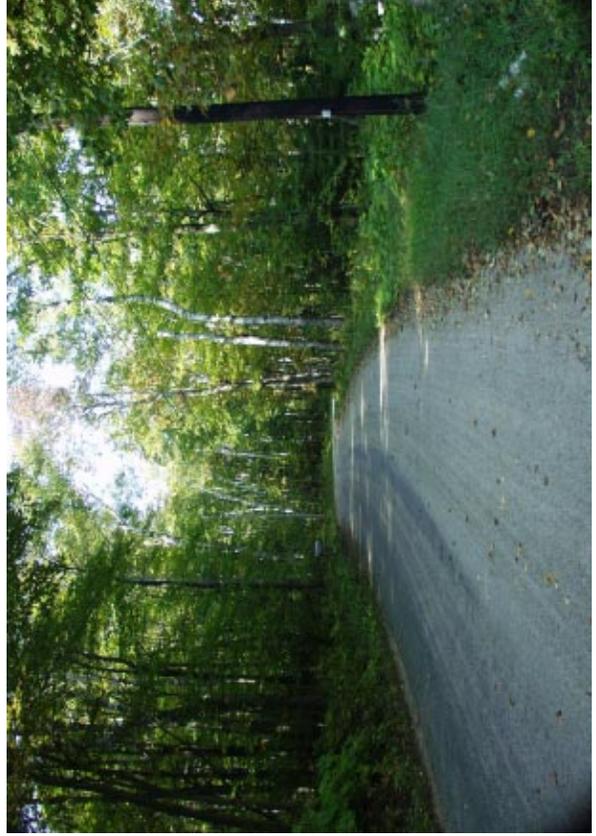


Table Bluff



Between Table Bluff & Wisconsin Bay

ALL PHOTOS BY COLEEN FEUCHT

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# GRAND TRAVERSE ISLANDS

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## LOCATION:

The Grand Traverse Islands (or Lake Michigan Islands) includes all of the major islands located in the water surrounding Door County, such as Pilot Island (T32N, R30E), Plum Island (T33N, R30E), Washington Island (T33-34N, R30E), Detroit Island (T32-33N, R30E), Rock Island (T34N, R30E), and Chambers Island (T31N, R29E). Smaller islands included in this landscape are Cana Island (T30N, R29E), Horseshoe Island (T31N, R26E), Hat Island (T30N, R26E), Adventure/Strawberry Island (T31N, R26E), Little Strawberry Island (T31N, R26E), Jack Island (T31N, R26E), Sister Islands (T31N, R27E), Spider Island (T31N, R29E), Gravel Island (T32N, R29E), Hog Island (T33N, R30E), and Fish Island (T33N, R30E). As this report represents general areas of concern, exact locations of boundary lines have not been designated.

## GENERAL SITE DESCRIPTION:

Surrounding the Door Peninsula is a chain of islands in Lake Michigan and Green Bay called the Grand Traverse Islands. Grand Traverse refers to the route travelers followed; once they came to Rock Island, a “Grand Traverse” was made across Lake Michigan to the southern peninsula (Holand 1917).

Most islands (except Chambers Island) are underlain by Silurian dolostone with outcrops along shorelines and an occasional interior escarpment. Dolostone shoreline communities known as Great Lakes alkaline rock shores are present on eastern and southeastern coasts of the islands. Sometimes these communities grade into alvar, a globally rare plant assemblage. Of the 19 islands in the Grand Traverse, 17 are located in Door County and are discussed. Pilot, Plum, Washington, Detroit, Rock, and Chambers Islands have been studied at length and descriptions are fairly detailed. These islands are also labeled accordingly on site maps.

Cana Island and Horseshoe Island are both small and have been less well documented. The other islands are considered smaller ‘bird’ islands. They include Hat Island, Adventure Island, Little Strawberry Island, Jack Island, Sister Island, Spider Island, Gravel Island, Hog Island, and Fish Island. The bird islands are now predominantly used by colonial waterbirds such as Herring Gulls (*Larus argentatus*) and Double-crested Cormorants (*Phalacrocorax auritus*). Their value for rare plant and animal communities has thus been degraded (Judziewicz and Kopitzke 1999).

## ECOLOGICAL SIGNIFICANCE:

Five State Natural Areas have been designated at various sites among the Grand Traverse Islands: Jackson Harbor Ridges, Big & Little Marsh, and Coffee Swamp all on Washington Island. Rock Island is a state park and a large portion of the island, Rock Island Woods, is a State Natural Area. Sister Islands is also State Natural Area. Washington Island has several exposed areas of escarpment along the northern, western, and southeastern edges with 20-120 foot tall bluffs. All of these islands form a portion of the Niagara Escarpment. Nearly 850 acres of wetlands (Coffee Swamp, Jackson Harbor Ridges, Big and Little Marsh, and Boyer’s Bluff) are found near the eastern and northwestern portions of Washington Island.

. When comparing the islands with data from 25-75 years ago drastic changes can be seen (Judziewicz and Kopitzke 1999). Vegetation on the smaller islands has been severely impacted by colonial water birds in the last decade. Human residential developments and white-tailed deer herbivory are widespread on most islands. The sensitive nature of the plant and animal assemblage makes them particularly susceptible to human disturbance. Despite Door Peninsula’s islands having been severely impacted by human activity in the late 19<sup>th</sup> and early 20<sup>th</sup> century, evidence is clear that the many of these islands still house some of the richest rare plant reserves in Wisconsin.

Inventories of plants and animals conducted among these island communities at various times have documented 64 rare species of animals, invertebrates and plants, including 18 natural community types. See Wisconsin Natural Heritage Inventory listing, Appendix “B” and natural community cross reference, Appendix “A”.

### **NOTEWORTHY CULTURAL AND HISTORICAL FEATURES:**

The State Historical Society of Wisconsin has identified several historic sites on or near the islands, which are noted in the National Register of Historic Places. The Chester H. Thordarson Estate dates from 1910-1935 and was placed in the register in 1985. Along the southwest tip of the island Thordarson built a Viking meeting hall that was considered his great achievement. He was said to be an excellent botanist, however Anna Threlfall and Ted Cochrane did not take the first known plant collections until 1971 and 1972 respectively, mainly because Thordarson did not like guests on the island (Judziewicz and Kopitzke 1999).

There are several other areas of historic interest found in the National Register. The Louisiana Steamer shipwreck in the Town of Washington was deemed a historic site in 1992 and dates from 1887-1913. Pilot Island Lighthouse was put in the register in 1983 and dates to 1858. Pilot Island NW Site shipwrecks were put into the register in 1992 and date to 1857-1892. Plum Island Range Rear Lighthouses were deemed historic sites in 1984 and date to 1889 and 1897.

Rock Island Historic District was put into the register in 1972. Rock Island was well known to French explorers under the names of Potawatomi Island and Louse Island. It is considered the first place in Wisconsin visited by white men, when Jean Nicolet passed through the area in 1634. The first lighthouse in Door County was the ‘Pottawatomie Light.’ It was built in 1836 and in use by 1837. The house built for the lighthouse keeper is also the oldest in the county. The first keeper was David E. Corbin, a former sergeant in the War of 1812 (Holand 1917).

Pilot Island lighthouse is in the National Register. It was the second lighthouse to be built in Door County. It is known as the Porte des Morts Station. Because of the importance of this station, there were three keepers. Depressed by the isolated island, the first assistant keeper committed suicide on June 20<sup>th</sup> 1880 (Holand 1917).

Washington Island at one time belonged to Native Americans. Many village sites, cemeteries, mounds and cornfields are found on the island. The shorelines of Detroit Harbor, Little Lake, and Jackson Harbor were once Native American village sites. The first permanent European settlement in Door County was on Rock Island. Around 1850 many moved from Rock Island to Washington Island. It later became a potato growing center along with fruits and grains (Holand 1917).

### **SITE FEATURES**

#### **Pilot Island**

Pilot Island is a small 3.5 acre island with a somewhat steep rocky shoreline. An old Coast Guard building and lighthouse are present, and were formerly occupied. Cormorants began nesting on the island 5 years ago, and have managed to kill most of the trees, mainly white cedar. The significance of Pilot Island is that it has no human presence and is an important bird nesting area.

- Pilot Island is owned and managed by the federal government and land use is predominantly as a natural area.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- The majority of living vegetation is dense shrubs with open grassy and weedy areas near the Coast Guard building. For the remainder of the island dominant species are white-cedar (*Thuja occidentalis*), red-berried elder (*Sambucus racemosa*), Red raspberry (*Rubus idaeus*), chokecherry

(*Aronia melanocarpa*), motherwort (*Chaiturus marrubiastrum*), and catnip (*Nepeta cataria*) (Judziewicz and Kopitzke 1999).

- Nesting colonies of Herring Gulls (500 pair) and Cormorants (200 pair) make up the bulk of the fauna. Other probable nesters include Great Blue Herons and Red-breasted Mergansers (*Mergus serrator*).
- Rare species have not been documented on Pilot Island.
- The aesthetic value of Pilot Island is that it is predominantly absent of human presence, a rare occurrence for most islands.

### **Plum Island**

Plum Island, named because it is plumb in the center of Deaths Door (Holand 1917), is approximately 267 acres in size and has a maximum elevation of 13 meters. The island is mostly forested, and U.S. Coast Guard facilities are present on the northeast and southwest shores. The shoreline has 2-3 meter cliffs along the eastern shore, gravel beach on the south and west sides, and a narrow sandy beach on the north side (Judziewicz and Kopitzke, 1999). The US Coast Guard currently owns Plum Island. However, the Coast Guard has determined that Plum Island is surplus property, and the process to transfer ownership to another entity is in progress.

- The U.S. Coast Guard controls land use, therefore casual visits to the island are not permitted.
- Soils are shallow to deep, well drained, and almost level to moderately steep. A sandy loam or loam subsoil overlies sandy loam or fine sandy loam till or dolostone bedrock (USDA SCS 1978).
- A small wetland locally known as Carp Lake on the northeast tip of the island has unique physiographic features. It is recurrently connected and separated from Lake Michigan.
- Forest communities are diverse. Sugar maple (*Acer saccharum*) and basswood (*Tilia americana*) forests dominate the interior. White cedar is prevalent along coastal areas especially where dolostone is near the surface. A heavy select cut opened the canopy to red raspberry and common hound's-tongue (*Cynoglossum officinale*). The east and south coast have white cedar along dolostone bluffs. One-flowered cancer-root (*Orobanche uniflora*) and climbing fumitory (*Adlumia fungosa*) are common understory plants. In sand dominated areas dune goldenrod (*Solidago simplex*, var. *gillmanii*) is abundant.
- Near Carp Lake on the northwest section of the island plant species are diverse. During a 1999 survey when Lake Michigan was low, a meadow near the lagoon was dominated by brook lobelia (*Lobelia kalmii*), rushes (*Juncus spp.*), and St. John's-wort (*Hypericum spp.*). Southwest of the lagoon is a 10-acre sedge meadow. Dominant plant species include bluejoint (*Calamagrostis canadensis*) and tussock sedge (*Carex stricta*). In a strip of disturbed boreal forest near the Coast Guard Station dwarf lake iris (*Iris lacustris*), alvar violet (*Viola nephrophylla*), and white camass (*Zigadenus elegans*) are present (Judziewicz and Kopitzke 1999).
- Animals present on the island include nesting Bald Eagles (*Haliaeetus leucocephalus*) and white-tailed deer (*Odocoileus virginianus*). Pigs (*Suscrofa domesticus*) were introduced sometime before 1998 (Judziewicz and Kopitzke 1999), but they are no longer present. In Carp Lake, carp (*Cyprinus carpio*) are seasonally abundant.

- Federally threatened dwarf lake iris occurs near Carp Lake (Judziewicz and Kopitzke 1999).
- Plum Island has been impacted by logging, but remains an aesthetic natural forested area because of the absence of human presence. If left alone re-growth of vegetation could increase the aesthetic value of Plum Island.

### **Washington Island**

Washington Island is the largest of the Grand Traverse islands and covers approximately 35 square miles. It is located at the northern tip of the Door Peninsula. Four coastal wetlands are associated with the island: Coffee Swamp, Jackson Harbor Ridges, and Big and Little Marsh. Development pressure is strong throughout the island, including sensitive areas such as the high dolostone cliffs at Boyer Bluff.

Numerous, small private lots with houses coexist along the southeastern shore of the island along with occurrences of alkaline rock shore communities. A number of owners have signed Protective Agreements to safeguard this community and the plants that grow in it, including the federally listed dwarf lake iris. Similar protection efforts would benefit other priority sites on the island (Judziewicz and Kopitzke 1999).

- Washington Island is in the Town of Washington. They have adopted the county zoning ordinance.
- Upland and lowland hardwoods are dominant forest types. Conifer species including hemlock, white spruce and balsam fir are present in varying degrees within hardwood stands. Lowland conifer stands dominated by white cedar are also present. The quality of these forests is variable based on site condition and past land use. Forest quality ranges from poor to good quality second growth.
- Land use is predominantly forested with lesser amounts of general agriculture, estate, single family residential, recreational commercial, countryside, and mixed use commercial in the ferry dock area. The Town of Washington has a population of 623 according to the 1990 census (Kasprzak and Walter 2001).
- Soils of Washington Island are mainly of two types. Most of the island, including the interior portion contains soils shallow to deep, well drained, almost level to moderately steep. Sandy loam or loam subsoil overlays sandy loam or fine sandy loam till or dolostone bedrock. The northeast tip and southern shore contains soils that are deep and moderately deep, well drained to poorly drained, and gently sloping to sloping. Fine sand or sandy loam subsoil overlay sand or sand and gravel outwash, and very poorly drained, nearly level organic soil (USDA SCS 1978).
- Detroit Harbor is the south facing bay on the southwest section of Washington Island. This harbor provides spawning habitat for smallmouth bass (*Micropterus dolomieu*), yellow perch (*Perca flavescens*), and northern pike (*Esox Lucius*). Brown trout (*Salmo trutta*) are annually stocked in Detroit Harbor (Corbisier 2000).
- West Harbor is located on the southwest side of Washington Island. It has approximately 50 acres of water area lying below the normal high water mark of Lake Michigan. West Harbor is noted for its diverse population of native aquatic plants and the minimal occurrence of invasive exotic plants. Because high quality submerged aquatic species are rare in Lake Michigan this area is being reviewed to become a state natural area by the WDNR. Known plants include flat-stemmed pondweed (*Potamogeton zosteriformis*), milfoil (*Myriophyllum spp.*), Richardson's pondweed (*Potamogeton richardsonii*), wild celery (*Vallisneria americana*), Illinois pondweed (*Potamogeton illinoensis*), muskgrass (*Chara spp.*), and coontail (*Ceratophyllum demersum*). Curly leafed pondweed (*Potamogeton crispus*) an invasive exotic is also present. The plant community appears to support a

diverse fishery and benthic community (Fassbender 2000). Smallmouth bass and yellow perch are common fish in the harbor.

- Figenscaus Harbor (sometimes referred to as Figenscaus Bay) is located on the southwest corner of Washington Island. It has approximately 100 acres of water area lying below the normal high water mark of Lake Michigan. This harbor also has a diverse community of native aquatic plants, and is also being studied as a possible state natural area. Known plants include flat-stemmed pondweed, milfoil, Richardson pondweed, wild celery, Illinois pondweed, chara, and coontail. Curly leafed pondweed (*Potamogeton crispus*) an invasive exotic is also present. The aquatic plants support a diverse fishery and benthic community. This area is also used heavily by migrating waterfowl (Fassbender 2000).
- Washington Harbor is located in the northwest section of Washington Island. This north facing bay is located between Boyer Bluff to the west and Coffee Swamp to the east. Various archaeological sites are located near Washington Harbor. A historical site is found on the southeast shoreline. The dominant fish of this harbor is smallmouth bass. Other fish include yellow perch, northern pike, and Chinook salmon (*Oncorhynchus tshawytscha*).
- Facing Rock Island State Park is Jackson Harbor. It has approximately 100 acres of water area lying below the normal high water mark of Lake Michigan. Like West Harbor and Figenscaus Harbor, Jackson Harbor houses a highly diverse population of native aquatic plants and is being looked at by the WDNR for state natural area designation. Known plants include flat stemmed pondweed, milfoil, Richardson pondweed, wild celery, sago pondweed (*Potamogeton pectinatus*), largeleaf pondweed (*Potamogeton amplifolius*), elodea (*Elodea canadensis*), and small pondweed (*Potamogeton pusillus*). Curly leafed pondweed (*Potamogeton crispus*) and Eurasian water milfoil (*Myriophyllum spicatum*), invasive exotics are also present. A diverse fishery and benthic community seems to thrive because of the aquatic plants. Waterfowl also use this harbor during migration (Fassbender 2000). Most of the eastern shoreline is sand beach and wetlands. Helping to preserve the beach, dunes, swales, and rare plants is the designation, Jackson Harbor Ridges State Natural Area. The bay is a spawning habitat for smallmouth bass, northern pike, and yellow perch (Corbisier 2000).
- Little Lake is located in the northwest section of Washington Island. The lake is 23.6 acres and has a maximum depth of seven feet. This landlocked lake may have been created from a shallow bay of the glacial Lake Nipping stage. A 250-foot cobblestone ridge separates Little Lake from Lake Michigan (Kasprzak and Walter 2001). A small museum and dock serve as a public access point at the southwest portion of the lake. Older stands of white cedar and hemlock (*Tsuga canadensis*) surround the north side of the lake, while the remaining portion is surrounded with various types of wooded vegetation. A floating bog mat is located in the northeast section of Little Lake.
- Animals associated with Little Lake are blue-spotted salamanders (*Ambystoma laterale*), several species of frogs, and breeding waterfowl. Songbirds are common residents during the spring and summer months on Washington Island.
- Rare boreal rich fen plants of Washington Island wetlands include slim-stem small-reedgrass (*Calamagrostis stricta*), low calamint (*Calamintha arkansana*), northern bog sedge (*Carex gynocrates*), livid sedge (*Carex livida var radicaulis*), showy lady's-slipper (*Cypripedium reginae*), tufted hairgrass (*Deschampsia cespitosa*), few-flower spikerush (*Eleocharis quinqueflora*), and thickspike (*Elymus lanceolatus spp. psammophilus*). Rare emergent aquatic plants include variegated horsetail (*Equisetum variegatum*), seaside spurge (*Euphorbia polygonifolia*), and lesser fringed gentian (*Gentianopsis procera*). One rare Great Lakes beach plant, the American sea-rocket (*Cakile*

*edentula*) occurs on Washington Island. The dwarf lake iris (*Iris lacustris*), a Great Lakes endemic known only from the shores of Lake Michigan and Huron, occurs in several locations.

- Rare northern wet-mesic forest plants include bird's-eye primrose (*Primula mistassinica*), northern black currant (*Ribes hudsonianum*), tufted club-rush (*Scirpus cespitosus*), Ohio goldenrod (*Solidago ohioensis*), sticky goldenrod (*Solidago simplex var gillmanii*), sticky false-asphodel (*Tofieldia glutinosa*), and common bog arrow-grass (*Triglochin maritimum*) (Merryfield 2000).
- The aesthetic value of Washington Island includes its natural sand and cobblestone beaches, large bluffs and cliff areas, inland lake and wetland areas, and its indented bays that house rare aquatic plant life.

### **Coffee Swamp**

Coffee Swamp is approximately 1200 acres of low wetlands along the northern coast of Washington Island. It is designated a State Natural Area and contains a boreal rich fen, northern wet-mesic forest, northern hardwood swamp, and northern sedge meadow (Judziewicz and Kopitzke 1999). Coffee Swamp is unique because of its sudden transition from a large depression to upland deciduous forest (Corbisier 2000).

- The central portion of Coffee Swamp contains a small seepage pond. The pond is shallow, and nearly dry during times of drought and in late summer. Substrate is pure marl. North of the pond is 9 acres of boreal rich fen (Merryfield 2000).
- Vegetation within the fen is primarily wire-leaved sedge (*Carex spp.*), sweet gale (*Myrica gale*), bogbean (*Menyanthes trifoliata*), bog goldenrod (*Solidago uliginosa*), and hoary willow (*Salix candida*). Invasive species are known to the fen including glossy buckthorn (*Rhamnus frangula*) and giant reed (*Phragmites australis*). Near the south side of the pond is a large 225-acre northern wet-mesic forest or white cedar swamp.
- North of the fen is a small 10-acre northern hardwood swamp dominated by black ash. Small sections of northern sedge meadow also occur throughout the Coffee Swamp complex (Merryfield 2000). The exotic plant glossy buckthorn is invading here as well. Extending to the south and west of Mountain Tower Park is approximately 100 acres of good quality second-growth beech (*Fagus grandifolia*) and sugar maple forest (Judziewicz and Kopitzke 1999).
- White-tailed deer are known to heavily browse the cedar swamp. Frogs and waterfowl also use this wetland habitat.
- Mountain Tower Park includes a unique moist cliff habitat with rare fern species.

### **Jackson Harbor Ridges**

Jackson Harbor Ridges comprises approximately 225 acres and is located on the northeast side of Washington Island. This complex has forested ridges and swales with associated Great Lakes dunes and beaches and interdunal ponds. Most of Jackson Harbor is designated a State Natural Area. The remaining portion is owned by one landowner that has signed a voluntary Protective Agreement (Judziewicz and Kopitzke 1999).

- Land use is low density residential and reserved wetlands and ridges. Surrounding waters are used for boating and recreational purposes.

- The beach area has many dry and wet sand areas and interdunal swales. One large swale includes an unusual community of plants preferring wet calcareous soils (Merryfield 2000).
- Common plant species include brook lobelia (*Lobelia kalmii*) shrubby cinquefoil (*Pentaphylloides floribunda*), Arctic primrose (*Primula mistassinica*), low calamint, slender bog arrow-grass (*Triglochin palustris*), bladderworts (*Utricularia spp.*), and various sedges.
- Drier dunes contain drought resistant plants like bearberry (*Arctostaphylos uva-ursi*), junipers (*Juniperus spp.*), and sand coreopsis (*Coreopsis lanceolata*). Behind the dunes is a mixed conifer-hardwood forest of red and white pines, white cedar, balsam fir (*Abies balsamea*), and American beech (Merryfield 2000).
- Other plants common at Jackson Harbor are Seneca snakeroot (*Polygala senega*) and Iceland moss (*Cetraria islandica*).
- A sand spit at the entrance point to Jackson Harbor attracts gulls, terns, shorebirds and waterfowl (Merryfield 2000). Many species of songbirds are common in Jackson Harbor (Zimmerman 1989).

### **Big and Little Marsh**

Together Big and Little Marsh are approximately 570 acres located halfway up the eastern coast of Washington Island. Percy Johnson County Park is 5 acres located near a sandy barrier beach mostly developed with unpaved roads and houses. The park contains good quality remnant Great Lakes Beach and Lake Dune communities with several rare plants. Behind the beach is undeveloped open wetland and wooded swamp called Big Marsh. Northeast of Big Marsh is Little Marsh also known as Wickman Marsh (Corbisier 2000). It includes swamp hardwoods and an ephemeral pond (Merryfield 2000).

- Both Big and Little Marsh are privately owned, and there is some residential development (Zimmerman 1989).
- Big Marsh has sections containing patches of nearly bare marl with pavements of dolostone gravel and cobbles exposed when water levels are low (Merryfield 2000).
- Water depth in Big Marsh ranges from 2 feet in the spring to completely dry in the fall. Water levels are also dependent on Lake Michigan (Merryfield 2000). Little Marsh contains 14 acres of open water segmented by woodland creating a north and south basin. Maximum depth is 1.5 feet (Corbisier 2000).
- Big Marsh is a combination of boreal rich fen, and relatively high quality northern wet-mesic forest. A 38-acre emergent aquatic marsh is located on marl substrate dominated by softstem bulrush (*Schoenoplectus tabernaemontani*). Southwest is a 60-acre northern wet-mesic forest or white cedar swamp of high quality. Northwest of the marsh is a 7-acre boreal rich fen dominated by wire-leaved sedges, sweet gale, shrubby cinquefoil, and swamp buckthorn (*Rhamnus alnifolius*). Little Marsh contains lower quality communities, predominantly a northern hardwood swamp dominated by black ash (*Fraxinus nigra*), and an ephemeral pond (Merryfield 2000).
- Little Marsh provides resting habitat for waterfowl during migration (Corbisier 2000).
- Several rare plant species occur in Big Marsh and its surrounding area.

## Detroit Island

Detroit Island is 2.3 miles long by .08-0.4 miles wide, is located a few hundreds yards east of the Washington Island ferry dock, and ranges up to 25 meters above Lake Michigan. The island is primarily privately owned. Despite large deer populations, the island has high ecological quality and should be considered by the DNR for State Natural Area designation (Judziewicz and Kopitzke 1999).

- Detroit Island is in the Town of Washington. Washington has adopted the county's zoning ordinance.
- Land use is predominantly natural area and estate along the shoreline of the north half of the island.
- Silurian dolostone outcrops, and interior low escarpments underlay the surface of the island. The shore at the southern tip is considered a high quality Great Lakes alkaline rock shore community (Judziewicz and Kopitzke 1999). Soils are of Summerville-Longrie-Omena association (USDA SCS 1978).
- Vegetation includes recent, select-cut forests of sugar maple, white birch, red maple, basswood, red oak, and hop-hornbeam (*Ostrya virginiana*). In interior portions of the island are occasional balsam fir and beech trees. Because of the recent cutting, species such as red raspberry, chokecherry, and common hound's tongue are common.
- Common species in low dolostone scarps include marginal shield fern (*Dryopteris marginalis*) and yellow lady's slipper (*Cypripedium pubescens*). Large canopy white pines are found along the west coast of the island. Ephemeral plants such as Dutchman's-breeches (*Dicentra cucullaria*), big white trilliums (*Trillium grandiflorum.*), wild leeks (*Allium tricoccum*), and Canada and yellow violets (*Viola canadensis* and *V. pubescens*) are found on the central hill. On the northwest portion of the island is a small black ash swamp with tag alder (*Alnus incana*) and lake sedge (*Carex lacustris*).
- A Great Lakes alkaline rockshore forms the southern tip of Detroit Island. This special community of plants includes Baltic rush (*Juncus arcticus* subsp. *littoralis*), silverweed (*Argentina anserina*), bird's-eye primrose (*Primula mistassinica*), low calamint, white camass, Indian paintbrush (*Castilleja coccinea*), and Seneca snakeroot. There are various sedges (*Carex aurea*, *C. crawei*, *C. viridula*, and *Rhynchospora capillacea*), marsh fern (*Thelypteris palustris*), tufted hairgrass, alvar violet, brook lobelia, frost aster (*Aster pilosus*), shrubby St. John's-wort (*Hypericum kalmianum*), and lesser fringed gentian. Most of the coast surrounding the island contains white cedar. Sandy swales support several colonies of dwarf lake iris (Judziewicz and Kopitzke 1999).
- Animal life includes high populations of white-tailed deer and shore birds during migration (Judziewicz and Kopitzke 1999). A diverse assemblage of reptiles includes northern-banded water snakes. Rare plant species occur along the south tip of the island within the alkaline rockshore community (Judziewicz and Kopitzke 1999).

