



Master Plan

Glacial Lake Grantsburg Properties Burnett Co, Wisconsin

Wildlife Areas

1. Crex Meadows
2. Fish Lake
3. Amsterdam Sloughs

January 2016
Wisconsin Department of Natural Resources
DNR PUB-LF-087



**Glacial Lake Grantsburg Properties
MASTER PLAN**

**Approved by the Natural Resources Board
January 2016**

Wisconsin Department of Natural Resources

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Cover photo - Crex Meadows Wildlife Area, Burnett County

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MAP E-SERIES*: AMSTERDAM SLOUGHS WILDLIFE AREA

MAP F: CREX-NAMEKAGON BARRENS PARTNERSHIP CORRIDOR

SERIES* MAPS INCLUDE THE FOLLOWING:

1 = DNR & OTHER LANDS

1A=AERIAL VIEW

2= EXISTING & PLANNED INFRASTRUCTURE

3= EXISTING LAND COVER

4= LAND MANAGEMENT CLASSIFICATIONS

CHAPTER 1: OVERVIEW OF PLAN AND PROPERTIES

Purpose and Management Authority

The purpose of this master plan is to guide management of the GLG properties towards fulfillment of an established Vision and Goals that will continue to provide high-quality natural resources, recreational experiences, and sustainable timber resources for present and future generations.

This plan builds upon the substantial foundation laid by previous master plans, wildlife program guidance, and habitat and biotic inventory work conducted over the last several decades. The planning process considered comments received during two public meetings (April 17, 2014 and July 7, 2015) and two 30-day comment periods, including involvement from the public, with partner agencies and interest from local officials. The Vision and Goals for the GLG properties are the foundation for the management objectives and prescriptions listed in Chapter Two.

Property master planning, governed by ch. NR 44 Wis. Admin. Code, is the process that determines how a property will be managed and developed. Administrative code specifies the general planning process and content of a master plan. Chapter four of this master plan, in combination with chapters two, three and five, collectively constitutes an Environmental Assessment (EA) for the GLG master plan. This EA meets the requirements of the Wisconsin Environmental Policy Act (WEPA) and Chapter NR 150 of Wisconsin Administrative Code. This code also establishes a uniform land management classification system to be applied in the master plan. By administrative code, the master plan is the controlling authority for all actions and uses on a property.

Wildlife Areas

Wildlife Areas are acquired and managed under the authority of Wis. Stat. s. 23.09 (2) (d) 3, and s. NR 1.51 Wis. Admin. Code. Wildlife Areas are designated to provide places where people can hunt, trap or fish. Wildlife Areas are also open for traditional outdoor uses of walking, skiing, snow shoeing, nature study, berry picking, and other low-impact recreational activities. As directed by s. NR 1.51 and s. NR 1.61, other recreational uses may be allowed by the master plan if those uses do not detract from the primary purpose of these properties.

State Natural Areas

State Natural Areas (SNAs) are managed under the authority of s. NR 1.32 Wis. Admin. Code, and 23.27 to 23.29 Wis. Statutes. SNAs are sites that protect outstanding examples of the state's native natural communities. They are areas that are essentially unaltered by human-caused disturbances or that have substantially recovered from such disturbances. SNAs are considered the state's best examples of native biodiversity. Protection and enhancement of these natural features will receive major consideration in management planning for SNAs; other recreational uses are permitted if they do not threaten these natural values.

The Glacial Lake Grantsburg Properties

Properties in this planning group are:

1. **Crex Meadows Wildlife Area** - northwest Burnett County, one mile north of Grantsburg. Embedded State Natural Areas (SNA) include:
 - Crex Sand Prairie SNA: 79 acres
 - Reed Lake Meadow and Barrens SNA: 3,568 acres
2. **Fish Lake Wildlife Area** - southern Burnett County, approximately six miles south of Grantsburg. Embedded State Natural Areas include:

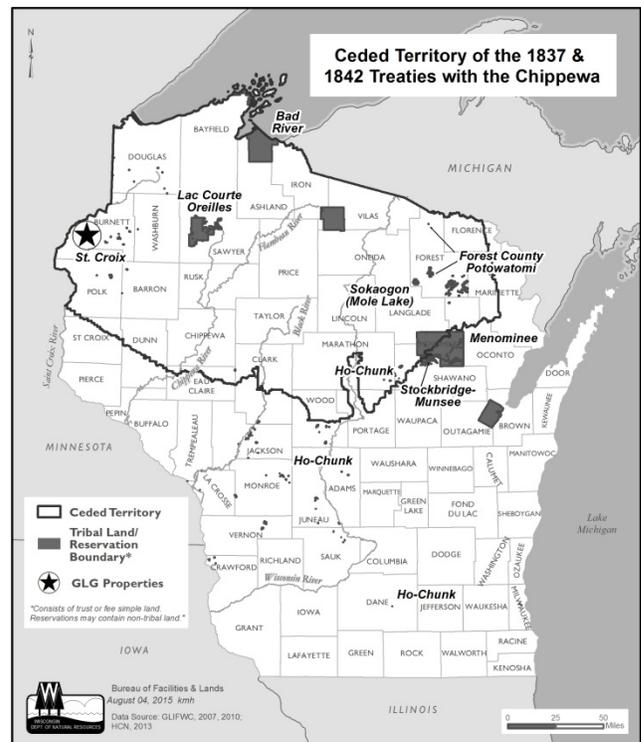
Property	Acreage
1. Crex Meadows Wildlife Area	28,553
2. Fish Lake Wildlife Area	13,609
3. Amsterdam Sloughs Wild. Area	5,483

- Fish Lake Pines SNA: 40 acres
 - Fish Lake Meadow SNA: 1,880 acres
3. **Amsterdam Sloughs Wildlife Area** - east of Crex Meadows in Burnett County, northwest (two miles) of Siren. Embedded State Natural Area includes:
- Blomberg Lake and Woods SNA: 966 acres

Tribal Resources on Ceded Territory

The Glacial Lake Grantsburg properties are within the ceded territory of the Ojibwe Tribes and are located near the Saint Croix Band of the Lake Superior Ojibwe, also known as the Chippewa. Prior to European settlement, Fox, Dakota, and Chippewa Tribes used the area extensively for hunting and gathering. Wildfires maintained the sedge marshes, Jack pine-scrub oak, and prairie savanna components of this barrens habitat.

Native American tribes remain independent, sovereign nations, as they were prior to the arrival of Europeans in North America. The Ojibwe Tribes ceded some lands in the northern one-third of Wisconsin to the United States Government in the Treaties of 1837 and 1842 (Appendix C). In those treaties, they reserved their rights to hunt, trap, fish and gather within various publicly-owned lands. Treaty rights are currently being exercised and implemented.



Significance of the Properties - History, Ecology and Conservation

The Glacial Lake Grantsburg (GLG) properties contain magnificent vistas inside a mosaic of **48,000 acres of wetlands and oak/pine barrens** within the St. Croix River watershed, in a predominantly remote setting in Burnett County.

Historically, the vast glacial lake for which this region is known, formed when the last advance of the Wisconsin glacier blocked the St. Croix River. After the ice dam melted, a series of shallow lakes and extensive marshes remained. This area contains some of the largest sedge marshes in the upper Midwest that provide critical open habitat for area-sensitive species. An impressive diversity of rare birds now exists due to the abundance of large, high-quality wetland habitats for which these properties are managed. Connection to open upland grasslands and barrens makes this one of the premiere open landscapes in the entire state for birds.

During the middle 1800's, European settlers began draining wetlands and logging, which eventually led to large scale commercial drainage, fire control, and large scale disappearance of species such as waterfowl, and cranes. The Crex Carpet Company became the major landowner (23,000 acres) in the region in 1912. They harvested sedge grass for the carpet and furniture industry, until bankruptcy caused by market changes (linoleum flooring) and the Great Depression. By the 1940's nearly two thirds of the land in the region was tax delinquent. Federal financing helped the state purchase tax delinquent lands to restore original wetlands and uplands as public wildlife areas. The state retained the name "Crex Meadows" for the wildlife area. Crex Carpet Co. had derived its name from the scientific name of the local sedges (*Carex*). Local people referred to the sedge marshes as 'meadows' and called them Crex meadows when they were owned by the carpet company.

These properties anchor the southern extent of the "barrens" that extend from northern Polk County to southern Bayfield County and covers 1,900 square miles (Map B). Now considered a rare ecological community of bountiful species diversity

and beauty, pine and oak barrens historically covered 7% of Wisconsin's landscape. This fire-adapted savanna system typically occurs on sandy, glacial outwash soil, dominated by grasses, low-growing shrubs and trees, and scattered large trees (Curtis 1959, WDNR 2015). The importance of this landscape for preserving species biodiversity cannot be overstated.

The oak/pine barrens community represented in the GLG properties is a rare, geographically restricted and globally imperiled habitat. In North America, pine barrens exist primarily in the upper Midwest, especially in Wisconsin, Michigan, and Minnesota. Pine barrens with similar vegetation in the northeastern United States are also globally rare, but are composed of an entirely different assemblage of species and completely lack the prairie plant component present in Wisconsin barrens communities. Wisconsin has the most significant (and possibly the best) opportunity in North America to preserve, restore, and manage large scale barrens communities (Curtis 1959, WDNR 2015).

There are five State Natural Areas and several Primary Sites on the GLG properties. The Natural Heritage Conservation program GAP analysis provides guidance on the number of State Natural Areas needed to meet the critical ecological reference area requirements for forest certification, ecosystem/species preservation, research, and education goals of the program. Natural Areas are generally open to fishing, hunting, trapping and other traditional outdoor activities.

Improved monitoring and control of invasive species will be a critical management activity. Control is a difficult task due to the tenacity of invasive species, the presence of multiple species on the properties, and the limited resources available to address this challenge.

Significance of the Properties - Recreation

The Glacial Lake Grantsburg properties are among the most popular and frequently visited DNR properties in Wisconsin, attracting visitors both from the Midwest and World-wide. Approximately 25% of visitors come to hunt, trap, and harvest berries, mushrooms, sage, and wild rice. During the 1980's, estimates were made that indicated Crex Meadows Wildlife Area received more than 120,000 visitors/year. DNR considers it one of its flagship properties in the top tier of public use and popularity. Most visitors come to view wildlife; thousands of hunters and trappers use the property. Popularity is attributed to spectacular vistas and great diversity and abundance of plants and wildlife. The wildlife education program conducts multiple outdoor skills programs each year. Programs that focus on hunting and trapping include Hunter Education, Learn to Hunts, basic archery, basic trapper education, advanced water trapping, and wolf trapper education programs. Additional courses include favorites such as snowshoeing, compass course, geocaching, forestry, and fire ecology; along with birdwatching, photography and Youth Conservation Camp activities. These are only a sample of the many recreation options. (See Appendix E)

A large percentage of visitors come to view the wildlife, oak/pine barren ecosystem and wetland landscape. Popularity is *international* in scope and is attributed to the large scale of spectacular, unobstructed vistas, a great diversity and abundance of plant and wildlife species, with a system of well-maintained roads (~90 miles township, county, & DNR), observation areas and rest areas. Recreational resources are used by an active resident base, and both in-state and out-of-state visitors, especially from the Minneapolis-Saint Paul metropolitan area. Maps A and B illustrate this regional landscape comprised of the Twin Cities, St Croix National Scenic Riverway, St Croix State Park, Interstate State Park and other public lands up to the Northern Great Lakes Visitor Center near Ashland. (Appendices E & F list additional recreation opportunities and infrastructure.)

Funds primarily from sales of Wisconsin hunting and trapping licenses, from the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act), and donations from the Friends of Crex contribute to the purchase and management of the GLG properties. The properties are protected by statutes and federal regulations that prohibit a state fish and wildlife agency from allowing recreational activities and related facilities that would interfere with the purpose for which the state acquired, developed, or is managing the land.

The properties provide an important recreational resource and economic benefit to the region. They are an integral component of an ecotourism corridor that exists from the Twin Cities, MN to Bayfield, WI. The Crex Meadows Wildlife Education and Visitor Center, supported in part by the [Friends of Crex](#), has well over 14,000 annual visitors; a mere subset of the *hundreds of thousands* of visitors who use these properties. Situated close to the town of Grantsburg, the center serves as a focal point for a large percentage of visitors from out-of-state, and provides a wide range of information. Crex Meadows

Wildlife Area and Fish Lake Wildlife Area are *significant* destinations for bird watchers (see Chapter Three). In Wisconsin, bird watching ranks second in the nation in popularity, with 1.7 million residents participating. Travel for the purposes of outdoor recreation is an integral part of the state's tourism industry and a key economic sector within this region. The Friends of Crex provides significant support and contributions for public awareness, education, and hands-on opportunities for recreation, conservation and enjoyment of the properties. There are endless opportunities for expanding these types of property uses.

Reduction in permanent staff stationed at Crex over the last several decades has negatively impacted the ability to conduct habitat management and maintenance activities on all GLG properties. Property staff increasingly relies on community involvement and partnerships and are grateful for the assistance.

The master plan recognizes that the ability to achieve the vision and goals for these properties will be realized only if the vision and goals are shared by the private landowners, local units of government, and other conservation organizations within the region. The plan provides for continued collaborations between the department and private landowners, local units of government, and a variety of conservation organizations to protect and manage the natural resources of the region.

Community Involvement and Partnerships

The Friends of Crex, Inc. established in 1984, is a dedicated volunteer group who serve as an informational resource for visitors and area landowners, with a vision of preserving the ecological integrity of the a GLG properties. It is a non-profit corporation that provides volunteer and financial assistance needed to support the wildlife education program and management goals of the GLG properties (Appendix B). The largest in the state of its kind, the Friends group established an endowment fund to provide perpetual funding to support education and management, including LTE positions, supplies and land purchases. For more information, visit [Friends of Crex, Inc.](http://www.crexmeadows.org) (www.crexmeadows.org).

The Village of Grantsburg is located directly adjacent to Crex Meadows Wildlife Area. As part of Grantsburg's recent revitalization process, Crex Meadows is recognized as one of the main assets and attractions of the community. The tag line "Start Here" is being used by the Grantsburg Revitalization Organization to highlight visitors' opportunities to explore the GLG properties and the other abundant natural resources the region has to offer.

The Northwest Wisconsin Concentrated Employment Program, Inc. (CEP) administers the **Crex Meadows Youth Conservation Camp**, an eight-week summer program of two-week sessions. This unique and popular program provides regional high school students a chance to earn science or elective credits towards graduation, while learning skills (trail maintenance, seed harvesting, bird banding, plant inventory) and earning a minimum wage working with DNR staff and CEP crew leaders. The program aims to build sustainable communities, while supporting education and the environment. Information is available from [CEP, Inc.](http://www.nwcep.org) or (www.nwcep.org).

Burnett County Forestry and the Crex-Namekagon Barrens Partners are considering an innovative project intended to incorporate priorities of the Burnett County Forest Fifteen Year Plan, the Northwest Sands Landscape Level Management Plan, DNR Wildlife Action Plan, Sharp-tailed Grouse Management Plan, NW Sands Habitat Corridor Plan, and DNR Land Legacy Report. Collaboration is intended to offset dwindling wildlife populations, benefit outdoor recreationists, better address established conservation goals, enhance local partnerships, and support the local timber industry. (see Appendix D)

Partners collaborate with DNR and may use forest management practices that create ecologically-based stepping stones of oak/pine barrens habitat to link wildlife habitat from Crex Meadows Wildlife Area to Namekagon Barrens Wildlife Area. Working together, the goal is to improve wildlife species abundance and diversity representative of barrens habitats, by connecting the remaining habitat fragments that are otherwise too small to support long-term species survival.

These proactive steps may prevent future federal management actions for species recovery. While management at Crex supports barrens wildlife such as sharp-tailed grouse and upland sandpiper, their spiraling population decline is likely caused by deteriorating habitat quantity and quality on surrounding lands, with the result being an inability of these lands to provide

demographic or genetic support for the Crex subpopulation. Reconnecting sharp-tailed grouse subpopulations to insure their presence into the future requires their movement between areas to allow genetic exchange. The sharp-tailed grouse is an umbrella species. Management practices that ensure their survival will also conserve the full range of wildlife species associated with the barrens ecological landscape, including American woodcock, golden-winged warblers and whip-poor-wills, and possibly prevent federal listing of these species that are experiencing a significant population decline.

Public Lands: An Investment in Wisconsin's Future

Wisconsin is known for its abundant natural resources, for the value our citizens place on the rich traditions of hunting, fishing, trapping, camping and hiking, and for the ease of access to recreational land and wild places for everyone who lives here, including those who live in our largest metropolitan areas. We are defined by our clean lakes and rivers, vast forests, and abundant fish and wildlife. Conserving these resources is not an expense, but an investment that pays many dividends, both economic and social. A University of Minnesota study found that for every \$1 invested in conserving natural areas in that state, there is a return of up to \$4 (MEP 2011). Although similar data are not available for Wisconsin, one can imagine that a similar return of \$4 on each \$1 investment in public land in Wisconsin is quite possible.

The State of Wisconsin manages about 1.6 million acres of publicly-owned forests, barrens and savannas, grasslands, wetlands, shrublands, streams and lakes. Most of these lands are open to hunting, fishing, trapping, hiking, cross-county skiing, wildlife watching, and other outdoor, nature-based recreation. The economic impact of fishing, hunting and wildlife watching in Wisconsin is considerable. According to the 2006 National Survey of Fishing, Hunting and Wildlife-Associated Recreation, Wisconsin report (USFWS 2008), a total of 2.9 million residents and non-residents aged 16 years and older fished, hunted and/or watched wildlife in Wisconsin in 2006, spending \$3.7 billion in the process.

Nearly 1.39 million anglers spent 20.8 million days fishing in 2006, accounting for \$1.66 billion in retail sales and \$2.75 billion in overall economic output. This generated \$196 million in state and local taxes and provided 30,000 jobs (Southwick Associates 2007a). Nearly 700 thousand hunters spent 10 million days hunting in 2006, accounting for \$1.39 billion in retail sales, \$2.19 billion in overall economic impact, and generating \$197 million in state and local tax revenue and 25,000 jobs (Southwick Associates 2007b). Wisconsin's \$12 billion/year tourism industry (TFW 2012) and \$23 billion/year forest industry (WDNR 2009) are inextricably linked to abundant natural resources and a vibrant public land base. All DNR-managed lands have been certified as sustainable by two separate third-party audit firms, indicating that these lands meet the social, ecological, and economic rights and needs of the present generation without compromising those of future generations. All timber harvested from state lands can be marketed as sustainable and therefore has an enhanced value.

Even those citizens who do not engage in hunting, fishing, hiking, camping, or other outdoor activities on public lands have a reason to value them. These lands provide "ecosystem services" that improve our quality of life in various ways. Ecosystem services are conditions or processes associated with natural ecosystems that provide benefits to humans.

For example, land conservation protects human health by keeping our drinking water clean and is a cost-effective tool in protecting water quality. A growing understanding of the role that forests and natural lands play in filtering pollutants and maintaining water quantity and quality has led many municipalities and water suppliers, particularly those in growing communities, to consider land protection as part of a multiple-barrier approach to providing safe drinking water. A study conducted by the Trust for Public Land and the American Water Works Association showed that forestland in particular greatly reduces the cost of treating drinking water. For every 10 percent increase in the source area's forest cover (up to 60 percent), treatment and chemical costs decreased approximately 20 percent (Ernst 2004).

Wetlands provide natural flood insurance by acting as sponges, storing rain that runs off the land and slowly releasing it to the atmosphere, groundwater, and adjacent lakes, rivers and streams. Strategic wetland protection and restoration can help reduce flood peaks and damage, protect human health and safety, and reduce the need for expensive projects such as levees, detention ponds, and the reconstruction of flood-damaged roads.

Ingraham and Foster (2008) estimated the value of some of these basic ecosystem services. They calculated an economic value for the wildlife habitat, carbon sequestration, disturbance prevention (e.g., flood control), freshwater management and

supply, nutrient regulation, and waste management provided by USFWS National Wildlife Refuges in the contiguous United States. The value of services provided by forests, shrublands, grasslands, and wetlands amounted to \$2,900/acre/year. Using this approach, Wisconsin's public lands provide a total return of \$3.33 billion/year or \$2,400/acre/year (Table 1-1).

Table 1-1. Estimated Annual Value of Ecosystem Services Provided by WDNR-owned Lands.

	Dollars/acre*	WDNR-owned acres	Value
Forests	\$1,014.27	879,898	\$892,454,144
Shrublands	\$660.13	121,928	\$80,488,331
Grasslands	\$61.67	160,211	\$9,880,212
Wetlands	\$10,608.43	221,522	\$2,350,000,630
Total		1,383,559	\$3,332,823,318

Our wild lands also provide a cultural and historical connection to who we are and where we've been. They provide a sense of place in the landscape and are important habitats for people. They include historic and archaeological sites, scenic views, water access, bridges and more. Trails, for example, are links to our natural resources. They play an important role in providing access to the outdoors for people with varied physical abilities, support environmental education, and build a public commitment to environmental conservation.

The majority of Americans agree that preserving undeveloped land for outdoor recreation is important (Outdoor Foundation 2011). Lack of access to, and consequent lack of interest in nature, keeps kids from experiencing the outdoors, leading to a growing disparity between the time children spend indoors wired to technology and the time they spend outside enjoying nature (TNC 2011). Evidence suggests that children and adults benefit so much from contact with nature that land conservation can now be viewed as a public health strategy (Frumkin and Louv 2007).

It can be difficult to weigh the ultimate value of purchasing, conserving, and managing public land in Wisconsin. Upfront costs are obvious and immediate, while benefits are usually long-term and may seem vague by comparison. However, in addition to dollars and cents, land conservation also should be measured in the currency of recreation, environmental benefits, connections to nature, and land health. Expenditures for public land conservation and management are best understood not as a cost but as an investment that will pay dividends, including economic ones, long into the future (Gies 2009). Likewise, the land acquisition and management strategies outlined in this master plan will pay commensurate dividends to the region and its residents, long into the future.

Chapter 2: Management, Development and Use

This chapter contains three sections of instructions to achieve an overarching vision and goals:

Section One provides universal management elements for state properties, that apply to all GLG properties.

Section Two contains a brief description of the individual properties followed by property-specific management elements.

Factors considered when developing the management objectives and prescriptions include habitat distribution and quality, habitat needs of species of greatest conservation need, game species life cycle requirements, recreational use and trends, land use patterns and trends, and public input.

Vision Statement

The Glacial Lake Grantsburg properties are a vital contributor to the preservation of oak/pine barrens, a rare and globally imperiled natural community, in the Northwest Sands Ecological Landscape. These properties provide abundant hunting, trapping, gathering, wildlife watching and educational opportunities. The abundance and diversity of wildlife, including rare bird species that inhabit this landscape attracts an international constituency who appreciate not only the wildlife, but also the grand scale of wetlands and oak/pine barrens found here. The Crex Meadows Wildlife Conservation Education Program, supported in part by The Friends of Crex, enhances public appreciation and support for wildlife and wildlife management for current and future generations.

Goals

- Provide abundant recreational opportunities for hunting, trapping, gathering, wildlife viewing, scenic enjoyment, and other nature-based uses that are compatible with the property's capabilities and habitat management goals.
- Restore, manage and perpetuate wetland and oak/pine barren habitats to support property and ecological landscape habitat and ecological management goals.
- Maintain and enhance ecological connectivity between aquatic and terrestrial communities, and on a landscape scale, promote their sustainability in association with other nearby town, county, state, federal and tribal lands.
- Provide high quality habitat for wildlife species that are dependent on wetlands and oak/pine barrens.
- Manage the properties using principles of ecosystem management and sustainable forestry.
- Contribute to the local and regional economies through management of wildlife recreational opportunities and sustainably produced forest products.
- Provide a wildlife conservation education program that generates a land and wildlife ethic into perpetuity.

Section 1: Universal Elements for All Properties

Resource Management by Land Management Classifications

Management of these properties is generally described by a specific land management classification (per NR 44 Wis. Admin. Code) that describes the primary management objectives for a property or management unit within a property. These classifications are determined during the master planning process and help identify the preferred set of actions to achieve short and long-term objectives. Only management activities or techniques identified or referenced in this master plan and compatible with the site's ecological capability may be pursued in these management areas. Property parcels purchased after master plan approval will be classified and managed according to the surrounding land management areas, unless specified by DNR Board 'green sheet' materials. If different interests warrant another classification, a master plan amendment will be pursued.

The Glacial Lake Grantsburg properties combined have ten land management areas, with four Land Management Classifications. Those classifications are as follows:

Habitat Management Area (NR 44.06(5)) - The primary objective for this classification is to provide integrated upland, wetland and/or aquatic habitat management that supports a variety of plant and animal species. Typically the emphasis is to provide habitats needed to sustain productive game species populations. Although the production of forest products is not the primary focus, harvesting of forest products will occur at some locations. Areas that initially do not have desired habitat conditions, but have a high potential to be restored may be included under this classification.

Native Community Management Area (NR 44.06(6)) - Native Community Management areas are managed to perpetuate pre-settlement plant and animal communities, whether upland, wetland or aquatic, and protect the biological diversity of the native ecosystems. A Native Community is a distinct and reoccurring assemblage of indigenous flora and fauna associated with similar physical settings. Areas that initially do not have the desired community conditions, but have a reasonable potential to be restored may be included in this classification. All of the traditional recreational uses, such as fishing, hunting, trapping and nature enjoyment are allowed on the Native Community Management Areas, except if the area needs to be closed during breeding season or to protect a very fragile habitat.

Recreation Resources Management Area (NR 44.06(8)) with **Type 3 Recreational Use Setting** sub-classification (NR 44.07(6)) - This classification provides and maintains land areas and facilities for outdoor public recreation or education. An area designated as a **Type 3 Recreational Use Setting** shall be managed to provide readily accessible areas with modest recreational facilities offering opportunities at different times and places for a variety of dispersed recreational uses and experiences. Facility development shall be simple and provide a modest level of user conveniences.

Special Management Area (NR 44.06(7)) - This designation is to provide and maintain areas and facilities for special uses not included under other land management classifications, such as administrative or service facility areas, and cultural use areas.

Table 2-1 lists ten management areas for the GLG properties, including acreage, and the four land management classifications.

Table 2-1 Land Management Classifications for GLG Properties		
Acres	Classification (% of total)	Area #
Habitat Management Areas (98%)		
28,993	Crex - Barrens and Wetlands*	1
13,609	Fish Lake - Barrens and Wetlands*	5
4,199	Amsterdam Sloughs - Barrens and Wetlands*	8
Native Community Management Area (1%)		
43	Fish Lake Pines	6
966	Blomberg Lake and Woods	9
Recreation Management Area (0.2%)		
51	Crex Rest Area	2
160	Crex Dog Training Area	3
Special Management Areas (0.04%)		
31	GLG Headquarters & Special Events (Crex)	4
12	Cemetery Buffer (Fish Lake)	7

** Includes designated State Natural Area*

Universal Objectives and Prescriptions

The following universal objectives, prescriptions and management actions that support them apply to all the GLG properties. Additional management objectives and prescriptions for specific habitats and management areas on individual properties are included by individual property, in Section 3 of this chapter. Universal objectives and prescriptions will be applied contingent upon availability of staff and material resources, or modified as needed to respond to unpredictable or catastrophic events (e.g., storm damage or severe insect/disease infestations).

Vegetation Management Actions

The primary management actions used to implement the objectives and prescriptions in the actively managed portions of the GLG properties are water level manipulations and land management. Land management will maintain a diversity of cover types and age classes for forest health, wildlife habitat and aesthetic appeal. This will be accomplished through different management approaches, depending on habitat type, site-specific goals and recreational or aesthetic considerations.

Management actions include:

- Mechanical (e.g., mow, brush, bulldoze) or manual (e.g. cut, pull) control
- Chemical control of vegetation or pests using approved products and application techniques.
- Bio-control measures may be used as deemed appropriate, safe and effective.
- Commercial timber harvests, including biomass harvests that follow approved Wisconsin Biomass Harvesting Guidelines, and firewood permits.
- Seeding or planting native woody and herbaceous species for forest regeneration and barrens management.
- Prescribed burning.

- Plant crops to provide supplemental wildlife forage, public wildlife viewing and hunting opportunities at suitable habitat management locations.
- Water level manipulations at flowages and impoundments to manage wetland vegetation.

Wildlife management tools that may be used include:

- Use of nest boxes, platforms or similar devices to enhance reproduction of desired wildlife.
- Beaver and muskrat population control.

Invasive Species Actions

The threat of exotic and/or invasive species, including plants, animals, insects and diseases represent a significant and growing threat to our native plant and animal communities. To address this concern, invasive species inventory, monitoring and control actions shall be included in the annual property planning for each property. Inventory, monitoring and control efforts shall follow the guidance provided in the Department's *Property Managers Handbook* and reference the DNR website www.dnr.gov key words: invasives, control, and by the Invasive Plants Association of Wisconsin (<http://www.ipaw.org>). Also refer to invasive species Best Management Practices (BMPs) for forestry, recreation, urban forestry, and rights-of-way, developed by the Wisconsin Council on Forestry (<http://council.wisconsinforestry.org/>).

Priority activities include:

- Monitor properties to detect new infestations and target these for rapid response. Annual property-wide inspections are ideal, but not always practicable. At a minimum, annual inspections should be conducted at entry points such as trails, roads, waterways, rights-of-way, and areas where soil has been disturbed.
- Control new or existing invasive species as practicable, using manual, mechanical and chemical vegetation management methods noted above. Mowing should be timed to avoid dispersal of invasive plant seeds and mowing equipment should be cleaned as appropriate.
- Monitor control activities to assess effectiveness and determine if follow-up is needed.

Invasive plant species are generally restricted to trails, roadsides, and low quality habitats, although a few are well-established in some areas of the GLG. Many of the high-quality areas and areas managed for wildlife habitat are not heavily infested. Invasive plant species that are widespread on the GLG and have the greatest impact to native species diversity, rare species habitats, or high-quality natural communities are:

1. spotted knapweed (*Centaurea biebersteinii*)
2. reed canary grass (*Phalaris arundinacea*)
3. common reed grass (*Phragmites australis*)
4. Canada thistle (*Cirsium arvense*)
5. purple loosestrife (*Lythrum salicaria*)
6. leafy spurge (*Euphorbia esula*)
7. narrow-leaved cat-tail (*Typha angustifolia*)

Informing property users of required and voluntary actions will help slow the spread of aquatic and terrestrial invasive species. Examples include cleaning and disinfecting boats and equipment; not transporting live fish or spawn away from their indigenous waters; not transporting bait species between water bodies, not using *Phragmites* and narrow leaved cat-tail in waterfowl blinds, and hunters/hikers cleaning boots and clothing to reduce the spread of seed.

Universal Outreach Actions

Staff and volunteers collaborate to inform, educate and share information with users and private landowners, especially on parcels adjacent to department properties, as time and resources allow. Outreach priorities include:

- Monitoring and control of invasive species.
- Habitat management to protect/enhance critical habitat for game species, and Endangered, Threatened and Species of Greatest Conservation Need.
- Using community partnerships to advance the GLG Vision and Goals.

Management by Habitat and Forest Type

The department uses several habitat classification systems when planning and performing management activities. The two systems used in this plan are natural communities and forest cover types. Each has a different purpose, function, and scale. The natural community system is broader and ecologically defined, based on assemblages of plant and animal species that are repeated across the landscape in an observable pattern. It is a particularly useful tool for identifying interconnected, functional natural elements. The forest cover type system was developed as a forest management tool, used to identify and apply management to different timber types and other types of vegetation. Specifically, a forest stand is designated as a certain cover type if $\geq 50\%$ of its basal area is dominated by a particular tree species. Sites with $< 10\%$ trees are considered non-forested and are classified (e.g., grassland, lowland brush, etc.) according to the predominant vegetation present. Forest reconnaissance data are collected using these cover types, and are stored in the Wisconsin Forest Inventory & Reporting System (WisFIRS).

A forest cover type system focuses on specific vegetation types and is useful for directing and carrying out vegetation management activities. However, both natural communities and the forest cover types are essential components in planning and management to assure that the overall integrity and function of managed resources are maintained.

The **Vision and Goals** listed above for the GLG properties include two land management principles that provide a framework for the resource management provisions in this chapter:

- Maintain, restore, and enhance the oak/pine **barrens** at a landscape scale to benefit wildlife species.
- Maintain, restore, and enhance the quality and extent of open **wetlands** to benefit wildlife species.

The barrens and wetlands management objectives and prescriptions below apply to all properties covered under this plan. Additional site-specific objectives and prescriptions are included in section two of this chapter.

Barrens

The pine/oak barrens natural community type is considered imperiled globally because of rarity, as defined by the Wisconsin Natural Heritage Inventory Program. This community is typically characterized by scattered jack pines, or less commonly, red pines, sometimes mixed with northern pin and bur oaks. Scattered trees or groves are interspersed with openings in which shrubs such as hazelnuts, sand cherry, and prairie willow are prominent, along with prairie grasses and forbs. The ground layer often contains species characteristic of "heaths", such as blueberries, bearberry, and sweet fern. Other characteristic plants include dry sand prairie species (June grass, little bluestem, silky and azure asters, lupine, blazing-stars, and western sunflower).

This description of a barrens community highlights the critical early stages of open barrens habitat, regardless of the size and age of the trees present. A late stage barrens community made up of mature northern pin oak and jack pine can be viewed as a forest community. However, in the Northwest Sands Ecological Landscape, it is a late stage barrens habitat waiting to renew its life cycle. It is in the early stages of development that a barrens community serves its most ecologically important function by providing critical habitat for many area-sensitive species. This early barrens habitat is the globally impaired habitat on which many species depend.

Wisconsin's Comprehensive Wildlife Action Plan (2005) identifies 28 vertebrate Species of Greatest Conservation Need (declining in Wisconsin and or throughout their range) as moderately or significantly associated with pine barrens. Numerous invertebrate species are also dependent on this community type including the federally endangered Karner blue butterfly, the state endangered phlox moth, and the state threatened frosted elfin. Barrens openings provide habitat for many game species such as white-tailed deer, American woodcock, wild turkey and sharp-tailed grouse.

Land management in areas of oak/pine barrens primarily focuses on simulating the natural disturbances that historically functioned to maintain structure and diversity in these communities.

Objectives

- Maintain, restore, and enhance the ecological function of the Northwest Sands barrens community by providing a core of early successional barrens habitat.
- Manage barrens as a shifting mosaic of habitat by following the principles and general framework described in the [Northwest Sands Habitat Corridor Plan](#) (Reetz et. al, 2013).
- Protect, maintain, and increase barrens ground layer vegetation with specific emphasis on rare plants.
- Protect and maintain wildlife associated with barrens habitat, with specific emphasis on rare birds, herptiles and invertebrates.
- Support Karner blue butterfly (Kbb) recovery objectives based on delisting goals stated in the Federal Recovery Plan (USFWS 2003) and the Karner Blue Butterfly Habitat Conservation Plan (HCP) (WDNR 2010b).
- Promote large savanna legacy trees, focusing on bur oak and jack pine, to provide savanna structure, mast crops and seed trees.

A Barrens Partnership Corridor – see Appendix D
Regional partners such as Burnett County Forestry, Steigerwaldt Land Services, and conservation groups may voluntarily collaborate with DNR and use forest management practices to create stepping stones of habitat that link wildlife sub-populations from Crex Meadows Wildlife Area to Namekagon Barrens Wildlife Area. Working together, the goal is a landscape scale effort to prevent further loss and improve wildlife species abundance and diversity representative of oak/pine barrens habitats, by connecting fragments that are otherwise too small to support long-term species survival.

Partners have the flexibility to create five habitat patches (stepping stones), approximately three miles apart and possibly use long-term lease or conservation easement options to preserve core barrens patches. If partners choose, specific land agreements may be determined for each core through partner consultation with landowners. The corridor was determined based on ecological landscape attributes (Reetz et al) for habitat restoration potential.

Prescriptions

- The property manager shall develop an annual barrens management fire plan for the GLG properties, developed in consultation with area biologists, foresters and NHC staff.
- Develop and maintain structural diversity including open treeless areas, shrub savanna, savanna, near-closed and closed canopy woodlands of jack pine and/or oak.
- To provide optimal wildlife habitat: maintain, enhance, and expand oak/pine barrens and retain aspen where practicable and it does not conflict with other property objectives, to benefit both common wildlife species such as ruffed grouse, American woodcock, and white-tailed deer and uncommon species such as golden-winged warbler, and black-billed cuckoo.
- Enhance and create open areas with commercial timber harvesting (including biomass), mechanical brushing, prescribed burning, and selective use of herbicides.
- Coordinate barrens management with regional partners. Follow the principles and general framework described in the [Northwest Sands Habitat Corridor Plan](#) (Reetz et. al, 2013).
- Manage consistent with existing (and future) federal recovery goals for Wisconsin Kbb population at Crex Meadows and Fish Lake wildlife areas (USFWS 2003).
- Maintain and increase as feasible, the property carrying capacity for Kbb through habitat improvement.
- Retain scattered large oaks and pines to serve as savanna legacy trees.
- When harvesting timber, implement large regeneration/conversion harvests where possible, to mimic natural disturbance patterns.

Wetlands

Wetlands, primarily unforested types, including extensive sedge marshes, deep-water marshes, alder thickets, wild rice and flowages, together cover **over half of all the GLG properties**. Emergent marsh areas have persistent to permanent water typically with low flow. The habitat type is dominated by both emergent and submergent vegetation. Some of the common species present often include wild rice, cattail, Bulrush, burr reed and water lilies. These wetlands are permanent or maintained through the use of a combination of berms, dams, or other water control structures for flexibility to artificially manipulate seasonal water levels.

Wetland forests also exist on the GLG properties. Swamp conifers, which contain tamarack and black spruce or in other areas are dominated by swamp hardwoods consisting primarily of black ash, green ash and red maple.

Objectives:

- Maintain and restore the hydrology, extent and quality of the sedge meadow, emergent marsh and deep water marsh community types on all sites where they occur, for benefit of common species such as mallard, blue-winged teal, wood duck, trumpeter swans, beaver, muskrat, otter; for uncommon species such as king rail, American bittern, least bittern, black tern, willow flycatcher, and sharp-tailed grouse; and for migratory species such as shorebirds, water birds, and passerines.
- Provide maximum wildlife benefits on wetlands, particularly habitat for waterfowl nesting, brood rearing, and migratory stopover.
- Protect and enhance avian and herptile nesting opportunities.
- A Wild Rice Advisory Committee (DNR, tribal representatives, stakeholders) serves as the resource for guiding wild rice management. (see Crex Meadows wild rice in Section 3 of this chapter)
- Merchantable timber forest stands on wetlands may be regenerated using limited harvest activities, following guidelines outlined in the DNR Silviculture and Forest Aesthetics Handbook.
- Maintain swamp hardwood forest health and protect wetland water quality from Emerald Ash Borer (EAB) as practicable, using alternative management strategies outlined by DNR Forestry management guidelines for EAB.

Prescriptions:

- The property manager shall maintain a detailed Water Management Plan for the GLG dikes and water control structures, and update it as needed.
- Timber harvests will only be conducted under frozen ground or very dry conditions, using techniques and equipment that prevent rutting.
- Remove woody vegetation in areas undergoing conversion from open sedge meadow to shrubs and brush, using prescribed fire, mechanical mowing, and herbicide.
- On sites dominated by monotypic stands of *Phragmites* or reed canary grass, where feasible use prescribed fire, mowing, and herbicide treatment.
- Include prescribed fire to maintain the health of vegetative communities.
- Seasonally manipulate water levels on flowages to mimic natural fluctuations that improve and enhance waterfowl use and improve shorebird habitat, to benefit wetland floral and faunal communities, and facilitate vegetative management practices. Conduct periodic partial and/or complete drawdowns as needed to promote the resurgence of desirable wetland species like smartweeds (*Polygonum spp.*), arrowheads (*Sagittaria spp.*), and bidens (*Bidens spp.*) and to provide stopover habitat for migratory shorebirds.
- Maintain approximately 300 prairie potholes to provide breeding pair ponds for waterfowl.
- Wetland vegetation may be enhanced through planting as practicable (e.g. wild rice, bidens), when existing seed banks are insufficient.
- Maintain existing dikes (e.g. mow, patch, control invasive species) and water control structures, with major maintenance on approximately 20-30⁺ year rotations. Structures may be removed where deemed necessary after evaluation and consultation.

- Utilize timber sales adjacent to large sedge meadows to create open vistas. To preserve the viewshed and enhance habitat for species that depend on open habitat, avoid leaving buffer strips of trees along wetland edges.
- Control beaver and muskrat populations to mitigate dike damage and damming of control structures.
- Inventory and monitor herptile populations to document and evaluate their habitat needs. Implement appropriate management actions to support herptile populations, using plan variance if necessary.

Forested Habitats

Objectives:

The primary management objective for forest habitat is to manage for early successional forest found within barrens habitat for the benefit of species that depend on open habitats like sharp-tailed grouse and grassland nesting birds. A secondary objective on these properties is to manage forest habitat compartments to provide optimal forest wildlife habitat throughout the rotation cycle that produces sustainable forest products. Jack pine is a species in decline and acreage should be maintained or increased in areas outside of burn units. The DNR Silvicultural Handbook will be used as a management guide.

All forest management activities, except for site-specific exceptions, follow the guidelines in the *WDNR Silviculture and Forest Aesthetics Handbook* (2431.5), *Public Forest Lands Handbook* (2460.5), *Timber Sale Handbook* (2461), and *Old-growth and Old Forests Handbook* (2480.5). Consult these handbooks for additional details and management considerations (<http://dnr.wi.gov> key words forest handbook). Handbooks provide silvicultural guidance that applies to all forest properties owned by the Department of Natural Resources (DNR), all county forest lands as specified in the comprehensive county forest land use plan, and private forest tax law lands.

The general forest prescriptions and the more specific prescriptions listed below are for the principle forest types found throughout the GLG (see land cover maps). These prescriptions include an overview of the general management methods and guidance from the *Silviculture Handbook* and some additional considerations to be applied to this group of properties. **These prescriptions are used to manage toward the land cover objectives as noted in the current and projected forestry-based cover tables for the management areas listed in section 2 of this chapter.**

Prescriptions – General Forestry:

- Require loggers to utilize established best management practices for all aspects of conducting timber harvest and removal. (e.g. *Best Management Practices for Water Quality*, FR-093)
- Retain snags and coarse woody habitat whenever their retention does not conflict with other management objectives or pose a danger to loggers.
- Leave long-lived reserve trees as individuals or in groups to provide timber, wildlife, and aesthetic value when retention does not conflict with regeneration and other forest management objectives.
- Conduct timber sales earlier than standard rotation timelines, when site objectives are compatible.
- Salvage trees damaged by wind, ice, fire, insects, and disease as long as the salvage meets the overall objectives for the site and is economically feasible.
- Maintain site hydrology for lowland forest types (bottomland hardwood, swamp hardwood, tamarack); restore where feasible.
- Use intermediate forest treatments, such as release or crown thinning, where appropriate to develop young stands or improve composition (e.g., oak).
- Follow Wisconsin's Forestland Woody Biomass Harvesting Guidelines when conducting forest management where biomass harvesting is compatible with site objectives. Exceptions to the biomass guidelines may be used if they fit the site objective.

Prescriptions – By Species on GLG Properties:

When creating ‘stepping stones’ or rolling patches of barrens habitat, do not follow the Green Tree Retention Guidelines or other standard Silviculture guidelines that create viewshed barriers. Create open vistas when managing for area sensitive species that prefer open habitats.

1. Aspen: use coppice harvest at approximately 50 years, with earlier treatment for lower quality stands to regenerate. Allow some quality stands to mature 60+ years before harvest. Maintain a variety of age classes and stand sizes to benefit a variety of wildlife species. Manage some areas for young forests using 30-year rotation to promote the benefits of young forests for a variety of wildlife. Manage large cuts for early successional barrens when adjacent to barrens. On remote island or edges of flowages, modify standard management or apply no management, based on accessibility. When promoting barrens habitat, mowing, prescribed fire, herbicide use or other methods may be used to reduce aspen prevalence.
2. Scrub Oak: cut at a rotational age of 50 – 60 years to regenerate scrub oak stands. In higher quality stands, rotational age may be extended out to 80 – 90 years. In areas not managed for early successional barrens, convert some oak to jack pine to offset jack pine decline. In stands mixed with aspen promote aspen for its value as a young forest. When promoting barrens habitat, prescribed fire, brushing, mowing and herbicide use will be used to maintain an early successional stage oak forest.
3. Jack Pine: manage through commercial timber harvest. Regenerate through combination of natural seed sources, tree planting, and using various site preparation methods, including mechanical and herbicide. Retain sentinel jack pines where possible, for aesthetic purposes, and maintain or increase jack pine outside of burn units. In the area of the 1980 Ekdahl Church fire, manage for age diversity and regenerate some stands early to promote a variety of age classes for wildlife.
4. White Pine: maintain naturally occurring stands and manage through selective harvest. Regenerate stands predominantly through natural reproduction, although site preparation, seeding or planting may be used. Manage for rotations of 100-160 years. Thin to maintain health and vigor throughout rotation. Allow some trees to live over 200 years in areas protected from fire. Maintain presence in forests for aesthetics and size diversity.
5. Red Pine: maintain naturally occurring stands. In plantations, use selective thinning through rotation age, to convert the plantation to surrounding cover types, favoring jack and white pine. Allow some natural regeneration during plantation phase-out. When mixed with jack pine, manage for jack pine and maintain a few red pines for sentinel trees and age/size diversity.