## Rock Island

Rock Island is approximately 900 acres and is the highest island in the Grand Traverse archipelago reaching 65 meters above Lake Michigan. Considered the gem of all islands in the chain, it is the most remote from the mainland of Door County. Rock Island was named a Wisconsin State Park in 1964 and later 570 acres was designated as a State Natural Area in 2002. Rock Island is owned and managed by the Wisconsin Department of Natural Resources. Threats to Rock Island include deer

herbivory, and garlic mustard (*Alliaria petiolata*) first seen in 1997, and now under active management. Dunes and beaches on the south shore of the island have been severely degraded by visitors so that remnant dune and beach communities are probably no longer viable (Judziewicz and Kopitzke 1999).

- Land use is primarily natural area with low-key recreation and tourism.
- Like all previously mentioned islands, soils are of Summerville-Longrie-Omena association (USDA SCS 1978).
- Vegetation includes old growth beech and sugar maple forests. Hop-hornbeam is a common understory tree along with yellow birch (*Betula allgheniensis*). Spring ephemeral plants are predominately wild leeks with interspersed Virginia waterleaf (*Hydrophyllum virginianum*), Carolina spring beauty (*Claytonia caroliniana*) and Dutchman's-breeches.
- Deer herbivory has selected beech seedlings rather than sugar maple throughout the entire forest. The northern one-third of the island displays small colonies of broad-leaved wood sedge (*Carex platyphylla*).
- West of Fernwood Trail in the center of the island are hardwood seeps, a unique feature to the island as well as Door County. A small wet clearing in the beech forest contains dense concentrations of ostrich fern (*Matteuccia struthiopteris*) and state threatened drooping sedge (*Carex prasina*). Included here are spring ephemerals such as wild leeks, Dutchman's-breeches, and bishop's-cap (*Mitella diphylla*). Other plants present in this wet clearing are meadow horsetail (*Equisetum pratense*), hairy-leaved sedge (*Carex hirtifolia*), and black snakeroot (*Sanicula gregaria*).
- Dolostone escarpments break-up the interior forest. Scree slopes are covered with a variety of ferns, such as bulblet fern (*Cystopteris bulbifera*) and marginal fern. Less frequent is walking fern (*Asplenium rhizophyllum*) and Steller's cliffbrake (*Cryptogramma stelleri*). Climbing fumitory also occurs here. The forest canopy contains white cedar, balsam fir, and sugar maple, and dense concentrations of mountain maple (*Acer spicatum*) comprise the understory. One slope is comprised of beech and maple, and is carpeted with broad-leaved sedge.
- The north, east, and west shores house white cedar dominated dolostone cliffs. Other plants found in such areas include buffalo-berry (*Shepherdia canadensis*), white camass, ebony sedge (*Carex eburnea*), hairy goldenrod (*Solidago hispida*), rock whitlow-grass, and moss (*Hyclominum splendens*).
- The beach ridges inland of the south coast contain white pines, white spruce, blueberries (*Vaccinium spp.*), and wintergreen (*Gaultheria procumbens*). A remnant Great Lakes dune community along the beach is dominated by beach-grass (*Ammophila breviligulata*), Canada wild-rye (*Elymus canadensis*), and beach-pea (*Lathyrus japonicus*). Several rare plants found here are thick-spike wheat grass (*Elytrigia dasystachya*), dune goldenrod, and seaside spurge. A small abandoned gravel pit located approximately 100 meters from the old Viking hall contains many calciphilic species. Dominant plants include cattails, soft-stemmed bulrush, brook lobelia, Ohio goldenrod, and purple false foxglove (*Agalinis purpurea*).
- Common exotic plants found in lawns and clearings of the old Thordarson estate don't seem to impact the island. Three dominant exotic plants are "Icelandic" thyme (*Thymus praecox*), saxifrage pink (*Pertorhagia saxifraga*), and snow-in-summer (*Cerastium tomentosum*) (Judziewicz and Kopitzke 1999).

- Rock Island has excellent quality state significant rare species and plant communities including a Great Lakes dune community. The flora of 359 species is surprisingly rich considering the near-total lack of wetlands (Judziewicz and Kopitzke 1999).
- The aesthetic value of Rock Island is its remote setting away from the mainland of Door County and receives less human disturbance than other areas. The island is state owned and people can visit and enjoy the island's scenic attributes through low disturbance recreational activities.

### **Chambers Island**

Chambers Island is 5 square miles and the second largest of Wisconsin's Lake Michigan Islands. It is located approximately 3.1 miles northwest of Fish Creek and 3.9 miles from the Michigan shoreline. The island's dunes, beaches, and forests remain relatively intact. This island is privately owned except for a 40 acre Town of Gibraltar Park at the lighthouse (Judziewicz and Kopitzke 1999).

- Chambers Island is in the Town of Gibraltar. Gibraltar has adopted Door County's zoning ordinance.
- Land use is primarily small estate residential and recreational and commercial near the dock and retreat center. Town roads are low-specification "tunnels" in the woods. This helps to discourage the invasion of the forest by cowbirds. Cooperation between the WDNR and Chambers Island Landowners Association (CILA) benefits the plant and animal community.
- Issues of concern include continuing responsible forestry practices (there is a select cut for sawtimber every 15 years) maintaining "low-spec" town roads, and assuring logging equipment is free of garlic mustard seeds (Judziewicz and Kopitzke 1999).
- The Island is composed of sand, clay and gravel, with a maximum elevation of only 17-m above Green Bay. Although the underlying bedrock is mapped as Silurian dolostone, it is nowhere exposed on the island and the sandy-clayey soils give general indications of being nutrient-poor and somewhat acidic. Topography is more similar to Marinette County than that of Door County (Judziewicz and Kopitzke 1999).
- Several wetlands are found on the island. Lake Mackaysee is a large 374 acre shallow lake with a maximum depth of 27 feet. The lake is thought to be spring fed. A 1994 survey showed no evidence of exotic plant species (Corbisier 2000). There are aquatic macrophytes and several ridges and swales on the western shore. Approximately 0.4 miles south of Lake Mackaysee is a wetland area dominated by small leatherleaf (*Chamaedaphne calyculata*).
- Krause or Mud Lake is 3.7 acres with a maximum depth of 24 feet (Corbisier 2000). It is surrounded by acidic oak-pine-aspen woodlands including huckleberry (*Gaylussacia baccata*) and blueberry. Adjoining wetlands contain three-way sedge (*Dulichium arundinaceum*) and sweet flag (*Acorus americanus*) (Judziewicz and Kopitzke 1999).
- Forests are of variable quality and are extensive. They include second growth mixed beech, hemlock, sugar maple, red oak, basswood, red maple, birch, and an occasional bitternut hickory (*Carya cordiformis*). Other vegetation is predominantly white pine, red pine (*Pinus resinosa*), and juniper (*Juniperus communis*). Understory is comprised of violets (*Viola spp.*), wood anemone (*Anemone quinquefolia*), hog peanut (*Amphicarpa bracteata*), wide-leaved panic grass (*Panicum latifolium*), smooth aster (*Aster laevis*), and pale vetch (*Lathyrus ochroleucus*).

- Near the lighthouse and north end of the island are a variety of wildflowers including great flowered trillium and great-flowered bellwort (*Uvularia grandiflora*). Where dolostone gravel wash up onto the shoreline, buffalo-berry and herb-robert (*Geranium robertianum*) occur.
- Sand Point and North Bay harbor remnants of a Great Lakes barren community, possibly the best example of this community type in the state. Typical plants include juniper, beach-grass, white and red pines, little bluestem (*Schizachyrium scoparium*), Indian-grass (*Sorghastrum nutans*), needle-and-thread grass (*Stipa spartea*), Muhlenberg's sedge (*Carex muhlenbergii*), New Jersey tea (*Ceanothus spp.*) butterflyweed (*Asclepias tuberosa*), blazing-star (*Liatris aspera*), hoary puccoon (*Lithospermum carolinense*) and spotted knapweed (*Centaurea maculosa*) an aggressive exotic.
- A related natural community is Great Lakes beaches that occurs on three parts of the island. Dominant species are cocklebur (*Xanthium strumarium*), evening primrose (*Oenothera spp.*), knotweed (*Polygonum ramossimum*), and state special concern species the American sea-rocket (*Cakile edentula*) and seaside spurge (*Euphorbia polygonifolia*) (Judziewicz and Kopitzke 1999).
- White-tailed deer have been absent on the island for approximately 10 years, allowing for tree regeneration (Judziewicz and Kopitzke 1999). Many species of songbirds are common on the island.
- Mackaysee Lake contains excellent populations of largemouth bass (*Micropterus salmoides*), smallmouth bass, and northern pike. Bluegill (*Lepomis macrochirus*) and yellow perch are also present; Lake sturgeon (*Acipenser fulvescens*) have been reported but have not been documented. No current records exist for fish in Mud Lake; historically largemouth bass, and bluegills were the dominant species (Corbisier 2000).
- Heritage Areas of Door County (Emmerich 1978) cites the historic and aesthetic value of Chambers Island as a wildlife habitat with special forest resources (Zimmerman 1989). Aesthetic value is also due to the absence of invasive exotic plants, lack of deer herbivory, and remoteness from the mainland.

### **Cana Island**

Cana Island is 8.7 acres located off the coast of the Lake Michigan shore 7 miles northeast of Bailey's Harbor. When lake levels are low, the island is connected with the mainland by a causeway. Cana Island is known for its restored and maintained lighthouse, circa 1870, that is in the National Register of Historic Places.

- Cana Island is in the Town of Bailey's Harbor. The federal government owns the island.
- The primary land use is natural area including upland and lowland boreal forest, light residential and one small animal farm (Zimmerman 1989).
- The shoreline consists of low dolostone shelves. The island is part of the Niagara Escarpment composed of dolostone bedrock and cobble stone with scattered glacial erratics. There is only a thin layer of soil covering the bedrock (Hamm 2001).
- There are several small wetlands and wet shore lots on Cana Island (Zimmerman 1989).
- White cedar forests dominate the vegetation cover. Understory plants are relatively disturbed. There are many invasive exotic plants on the island (Judziewicz and Kopitzke 1999).

- Deer herbivory is widespread (Judziewicz and Kopitzke 1999). A high diversity of forest birds including many warbler species was noted in 1988 (Zimmerman 1989).
- There is one rare plant species present on the island (Judziewicz and Kopitzke 1999.) Rare roadside flowers were reported in the late 1980's (Zimmerman 1989).
- The aesthetic value of Cana Island is primarily its quality scenic and natural views. Many consider the Cana lighthouse representative of all island lighthouses on the Door Peninsula.

### **Hat Island**

Hat Island is named for its shape. It is less than 2.5 acres in size, sitting low in Green Bay 2 miles from the Door Peninsula between Egg Harbor and Fish Creek. The island was once forested, however only a few dead skeletal remains of cottonwoods still stand and a small colony of dutchman's breeches at the highest point (Judziewicz and Kopitzke 1999).

- Hat Island is in the Town of Egg Harbor. Egg Harbor utilizes an independent planning commission with a sub-division ordinance. The Egg Harbor Town Board enacted a moratorium on commercial development from January 1998 to March 1999. Under the 'master development plan' wetlands, forests, the Niagara Escarpment and open space will be protected. The Nature Conservancy is working with the town to identify high quality natural resources in Egg Harbor (Grimm 2001).
- Hat Island is privately owned. Land use is predominantly natural area.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- Vegetation is comprised of dead cottonwood (*Populus deltoides*), Dutchman's breeches, red raspberry, wild black currant (*Ribes americanum*), chokecherry, and red-berried elder. Invasive exotic plants include motherwort and catnip (Judziewicz and Kopitzke 1999).
- Hat Island is a breeding ground for herring gulls and cormorants (Judziewicz and Kopitzke 1999).
- There are no known rare plant or animal species on Hat Island (Judziewicz and Kopitzke 1999).

### **Adventure (Strawberry, or Big Strawberry) Island**

Adventure Island is approximately 20 acres and is located approximately 2 miles northwest of Fish Creek. The island was popular in the 1920's and 1930's as a boys summer camp. A Milwaukee Public Museum expedition made several plant collections in July of 1897 (Judziewicz and Kopitzke 1999).

- Strawberry Island is in the Town of Gibraltar. Gibraltar has adopted the county's zoning ordinance.
- The island is privately owned and maintained as natural area. Because of intense past human activity, native vegetation has been severely altered (Judziewicz and Kopitzke 1999).
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).

- A white cedar-basswood-quaking aspen forest has a dense understory of red-osier dogwood, chokecherry, exotic honeysuckle (*Lonicera spp.*), red raspberry, and Canada yew (Judziewicz and Kopitzke 1999). There are few herbs and no rare plant species recorded.
- Herring gulls are known to nest on the island.

### **Little Strawberry Island**

- Little Strawberry Island is 6 acres in size, and is located in Green Bay just to the north of Adventure Island. Nesting cormorants and gulls threaten the native vegetation of the island (Judziewicz and Kopitzke, 1999). The island is privately owned, and is predominantly natural area. A small cabin is located at the east end of the island.
- Little Strawberry Island is in the Town of Gibraltar. Gibraltar has adopted the county's zoning ordinance.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- Vegetation is dominated by stands of basswood and the understory plant cow-parsnip (*Heracleum lanatum*). There are a few remnant mesic forest herbs such as dicentras (*Dicentra canadensis* and *D. cucullaria*) and yellow trout-lily (*Erythronium americanum*) (Judziewicz and Kopitzke 1999).
- There are no known rare plant or animal species on Little Strawberry Island.

### **Jack Island**

Jack Island is a 5-acre, low, brushy island in the waters of Green Bay. The island was once forested and housed a resort in the 1930's. Because of breeding colonies of gulls and cormorants vegetation on the island has been severely altered. Jack Island is connected to Little Strawberry Island. It is possible at times to wade between the two islands, as well as Pirate Island, a shoal located a short distance to the northeast of Jack Island (Judziewicz and Kopitzke 1999).

- Jack Island is in the Town of Gibraltar. Gibraltar has adopted the county's zoning ordinance.
- The island is privately owned and maintained in a natural state.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- Herring gulls and cormorants are the conspicuous nesting species. It is unknown what other animal species are present, as comprehensive surveys have not been conducted.
- Vegetation is comprised of a few dead cottonwoods among red-osier dogwoods, and red-berried elders. Exotic herbs such as motherwort and catnip are abundant (Judziewicz and Kopitzke 1999).
- No rare plant or animal species are known from Jack Island. However, in 2002, a nesting colony of the state endangered Caspian Tern (*Sterna caspia*) was found on Pirate Island.

### **Horseshoe Island**

Horseshoe Island, named for its distinctive shape, is 37 acres and is located approximately one-half mile from the mainland of Peninsula State Park. The island is a favorite anchoring spot for boaters who often wade ashore with picnic lunches (Judziewicz and Kopitzke 1999).

- The island is owned and administered by the WDNR as part of Peninsula State Park and is located in the geographic boundary of the Town of Gibraltar.
- Land use is primarily low impact recreation.
- Soils are sloping glacial till plains underlain by dolostone bedrock. Rock outcrops are common (USDA SCS 1978).
- No surface water resources are present on the island.
- Stands of white cedar are found along the dolostone cliffs on the north and west coast. Younger balsam fir and white birch are common. Climbing fumitory and weedy garlic mustard are abundant understory plants (Judziewicz and Kopitzke 1999).
- There are no known rare plant or animal species on the island.
- The aesthetic value of Horseshoe Island is mainly as a favorite scenic area used by boaters. It also has value as a natural area for various plants and animals.

### **Sister Islands**

Sister Islands are two uninhabited bird islands separated by a shoal, located approximately 1.5 miles northwest of Sister Bay in the waters of Green Bay (Judziewicz and Kopitzke 1999). These islands are sometimes above water and sometimes below depending on water fluctuations of Green Bay.

- Sister Islands are in the Town of Liberty Grove. The islands are State Natural Areas that are owned and managed by the WDNR.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- Vegetation has not been surveyed since William E. Tans of the WDNR visited the islands in 1977. Common plants were box elder (*Acer negundo*), orange jewelweed (*Impatiens capensis*), red-osier dogwood, bittersweet nightshade (*Solanum dulcamara*) and stinging nettles (*Urtica dioica*) (Judziewicz and Kopitzke 1999).
- Cormorants and gulls dominate the islands.
- No rare plant or animal species have been documented on the island.

### **Spider Island**

Spider Island is a low, rocky 23-acre island located approximately 0.4 miles from the southern shore of Newport State Park in Lake Michigan (Judziewicz and Kopitzke 1999). The U.S. Fish and Wildlife Service owns and manages Spider Island as part of the Green Bay National Wildlife Refuge.

- Spider Island is in the Town of Liberty Grove.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- Vegetation was first documented in 1905 by the Milwaukee Public Museum botanists. A white cedar, tamarack, and white birch forest dominated the island at that time. Boreal forest and Great Lakes shoreline understory species were blueflag iris (*Iris virginica*), wood lily (*Lilium philadelphicum*), and Indian paintbrush.
- By 1966, waterbirds like the herring gull had invaded the island degrading the forest to white birch, white cedar, white spruce, and Canada yew. Shrub species included red-osier dogwood, red raspberry, and red-berried elder.
- No surface water resources are present on the island.
- In 1983, Gary Fewless, botanist from University of Wisconsin Green Bay, reported exotic herbs and remnant shrubs like yew and wild black currant dominated the island. The U.S. Fish and Wildlife Service now reports that the forest has completely disappeared (Judziewicz and Kopitzke 1999).
- Due to the lack of vegetation, wildlife populations on Spider Island are limited. During the nesting season, the island is home to large breeding colonies of Herring Gulls and Double-crested Cormorants. Canada Geese and Red-breasted Mergansers are also known to breed on the island.
- No rare plant or animal species have been recorded on the island.

### **Gravel Island**

Gravel Island is 1.7 acres located off the eastern tip of the Door Peninsula (Judziewicz and Kopitzke, 1999).

- The island is owned and managed by the U.S. Fish & Wildlife Service as Gravel Island NWR. Land use is maintained as a natural area for wildlife.
- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- No surface water resources are present on the island.
- Vegetation was surveyed in July of 1999. No vascular plants were observed (Judziewicz and Kopitzke 1999). There are no known rare plant or animal species.
- The only wildlife species documented from the island are nesting herring gulls.

## **Hog Island**

Hog Island is a small, low, and brushy island located approximately 0.4 miles from the eastern shore of Washington Island. The Island is a National Wildlife Refuge, owned by the U.S. Fish and Wildlife Service, and is a natural area for nesting waterfowl.

- Soils are nearly level to sloping on old glacial lake beach ridges. Dolostone bedrock is at a depth of 40 or more inches (USDA SCS 1978).
- No surface water resources are present on the island.
- Vegetation was documented in the 1970's and included Canada yew, red-osier dogwood, red-berried elder, red raspberry, and wild black currant formed a dense brush layer. White cedar, white birch and aspen were also present.
- The island was surveyed in 1999 and consisted of red-berried elder, red raspberry, among other weedy shrubs. A few balsam fir and Canada yew trees are still standing (Judziewicz and Kopitzke 1999).
- Bird species known to breed on the island include Red-breasted Mergansers, Herring Gulls, Black-crowned Night-Herons, and Great Blue Herons. When the island was surveyed in 1999, Herring Gulls were abundant, however Cormorants were not found (Judziewicz and Kopitzke 1999).
- No known rare plant or animal species have been documented on the island.

## **Fish Island and Fisherman's Shoal**

These tiny 1.2-acre gravel bars are the farthest points of land in eastern Wisconsin. When visited in 1999 neither islet had evidence of vascular plants (Judziewicz and Kopitzke 1999).

- Fish Island and Fisherman's Shoal are in the Town of Washington. The town has adopted the county's zoning ordinance.
- Land use is maintained as a natural area for wildlife.
- Soils are of gravel and sand (Judziewicz and Kopitzke 1999).
- No surface water resources are present on the island and no vegetation was documented when last surveyed.
- The only breeding bird present is a small number of Herring Gulls. No known rare plant or animal species are found on Fish Island and Fisherman's Shoal.

## **CONSERVATION GOALS:**

- Protect rare species and natural communities among the Grand Traverse Islands as identified in recent Natural Heritage Inventories.
- Maintain second growth mixed forest types on Chambers, Plum, Detroit, and Rock Islands to discourage invasion of parasitic and predatory birds.
- Encourage increased management and control of deer populations and logging practices to help promote tree regeneration.

- Expand designated State Natural Areas (Coffee Swamp & Jackson Harbor Ridges) to include other natural communities of ecological quality.
- Consider additional sites of ecological significance among the Grand Traverse Islands for designation as State Natural Areas.
- Create a comprehensive ecological management plan to protect the diverse number of natural communities and rare plant and animal species representative of the Grand Traverse Islands habitat.

#### **THREATS:**

- On Plum and Detroit Islands, timber harvest, reforestation and timber stand improvement measures were undertaken with DNR forestry guidance in the mid-1980's.
- High deer populations following forest management practices negatively impacted regeneration.
- Washington Island faces development pressures throughout the island. In Coffee Swamp, deer herbivory and the invasion of glossy buckthorn threaten understory plants.
- Rock Island is threatened by deer herbivory, invasion of garlic mustard, and human visitors to beach and dune communities (Judziewicz and Kopitzke 1999).
- The smaller bird islands have been completely dominated by colonial waterbirds. Native vegetation and animal life has been replaced with breeding cormorants and gulls (Judziewicz and Kopitzke 1999).

#### **INFORMATION NEEDS / GAPS:**

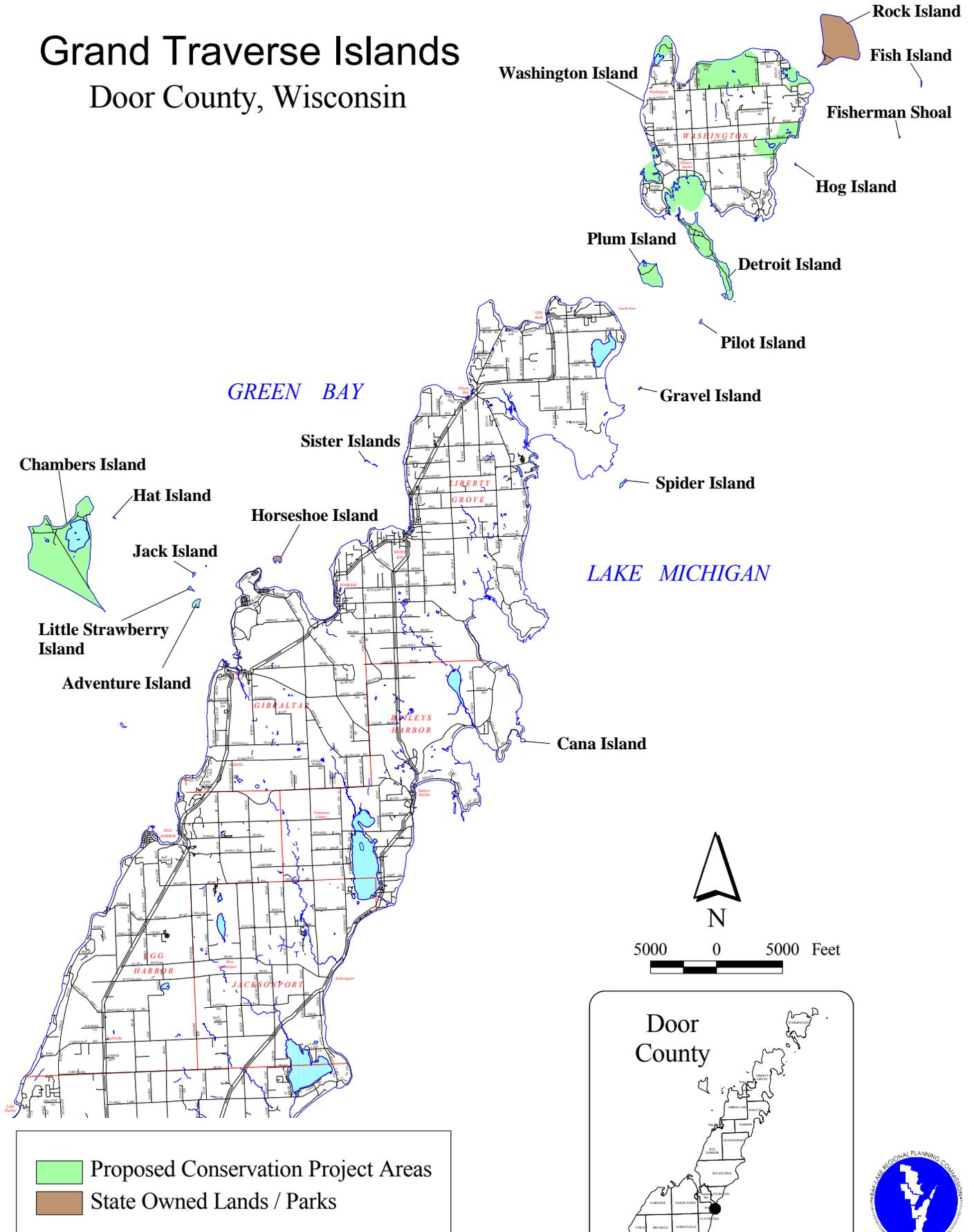
- Inventory of plant and animal species on some of the smaller islands
- Develop list of individuals and supportive groups interested in land conservation activities



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# Grand Traverse Islands

## Door County, Wisconsin

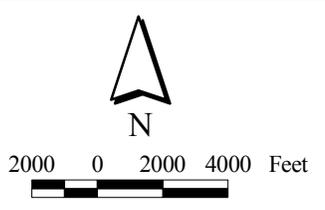
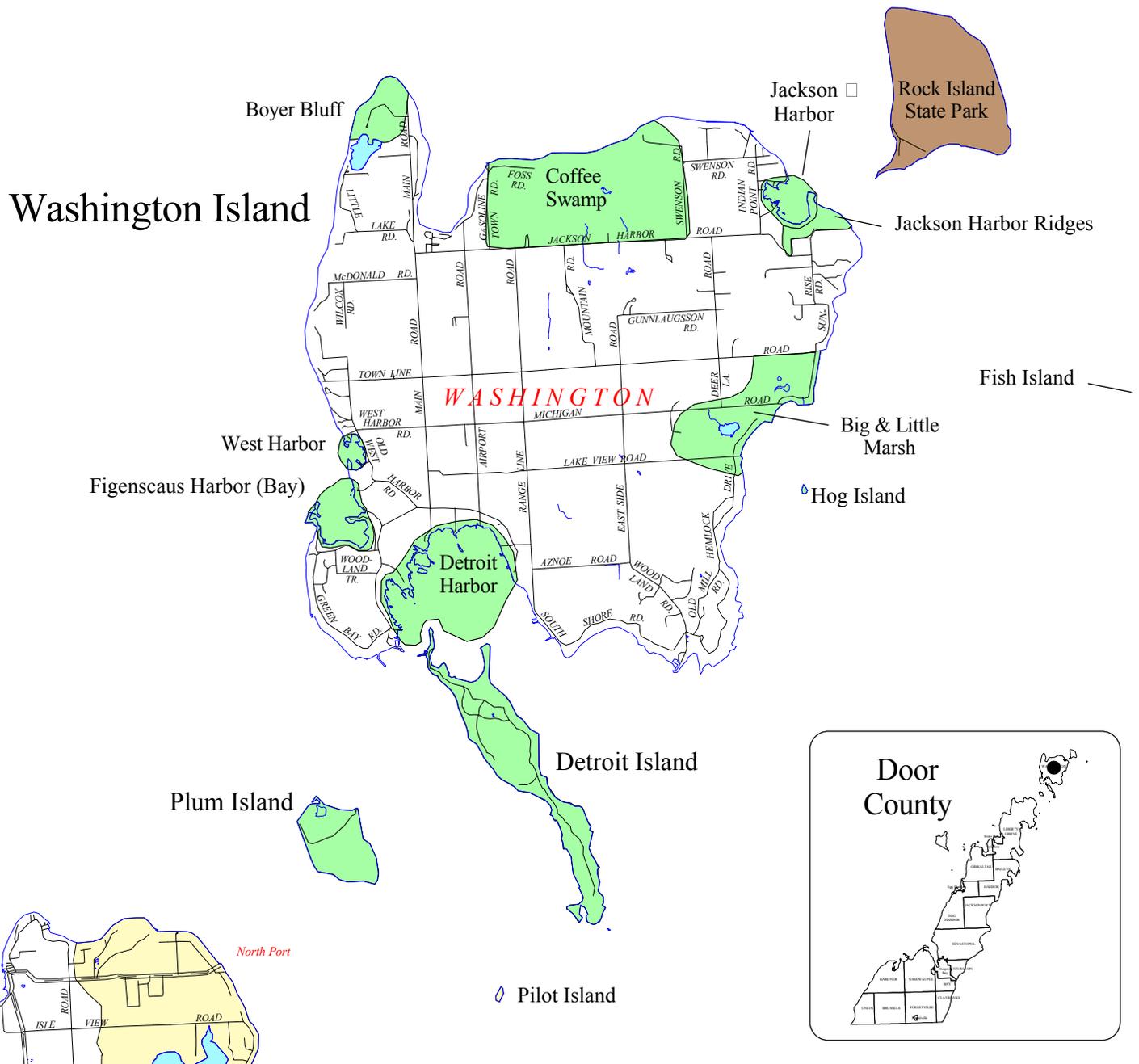


NOTE: Site boundaries are approximate.