Recreation Management on GLG Properties

The Glacial Lake Grantsburg properties are among the most popular and frequently visited DNR properties in Wisconsin. Approximately 25% of visitors come to hunt, trap, and harvest berries and wild rice. During the 1980’s, estimates were made that indicated Crex Meadows Wildlife Area received more than 120,000 visitors/year. DNR considers it in the top tier of public use for all properties. Most visitors come to view wildlife, and thousands of hunters and trappers use the property. Popularity is attributed to spectacular vistas and great diversity and abundance of plants and wildlife. The wildlife education program conducts multiple outdoor skills programs each year. Programs that focus on hunting and trapping include Hunter Education, Learn to Hunts, basic archery, basic trapper education, advanced water trapping, and wolf trapper education programs. Additional courses include favorites such as snowshoeing, compass course, geocaching, forestry, and fire ecology; along with birdwatching, photography and Youth Conservation Camp activities. These are only a sample of the many recreation options. (See Appendix E)

Close to 75% of visitors come to view the wildlife, oak/pine barren ecosystem and wetland landscape. Popularity is *international* in scope and is attributed to the large scale of spectacular, unobstructed vistas, a great diversity and abundance of plant and wildlife species, with a system of well-maintained roads (~90 miles township, county, & DNR), observation

areas and rest areas. Recreational resources are used by an active resident base, and both in-state and out-of-state visitors, especially from the Minneapolis-Saint Paul metropolitan area. Maps A and B illustrate this regional landscape comprised of the Twin Cities, St Croix National Scenic Riverway, St Croix State Park, Interstate State Park and other public lands up to the Northern Great Lakes Visitor Center near Ashland. (Appendices E & F list additional recreation opportunities and infrastructure.)

Funds primarily from sales of Wisconsin hunting and trapping licenses, from the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act), and donations from the Friends of Crex contribute to the purchase and management of the GLG properties. The properties are protected by statutes and federal regulations that prohibit a state fish and wildlife agency from allowing recreational activities and related facilities that would interfere with the purpose for which the State acquired, developed, or is managing the land.

The properties provide an important recreational resource and economic benefit to the region. They are an integral component of an ecotourism corridor that exists from the Twin Cities, MN to Bayfield, WI. **The Crex Meadows Wildlife Education and Visitor Center**, supported in part by the [Friends of Crex](#), has well over 14,000 annual visitors; a mere subset of the *hundreds of thousands* of visitors who use these properties. Situated close to the town of Grantsburg, the center serves as a focal point for a large percentage of visitors from out-of-state, and provides a wide range of information. Crex Meadows Wildlife Area and Fish Lake Wildlife Area are *significant* destinations for bird watchers (see Chapter Three). In Wisconsin, bird watching ranks second in the nation in popularity, with 1.7 million residents participating. Travel for the purposes of outdoor recreation is an integral part of the state's tourism industry and a key economic sector within this region. The Friends of Crex provides significant support and contributions for public awareness, education, and hands-on opportunities for recreation, conservation and enjoyment of the properties. There are endless opportunities for expanding these types of property uses.

The department is committed to providing exceptional outdoor recreation opportunities for people of all abilities. All new construction and renovation of infrastructure will follow guidelines set forth within the Americans with Disabilities Act and consistent with NR 44 Wis. Admin. Code standards for land use classification, at the site where the development is located. The property manager has the authority to make reasonable accommodations for people with disabilities, consistent with the requirements of the area's land use classification. Property managers may also allow the use of power-driven mobility devices (PDMDs) on trails consistent with federal law for PDMDs located in 28 CFR s. 35.137.

All department-owned lands within wildlife areas and state natural areas are open to traditional outdoor recreational uses, including fishing, hunting, trapping, walking, and nature study; however, wildlife refuges are usually closed to all entry unless otherwise stated, and fish refuges closed to entry during fish spawning periods, (s. NR 1.61 Wis. Admin. Code). Asparagus berry, and mushroom picking and nut-gathering are also permitted.

The **Vision and Goals** listed above for the GLG properties include **three recreation management principles** as a framework for the recreation management provisions:

- **Provide abundant recreational opportunities for hunting, trapping, gathering, wildlife viewing, scenic enjoyment, and other nature-based uses, compatible with the property's capabilities and habitat management goals.**
- **Provide a wildlife conservation education program that generates a land and wildlife ethic into perpetuity.**
- **Contribute to the local and regional economies through management of wildlife recreational opportunities and sustainably produced forest products.**

The recreation management objectives and prescriptions below apply to all properties covered under this plan. *Site-specific objectives and prescriptions are listed in section three of this chapter.*

Recreation Objectives for GLG Properties

- Increase the percent of public who know and embrace the GLG management Vision & Goals.
- Increase the number of youth (and adults) who participate in workshops, programs, camps, and events offered through the Crex Wildlife Education and Visitor Center, and who recreate on the GLG properties.

- Provide programs and events that increase environmental awareness and interpret ecological processes, wildlife and natural resource conservation and management, and species of interest found at the GLG wildlife areas. These programs serve as examples for the anticipated development of a DNR Wildlife Education Strategic Plan in the Bureau of Wildlife Management.
- Provide programs, training and events that utilize the grounds, trails, and classroom, geared toward development of outdoor skills and outdoor enjoyment for all age groups.
- Promote physical fitness through a wide range of outdoor and nature-based events; accommodate disabled access needs to allow participation in activities / programs.
- Encourage research, educational activities, and workshops consistent with the primary management purposes and user safety.
- Continue collaboration with Friends of Crex in support of recreation, management, and education goals.
- Partner in developing a NW Wisconsin Ecotourism Corridor with groups such as: Village of Grantsburg, Interstate State Park; Namekagon Barrens Wildlife Area; Douglas County Wildlife Area; Northern Great Lakes Visitor Center; county departments of tourism in Polk, Burnett and Douglas counties, NPS and USFWS Region 3.
- Improve public access and visibility of the GLG Headquarters (Crex Meadows Wildlife Education Center) from County Road F, and from State Hwy 70 both east and west of Grantsburg.

Recreation Prescriptions for GLG Properties

- Utilize educational presentations, exhibits and messages to enhance visitors' experience and appreciation for the barrens and wetlands landscape, and the diversity of the wildlife and plant species in these environments.
- Expand skills programs and use volunteers and mentors to organize and lead training events.
- Provide information to support communication about GLG properties/programs on the Friends of Crex web pages.
- Meet Wisconsin Department of Public Instruction standards for youth skill sets in the areas of Environmental Education, Science, English, Social Studies, Mathematics, and Physical Education as appropriate, for programs offered to school groups.
- Revise/update visitor property maps for each property.
- Auto Tour: update the extremely popular 24-mile self-guided Crex Meadows [auto tour](#), with a guidebook available at the GLG visitor center, and on the Friends of Crex web site, and develop a downloadable application for smart phones.
- Develop similar auto tours (to observe variety of management techniques and watchable wildlife) for Fish Lake and Amsterdam Sloughs wildlife areas.
- Expand and link recreational opportunities within the Northwest Sands by working with National Park Service, USFWS and other federal, state, and county partners to establish connections to similar destinations, trails, and amenities.
- Provide outreach to Minnesotans, who constitute 60% of landowners in Burnett County. Encourage their further exploration, use and appreciation of the NW Wisconsin barrens and wetland communities.
- Evaluate handicap accessible access on a regular basis and make improvements as feasible.
- Install information kiosks and amenities at trail heads to provide maps and information about recreational opportunities, management policies, and alerts about issues such as wildfire or weather safety, or invasive species.
- Maintain an MOU with Friends of Crex (Appendix B, Property Manager lead contact)
- Work with Burnett County and Village of Grantsburg in support of their ideas to improve visibility of GLG property access, such as a road extension through the village of Grantsburg to State Roads 70 and 87. Improvement would better guide visitors to the Crex Meadows Wildlife Education & Visitor Center.
- Remind visitors to leash dogs April 15 – July 31, except as noted in NR 45.06(2), Wis. Admin. Code.
- Additional details are listed in sections below; in Map Series 2 for each property; and in Appendices E and F.

a. Hunting, Trapping, and Gathering on Land and Water

Hunting and trapping opportunities are abundant and are major recreational activities on the GLG properties, with opportunities to pursue waterfowl (mallard, blue-winged teal, wood duck, Canada goose), white-tailed deer, American black bear, bobcat, red and gray fox, fisher, American beaver, North American river otter, raccoon, striped skunk, woodcock, snipe, ruffed grouse, rail, gray squirrel, snowshoe hare, and cottontail rabbits. Trappers have opportunities for just about every furbearer known in Wisconsin. Crex Meadows was one of few places in Wisconsin that offered opportunities for sharp-tailed grouse hunting when populations were large enough to issue permits. Sharp-tailed grouse populations in Wisconsin are well below historic levels, and have been declining since 1998, according to the [Wisconsin Sharp-tailed Grouse Survey and Status](#). (WDNR 2013b).

Hunters desire wildlife habitat capable of producing good populations of wildlife, while staying free from excessive human disturbance. It is important to provide multiple opportunities and to disperse hunters as much as possible for safety, to enhance users' experience and to avoid user conflicts. The GLG properties will continue to accommodate hunting throughout all of the open hunting seasons. Regulations governing hunting and trapping are outside the scope of the master plan.

Wild rice beds have become important harvest areas for both tribal and non-tribal ricers (see wild rice at Crex Meadows in Section 3 of this chapter). Abundant berry-picking opportunities exist in the early stage barrens, especially for blueberries, for which these properties have long been popular. Mushrooms are also favorite harvest foods. White sage (an herb) is commonly collected by tribal members.

Fishing opportunities are limited due to freeze-out conditions in many years. A variety of minnows and forage fish provide an ample food source for wildlife.

Objectives

- Offer abundant hunting and trapping opportunities for big and small game.
- Support opportunities for sustainable water access at all GLG properties.
- Provide conditions where users of the wetlands and barrens area may feel they are in a secluded setting.
- A joint committee of WDNR and tribal representatives serves as a resource for wild rice harvesting. (see Crex Meadows wild rice in Section 3 of this chapter)

Prescriptions

- Provide optimal public access for hunting, trapping, and gathering.
- Share information on the high quality waterfowl hunting opportunities with the public and county, state, and federal resource management partners.
- Maintain existing boat landings and seek increased canoe and kayak access points.
- Provide access to places for walk-in duck hunting using waders and decoys, as an alternative to using boats.
- Consider and provide if feasible, pop-up ADA deer hunter blinds for those hunters with ADA permits, as an alternative to shooting out of trucks.
- Work with the Friends of Crex to provide volunteers to accommodate/assist an aging hunting population. Consider volunteers to assist property users overcome physical limitations (drag the boat, put out decoys, etc).
- Provide opportunities for non-motorized hunter access, and remote hunting experiences, both for waterfowl and upland game.
- Provide information about hunting rules and opportunities at information kiosks, in publications or online, taking care not to over-promote specific locations.
- Wild rice harvesters may be reminded of state statute to use canoes that are hand propelled by paddle or pole.

b. Birdwatching, Wildlife Viewing, Nature Study and Scenic Viewing

Birdwatching, wildlife viewing and nature study of rare, abundant and diverse species on the wetlands and oak/pine barrens habitat are perhaps the most popular activities on the GLG properties. Approximately 75% of Crex visitors come to view the wildlife and landscape. Visitors range from the casual observer to serious birder and naturalist. **Birdwatching** is more

popular than hunting and fishing both in Wisconsin and nationally, and is a growing recreational activity (USFWS and USCB, 2011). Wisconsin ranks second nationally in the proportion of citizens considered birders, with one-third of residents age 16 and older reporting they travel to watch birds, or actively watch and identify birds around their home (USFWS, 2011).

Over 270 species of birds use the GLG properties. Many species congregate in the region during migration due to the proximity of Lake Superior and the Mississippi River Flyway. Crex Meadows Wildlife Area is a recognized Important Bird Area, (WDNR, 2007), that draws significant numbers of visitors to view high populations of wetland species, barrens and grassland species and thousands of migratory waterfowl, shorebirds, and sandhill cranes. For further information, see the Wisconsin Bird Conservation Initiative web page for Crex Meadows at <http://wisconsinbirds.org/iba/sites/crexmeadows.htm>

Raising public awareness and understanding of wildlife conservation happens on public lands where visitors can see for themselves the connections between people, wildlife, habitat, and land management. Well-designed interpretive signs and exhibits explain wildlife's needs and DNR management actions. While helping to instill a land ethic, these properties also demonstrate to landowners how to make sustainable use of lands that benefit both humans and wildlife.

The GLG master plan maintains and enhances opportunities for the public to study and observe natural communities, scenery, plants and wildlife throughout the properties. The Crex Meadows plant list includes over 700 species, including more than 200 with prairie affinities. Mammals include nearly every mammal found in Wisconsin, with a good variety of reptiles, amphibians, and invertebrates found on the properties. The properties are also near Governor Knowles State Forest and thousands of acres of county forest. Both GLG and the state forest are located on the Great Wisconsin Birding and Nature Trail system.

Objective

- Provide opportunities for birding and wildlife watching, scenic viewing, photography and nature study.

Prescriptions

- Provide interpretive handouts and educational brochures, including wildflower and wildlife species lists, and maps.
- Identify and designate additional vistas or scenic overlooks as wildlife and plant observation sites along roads or trails at suitable locations. Include parking for 3-5 vehicles, permanent benches for sitting, and information kiosks at each location. Maintain existing scenic overlooks.

c. Camping

In the GLG vicinity, the department encourages use of campgrounds at nearby state parks, state forests, county, and federal locations; campsite density here is above average for Wisconsin (see Chapter 3). Although camping is not a primary purpose of state wildlife areas, the GLG properties and others have traditionally allowed limited, dispersed camping to provide for "hunting camps" during fall hunting seasons. Several key policies that guide camping on wildlife areas include:

1. NR 1.51(3)(d), Wis. Admin. Code, Management of state wildlife areas.
2. NR 45.10, Wis. Admin. Code, Use of Department Properties
3. DHS 178.02(2), Wis. Admin. Code, and related MOUs between DHS-DNR, such as one signed in 2001.

Objective

- Provide dispersed camping opportunities on GLG properties to support traditional hunting uses or nature study, such that they do not interfere with the primary purpose of the property.

Prescriptions

- At appropriate locations determined by the property manager, accommodate dispersed camping opportunities by permit during fall hunting seasons (Sept - Dec). No camp sites will be designated and no facilities will be provided.
- Continue to provide dispersed camping by permit on Crex Meadows Wildlife Area, Management Area 3, during fall hunting seasons (Sept - Dec).

d. Snowshoeing, Cross-Country Skiing, Skijoring and Hiking

Snowshoeing, cross-country skiing, and hiking are all pursued, with little impact on the property or other recreational uses.

Snowshoeing

Snowshoeing has become a popular sport in recent years throughout Wisconsin, including GLG properties. While all areas of the property are open to snowshoeing, including roads and trails, demand is increasing for trails that are specifically marked and designated for this use.

Prescriptions

- Continue the program of renting snowshoes, especially for school groups, at the Crex Visitor Center.
- Explore designating primitive to lightly developed snowshoeing trails at several locations, to be determined. Map and sign any routes that are suitable.

Hiking, Cross-Country Skiing and Skijoring

Multiple trails exist for hiking, skijoring, cross-country skiing, and snowshoeing, including Hay Creek Hiking Trail and Upper Phantom Cross Country Ski and Hiking Trail. The [Hay Creek Hiking Trail](#) begins and ends near the Visitor Center. It is approximately 1.5 miles long and winds through a forested area to the Hay Creek Flowage. An observation platform is located on the south shore of the flowage. From the platform, one may see ducks, geese, herons, and osprey which sometimes nest on the osprey platform on the east end of the flowage. The [Upper Phantom Cross Country Ski and Hiking Trail](#) contains four loops totaling 3.7 miles. The loops are color coded and a map of the trail system is located at the parking lot on East Refuge Road. The trail is not regularly groomed but is tracked by users. It is relatively flat. Other trails are located near the Crex rest area and on Fish Lake Wildlife Area at Fish Lake Pines, the Camp 6 area, and McCann Ponds. There are trails off Olson Road and within the Bruss parcel on Amsterdam Sloughs Wildlife Area.

Prescriptions

- Maintain existing lightly developed trail loops.
- Provide visitors information about the well-groomed, extensive ski trail system at Governor Knowles State Forest and the Grantsburg Nordic Ski Trail just a few miles southwest of Crex Meadows.
- Maintain winter use parking, and install trail confidence markers, maps, and trail head information.

e. Bicycle Riding and Horseback Riding

Bicycle riding and horseback riding are permitted on roads designated for vehicle travel; otherwise they are not authorized uses on the properties. Physical limitations of the properties such as the predominance of wet soils and limited contiguous uplands are not conducive to these trail uses. There are significant opportunities (>50 trail miles) for these forms of recreation on many nearby public lands in the region.

Prescriptions

- Continue to coordinate nature-based bicycle rides on roads through the properties to encourage visitors to learn about the properties while gaining exercise.
- Consult with the townships on providing black top surface or a better grade of ‘bicycle-friendly’ gravel for road surfaces to facilitate bicycle travel on roadways.

f. Designated Recreation Trails

The phrase “designated trails” refers to trails that are designed, maintained, and limited to specific uses and are shown on the infrastructure maps. Hunter walking trails may be found on each property from seasonal use by hunters, although they are not designated. Some trails are designated for disabled access (see section two and infrastructure maps). Trail-based recreational activities such as hiking, cross-country skiing, snowshoeing, and wildlife viewing are a popular and natural fit

with a few areas of the property. Given the extensive road access within the GLG properties, adequate opportunities exist for recreating on the properties via bicycle and wintertime snowmobile and ATV.

Prescriptions

- Maintain primitive to moderately developed, interpretive trails and infrastructure.
- Develop up to 3 miles of barrier free, moderately developed, ADA accessible trail surfaced to accommodate wheel chairs and walkers in a location to be determined, to provide access to scenic view-sheds. The trail may be a portion or portions of established recreation trails.
- Provide barrier-free ADA accessible trail opportunities where feasible and practicable.
- Provide opportunities for bicycling based on demand, suitability of routes and seasonal/temporal use of roads by other recreationists, such as birdwatchers, hunters, etc.
- Use signage and creative program scheduling to avoid or minimize conflicts between equestrians, bikers, hikers, or other non-motorized and motorized users.
- Upgrade trails to enhance the interpretive hiking experience, including trail signage, informational kiosks and brochures and related amenities.

g. Motorized Sports

Snowmobile and winter ATV riding is available from December to March on county snowmobile trails and routes. Across the properties, 22 miles of designated trails accommodate this shared use after close of firearm deer season and when weather and trail conditions allow. ATVs and other vehicles are prohibited off designated snowmobile and ATV trails. Erosion and spread of invasive species has occurred from use of off-road vehicles on prohibited areas. The snowmobile trail provides scenic riding opportunities along each property. Trails are maintained by the local snowmobile clubs. More than 32 miles of snowmobile trail extend from the village of Grantsburg to Wolf Creek. Additionally, a statewide snowmobile trail system primary corridor exists through nearby Governor Knowles State Forest. Nearby state properties, county forest lands, and the Gandy Dancer State Trail provide additional mileage.

The trails connect to regional snowmobile trails and are part of the statewide snowmobile trail system. Winter ATV riding is available on more than 50 miles of trails in surrounding Burnett and Polk counties. Spring, summer and fall ATV riding is available throughout Burnett and Polk counties on 85 miles of developed trails. During fall, some adjacent town roads are open as ATV routes enabling riders to travel through nearby Governor Knowles State Forest.

Objectives

- Allow 22 miles of connectivity between local and regional trail networks.
- The property manager may authorize mobility impaired access permits.

h. Day Use Areas

Day use areas are generally rustic in nature and are usually located at recreational trail heads and parking access points. The sites are popular locations for birding and wildlife viewing, berry picking and hunter/walking access. Amenities are minimally developed with a map board kiosk and informational brochures.

Upgrading amenities at popular locations would meet several needs. Additional signage and information facilities would strengthen a sense of place, and reinforce GLG identity.

Providing additional amenities at popular access points and day-use areas would enhance user experience for a key recreation niche – nature observation, scenic and wildlife viewing. The popularity of a particular day use location, or access to unique scenic or recreational values, will determine the level of development. Improvements will be designed to provide appropriate public access and necessary amenities, such as parking, and interpretive information.

Objective

- Provide recreational day-use areas where visitors can rest or pursue outdoor interests in an attractive outdoor setting at suitable locations throughout the GLG properties.

i. Parking Areas**Objective**

- Provide adequate parking facilities throughout the wildlife areas for public access.

Prescriptions

- Maintain parking areas as appropriate to use and demand.
- Install information facilities and signage at up to ten public access points throughout the properties to enhance visitor experience and to reinforce GLG identity.

State Natural Areas

The primary purpose of State Natural Areas (SNAs) is to protect outstanding examples of Wisconsin's native natural communities, significant geological formations, and archeological sites.

SNAs are valuable for research and educational use, the preservation of genetic and biological diversity, and for providing benchmarks for determining the impact of use on managed lands. They also provide some of the last refuges for rare plants and animals. Sections 23.27-23.29 Wis. Statutes provide legislative authority and direction for the acquisition, designation, dedication, and management of SNAs. Section 23.27(1) defines natural areas as "reserves for native biotic communities...habitat[s] for endangered, threatened, or critical species...or areas with highly significant geological or archaeological features". Section 23.28(1) provides authority to designate natural areas as SNAs, and Section 23.29 provides authority to legally dedicate and protect SNAs in perpetuity.

SNAs may be either stand-alone properties or embedded within another property type, such as a State Wildlife Area. In the latter case, the SNA is an overlay designation.

Existing SNA Overlays

The GLG Master Plan includes 4 overlay SNAs on lands owned by the Department. They are as follows:

- Reed Lake Meadow (3,568 ac)
- Crex Sand Prairie (79 ac)
- Fish Lake Meadow (1,880 ac)
- Fish Lake Pines (40 ac)
- Blomberg Lake (390 ac)

New SNA Overlay

This master plan expands Blomberg Lake SNA to Blomberg Lake & Woods SNA, described in section three of this chapter.

General Administration, Management Policies and Provisions

The following section describes general property administration, and the management policies and provisions that apply to all state managed lands.

Funding Constraints

Implementation of the master plan is dependent upon staffing and funding allocations that are set by a process outside of the master plan. Operational funding for the department is established by the state legislature. Development projects also follow an administrative funding and approval process outside of the master plan. Many of the initiatives contained within the plan are dependent upon additional funding and staffing support. Therefore, a number of legislative and administrative processes outside of the master plan will determine how quickly portions of this master plan will be implemented.

Properties purchased or managed with funds from the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act) or the Federal Aid in Sport Fish Restoration Act have additional management constraints that must be considered. Wisconsin statutes and regulations prohibit a state fish and wildlife agency from allowing recreational activities and related facilities that would interfere with the purpose for which the state acquired, developed, or is managing the land.

Facility Management Authority

Property managers may relocate or temporarily close road and trail segments or other public use facilities as deemed necessary after appropriate authorization by normal department approval processes. The new road or trail (or other facility) location and design must be consistent with the land classification requirements (NR 44) and the management objectives for the management area in which it is located.

Public Health and Safety

All facilities will comply with federal, state, and local health and sanitation codes. The property manager has the authority to close trails and other facilities on the property when necessary due to health, safety, or environmental damage concerns. In designated public use areas, such as designated parking lots and designated trails, trees or other natural elements that are deemed public hazards will be removed. Safety inspections are done at least twice per year.

Refuse Management

Visitors are required to carry out any refuse they bring in because no designated refuse or recycling receptacles are available. Burying of refuse is not allowed anywhere on the properties.

Road Management Plan and Public Vehicle Access Policy

Pursuant to Wis. Stat. 23.116, the planning process considered the status and evaluated the network of public access, service and habitat management roads on the properties. Part of the evaluation process was to determine which roads may be open to the public for the use of motorized vehicles. A network of approximately 90 miles of public road access, including township, county and department-owned roads exists within the three GLG properties. This includes approximately 23 miles of department-owned primitive access and service roads. Abundant public access currently exists. Users consistently comment how they enjoy the excellent public access available, and with more than 50% of the properties covered in wetlands, limited opportunities exist for expanding vehicle access. The recreation objectives (section 2-1) are designed to increase overall public use and recreation access. Closed service roads are gated, bermed or signed. (Maps C-2, C-3, D-2, D-3, E-2, E-3, and Appendix F)

Department-maintained service roads that are not open to public vehicles and access roads that are open will be maintained as primitive roads (NR 44.07(3), Wis. Admin. Code). Primitive roads may not be negotiable by ordinary highway vehicles; they are seasonal and not regularly maintained; ruts and downed trees may be present. Maintenance is done on primitive roads as needed, or as time and resources allow. The property manager may determine which of these road standards to apply on a case by case basis.

The following management prescriptions apply to department managed roads:

- Maintain permanent service roads and public access roads in a sustainable condition according to Wisconsin Forestry's Best Management Practices for Water Quality.
- Maintain parking areas.
- Regularly inspect active roads, especially after heavy storm events. Clear debris as needed from the road surfaces, culverts and ditches to decrease unsafe conditions and prevent damage.
- Maintain stable road surfaces to facilitate proper drainage and reduce degradation from traffic during wet or soft conditions; or close the road when these conditions exist.
- Monitor soil disturbance and take measures to prevent excessive damage.
- Restore roads used in timber harvests to non-erosive conditions, in accordance with Wisconsin Forestry's Best Management Practices for Water Quality.

Road and Trail Standards Roads and trails are classified as follows in NR 44.07(3), Wis. Adm. Code:

(a) Primitive road. A primitive road shall be a temporary or permanent seasonal road with a maximum sustained cleared width normally not exceeding 12 feet, little or no roadbed grading, minimal cut and fill, a surface of primitive or native material. **Note:** Due to their unimproved, rough condition, primitive roads commonly are only suitable for H/ohci's and other off-highway vehicles, and may not be negotiable by ordinary highway vehicles.

(b) Lightly developed road. A lightly developed road shall be a temporary road, a permanent seasonal road or a permanent all-season road which is primarily a single lane with a maximum sustained cleared width normally not exceeding 16 feet, is lightly to well-graded with minimal cut and fill, is surfaced with primitive, native or aggregate materials except in limited special use situations where asphalt may be used, and has a maximum speed design of 15 mph. **Note:** Due to the variability of roadbed conditions at different times and places, some lightly developed roads might not be negotiable by ordinary highway vehicles.

(c) Moderately developed road. A moderately developed road shall be a permanent seasonal road or a permanent all-season road which typically is 2-lane, but may be one-lane, have a maximum sustained cleared width normally not exceeding 45 feet for 2-lane and 30 feet for one-lane, a well-graded roadbed and may have moderate cuts and fills and shallow ditching, has a surface of aggregate, asphalt or native material, and a maximum design speed of 25 mph.

(d) Fully developed road. A fully developed road shall be a permanent all-season road with a cleared width normally of 50 feet or more, a roadbed with cuts and fills as needed, an aggregate, asphalt or other paved surface and be designed for speeds exceeding 25 mph.

(e) Primitive trail. A primitive trail shall be a minimally developed single-file trail with a maximum sustained cleared width normally not exceeding 8 feet and a minimal tread width for the intended use, have a rough, ungraded bed where large rocks, stumps and downed logs may be present. It primarily follows the natural topography, has no or few shallow cuts and fills, and is surfaced with primitive or native materials, except for limited distances where environmental conditions require the use of other materials. Modifications to the natural trail surface are limited to that which is minimally necessary to provide essential environmental protection.

(f) Lightly developed trail. A lightly developed trail shall be a trail with a maximum sustained cleared width normally not exceeding 16 feet, a moderately wide tread width for the designated uses, a rough-graded base to remove stumps and large rocks, and a surface of primitive or native materials, except where other materials are required due to environmental conditions or where the trail also serves as a lightly developed road where other types of surfacing materials are used.

(g) Moderately developed trail. A moderately developed trail shall be a trail with a maximum sustained cleared width normally not exceeding 8 feet, a minimal tread width for the intended use, a relatively smooth graded base with a compacted surface composed of stable materials such as aggregate. Where practicable and feasible, a moderately developed trail shall, at a minimum, meet the standards for recreational trails accessible to persons with a disability.

(h) Fully developed trail. A fully developed trail shall be a trail with a smoothly graded base and a stable, hard surface composed of materials such as asphalt, aggregate or frozen earth. The trail's cleared width, tread width and cuts and fills are

not limited, but shall be appropriate for the trail's intended use. To the degree practicable and feasible, fully developed pedestrian trails shall be fully accessible by persons with physical disabilities.

Public Access on Service Roads

The public may walk service roads and dikes to gain access on properties for hunting, trapping, wildlife watching, nature appreciation, etc. These are not designed or maintained as hiking trails, but people are free to walk anywhere on properties unless posted closed to the public.

Disabled Accessibility

The department is committed to providing exceptional outdoor recreation opportunities for people of all abilities. All new construction and renovation of infrastructure will follow guidelines set forth within the Americans with Disabilities Act and also be done in a manner consistent with NR 44 Wis. Admin. Code standards of the land use classification of the site where the development is located.

The property manager has the authority to make reasonable accommodations for people with disabilities, consistent with the requirements of the area's land use classification. Property managers also may allow the use of power-driven mobility devices (PDMDs) on trails consistent with a federal law for PDMDs located in 28 CFR s.35.137.

Endangered, Threatened and Species of Special Concern Protection

Individuals of all endangered, threatened, special concern species and populations of SGCN will be protected. All known critical habitat for these species will be protected or maintained through management which incorporates guidance from staff specialists, research and current literature, and consultation with the Bureau of Natural Heritage Conservation. The Natural Heritage Inventory (NHI) will be checked prior to any management activity to ensure that any adverse impacts associated with listed species are avoided or minimized to the greatest extent practical.

Archaeological Resource Protection

Property managers will prevent physical disturbance of archaeological features on properties. This includes controlling woody species invasion. Managers will follow DNR guidelines outlined in "Burials, Earthworks and Mounds Preservation Policy and Plan". A cultural review indicated the presence of several recorded Euro-American buildings and cemeteries within Crex Meadows and Fish Lake wildlife areas from the late 1880's – early 1900's. Some sites are designated with signage. Management policy (Wis. Stats. 44.40 and Manual Code 1810.10) requires that any activities with the potential to disturb archaeological sites will only be undertaken after consultation with the department archaeologist (Dudzic 2012).

Water Quality

All forest management activities will comply with the most recent version of Wisconsin Forestry's BMPs for water quality.

Water quality parameters for turbidity on Crex Meadows Wildlife Area can range from very good to poor depending on time of year, precipitation events, and patterns of groundwater discharge. Turbidity has prompted inquiries about the water quality of streams flowing out of Crex Meadows Wildlife Area. Mobilization of iron present in soil is accelerated when inundated with organic rich water. This creates anoxic conditions in soil, which causes iron to become reduced and soluble. The iron is then transported with groundwater. When iron-rich groundwater discharges to streams or ponds, the iron is oxidized and iron floc (precipitate) is produced. Iron floc causes a rusty-colored turbidity in the water. Air photos of the region taken in 1938 may provide insight. The DNR water program is conducting a study during 2014-2015 to better understand the mobilization and transport of iron occurring at the Crex Meadows Wildlife Area, and determine the extent of any chemical and biological impact iron may be having on receiving streams. Preliminary data analyses suggest that iron floc turbidity causes an aesthetic impact and does not negatively impact stream biological communities.

Forest Certification

In 2004, Wisconsin State Forests gained dual Forest Certification from the Forest Stewardship Council (FSC) and Sustainable Forestry Initiative (SFI). In 2009, State Forests were re-certified under FSC and SFI and the balance of DNR-owned land was added to the certification. Independent, third-party certification means that management of Wisconsin's DNR-owned land meets strict standards for ecological, social, and economic sustainability. Forest certification helps Wisconsin remain competitive in global markets that increasingly demand certified raw materials. Management of multi-use lands involves balancing the goals of conserving forestland, supporting economic activities, protecting wildlife habitat, and providing recreational opportunities. Forests and other lands on fish and wildlife properties are managed to meet the Forest certification principles.

Prescribed Fire

Prescribed burns are a management tool that mimics natural fire disturbance and helps control many woody plants and invasive weeds, improves the quality of wildlife habitat, reduces fuels to lessen fire hazard, and liberates nutrients tied up in dead plant material. Upland nesting cover used by sharp-tailed grouse, waterfowl and songbirds is more productive if periodically burned. Wetlands also benefit from fire. Prescribed fire may be used as a management tool where feasible and safe except when restricted by management area prescription.

Fire Suppression

As stated in Wisconsin Statutes 26.11, "The Department is vested with power, authority and jurisdiction in all matters relating to the prevention, detection and suppression of forest fires outside the limits of incorporated villages and cities in the state except as provided in sub (2), and to do all things necessary in the exercise of such power, authority and jurisdiction." Wildland fire suppression actions will consider the property management goals and the threats of the fire to life and property. Appropriate techniques will be used in each event to provide effective fire suppression while minimizing resource damage.

Forest Pest Control

As stated in Wisconsin Statute 26.30, "It is the public policy of the state to control forest pests on or threatening forests of the state..." Any significant forest pest events will be evaluated with consideration given to the property management goals and the potential threat of the pest to other landowners. Infestations will be managed according to the respective management plan, if they exist. Responses to significant infestations from other pests, including but not limited to the emerald ash borer, may include timber salvage or pesticide treatments. Any response to a significant pest outbreak or threat of a significant pest outbreak will be evaluated by an interdisciplinary team of scientists and communicated through press releases and notices to interested parties. If necessary, an immediate emergency response to prevent a major outbreak may be authorized by the State Forester.

Authorized Response to Catastrophic Events

Catastrophic events are rare, but allowances must be made to provide management flexibility when such events occur. These events may include severe flooding, ice and wind storms, insect and disease infestations, wildfires or other catastrophic occurrences. The immediate management responses to these events will follow existing department protocols. If the management objectives and prescriptions need to be revised a variance to the master plan must be approved by the Natural Resources Board.

Wildfires, tree diseases and insect infestations shall be controlled to the degree appropriate to protect the values of each management area. However, emergency actions may be taken to protect public health and safety, or as directed by the State Forester to prevent a catastrophic incident from spreading to adjacent forest lands.

Management responses to catastrophic events are determined on a case-by-case basis. Salvage of trees damaged by wind, fire, ice, disease, or insects may occur if consistent with the objectives and prescriptions for the management area. Salvage may also occur as part of an emergency response plan authorized by the State Forester.

Chemical Use

Herbicides and pesticides may be used on these properties for purposes such as controlling invasive plants, limiting plant competition in restoration areas, and controlling insects, except as restricted in the property specific management prescriptions in this master plan. All chemical applications shall follow applicable department procedures and herbicide and pesticides label requirements.

Non-Metallic Mining Policy

The department may use gravel, sand, fill dirt, or other fill material from department-owned lands for department use. Under certain circumstances other government bodies or agencies may also have access to these materials. Section 23.20 of the Wisconsin Statutes states, “the department may permit any town, county, or state agency to obtain gravel, sand, fill dirt or other fill material needed for road purposes from any department-owned gravel pit or similar facility if this material is unavailable from private vendors within a reasonable distance of the worksite. The department shall charge a fee for this material commensurate with the fee charged by private vendors.”

Any nonmetallic mining is regulated under the requirements of NR 135 Nonmetallic Mining Reclamation, Wis. Adm. Code, except for sites that do not exceed one acre in total for the life of the mining operation. Site reclamation under NR 135 is administered by the county. NR 135 requires mining sites to be located appropriately, operated in a sound environmental manner, and that all disturbed areas be reclaimed according to a reclamation plan. New sites will not be considered if they will impact significant geological or ecological feature or sites within any designated State Natural Area.

Department of Transportation (DOT) projects are exempt because DOT projects have their own reclamation requirements.

Real Estate Management

Acquisition Policies

It is the policy of the Natural Resources Board and the DNR to acquire lands from willing sellers only. As required by state and federal laws, the department pays just compensation for property, which is the estimated market value based on an appraisal. Staff may periodically contact landowners within the property boundary to explain the department’s land acquisition program and determine if they have an interest in selling their property. Acquisition priorities for the properties vary from year to year and are based on a number of factors, such as resource management or recreation needs and the availability of funds from various governments, non-profit and private sources.

It may be in the interest of the landowner and the department to acquire only part of the rights to a property, or an easement. The department has a number of easement options available to address these situations. Fisheries easements provide access for anglers, protection of riparian habitat and control of land to conduct habitat development or management projects. This option should be pursued on streams and rivers to protect critical or unique habitat when fee acquisition is not feasible due to costs, local concerns, or an owner’s desire to retain fee title to the land.

Land Acquisition Guidelines

Criteria, such as the following, have been used to assess the conservation and recreation merits of property being offered by willing sellers.

1. Lands greater than 40 acres with no or low-value improvements.
2. Lands that could provide high quality wildlife habitats or contain critical habitat for Species of Greatest Conservation Need and/or contain Natural Communities identified as rare within the Northwest Sands and Superior Coastal Plain Ecological Landscapes.
3. Lands that can provide access to high-quality fishing, hunting, and trapping experiences as well as opportunities for other compatible nature-based outdoor activities.

4. Lands adjacent to current state lands or other protected lands, particularly if they can provide a buffer from existing or future incompatible land uses.
5. Lands that currently affect the hydrology of important conservation lands.
6. Lands affected by the restoration of wetlands (e.g., restoration efforts are constrained by flooding impacts on surrounding private lands).

Portions of properties not needed for conservation purposes may be sold/leased back for agricultural or other compatible uses, though the state may retain development and public access rights.

Adjusted project boundaries often follow roads or natural features (e.g., streams or rivers). This approach ensures adequate access is available for lands that may be acquired in the future and it is easier to portray where the boundaries are located. Project boundaries often encompass more land than their respective acreage goals. This provides the department and partners with flexibility when negotiating the purchase, sale or trade of land for recreation and conservation purposes.

Using roads as boundaries will bring developed parcels (e.g., homes, farmsteads and other improvements) into the project boundary. The department does not seek to acquire parcels with improvements. Acquisition criteria reduce the scores of parcels with substantial improvements. When buildings are purchased as part of a larger land holding, the buildings are typically split from the larger parcel and sold according to and consistent with local ordinances. An occasional purchase/easement may be needed for public access (e.g., upland parking area on a wetland dominated property).

Funding for land acquisition can come from a variety of federal (e.g., Pittman-Robertson and others), state (e.g., Stewardship), local and private (e.g., land trusts) sources as well as land donations.

Future Boundary Adjustments

Adjustments in property boundaries are occasionally needed. In some cases parcels of land are removed from the boundary to allow alternative uses with public benefits. Other times small parcels adjacent to the property need to be added so they may be purchased for resource protection or to meet expanding recreational needs. Property boundary changes of more than 40 acres require approval by the Natural Resources Board. Wisconsin Administrative Code Ch. NR 44 provides a plan amendment process that may be used to make adjustments in the property boundary after the master plan is approved.

Where land purchase or easements are being considered, the department can acquire land under the various authorities in State Statute 23.09.

Payment in Lieu of Taxes

State law requires the Department of Natural Resources to make payments in lieu of property taxes (PILT). The department uses an automated process for collecting information and calculating PILT payments. The process is determined by statute with little room for interpretation or calculation by the department. There are two separate statutes and several formulas under each statute that dictate the amount of each individual payment.

Wisconsin statute s. 70.113 Stats. applies to land acquired by the department prior to January 1, 1992. Payments under this statute are made directly to the taxation district in which the land is located. Schools, VTAE and counties do not receive any payment under this law.

Wisconsin statute s. 70.114 Stats. governs payments in lieu of property taxes for all lands purchased by the department after January 1, 1992. This law has been amended several times so the specific formula used by the department to determine each specific payment varies depending on when the property was acquired and how. Payments are made to each taxing district in January, similar to the way a private citizen would pay their property taxes and each taxing district then makes payments to all taxing jurisdictions in the taxing district.

For detailed information on how the department pays property taxes, visit dnr.wi.gov and search "PILT".

Conveyed Easements and Other Land Use Agreements

Easements, access permits, land use agreements and leases across department land require consultation and joint action by the affected program and the Bureau of Facilities and Lands Real Estate staff. While such situations may serve a public purpose (e.g., a utility corridor or a road) they can adversely affect a management unit by:

- Restricting the department's future management options,
- Limiting the public's full use and enjoyment of a property,
- Preventing natural succession of cover types,
- Introducing exotic and invasive species to the property,
- Introducing additional herbicides and other contaminants to the property, and
- Creating liability concerns.

The conveyance of easements and other agreements is subject to sections NR 1.48 and NR 1.485, Wis. Adm. Code. Before any rights are conveyed, the Bureau of Facilities and Lands Real Estate staff must determine if federal funds were used to acquire the land and, if so, obtain the appropriate approvals.

Master Plan Implementation and Public Communications

An annual report on implementing this master plan will be drafted and used to monitor the progress made in meeting the plan's management objectives. Annual reports will be available to the public on the WDNR Internet Web site and linked to the respective property descriptions. The report will provide information on how the public can become involved in master plan implementation and when significant, new property management issues arise.

The annual report will summarize the following:

- Management and development activities completed,
- Significant issues addressed,
- Planned management and development activities for the upcoming year, and
- Potential changes to management actions or approaches.

The annual report may also include information on topics related to property management and uses. Examples include: the status of forest insect or disease problems, storm damage, updates on endangered or threatened species, recreation management issues, and recreational use trends.

In the event the department considers a substantive change to the master plan (i.e., a plan variance or amendment) the public will be informed of the proposal and the review and comment process. As appropriate, news releases will be used to announce master plan amendment/variance proposals and review procedures. The department will also maintain a contact list of persons, groups, and governments who have requested to be notified of potential plan changes.

The following department staff may be contacted regarding questions about the Glacial Lake Grantsburg properties. At the time of this publication, their contact information is:

Steve Hoffman	715-463-2896	steve.hoffman@wisconsin.gov	Property Supervisor & Wildlife Biologist
Kristi Pupak	715-463-2896	kristina.pupak@Wisconsin.gov	Wildlife Educator, Crex Visitor Center

Section 2: Individual Property Elements

Unless specifically addressed in each management area below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” and “Recreation Management” provided in Section One of this chapter.

A variety of DNR, federal and county sources were used to estimate the cover types and land uses on or adjacent to the GLG properties. They include existing DNR Wildlife and Facilities and Lands records, Forestry WISFIRS data base, Water Division Wetland acreages and WISCLAND cover types. These data sources use different criteria for assessing habitat types and land uses, so different estimates may be developed depending on the source(s) used. Small inclusions of different cover types may be embedded within a more dominant cover type in the acreage descriptions and related maps.

Crex Meadows Wildlife Area (Map Series C)

Crex Meadows Wildlife Area is the largest state-owned wildlife area in Wisconsin. Comprised of wetlands, oak/pine barrens (also called brush prairies), and forests scattered across a gently rolling landscape in western Burnett County, it can be reached off from State Hwy 70 near Grantsburg. Directional signs guide visitors through Grantsburg to Crex Meadows Wildlife Education and Visitor Center, located on County Hwy D. This Visitor Center (described below) serves as the headquarters for information about the GLG properties. (Maps A and C-2W).