Source: Bay-Lake Regional Planning Commission, 2003.

# Grand Traverse Islands, Northern Group

## Door County, Wisconsin



- Northern Islands
- Adjacent Project Areas
- State Owned Lands/Parks

NOTE: Site boundaries are approximate.



Source: Bay-Lake Regional Planning Commission, 2003.

# Washington Island & Vicinity



RICHARD C FOLLMER

Southwest corner of Washington Island - Detroit Harbor (center) - Figenscaus Harbor (upper right)



ROY AIKEN

Plum Island



ROY AIKEN

Detroit Island

# Washington Island



ROY AIKEN

West Harbor



ROY AIKEN

Fignscaus Harbor (Bay)



RICHARD C. FOLLMER

Southeast corner of Washington Island

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## — Glossary —

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### ***biological diversity (also, biodiversity)***

The variety of life and its processes; it includes the variety of living organisms, the genetic differences among them, the communities and ecosystems in which they occur, and the ecological and evolutionary processes that keep them functioning, yet ever changing and adapting. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

### ***buffer or buffer zone***

A defined area of land that surrounds or borders a given natural feature (such as a river, designated natural area, or bluff) within which specified protections are established to minimize threats to the ecological integrity of the natural feature.

### ***canopy***

Typically the uppermost continuous layer of branches and foliage in a stand of trees or shrubs, but can also refer to middle and lower layers in stands of multiple storeys. (from Julian & Katherine Dunster's *Dictionary of Natural Resource Management*, 1996, UBC Press, Vancouver, BC)

### ***carrying capacity***

Conventionally defined as the maximum population size of a given species that an area can support without reducing its ability to support the same species in the future. In the human context, William Catton defines it as the maximum "load" (population x per capita impact) that can safely and persistently be imposed on the environment by people. (from *Our Ecological Footprint*, Mathis Wackernagel & William Rees, 1996, New Society Publishers, Canada)

### ***ecology***

The study of the relationships between living organisms and their physical (nonliving) environment. In its broadest sense, ecology is the study of organisms as they exist in their natural environment. (from Harper Collins' *Environmental Science Dictionary*)

### ***ecological integrity***

Refers to a system's wholeness, including presence of all appropriate elements and occurrence of all natural processes at appropriate rates. A landscape or area with high ecological integrity reflects natural evolutionary processes. (adapted from *Biological Integrity versus Biological Diversity as Policy Directives*, Angermeir and Karr)

### ***ecosystem***

A dynamic complex of plant, animal, fungal, and microorganism communities and their associated nonliving environment interacting as an ecological unit. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

### ***edge***

The zone where two different habitat types meet. It can range from an abrupt change from one to the other (hard edge) to a gradual integration of the two (soft edge). An edge can be of natural origin (such as the area where a grassland meets a woodland) or man-made origin (such as the area where a roadway clearing meets a woodland). See also edge effects. (adapted from *Wisconsin's Biodiversity as a Management Issue*, 1995 WI DNR.)

### ***edge effects***

The ecological changes that occur at the boundaries of ecosystems; these include changes in species composition, gradients of moisture, sunlight, soil and air temperature, wind speed, etc. Many edge effects have negative consequences. For example, forest-interior species have their populations reduced by edge effects. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

***environmentally sensitive area***

Commonly used to describe areas whose destruction or disturbance will negatively affect the life or economic interests of a community by causing hazards such as flooding, landslides, and pollution of groundwater and surface waters; or by causing loss of topsoil or property due to accelerated erosion. Also used to describe areas that: 1) possess ecological functions or natural elements that are known to be fragile and vulnerable to disruption or disturbance, 2) serve as habitat for rare species or threatened natural communities, or 3) possess other conservation values identified as important to a community, such as scenic beauty and wildlife breeding/nesting areas. (adapted from *Performance Controls for Sensitive Lands*, C. Thurow et. al.)

***exotic (non-native or invasive) species***

A species accidentally or purposefully introduced into an area (reintroduction, transplant, restocking, or accidental release) where it did not formerly occur. The concept of exotic versus native species depends on the temporal and spatial context of analysis and if extended back to the last ice age, can be quite complicated. Exotic species often, but not always, have undesirable effects on native species and the ecological integrity of the native ecosystem. (from Julian & Katherine Dunster's *Dictionary of Natural Resource Management*, 1996, UBC Press, Vancouver, BC)

***fen***

Wetlands that receive nutrients via direct contact with mineral enriched groundwater. A "poor" fen has very low concentrations of plant nutrients and floristically resembles a bog. A "rich" fen has relatively high concentrations of nutrients, but is still characterized by the accumulation of peat.

***fragmentation***

The disruption of extensive habitats into isolated and small patches. Fragmentation has two primary negative components for living things: loss of total habitat area, and smaller, more isolated remaining habitat patches. (from *Principles of Conservation Biology*, G. Meffe & C. Carrol et. al.)

***groundwater***

Water that occupies the pore spaces, the layers between boundaries of sedimentary rock strata (bedding planes), and joints of rocks, and originates from two main sources: as hot mineral water rising from deep within the earth, or as water resulting from percolation of precipitation and meltwater from the surface. Groundwater may return to the surface by seepage or through springs, or may be artificially withdrawn through the use of wells. (adapted from Harper Coffins' *Environmental Science Dictionary*)

***habitat***

The place where an organism lives and its surrounding environment, including its biotic (living) and abiotic (nonliving) components. Habitat includes everything that an organism needs to survive. (adapted from *Wisconsin's Biodiversity as a Management Issue*, WI DNR.)

***harmful exotic species***

Any exotic species that can naturalize and either: (1) causes or may cause displacement of, or otherwise threaten, native species in their natural communities; or (2) threaten or may threaten natural resources or their use in the state. (from MN Statutes 84D.01, Subd.7.)

***hanging swamp (perched swamp)***

An upland ephemeral swampy area not connected to the groundwater table and characterized by a bottom composed of clay or impervious materials that preclude seepage into the groundwater. These are excellent habitat for amphibians and waterfowl.

***herbaceous layer***

Vegetation or vegetative layer that is usually forbs, grasses or leafy plants. (from *Dictionary of Natural Resource Management*, Julian and Katherine Dunster 1996, UBC Press, Vancouver, BC)

**hydrological cycle**

The cyclical movement of water from the ocean to the atmosphere, through rain to the surface, through runoff and groundwater to streams, and back to the sea. (from *Earth*, F. Press and R. Siever)

**hydrology**

The science of that part of the hydrologic cycle between rain and return to the sea; the study of water on and within the land. (from *Earth*, F. Press and R. Siever)

**impervious surface**

Generally used in reference to water, an impervious surface is one (e.g. pavement, asphalt, roofing material) through which water cannot drain. The existence of impervious surfaces is linked to increased rates and speed of runoff from an area, in that they prevent water from draining into the soil.

**indicator species**

A species used as a gauge for the condition of a particular habitat, community, or ecosystem. (from *Principles of Conservation Biology*, G. Meffe and C. Carrol et al)

**interior species**

A species adapted to the conditions of a forest interior. Populations of interior species may decline or cease to thrive if subjected to edge environments. (from *Ecology of Greenways*, J. Thorne)

**local government unit**

A unit of government at the township, village, city, or county level.

**native species**

Usually, a species known to have existed on a site prior to the influence of humans. It depends on the temporal or spatial context of analysis, since long-established exotic species are often considered to be native by default. (from *Dictionary of Natural Resource Management*, Julian & Katherine Dunster 1996, UBC Press, Vancouver, BC)

**natural area**

A site largely unaltered by modern human activity, where native vegetation is distributed in naturally occurring patterns. (*See also*, a working definition, Appendix D, page 179)

**natural community**

An assemblage of plants and animals, in a particular place at a particular time, interacting with one another, the abiotic environment around them, and subject to primarily natural disturbance regimes. Those assemblages that are repeated across a landscape in an observable pattern constitute a community type. No two assemblages, however, are exactly alike. (*See also*, Chapter 1, page 16, paragraph 4)

**natural disturbance events**

Recurring perturbations (such as lightning-caused fires, high winds, storms, floods, and insect outbreaks) that occur in ecosystems without human intervention. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

**natural succession**

The natural, sequential change of species composition of a community in a given area. (from *Principles of Conservation Biology*, G. Meffe and C. Carrol et. al.)

**old-growth forest**

Several definitions are possible depending on the forest type under scrutiny. Typically, old-growth forests differ significantly from younger forests in structure, ecological function, and species composition. Typical characteristics of an old-growth forest include: (1) moderate to high canopy closure; (2) patchy, multi-layered, multi-species canopy with trees of several age classes, but dominated by large overstorey trees, some with broken tops and other indications of old and decaying wood; (3) numerous large, standing, dead trees; (4) heavy accumulations of down woody debris; and (5) the presence of species and functional processes that are representative of the potential natural community.

On the Pacific coast of North America, old-growth characteristics begin to appear in unmanaged forests of 175 to 250 years of age, but this will vary considerably across the continent, depending on the site and forest type. *See also* second-growth forest. (from *Dictionary of Natural Resource Management*, Julian & Katherine Dunster 1996, UBC Press, Vancouver, BC)

***open space***

Land that is largely free of man-made structures, where ground cover is such that rain may enter the soil to replenish groundwater. May include but is not limited to natural areas, parks, and agricultural lands. (adapted from *Land Protection Options*, L. Allmann)

***population***

In biology, any group of organisms belonging to the same species at the same time and place. (from *Saving Nature's Legacy*, R. Noss and A. Cooperrider)

***riparian***

Relating to or living or located on the bank of a natural watercourse (as a river or stream) or sometimes of a lake. (adapted from *Webster's New Collegiate Dictionary*)

***second-growth forest***

Relatively young forests that have developed following a disturbance (e.g., wholesale cutting, extensive fire, insect attack) of the previous stand of old-growth forest. Restricted in application to those parts of the world where clearly discernible, old-growth forest still exist, or did exist not long ago. *See also* old growth forest. (from *Dictionary of Natural Resource Management*, Julian & Katherine Dunster, 1996, UBC Press, Vancouver, BC)

***State natural area***

Sites formally designated by the WDNR that contain outstanding examples of native biotic communities and are often the last refuges in the state for rare and endangered species of plants and animals. Areas are devoted to scientific research, the teaching of conservation biology, and especially to the preservation of their natural values and genetic diversity for future generations. (*See also*, Appendix D for additional information)

***understory***

The trees and other woody species growing under the canopies of large adjacent trees and other woody growth. *See* canopy. (from *Dictionary of Natural Resource Management*, Julian & Katherine Dunster, 1996, UBC Press, Vancouver, BC)

***warm water forage fishery***

Stream or lake waters which support fishes with a maximum summer water temperature tolerance of about 80 degrees Fahrenheit. Bluegills, perch, and largemouth bass are examples. (U.S. Forest Service, FSM 2605, Sept 1974)

***watershed***

An area of land, which may or may not be under forest cover, draining water, organic matter, dissolved nutrients, and sediments into a lake or stream. (from *Dictionary of Natural Resource Management*, Julian & Katherine Dunster, 1996, UBC Press, Vancouver, BC)

***wildlife corridor***

1) an area of continuous native vegetation designed to promote connectivity and movement of wildlife between isolated natural areas, or 2) a series of patches of natural vegetation that may serve as "stepping stones" that promote connectivity and movement of wildlife between natural areas. (adapted from *Ecology of Greenways*, Smith et. al.) The natural, sequential change of species composition of a community in a given area. (from *Principles of Conservation Biology*, G. Meffe and C. Carrol et. al.)

***xeric***

Refers to a habitat characterized by dry conditions rather than mesic (moderate) or hygric (wet) conditions. (from *Dictionary of Ecology*, Hanson, Herbert C. 1962 Philosophical Library, N.Y., 382 p.)

# Natural Communities Cross Reference to Natural Areas

Occurrences of Natural Communities Door County, Wisconsin		Significant Wildlife Habitat & Natural Areas																
		1. Ahnapee River Corridor	2. Black Ash Swamp	3. Delwiche Pinery / Sand Hill Pinery & Fabry Creek Complex	4. Renard Swamp	5. Stoney Creek Wetlands Complex	6. Brussels Hill / Kayes Creek / Gardner Swamp Complex	7. Hungry Settlement Marsh	8. Southern Lake Michigan Shoreline	9. Sawyer Harbor / Lost Creek / Larsen Creek Watershed	10. West Branch Whitefish Bay Creek	11. Bay Shore Bluff Lands	12. Logan Creek / Lost Creek Area	13. Bay to Lake Wildlife Corridor	14. Ephraim / Baileys Harbor Forest Corridor & North Bay Lowlands	15. Mink River / Rowley's Bay System	16. Europe Lake Forest Area	17. Grand Traverse Islands
1	Alder Thicket	X	X			X	X	X	X			X		X	X			
2	Alkaline Clay Bluff								X									
3	Alvar									X	X							X
4	Bedrock Shore								X						X			
5	Boreal Forest								X						X			X
6	Boreal Rich Fen								X				X	X				X
7	Calcareous Fen								X		X	X	X	X	X	X		X
8	Emergent Aquatic	X	X			X	X		X	X		X	X		X			X
9	Ephemeral Pond	X	X	X	X	X			X		X		X	X	X	X		
10	Forested Ridge & Swale								X				X	X	X			
11	Forested Seep				X									X	X			X
12	Great Lakes Alkaline Rockshore								X					X	X			X
13	Great Lakes Barrens																	X
14	Great Lakes Beach								X					X	X			X
15	Great Lakes Dune								X								X	
16	Hardwood Swamp	X	X									X	X					X
17	Interdunal Wetland								X						X	X		X
18	Lake Shallow, very hard drainage (marl)								X						X			X
19	Lake Shallow, hard drainage	X							X			X		X				
20	Lake Shallow, hard, seepage								X				X				X	X
21	Mesic Cedar Forest	X				X			X					X	X			X
22	Moist Cliff					X			X		X		X	X	X			X
23	Northern Wet Forest		X			X			X						X			
24	Northern Dry Forest																	X
25	Northern Dry-Mesic Forest			X					X	X	X	X					X	X
26	Northern Mesic Forest			X	X		X		X	X	X	X	X	X	X	X	X	X
27	Northern Sedge Meadow	X							X			X	X	X	X			X
28	Northern Wet-Mesic Forest		X			X	X		X	X	X	X	X	X	X	X		X
29	Open Bog							X							X			
30	Shore Fen																	X
31	Shrub Carr	X	X			X	X	X	X	X		X	X	X	X	X		X
32	Southern Hardwood Swamp		X		X	X	X				X	X						
33	Southern Mesic Forest				X						X							X
34	Southern Sedge Meadow					X	X											
35	Springs & Spring Runs, Hard	X		X		X			X	X	X			X	X			X
36	Submergent Aquatic	X				X			X		X	X		X	X			
37	Talus Forest						X				X		X	X				



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## Appendix B

# Door County's Rare Species & Natural Communities

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The state of Wisconsin is replete with natural beauty. Our state contains a large diversity of native plant communities ranging from eastern deciduous, northern coniferous and boreal forests to prairies and savannas. Wisconsin's glacial past left the soils that support these diverse communities, including a legacy of aquatic features including bogs, lakes, spring ponds, and wetlands. These landscapes host an array of native species, many of which we observe and cherish while others are yet to be discovered and studied.

People are part of the Wisconsin landscape as well. The natural wealth of our state has provided generations of farmers with fertile soils for crops. The northern and southern forests are a key resource for the building and manufacturing economy so important to the livelihood of many of Wisconsin's citizens. The enjoyment that people receive from outdoor activities, such as hunting and fishing, hiking and camping, and observing nature, is part of our culture. Thus, the ties that bind people to nature are diverse and deep.

But much of this natural splendor has been lost through human use of the landscape and its natural resources. How much of the remainder can and should be preserved? This is one of the biggest questions facing the people of Wisconsin and Door County today. In order to make decisions about what, where, and how much can and should be saved, we must first know what remains, where it is, and whether or not something threatens its continued existence. Wisconsin's Natural Heritage Inventory (NHI) is one of the critical tools that can be used in making these decisions.

The NHI is a statewide inventory of known locations and conditions of rare and endangered species. Users need to recognize that parts of the state have not yet been inventoried. Thus an ***"absence of evidence is not evidence of absence"***. *Nor does the presence of one element imply that other elements were surveyed for but not found.*

Despite these limitations, the NHI is the state's most comprehensive database on biodiversity and is widely used. In most cases, locations for species and natural communities that are tracked in the NHI are available down to a township level. The exceptions are those species whose locations are considered to be sensitive. Their locations are available down to a county level.

Wisconsin's Natural Heritage Inventory program's full-time staff of biologists, as part of an international network, conduct inventories, identify rare species, and describe natural community occurrences. These are the individuals who endure tired feet and irritating insect bites to search the state for rare species and their habitats. A variety of part-time and temporary employees, other science professionals, and volunteers supplement data collection efforts.

The Natural Heritage Inventory program's three objectives are to:

- 1) collect information on occurrences of rare plants and animals, high-quality natural communities, and significant natural features in Wisconsin,
- 2) standardize this information, enter it into an electronic database, and mark locations on base maps for the state, and
- 3) use this information to further the protection and management of rare species, natural communities, and natural features.

Information in the Natural Heritage Inventory is sensitive because rare species are very vulnerable to collection as well as destruction. Publication of exact locations may threaten their continued existence. It is for this reason that the NHI data are exempt from the Wisconsin Open Records Law. However, the Bureau of Endangered Resources can and does share NHI data to facilitate protection, plan management, design preserves, and avoid impacts to rare resources.

The following pages catalog rare animals, invertebrate, plants, and natural communities keyed to the 17 proposed conservation areas and other state owned or private landscapes that surround or make up part of these conservation areas.

Several species are classified as rare and sensitive to further loss such that their location is generalized only to the county. There are seven species in this classification; two animal species; the Northern Goshawk (*Accipiter gentilis*), and Bat Hibernaculum (*Bat hibernaculum*) and five plant species; Round-leaved Orchis (*Amerorchis rotundifolia*), Fairy Slipper (*Calypso bulbosa*), Ram's Head Lady's Slipper (*Cypripedium arietinum*), Small Yellow Lady's Slipper (*Cypripedium paraviflorum*), and Showy Lady's Slipper (*Cypripedium reginae*).

Please take note of the following when using these tables:

- 1) *The presence of a rare species at a location does not imply that all taxonomic groups have been surveyed at that site. As such, the data should be interpreted with caution and an "absence of evidence is not evidence of absence" is a philosophy that should be in force.*
- 2) *These tables include data provided by the Wisconsin Department of Natural Resources' Natural Heritage Inventory Program (WNHI). The NHI Program houses the most complete database of locations and status of rare species, high quality natural communities, and natural features in Wisconsin. Data provided are based on a comprehensive rare species inventory of the state. The lack of data shall not be construed to mean that no significant features are present. The WNHI makes no guarantee or warranty concerning the accuracy or completeness of information contained in the database and does not necessarily endorse any interpretation or products derived from the data.*

# Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
1	BUTEO LINEATUS	RED-SHOULDERED HAWK	Animal	Proposed Conservation Area	Bay to Lake Wildlife Corridor
2	WILSONIA CITRINA	HOODED WARBLER	Animal	Proposed Conservation Area	Bay to Lake Wildlife Corridor
3	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
4	HARDWOOD SWAMP	HARDWOOD SWAMP	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
5	EMERGENT AQUATIC	EMERGENT AQUATIC	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
6	NORTHERN SEDGE MEADOW	NORTHERN SEDGE MEADOW	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
7	BOREAL RICH FEN	BOREAL RICH FEN	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
8	NORTHERN IMESIC FOREST	NORTHERN IMESIC FOREST	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
9	MOIST CLIFF	MOIST CLIFF	Community	Proposed Conservation Area	Bay to Lake Wildlife Corridor
10	CONNECTICUT PROPNQUIUS	NORTHERN CLEARWATER CRAWFISH	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
11	HYDROPHORUS VITTATUS	A PREDACEOUS DIVING BEETLE	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
12	CYMBIODYTA ACUMINATA	A WATER SCAVENGER BEETLE	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
13	MATUS BICARINATUS	A PREDACEOUS DIVING BEETLE	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
14	HYDROBIUS MELAENUM	A WATER SCAVENGER BEETLE	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
15	HYDROMETRA MARTINI	A WATER MEASURER	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
16	AESHNA CLEPSYDRA	MOTTLED DARNER	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
17	EPIAESCHNA HEROS	SWAMP DARNER	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
18	SOMATOCHLORA FRANKLINI	DELICATE EMERALD	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
19	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
20	ISCHNURA HASTATA	CITRINE FORKTAIL	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
21	HENDERSOIA OCCULTA	CHERRYSTONE DROP	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
22	VERTIGO ELATIOR	TAPERED VERTIGO	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
23	VERTIGO MORSEI	SIX-WHORL VERTIGO	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
24	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
25	CATINELLA EXILE	PLEISTOCENE CATINELLA	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
26	SUCCEINAE BAKERI	A LAND SNAIL	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
27	GLYPHYALINIA WHEATLEYI	BRIGHT GLYPH	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
28	PARAVITREA MULTIDENTATA	DENTATE SUPERCIL	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
29	STRATIURA FERREA	BLACK STRIATE	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
30	STRATIURA MILIUM	FINE-RIBBED STRIATE	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
31	VITRINA ANGELICAE	TRANSPARENT VITRINE SNAIL	Invertebrate	Proposed Conservation Area	Bay to Lake Wildlife Corridor
32	CIRSUM PITCHERI	DUNE THISTLE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
33	SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
34	TANACETUM HURONENSE	LAKE HURON TANSY	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
35	CAKILE EDENTULA	AMERICAN SEA-ROCKET	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
36	DROSEREA LINEARIS	SLENDERLEAF SUNDEW	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
37	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
38	ADLUMMA FUNGOSA	CLIMBING FUMITORY	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
39	OROBANCHE UNIFLORA	ONE-FLOWERED BROOMRAPE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
40	GEOCAULON LIVIDUM	NORTHERN COMANDRA	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
41	LEUCOPHYSAUS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
42	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
43	CAREX EXILIS	COAST SEDGE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
44	CAREX LIVIDA VAR RADICULIS	LIVID SEDGE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
45	CAREX PLATYPHYLLA	BROAD-LEAF SEDGE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
46	SCRIPUS CESPIITOSUS	TUFTED CLUB-RUSH	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
47	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
48	TRIGLOCHIN MARTIANA	COMMON BOG ARROW-GRASS	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
49	TRIGLOCHIN PALUSTRIS	SLENDER BOG ARROW-GRASS	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
50	STREPTOPUS AMPLEFOLIUS	WHITE MANDARIN	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
51	PLATANATHERA HOOKERI	HOOKER ORCHIS	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
52	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
53	ELYMUS LANCEOLATUS SSP PSAMMOPHILUS	THICKSPIKE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
54	FESTUCA OCCIDENTALIS	WESTERN FESCUE	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
55	ASPLENIDIUM TRICHOMANES	MADENHAIR SPLEENWORT	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor

# Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
56	EQUISETUM PALUSTRE	MARSH HORSETAIL	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
57	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	Proposed Conservation Area	Bay to Lake Wildlife Corridor
58	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	Proposed Conservation Area	Black Ash Swamp
59	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	Proposed Conservation Area	Black Ash Swamp
60	MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
61	SPIZA AMERICANA	DICKCISSEL	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
62	AMMODRAMUS SAVANARUM	GRASSHOPPER SPARROW	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
63	CARDUELIS PINUS	PINE SISKIN	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
64	FUNDULUS DIAPHANUS	BANDED KILLIFISH	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
65	EMYDOIDEA BLANDINGII	BLANDING'S TURTLE	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
66	NORTHERN MESIC FOREST	NORTHERN MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
67	HYDROBIUS MELANEM	A WATER SCAVENGING BEETLE	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
68	CORDULEGASTER OBLIQUA	ARROWHEAD SPIKETAIL	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
69	HENDERSONIA OCCULTA	CHERRYSTONE DROP	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
70	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
71	SUCCINEA BAKERI	A LAND SNAIL	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
72	GLYPHYALINIA RHODSI	SCULPTED GLYPH	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
73	PARAVITREA MULTIDENTATA	DENTATE SUPERCOIL	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
74	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
75	CAREX FORMOSA	HANDSOME SEDGE	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
76	BUTEO LINEATUS	RED-SHOULDERED HAWK	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
77	SOUTHERN HARDWOOD SWAMP	SOUTHERN HARDWOOD SWAMP	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
78	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
79	SOUTHERN MESIC FOREST	SOUTHERN MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
80	SOUTHERN MESIC FOREST	SOUTHERN MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
81	NORTHERN DRY-MESIC FOREST	NORTHERN DRY-MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
82	NORTHERN MESIC FOREST	NORTHERN MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
83	ILYBIUS IGNARUS	DIVING BEETLE	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
84	HYDROMETRA MARTINI	A WATER MEASURER	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
85	HENDERSONIA OCCULTA	CHERRYSTONE DROP	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
86	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
87	VERTIGO IOWANENSIS	IOWA PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
88	GLYPHYALINIA RHODSI	SCULPTED GLYPH	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
89	PARAVITREA MULTIDENTATA	DENTATE SUPERCOIL	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
90	STRIATURA FERREA	BLACK STRIATE	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
91	ADLUMBA FLUGGOSA	CLIMBING FUMITORY	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
92	OROBANCHE UNIFLORA	ONE-FLOWERED BROOMRAPE	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
93	LEUCOPHYSA LIS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
94	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
95	CAREX CONGINNA	BEAUTIFUL SEDGE	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
96	CAREX PLATYPHYLLA	BROAD-LEAF SEDGE	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
97	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
98	PLATANATHERA HOOKERI	HOOKER ORCHIS	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
99	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
100	BOTAURUS LENTIGNOSUS	AMERICAN BITTERN	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
101	NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	Animal	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
102	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
103	NORTHERN SEDGE MEADOW	NORTHERN SEDGE MEADOW	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
104	BOREAL RICH FEN	BOREAL RICH FEN	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
105	BOREAL FOREST	BOREAL FOREST	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
106	GREAT LAKES ALKALINE ROCKSHORE	GREAT LAKES ALKALINE ROCKSHORE	Community	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
107	CORDULEGASTER OBLIQUA	ARROWHEAD SPIKETAIL	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
108	EPIAESCHNA HEROS	SWAMP DARNER	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
109	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex
110	LESTES EURINUS	AMBER-WINGED SPREADINGWING	Invertebrate	Proposed Conservation Area	Brussels Hill/Kayes Creek/Gardner Swamp Complex

Data Source: Wisconsin DNR Natural Heritage Inventory Program - October 24, 2002

## Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
111	CHROMAGRION CONDITUM	AURORA DAMSELFLY	Invertebrate	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
112	SOLIDAGO OHIOENSIS	OHIO GOLDENROD	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
113	CAKILE EDENTULA	AMERICAN SEA-ROCKET	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
114	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
115	DRABA LANCEOLATA	LANCULATE WHITLOW-CRESS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
116	ASTRAGALUS NEGLECTUS	COOPER'S MILKWEED	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
117	ADLUMIA FUNGOSA	CLIMBING FUMITORY	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
118	GENTIANOPSIS PROCERA	LESSER FRINGED GENTIAN	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
119	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
120	PTEROSPORA ANDROMEDA	GIANT PINEDROPS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
121	PRIMULA MISTASSINICA	BIRD'S-EYE PRIMROSE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
122	LEUCOPHYSAUS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
123	CAREX CAPILLARIS	HAIR-LIKE SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
124	CAREX CONOINNA	BEAUTIFUL SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
125	CAREX CRAWEI	CRAWEE SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
126	CAREX GARBERI	ELK SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
127	CAREX GYNOCRATES	NORTHERN BOG SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
128	CAREX VAGINATA	SHEATHED SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
129	ELEOCHARIS QUINQUEFLORA	FEW-FLOWER SPIKERUSH	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
130	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
131	TRIGLOCHIN MARITIMA	COMMON BOG ARROW-GRASS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
132	TRIGLOCHIN PALUSTRIS	SLENDER BOG ARROW-GRASS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
133	PLATANTHERA DILATATA	LEAFY WHITE ORCHIS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
134	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
135	DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
136	FESTUCA OCCIDENTALIS	WESTERN FESCUE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
137	TRisetium MELICOIDES	PURPLE FALSE OATS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
138	ASPLENIUM TRICHOMANES	MADENHAIR SPLEENWORT	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
139	GYMNOCARPIUM ROBERTIANUM	LIMESTONE OAK FERN	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
140	EQUISETUM VAREGATUM	VAREGATED HORSETAIL	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
141	BUCEPHALA CLANGULA	COMMON GOLDENEYE	Animal	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
142	MERGUS SERRATOR	RED-BREASTED MERGANSER	Animal	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
143	DENDROICA TIGRINA	CAPE MAY WARBLER	Animal	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
144	HENDERSONIA OCCULTA	CHERRYSTONE DROP	Invertebrate	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
145	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
146	VERTIGO IOWAENSIS	IOWA PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
147	PARAVITREA MULTIDENTATA	DENTATE SUPERCOWL	Invertebrate	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
148	STRIATURA FERREA	BLACK STRIATE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
149	SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
150	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
151	ADLUMIA FUNGOSA	CLIMBING FUMITORY	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
152	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
153	PARNASSIA PARVIFLORA	SMALL-FLOWER GRASS-OF-PARNASSUS	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
154	VIOLA ROSSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
155	CAREX CRAWEI	CRAWEE SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
156	CAREX GARBERI	ELK SEDGE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
157	ELEOCHARIS QUINQUEFLORA	FEW-FLOWER SPIKERUSH	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
158	MEDEOLA VIRGINIANA	INDIAN CUCUMBER-ROOT	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
159	FESTUCA OCCIDENTALIS	WESTERN FESCUE	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
160	EQUISETUM PALUSTRE	MARSH HORSETAIL	Plant	Proposed Conservation Area	Ephraim/Baileys Harbor/North Bay Corridor
161	HEMIDACTYLUM SCUTATUM	FOUR-TOED SALAMANDER	Animal	Proposed Conservation Area	Grand Traverse Islands
162	NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	Animal	Proposed Conservation Area	Grand Traverse Islands
163	LARUS MARINUS	GREAT BLACK-BACKED GULL	Animal	Proposed Conservation Area	Grand Traverse Islands
164	LAKE--SHALLOW, HARD, SEEPAGE	LAKE--SHALLOW, HARD, SEEPAGE	Community	Proposed Conservation Area	Grand Traverse Islands
165	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	Proposed Conservation Area	Grand Traverse Islands

Data Source: Wisconsin DNR Natural Heritage Inventory Program - October 24, 2002

# Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
166	HARDWOOD SWAMP	HARDWOOD SWAMP	Community	Proposed Conservation Area	Grand Traverse Islands
167	EMERGENT AQUATIC	EMERGENT AQUATIC	Community	Proposed Conservation Area	Grand Traverse Islands
168	BOREAL RICH FEN	BOREAL RICH FEN	Community	Proposed Conservation Area	Grand Traverse Islands
169	SOUTHERN MESIC FOREST	SOUTHERN MESIC FOREST	Community	Proposed Conservation Area	Grand Traverse Islands
170	NORTHERN DRY FOREST	NORTHERN DRY FOREST	Community	Proposed Conservation Area	Grand Traverse Islands
171	NORTHERN DRY-MESIC FOREST	NORTHERN DRY-MESIC FOREST	Community	Proposed Conservation Area	Grand Traverse Islands
172	NORTHERN MESIC FOREST	NORTHERN MESIC FOREST	Community	Proposed Conservation Area	Grand Traverse Islands
173	MOIST CLIFF	MOIST CLIFF	Community	Proposed Conservation Area	Grand Traverse Islands
174	GREAT LAKES BEACH	GREAT LAKES BEACH	Community	Proposed Conservation Area	Grand Traverse Islands
175	GREAT LAKES ALKALINE ROCKSHORE	GREAT LAKES ALKALINE ROCKSHORE	Community	Proposed Conservation Area	Grand Traverse Islands
176	GREAT LAKES DUNE	GREAT LAKES DUNE	Community	Proposed Conservation Area	Grand Traverse Islands
177	GREAT LAKES BARRENS	GREAT LAKES BARRENS	Community	Proposed Conservation Area	Grand Traverse Islands
178	HYDROMETRA MARTINI	A WATER MEASURER	Community	Proposed Conservation Area	Grand Traverse Islands
179	LYCAENA DORCAS	DORCAS COPPER	Invertebrate	Proposed Conservation Area	Grand Traverse Islands
180	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	Proposed Conservation Area	Grand Traverse Islands
181	SENECIO CONGESTUS	MARSH RAGWORT	Plant	Proposed Conservation Area	Grand Traverse Islands
182	SOLIDAGO OHIOENSIS	OHIO GOLDENROD	Plant	Proposed Conservation Area	Grand Traverse Islands
183	SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	Plant	Proposed Conservation Area	Grand Traverse Islands
184	CAKILE EDENTULA	AMERICAN SEA-ROCKET	Plant	Proposed Conservation Area	Grand Traverse Islands
185	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	Proposed Conservation Area	Grand Traverse Islands
186	DRABA ARABISANA	ROCK WHITLOW-GRASS	Plant	Proposed Conservation Area	Grand Traverse Islands
187	DRABA LANCEOLATA	LANCEOLATE WHITLOW-CRESS	Plant	Proposed Conservation Area	Grand Traverse Islands
188	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant	Proposed Conservation Area	Grand Traverse Islands
189	ASTRAGALUS NEGLECTUS	COOPER'S MILKVETCH	Plant	Proposed Conservation Area	Grand Traverse Islands
190	ADLUMMA FUNGOSA	CLIMBING FUMITORY	Plant	Proposed Conservation Area	Grand Traverse Islands
191	GENTIANOPSIS PROCERA	LESSER FRINGED GENTIAN	Plant	Proposed Conservation Area	Grand Traverse Islands
192	RIBES HUDSONIANUM	NORTHERN BLACK CURRANT	Plant	Proposed Conservation Area	Grand Traverse Islands
193	RIBES OXYACANTHOIDES	CANADA GOOSEBERRY	Plant	Proposed Conservation Area	Grand Traverse Islands
194	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant	Proposed Conservation Area	Grand Traverse Islands
195	PTEROSPORA ANDROMEDA	GIANT PINEDROPS	Plant	Proposed Conservation Area	Grand Traverse Islands
196	OROBANCHE UNIFLORA	ONE-FLOWERED BROOMRAPE	Plant	Proposed Conservation Area	Grand Traverse Islands
197	PRIMULA MISTASSINICA	BIRD'S-EYE PRIMROSE	Plant	Proposed Conservation Area	Grand Traverse Islands
198	PARMASSIA PARVIFLORA	SMALL-FLOWER GRASS-OF-PARNASSUS	Plant	Proposed Conservation Area	Grand Traverse Islands
199	LEUCOPHYSALIS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	Proposed Conservation Area	Grand Traverse Islands
200	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Grand Traverse Islands
201	CAREX CRAWEI	CRAWEE SEDGE	Plant	Proposed Conservation Area	Grand Traverse Islands
202	CAREX GARBERI	ELK SEDGE	Plant	Proposed Conservation Area	Grand Traverse Islands
203	CAREX GYNOCRATES	NORTHERN BOG SEDGE	Plant	Proposed Conservation Area	Grand Traverse Islands
204	CAREX LIVIDA VAR RADICALLIS	LIVID SEDGE	Plant	Proposed Conservation Area	Grand Traverse Islands
205	ELEOCHARIS QUINQUEFLORA	FEW-FLOWER SPIKERUSH	Plant	Proposed Conservation Area	Grand Traverse Islands
206	SCIRPUS CESPITOSUS	TUFTED CLUB-RUSH	Plant	Proposed Conservation Area	Grand Traverse Islands
207	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Grand Traverse Islands
208	TRIGLOCHIN MARTIANA	COMMON BOG ARROW-GRASS	Plant	Proposed Conservation Area	Grand Traverse Islands
209	MEDEOLA VIRGINIANA	INDIAN CUCUMBER-ROOT	Plant	Proposed Conservation Area	Grand Traverse Islands
210	TOPIELDIA GLUTINOSA	STICKY FALSE-ASPHODEL	Plant	Proposed Conservation Area	Grand Traverse Islands
211	IMALAXIS BRACHYPODA	WHITE ADDER'S-MOUTH	Plant	Proposed Conservation Area	Grand Traverse Islands
212	PLATANOTHERA HOOKERI	HOOKER ORCHIS	Plant	Proposed Conservation Area	Grand Traverse Islands
213	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant	Proposed Conservation Area	Grand Traverse Islands
214	DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	Plant	Proposed Conservation Area	Grand Traverse Islands
215	DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	Plant	Proposed Conservation Area	Grand Traverse Islands
216	ELYMUS LANCEOLATUS SSP PSAMMOPHILUS	THICKSPIKE	Plant	Proposed Conservation Area	Grand Traverse Islands
217	FESTUCA OCCIDENTALIS	WESTERN FESCUE	Plant	Proposed Conservation Area	Grand Traverse Islands
218	GYMNOCARPUM ROBERTIANUM	LIMESTONE OAK FERN	Plant	Proposed Conservation Area	Grand Traverse Islands
219	EQUISETUM PALUSTRE	MARSH HORSETAIL	Plant	Proposed Conservation Area	Grand Traverse Islands
220	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	Proposed Conservation Area	Grand Traverse Islands

Data Source: Wisconsin DNR Natural Heritage Inventory Program - October 24, 2002

## Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
221	NYCTICORAX NYCTICORAX	BLACK-CROWNED NIGHT-HERON	Animal	State Owned	Grand Traverse Islands
222	MERGUS MERGANISER	COMMON MERGANISER	Animal	State Owned	Grand Traverse Islands
223	MERGUS SERRATOR	RED-BREASTED MERGANISER	Animal	State Owned	Grand Traverse Islands
224	DIADOPHIS PUNCTATUS EDWARDSII	NORTHERN RINGNECK SNAKE	Animal	State Owned	Grand Traverse Islands
225	FORESTED SHEEP	FORESTED SHEEP	Community	State Owned	Grand Traverse Islands
226	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	State Owned	Grand Traverse Islands
227	INTERDUNAL WETLAND	INTERDUNAL WETLAND	Community	State Owned	Grand Traverse Islands
228	SOUTHERN MESIC FOREST	SOUTHERN MESIC FOREST	Community	State Owned	Grand Traverse Islands
229	NORTHERN DRY-MESIC FOREST	NORTHERN DRY-MESIC FOREST	Community	State Owned	Grand Traverse Islands
230	MOIST CLIFF	MOIST CLIFF	Community	State Owned	Grand Traverse Islands
231	GREAT LAKES DUNE	GREAT LAKES DUNE	Community	State Owned	Grand Traverse Islands
232	CIONELLA MORSEANA	APPALACHIAN PILLAR	Invertebrate	State Owned	Grand Traverse Islands
233	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	State Owned	Grand Traverse Islands
234	VERTIGO PARADOXA	MYSTERY VERTIGO	Invertebrate	State Owned	Grand Traverse Islands
235	VERTIGO IOWAENSIS	IOWA PLEISTOCENE VERTIGO	Invertebrate	State Owned	Grand Traverse Islands
236	SUCCINEA BAKERI	A LAND SNAIL	Invertebrate	State Owned	Grand Traverse Islands
237	GLYPHYALINIA RHODSI	SCULPTED GLYPH	Invertebrate	State Owned	Grand Traverse Islands
238	PARAVITREA MULTIDENTATA	DENTATE SUPERCOIL	Invertebrate	State Owned	Grand Traverse Islands
239	STRIATURA FERREA	BLACK STRIATE	Invertebrate	State Owned	Grand Traverse Islands
240	OSMORHIZA CHILENSIS	CHILEAN SWEET CICELY	Plant	State Owned	Grand Traverse Islands
241	SOLIDAGO OHIOENSIS	OHIO GOLDENROD	Plant	State Owned	Grand Traverse Islands
242	SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	Plant	State Owned	Grand Traverse Islands
243	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	State Owned	Grand Traverse Islands
244	DRABA ARABISANS	ROCK WHITLOW-GRASS	Plant	State Owned	Grand Traverse Islands
245	DRABA LANCEOLATA	LANCEOLATE WHITLOW-CRESS	Plant	State Owned	Grand Traverse Islands
246	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant	State Owned	Grand Traverse Islands
247	ADLUMMA FLUGGOSA	CLIMBING FUMITORY	Plant	State Owned	Grand Traverse Islands
248	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant	State Owned	Grand Traverse Islands
249	UTRICULARIA GEMINISCAPA	HIDDEN-FRUITED BLADDERWORT	Plant	State Owned	Grand Traverse Islands
250	PTEROSPORA ANDROMEDA	GIANT PINEDROPS	Plant	State Owned	Grand Traverse Islands
251	OROBANCHE UNIFLORA	ONE-FLOWERED BROOMRAPE	Plant	State Owned	Grand Traverse Islands
252	LEUCOPHYSA LIS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	State Owned	Grand Traverse Islands
253	VIOLA ROSSTRATA	LONG-SPUR VIOLET	Plant	State Owned	Grand Traverse Islands
254	CAREX CRAWEI	CRAWE SEDGE	Plant	State Owned	Grand Traverse Islands
255	CAREX GARBERI	ELK SEDGE	Plant	State Owned	Grand Traverse Islands
256	CAREX PLATYPHYLLA	BROAD-LEAF SEDGE	Plant	State Owned	Grand Traverse Islands
257	CAREX PRASINA	DROOPING SEDGE	Plant	State Owned	Grand Traverse Islands
258	IRIS LAGUSTRIS	DWARF LAKE IRIS	Plant	State Owned	Grand Traverse Islands
259	MEDEOLA VIRGINIANA	INDIAN CUCUMBER-ROOT	Plant	State Owned	Grand Traverse Islands
260	PLATANTHERA HOOKERI	HOOKER ORCHIS	Plant	State Owned	Grand Traverse Islands
261	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant	State Owned	Grand Traverse Islands
262	DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	Plant	State Owned	Grand Traverse Islands
263	ELYMUS LANCEOLATUS SSP PSAMMOPHILUS	THICKSPIKE	Plant	State Owned	Grand Traverse Islands
264	FESTUCA OCCIDENTALIS	WESTERN FESCUE	Plant	State Owned	Grand Traverse Islands
265	DRYOPTERIS EXPANSA	SPREADING WOODFERN	Plant	State Owned	Grand Traverse Islands
266	GYMNOCARPUM ROBERTIANUM	LIMESTONE OAK FERN	Plant	State Owned	Grand Traverse Islands
267	EQUISETUM PALUSTRE	MARSH HORSETAIL	Plant	State Owned	Grand Traverse Islands
268	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	State Owned	Grand Traverse Islands
269	BARTRAMIA LONGICAUDA	UPLAND SANDPIPER	Animal	State Owned	Grand Traverse Islands
270	MELANERPES ERYTHROCEPHALUS	RED-HEADED WOODPECKER	Animal	State Owned	Grand Traverse Islands
271	DENDROICA CAERULESCENS	BLACK-THROATED BLUE WARBLER	Animal	State Owned	Grand Traverse Islands
272	AMMODRAMUS HENSLIOWII	HENSLOW'S SPARROW	Animal	State Owned	Grand Traverse Islands
273	STURNELLA NEGLECTA	WESTERN MEADOW LARK	Animal	State Owned	Grand Traverse Islands
274	NORTHERN MESIC FOREST	NORTHERN MESIC FOREST	Community	State Owned	Grand Traverse Islands
275	GREAT LAKES BEACH	GREAT LAKES BEACH	Community	State Owned	Grand Traverse Islands

Data Source: Wisconsin DNR Natural Heritage Inventory Program - October 24, 2002

# Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
276	GREAT LAKES ALKALINE ROCKSHORE	GREAT LAKES ALKALINE ROCKSHORE	Community		Grand Traverse Islands
277	CAENIS YOUNGI	A CAENID MAYFLY	Invertebrate		Grand Traverse Islands
278	CIONELLA MORSEANA	APPALACHIAN PILLAR	Invertebrate		Grand Traverse Islands
279	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate		Grand Traverse Islands
280	GLYPHYVALINIA RHODSI	SCULPTED GLYPH	Invertebrate		Grand Traverse Islands
281	PARAVITREA MULTIDENTATA	DENTATE SUPERCOIL	Invertebrate		Grand Traverse Islands
282	STRIATURA FERREA	BLACK STRIATE	Invertebrate		Grand Traverse Islands
283	CIRSIUM PITCHERI	DUNE THISTLE	Plant		Grand Traverse Islands
284	SOLIDAGO OHIOENSIS	OHIO GOLDENROD	Plant		Grand Traverse Islands
285	SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	Plant		Grand Traverse Islands
286	CAKILE EDENTULA	AMERICAN SEA-ROCKET	Plant		Grand Traverse Islands
287	DRABA ARABISANS	ROCK WHITLOW-GRASS	Plant		Grand Traverse Islands
288	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant		Grand Traverse Islands
289	ADULMA FUNGOSA	CLIMBING FUMITORY	Plant		Grand Traverse Islands
290	GENTIANOPSIS PROCERA	LESSER FRINGED GENTIAN	Plant		Grand Traverse Islands
291	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant		Grand Traverse Islands
292	OROBANCHE UNIFLORA	ONE-FLOWERED BROOMRAPE	Plant		Grand Traverse Islands
293	PRIMULA MISTASSINICA	BIRD'S-EYE PRIMROSE	Plant		Grand Traverse Islands
294	PARMASSIA PARVIFLORA	SMALL-FLOWER GRASS-OF-PARNASSUS	Plant		Grand Traverse Islands
295	CAREX GRAWEI	CRAWE SEDGE	Plant		Grand Traverse Islands
296	CAREX GARBERI	ELK SEDGE	Plant		Grand Traverse Islands
297	CAREX PLATYPHYLLA	BROAD-LEAF SEDGE	Plant		Grand Traverse Islands
298	ELEOCHARIS QUINQUEFLORA	FEW-FLOWER SPIKERUSH	Plant		Grand Traverse Islands
299	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant		Grand Traverse Islands
300	TRIGLOCHIN MARTIMA	COMMON BOG ARROW-GRASS	Plant		Grand Traverse Islands
301	TOFIELDIA GLUTINOSA	STICKY FALSE-ASPHODEL	Plant		Grand Traverse Islands
302	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant		Grand Traverse Islands
303	DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	Plant		Grand Traverse Islands
304	ELYMUS LANCEOLATUS SSP PSAMMOPHILLUS	THICKSPIKE	Plant		Grand Traverse Islands
305	ASPLENIUM TRICHOMANES	MAIDENHAIR SPLEENWORT	Plant		Grand Traverse Islands
306	ASPLENIUM VIRIDE	GREEN SPLEENWORT	Plant		Grand Traverse Islands
307	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
308	HYDROPORUS VITTATUS	A PREDACEOUS DIVING BEETLE	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
309	TANACETUM HURONENSE	SEASIDE SPURGE	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
310	EUPHORBIA POLYGONIFOLIA	LAKE HURON TANSY	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
311	RANUNCULUS GIMELINII	SMALL YELLOW WATER CROWFOOT	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
312	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
313	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
314	TRIGLOCHIN PALUSTRIS	SLENDER BOG ARROW-GRASS	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
315	STREPTOPUS AMPELIFOLIUS	WHITE MANDARIN	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
316	MALAXIS BRACHYPODA	WHITE ADDER'S-MOUTH	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
317	EQUISETUM PALUSTRE	MARSH HORSETAIL	Plant	Proposed Conservation Area	Logan Creek/Lost Lake Area
318	COTURNICOPS NOVEBORACENSIS	YELLOW RAIL	Animal	Proposed Conservation Area	Logan Creek/Lost Lake Area
319	FUNDULUS DIAPHANUS	BANDED KILLIFISH	Animal	Proposed Conservation Area	Logan Creek/Lost Lake Area
320	NORTHERN WET FOREST	NORTHERN WET FOREST	Community	Proposed Conservation Area	Logan Creek/Lost Lake Area
321	EMERGENT AQUATIC	EMERGENT AQUATIC	Community	Proposed Conservation Area	Logan Creek/Lost Lake Area
322	NORTHERN SEDGE MEADOW	NORTHERN SEDGE MEADOW	Community	Proposed Conservation Area	Logan Creek/Lost Lake Area
323	ALDER THicket	ALDER THicket	Community	Proposed Conservation Area	Mink River
324	SPRINGS AND SPRING RUNS, HARD	SPRINGS AND SPRING RUNS, HARD	Community	Proposed Conservation Area	Mink River
325	SOMATOCHLORA HINEANA	HINE'S EMERALD	Community	Proposed Conservation Area	Mink River
326	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Mink River
327	PARAVITREA MULTIDENTATA	DENTATE SUPERCOIL	Invertebrate	Proposed Conservation Area	Mink River
328	ADULMA FUNGOSA	CLIMBING FUMITORY	Invertebrate	Proposed Conservation Area	Mink River
329	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Mink River
330	PLATANATHERA ORBICULATA	LARGE ROUNDLEAF ORCHID	Plant	Proposed Conservation Area	Mink River