Managed Land:	28,553 acres
Acquisition Authority:	32,397 acres
Project Boundary:	32,397 acres

Wetlands cover over half the property, including extensive sedge marshes, deep-water marshes, wild rice beds, and man-made flowages. Since 1946, over 18 miles of dikes were constructed to create 34 flowages that flood approximately 8,000 acres. Management includes approximately 7,000 acres of oak and pine barrens, and 6,000 acres forested with oak, jack pine, and aspen. Crex contains a diversity of plants and animals, extensive prairie grasses and forbs, and wildlife species not often found elsewhere such as Karner blue butterflies, Blanding’s turtles, timber wolves, and numerous breeding trumpeter swans. Abundant wildlife viewing and recreational opportunities make Crex one of the most popular wildlife areas the state.

Administrative Facilities (Management Area 4)

Crex Meadows Wildlife Area, Fish Lake Wildlife Area and Amsterdam Sloughs Wildlife Area are all managed by an integrated team of DNR staff stationed in Grantsburg, WI. The Wildlife Education and Visitor Center, built in 2002 with funding from the Friends of Crex, contains classrooms, a 60-seat auditorium equipped with multi-media technology, exhibits, video room, library and gift shop. Staff offices are located within the building near its entrance. The building is open daily from late March through mid-November and Monday-Friday during winter (closed holidays). Situated close to the Village of Grantsburg, the visitor center serves as a focal point for a large percentage of visitors from out-of-state, and provides a wide range of information. The center attracts over 14,000 annual visitors who enjoy self-guided tours of its exhibits, nature trails, restored wetland and prairie garden, and attend wildlife-based educational programs designed for children, adults, and groups. The Crex Meadows Wildlife Education and Visitors Center supports the promotion of practical, hands-on conservation measures. Its mission is to enhance public appreciation and support for wildlife and wildlife management.

There are 22 buildings on Crex Meadows Wildlife Area. All but two are located in the vicinity near the main entrance to the property. Buildings include: the visitor center, office, bunkhouses, bath house, mess hall, registration building, crew shop and headquarters, cold storage building, carpenter shop, grain bin, lumber shed and corn cribs, three NWCEP cabins, a cold storage building on Curry Road and a pump house located on Main Dike Road. One storage building on a recently acquired parcel is scheduled for removal.

Ground-breaking for a new mess hall is anticipated for 2015. An unheated 50-year old mess hall will be replaced and upgraded to a multi-purpose facility. Northwest Wisconsin Concentrated Employment Program, Inc. (NWCEP) is a primary user of the mess hall for 8 weeks each summer, as part of a jobs training program for teenage youth. DNR is providing half the funding, and the Friends of Crex together with NWCEP providing the other half.

Public Access

Recreational opportunities are described in section one of this chapter. Infrastructure for the Crex Meadows Wildlife Area (current and planned) is shown on Maps C-2W (west) and C-2E (east), and Appendix F.

A system of well-maintained roads (over 40 miles), observation areas and a rest area provide excellent access and wildlife-based recreation and viewing opportunities throughout the year. This abundant road access includes township and county roads. The department maintains 36 gravel or natural surface parking areas. Parking is permitted seasonally along the shoulders of most town and county roads. Over 13 miles of department-owned, unimproved service roads provide interior property access for DNR management and public recreation. Only county and township roads are plowed during winter.

The vast array of flowages and wetlands are managed in part through maintenance of 18 miles of dikes and 35 water control structures that create 34 impoundments. A water management plan, updated and revised periodically, is available to staff at the Crex Meadows maintenance building and Grantsburg Ranger Station.

Six boat ramps and numerous carry-in boat access sites are located around the property. Close proximity of town roads to many of the flowages provides carry-in access for watercraft in many undesignated locations.

Two trails exist specifically for hiking and cross-country skiing: Hay Creek Hiking Trail and Upper Phantom Cross Country Ski and Hiking Trail. The [Hay Creek Hiking Trail](#) begins and ends near the Visitor Center. It is approximately 1.5 miles long and winds through a forested area to the Hay Creek Flowage. An observation platform is located on the south shore of the flowage. From the platform, one may see ducks, geese, herons, and osprey which sometimes nest on the osprey platform on the east end of the flowage. The [Upper Phantom Cross Country Ski and Hiking Trail](#) contains four loops totaling 3.7 miles. The loops are color coded and a map of the trail system is located at the parking lot on East Refuge Road. The trail is not regularly groomed but is tracked by users. It is relatively flat and ideal for beginners. Another primitive hiking trail exists at the rest area (Management Area 2).

Scenic overlooks are maintained at four locations.

A county-maintained snowmobile trail traverses approximately 12 miles across the center of the property. It runs north from Grantsburg generally along Phantom Lake Trail, Main Dike Road and James Road.

Handicap accessible trails include the Norm Stone Prairie Trail adjacent to the visitor center parking lot, and the Boardwalk Trail behind the visitor center.

Management, Challenges, & Constraints

Crex Meadows wildlife area is managed to provide opportunities for public hunting, trapping, bird watching, nature study and other compatible forms of outdoor recreation. Management is funded primarily by hunters and trappers through their purchase of licenses and payment of a federal excise tax on firearms and ammunition. It is managed primarily for the barrens and wetlands native to this landscape and to protect the 17 natural communities and their associated plant and wildlife species. Management objectives and prescriptions are described in Section One of this chapter. Wetland and oak/pine barrens restoration and maintenance practices are employed to a greater degree here than at any other wildlife area in Wisconsin.

Wetland management is used to provide healthy wetlands for wildlife in a diversity of wetland types. While wetland water levels in much of the lakes region of Northern Wisconsin are held static for recreation and other human interests, GLG property managers annually manipulate water levels to mimic and restore the habitat types found within natural fluctuating wetlands, which ultimately provide an optimal diversity of wildlife species. Management practices include water level manipulation, no management, prescribed burning, aquatic invasive plant species control, and construction and maintenance of flowage dikes. More than 300 prairie potholes are maintained to provide breeding pair ponds for waterfowl.

Water levels are managed through 35 water control structures, eight miles of water transfer ditches, and a diversion pump. At least 18 miles of constructed dikes create 34 flowages that flood approximately 8,000 acres. Water level management activities include drawdowns and partial drawdowns of flowages. Water is moved between flowages by pumping or gravity flow to manage wetland habitat. Dikes are mowed and herbicide is used to control brush and trees. Invasive species control

is undertaken through mechanical, chemical and biological control agents. Major maintenance activities are undertaken to keep existing dikes in proper condition and new dikes are constructed to create additional flowages. Water management practices have sometimes created conflict with neighboring landowners. Most complaints occur during periods of increased ground water levels which cause localized flooding of low areas outside the Crex property boundaries.

Oak and Pine Barrens (approximately 10,000 acres) are maintained and restored using techniques such as mowing, commercial and non-commercial timber harvest, whole tree harvesting for biomass fuels, herbicide application, clearing, firebreak construction, and prescribed burning. Approximately 1,000 - 3,000 acres are burned annually.

Wild Rice stands are annually assessed by DNR and Great Lakes Indian Fish and Wildlife Commission on the property using aerial surveys. For more than three decades the partnership has been monitoring, planting, managing, and enjoying the production of wild rice in cooperation with other resource managers in northern Wisconsin. A Wild Rice Advisory Committee (joint committee of WDNR and tribal representatives) serves as the resource for wild rice management objectives.

Wild rice historically is an important part of northwest Wisconsin's wetland ecology, fish and wildlife habitat, and a cultural food source. Its availability makes this property attractive to wildlife, waterfowl hunters and ricers. Although water levels are managed at the best perceived level to grow rice, drought conditions sometimes decrease water levels to where ricing (even canoeing for duck hunting) is challenging. Wild rice harvesters are restricted by state statute to use canoes that are hand propelled by paddle or pole. Wild rice was successfully seeded in a number of flowages on Crex in the early 1990's. In good production years some flowages on Crex have yielded a very large percentage of the total reported wild rice harvest in the state. The Crex flowages are harvested by both tribal and non-tribal ricers.

The **Important Bird Area** status reflects landscape-level management for oak/pine barrens, northern sedge meadows and marshes, and emergent marsh/wild rice habitats. Similarly, it is a designated **Land Legacy Place** and a **Conservation Opportunity Area** for pine-oak barrens of global significance and large sedge meadows, fens, and prairies of Upper Midwest/regional significance in the Wisconsin Wildlife Action Plan (WDNR 2011a).

Invasive species threats and control opportunities are described previously in the Rapid Ecological Assessment section. A variety of surveys are conducted to monitor wildlife populations and harvest levels, evaluate management practices, and determine levels of public use.

The Friends of Crex, Inc. established in 1984, is a dedicated volunteer group who serve to support and assist Wisconsin DNR with wildlife management and wildlife conservation education at the GLG properties. They are an informational resource for visitors and area landowners. It is a non-profit corporation that provides volunteer and financial assistance needed to support the wildlife education program and management goals of the GLG properties (Appendix B). For more information, visit [Friends of Crex, Inc.](http://www.crexmeadows.org) (www.crexmeadows.org).

Crex Meadows Youth Conservation Camp is an eight-week summer program of two-week sessions, administered by the Northwest Wisconsin Concentrated Employment Program, Inc. (CEP). A unique and popular program designed for regional high school students, CEP offers those who qualify a chance to earn science or elective credits towards graduation, while learning skills (trail maintenance, seed harvesting, bird banding, plant inventory) and earning a minimum wage working with DNR staff and CEP crew leaders. The program aims to build sustainable communities, while supporting education and the environment. Information is available from [CEP, Inc.](http://www.nwcep.org) or (www.nwcep.org).

Reduction in permanent staff stationed at Crex over the last several decades has reduced the ability to conduct habitat management and maintenance activities on all GLG properties.

Land Management Classifications

The Crex Meadows Wildlife Area is divided into four land management areas: one Habitat Management Area, two Recreation Management Areas with Type 3 Recreation, and one Special Management Area for GLG Headquarters and Special Events. (Map C-4)

Area 1: Barrens & Wetlands Habitat Management Area (28,993 acres)

This management area predominantly contains habitats ranging from wetlands to open prairie and oak/pine barrens, to savanna, with lesser extents of white pine, aspen and northern hardwood forests. Wetlands are common throughout the Management Area, representing more than 50% of the land cover. (see Wetlands, p. 20)

Past disturbances, especially fire, contributed to the natural and abundant species diversity found here. Oak savanna and jack pine barrens will continue to dominate this area, with barrens-associated herbaceous ground flora well represented. The oak savanna will rotate between savanna and partial open canopy forest, while partial open canopy will provide rare species habitat and high quality natural community remnants. Diversity in tree density will provide forest products and critical habitat for savanna-dependent wildlife, such as wild turkey and red-headed woodpecker. Throughout the management area, ground vegetation consists of many barrens-associated grasses and forb species such as silky prairie clover, wild lupine, and bluestem grasses. This ground vegetation is more diverse in areas where sufficient light reaches the forest floor. Many rare and common wildlife species are associated with this habitat including whip-poor-will and wild turkey. The jack pine barrens will rotate between open jack pine barrens and jack pine forest. A partial open canopy provides rare species habitat with high quality natural community remnants; whereas more closed jack pine forest provides forest products and critical habitat for wildlife such as Connecticut Warbler and Whip-poor-will. This habitat management area has been identified as important for native barrens ground layer plants, the globally imperiled Oak/Pine Barrens plant community and prairie species diversity (WDNR 2015). Barrens-dependent wildlife including many special concern species and Species of Greatest Conservation Need (SGCN) have been documented here, such as Upland Sandpiper, Sharp-tailed Grouse and Connecticut Warbler (see Appendix A).

The large open oak/pine barrens will persist, providing a high quality, ecologically functional community continuum of age classes (prairie, shrub, scrub to tall tree) for rare species that depend on this community. (see Barrens, p. 18)

The barrens will contain a range of age and size classes of jack pine stands, some that are nearly pure jack pine, and others that are jack pine mixed with red pine, scrub oak and aspen. A continuum of community types will be present, ranging from relatively open Pine Barrens to older stages of Northern Dry and Dry-mesic Forest. High quality barrens ground flora will be maintained during all management treatments.

Opportunities for hunting, trapping, hiking, nature study, bird watching and other wildlife viewing are available.

Table 2-2 shows approximate acreage of current and projected forestry-based cover for Area 1 public land (Map C-3).

Cover Type	Current		Change Predicted in 50 years	
	Acres	% Cover	Acres	% Cover
Non-Forested Wetland	11,898	41		
Oak	8,864	31	7756	27
Water	2,567	9		
Aspen	2,369	8	3,000	11
Grassland	1,495	5		
Upland Conifer	1,116	4	1,200	4
Upland Hardwood	265	1	200	7
Developed	208	<1		
Field	138	<1		
Swamp Conifer	37	<1		
Swamp Hardwood	23	<1		
Shrub	13	<1		
Total	28,993	100	28,993	100

Objectives and Prescriptions

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” and “Recreation Management” provided in Section One of this chapter.

Wildlife Refuge: A 2,300 acre refuge management zone overlays a portion of the Barrens and Wetlands Habitat Management Area. It is the only area on the property closed to hunting, trapping and public access. Its primary purpose is to provide a resting area for migrating birds. Water levels are manipulated to provide optimal habitat, especially for shorebirds and waterfowl. Levels are generally lowered during spring and fall to provide shallow pools and mudflats. Approximately 120 acres of corn, rye, buckwheat and other crops are planted each year to attract wildlife, especially waterfowl. These food patches also present opportunities for wildlife observation. Thousands of ducks, geese and cranes use this area as a staging area during October and November. Other management practices include waterfowl banding (using swim-in and cannon netting), and construction of nesting structures for waterfowl, eagles, osprey and herons.

Wildlife Refuge Zone Management Objective

- Maintain 2300 acres as a wildlife refuge (NR 11.04(4)(a), Wis. Admin. Code)

Wildlife Refuge Zone Management Prescriptions

- Closed to all public access per NR 45.04 (1) b Wis. Admin. Code. Wildlife viewing is available from roads adjacent to the refuge.
- Maintain an option to manage 110 acres of cropland to provide supplemental wildlife forage and public wildlife viewing opportunities.

State Natural Areas

The Crex Sand Prairie SNA, the Reed Lake Meadow/Barrens SNA, and a portion of the Kohler-Peet Barrens SNA are all contained within the Barrens and Wetlands Management Area. The large sedge marshes at Crex such as those found in Reed Lake Meadow serve as critical sharp-tailed grouse leks (dancing grounds). They have the same management objectives and prescriptions as the rest of the area.

Crex Sand Prairie (79 acres) was designated a state natural area in 1958. Roadside parking and an observation area are available. Approximately 34 acres are designated as part of the wildlife refuge, closed to all public use per ch. NR 45.04 (1)b Wis. Admin. Code.

Reed Lake Meadow (3,568 acres) was designated a state natural area in 2003. This landscape mosaic consists of extensive barrens and wetlands scattered with small lakes. A large open wetland exists southwest of Reed Lake. It is managed for oak barrens, northern sedge meadow, Karner blue butterflies, an aquatic preserve, and wetland protection. Management objectives and prescriptions are no different from the rest of the management area.

Kohler-Peet Barrens (527 acres) was designated a state natural area in 1979. It is a nearly flat expanse of sandy, open barrens situated within the vast glacial outwash deposits of northwestern Wisconsin. Many rare and uncommon animals of open habitats are found here including the federally endangered Karner blue butterfly, sharp-tailed grouse, eastern bluebird, vesper sparrow, and field sparrow. The barrens flora is diverse with many species of prairies, barrens, and bracken grassland communities.

Area 2: Rest Area - Recreation Management Area (51 acres)

This day use area holds an age’s long tradition as a rest area along a public travel route. It provides a rest area for property users including hunters, school groups, birdwatchers, and those attending special events (Appendix E). It is located near a historical marker and scenic overlook. Camping is allowed in the area during fall (Sept – Dec) and is restricted to a small number of sites. Campers must register at the Crex Wildlife Education & Visitor Center. The rest area includes parking, picnic tables, benches, fire grates, toilets, and a water pump.

This area is characterized by older northern pin oak forest type with an open vista overlooking the Reisinger Flowage and the northern end of the Crex Meadows Wildlife Refuge.

Table 2-3 shows current and projected forestry-based cover for Area 3 public land (Map C-3). Projected forestry-based cover is not anticipated to change.

Current & Projected Cover		
Cover Type	Acres	% Cover
Oak	35	68
Non-Forested Wetland	11	22
Developed	5	10
Total	51	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” and “Recreation Management” provided in Section One of this chapter.

Objective

- Provide a picnic and day use area for visitors.

Prescriptions

- Install a picnic shelter with capacity for up to 40 people.
- Install facilities that provide maps and information about the property.
- Maintain potable water and pit toilets.
- Maintain picnic tables, fire rings, the primitive hiking trail, and information kiosk.
- Continue to provide dispersed camping by permit, during fall hunting seasons (Sept - Dec).
- Provide informational signage for the 1.4 miles of primitive trail used for hiking and xc skiing.
- Develop no additional recreational amenities.
- Ensure commercial timber harvests maintain an aesthetic forest buffer for camping and to shade the primitive trail.

Area 3: Dog Training and Artesian Well Water Access - Recreation Management Area (160 acres)

This 160-acre recreation area is located on the south-central border of the Crex Meadows WA project boundary. The area contains an artesian well that is popular among the local community. Hunters use this parcel as a dog training area. This area is characterized by an area of old grassy fields that cover about 100 acres. Mixed forest and wetlands cover the remaining 60 acres.

Table 2-4 shows approximate acreage of current and projected forestry-based cover for Area 4 public land (Map C-3).

Cover Type	Current		Change Predicted in 50 years	
	Acres	% Cover	Acres	% Cover
Grassland	101	63		
Oak	28	18	23	14
Non-Forested Wetland	15	9		
Upland Conifer	15	9	20	12
Developed	1	6		
Total	160	100	160	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” and “Recreation Management” provided in Section One of this chapter.

Objectives

- Designate the area for seasonal dog training.
- Manage areas of upland cover to facilitate dog training.
- Continue to allow public access to the artesian well.

Prescriptions

- Improve / maintain vehicle access to a parking area near the artesian well.
- Develop up to two parking areas to provide safe off-road access.
- Develop a 100-160 acre Class 2 dog training area (s. NR 17.05(2) Wis. Admin. Code).
- Convert portions of ‘old field’ land cover to native grass and forbs, to offer a mix of habitat types for dog training.
- Explore utilizing sharecropping to create areas of crops and short grass habitat types to facilitate dog training.

Area 4: GLG Headquarters and Special Events - Special Management Area (31 acres)

This 31-acre special management area includes the Crex Meadows Wildlife Education and Visitor Center and an administrative area encompassing field offices, youth camp facilities, workshop, and storage buildings for managing all the GLG properties. **The Friends of Crex, Inc.**, volunteers serve as an informational resource for visitors and area landowners, with a vision of preserving the ecological integrity of the a GLG properties. Its mission is to enhance public appreciation and support for wildlife and wildlife management for current and future generations. This non-profit corporation provides volunteer and financial assistance needed to support the wildlife education program and management goals of the GLG properties (Appendix B).

Crex Meadows Wildlife Education and Visitor Center staff (both paid and volunteer) provide educational and interpretive programming, office support, and facilities maintenance. Facilities include parking for 30 vehicles, bus parking, overflow parking for 50 vehicles, classrooms, a 60-seat auditorium equipped with multi-media technology, exhibits, video room, library, gift shop, and rest rooms. Refer to the Universal Recreation Prescriptions for GLG properties (section one of this chapter) and to Appendix E for extensive lists of recreation opportunities offered.

Long-awaited plans include construction of an unheated storage building for equipment, a new mess hall for youth camps and visitor programs, increasing wildlife education staff to help meet the increasing demand for programs and customer/visitor services, and accommodating increased property use.

Table 2-5 shows approximate acreage of current and projected forestry-based cover for Area 5 public land (Map C-3).

Cover Type	Current		Change Predicted in 50 years	
	Acres	% Cover	Acres	% Cover
Developed	15	48	16	52
Non-Forested Wetland	9	29		
Oak	4	13	2	6
Upland Conifer	3	10	4	13
Total	31	100	31	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Recreation Management on all Properties” provided in Section One of this chapter.

Objective

- Provide areas and facilities to support operations and delivery of public services and educational programming to implement the GLG vision and goals.

Management Prescriptions:

- Maintain the office/heated work area and storage areas for use by department staff. Maintain, enhance, expand and replace existing buildings as needed.
- Plan and oversee construction of a new dormitory center. Consider as examples, facilities at Sandhill WA (Wood Co), MacKenzie Center (Columbia Co), UW Kemp Station (Vilas Co), UW Treehaven (Lincoln Co), etc. Continue to build state and public support, beyond what already exists from local legislators.
- Oversee construction of new unheated storage building (30 ft. x 70 ft.), approved in 2014 biennial budget.
- Oversee construction of new mess hall / multipurpose building, per 2014 approval, when fundraising is completed.
- Oversee construction of an outdoor amphitheater that seats approximately 60 people.
- Install a picnic shelter with capacity for up to 60 people.
- Maintain collaborative role working with Northwest Wisconsin Concentrated Employment Program in the summer camp programs for high school students.
- Maintain the two ADA accessible trails (marsh boardwalk and prairie habitat).
- Construct ADA accessible sidewalks or paths between buildings, as financial resources allow.
- Expand facilities for archery, the challenge course, and geocaching programs.
- Develop and maintain the interpretive trails, including benches, displays, and picnic tables.
- Maintain the grounds (turf, trees, etc.) around all buildings as appropriate to enhance building maintenance and protection from wild fire or storm damage and to ensure visitor safety. Utilize native landscape plantings in strategic locations. Away from buildings, manage the landscape to sustain existing native habitats and provide for visitor education through interpretation.
- Preserve the tradition of hosting a fall wildlife festival. (30+ years, since 1982).
- Use mechanized snow removal equipment for sidewalks and paths, as financial resources allow.
- Maintain parking for 30 - 50 vehicles, including bus parking.

Fish Lake Wildlife Area (Map Series D)

Fish Lake Wildlife Area is another critical piece of the Northwest Sands oak/pine barrens (Priority Conservation Areas, Appendix A). The barrens extend from northern Polk County to southern Bayfield County and covers 1,900 square miles. The southern portion of the barrens, where Fish Lake, Crex Meadows, and Amsterdam Sloughs is located, contains huge sedge marshes.

Managed Land:	13,649 acres
Acquisition Goal:	14,075 acres
Project Boundary:	14,075 acres

The sandy uplands of the wildlife area were historically covered by a jack pine savannah or oak/pine barrens. The vegetation consisted of large jack and red pine widely scattered throughout an open expanse of prairie grasses and wildflowers and a variety of woody vegetation including sweet fern, hazel, willow, blueberry and oak brush. The plant community was maintained by natural and human caused fires that frequently swept through the area. Several large sedge marsh communities are present on the property. Fish Lake itself is a natural lake located in the northwest corner of the property adjoins one of these large sedge marshes.

Facilities and Public Access

Recreational opportunities are described in section one of this chapter. Infrastructure (current and planned) is shown on Map D-2 and Appendix F. An unheated storage shed is the only building on the property.

The department maintains 25 gravel or grass parking areas. Parking is permitted seasonally along the shoulders of most town and county roads. Thirteen miles of department-owned, unimproved service roads provide interior property access for DNR maintenance and public recreation. Only county and township roads are plowed during winter.

To enhance hunting, trapping and wildlife habitat, wetlands are managed partly through maintenance of 14 walkable dikes, 13 water control structures and 13 impoundments.

Boat or canoe landings are located on two water bodies: at Fish Lake, reachable by a public access road east from Shogren Rd, and at Dueholm Flowage on the south end of the property, 0.5 miles off County Hwy O. Watercraft can also be carried in by hand at several other locations on the property.

Three hiking trails exist on the property. One trail traverses the Fish Lake Pines natural area, with access and parking from Hickerson Rd. The other two trails are accessible from parking areas accessible from Stolte and Fish Lake roads.

Management, Challenges & Constraints

The property is managed by a team of DNR staff stationed in Grantsburg, primarily using funds provided by hunters and trappers through their purchase of licenses and payment of a federal excise tax on firearms and ammunition.

During the 1950's dikes were constructed to re-flood the previously drained marshes, and management has since focused on restoring native wetland and barrens wildlife habitats. Thirteen flowages flood approximately 2,322 acres. Numerous wetland potholes, several small run-off ponds and a water transfer ditch were constructed. Wetlands are managed primarily by periodic drawdowns of the flowages and prescribed burning. More than 3,000 acres of restored barrens are also maintained by prescribed burning. Approximately 1,500 acres of forest are sustainably managed for wildlife habitat and timber production. One natural lake (Fish Lake) exists in the northwest corner of the property. Overall, timber sales, prescribed burning, and wetland drawdowns are the principle management tools used to restore and maintain this wildlife habitat. Management objectives and prescriptions are described in section one of this chapter and in areas below.

Unauthorized use of off-road vehicles on parts of the property has caused erosion and spread invasive species.

Land Management Classifications

The Fish Lake Wildlife Area is divided into three land management areas: one Habitat Management Area, one Native Community Management Area, and one Special Management Area (a cemetery buffer). (Map D-4)

Area 5: Barrens & Wetlands (Fish Lake) Habitat Management Area (13,609 acres)

Found near the southern terminus of Northwest Sands Ecological Landscape, this management area contains a mix of open sedge marshes and uplands. Over half of the property is covered by wetland habitat. Northern pin oak covers the majority of uplands, both in early successional barrens habitat and in mature oak forest. In portions of this area, a mixed forest of white and red pine exists. A small amount of land within the Grettum Flowage Wildlife Refuge is currently sharecropped.

The Barrens and Wetlands Habitat Management Area contains one special management zone: the Grettum Flowage Wildlife Refuge zone.

Table 2-6 shows approximate acreage of current and projected forestry-based cover for Area 5 public land (Map D-3).

Cover Type	Current		Change Predicted in 50 years	
	Acres	% Cover	Acres	% Cover
Non-Forested Wetland	6,080	45		
Oak	3,333	25	3,047	22
Grassland	1,063	8		
Water	1,242	9		
Aspen	981	7	1,250	9
Upland Conifer	639	5	700	5
Upland Hardwood	111	<1		
Field	100	<1	91	<1
Swamp Hardwood	40	<1		
Swamp Conifer	10	<1		
Developed	10	<1		
Total	13,609	100	13,609	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” and “Recreation Management” provided in Section One of this chapter.

Prescription

- Develop information facilities and a wildlife observation lookout at the Bucklund Rd / State Hwy 87 parking lot.

Grettum Flowage Wildlife Refuge (1,200 acres) is closed during waterfowl hunting season, and open to hunting and trapping during the remainder of the year.

Grettum Flowage Wildlife Refuge Zone Objective

- Maintain 1200 acres as a wildlife refuge (NR 11.04(4)(a), Wis. Admin. Code).

Grettum Flowage Wildlife Refuge Zone Prescriptions

- Closed to hunting and trapping during the waterfowl season.
- Open to hunting deer during the nine-day firearm and muzzleloader season.
- Maintain 50 acres to provide supplemental wildlife forage and wildlife viewing opportunities.

State Natural Area Designations

Fish Lake Meadow State Natural Area (1,880 acres) was designated in 2003. It lies within Management Area 5: Barrens and Wetlands, and has the same management objectives and prescriptions as this habitat management area. It is a vast northern sedge meadow bordering Fish Lake, dominated by wire-leaved sedges and bog vegetation. This wet meadow often has 4-12 inches of standing water. Fish Lake water levels fluctuate naturally and have no water control structures.

Area 6: Fish Lake Pines Native Community Management Area (40 acres)

Fish Lake Pines State Natural Area (40 acres) designated in 2003 within the property, is a native community management area for a remnant mature dry-mesic forest of white and red pine, with northern pin oak (scrub oak) surrounded by wetlands. Located northeast of Dueholm Flowage, the area is managed passively, which allows nature to determine the site's ecological characteristics. The dry-mesic forest is being allowed to convert over time to a more mesic forest, with natural loss of oak, aspen and red pine.

Table 2-7 shows approximate acreage of current and projected forestry-based cover for Area 6 public land (Map D-3).

Cover Type	Current		Change Predicted in 50 years	
	Acres	% Cover	Acres	% Cover
Upland Conifer	22	55	33	83
Aspen	14	35	5	12
Oak	3	8	2	4
Non-Forested Wetland	1	2		
Total	40	100	40	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Recreation Management on all Properties” provided in Section One of this chapter.

Objective

- Passively manage towards a mixed forest of long-lived species such as white pine and Northern Hardwoods, with older age classes.

Prescriptions

- Allow only natural processes to shape matrix of older forest characteristics.
- Conduct no timber harvest; no prescribed burns.
- Salvage operations due to catastrophic wind, ice, fire, disease or insects may take place. Prior to salvage, consult an interdisciplinary team from Wildlife, Forestry, and NHC to determine salvage or management, considering the original objectives of the area.
- Maintain the primitive hiking trail.
- Allow and encourage research and monitoring.
- Develop no additional recreational features.
- Use appropriate fire suppression techniques to minimize resource damage.

Area 7: Cemetery Buffer - Special Management Area (12 acres)

The Cemetery Buffer Special Management Area is designed as a buffer area on DNR land that surrounds the St. Olaf Cemetery. Established in 1870, the cemetery is a three-acre privately owned parcel surrounded on three sides by Fish Lake Wildlife Area. Access is on the north side from Assembly Road. The cemetery is managed by the Cemetery Board of Bethany Lutheran Church. Management Area 8 provides definition to the historical (verbal) agreement between forestry and wildlife program staff, that the area surrounding the cemetery be managed as a no harvest zone, to protect the aesthetics of the cemetery. Passively managing these lands as described below is meant to provide a long-term consistent landscape adjoining the cemetery.

Table 2-8 shows approximate acreage of current and projected forestry-based cover for Area 7 public land (Map D-3).

Cover Type	Current		Change Predicted in 50 years	
	Acres	% Cover	Acres	% Cover
Upland Hardwood	10	83	8	67
Upland Conifer	1	8	3	25
Grassland	1	8		
Total	12	100	12	100

Objective

- Passively manage towards a mixed forest of long-lived species such as white pine, spruce, cedar, and Northern Hardwoods. Encourage older age classes.

Prescriptions

- Allow only natural processes to shape matrix of older forest characteristics.
- Conduct no timber harvest.
- Salvage operations due to catastrophic wind, ice, fire, disease or insects may take place. Prior to salvage, consult an interdisciplinary team from Wildlife, Forestry, and NHC to determine salvage or management, considering the original objectives of the area.
- Develop no recreational features or other infrastructure.
- Use appropriate fire suppression techniques to effectively minimize resource damage.
- Control new or existing invasive species as practicable, using manual, mechanical and chemical vegetation management methods.

Amsterdam Sloughs Wildlife Area (Map Series E)

Amsterdam Sloughs Wildlife Area is another critical piece of the Northwest Sands oak/pine barrens (Priority Conservation Areas, Appendix A). The barrens extend from northern Polk County to southern Bayfield County and covers 1,900 square miles. The southern portion of the barrens, where Fish Lake, Crex Meadows, and Amsterdam Sloughs is located, contains huge sedge marshes. This GLG property is also located in Burnett County, only several miles east of Crex Meadows Wildlife Area, and northwest (two miles) of Siren. Blomberg Lake and Woods State Natural Area (966 acres) lies embedded within the southwest portion of the property. Acquisition for the wildlife area began in 1956.

Managed Land:	5,052 acres
Acquisition Goal:	5,483 acres
Project Boundary:	5,483 acres

Facilities and Public Access

Recreational opportunities are described in section one of this chapter. Infrastructure (current and planned) is shown on Map E-2 and Appendix F. There are no buildings on the property.

Access (and parking) is primarily from perimeter roads. The department maintains 15 gravel or grass parking areas, and does not plow snow. Parking is permitted seasonally along the shoulders of most town and county roads. With over half of the property covered by wetlands, much of the interior is accessible only by foot. The wetlands are accessible in part on foot across 2.5 miles of dikes. Maintenance includes dikes, five water control structures and nine impoundments.

A boat ramp adjacent to a bridge is available for public use at Black Brook Flowage on the north end of the property, off County Hwy D. Watercraft may be carried into other flowages on the property by hand.

Management, Challenges & Constraints

The property is managed by a team of DNR staff working out of Grantsburg and the Webster Ranger Station, primarily using funds provided by hunters and trappers through their purchase of licenses and payment of a federal excise tax on firearms and ammunition. Management to restore pre-settlement vegetation and associated wildlife includes restoring drained wetlands, barrens, and maintaining tamarack and northern-mesic forest. Refer to section one of this chapter and management areas described below for management objectives and prescriptions.

Development of Amsterdam Sloughs Wildlife Area began in 1968 when dike construction created the 500-acre Black Brook Flowage. Since then, several smaller flowages were constructed. Seventy-five potholes, averaging 1/10-acre in size, were dug to function as breeding ponds for waterfowl. Several miles of firebreaks were constructed to facilitate prescribed burning to restore and maintain the native brush-prairie. Native prairie grass restorations provide nesting cover for waterfowl.

Challenges include disturbance to soil, wildlife, recreation, and ecological communities from ATVs/UTVs driven in prohibited areas. Land management and efforts to improve access in much of the Natural Area are not feasible due to soil characteristics and topographical features that characterize their inaccessible nature.

Additional management challenges include illegal dumping of trash and off-road vehicle use on the property. As the smallest of the GLG properties and furthest distance from staff locations, Amsterdam Sloughs receives less staff attention than the closer, larger properties in this property group.

Land Management Classifications

The Amsterdam Sloughs Wildlife Area is divided into two land management areas: a Habitat Management Area and a Native Community Management Area. (Map E-4)

Area 8: Barrens & Wetlands (Amsterdam) Habitat Management Area (4,199 acres)

Over half of Amsterdam Sloughs Wildlife Area is covered by wetlands. Due to these wetlands, road access is limited to the perimeter of the property. A matrix of wooded islands can be found scattered throughout the wetlands. Trees are a mix of scrub oak and aspen. An active timber harvest program has promoted good aspen age diversity. While most of the property lies in the Northwest Sands Ecological Landscape a small portion of the property is in the Transitional Forest Ecological Landscape. This area has some of the best upland hardwood forest found on any of the GLG properties.

Table 2-9 shows the approximate acreage of current and projected forestry-based cover for Area 8 public land (Map E-3). Projected forestry-based cover is not anticipated to change.

Cover Type	Current & Projected Cover	
	Acres	% Cover
Non-Forested Wetland	1,789	43
Aspen	697	17
Oak	679	16
Grassland	483	12
Water	262	6
Lowland Shrub	100	2
Upland Hardwood	65	1
Swamp Conifer	58	1
Upland Conifer	42	1
Developed	15	<1
Swamp Hardwood	9	<1
Total	4,199	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” and “Recreation Management” provided in Section One of this chapter.

Prescriptions

- Designate and develop a one-mile, moderately developed, hunting and wildlife viewing trail network (barrier-free), and develop a parking area at the Bruss Road entrance.
- Provide up to six waterfowl and deer hunting blinds that offer a rugged, yet manageable experience for disabled users and the general public.
- Maintain three disabled accessible hunting trails that allow vehicle access to hunting areas. Disabled hunters may register to access the trails at the Crex Meadows Education and Visitor Center in Grantsburg.
- Maintain vast interior wetlands to promote opportunities for semi-wilderness hunting experiences.

Area 9: Blomberg Lake & Woods Native Community Management Area (966 acres)

This management area contains the shallow 68-acre Blomberg Lake, which is a bog lake surrounded by a mix of open peatland and tamarack-dominated wetland forest. This area also contains good-quality examples of Northern Sedge Meadow and Northern Mesic Forest. Situated on the boundary between the Northwest Sands and Forest Transition Ecological Landscapes, the management area contains a diverse mix of vegetative community types. It includes the Blomberg Lake Natural Area (309 acres) that was designated in 2003.

Table 2-10 shows the approximate acreage of current and projected forestry-based cover for Area 9 public land (Map E-3). Projected forestry-based cover is not anticipated to change.

Cover Type	Current & Projected Cover	
	Acres	% Cover
Non-Forested Wetland	436	45
Oak	200	21
Swamp Conifer	146	15
Water	76	8
Aspen	49	5
Upland Hardwood	38	4
Swamp Hardwood	21	2
Total	966	100

Unless specifically addressed below, follow the “Universal Elements for All Properties” including “Management by Habitat and Forest Type” provided in Section One of this chapter.

Objectives

- Maintain a block of representative natural community types, including Tamarack (poor) Fen, Bog Lake and Northern Mesic Forest.
- Provide stands with older age classes, where possible.

Prescriptions

- Passively manage the forested and unforested wetlands to protect and enhance the quality of the bog lake and tamarack community. Salvage operations due to catastrophic wind, ice, fire, disease or insects may take place. Prior to salvage, consult an interdisciplinary team from Wildlife, Forestry, and NHC to determine whether salvage should occur, considering the original objectives of the area.
- Actively manage the forested uplands using timber sales to improve vigor and overall quality of these stands. Use extended rotation silvicultural techniques on appropriate sites.
- Retain cover for ephemeral ponds and avoid negatively impacting their hydrology.
- Allow and encourage research and monitoring.
- Develop no recreational features or infrastructure.

State Natural Area

The **Blomberg Lake and Woods State Natural Area** (966 acres) overlays the entire management area. The management objectives and prescriptions remain the same for this overlay. The overlay expands the Blomberg Lake State Natural Area (309 acres), designated in 2003.

Chapter 3: Supporting Information

Regional Analysis

The Regional Analysis component of this document describes the biological/ecological, cultural, economic, and recreational environment that affects the properties and their uses. It characterizes the existing property resources within the Ecological Landscape in which they exist and highlights the degree to which they are significant both regionally and within the project boundary. It identifies significant ecological and recreational needs of the region. It also defines existing and potential social demands or constraints that affect these properties and should be considered during the planning process.

This Regional Analysis is defined within an Ecological Landscape framework of Wisconsin, to describe current knowledge, use and potential of three elements: Biological Resources, Socio-economic Characteristics, and Recreational Resources.

Ecological Landscapes of Wisconsin

The “Ecological Landscapes of Wisconsin” handbook (WDNR, 2015), delineates 16 Ecological Landscapes in Wisconsin that have similar ecology and management potential. For each Ecological Landscape there are: 1) descriptions of ecological resources and socioeconomic conditions; 2) descriptions of Wisconsin’s role in sustaining these resources within regional and global perspectives, and 3) highlights of ecological management opportunities best suited for each Ecological Landscape.

This handbook was designed to provide the scientific information needed to make strategic and effective decisions in department master planning. Its use creates efficiency by integrating and focusing the work of multiple department and partner programs (Water, Forestry, Fish, Wildlife and Endangered Resources), plans, and funding sources within the framework of an Ecological Landscape. The handbook provides tools to develop management strategies that are ecologically appropriate for a region. Applying ecosystem management concepts and opportunities described in the handbook may prevent conflicting or incompatible management among different department programs on adjoining lands.

Northwest Sands

The **Northwest Sands** is the Ecological Landscape in which the majority of the Glacial Lake Grantsburg property group resides. The Northwest Sands regional descriptions of biological resources, socio-economic characteristics and recreational resources are provided in Chapter 17 of the *Ecological Landscapes Handbook*. This Chapter is incorporated by reference in its entirety within this planning document. Information on Chapter 17 and the remainder of the handbook are accessible on the Wisconsin DNR website (dnr.wi.gov) and by searching keywords “Ecological Landscape of Wisconsin or Northwest Sands.”

The chapter’s introductory summary, “**Northwest Sands Ecological Landscape at a Glance**” (included below) provides a quick overview of the types of information useful in this planning effort. This “landscape at a glance” was copied verbatim (below) from the *Ecological Landscape Handbook*. Figure 1 depicts a map showing the GLG properties overlaid on the Ecological Landscapes of Wisconsin.

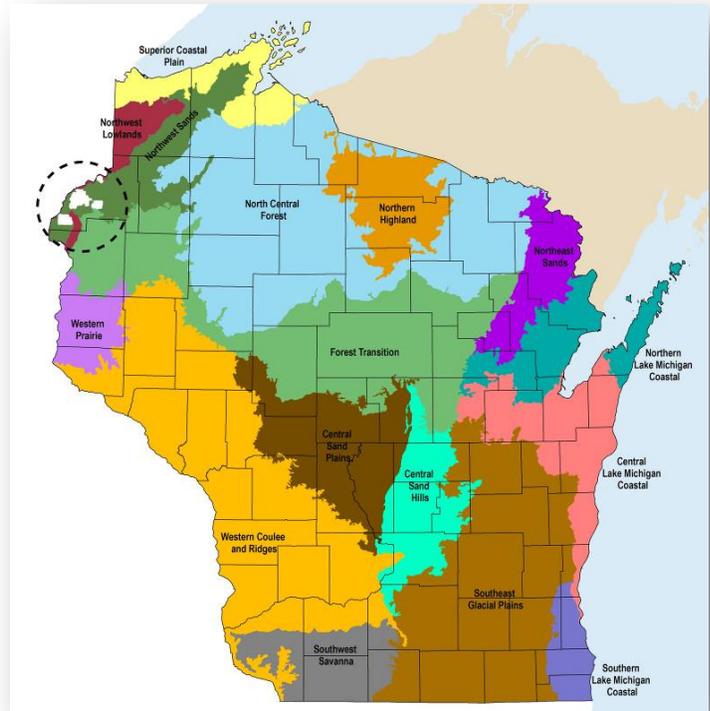


Figure 1: Glacial Lake Grantsburg Property Group (in white) and the 16 Ecological Landscapes of Wisconsin.

Northwest Sands Ecological Landscape at a Glance (WDNR, 2015)

Physical and Biotic Environment	
Size	1,956 square miles (1,251,723 acres) of land surface are within the Northwest Sands Ecological Landscape. This is 3.5% of the land area of the State of Wisconsin.
Climate	Mean annual temperature (41.30 F) is similar to other northern ecological landscapes. Annual precipitation averages 31.4 inches and annual snowfall about 61 inches, also similar to other northern ecological landscapes. The growing season is short and averages 121 days. Although there is adequate rainfall to support agricultural row crops such as corn, the sandy soil and short growing season limit row crop agriculture, especially in the northern part of the ecological landscape.
Bedrock	Underlying bedrock at the southern edge of the Northwest Sands is Cambrian quartzose and glauconitic sandstone and siltstone. In the northern portion, the bedrock is Precambrian basalt, lithic conglomerate, shale, and feldspathic to quartzose sandstone. Bedrock is covered with 100 to 600 feet of glacial drift (sand, gravel, and silt), with the thickest deposits in the northern half. No terrestrial bedrock exposures are known from this ecological landscape.
Geology and Landforms	This ecological landscape is the most extensive and continuous xeric glacial outwash system in northern Wisconsin. It has two major geomorphic components. One is a large outwash plain pitted with depressions, or “kettle lakes.” The other component is a former spillway of Glacial Lake Duluth (which preceded Lake Superior) and its associated terraces. The spillway is now a river valley occupied by the St. Croix and Bois Brule Rivers. The hills in the northeast are formed primarily of sand, deposited as ice-contact fans at the outlet of subglacial tunnels. Lacustrine deposits (especially fine materials of low permeability such as clays) from Glacial Lake Grantsburg underlie Crex Meadows and Fish Lake Wildlife Areas, and are responsible for impeding drainage, leading to the formation of the large wetlands there.
Soils	Upland soils are typically sands or loamy sands over deeper-lying strata of sand, or sand mixed with gravel. These soils drain rapidly, leading to xeric, droughty conditions within the ecological landscape. Wetlands in low-lying depressions have organic soils of peat or muck.
Hydrology	This ecological landscape has significant concentrations of glacial kettle lakes, most of them seepage lakes, a well-developed pattern of drainage lakes, and several large wetland complexes. The lakes cover roughly 4.8% of the area of the Northwest Sands, the third highest percentage among ecological landscapes in Wisconsin. The headwaters of the St. Croix and Bois Brule rivers are here. Major rivers include the St. Croix, Namekagon, Yellow, and Totagatic. Springs and seepages are common along the Upper Bois Brule but local elsewhere.
Current Landcover	Landcover is a mix of dry forest, barrens, grassland, and agriculture, with wetlands occupying significant parts of the bed of extinct Glacial Lake Grantsburg, kettle depressions, and some river valleys. Within the forested portion, pine, aspen-birch, and oak are roughly equally dominant. The maple-basswood, spruce-fir, and bottomland hardwood forest types occupy small percentages of the ecological landscape’s forests. The open lands include a large proportion of grassland and shrubland. Emergent/wet meadow and open water are significant in the southern part of the Northwest Sands. There is very little row-crop agriculture.
Socioeconomic Conditions <i>(The counties included in this socioeconomic region are: Bayfield, Burnett, Douglas and Washburn).</i>	
Population Density	21 persons/ mi ²
Per Capita Income	\$26,208
Economic Sectors	The largest employment sectors in 2007 were: Government (18.7%); Tourism-related (15.8%), Retail trade (10.7%); Health care and social services (9.7%). Although forestry does not have a large impact on the number of jobs, it is the sector that has the largest impact on the natural resources in the ecological landscape.
Public Ownership	Forty-eight percent of the land and water in the NWS EL is in public ownership. Federal lands include parts of the Chequamegon-Nicolet National Forest and the St. Croix National Scenic Riverway.