Data Source: Wisconsin DNR Natural Heritage Inventory Program - October 24, 2002

# Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
331	BOREAL RICH FEN	BOREAL RICH FEN	Community	Private Owned	Private Conservation Area
332	CAREX LIVIDA VAR RADICULIS	LIVID SEDGE	Plant	Private Owned	Private Conservation Area
333	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant	Private Owned	Private Conservation Area
334	NORTHERN MESC FOREST	NORTHERN MESC FOREST	Community	Proposed Conservation Area	Renard Swamp
335	ADULMIA FUNGOSA	CLIMBING FUMITORY	Plant	Proposed Conservation Area	Renard Swamp
336	LUXILUS CHRYSOCEPHALUS	STRIPED SHINER	Animal	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
337	FUNDULUS DIAPHANUS	BANDED KILLFISH	Animal	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
338	ALVAR	ALVAR	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
339	HYDROPORUS VITTATUS	A PREDACEOUS DIVING BEETLE	Invertebrate	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
340	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
341	CAREX RICHARDSONII	RICHARDSON SEDGE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
342	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
343	ACRIS CREPTANS BLANCHARDI	BLANCHARD'S CRICKET FROG	Animal	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
344	CHARADRIUS MELODUS	PIPING PLOVER	Animal	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
345	FUNDULUS DIAPHANUS	BANDED KILLFISH	Animal	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
346	LAKE--SHALLOW, HARD, DRAINAGE	LAKE--SHALLOW, HARD, DRAINAGE	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
347	LAKE--SHALLOW, VERY HARD, DRAINAGE (MARL)	LAKE--SHALLOW, VERY HARD, DRAINAGE (MARL)	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
348	NORTHERN WET-MESC FOREST	NORTHERN WET-MESC FOREST	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
349	EMERGENT AQUATIC	EMERGENT AQUATIC	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
350	NORTHERN SEDGE MEADOW	NORTHERN SEDGE MEADOW	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
351	BOREAL RICH FEN	BOREAL RICH FEN	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
352	ALDER THICKET	ALDER THICKET	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
353	NORTHERN DRY-MESC FOREST	NORTHERN DRY-MESC FOREST	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
354	NORTHERN MESC FOREST	NORTHERN MESC FOREST	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
355	FORESTED RIDGE AND SWALE	FORESTED RIDGE AND SWALE	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
356	GREAT LAKES BEACH	GREAT LAKES BEACH	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
357	GREAT LAKES DUNE	GREAT LAKES DUNE	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
358	GRAMMIA OITHONA	OITHONA TIGER MOTH	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
359	GRAMMIA PHYLIRA	PHYLIRA TIGER MOTH	Community	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
360	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
361	HENDERSONIA OCCULTA	CHERRYSTONE DROP	Invertebrate	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
362	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
363	PARAVITREA MULTIDENTATA	DENTATE SUPERCOIL	Invertebrate	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
364	STRATIURA FERREA	BLACK STRIATE	Invertebrate	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
365	OSMORHIZA CHILENSIS	CHILEAN SWEET CICELY	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
366	CIRSIIUM PITCHERI	DUNE THISTLE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
367	SOLIDAGO SIMPLEX VAR GILLMANII	STICKY GOLDENROD	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
368	CAKILE EDENTULA	AMERICAN SEA-ROCKET	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
369	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
370	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
371	GENTIANOPSIS PROCERA	LESSER FRINGED GENTIAN	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
372	TIARELLA CORDIFOLIA	HEART-LEAVED FOAM-FLOWER	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
373	LEUCOPHYSALIS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
374	VIOLA ROSTRATA	LONG-SPUR VIOLET	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
375	CAREX BACKII	ROCKY MOUNTAIN SEDGE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
376	CAREX CRAWEI	CRAWEE SEDGE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
377	CAREX EXILIS	COAST SEDGE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
378	CAREX GYNOCRATES	NORTHERN BOG SEDGE	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
379	RHYNCHOSPORA FUSCA	BROWN BEAKRUSH	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
380	SCIRPUS CESPITOSUS	TUFTED CLUB-RUSH	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
381	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
382	TRIGLOCHIN MARITIMA	COMMON BOG ARROW-GRASS	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
383	TRIGLOCHIN PALUSTRIS	SLENDER BOG ARROW-GRASS	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
384	ARETHUSA BULBOSA	SWAMP-PINK	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds
385	IMALIXIS BRACHYPODA	WHITE ADDER'S-MOUTH	Plant	Proposed Conservation Area	Sawyer Harbor Lost Creek/Larsen Creek Watersheds

# Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
386	PLATANATHERA DILATATA	LEAFY WHITE ORCHIS	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
387	PLATANATHERA HOOKERI	HOOKER ORCHIS	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
388	PLATANATHERA ORBICULATA	LARGE ROUNDLEAF ORCHID	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
389	CALAMOVILFA LONGIFOLIA VAR MAGNA	SAND REED-GRASS	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
390	DESCHAMPSIA FLEXUOSA	CRINKLED HAIRGRASS	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
391	ELYMUS LANCEOLATUS SSP PSAMMOPHILLUS	THICKSPIKE	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
392	GYMNOCARPUM ROBERTIANUM	LIMESTONE OAK FERN	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
393	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
394	BOTRYCHIUM LUNARIA	MOONWORT GRAPE-FERN	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
395	BOTRYCHIUM LUNARIA	MOONWORT GRAPE-FERN	Plant	Proposed Conservation Area	Southern Lake Michigan Shoreline
396	BUCEPHALA CLANGULA	COMMON GOLDENEYE	Animal	State Owned	Southern Lake Michigan Shoreline
397	BUCEPHALA CLANGULA	COMMON GOLDENEYE	Animal	State Owned	Southern Lake Michigan Shoreline
398	LAKE--SHALLOW, HARD, DRAINAGE	LAKE--SHALLOW, HARD, DRAINAGE	Community	State Owned	State Lands
399	NORTHERN WET-MESIC FOREST	NORTHERN WET-MESIC FOREST	Community	State Owned	State Lands
400	SHRUB-CARR	SHRUB-CARR	Community	State Owned	State Lands
401	OPEN BOG	OPEN BOG	Community	State Owned	State Lands
402	BOREAL FOREST	BOREAL FOREST	Community	State Owned	State Lands
403	BOREAL FOREST	BOREAL FOREST	Community	State Owned	State Lands
404	GREAT LAKES ALKALINE ROCKSHORE	GREAT LAKES ALKALINE ROCKSHORE	Community	State Owned	State Lands
405	GREAT LAKES ALKALINE ROCKSHORE	GREAT LAKES ALKALINE ROCKSHORE	Community	State Owned	State Lands
406	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	State Owned	State Lands
407	SOMATOCHLORA HINEANA	HINE'S EMERALD	Invertebrate	State Owned	State Lands
408	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	State Owned	State Lands
409	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	State Owned	State Lands
410	VERTIGO HUBRICHTI	MIDWEST PLEISTOCENE VERTIGO	Invertebrate	State Owned	State Lands
411	VERTIGO IOWAENSIS	IOWA PLEISTOCENE VERTIGO	Invertebrate	State Owned	State Lands
412	CATINELLA EXILE	PLEISTOCENE CATINELLA	Invertebrate	State Owned	State Lands
413	PARAVITREA MULTIDENTATA	DENTATE SUPERCIL	Invertebrate	State Owned	State Lands
414	STRIATURA FERREA	BLACK STRIATE	Plant	State Owned	State Lands
415	SOLIDAGO OHIOENSIS	OHIO GOLDENROD	Plant	State Owned	State Lands
416	TANACETUM HURONENSE	LAKE HURON TANSY	Plant	State Owned	State Lands
417	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	State Owned	State Lands
418	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant	State Owned	State Lands
419	GENTIANOPSIS PROCERA	LESSER FRINGED GENTIAN	Plant	State Owned	State Lands
420	GENTIANOPSIS PROCERA	LESSER FRINGED GENTIAN	Plant	State Owned	State Lands
421	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant	State Owned	State Lands
422	CALAMINTHA ARKANSANA	LOW CALAMINT	Plant	State Owned	State Lands
423	PTEROSPORA ANDROMEDA	GIANT PINEDROPS	Plant	State Owned	State Lands
424	PRIMULA MISTASSINICA	BIRD'S-EYE PRIMROSE	Plant	State Owned	State Lands
425	PRIMULA MISTASSINICA	BIRD'S-EYE PRIMROSE	Plant	State Owned	State Lands
426	GEOCAULON LIVIDUM	NORTHERN COMANDBRA	Plant	State Owned	State Lands
427	PARMASSIA PARVIFLORA	SMALL-FLOWER GRASS-OF-PARNASSUS	Plant	State Owned	State Lands
428	LEUCOPHYSALIS GRANDIFLORA	LARGE-FLOWERED GROUND-CHERRY	Plant	State Owned	State Lands
429	VIOLA ROSSTRATA	LONG-SPUR VIOLET	Plant	State Owned	State Lands
430	CAREX CRAWWEI	CRAWE SEDGE	Plant	State Owned	State Lands
431	CAREX CRAWWEI	CRAWE SEDGE	Plant	State Owned	State Lands
432	CAREX GARBERI	ELK SEDGE	Plant	State Owned	State Lands
433	CAREX GARBERI	ELK SEDGE	Plant	State Owned	State Lands
434	CAREX LIVIDA VAR RADICAILIS	LIVID SEDGE	Plant	State Owned	State Lands
435	ELEOCHARIS QUINQUEFLORA	FEW-FLOWER SPIKERUSH	Plant	State Owned	State Lands
436	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	State Owned	State Lands
437	IRIS LACUSTRIS	DWARF LAKE IRIS	Plant	State Owned	State Lands
438	TRIGLOCHIN PALUSTRIS	SLENDER BOG ARROW-GRASS	Plant	State Owned	State Lands
439	MALAXIS BRACHYPODA	WHITE ADDER'S-MOUTH	Plant	State Owned	State Lands
440	PLATANATHERA ORBICULATA	LARGE ROUNDLEAF ORCHID	Plant	State Owned	State Lands

Data Source: Wisconsin DNR Natural Heritage Inventory Program - October 24, 2002

## Rare Species & Natural Communities Found in Proposed Conservation Areas & Other Protected Areas Door County, Wisconsin

No.	Scientific Name	Common Name	Group	Site Type	Area or Site Name
441	CALAMAGROSTIS STRICTA	SLIM-STEM SMALL-REEDGRASS	Plant	State Owned	State Lands
442	DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	Plant	State Owned	State Lands
443	DESCHAMPSIA CESPITOSA	TUFTED HAIRGRASS	Plant	State Owned	State Lands
444	GYMNOCARPIUM ROBERTIANUM	LIMESTONE OAK FERN	Plant	State Owned	State Lands
445	EQUISETUM VARIEGATUM	VARIEGATED HORSETAIL	Plant	State Owned	State Lands
446	BOTRYCHIUM LUNARIA	MOONWORT GRAPE-FERN	Plant	State Owned	State Lands
447	OPHIOGLOSSUM PUSILLUM	ADDER'S-TONGUE	Plant	State Owned	State Lands
448	CIRCUS CYANEUS	NORTHERN HARRIER	Animal	Proposed Conservation Area	Stony Creek Wetlands Complex
449	CARDAMINE PRATENSIS	CUCKOOFLOWER	Plant	Proposed Conservation Area	Stony Creek Wetlands Complex
450	CAREX CRAWEI	CRANE SEDGE	Plant	Proposed Conservation Area	Stony Creek Wetlands Complex
451	IMATUS BICARINATUS	A PREDACEOUS DIVING BEETLE	Invertebrate	Proposed Conservation Area	Stony Creek Wetlands Complex
452	ILYBIUS IGNARUS	DIVING BEETLE	Invertebrate	Proposed Conservation Area	Stony Creek Wetlands Complex
453	CORDULEGASTER OBLIQUA	ARROWHEAD SPIKETAIL	Invertebrate	Proposed Conservation Area	West Branch Whitefish Bay Creek
454	TANACETUM HURONENSE	LAKE HURON TANSY	Plant	Proposed Conservation Area	West Branch Whitefish Bay Creek
455	EUPHORBIA POLYGONIFOLIA	SEASIDE SPURGE	Plant	Proposed Conservation Area	West Branch Whitefish Bay Creek
456	TRIGLOCHIN PALUSTRIS	SLENDER BOG-ARROW-GRASS	Plant	Proposed Conservation Area	West Branch Whitefish Bay Creek
457	STREPTOPUS AMPLEXIFOLIUS	WHITE MANDARIN	Plant	Proposed Conservation Area	West Branch Whitefish Bay Creek

### NOTES:

The presence of a rare species at a location does not imply that all taxonomic groups have been surveyed at that site. As such,  the data should be interpreted with caution and an "absence of evidence is not evidence of absence" is a philosophy that should be in force.

These tables include data provided by the Wisconsin Department of Natural Resources' Natural Heritage Inventory Program (WNHI). The WNHI  program houses the most complete database of the location and status of rare species, high quality natural communities, and natural features in  Wisconsin. Data provided by the WNHI are based on a comprehensive rare species inventory of the state. The lack of data shall not  be construed to mean that no significant features are present. The WNHI makes no guarantee or warranty concerning the accuracy or  completeness of information contained in the database and does not necessarily endorse any interpretation or products derived from the data.



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# Appendix C

## Abbreviated List of

### The Wisconsin Natural Heritage Inventory's Recognized Natural Communities of Door County, Wisconsin

Prepared by Eric Epstein, Emmet Judziewicz  
and Elizabeth Spencer

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This document will be periodically updated and expanded. Future editions will include or be linked to additional descriptive information, range maps, and crosswalks to other vegetation classification systems.

#### **Alder Thicket**

These wetlands are dominated by thick growths of tall shrubs, especially speckled alder (*Alnus incana*). Among the common herbaceous species are Canada bluejoint grass (*Calamagrostis canadensis*), orange jewelweed (*Impatiens capensis*), several asters (*Aster lanceolatus*, *A. puniceus*, and *A. umbellatus*), boneset (*Eupatorium perfoliatum*), rough bedstraw (*Galium asprellum*), marsh fern (*Thelypteris palustris*), arrow-leaved tearthumb (*Polygonum sagittatum*), and sensitive fern (*Onoclea sensibilis*). This type is common and widespread in northern and central Wisconsin, but also occurs in the southern part of the state.

#### **Alkaline Clay Bluff**

Steep, clay bluffs occur along some stretches of the Great Lakes shorelines and less commonly inland on streams draining into Lake Superior and Lake Michigan. Vegetative cover ranges from forested with pines (*Pinus resinosa* and *P. strobus*), white cedar (*Thuja occidentalis*) and white birch (*Betula papyrifera*), to bare clay with only a few herbs present. Buffaloberry (*Shepherdia canadensis*) is a characteristic shrub, but more typically, alders (*Alnus incana* and *A. crispa*), as well as herbs such as Canada goldenrod (*Solidago canadensis*) and pearly everlasting (*Anaphalis margaritacea*) are prevalent. Both native and exotic pioneers such as fireweed (*Epilobium angustifolium*) and Canada thistle (*Cirsium arvense*) are common, especially on unstable sites. But it is the semi-stabilized “weeping” bluffs that are of the greatest biological interest. Golden sedge (*Carex aurea*), orchids and calciphilic fen species may colonize such sites, which can be local repositories of rare or otherwise noteworthy species.

#### **Alvar**

This rare community consists of areas of thin discontinuous soil overlying horizontal beds of limestone or dolostone in the vicinity of Great Lakes shorelines. They are characterized by relatively low tree cover and a distinctive biota, which includes elements of rock pavement, prairie, savanna and boreal forest communities. Among these are regional endemics, some very rare. Small coniferous and deciduous trees (cedar, fir, pine, oak, aspen, birch) are scattered among an assemblage of species that can include big bluestem (*Andropogon gerardii*), little bluestem (*Schizachyrium scoparium*), Indian-grass (*Sorghastrum nutans*), and wood lily (*Lilium philadelphicum*), as well as shoreline plants such as silverweed (*Potentilla anserina*) and dwarf lake iris (*Iris lacustris*).

### **Bedrock Shore**

Wave-splashed bedrock shoreline ledges are best developed on sandstone in the Apostle Islands of Lake Superior. Stunted trees of white cedar (*Thuja occidentalis*), white birch (*Betula papyrifera*), showy mountain ash (*Sorbus decora*) and green alder (*Alnus crispa*) are often present in crevices. Common herbs are ticklegrass (*Agrostis hyemalis*), fireweed (*Epilobium angustifolium*), and Canada goldenrod (*Solidago canadensis*), but the flora often includes unusual plants such as bird's-eye primrose (*Primula mistassinica*), brook lobelia, and three-toothed cinquefoil (*Potentilla tridentata*).

### **Boreal Forest**

In Wisconsin, mature stands of this forest community are dominated by white spruce (*Picea glauca*) and balsam-fir (*Abies balsamea*), often mixed with white birch (*Betula papyrifera*), white cedar (*Thuja occidentalis*), white pine (*Pinus strobus*), balsam-poplar (*Populus balsamifera*) and quaking aspen (*Populus tremuloides*). Mountain ash (*Sorbus spp.*) may also be present. Common understory herbs are large-leaved aster (*Aster macrophyllus*), bluebead lily (*Clintonia borealis*), Canada mayflower (*Maianthemum canadense*), wild sarsaparilla (*Aralia nudicaulis*), and bunchberry (*Cornus canadensis*). Most Wisconsin stands are associated with the Great Lakes, especially the clay plain of Lake Superior, and the eastern side of the northern Door Peninsula on Lake Michigan. Of potential interest from the perspectives of vegetation classification and restoration, white pine had the highest importance value of any tree in the Lake Superior region, as recorded during the original land survey of the mid-1800's.

### **Boreal Rich Fen**

Neutral to alkaline cold open peatlands of northern Wisconsin through which carbonate-rich groundwater percolates. Sphagnum mosses are absent or of relatively minor importance, as calciphilic species (especially the "brown" mosses) predominate. Dominant characteristic plants include woolly sedge (*Carex lasiocarpa*), twig rush (*Cladium mariscoides*), beaked bladderwort (*Utricularia cornuta*), rushes (*Juncus spp.*), and Hudson Bay cotton-grass (*Scirpus hudsonianus*). Shrubby phases also occur, with bog birch (*Betula pumila*), sage willow (*Salix candida*), and speckled alder (*Alnus incana*) present in significant amounts.

### **Calcareous Fen**

An open wetland found in southern Wisconsin, often underlain by a calcareous substrate, through which carbonate-rich groundwater percolates. The flora is typically diverse, with many calciphiles. Common species are several sedges (*Carex sterilis* and *C. lanuginosa*), marsh fern (*Thelypteris palustris*), shrubby cinquefoil (*Potentilla fruticosa*), shrubby St. John's-wort (*Hypericum kalmianum*), Ohio goldenrod (*Solidago ohioensis*), grass-of-parnassus (*Parnassia glauca*), twig-rush (*Cladium mariscoides*), brook lobelia (*Lobelia kalmii*), boneset (*Eupatorium perfoliatum*), swamp thistle (*Cirsium muticum*), and asters (*Aster spp.*). Some fens have significant prairie or sedge meadow components, and intergrade with those communities.

### **Emergent Aquatic**

These open, marsh, lake, riverine and estuarine communities with permanent standing water are dominated by robust emergent macrophytes, in pure stands of single species or in various mixtures. Dominants include cat-tails (*Typha spp.*), bulrushes (particularly *Scirpus acutus*, *S. fluviatilis*, and *S. validus*), bur-reeds (*Sparganium spp.*), giant reed (*Phragmites australis*), pickerel-weed (*Pontederia cordata*), water-plantains (*Alisma spp.*), arrowheads (*Sagittaria spp.*), and the larger species of spikerush such as (*Eleocharis smallii*).

### **Ephemeral Pond**

These ponds are depressions with impeded drainage (usually in forest landscapes), that hold water for a period of time following snowmelt but typically dry out by mid-summer. Common aquatic plants of these habitats include yellow water crowfoot (*Ranunculus flabellaris*), mermaid weed (*Proserpinaca palustris*), Canada bluejoint grass (*Calamagrostis canadensis*), floating manna grass (*Glyceria septentrionalis*), spotted cowbane (*Cicuta maculata*), smartweeds (*Polygonum spp.*), orange jewelweed (*Impatiens capensis*), and sedges. Ephemeral ponds provide critical breeding habitat for certain invertebrates, as well as for many amphibians such as frogs and salamanders.

### **Forested Ridge and Swale**

This is a complex of semi- to fully-stabilized, often forested beach / dune ridges alternating with wet open to forested swales, found on the shores of the Great Lakes but best-developed along Lake Michigan. Both parallel the coast and offer exceptionally complex and diverse habitats for wetland, upland, and Great Lakes shoreline plants. Ridges may support assemblages similar to boreal, northern mesic or northern dry-mesic forests. Water depth is a controlling factor in the swales, and the vegetation may run the gamut from open (emergent marsh, fen, or sedge meadow), shrub (bog birch, alder), or forested wetlands (often white cedar, black ash are prominent in these).

### **Forested Seep**

These are shaded seepage areas with active spring discharges in (usually) hardwood forests that may host a number of uncommon to rare species. The overstory dominant is frequently black ash (*Fraxinus nigra*), but yellow birch (*Betula allegheniensis*), American elm (*Ulmus americana*) and many other tree species may be present including conifers such as hemlock (*Tsuga canadensis*) or white pine (*Pinus strobus*). Understory species include skunk cabbage (*Symplocarpus foetidus*), water-pennywort (*Hydrocotyle americana*), marsh blue violet (*Viola cucullata*), swamp saxifrage (*Saxifraga pennsylvanica*), golden saxifrage (*Chrysosplenium americanum*), golden ragwort (*Senecio aureus*), silvery spleenwort (*Athyrium thelypteroides*) and the rare sedges (*Carex scabrata* and *C. prasina*). Most documented occurrences are in the Driftless Area, or locally along major rivers flanked by steep bluffs.

### **Great Lakes Alkaline Rockshore**

These are creviced, wave-splashed, nearly horizontal dolostone ledges along Lake Michigan on the Door Peninsula. Depending on lake levels, large expanses of this habitat may be either inundated or exposed during a given year. Common members of this community are the shrubs ninebark (*Physocarpus opulifolius*), shrubby cinquefoil (*Potentilla fruticosa*), and the herbs silverweed (*Potentilla anserina*), goldenrods (especially *Solidago hispida*), brook lobelia (*Lobelia kalmii*), gentians (*Gentiana spp.*), grasses-of Parnassus (*Parnassia spp.*), Indian paint-brush (*Castilleja coccinea*), low calamint (*Calamintha arkansana*) and many other calciphiles. Plants endemic to the Great Lakes shores are significant components of some stands.

### **Great Lakes Beach**

This beach community usually occurs in association with active dune systems. The beaches of the Great Lakes are extremely dynamic features, strongly influenced by water level changes and storm events. They support a suite of very specialized organisms, although unprotected shorelines may be entirely unvegetated. The plant species found in this community include (along Lake Michigan) seaside spurge (*Euphorbia polygonifolia*) and American sea-rocket (*Cakile edentula*).

### **Great Lakes Dune** (formerly called Lake Dune)

The dominant plant in these semi-stabilized, open dunes along Great Lakes shorelines, is usually the sand-binding marram grass (*Ammophila breviligulata*). Frequent associates are common juniper (*Juniperus communis*), Canada wild-rye (*Elymus canadensis*), false-heather (*Hudsonia tomentosa*), beach-pea (*Lathyrus japonicus*), beach wormwood (*Artemisia campestris*), sand cherry (*Prunus pumila*), and various willows (*Salix spp.*). Two plants endemic to the Great Lakes region, pitcher's thistle (*Cirsium pitcheri*) and Lake Huron tansy (*Tanacetum huronense*; possibly now extirpated in Wisconsin), occur in this community along Lake Michigan.

### **Great Lakes Barrens**

In Wisconsin, this variant of a pine savanna is known from only restricted to one sandy site on Lake Superior. The dominant tree species in this open stand are of wind- and fire-deformed trees. Red pines (*Pinus resinosa*) with white pine (*P. strobus*) also present. The understory consists of dense growths of lichens with scattered bushes or thickets of common juniper (*Juniperus communis*), early blueberry (*Vaccinium angustifolium*) and huckleberry (*Gaylussacia baccata*). Other Common plants herbs are hairgrass (*Deschampsia flexuosa*), ticklegrass (*Agrostis hyemalis*), and false-heather (*Hudsonia tomentosa*), and bearberry (*Arctostaphylos uva-ursi*).

### **Hardwood Swamp**

These are northern deciduous forested wetlands that occur along lakes or streams, or in insular basins in poorly drained morainal landscapes. The dominant tree species is black ash (*Fraxinus nigra*), but in some stands red maple (*Acer rubrum*), yellow birch (*Betula allegheniensis*), and (formerly) American elm (*Ulmus americana*) are also important. The tall shrub speckled alder (*Alnus incana*) may be locally common. The herbaceous flora is often diverse and may include many of the same species found in Alder Thickets. Typical species are marsh-marigold (*Caltha palustris*), swamp raspberry (*Rubus pubescens*), skullcap (*Scutellaria galericulata*), orange jewelweed (*Impatiens capensis*), and many sedges (*Carex spp.*). Soils may be mucks or mucky sands.

### **Interdunal Wetland**

Wind-created hollows that intersect the water table within active dune fields along the Great Lakes. These maybe colonized by wetland plants, including habitat specialists that are of high conservation significance. Common members of this wetland community on Lake Superior are twig-rush (*Cladium mariscoides*), species of rushes (especially *Juncus balticus*), pipewort (*Eriocaulon septangulare*), the sedge (*Carex viridula*), ladies-tress orchids (*Spiranthes sp.*) and bladderworts (*Utricularia cornuta* and *U. resupinata*).