	Important state-owned lands include Crex Meadows, Fish Lake, Amsterdam Sloughs, and Douglas County Wildlife Areas, and parts of the Brule River and Governor Knowles State Forests. Extensive county forests are owned and managed by Bayfield, Burnett, Douglas, and Washburn counties.
Other Notable Ownership	The Wisconsin Chapter of The Nature Conservancy has developed conservation agreements with a number of persons owning land along and near the Brule River in Douglas County.

Considerations for Planning and Management

Lakeshore development has been occurring at a rapid rate, partly because of this ecological landscape's close proximity to the Minneapolis-St. Paul metropolitan area. The sandy soils are low in productivity and highly erodible, and great care must be taken when planning and conducting timber harvests, and in using motorized recreational vehicles such as ATVs, to avoid causing damage to slopes and fragile vegetation. Many rare plants and animals occur here, especially in the barrens and sedge meadow habitats, and these need consideration when planning and conducting management activities here. Increasing connectivity between patches of open or semi-open lands such as pine or oak barrens remnants, and reducing habitat fragmentation and isolation, are major management considerations for the Northwest Sands. Achieving greater connectivity between open habitats may be accomplished by the use of firebreaks, rights-of-way, pastureland, CRP, or other types of non-forested cover. There is typically sharp contrast ("hard edge") between the open, non-forested habitats and the surrounding dry forests. Identifying areas where some of this high contrast hard edge may be reduced is needed to plan for and provide greater structural variability in the dynamic barrens ecosystems and to better meet the needs of species not well adapted to either very open or densely canopied habitats. In recent years there has been a great increase in the amount of land planted up to pine plantations, usually at the expense of dry forest and barrens communities. Much of the vegetation here is dependent on periodic disturbance, especially via the use of prescribed fire. Some types of land disturbance can facilitate the colonization and spread of invasive plants. Leafy spurge and spotted knapweed are among the invasive plants currently posing problems in sandy uplands. Common reed and purple loosestrife is present in some open wetlands and may be increasing. Glossy buckthorn has been reported from the extensive cedar swamps along the upper Brule River.

Management Opportunities

The Northwest Sands is the best place in Wisconsin to manage for the globally rare Pine Barrens community. Large-scale barrens management is possible here because of the ecological suitability of the land, the presence of numerous remnants, and substantial public ownership. There are opportunities to connect existing barrens remnants and restoration projects with corridors and manage them with a mosaic of compatible vegetation types. Prescribed fire and other management tools can be used to develop more diverse structural characteristics, and to enhance or restore species composition in many pine-oak barrens communities. Some of the state's best places to manage for dry forests of jack pine, northern pin oak, and red pine are found here. There are also opportunities to manage for older dry-mesic white pine-red pine-red oak forests, in the rugged northern part of the ecological landscape, on the slopes above the Bois Brule River in Douglas County, along the St. Croix River in Burnett and Polk counties, and at scattered locations elsewhere.

Wetlands are extensive, provide habitat for many sensitive species and represent major management opportunities. The open meadows and marshes in the southwestern part of the Northwest Sands are particularly important because of their size, condition, intact hydrology, and the presence of numerous habitat specialists. Some of the larger marshes are within the managed flowages at Crex Meadows and Fish Lake Wildlife Areas, and at Gordon on the St. Croix River. Acid peatlands of black spruce-tamarack swamp, muskeg, open bog, and poor fen are widespread and common, especially in areas of pitted outwash, where lakes and poorly drained kettle depressions are important landscape features.

The Northwest Sands harbors significant concentrations of glacial kettle lakes. Development pressures are high. The lakes provide high quality habitats for aquatic organisms, resident and migratory birds, and many other species. Inland Beaches are rare, localized, or absent in most of Wisconsin. Here, beach communities occupy the sand and gravel littoral zones of softwater seepage lakes with upland shorelines and which experience naturally fluctuating water levels. There is a need to conduct an inventory of lacustrine and beach habitats to identify the best occurrences and associated rare species populations. The protection of undeveloped lakes and associated high-quality habitats is a significant opportunity in the Northwest Sands.

The St. Croix, Namekagon, Totagatic, Bois Brule, and Eau Claire rivers warrant special attention because of their excellent water quality, exceptional aquatic biota, recreational opportunities, and aesthetic features. The north-south orientation of the St. Croix and Bois Brule rivers, along with the generally unfragmented condition of the forests bordering these rivers, makes them highly significant to migratory birds and probably, to other species. The extensive white cedar swamp along the upper Bois Brule River is among Wisconsin's best examples of that community type and merits strong protection. Excellent occurrences of alder thicket, springs and spring seeps, and spring ponds also occur along the upper Brule and present additional management and protection opportunities.

Biological Resources

The biological resources of the Glacial Lake Grantsburg properties are described in detail in the Northwest Sands Ecological Landscape chapter noted above, along with details on socio-economic conditions and recreation resources. DNR staff tailored a summary of that chapter below, plus additional information and interpretation specific to the properties of interest for planning purposes. Biological resources descriptions are derived from both documents.

Rapid Ecological Assessment

Text in the following section is from the “Rapid Ecological Assessment for the Glacial Lake Grantsburg Planning Group: A Rapid Ecological Assessment Focusing on Rare Plants, Selected Rare Animals, and High-quality Natural Communities” (WDNR, 2011a).

The objectives of this project were to collect biological inventory information for the development of a master plan for the GLG and to analyze, synthesize and interpret this information for use by the master planning team. This effort focused on assessing areas of documented or potential habitat for rare species and identifying natural community management opportunities.

Existing NHI data are often the starting point for conducting a biotic inventory to support master planning. Prior to this project, NHI data for the GLG were limited to: 1) the Statewide Natural Area Inventory, a county-by-county effort conducted by WDNR’s Bureaus of Research and Endangered Resources between 1969 and 1984 that focused on natural communities but include some surveys for rare plants and animals, 2) breeding bird surveys on State Natural Areas, 3) surveys conducted for the Biodiversity in Selected Natural Communities Related to Global Climate Change (Peatlands Project; Anderson et al. 2008), and 4) taxa specific surveys.

The most recent taxa-specific field surveys for the study area were conducted during 2010. Surveys were limited in scope and focused on documenting high quality natural communities, rare plants, breeding birds, herptiles, and, for some properties, aquatic and terrestrial invertebrates. The collective results from all of these surveys were used, along with other information, to identify ecologically important areas (Primary Sites) on the GLG.

Survey locations were identified or guided by using recent aerial photos, USGS 7.5’ topographic maps, various Geographic Information System (GIS) sources, information from past survey efforts, discussions with property managers, and the expertise of several biologists familiar with the properties or with similar habitats in the region. Based on the location and ecological setting of properties within the GLG, key inventory considerations included the identification of high quality barrens, forests, and wetland communities and the location of habitats that had the potential to support rare species. Private lands surrounding the GLG were not surveyed.

Past Efforts

Various large-scale research and planning efforts have identified a number of locations within the GLG as being ecologically significant. The following are examples of such projects and the significant features identified.

Land Legacy Report

The Land Legacy Report (WDNR 2006b) was designed to identify Wisconsin’s most important conservation and recreation needs for the next 50 years. The Danbury to Sterling Corridor (including all of the properties within this group) was identified as important for waterfowl and shorebirds using the large and high-quality wetlands, sharp-tailed grouse (*Tympanuchus phasianellus*), and the Federally Endangered Karner blue butterfly (*Lycaeides melissa samuelis*). Crex Meadows was also recognized as an important site for its diverse habitats that support wildlife populations. Both sites were assigned a score of five points on their five-point scale, meaning it possesses “outstanding ecological qualities, is of adequate size to meet the needs of the critical components, and/or harbors natural communities or species of global or continental significance” (WDNR 2006b).

Important Bird Areas

Important Bird Areas (IBA; WDNR 2007) are critical sites for the conservation and management of Wisconsin's birds.

- The Fish Lake Wetlands and Barrens IBA includes Fish Lake Wildlife Area and Fish Lake Meadow and Fish Lake Pines State Natural Areas and was recognized for its importance to sedge meadow bird species and potential for Pine Barrens restoration.
- Crex Meadows Wildlife Area was recognized as an IBA because it contains critical habitat for a number of priority bird species. It is also an important concentration area in the spring and fall for waterfowl, shorebirds, and waterbirds.

Wisconsin Wildlife Action Plan: Conservation Opportunity Areas

The Wisconsin Wildlife Action Plan (WAP; WDNR 2006b) recognized six Conservation Opportunity Areas (COA) within the GLG (see Appendix A). Conservation Opportunity Areas are places in Wisconsin that contain ecological features, natural communities, or Species of Greatest Conservation Need (SGCN) habitat for which Wisconsin has a unique responsibility for protection when viewed from the global, continental, upper Midwest, or state perspective.

- The Amsterdam Sloughs, Crex, and Fish Lake COAs were recognized because of their large sedge meadows, fens, and prairies.
- The Crex Barrens and Wetlands and Fish Lake Barrens and Wetlands COAs were recognized because of the pine-oak barrens present.
- The St. Croix Ridge COA was recognized because of the medium-sized river systems and adjacent terrace communities present.

The Nature Conservancy's Superior Mixed Forest Ecoregion Conservation Plan

The Nature Conservancy's (TNC) Superior Mixed Forest Ecoregion Conservation Plan (TNC 2002) covers an area that encompasses much of northern Wisconsin, northern Minnesota, a small portion of Michigan's Upper Peninsula, and parts of southern Manitoba and southern Ontario. The plan resulted in a set of terrestrial and aquatic "Conservation Areas" that represent viable natural community types, globally rare native species, and other selected features. The GLG is included within the Fish Lake / Crex Meadows Conservation Area. It is over 139,000 acres and corresponds roughly with the 212Ka01 (Grantsburg Dunes) Landtype Association, surrounding numerous state, county, and private ownerships in western Burnett and northwest Polk counties.

Wisconsin Wetland Association Wetland Gems

The GLG was recognized by the Wisconsin Wetlands Association (WWA) as having several "wetland gems" (WWA 2010). These habitats are critically important to Wisconsin's biodiversity, provide nearby communities with valuable functions and services, and serve as recreational and educational opportunities.

- The Blomberg Lake Wetland Gem is within Amsterdam Sloughs Wildlife Area and Blomberg Lake State Natural Area. This area has high quality wetlands that provide exceptional wildlife habitats for a variety of birds, amphibians, and mammals.
- The Crex Meadows and Rice Lake Wetland Gem has thousands of acres of wetlands that provide habitat for over 270 species of birds, and a variety of reptiles, amphibians, and invertebrates.
- The Fish Lake Meadow Wetland Gem comprises several thousand acres of wetlands within Fish Lake Wildlife Area and Fish Lake Meadow State Natural Area. There is a diversity of wetland types at this site that provide habitat to and abundance of wildlife.

Grassland Bird Habitat Management

The Crex Meadows / Fish Lake Complex was recognized as a Priority Landscape for Grassland Bird Management (Sample and Mossman 1997) because it contains the most permanently managed grassland habitat in the state. The report noted that

coordination of planning and management for habitats including prairies, sedge meadows, surrogate grasslands, upland shrub, savannas, and closed forests should be explored.

Forest Certification

All DNR-managed lands, including state parks, wildlife areas, and natural areas, are recognized by the Forest Stewardship Council and the Sustainable Forestry Initiative as being responsibly managed (WDNR 2009). This certification emphasizes the state's commitment to responsibly managing and conserving forestlands, supporting economic activities, protecting wildlife habitat, and providing recreational opportunities.

Ecological Context

The majority of the GLG is located in the Northwest Sands Ecological Landscape (WDNR 2015) (Figure 1, Page 5). A small fraction is located in the Northwest Lowlands Ecological Landscape. Major landforms include flat plains or terraces along glacial meltwater channels, and pitted or "collapsed" outwash plains containing kettle lakes. Soils are predominantly deep sands, low in organic material and nutrients.

Historic vegetation for the Northwest Sands Ecological Landscape at the time of the General Land Office survey was predominantly jack pine (*Pinus banksiana*) and scrub oak (*Quercus spp.*) forest and barrens. Eastern white pine (*Pinus strobus*) and red pine (*Pinus resinosa*) forests were also a sizable component of the Ecological Landscape. Numerous barrens occurred in the southwest half, the portion where the GLCPG is now located, and a few large barrens within the northeast half. Most of the trees in the barrens were jack pine, but red pine savannas were present and oak savannas occurred in the south central section.

Current vegetation is a mix of forest, agriculture, grassland and barrens, with some wetlands in the river valleys. Within the forested portion, pine (*Pinus sp.*), aspen (*Populus sp.*), birch (*Betula sp.*) and oak (*Quercus sp.*) are equally dominant. The maple (*Acer sp.*), basswood (*Tilia americana*), spruce (*Picea sp.*), fir (*Abies sp.*), and lowland hardwood forest type groups occupy small percentages. Within the open lands, there is a relatively large proportion of grassland and shrubland, a small but significant amount of emergent/wet meadow and open water in the southern part of the Northwest Sands, and very little row-crop agriculture.

Several hundred kettle lakes occur in the pitted outwash plain. The headwaters of the St. Croix-Namekagon and Brule River systems are located here amid flat plains, sedge meadows, bog complexes, and major barrens. Water quality in seepage lakes is generally very good. Groundwater conditions are among the least polluted yet most vulnerable in the state.

Ecological Landscapes are based on aggregations of ecoregional units called **Landtype Associations** (LTAs) from this national system of delineated ecoregions: National Hierarchical Framework of Ecological Units (NHFEU) (Cleland, 1997). Landtype Associations represent an area of 10,000 – 300,000 acres and contain similarities of landform, soil, and vegetation.

The following Landtype Associations are within the study area:

- Grantsburg Dunes (212Ka01). The characteristic landform pattern is undulating outwash plain with dunes, marshes, and swamps common. Soils are predominantly excessively drained fine sand over outwash. This LTA comprises 83% of the GLG.
- Siren Plains (212Ka09). The characteristic landform pattern is undulating outwash plain and lake plain complex. Soils are predominantly moderately well drained sand over outwash or clayey lacustrine. This LTA comprises 12% of the GLG.
- Grantsburg Lake Plain (212Ka02). The characteristic landform pattern is nearly level lake plain with common sand ridges. Soils are predominantly poorly drained clay loam over calcareous clayey lacustrine. This LTA comprises 4% of the GLG.
- Almelund Moraine (212Kb32). The characteristic landform pattern is rolling collapsed moraine with scattered lake plains. Soils are predominantly moderately well drained fine sandy loam over calcareous sandy loam till. This LTA comprises 1% of the GLG.

Geology and Geography

Based on general broad-scale bedrock maps, the GLG overlies Cambrian sandstone (Vogl 1964). Bedrock is between 50 and 100 feet from surface throughout and is primarily covered with sand and gravel deposits and peat.

The level topography of the GLG is the result of glacial activity and specifically the many glacial lakes that occupied this area. Glacial Lake Grantsburg existed in most of Burnett County about 14,000 years ago. Lake Grantsburg formed when a sublobe of the large Des Moines Lobe in Minnesota blocked the St. Croix Valley and impounded glacial meltwater. When the glacial lake drained about 12,300 years ago, much of the lacustrine surface was eroded or buried when outwash from Glacial Lake Superior flowed through the St. Croix Valley. This resulted in terraces close to the river and a thin layer of outwash covering the original lakebed further from the spillway. Another glacial lake, Lake Lind, existed at an even earlier stage and deposited the lacustrine materials that underlie parts of the GLG.

Soils

GLG soil drainage classes range from very poorly drained (the most extensive class at 33% of the property acreage) to moderately well drained (12% of the GLG). There are 72 different soil map units found within the GLG boundaries.

Lacustrine deposits from Glacial Lake Grantsburg impeded drainage and developed the hydric muck soils that dominate the large wetlands on the properties. The hydric muck soils vary from very deep, over 80 inches, to a thin layer that overlays the clay and silt-textured lakebed that remains.

The low sand hills scattered over the area were produced as the waters of the glacial lake receded and wind action occurred on the exposed beach lines and bare tracts and built up low dunes (Vogl 1964). The soils in these areas are deep sand, greater than 60 inches deep.

Hydrology

All of the GLG is within the Mississippi River basin and the Trade River, Wood River, Clam River, and Yellow River (Burnett Co.) watersheds. The flat topography and impeded drainage has resulted in an abundance of large wetlands. Dikes and water control structures within the study area flood thousands of acres of wetlands. Potholes have also been dug to function as breeding ponds for wildlife.

There are six natural lakes within the GLG: Blomberg, Buggert, Fish, Fuhrman, Reed, Rice, and Zalesky Pond. Blomberg Lake is a 68-acre shallow, seepage lake. The shallow lake (4 foot maximum depth) supports only a few aquatic plants including white (*Nymphaea odorata*) and yellow water-lily (*Nuphar advena*), and large-leaved pondweed (*Potamogeton amplifolius*). Fish Lake is a 175-acre seepage lake with a sand and muck bottom. Rice and Reed lakes are permanent open waters without emergent aquatic plant species. Buggert and Fuhrman lakes have abundant emergent aquatic species.

Two streams, Logging Creek and North Fork Trade River (aka Canute Creek), flow through Fish Lake Wildlife Area, where they are dammed to create flowages, and then flow south into the Trade River and eventually into the St. Croix River.

Waters in Crex Meadows Wildlife Area that flow into the Wood River, a warm water stream that drains into the St. Croix River, include: Hay Creek, Whiskey Creek, Iron Creek, ditches, flowages, and several unnamed creeks.

Current Vegetation – Natural Communities

Current vegetation of the GLG has been influenced by many historical factors including grazing, homesteads, unsustainable logging during the “cutover” period, and wildfires; as well as current factors including fire suppression, invasive species, ecological restoration, and hydrological manipulation; and environmental factors including geology, soils, hydrology, and climate.

Crex Meadows Wildlife Area

Northern Sedge Meadows, pine-oak barrens, Northern Dry Forests, and Northern Dry-mesic Forests are the highest-quality natural communities at Crex Meadows Wildlife Area.

Northern Sedge Meadows are generally dominated by woolly-fruit sedge (*Carex lasiocarpa*), few-seeded sedge (*C. oligosperma*), and blue-joint grass (*Calamagrostis canadensis*) with a *Sphagnum* groundlayer. These areas appear to have contained more peat in the past with recent droughts and possible past disturbances resulting in less peat and a more uniform cover of sedges. Wetland edges are diverse and may have prairie willow (*Salix humilis*), slender willow (*S. petiolaris*), early low blueberry (*Vaccinium angustifolium*), leather-leaf (*Chamaedaphne calyculata*), steeplebush (*Spiraea tomentosa*), and black chokeberry (*Aronia melanocarpa*).

The pine-oak barrens is better described as brush prairie and is not currently well-represented by an NHI natural community type. The barrens/brush prairie vegetation that is being managed is generally a continuum from open and brush/oak grub dominated to oak savanna to oak woodland. The brush prairie is generally characterized by northern pin (scrub) oak grubs over a sand prairie understory. Another open variant is a low shrub dominated area of early low blueberry, sweet-fern (*Comptonia peregrina*), and bracken fern. The oak savanna has scattered northern pin (scrub) oak trees (9-15 in. dbh) with about 10% canopy cover, oak brush about 20% cover, and shrub patches of New Jersey tea (*Ceanothus americanus*), American hazelnut (*Corylus americana*), prairie willow, and sand cherry (*Prunus pumila*). Herbs within the oak savanna generally include little blue-stem (*Schizachyrium scoparium*), June grass (*Koeleria macrantha*), prairie goldenrod (*Solidago ptarmicoides*), rough blazing-star (*Liatris aspera*), western sunflower (*Helianthus occidentalis*), and wild lupine (*Lupinus perennis*). The oak woodland type generally has 80% canopy cover of northern pin (scrub) oak (9-15 in. dbh), thickets of American hazelnut, and a Pennsylvania sedge-dominated understory.

Northern Dry Forests at Crex Meadows Wildlife Area are important in the continuum from open prairie to closed-canopy forest. The best examples are dominated by jack pine and northern pin oak (scrub) oak with about 80% tree cover. Other species present include prairie tickseed (*Coreopsis palmata*), wood-betony (*Pedicularis canadensis*), Pennsylvania sedge, American hazelnut, and wood anemone (*Anemone quinquefolia*). Prairie plants are present in openings and along trails.

Northern Dry-mesic Forests are rare at Crex Meadows Wildlife Area and the best example has variable quality and patchy composition from past cutting, although native species dominate. Forested swales and other wetlands are present within the forest. Canopy gaps are dominated by Pennsylvania sedge and early low blueberry.

Fish Lake Wildlife Area

The highest quality natural communities at Fish Lake Wildlife Area are Northern Sedge Meadows, Oak Barrens, and Northern Dry-mesic Forests.

Good quality Northern Dry-mesic Forests are characterized by a canopy of Northern pin (scrub) oak, white pine, and red maple. The average dbh of the canopy trees is 15 inches. White pine forms a supercanopy in some areas with those trees greater than 15 in. dbh. Coarse woody debris, including large diameter stems is present. The cover of the tall shrub layer varies and includes American hazelnut. Herbaceous species vary in diversity and abundance and generally include: three-leaved gold-thread (*Coptis trifolia*), partridgeberry (*Mitchella repens*), large-leaved shin-leaf (*Pyrola elliptica*), bunchberry (*Cornus canadensis*), hairy sweet cicely, broad-leaf enchanter's-nightshade (*Circaea lutetiana*), American starflower (*Trientalis borealis*), and wintergreen (*Gaultheria procumbens*).

Northern Sedge Meadows, within a wetland complex of bog birch and tamarack dominated areas, are generally good quality with few invasive species. The highest quality Northern Sedge Meadow is a vast open meadow dominated by the narrow leaved sedges woolly-fruit sedge, few-seeded sedge, and creeping sedge (*Carex chordorrhiza*). Small patches of shrubby vegetation are scattered throughout the meadow, some with heath vegetation dominant, others with bridal-wreath, dogwoods (*Cornus sp.*), or speckled alder.