### **Lake – shallow, hard, drainage**

These are lakes that are less than 16 feet deep with total alkalinity between 40ppm and 90ppm that receives and discharges water through surface streams. These lakes may also receive water through ground water flow.

### **Lake – shallow, hard, seepage**

These are lakes that are less than 16 feet deep with a total alkalinity between 40ppm and 90ppm that receives their water from rainfall, overland flow and ground water infiltration. These are essentially landlocked water bodies.

### **Lake – shallow, very hard, drainage (marl)**

These are lakes that are less than 16 feet deep with a total alkalinity greater than 90ppm that receives and discharges water through surface streams. These lakes may also receive water through ground water infiltration and overland flow.

### **Mesic Cedar Forest**

This is a rare upland forest community of mesic sites in northern Wisconsin, characterized by white cedar (*Thuja occidentalis*) and various associates including hemlock (*Tsuga canadensis*), white spruce (*Abies balsamea*), yellow birch (*Betula alleghaniensis*), and white pine (*Pinus strobus*). The herb layer may contain Canada mayflower (*Maianthemum canadense*), twinflower (*Linnaea borealis*), clubmosses (*Lycopodium spp.*), and others. More information is needed on this community type.

### **Moist Cliff**

This "micro-community" occurs on shaded (by trees or the cliff itself because of aspect), moist to seeping mossy, vertical exposures of various rock types, most commonly sandstone and dolostone. Common species are columbine (*Aquilegia canadensis*), the fragile ferns (*Cystopteris bulbifera* and *C. fragilis*), wood ferns (*Dryopteris spp.*), rattlesnake-root (*Prenanthes alba*), and wild sarsaparilla (*Aralia nudicaulis*). The rare flora of these cliffs vary markedly in different parts of the state; driftless area cliffs might have northern monkshood (*Aconitum noveboracense*), those on Lake Superior, butterwort (*Pinguicula vulgaris*), or those in Door County, green spleenwort (*Asplenium viride*).

### **Northern Dry Forest**

This forest community occurs on nutrient-poor sites with excessively drained sandy or rocky soils. The primary historic disturbance regime was catastrophic fire at intervals of decades to approximately a century. Dominant trees of mature stands include jack and red pines (*Pinus banksiana* and *P. resinosa*) and/or Hill's oak (*Quercus ellipsoidalis*). After catastrophic logging of the late 19<sup>th</sup> and early 20<sup>th</sup> centuries large acreages supporting of this forest type were cut and burned during the catastrophic logging of the late 19<sup>th</sup> and early 20<sup>th</sup> century. Much of this land was then colonized by white birch (*Betula papyrifera*) and/or quaking aspen (*Populus tremuloides*), or converted to pine plantations starting in the 1920s. Common understory shrubs are hazelnuts (*Corylus spp.*), early blueberry (*Vaccinium angustifolium*) and brambles (*Rubus spp.*); common herbs include bracken fern (*Pteridium aquilinum*), starflower (*Trientalis borealis*), barren-strawberry (*Waldsteinia fragarioides*), cow-wheat (*Melampyrum lineare*), trailing arbutus (*Epigaea repens*), and members of the shinleaf family (*Chimaphila umbellata*, *Pyrola spp.*). Vast acreages of open "barrens" were also planted to pine, or naturally succeeded to densely stocked "dry" forests.

### **Northern Wet Forest**

Black spruce (*Picea mariana*) and tamarack (*Larix laricina*) dominate these weakly minerotrophic conifer swamps, located in the North. Jack pine (*Pinus banksiana*) may be a significant canopy component in certain parts of the range of this community complex. Understories are composed mostly of sphagnum (*Sphagnum spp.*) mosses and ericaceous shrubs such as leatherleaf (*Chamaedaphne calyculata*), Labrador-tea (*Ledum groenlandicum*), and small cranberry (*Vaccinium oxycoccos*) and sedges such as (*Carex trisperma* and *C. paupercula*). The Natural Heritage Inventory has split out two entities, identified (but not strictly defined) by the two dominant species (see Black Spruce Swamp and Tamarack Swamp).

### **Northern Dry-Mesic Forest**

In this forest community, mature stands are dominated by white and red pines (*Pinus strobus* and *P. resinosa*) and sometimes mixed with red oak (*Quercus rubra*) and red maple (*Acer rubrum*). Common understory shrubs are hazelnuts (*Corylus spp.*), blueberries (*Vaccinium angustifolium* and *V. myrtilloides*), wintergreen (*Gaultheria procumbens*), partridge-berry (*Mitchella repens*); among the dominant herbs are wild sarsaparilla (*Aralia nudicaulis*), Canada mayflower (*Maianthemum canadense*), and cow-wheat (*Melampyrum lineare*). Stands usually occur on sandy loams, sands or sometimes-rocky soils. Stands usually occur on sandy or sometimes rocky soils.

### **Northern Mesic Forest**

This forest complex covered the largest acreage of any Wisconsin vegetation type prior to European settlement. Sugar maple (*Acer saccharum*) is dominant or co-dominant in most stands, while hemlock (*Tsuga canadensis*) was the second most important species, sometimes occurring in nearly pure stands with white pine (*Pinus strobus*). Beech (*Fagus grandifolia*) can be a co-dominant with sugar maple in the counties near Lake Michigan. Other important tree species were yellow birch (*Betula allegheniensis*), basswood (*Tilia americana*), and white ash (*Fraxinus americana*). The groundlayer varies from sparse and species poor (especially in hemlock stands) with woodferns (especially *Dryopteris intermedia*), bluebead lily (*Clintonia borealis*), clubmosses (*Lycopodium spp.*), and Canada mayflower (*Maianthemum canadense*) prevalent, to lush and species-rich with fine spring ephemeral displays. After old-growth stands were cut, trees such as quaking and bigtoothed aspens (*Populus tremuloides* and *P. grandidentata*), white birch (*Betula papyrifera*), and red maple (*Acer rubrum*) became and still are important in many second-growth Northern Mesic Forests. Several distinct associations within this complex warrant recognition as communities, and draft abstracts of these are currently undergoing review.

### **Northern Sedge Meadow**

Sedges and grasses dominate this open wetland community. There are several common subtypes: Tussock meadows, dominated by tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*); Broad-leaved sedge meadows, dominated by the robust sedges (*Carex lacustris* and / or *C. utriculata*); and Wire-leaved sedge meadows, dominated by such species as woolly sedge (*Carex lasiocarpa*) and few-seeded sedge (*C. oligosperma*). Frequent associates include marsh bluegrass (*Poa palustris*), manna grasses (*Glyceria spp.*), panicked aster (*Aster lanceolatus*), joe-pye-weed (*Eupatorium maculatum*), and the bulrushes (*Scirpus atrovirens* and *S. cyperinus*).

### **Northern Wet-Mesic Forest**

This forested minerotrophic wetland is dominated by white cedar (*Thuja occidentalis*), and occurs on rich, neutral to alkaline substrates. Balsam fir (*Abies balsamea*), black ash (*Fraxinus nigra*), and spruces (*Picea glauca* and *P. mariana*) are among the many potential canopy associates. The understory is rich in sedges (such as *Carex disperma* and *C. trisperma*), orchids (e.g., *Platanthera obtusata* and *Listera cordata*), and wildflowers such as goldthread (*Coptis trifolia*), fringed polygala (*Polygala pauciflora*), and naked miterwort (*Mitella nuda*), and trailing sub-shrubs such as twinflower (*Linnaea borealis*) and creeping snowberry (*Gaultheria hispidula*). A number of rare plants occur more frequently in the cedar swamps than in any other habitat.

### **Open Bog**

These non-forested bogs are acidic, low nutrient, northern Wisconsin peatlands dominated by mosses (*Sphagnum spp.*) that occur in deep layers, often with pronounced hummocks and hollowswales. Also present are a few narrow-leaved sedge species such as (*Carex oligosperma* and *C. pauciflora*), cotton-grasses (*Eriophorum spp.*), and ericaceous shrubs, especially bog laurel (*Kalmia polifolia*), leatherleaf (*Chamaedaphne calyculata*), and small cranberry (*Vaccinium oxycoccus*). Plant diversity is very low but includes characteristic and distinctive specialists. Trees are absent or achieve very low cover values as this community is closely related to and intergrades with Muskeg. When this community is found in southern Wisconsin, it is often referred to as a Bog Relict.

### **Shore Fen** (formerly called Coastal Fen)

This open peatland community occurs primarily along Great Lakes shorelines, especially near the mouths of estuarine streams. Along Lake Superior most stands are separated from the lake waters by a sand spit. The floating sedge mat is composed mostly of woolly sedge (*Carex lasiocarpa*); co-dominants are sweet gale (*Myrica gale*) and bogbean (*Menyanthes trifoliata*). The following herbs are common in this diverse, circumneutral, nutrient-rich community: twigrush (*Cladium mariscoides*), marsh horsetail (*Equisetum fluviatile*), a spikerush (*Eleocharis elliptica*), intermediate bladderwort (*Utricularia intermedia*), marsh bellflower (*Campanula aparinoides*), narrow-leaved willow-herb (*Epilobium leptophyllum*), water-parsnip (*Sium suave*), and bog willow (*Salix pedicellaris*). Coastal fens are distinguished from open bogs and poor fens (which may adjoin them in the same wetland complex) by the lack of Sphagnum spp. mosses, higher pH, and direct hydrologic connection to the Great Lakes. They are distinguished from rich fens by the absence of indicator species such as linear-leaved sundew (*Drosera linearis*), grass-of-parnassus (*Parnassia glauca*), false asphodel (*Tofieldia glutinosa*) and a spikerush (*Eleocharis rostellata*).

### **Shrub-Carr**

This primarily Southern wetland community is dominated by tall shrubs such as red-osier dogwood (*Cornus stolonifera*), but meadow-sweet (*Spiraea alba*), and various willows (*Salix discolor*, *S. bebbiana*, and *S. gracilis*) are frequently also important. Canada grass bluejoint grass (*Calamagrostis canadensis*) is often very common. Other herbs Associates are similar to those found in Alder Thickets and tussock-type Sedge Meadows. This type is common and widespread in southern Wisconsin but also occurs in the north.

### **Southern Hardwood Swamp** (A split from Curtis' Southern Wet-Mesic Forest)

This is a deciduous forested wetland community type found in insular basins with seasonally high water tables. It is best developed in glaciated southeastern Wisconsin. The dominant trees are red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), and formerly, American elm (*Ulmus americana*). The exotic reed canary grass (*Phalaris arundinacea*) is often dominant in the understory. This Natural Heritage Inventory community partly includes the Southern Wet-Mesic Forest of the Curtis classification.

### **Southern Mesic Forest**

This upland forest community occurs on rich, well-drained soils. The dominant tree species is sugar maple (*Acer saccharum*), but basswood (*Tilia americana*) and (near Lake Michigan) beech (*Fagus grandifolia*) may be co-dominant. Many other trees are found in these forests, including those of the walnut family (*Juglandaceae*). The understory is typically open (sometimes brushy with species of gooseberry (*Ribes*) if there is a past history of grazing) and supports fine spring ephemeral displays. Characteristic herbs are spring-beauty (*Claytonia virginica*), trout-lilies (*Erythronium spp.*), trilliums (*Trillium spp.*), violets (*Viola spp.*), bloodroot (*Sanguinaria canadensis*), blue cohosh (*Caulophyllum thalictroides*), mayapple (*Podophyllum peltatum*), and Virginia waterleaf (*Hydrophyllum virginianum*).

### **Southern Sedge Meadow**

Widespread in southern Wisconsin, this open wetland community is most typically dominated by tussock sedge (*Carex stricta*) and Canada bluejoint grass (*Calamagrostis canadensis*). Common associates are water-horehound (*Lycopus uniflorus*), panicked aster (*Aster simplex*), blue flag (*Iris virginica*), Canada goldenrod (*Solidago canadensis*), spotted joe-pye-weed (*Eupatorium maculatum*), broad-leaved cat-tail (*Typha latifolia*), and swamp milkweed (*Asclepias incarnata*). Reed canary grass (*Phalaris arundinacea*) may be dominant in grazed and/or ditched stands. Ditched stands can succeed quickly to Shrub-Carr.

**Springs and spring runs; hard.**

Springs found in areas of active ground water flow with the water having a total alkalinity greater than 40ppm.

**Submergent Aquatic**

This herbaceous community of aquatic macrophytes occurs in lakes, ponds, and rivers. Submergent macrophytes often occur in deeper water than emergents, but there is considerable overlap. Dominants include various species of pondweeds (*Potamogeton spp.*) along with waterweed (*Elodea canadensis*), slender naiad (*Najas flexilis*), eel-grass (*Vallisneria americana*), and species of water-milfoil (*Myriophyllum*) and bladderworts (*Utricularia*).

**Talus Forest**

This description is based on a very limited number of stands examined and should be regarded as preliminary. Talus Forest develops on a substrate of quartzite, sandstone, dolostone, rhyolite, and possibly other rock types. Canopy cover ranges from sparse to moderately dense. Tree dominance is variable, and can include white pine (*Pinus strobus*), red cedar (*Juniperus virginiana*), paper birch (*Betula papyrifera*), northern white cedar (*Thuja occidentalis*), red pine (*Pinus resinosa*) and others.

Among the characteristic understory plants noted to date are the shrubs mountain maple (*Acer spicatum*), red-berried elder (*Sambucus pubens*), and bristly sarsaparilla (*Aralia hispida*). Representative herbs include common polypody (*Polypodium vulgare*), wood fern (*Dryopteris marginalis*), walking fern (*Asplenium rhizophyllum*), harebell (*Campanula rotundifolia*), columbine (*Aquilegia canadensis*), fumitory (*Adlumia fungosa*), leafcup (*Polymnia canadensis*), and pale corydalis (*Corydalis sempervirens*). Crustose lichens and various mosses sometimes reach high cover values.

Talus Forest communities often reflect the composition of forests in the surrounding landscape, but include plants and animals that are adapted to take advantage of the rock substrate, microclimatic conditions such as cold air drainage, and groundwater seepage. These habitat specialists, presumably including some of the mosses and lichens, are likely to be the species that are most restricted to such environments and of the greatest conservation concern.

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## **Appendix D**

# **Natural Areas – A Definition and Status Report**

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### **Natural Area: A working definition**

A natural area is a site largely unaltered by modern human activity, where native vegetation is distributed in naturally occurring patterns. These patterns change over time under the influences of natural processes such as windstorms, drought, flooding cycles, and wildfires, as well as interactions between plants and wildlife that inhabit or periodically use a site. A natural area may be host to one or more natural community types such as boreal forest, open bog, talus forest or calcareous fen, the existence and extent of which are determined by factors such as climate, soil composition, and a site's unique history. Many natural areas do include some evidence of modern human activity, such as small areas of former croplands in a site largely dominated by native prairie, or occasional decayed stumps in a forest that was logged long ago. However, natural areas are characterized by being primarily in a natural state, with only minor evidence of disturbance from modern human activity.

### **Where natural areas are found**

Natural areas occur on private as well as public land, and across political jurisdictions. They may be found in designated preserves, within existing parks, or may be interspersed throughout developed and managed environments such as farms, ranches, commercial and industrial areas, and residential communities.

### **How natural areas fit into the larger landscape**

Of course, today's landscape looks very different from the way it looked 150 years ago. Many natural processes, such as large-scale fires and the presence of large herds of bison, are no longer present on most of the landscape. Natural areas today, ranging in size from a few acres to several thousand acres, are generally within larger landscapes that have been highly altered. Because all natural areas are an integral part of the larger landscape in which they exist, it is important to pay careful attention to wise stewardship of adjacent and nearby lands.

All natural areas may be considered "open space", but many types of open space are not natural areas. Golf courses, baseball fields, pine plantations, parks with maintained lawns that are landscaped with exotic species, all could be described as open space, but are places where natural features have been partially to totally displaced. While some such areas offer a degree of habitat to native plants and wildlife, others have been highly altered, leading to dramatic declines in diversity of species.

In many parts of the state, it is often not practical or even possible to protect natural areas large enough to include the natural patterns that once existed on the landscape. Nevertheless, even small natural areas are important, and sometimes represent the only opportunity to protect natural communities or rare species in an area. For example, a ten-acre prairie in western Wisconsin that is surrounded by croplands bears little resemblance to the huge expanse of prairie that once existed on the landscape. However, if it were of good quality, it would still be considered a natural area.

The surrounding land could be planted to native prairie using seeds from the natural area, or could be kept in other kinds of open space that might help buffer the land from activities that could lessen the integrity of the site. Similarly, a forty-acre old-growth forest is a natural area, even if it is surrounded by recent clearcuts. Allowing the clearcut forest to regenerate naturally would be one alternative that would help buffer the natural area and eventually add to its size.

### **Recognizing qualitative differences among natural areas and other types of open space**

The range of land uses on the landscape also leads to variability in the quality of natural areas. For example, one mesic cedar forest may be a large, intact natural community with little evidence of human use. Another may have a boardwalk nature trail in it and may occasionally receive some urban stormwater runoff. The second has a lower quality than the first, but could still be defined as a natural area. Similarly, one prairie might be managed with controlled burning and support a large diversity of native plant and animal species.

Another may be somewhat overgrown with brush, have a few exotic invasive plants, and support fewer native species. Again, the second has a lower quality than the first, but could still be high enough quality to be considered a natural area. In addition, lands not considered natural areas often still possess important natural resource values. For example, a field that was plowed in the past and that now supports European brome grass (an invasive exotic species) may provide important habitat for animals that live in grasslands, even though it is not considered a natural area. A forest that has been recently logged does not qualify as a natural area, but it does provide habitat for some species of wildlife and supports some natural resource functions.

Another kind of land not considered a natural area is land supporting restored vegetation, that is, it has been planted to native species in an effort to restore a natural community. These are lands that will someday resemble natural areas, but because they have been planted on altered sites, they are not defined as natural areas.

## **Wisconsin's State Natural Areas Program**

Wisconsin's landscape has experienced dramatic changes in the 150 years since intensive settlement began. Little remains of the natural plant and animal communities which occupied our lands and waters in the settlement era and which set the stage for what Wisconsin has become. Their scattered remnants, which escaped the saw, the plow, and other development, are called natural areas. These exceptional sites are often the last refuges for rare plants and animals. We owe much to Wisconsin's early conservationists, who in 1951 recognized the loss of natural communities and their importance, and fostered the first state program in the United States to preserve them.

State Natural Areas (SNAs) are formally designated sites devoted to scientific research, the teaching of conservation biology, and especially to the preservation of their natural values and genetic diversity for future generations. They are not intended for intensive recreational uses like picnicking or camping. Wisconsin's Natural Areas Program (NAP) holds to its original mission: to locate and preserve a system of State Natural Areas harboring all types of biotic communities, rare species, and other significant natural features native to Wisconsin. However, significant changes have come into the program since its inception.

### **Site Establishment and Protection**

Wisconsin's NAP is housed in the Bureau of Endangered Resources (BER), within the Department of Natural Resources. Staff of BER oversees all aspects of the NAP in consultation with the Natural Areas Preservation Council (NAPC). The Council, formerly called the State Board for the Preservation of Scientific Areas, was established by the state legislature in 1951. This group serves as an advisory body to the Natural Areas Program. Its eleven members, drawn from the scientific and educational community of the state, guides the NAP staff in their mission to identify, manage and protect natural areas.

The natural area preservation process begins with identification and selection of the highest quality sites. Identification of sites is accomplished largely through the continuing Natural Heritage Inventory (NHI); a section within the BER. The NHI maintains a comprehensive register of the state's natural features and rare species. This information, contained in an integrated system of maps and computer databases, is the result of 25 years of ongoing biological inventories.

Protection is accomplished using a variety of tools, including fee acquisition, donations, and conservation easements. Sites on state-owned lands, especially parks, forests, and fish and wildlife areas, can simply be designated as State Natural Areas by cooperative agreements and management plans between the NAP and the cooperator. Similarly, areas controlled by universities, federal agencies, and private groups, such as The Nature Conservancy, are brought into the natural areas system by a "memorandum of understanding" — a long-term, but not legally-binding, commitment to maintain the sites as natural areas. Sites not owned by the state are purchased from willing sellers using funds from the Stewardship Program. Established in 1989, the program provides money for state land acquisition, including \$1.5 million a year for natural area projects. An additional \$500,000 a year from Stewardship supplements the Natural [Heritage] Area Match Grant Program, which matches, dollar-for-dollar, private donations of land or funds to the Natural Areas Program. In addition to donations and outright fee acquisition, the NAP also purchases conservation easements on natural lands. Once secured by purchase or agreement, sites are formally "designated" as State Natural Areas, becoming part of the natural area system. Designation confers a significant level of protection as guaranteed by DNR Administrative Rules, Management Plans, and Memoranda of Understanding, in compliance with state statutes.

A higher level of protection is accomplished by Articles of Dedication, a kind of conservation easement, which provides the strongest long-term legal protection for land in the state. Legally "dedicated" sites are protected in perpetuity for natural area use and may not be taken for other functions without a finding of urgent and greater public need by the governor and the legislature.

As of September 2002, 353 sites covering more than 125,000 acres have been designated as State Natural Areas. In addition to protecting biotic communities, these areas provide refuge for many species of plants and animals on Wisconsin's Endangered and Threatened Species List.

### **Management**

Management of State Natural Areas is based on specific plans agreed to by the land managing agency. In most instances, the best management for natural areas is to do nothing except protect them from human disturbance. For many sites, however, invasive exotic species and encroaching woody plants are a real problem, requiring hands-on management. Prescribed burning and removal of trees and shrubs are used as management tools on prairies, fens, savannas, and sedge meadows. Whether managing natural areas or the person using them, much of the work is made possible through donations to the Endangered Resources Fund. The fund was established in 1984 as a means for direct public support of endangered resources protection projects, including management of designated natural areas.

### **Research and Educational Use**

Natural areas serve as excellent outdoor laboratories for research on biotic communities and the species that comprise them. A permit is required to conduct formal research on State Natural Areas, and each year dozens of researchers undertake projects on these sites. When granting a permit, the ability of the area to tolerate such use without deterioration must be considered. Natural areas maintained with minimal human disturbance provide an unusual and valuable standard, or "benchmark," for determining impact of use on managed lands. A baseline data acquisition project, which gathers basic plant and animal information necessary to establish these benchmarks, is an integral part of the NAP.

When combined with the state's wealth of rivers and lakes, including Lake Superior and Lake Michigan, the resulting range of habitat conditions is capable of supporting a wide array of plant and animal life. This is suggested by the abundance of natural community types that ecologists have identified here in Door County. Thirty-seven (37) natural communities have been cross-referenced with the seventeen (17) habitat areas described in this document, see table Appendix "A".

The State Natural Areas Program celebrated its 50th anniversary in 2002 with numerous events statewide with a Governor's Proclamation, designation of 14 new State Natural Areas, seven of which were in Door County.

Wisconsin had the first natural areas protection program in the nation, and it has become one of the most successful, safeguarding more than 125,000 acres, ranging from old-growth forests in the north, to bogs and bluffs in Central Wisconsin, to the prairies and savannas in the south. While 353 State Natural Areas were established in the first 50 years of the program there are still many native and rare ecosystems left to preserve and protect.

A guidebook featuring 150 of the best State Natural Areas will be produced containing 176 pages of narrative descriptions, maps, and directions to each of the 150 sites described in the book. The guide, titled "*Wisconsin Naturally*" can be ordered through the Bureau of Endangered Resources by calling (608) 266-7012

There are things you can do to help maintain this successful program in Wisconsin, such as giving your financial support the State Natural Areas through the purchase of wolf license plates or donating directly to the Endangered Resources Fund through the check-off on your state income tax forms. You are also encouraged to help protect rare and native plants and animal species by alerting the DNR biologists of their discovery.

Since its inception, in 1952, more than 350 areas in the state have been identified and established as "state natural areas" or "wildlife areas". Twenty-two (22) of these natural areas are located in Door County.

### **Door County's State Natural Areas**

*Peninsula Park Beech Forest*

*The Ridges Sanctuary*

*Toft Point*

*Jackson Harbor Ridges*

*Whitefish Dunes*

*Mink River Estuary*

*Baileys Harbor Boreal Forest & Wetlands*

*Kangaroo Lake*

*Europe Bay Woods*

*Ellison Bluff*

*Rock Islands Woods*

*Peninsula Park White Cedar Forest*

*Sister Islands*

*Newport Conifer-Hardwoods*

*Mud Lake*

*Marshall's Point*

*Moonlight Bay Bedrock Beach*

*Coffee Swamp*

*Bay Shore Bluff Lands*

*North Bay*

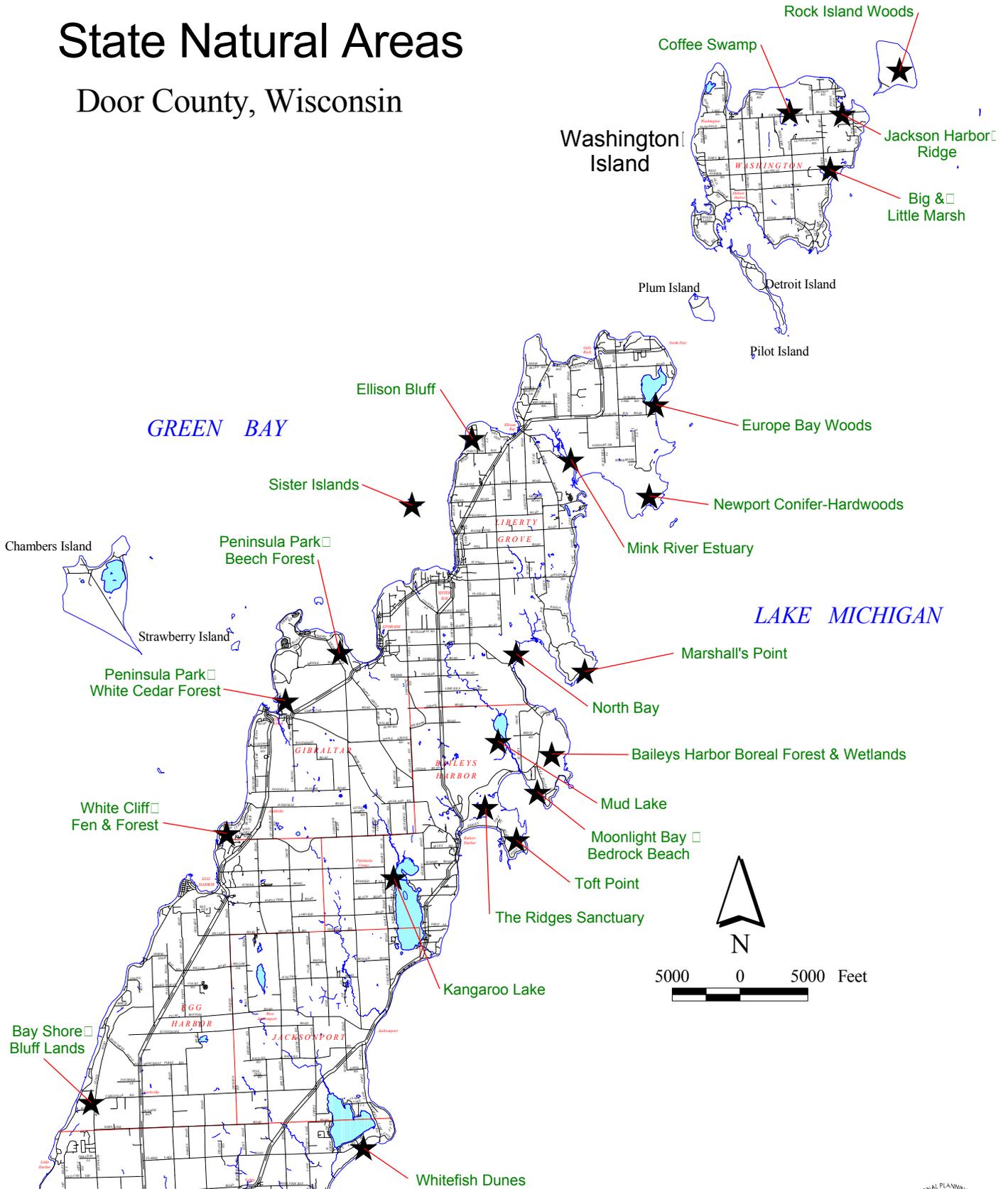
*White Cliff Fen & Forest*

*Big & Little Marsh*

The map on the facing page locates each of our Door County State Natural Areas and is followed by a brief description and in some cases instructions as to how the site might be found. State Natural Areas provide opportunities for citizens of all ages to gain knowledge and a better understanding of the nature of native plant and animal communities. However, excessive use of these sensitive areas can cause damage and in some cases access to the most fragile sites in the natural areas system is limited.

# State Natural Areas

Door County, Wisconsin



★ State Natural Area Locations



Source: Bay-Lake Regional Planning Commission, 2003.

## Peninsula Park Beech Forest State Natural Area

**Description:** Peninsula Park Beech Forest is comprised of 80-acres and features a continuum of forest types from the dry edge of the Niagara dolostone escarpment to rolling uplands forested with mesic species. The northern mesic forest is old second-growth, with sugar maple, American beech, hemlock, yellow birch, white birch, and ironwood; some trees are nearly 2 feet in diameter. Understory species include yellow blue-bead-lily, large-flowered trillium, red baneberry, Hooker's orchid, and long-bracted green orchid. Relict red oak and white pine are scattered through the area. To the east, between Shore Road and the bluff edge, is a young northern dry-mesic forest dominated by red oak and white pine. The bluff drops 150 feet to several terraces, which are forested with white cedar and hardwoods. The base of the bluff along Green Bay supports many ferns including bulblet, fragile, polypody, slender cliff brake, walking, and marginal wood ferns. The beach is composed of dolostone cobblestones with little vegetation. Numerous mesic forest plants and animals are present along with several uncommon orchids. Noted University of Wisconsin plant ecologist John Curtis used this site as a representative northern mesic forest study site. Peninsula Park Beech Forest is owned by the DNR and was designated a State Natural Area in 1952.

**Access:** From Ephraim, go south on State Highway 42 about 1 mile to the north entrance to Peninsula State Park. Follow Shore Road north to the Eagle Tower parking area. Access to the natural area is via Shore Road, Highland Road, or the Sentinel Hiking Trail, which forms the northern boundary of the site. Park maps are available at the contact station. A Wisconsin State Park sticker must be displayed on all vehicles entering the park.

## Peninsula Park White Cedar Forest State Natural Area

**Description:** Peninsula Park White Cedar Forest features a continuum of five distinct community types consisting of 53-acres that change with elevation away from Green Bay. On the western side of the site, a one-acre open marsh dominated by bluejoint grass, reed grass, and rushes is found. Immediately to the east of the marsh is an open calcareous meadow on a lake dune with low juniper, gay-wings, and two rare plants: lesser fringed gentian (*Gentianopsis procera*) and bird's-eye primrose (*Primula mistassinica*). A wet-mesic conifer swamp dominated by white cedar and black and white spruce is located in the transition between the lower and upper beach zones. Impressive vertical cliffs of Niagara dolostone, vegetated with ferns and other cliff-dwelling plants, are found on the western side. A mixed upland forest dominated by white cedar, white birch, and sugar maple is found at the summit of the escarpment. The floor of the cedar-spruce forest lacks diversity but does contain such showy species as yellow lady's-slippers and Indian paint-brush. The federally threatened dwarf lake iris (*Iris lacustris*) is found in scattered patches. Bird life is characteristic of areas much farther north and includes Winter Wren, Red-breasted Nuthatch, Nashville, Black-throated Green, and Blackburnian Warblers, Ovenbird, and Veery. Peninsula Park White Cedar Forest is owned by the DNR and was designated a State Natural Area in 1952.

**Access:** From Fish Creek, go north on State Highway 42 about 0.5 mile to the south entrance to Peninsula State Park. Follow Shore Road north into the park and obtain a park map at the office. Access to the natural area is from Shore Road via the Sunset Trail, or Middle Road via Hemlock Trail. A Wisconsin State Park sticker must be displayed on all vehicles entering the park.

## The Ridges Sanctuary State Natural Area

**Description:** The Ridges Sanctuary is comprised of 1070-acres and contains a diversity of unusual habitats, resulting in one of the greatest concentrations of rare plants in the Midwest. The preserve, recognized as a National Natural Landmark, was established in 1937 as Wisconsin's first area set aside to protect native flora. The natural area consists of seventeen narrow, crescent-shaped sandy ridges, formed over the past 2400 years by wind and the wave action of adjacent Lake Michigan. Each ridge represents a former beach line of Lake Michigan and took an average of 150 years to form. The narrow ridges are forested with black spruce, white spruce, balsam fir, and white pine with wet swales between the ridges. Swamp conifers occupy some of the swales; others are filled with marsh and bog flora. Sections of the forest can be classified as boreal and are similar to, but far disjunct from the northwestern Wisconsin boreal forests near Lake Superior. The cool waters of Lake Michigan heavily influence the local climate, allowing many northern species to thrive. Some areas of the ridges are open, wet, and calcareous. The list of rare species found at The Ridges is long and includes dwarf lake iris (*Iris lacustris*) in addition to 25 species of orchid. The largest known population of the federally endangered Hine's emerald dragonfly (*Somatochlora hineana*) is found here. The Ridges Sanctuary is owned by the private conservation organization The Ridges Sanctuary, Inc. and was designated a State Natural Area in 1953.

**Access:** From the junction of State Highway 57 and County Highway Q on the north side of Baileys Harbor, go east and north on Q 0.1 mile and follow the signs to The Ridges Sanctuary entrance east of the road. Several hiking trails wind through the natural area. Detailed maps are available at the office. A donation is requested for use of the trails.

## Sister Islands State Natural Area

**Description:** Sister Islands is an historic gull and tern nesting area consisting of two low, gravel islands of about 15-acres. It is one of the important gulleries in Green Bay. High water levels in the early 1980's have greatly reduced the size of the islands; in fact, during the low water levels of the 1960's, the islands were connected. The most common breeding birds are herring gulls, but small numbers of Red-winged Blackbird, Common Tern, Pintail, and Mallard are also present. The flora is quite variable due to the disturbance caused by nesting birds and fluctuating water levels. During low water years, shrubs and weeds dominate with small numbers of boxelder, red-osier dogwood, elderberry, bitter nightshade, spotted jewelweed, and stinging nettle also grow here. Sister Islands is owned by the DNR and was designated a State Natural Area in 1966.

**Access:** By boat 2 miles northwest of the public launch in Sister Bay.

## Toft Point State Natural Area

**Description:** Toft Point is comprised of about 686-acres, containing several outstanding native plant communities concentrated on a 1-mile-wide peninsula along Door County's Lake Michigan coast. The natural area is bordered on the north by Moonlight Bay and on the south by Baileys Harbor. There are more than two miles of Lake Michigan shoreline, with areas of wave-cut dolostone cliffs. Stretches of limestone cobble beach, mixed with marly soil, are exposed during periods of low lake levels. The vegetation of the eastern shoreline, influenced by the cooling effects of Lake Michigan, consists of a narrow strip of relict boreal forest dominated by balsam fir and white spruce. The majority of the peninsula is wooded with a mesic forest of sugar maple, yellow birch, hemlock, balsam fir, and scattered white pine. To the north, along Moonlight Bay, is an extensive calcareous sedge meadow that grades into shrub-carr and wet-mesic forest dominated by white cedar with occasional paper birch and black ash. Pockets of tamarack swamp and alder thicket are imbedded in the wetland. Extensive stands of hard-stemmed bulrush grow offshore in 1 to 4 feet of water, offering cover and spawning sites for a variety of fish. The natural area provides habitat for more than 440 vascular plant species and one of the most diverse bryophyte (mosses and liverworts) floras in the state. Several orchid taxa and many rare plant species find refuge here. Toft Point, along with the adjacent Ridges Sanctuary, contains many area-sensitive bird species including seventeen species of nesting warblers. The site is named for Kersten Toft who received the land as compensation for his work at a limestone quarry nearby. Remaining on site is an historic kiln, which is the state's best intact example of the early circular kilns that once dotted parts of the Niagara escarpment. The University of Wisconsin-Green Bay and the Wisconsin Chapter of The Nature Conservancy own Toft Point. The site is recognized by the National Park Service as a National Natural Landmark and was designated a State Natural Area in 1967.

**Access:** From the intersection of State Highway 57 and Ridges Road on the north end of Baileys Harbor, go east on Ridges Road about 1.4 miles, then north on an access lane (fire number 8380) to a parking area at the gate. Or, continue southeast on Ridges Road 1.1 miles, then east on Point Drive 1.2 miles to its end.

## Newport Conifer-Hardwoods State Natural Area

**Description:** Newport Conifer Hardwoods features 140-acres containing a mix of northern forest types along Lake Michigan near the northern tip of the Door Peninsula. The cool, moist influence of the lake has allowed a forest composed of white birch, sugar maple, beech, and ash to develop. Elsewhere, boreal-like forest of eastern hemlock, balsam fir, white spruce and white cedar predominates. A 3 to 8 foot high wall of dolostone blocks traverses the site from the northeast to the southwest. This ledge is the former shoreline sculpted during the Lake Nipissing stage of Lake Michigan. Above the ledge, hardwoods are found growing on a jumbled boulder substrate. In the south and east, the hardwood forests stabilize low sand dunes where large colonies of clubmoss can be observed. About ¼ mile of frontage on Lake Michigan is included in the natural area. Rare plants found here include western fescue (*Festuca occidentalis*), variegated scouring-rush (*Equisetum variegatum*), round-leaved orchid (*Platanthera orbiculata*), long-spurred violet (*Viola rostrata*) and the federally-threatened dwarf lake iris (*Iris lacustris*). Migrating songbirds make extensive use of the site and the rare Common Goldeneye (*Bucephala clangula*) breeds within the area. Newport Conifer Hardwoods is owned by the DNR and was designated a State Natural Area in 1971.

**Access:** From Ellison Bay, go east on State Highway 42 about 2 miles, then south and east on County Highway NP about 3 miles to the Newport State Park entrance. The natural area is accessible via the Newport and Ridge hiking trails (get a map at the park contact station). A Wisconsin State Park sticker must be displayed on all vehicles entering the park.

## Jackson Harbor Ridges State Natural Area

**Description:** Situated on Washington Island off the tip of the Door Peninsula, Jackson Harbor Ridges is made up of 70-acres containing several coastal plant communities and an exceptionally rich flora of rare and uncommon plants. The topography undulates with areas of dry to moist sand ridges and low, wet swales. Twelve ridges and swales are evident, the result of former Lake Michigan water levels. The swales contain an unusual plant community that prefers wet calcareous soils. Characteristic species here are brook lobelia, shrubby cinquefoil, bladderworts and several sedges. Bird's-eye primrose (*Primula mistassinica*), low calamint (*Calamintha arkansana*), and slender bog arrow-grass (*Triglochin palustris*) are among the rare plants found here. The 9-acre beach gradually grades into drier dunes, which are stabilized with drought tolerant species such as creeping juniper, bearberry, and sand coreopsis. The dunes harbor the federally-threatened dune thistle (*Cirsium pitcheri*) and the state-threatened dune goldenrod (*Solidago simplex* var. *gillmanii*) and sticky asphodel (*Tofieldia glutinosa*). Behind the dunes is a mixed conifer-hardwood forest of red and white pines, white cedar, balsam fir, and American beech. Patches of the federally-threatened dwarf lake iris (*Iris lacustris*) are scattered throughout. The point at the entrance to Jackson Harbor is a sand spit that attracts gulls, terns, shorebirds, and waterfowl. Jackson Harbor Ridges is owned by the Town of Washington and was designated a State Natural Area in 1973.

**Access:** From the end of Highway 42 at Northport Pier, take the ferry to Washington Island. From the ferry landing, go north on Losdells Point Road (County W) 1.7 miles, then continue north on Main Road 2.6 miles, then go east on Jackson Harbor Road 3.5 miles, then north on Indian Point Road 0.1 mile to a parking area on the right. The natural area lies to the east.

## Mud Lake State Natural Area

**Description:** Mud Lake State Natural Area is located within the Mud Lake Wildlife Area and consists of a 155-acre shallow (maximum depth 5') drainage lake surrounded by an extensive shrub and timber swamp. The lake has a truly wild character to it. The bottom is predominantly marl, although dolostone bedrock is exposed in some areas. Many old snags along the shoreline attest to water levels that fluctuate with seasonal precipitation. Aquatic plants are most diverse in the outlet stream (Reibolts Creek) and include bur-reed, coon's-tail, pondweed, and wild rice. In the lake, soft-stem bul-rush, yellow water-lily, common reed, and cat-tail is found. Immediately surrounding the open water is a narrow zone of shrubby northern sedge meadow dominated by sedges, willows, dogwoods, and sweet gale. The wetlands and lake provide habitat for the federally-endangered Hine's emerald dragonfly (*Somatochlora hineana*). The open zone grades into second-growth wet-mesic forest of white cedar, white spruce, balsam fir, and black ash. Reibolts Creek, which runs from Mud Lake to Lake Michigan, has been stocked with trout and supports a trout spawning run. Waterfowl use of the lake is occasionally heavy. Nesting birds include Pied-billed Grebe, American Bittern, Common Goldeneye, Mallard, Pintail, Blue-winged Teal, Wood Duck, and Virginia Rail. Mud Lake is owned by the DNR and was designated a State Natural Area in 1975.

**Access:** From Baileys Harbor, go north on State Highway 57 0.75 miles, then east on County Highway Q 2.5 miles to Sunset Drive, then north 1.2 miles to Birch Road, then west to Mud Lake.

## Whitefish Dunes State Natural Area

**Description:** Whitefish Dunes State Natural Area encompasses 230-acres within the boundaries of the Whitefish Dunes State Park and preserves the largest and most significant Great Lakes dunescape in Wisconsin. The complex of active and stabilized dunes protected by Whitefish Bay along the Lake Michigan coast contains a rich flora particularly adapted to this dynamic habitat. All stages of succession, from open beach through northern mesic and wet-mesic forest, are represented here. The lakeside fore dune is open, sandy and vegetated with common milkweed, beach wormwood, beach pea, lyrate rock-cress and several beach grasses, including the state-threatened thick-spike wheat grass (*Elytrigia dasystachya* ssp. *psammophila*) and sand-reed (*Calamovilfa longifolia* var. *magna*). Wisconsin's largest and most viable population of the federally-threatened dune thistle (*Cirsium pitcheri*) inhabits the shifting sands of the fore dune. The backside of the fore dune is forested with white birch, balsam fir, and white cedar and contains a ground cover of abundant Canada yew. The dunes farther from the lake are more stabilized and heavily wooded with northern mesic forest of sugar maple, large-toothed aspen, eastern hemlock, and American beech. Also present is a small bog lake with associated sedge meadow and frontage on Clark Lake, a baymouth bar lake. Common nesting birds include Red-eyed Vireo, Veery, Black-throated Green and Canada Warblers, American Redstart, and Eastern Wood-Pewee. Whitefish Dunes is owned by the DNR and was designated a State Natural Area in 1980.

**Access:** From the intersection of State Highway 57 and County Highway T in Valmy, go north on 57 1.1 miles, then east on Clark Lake Road (County Highway WD) about 3.6 miles to a parking lot at the park office. Park maps are available at the office. Several hiking trails lead south into the dunes. A Wisconsin State Park sticker must be displayed on all vehicles entering the park.

## Marshall's Point State Natural Area

**Description:** Marshall's Point consist of 113-acres and contains a relict boreal forest dominated by white cedar, balsam fir, and white spruce and includes 2000 feet of Lake Michigan shoreline. Old beach lines form 2- to 4-foot limestone ledges and provide local relief on the otherwise level topography. The coastal location, with its cool microclimate, is partially responsible for the rich association of mosses and liverworts. The vascular plant flora is equally as rich in diversity containing several rare and restricted plants. The interior of the site, near the peninsula's center, is forested with northern mesic forest that has been undisturbed for more than 100 years. Soils have formed over limestone bedrock and have accumulated raw organic matter. These are termed raw humus rendzina, an extremely rare phenomenon. Nesting birds include Winter Wren, Golden-crowned Kinglet, Blackburnian Warbler, Northern Parula, and White-throated Sparrow. Marshall's Point is owned by Marshall's Point Association and was designated a State Natural Area in 1986.

**Access:** Public access is restricted due to the sensitive nature of the site. Contact The State Natural Areas Program for more information.

## Mink River Estuary State Natural Area

**Description:** The Mink River Estuary encompasses more than 1465-acres and is one of the most pristine freshwater estuaries in the country. The river originates in alkaline, spring-fed wetlands in the central Door Peninsula and ends just a few miles downstream where it empties into Lake Michigan at Rowley's Bay. In between is the dynamic estuarine system, formed by the mixing and flushing of the waters of Lake Michigan and the Mink River. During periodic high water periods (seiches) the estuarine marshes are flooded, during low water the marshes are dry and many spring channels are evident. The vegetation of the natural area is diverse. Sedges, blue-joint grass, and other emergent vegetation with an overstory of willow, dogwood, and alder shrubs dominate the marshes bordering the river. Deeper areas of the marsh contain bulrush, wild rice, cat-tail and bur-reed. Water-lilies and water milfoil inhabit the deepest zone. The wetlands grade into lowland conifer swamp dominated by white cedar. A small stretch of beach along Rowley's Bay contains federally threatened dune thistle (*Cirsium pitcheri*) while patches of dwarf lake iris (*Iris lacustris*) are scattered through the property. The estuary is an important fish spawning and bird migration area. Numerous birds nest here including the Yellow Rail, a state threatened species. Other rare and uncommon birds include Black Duck, Black Tern, Black-crowned Night Heron, and Northern Harrier. Mink River Estuary is owned by the Wisconsin Chapter of The Nature Conservancy and was designated a State Natural Area in 1988.

**Access:** From the intersection of State Highway 42 and Mink River Road in Ellison Bay, go south on Mink River Road 2.7 miles, then east on Highway ZZ 0.9 mile to the Wagon Trail Resort on Rowley's Bay. A boat launch and canoe rental are available. For hiking access, from 42 and Mink River Road, go south on Mink River Road 1.2 miles to a parking area east of the road. For the eastern portion, from Ellison Bay, go east on 42 about 2.3 miles, then south on County Highway NP (Newport Drive) one mile to a parking area west of the road. The estuary is best seen by canoe.

## Moonlight Bay Bedrock Beach State Natural Area

**Description:** Moonlight Bay Bedrock Beach is comprised of about 112-acres and protects a 5-acre undisturbed bedrock beach, rare plant and animal communities, geological features, and adjacent boreal forest relict, all of which are dependent on the dynamic influence of Lake Michigan. The primary feature is the dolostone bedrock beach, which is periodically covered and exposed, depending on Lake Michigan water levels. When exposed, several plants indicative of these calcareous and unstable shorelines colonize the beach, including such rare species as small fringed gentian (*Gentianopsis procera*), tufted hair grass (*Deschampsia cespitosa*), bird's-eye primrose (*Primula mistassinica*), and several sedges (*Carex* spp.). Ambient shorelines are present as low ledges in the forested portions of the site. The boreal forest is typical of the northeastern Door Peninsula with white cedar, white spruce, paper birch, white pine, hemlock, and balsam fir. Common understory plants are thimbleberry and mountain maple. The groundlayer is sparse, with mosses and lichens predominating. The forest also harbors a population of the federally and state-threatened dwarf lake iris (*Iris lacustris*). Moonlight Bay Bedrock Beach is owned by the DNR and was designated a State Natural Area in 1990.

**Access:** From the intersection of State Highway 57 and County Highway Q north of Baileys Harbor, go north and east on Q 3.5 miles, then south on Cana Island Road 0.9 mile to Bues Point Road. Park southeast of the intersection and walk west into the natural area.

## Coffee Swamp State Natural Area

**Description:** Coffee Swamp consist of about 80-acres and occupies a former embayment of Lake Michigan along the northern coast of Washington Island. The natural area features a shallow, hard water seepage pond with a substrate of pure marl that nearly dries up in late summer and during years when the water level of Lake Michigan is low. Surrounding the pond is an open, treeless, boreal-rich fen dominated by wire-leaved sedges, sweet gale, and hoary willow. Boreal-rich fens are similar to their southern Wisconsin counterparts in having alkaline, saturated, peaty soils. They differ compositionally by having species more typical of nutrient poor northern wetlands such as round-leaved sundew, pitcher plant, cotton-grass, bog-rosemary, Labrador-tea, and bogbean. The fen also supports many rare plants, including tussock bulrush (*Scirpus cespitosus*), and false asphodel (*Tofieldia glutinosa*). Adjoining the fen is a northern wet-mesic forest dominated by white cedar situated on peat over gravel and sand ridges. Deer browse is heavy and some areas are lacking in cedar reproduction. Coffee Swamp is owned by the DNR and was designated a State Natural Area in 1994.

**Access:** The natural area is not accessible to the public at this time. Contact the State Natural Areas Program for more information about visiting this site.

## Baileys Harbor Boreal Forest & Wetlands State Natural Area

**Description:** Baileys Harbor Boreal Forest and wetlands consist of 329-acres along the northeastern coast of the Door Peninsula. Lake Michigan heavily influences the local climate of the forest area. Cooler springs and summers, warmer falls and winters, and reduced evaporation rates have allowed northern species and this boreal forest to thrive here, far south of their normal range. Balsam fir and white spruce dominate the boreal forest, which grades into northern wet-mesic forest of white cedar, white pine, paper birch, and hemlock. Many orchids and rare plants find refuge in the forest, including the federally threatened dwarf lake iris (*Iris lacustris*). The natural area protects 1.5 miles of undeveloped Lake Michigan shoreline. An extensive alkaline rockshore, or bedrock beach, is exposed during periods of low lake levels. Bird's-eye primrose (*Primula mistanssinica*), small fringed gentian (*Gentianopsis procera*), and tufted hair grass (*Deschampsia cespitosa*) are among the uncommon species thriving on the open dolostone flats. Migratory shorebirds and waterfowl are attracted to the undeveloped shoreline, and this site is one of the few known nesting sites in Wisconsin for the Common Goldeneye. The forested communities support a wide variety of birds associated with boreal habitats, including Yellow-bellied Flycatcher, Blackburnian Warbler, and Merlin. Baileys Harbor Boreal Forest and Wetlands is owned by the DNR and was designated a State Natural Area in 1995.

**Access:** From the intersection of State Highway 57 and County Highway Q north of Baileys Harbor, go northeast on Q 3.5 miles to Cana Island Road, then go south (right) 0.1 mile. Park along the road at the T intersection where Cana Island Road splits to form a triangle. Walk south along Cana Island Road 0.3 miles, then east into the natural area. Look for SNA signs marking the site's boundary.

## Kangaroo Lake State Natural Area

**Description:** Kangaroo Lake lies in a basin ½ mile from the Lake Michigan coast. The natural area site of about 357-acres contains a mosaic of communities including a shallow, marl-bottom lake, northern upland forest, northern wet-mesic forest and marsh. While marl lakes are relatively common throughout Door County, undeveloped ones such as Kangaroo Lake are exceptionally rare. The lake's source is the spring-fed Piel Creek, which originates from a series of small springs in an unusual marl fen 5 miles upstream. Piel Creek and the surrounding wetlands provide critical habitat for the federally endangered Hine's emerald dragonfly (*Somatochlora hineana*) and is one of only two known reproducing populations in the country. Lowland forest of white cedar, black ash, tamarack, black spruce, and balsam fir surround the north end of the lake, which is ringed by floating sedge mats. Characteristic shrubs include speckled alder, willows, and meadowsweet. Canada yew, a declining Wisconsin species, is found along a peninsula of the north basin. Common herbs are three-leaved gold-thread, dewberry, naked miterwort, and American starflower. A dolostone plateau with numerous crevices and areas of exposed bedrock contains a forest dominated by sugar maple, beech, white birch, and red oak with a rich diversity of spring wildflowers. Numerous other rare and endangered species are present including the state and federally threatened dwarf lake iris (*Iris lacustris*), the dorcas copper butterfly (*Lycaena dorcas*), Bald Eagle, Osprey, and Caspian Tern. The marsh also provides important breeding and migratory habitat for Black Terns, Sandhill Cranes, and many species of waterfowl. A causeway built in the late 1800's separates Kangaroo Lake into two distinct parts – a highly developed southern portion and the northern end, which has almost completely escaped development due to the extensive wetlands. Kangaroo Lake is owned by The Nature Conservancy and the Door County Land Trust and was designated a State Natural Area in 2002.

**Access:** From the intersection of Highways 57 and F in Baileys Harbor, go south on State Highway 57 1.4 miles, then west on County Highway E 1 mile to a small parking area north of the road. To access the western part, continue west and north on Highway E an additional 1.2 miles. Park along the road. A trail leads east into the site. The wetlands are best viewed by canoe. Put in at the east end of the Highway E causeway.

## White Cliff Fen and Forest State Natural Area

**Description:** Located less than ½ mile from Green Bay, White Cliff Fen and Forest features a deep, undisturbed forest containing 57-acres of white cedar and hardwoods surrounding a calcareous fen situated at the base of the Niagara escarpment. The fen is fed by ground water upwellings rich in calcium and magnesium bicarbonates and is dominated by woolly-fruit sedge and hard-stem bulrush. Other plant species include such fen indicators as brook lobelia, boneset, marsh fern, and common bog-arrow grass (*Triglochin maritima*) – a rare species despite its name. Other plants are marsh marigold, small-flowered false foxglove, northern bog goldenrod, and northern bog aster. Marsh milkweed is plentiful throughout the wetland and attracts numerous nectaring butterflies including a large number of monarchs. Limestone bedrock is exposed in areas of the fen, an indicator of a very shallow peat layer. An irregular, narrow border of shrubby cinquefoil, small white cedar, red-osier dogwood, alder-leaf buckthorn, and tamarack rings the fen. The area slowly grades into a white cedar and green ash woodland and then into an upland forest of white cedar, hemlock, red oak, big-tooth aspen, and white ash. Other trees include paper birch, beech, sugar maple, white pine, white spruce, and red pine. Although rare plant and animal surveys are pending, the surrounding area contains three rare land snails, and the Hine's Emerald dragonfly (*Somatochlora hineana*), a federally endangered species. Future inventories may reveal the presence of these and other rare species at this site. White Cliff Fen and Forest is owned by the Door County Land Trust and was designated a State Natural Area in 2002.

## Rock Island Woods State Natural Area

**Description:** Rock Island Woods consist of 570-acres with a mosaic of plant community types including northern hardwood forest, northern wet-mesic forest, forested seeps, and shaded cliff community. The interior plateau of Rock Island contains a mature mesic hardwood forest dominated by beech and sugar maple. Canopy associates include basswood and red oak. Groundlayer species are wild leek, spring-beauty, trout-lily, large-flowered trillium, common lady fern, blue cohosh, and jack-in-the-pulpit. Rare plants include drooping sedge (*Carex prasina*), Chilean sweet cicely (*Osmorhiza berteroi*), broad-leaf sedge (*Carex platyphylla*), and climbing fumitory (*Adlumia fungosa*). Several moist swales and forested seeps are found on north-facing depressions within the forest containing herbaceous species such as ostrich fern, clustered snakeroot, hairy sedge, and squirrel corn. Dolostone cliffs and ledges occur on the margins of the forest and some support an upland stand of nearly pure white cedar with some balsam fir and white birch along the rocky coastline. About 4 linear kilometers of low moist shaded dolostone cliffs are found in the interior of Rock Island. These moist seepage slopes support a lush growth of ferns with bulbet bladder, fragile, walking, slender cliff brake, northern wood, and intermediate wood ferns. Bird life is diverse with Spotted Sandpiper, Cliff Swallow, Veery, Ovenbird, American Redstart, and Canada, Blackburnian, and Black-throated Green Warblers. Rare plants and animals include Common Tern Caspian Tern, northern ringneck snake (*Diadophis punctatus edwardsii*), rock whitlow-grass (*Draba arabisans*), and mystery vertigo (*Vertigo paradoxa*), a land snail. Rock Island Woods is owned by the DNR and was designated a State Natural Area in 2002.

**Access:** Most visitors reach the area by taking the Washington Island ferry from Northport to Detroit Harbor then drive to Jackson Harbor and take the passenger ferry to Rock Island. No motorized vehicles are allowed.

## Europe Bay Woods State Natural Area

**Description:** Europe Bay Woods encompasses 200-acres located on an undeveloped isthmus between Lake Michigan and Europe Lake featuring over one mile of Great Lakes dune and beach communities, red pine groves, boreal forest, and northern dry-mesic and mesic forest. Once the ancient shoreline of Lake Michigan, the isthmus was created through wave action, resulting in the deposition of layers of sand and gravel. And now contains northern dry-mesic forest dominated by red pine and red oak with scattered hemlock, beech, and red maple. Common understory plants include beaked hazelnut, wild sarsaparilla, wintergreen, Canada mayflower, and rough-leaved rice grass. Also present is a mature mesic forest consisting of beech, sugar maple, red oak, and yellow birch on undulating topography. Along Lake Michigan is an undeveloped sand beach and low dunes grading to cobblestone beach and finally dolostone bedrock. The dunes contain extensive mats of bearberry and creeping juniper intermingled with rabbit-berry, sand cherry, and the state threatened prairie sand-reed (*Calamovilfa longifolia* var. *magna*). The dunes and beach harbor numerous rare plants and animals including bird's-eye primrose (*Primula mistassinica*), dune goldenrod (*Solidago simplex* var. *gillmanii*), seaside spurge (*Euphorbia polygonifolia*), lesser fringed gentian (*Gentianopsis procera*), Lake Huron locust (*Trimerotropis huroniana*), and beach-dune tiger beetle (*Cicindela hirticollis rhodensis*). On gently sloping sandy soils is a boreal forest of balsam fir, white cedar, quaking aspen, white birch, and white spruce with white and red pine as the site grades into a forested ridge and swale community. Rare boreal forest species include the federally threatened dwarf lake iris (*Iris lacustris*), giant pinedrops (*Pterospora andromedea*), crawe sedge (*Carex craweii*), Cape May Warbler, and Black-throated Blue Warbler. Europe Bay Woods is owned by the DNR and was designated a State Natural Area in 2002.

**Access:** From Ellison Bay, go east on State Highway 42 about 2 miles, then south and east on County Highway NP about 3 miles to the Newport State Park entrance. Get a park map at the contact station. A Wisconsin State Park sticker must be displayed on all vehicles entering the park.

## Ellison Bluff State Natural Area

**Description:** Ellison Bluff features 170-acres of densely wooded two-tiered rock terrace – part of the larger Niagara Escarpment rock formation that stretches and winds through the site providing spectacular views from the bluff tops. Extending from New York, into Wisconsin and forming the Door Peninsula, the limestone-capped Niagara Escarpment was formed through sediment deposition of inland seas more than 425 million years ago and contains fossil-rich sedimentary bedrock. Over time, the soft rocks under a more resistant limestone cap wear away leaving bluffs, which rise 200 feet above the Bay's shore. The cliffs, free face and sheer in places, contain sufficient ledges and fractures to support a vertical, talus slope forest of white cedar with Canada yew, mountain maple, red pine, basswood, and red elderberry. One cedar was determined to be 250 years old. The talus slope also supports 26 species of land snail including five rare species and two glacial relict species. The forested bluff top contains a northern mesic forest dominated by sugar maple, white ash, red oak, and beech. Also present are paper birch, big-tooth aspen, and hemlock. The understory is composed of wild sarsaparilla, big-leaved aster, Canada mayflower, large-flowered trillium, wood-betony, and bracken fern. At least two rare plants are also present: rock whitlow-grass (*Draba arabisans*) and broad-leaf sedge (*Carex platyphylla*). Birds include Great-crested Flycatcher, Least Flycatcher, Winter Wren, Black-throated Green Warbler, and Blackburnian Warbler. Ellison Bluff is owned by the County of Door and was designated a State Natural Area in 2002.

**Access:** From the intersection of Highway 42 and Garrett Bay Road in Ellison Bay, go southwest on 42 1.9 miles, then west on Porcupine Bay Road 0.7 mile, then north on Ellison Bluff Park Road 0.7 mile and then head west about 0.2 mile to an observation deck and parking lot. Hiking trails provide access to the natural area.

## Bayshore Blufflands State Natural Area

**Description:** Located along more than three miles of the Niagara Escarpment, Bayshore Blufflands is an ecologically complex site of 124-acres, with a diversity of plant communities both above and below the escarpment and a series of seeps and springs at the base of the bluff's talus slopes. Rising 150-200 feet above the low terrace of Green Bay, the steep carbonate cliffs and outcrops support numerous rare land snails including the cherrystone drop snail (*Hendersonia occulta*), a state-threatened species. Aspen, sugar maple, red oak, hemlock, and white cedar grow out of the talus affording complete shade to the escarpment maintaining the cool and damp conditions, which support a lush growth of mosses. The unique site conditions also support such uncommon species as climbing fumitory, mountain maple, bulbfern, common polypody, and fragile fern. Above the escarpment is a dry-mesic forest of red and white pine with red oak. The ground layer is dense dominated by round-leaved dogwood with northern bush honeysuckle, zig-zag goldenrod, big-leaved aster, and bracken fern. The site slowly grades into a richer, more mesic forest containing sugar maple, beech, and red oak with hemlock, and white pine. Also present is a wet-mesic forest of white cedar, big-tooth aspen, and black ash. Several white cedars reach impressive sizes here. Below the escarpment are seasonally flooded forests dominated by silver maple, and green ash with swamp white oak, American bladdernut, and great water-leaf. The site contains many rare plants including the federally threatened dwarf lake iris (*Iris lacustris*). Other species are variegated horsetail (*Equisetum variegatum*), Hooker's orchid (*Platanthera hookeri*), long-spurred violet (*Viola rostrata*), and large-flowered ground-cherry (*Leucophysalis grandiflora*). Rare animals include Red-shouldered Hawk (*Buteo linnaeus*), Midwest Pleistocene vertigo (*Vertigo hubrichti*), and Iowa Pleistocene vertigo (*V. iowaensis*). Bayshore Blufflands is owned by The Door County Land Trust and The Nature Conservancy and was designated a State Natural Area in 2002.

**Access:** From the intersection of Highways G and 42 in Egg Harbor, go south on 42 7.5 miles, then west on W. Carlsville Road 1.4 miles, then south on Reynolds Road 0.25 mile to a small parking area and Door County Land Trust kiosk.

## North Bay State Natural Area

**Description:** The North Bay Natural Area is one of the last remaining undeveloped stretches of Lake Michigan shore on the Door Peninsula. The site consists of 225-acres, with nearly one mile of uninterrupted lakeshore, this site offers a range of plant communities that change through time in response to the periodic rise and fall of lake water levels. The site contains many high quality remnant communities including northern sedge meadow, calcareous fen, northern wet, wet-mesic and mesic forest, boreal forests of white spruce and balsam fir, and springs and spring runs. Also present are coastal marshes and a complex of Lake Michigan dunes with associated ridge and swale topography. From the open waters of the lake, to the coastal marshes and fen, to the lowland forest and surrounding uplands, this area provides critical habitat for many endangered and threatened species including numerous orchids, the federally-threatened dwarf lake iris, and the third largest known breeding population of the federally endangered Hine's emerald dragonfly (*Somatochlora hineana*). North Bay is also an important spawning area for a majority of Lake Michigan's whitefish population. Of the estimated 1.2-1.5 million whitefish, approximately 1.1 million spawn in the waters between North Bay and Moonlight Bay in Door county. Outlet streams also provide important habitat for numerous game fish species including northern pike, yellow perch, smallmouth bass, trout, and chinook salmon. Six species of rare birds use this area for nesting and foraging including the federally threatened bald eagle (*Haliaeetus leucocephalus*) and state threatened osprey (*Pandion haliaetus*). This site also provides critical habitat for a wide diversity of migratory and nesting waterfowl including Bufflehead, Redhead, Hooded Mergansers, and Northern Pintail and the area is one of the few known nesting sites in Wisconsin of Common Goldeneye. A wide variety of shorebirds are also known to use the area. North Bay is owned by The Nature Conservancy and was designated a State Natural Area in 2002.

**Access:** From the junction of Highways 42 and ZZ (Maple Drive) in Sister Bay, go east on ZZ 0.6 mile, then south on Wood Crest Road nearly 2 miles, then east and southeast on County Q 1.4 miles, then north on Winding Lane 0.25 mile to a small parking area east of the road.

## Big and Little Marsh State Natural Area

**Description:** Big and Little Marsh features a complex of boreal rich fen, northern wet-mesic forest, and a large emergent aquatic marsh on bare marl. Located on Washington Island, off the tip of the Door County peninsula, the 43-acre site harbors numerous rare species. The extensive lowland conifer swamp is dominated by white cedar with lesser amounts of balsam fir and tamarack; the groundlayer supports three-leaved gold-thread, Canada mayflower, starry false Solomon's-seal, and three-seeded sedge. Rare species of the wet-mesic forest include northern bog sedge (*Carex gynocrates*) and northern black currant (*Ribes hudsonianum*). Soft-stem bulrush dominates the unusual aquatic marsh, which contains large expanses of seasonally dry marl and a pavement of dolomite gravel and cobbles. Frequent in the shallow pools is common bog-arrow grass (*Triglochin maritima*). Also present are false mermaid weed, northern bladderwort, pondweeds, and water smartweed. An upland hardwood forest of white cedar and hemlock surrounds the wetlands. Nearly 200' of Lake Michigan shore are protected within the natural area. The sandy, cobble beach harbors patches of the federally threatened dwarf lake iris (*Iris lacustris*) and is important foraging habitat for the federally endangered Hine's emerald dragonfly (*Somatochlora hineana*). Many birds funnel through this area during spring and fall migrations and a diversity of neotropical migrants breed here in summer. Big and Little Marsh is owned by the DNR and was designated a State Natural Area in 2003.

# Appendix E

## Statistics on Wisconsin's Biological Diversity

**Vegetation - Statewide:**

*All Forest* — Current total forested acres in WI is 58% of acreage in forest prior to European settlement (1995: 15.8 million acres; 1830s: ~ 27.1 million acres).

*Old-growth Forest* — Current old-growth forest in WI is less than 4% of acreage in old growth forest prior to European settlement (1995: <610,000 acres; 1830s: ~ 13.9 million acres).

*Wetlands* — Current wetland acreage in WI is roughly 53% of acreage in wetlands prior to European settlement (1995: 5.3 million acres; 1830s: ~ 10.0 million acres). Most remaining wetlands are in the northern third of the state.

*Oak Savanna* — Current oak savanna acreage is less than 0.01% of acreage of oak savanna acreage prior to European settlement (1995: 500 acres; 1830s: ~ 5.5 million acres).

*Prairie & sedge meadow* — Current acreage is less than 0.05 % of acreage in prairie prior to European settlement (1995: < 35,000 acres; 1830s: ~ 3.1 million acres). However, much of the remaining acreage has been highly degraded.

**Species Loss:** The following species are known to be extirpated in Wisconsin (gone from the state as a naturally occurring population since the early 1900s but exists elsewhere as a wild population).

**Birds:**

- Bewick’s Wren
- Whooping Crane
- American Peregrine Falcon
- American swallow-tailed kite
- Long-billed Curlew

**Mammals:**

- elk
- least shrew
- bison
- wolverine
- caribou
- woodland caribou

**Mussels:**

- scaleshell
- fat pocketbook

**Plants:**

- Mead’s milkweed
- spring blue-eyed mary
- horse-tail spike rush

**Fish:**

- deepwater cisco
- creek chubsucker
- ghost shiner
- ironcolor shiner

**Extinct Species:**

- Passenger Pigeon
- Carolina Parakeet

**Rare Plants & Animals:** Wisconsin's List of Endangered, Threatened and Special Concern Species (revised by the WI Dept. of Natural Resources in 2001) includes **526** animal species and **414** species of plants, lichens, and fungi. Of these (in descending order of peril), **131** were listed as endangered, **106** as threatened, and **703** as special concern.

**Rare Species in Door County:** The Wisconsin DNR lists **163** known plant and animal species from Door County which are either federally or state-listed, or classified as state species of special concern. A total of **45** known species from the county are listed by the State of Wisconsin as either threatened or endangered. Of these, **4** species are federally listed.

**SOURCES:** (1) The Natural Heritage Information System, (2) Wisconsin DNR’s Bureau of Endangered Resources List of Endangered, Threatened, and Special Concern Species, Dec. 2001, (3) Wisconsin’s Biodiversity as a Management Issue, A Report to Department of Natural Resources Managers, May 1995.



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# Appendix F

## Information Resources

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The following private organizations and government agencies are especially good resources for assistance with natural area information and protection. Other sources of information related to various aspects of natural areas protection are too numerous to list here, but include other programs in government agencies, museums, public libraries, and universities.

### *FOR NATURAL FEATURES INFORMATION:*

#### ***Natural Heritage Inventory Program (NHIP)***

Bureau of Endangered Resources  
WI Dept. of Natural Resources  
101 South Webster Street, P.O. Box 7921  
Madison, WI 53707-7921  
Tel.: (608) 266-2747 or 267-9788  
Web Site: [www.dnr.state.wi.us](http://www.dnr.state.wi.us)

The Natural Heritage Inventory Program of the Wisconsin Department of Natural Resources can provide information to local governments on known locations of rare and/or significant natural features in the state. Information may be useful for local governments involved in land conservation programs, environmental reviews, planning, management, research, and education.

#### ***Cofrin Center for Biodiversity***

University of Wisconsin at Green Bay  
Department of Natural & Applied Sciences  
Green Bay, WI 54311  
Tel: (920) 465-2272  
Web Site: [www.uwgb.edu/biodiversity](http://www.uwgb.edu/biodiversity)

The Cofrin Center for Biodiversity, located on the campus of the University of Wisconsin in Green Bay, brings together a variety of information resources about the plants, animals, and ecology of the Northern Lake States. The Center's aim is to promote biodiversity protections at the local level through education and scientific research.

#### ***University of Wisconsin-Extension – Lakeshore Basin Natural Resources Educator***

Brown, Calumet, Door, Kewaunee, & Manitowoc Counties  
925 Marquette Drive  
Kewaunee, WI 54216  
(920) 388-4313  
Web site: <http://clean-water.uwex.edu/lakeshore>

The Natural Resources Educator's office delivers educational programming related to natural resources, including land protection and preservation alternatives for municipalities, organizations, and individuals. Additional services offered through the Basin Educator includes information on land protection resources such as printed materials and contact with other natural resource oriented agencies and organizations.

***The Ridges Sanctuary***

P.O. Box 152  
8288 County Hwy Q  
Baileys Harbor, WI 54202  
Tel: (920) 839-2802  
Web site: [www.ridgesanctuary.org](http://www.ridgesanctuary.org)

The Ridges Sanctuary is a protected wildlife area accessible to the public and operated by a non-profit organization committed to preserving and protecting ecologically significant natural areas and providing environmental education opportunity. The Sanctuary's unique landscapes provide for a wide range for ecological research and field study.

***FOR LAND PROTECTION TOOLS AND ASSISTANCE:***

***US Fish & Wildlife Service***

2661 Scott Tower Drive  
New Franken, WI 54229  
Tel.: (920) 866-1717  
Web Site: <http://midwest.fws.gov/GreenBay/>

The Fish and Wildlife Service manages several programs primarily for restoration of wetlands, grasslands, and threatened and endangered species habitat. Technical assistance and financial help are available and requirements vary among programs.

***Natural Resource Conservation Service (NRCS)***

925 Marquette Drive  
Kewaunee, WI 54216  
Tel: (920) 388-0740  
Web Site: [www.nrcs.usda.gov](http://www.nrcs.usda.gov)

The Natural Resource Conservation Service (NRCS) provides technical and financial help to landowners for conservation practices, develop and improve fish and wildlife habitat, restore wetlands previously altered for agricultural use, and improve water quality. Public access is not required and eligibility varies depending on the program. The Natural Resources Conservation Service provides leadership in a partnership effort to help people conserve, maintain, and improve our natural resources and environment.

***Door County Land Trust (DCLT)***

P O Box 345  
Ephraim, WI 54211  
Tel.: (920) 839-9990

The Door County Land Trust is a private, nonprofit organization that promotes the protection and enhancement of open space, including farmland, wetlands, woodlands, bluff lands, wildlife habitat, and scenic areas in Door County. DCLT specializes in working with private citizens and public agencies (including local governments) that wish to establish perpetual conservation easements on qualifying land.

***The Nature Conservancy (TNC), Wisconsin Chapter – Door County Project***

306 South Third Avenue  
Sturgeon Bay, WI 54235  
Tel.: (920) 743-8695  
Web Site: [www.tnc.org](http://www.tnc.org)

The Nature Conservancy is an international nonprofit organization, with land protection priorities guided by science and ecological research. The Door County Project of TNC protects land through acquisitions, gifts of land, management agreements, conservation easements, cooperation with state and local units of government, and enrollment of private landowners in a volunteer registry program.

***American Farmland Trust***

1200 18<sup>th</sup> Street, NW, Suite 800  
Washington, DC 20036  
Tel: (202) 331-7300  
Web Site: [www.farmland.org](http://www.farmland.org)

American Farmland Trust is a private, non-profit organization founded in 1980 to protect our nation's farmland. AFT works to stop the loss of productive farmland and to promote farming practices that lead to a healthy environment.

***Wisconsin Department of Natural Resources***

DNR Forestry  
110 S. Neenah Ave.  
Sturgeon Bay, WI 54235  
Tel: (920) 746-2860  
Web Site: [www.dnr.state.wi.us](http://www.dnr.state.wi.us)

Provides technical forest stewardship assistance to woodland owners in Door County including public awareness, management planning, reforestation, timber stand improvement, timber harvesting, forest pests & various incentive programs to promote sustainable forestry.

***Wisconsin Department of Natural Resources***

Wildlife Biologist  
Door, Kewaunee, & Manitowoc Counties  
2220 E County Highway V  
Mishicot, WI 54228  
Tel: (920) 755-4983

The Wildlife Biologist's Office is responsible for managing Door County's Mud Lake and Gardner Swamp State Wildlife Areas. The DNR staff surveys and makes management recommendations for wildlife populations (primarily deer and turkey), and provides the public with information to promote the sound stewardship of our wildlife resources.

***Wisconsin Department of Natural Resources***

Bureau of Community Financial Assistance (CFA)

101 South Webster Street, P.O. Box 7921

Madison, WI 53707-7921

Tel: (608) 266-7555

Web Site: [www.dnr.state.wi.us](http://www.dnr.state.wi.us)

CFA administers numerous grants and loan programs. Financial program staff works closely with local governments and interested groups to develop and support projects that protect public health and environment, and provide recreational opportunities.

***Door County Soil and Water Conservation Department***

421 Nebraska Street

Sturgeon Bay, Wisconsin 54235

Tel: (920) 743-2214

The Soil and Water Conservation Department works with landowners to reduce soil erosion, increase wildlife habitat, improve water quality, and increase forestland through a variety of programs. The Conservation Reserve, Nonpoint Source Pollution Abatement and Environmental Quality Incentives Programs are among those that the department makes use of when providing assistance to county residents.

***FOR STATE ACQUISITION AND/OR DEDICATION OF NATURAL AREAS:***

***State Natural Areas (SNA) Program***

Wisconsin Department of Natural Resources

101 South Webster Street, P.O. Box 7921

Madison, WI 53707-7921

Tel.: (608) 266-3369

The State Natural Areas Program selectively acquires and manages land throughout the state that hosts exceptional natural features such as undisturbed natural communities, rare or endangered species habitat, geologic formations, and seasonal habitat for concentrations of birds and other wildlife. Local governments may wish to contact the SNA Program to inquire about the potential for SNA designation of natural areas on existing public lands, or the protection of natural areas on private lands through acquisition from willing sellers.

***FOR ASSISTANCE WITH FINANCING AND LAND TRANSACTIONS INVOLVING CONSERVATION REAL ESTATE:***

***The Trust for Public Land (TPL)***

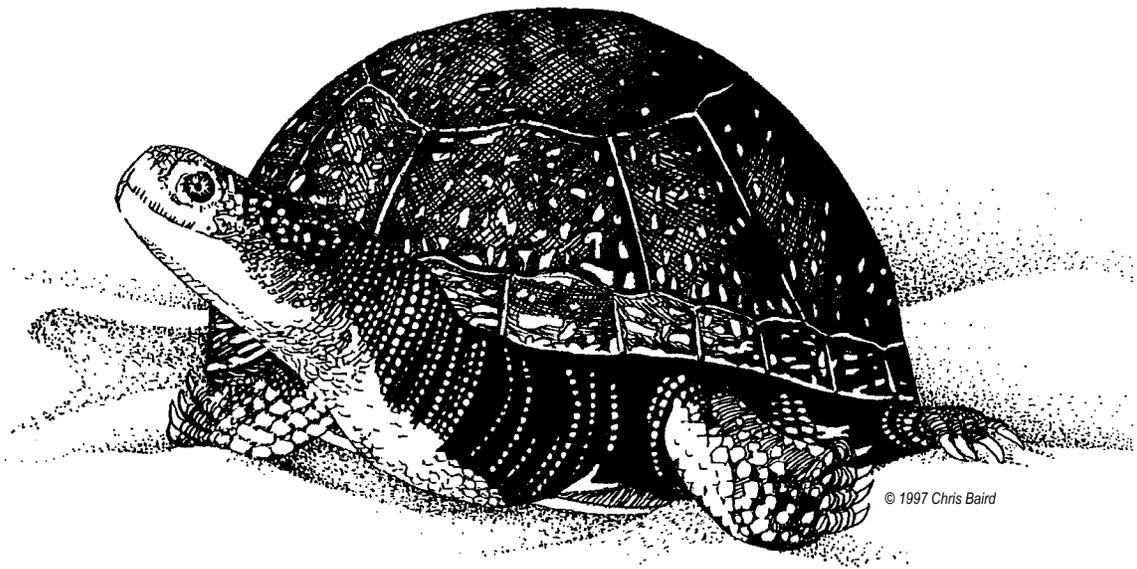
420 North 5th St., Suite 865

Minneapolis, MN 55401

Tel.: (612) 338-8494

Web Site: [www.tpl.org](http://www.tpl.org)

The Trust for Public Land is a national nonprofit conservation organization with its Midwest Regional Office in the Twin Cities. TPL specializes in the purchase of properties from willing sellers, with subsequent resale of the land to public agencies or nonprofit organizations for public open space use. TPL can assist local governments with identification of potential funding sources and financing for land acquisitions, can serve as interim title holder while a public agency procures the funds necessary for a purchase. And can help local governments and community groups to implement campaigns to mobilize support for natural areas and open space projects and their funding.



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## Reader's Notes

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**This publication was produced through the collective efforts of federal, state and local government agencies, local conservation organizations and citizen advocates.**