Pine-oak barrens occur on rolling dune topography and flat outwash within a complex of wet swales. The best examples of barrens are managed as brush prairie and have oak brush with variable cover and some diversity of prairie plants in more open areas. Prairie plants found are wild lupine, bird's-foot violet (*Viola pedata*), round-headed bush-clover (*Lespedeza capitata*), whip nutrush (*Scleria triglomerata*), false heather (*Hudsonia tomentosa*), and prairie onion (*Allium stellatum*). Lower quality areas have an herbaceous layer dominated by Pennsylvania sedge. Wet swales are generally dominated by trembling aspen.

Amsterdam Sloughs Wildlife Area

The highest quality natural communities at Amsterdam Wildlife Area are within the wetland complexes and include Northern Sedge Meadow and Tamarack (poor) Swamp.

Northern Sedge Meadow quality is variable with the highest-quality examples being large in size and having a diverse herbaceous layer dominated by common tussock sedge (*Carex stricta*), fen star sedge (*C. sterilis*), other broad leaf sedges (*Carex* spp.), swamp loosestrife (*Lysimachia thyrsiflora*), marsh fern (*Thelypteris palustris*), spotted Joe-Pye-weed (*Eupatorium maculatum*), horsetail (*Equisetum* spp.), swamp milkweed (*Asclepias incarnata*), tall cotton-grass (*Eriophorum viridi-carinatum*), and marsh marigold (*Caltha palustris*). Shrubby areas are present with willow (*Salix* spp.), speckled alder (*Alnus incana*), bog birch (*Betula pumila*), and bridal-wreath (*Spiraea* spp.). Low-quality areas are dominated by reed canary grass (*Phalaris arundinacea*) with common reed grass (*Phragmites australis*) is also present.

Tamarack (poor) Swamps are minerotrophic, have a canopy dominated by tamarack with red maple (*Acer rubrum*) and a shrub layer of speckled alder. They are generally of good quality. The understory varies locally, from Labrador-tea (*Ledum groenlandicum*) to three-fruited sedge (*Carex trisperma*), to speckled alder. Sphagnum and other mosses cover woody-peat hummocks with abundant cinnamon fern (*Osmunda cinnamomea*) and royal fern (*O. regalis*).

Around Blomberg Lake and a small, un-named lake is a narrow floating peat mat with a narrow rim of tamarack, black spruce, speckled alder, and bog birch with varying densities over sphagnum moss, cranberry (*Vaccinium* sp.), tawny cotton-grass (*Eriophorum virginicum*), pod-grass (*Scheuchzeria palustris*), and three-way sedge (*Dulichium arundinaceum*).

Northern Mesic Forests at Amsterdam Sloughs are rare and the best-quality example consists of 90% canopy cover of sugar maple (*Acer saccharum*) and red maple, with lesser amounts of northern red oak (*Quercus rubra*), white oak (*Quercus alba*), basswood, bigtooth aspen (*Populus grandidentata*), and white birch. All canopy trees are 4 – 18 in. diameter at breast height (dbh). The understory is quite open and dominated by hop-hornbeam (*Ostrya virginiana*) and red maple saplings, with occasional northern pin (scrub) oak (*Quercus ellipsoidalis*) and northern red oak saplings. The ground layer has areas of Pennsylvania sedge (*Carex pensylvanica*), round-lobed hepatica (*Anemone americana*), bracken fern (*Pteridium aquilinum*), maidenhair fern (*Adiantum pedatum*), black snakeroot (*Sanicula marilandica*), bottlebrush grass (*Elymus hystrix*), hairy sweet cicely (*Osmorhiza claytonii*), and blueberry (*Vaccinium* sp.). Scarce amounts of coarse and fine woody debris are present and very old tip up mounds are common. Ephemeral ponds are scattered, with standing water resulting from late season rain. The ponds are dominated by broad leaf sedges; some ponds have speckled alder and black ash (*Fraxinus nigra*).

The Wisconsin Wildlife Action Plan (WDNR 2006b) and the Ecological Landscapes of Wisconsin Handbook (WDNR in prep.) identifies 21 natural communities for which there are “Major” or “Important” opportunities for protection, restoration, or management in the Northwest Sands Ecological Landscape. Seventeen of these natural communities are present on the GLG:

- Alder Thicket
- Emergent Marsh – wild rice
- Northern Dry Forest
- Northern Dry-mesic Forest
- Northern Hardwood Swamp
- Oak Barrens
- Pine Barrens
- Shrub-carr
- Ephemeral Pond
- Impoundments/Reservoirs
- Inland Lakes
- Northern Sedge Meadow
- Northern Wet Forest
- Northern Wet-mesic Forest
- Submergent Marsh
- Surrogate Grasslands

Landscape Level Priorities

Large Wetlands

The wetlands of the GLG have undergone significant changes since Euro-American settlement. Early peat-dominated wetlands with sedges, emergent marsh vegetation and tamarack were converted to a dry wiregrass-dominated wetland through ditching, harvesting of tamarack, and cutting of sedges for commercial use.

Since 1945, when the Wisconsin Conservation Department (now Wisconsin DNR) took control of a large portion of the region that would become the Glacial Lake Grantsburg properties, management of the wetlands has focused on waterfowl production. This management currently consists of 56 flowages, 52 water control structures and 27 miles of dike creating open water and emergent vegetation that flood over 6,000 acres. Wetland management has focused on healthy wetlands for wetland wildlife. Within the regional context much of the open water areas are static or controlled. Using the water control mechanisms available on GLG properties, water levels can be varied to the benefit of wetland wildlife.

The large wetlands of the GLG provide important habitat for rare species, including birds and amphibians. A large majority of the impressive diversity of rare birds found on the GLG is due to this abundance of large, high-quality wetland habitats in addition to their connection to the open upland grasslands and barrens. This makes this one of the premiere open landscapes in the entire state for birds. The importance of this landscape-scale concept for preserving biodiversity holds true for other taxa as well, including reptiles, insects (including moths and butterflies), and mammals.

The large sedge meadows and associated small pools provide important breeding habitat for sedge wren (*Cistothorus platensis*), bobolink (*Dolichonyx oryzivorus*), American bittern (*Botaurus lentiginosus*), Le Conte's sparrow (*Ammodramus leconteii*), Nelson's sparrow (*Ammodramus nelsoni*), sandhill crane (*Grus canadensis*), northern harrier (*Circus cyaneus*), short-eared owl (*Asio flammeus*), and blue-winged teal (*Anas discors*). The GLG provides the best management opportunity in the state for Nelson's sparrow and yellow rail (*Coturnicops noveboracensis*) along with a core area for conservation of significant populations of rare marsh birds specifically the LeConte's sparrow and American bittern. Golden-winged warblers (*Vermivora chrysoptera*) are common in lowland shrubs within sedge meadows. Wisconsin holds a very large responsibility for managing for populations of the golden-winged warbler as a large percentage of the species global range occurs within the state. These areas provide potential habitat for whooping cranes (*Grus americana*) from the experimental population established in Wisconsin. Whooping cranes have been sighted in the area several times in recent years. These areas also provide important breeding habitat for amphibians.

Flowages, containing open water, emergent vegetation, and standing dead trees, are important resources for yellow-headed blackbird (*Xanthocephalus xanthocephalus*), black tern (*Chlidonias niger*), least bittern (*Ixobrychus exilis*), red-necked grebe (*Podiceps grisegena*), trumpeter swan (*Cygnus buccinator*), and heron species. A flowage within the GLG has consistent records of breeding red-necked grebes, representing one of only a handful of known breeding locations for this State Endangered species. These areas are also used by birds for feeding, loafing, and roosting. Flowages can support habitat for American bullfrog (*Lithobates catesbeianus*) and mink frog (*Lithobates septentrionalis*). Wild rice (*Zizania aquatica*) within these flowages provide an important resource in the spring and fall for migrating birds, including most waterfowl species, rails, coots, and blackbirds (WDNR and NRPC 2000).

Lowland shrubs, generally found on the margins of open wetlands or as the dominant cover in a wetland provide breeding habitat for many species, including willow flycatchers (*Empidonax traillii*), golden-winged warblers, veery (*Catharus fuscescens*), and sedge wren. Buehler et al (2007) identified protecting and maintaining lowland shrubs as a conservation priority for the north-central region of North America for golden-winged warbler populations and would benefit numerous other bird species of concern.

Sphagnum moss and tamarack dominated areas provide habitat for a diversity of sparrows including swamp sparrow (*Melospiza georgiana*), song sparrow (*Melospiza melodia*), savannah sparrow (*Passerculus sandwichensis*), and Lincoln's sparrow (*Melospiza lincolni*), as well as sedge wren, northern harrier, and veery.

Lowland forests provide habitat for many breeding birds, including veery, American redstart (*Setophaga ruticilla*), common yellowthroat (*Geothlypis trichas*), ovenbird (*Seiurus aurocapillus*), and black-and-white warbler (*Mniotilta varia*), chestnut-

sided warbler (*Dendroica pensylvanica*), rose-breasted grosbeak (*Pheucticus ludovicianus*), song sparrow, and yellow-bellied sapsucker (*Sphyrapicus varius*).

Prairie and Barrens

The GLG properties offer exceptional opportunities for managing prairie and barrens habitat. The GLG was once located at the western edge of the largest expanse of barrens in the state corresponding to the current location of the Northwest Sands Ecological Landscape. Since Euro-American settlement, this area, especially the barrens, have undergone significant changes (Radeloff et al. 1999). Prior to settlement, many of the historical barrens had scattered trees present and occurred in a continuum from the most open (Sand Prairie) stands to areas with the highest tree cover (Northern Dry Forest) with other combinations in-between, including barrens and woodland communities. Threats to barrens throughout the state include fire suppression, conversion to plantation, pest species, and development (Shively and Temple 1994).

The barrens habitats at the GLG provide a substantial proportion of the remaining large barrens habitat patches in northwestern Wisconsin (WDNR, 2015). These remnants of the globally rare barrens natural communities are critical to the long term survival of many species, including the Special Concern northern prairie skink (*Plestiodon septentrionalis*), eastern hog-nosed snake (*Heterodon platirhinos*) and gophersnake (*Pituophis catenifer*) (bullsnake), and the State Threatened Blanding's turtle (*Emydoidea blandingii*). It is likely that this gophersnake metapopulation is the best remaining in the entire state, and the Blanding's turtle and northern prairie skink metapopulations are probably among the top five remaining in the state. Other rare species relying on these areas are sharp-tailed grouse, upland sandpiper (*Bartramia longicauda*), brown thrasher (*Toxostoma rufum*), vesper sparrow (*Poocetes gramineus*), silky prairie-clover (*Dalea villosa*), and dwarf milkweed (*Asclepias ovalifolia*). The sharp-tailed grouse habitat provided on the GLG is crucial to the survival of the species in Wisconsin (WDNR and NRPC 2000). A record of the Special Concern Franklin's ground squirrel (*Spermophilus franklinii*) was verified via photographs in 2010. This species is quickly disappearing from much of its former range in Wisconsin and locations of known occurrences will be critical to management aimed at preserving this small mammal on the landscape. The gray wolf (*Canis lupus*) is common throughout the GLG with three territories overlapping within the project area.

The prairies and barrens of the GLG represent one of the most important opportunities in the state for protecting butterfly and moth diversity. Due to the rarity of these plant communities many of the representative butterfly and moth species are also quite rare. Some of these rare butterflies and moths are limited to specific larval host plant species. Identifying and managing for these host plants and facilitating this ecological relationship between plants and animals is critical to conserving these rare species. Within the GLG, there are eleven rare barrens obligate butterfly and moth species known to occur, with two of these species state or federally Endangered and the remainder either special concern or SGCN.

Species also likely use microhabitats within the barrens such as sand dunes that provide loose sand for reptile nesting areas. In addition, the shrubby ecotone between barrens and wetlands supports rare plants. Coarse woody debris is also an important component of vegetation structure within barrens. These areas provide cover, foraging habitat, and perch sites for many bird species (Mossman et al. 1991); act as a substrate for fungi; provide cover for invertebrates and small vertebrates; and are a nutrient reservoir (Niemuth and Boyce 1998).

Management to promote open brush prairies and oak barrens is being done on properties within the GLG. Crex Meadows Wildlife Area has an extensive history of management, including prescribed burning for brush prairie and barrens since 1947. Opportunities to manage at a landscape level are high because of the large size of the properties and the proximity to other public lands, including Governor Knowles State Forest and Burnett County Forests. Managing large tracts of land for barrens, including using large clear-cuts in areas managed for timber production, can help to mimic the natural disturbance patterns that are important to many barrens dependent species (Radeloff et al. 2000). Niemuth and Boyce (1998) concluded, however, that there are differences in resulting vegetation structure among clear-cutting, short-cycle prescribed burning, and crown fires. The resulting differences in vegetation structure can impact availability and quality of wildlife habitat. Management should seek to use landscape-level management to promote temporal variation in disturbance. As Vogl (1964) observed, "brush prairie savanna undoubtedly reverted back and forth from brush to forest and forest to brush again, depending on the absence or presence of fire."

Migratory Birds

The diversity of habitats on the GLG, from large wetlands and flowages to brush prairie, oak barrens, and pine and oak forests offers important resources for numerous bird groups. Large numbers of individuals from many species accumulate here during migration because these areas offer food, water, and shelter, the most important resources to migrating birds.

Large emergent wetlands and associated open water areas offer migratory birds such as waterfowl, shorebirds, songbirds, and waterbirds like herons diverse habitats during the migratory seasons. Important features include emergent aquatic plants such as wild rice, bidens, hard and soft-stem bulrush (*Schoenoplectus acutus* and *S. tabernaemontani*), cat-tails (*Typha sp.*), smartweed (*Polygonum spp.*), and arrowheads (*Sagittaria sp.*); open water areas that team with amphibians, fish, and aquatic invertebrates; and mudflats with abundant invertebrates and insect larvae. This plant and animal life provide important foraging opportunities during spring and fall migration for waterfowl, herons, bitterns, geese, cranes, and shorebirds. This area has become especially important to sandhill cranes, with more than 10,000 staging here during the fall migration. Other species that gather in large numbers are Canada geese (*Branta canadensis*), tundra swans (*Cygnus columbianus*), and trumpeter swans. Migratory raptors use these open areas to hunt waterfowl. These areas are also important staging areas for waterfowl that later disperse to breeding areas.

In addition, lowland shrubs present in these wetlands offer migrating songbirds protection from severe weather and predators, and feeding during a critical time in their life cycle. Lowland shrubs offer perches for capturing emerging aquatic insects in spring and food in the form of fruiting shrubs in fall, which are high in energy and are used by migrants to build fat reserves necessary for sustaining long migratory flights.

The GLG is also important to numerous wintering birds from the arctic and boreal regions including golden eagle (*Aquila chrysaetos*), short-eared owl, rough-legged hawk (*Buteo lagopus*), northern hawk owl (*Surnia ulula*), northern shrike (*Lanius excubitor*), snow bunting (*Plectrophenax nivalis*), and common redpoll (*Carduelis flammea*) (eBird 2010 & Collins 2010). These are birds that hunt in open grasslands and wetlands and move south to seek out more abundant prey and better conditions that will allow them to survive during a vulnerable period in their lives. Other important wintering birds include lapland longspurs (*Calcarius lapponicus*), horned larks (*Eremophila alpestris*), and snow buntings.

Threats to migratory birds include habitat destruction and habitat alteration (Duncan 2002). Habitat alteration includes the simplification of forest structure or the alteration of forest composition, including non-native invasive species that may change the kinds, quantity, and quality of food resources (Duncan 2002). Many wetlands in the surrounding landscape of the GLG, especially within the Northwest Lowlands Ecological Landscape, have been ditched or filled for agriculture or developed, threatening the availability of habitat for migrating birds. These areas are currently targeted for wetland restoration.

Ecological Priorities for SGCN

The Wisconsin Wildlife Action Plan identifies ecological priorities in each Ecological Landscape. Ecological priorities are the natural communities in each Ecological Landscape that are most important to the Species of Greatest Conservation Need.

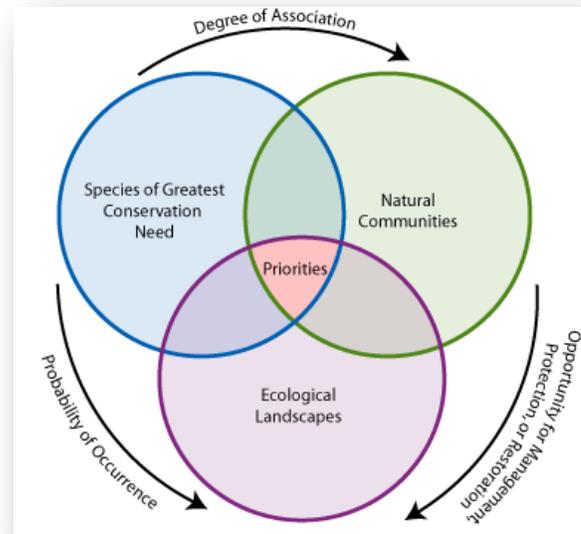


Figure 2. Illustrates the process used for identifying Ecological Priorities in the Wisconsin Wildlife Action Plan.

Appendix A highlights the Ecological Priorities for vertebrate SGCN on the GLG. Note that these Ecological Priorities include all of the natural communities that we have determined to provide the best opportunities for management on the GLG from an ecological and biodiversity perspective.

Rare Animals

Wisconsin's Natural Heritage Inventory (NHI) Working List includes those species that are listed either at the Federal or State level. As of September 2007, NHI documented 49 rare fauna within the Northwest Lowlands Ecological Landscape including one mammal, six birds, three herptiles, seven fishes, and 32 invertebrates. These include one federally endangered species, one candidate for future listing, five Wisconsin Endangered species, 10 Wisconsin Threatened species, and 34 Wisconsin Special Concern species. NHI documented 100 rare fauna within the Northwest Sands Ecological Landscape including three mammals, 28 birds, four herptiles, seven fishes, and 58 invertebrates. These include one federally endangered species, one candidate for future listing, five Wisconsin Endangered species, 11 Wisconsin Threatened species, and 79 Wisconsin Special Concern species.

Priority Species Management Plans (supplement to REA)

Two priority species, the federally endangered Karner blue butterfly, and the sharp-tailed grouse, have distinct management objectives and activities for them under the overall management goal for the GLG properties.

Karner blue butterfly (*Lycaeides melissa samuelis*) populations have been tracked through annual surveys on Crex Meadows and Fish Lake wildlife areas since 2008 on four key population sites. Populations have been low but persistent. The goal for Karner blue butterfly (KBB) recovery in the GLG area is to establish and maintain a large viable population (>6000 KBB) to meet federal delisting criteria for the KBB Recovery Plan (USFWS, 2003). The objective is to restore and maintain suitable occupied habitat across the landscape to support the needed large viable population, using accepted barrens restoration practices. The KBB depends on wild lupine as its plant host plant, and significant populations of both butterfly and plant exist at Crex Meadows and Fish Lake wildlife areas. WDNR is a partner in the U.S. Fish and Wildlife Service's Habitat Conservation Plan for Karner blue butterflies. Under this agreement, WDNR agrees to adopt certain management restrictions within KBB range, including the GLG properties.

Sharp-tailed grouse (*Tympanuchus phasianellus*) populations on managed properties in Wisconsin are well below historic levels, and in 2013, were 24% lower than the average number of dancing males between 2008-2012. Populations have been declining since 1998, according to the [Wisconsin Sharp-tailed Grouse Survey and Status](#). (WDNR, 2013b). Management of sharp-tailed grouse habitat is critical on the GLG properties for this species to continue to exist here.

Rare Plants

The rare plant database of WDNR's Natural Heritage Inventory as of September 2007 (WDNR 2007) contains records for 41 vascular plant species occurring within the Northwest Sands Ecological Landscape that are currently listed as Endangered (4), Threatened (9), or Special Concern (22) by the state of Wisconsin. In the Northwest Lowlands Ecological Landscape, the NHI contains records for 21 vascular plant species that are currently listed as Endangered (3), Threatened (5), or Special Concern (13) by the state of Wisconsin.

Invasive Plants

Non-native invasive species thrive in newly disturbed areas because they establish quickly, tolerate a wide range of conditions, are easily dispersed, and are no longer limited by the diseases, predators, and competitors that kept their populations in check in their native range. As a result, invasive plants can kill and outcompete native plants by monopolizing light, water, and nutrients and altering soil chemistry and mycorrhizal relationships. In situations where invasive plants become dominant, they may even alter ecological processes by limiting the ability to use prescribed fire and modifying hydrology. In addition to the threats on native communities and native species diversity, invasive species negatively impact forestry (by reducing tree regeneration, growth and longevity), recreation (by degrading fish and wildlife habitat and limiting access), agriculture, and human health (noxious weeds and non-native pathogens).

populations. This site is an outstanding concentration area in both fall and spring for waterfowl, shorebirds, and waterbirds, hosting tens of thousands of ducks, geese, sandhill cranes (*Grus canadensis*), and a variety of shorebirds (WDNR 2007).

The diversity of habitats at this site support an abundance of butterflies (Swengel 2010). Of particular importance are the barrens and sand prairie areas supporting numerous rare butterfly and moth species. There is one Federally Endangered butterfly, one State Endangered moth, and nine butterfly and moth species of Special Concern known from the site. In addition, records exist within the barrens and brush prairie areas for two Special Concern small mammal species including one in severe decline throughout much of its range. Due to the rarity of the barrens plant community, it is of utmost importance to maintain and enhance these habitats to preserve this biodiversity.

Management Considerations

This site is currently managed for the brush-prairie phase of oak barrens, generally for sharp-tailed grouse (*Tympanuchus phasianellus*) habitat, and open-water wetlands, generally for waterfowl production.

The barrens habitats at this site and the entire GLG provide a substantial proportion of the remaining large barrens habitat patches in northwestern Wisconsin and support areas that are critical to the long term survival of many rare species. Species likely use microhabitats found within the barrens such as sand dunes that provide larger areas of loose sand for reptile nesting areas. In addition, the shrubby ecotone between barrens and wetlands supports rare plants. Management of the remaining forests at this site that results in abundant downed coarse woody debris will maximize salamander, snake, and lizard habitat quality.

Opportunities to manage barrens at a landscape level are high at this site and throughout the GLG because of the large size of the properties and the proximity to other public lands, including Governor Knowles State Forest and Burnett County Forests. Management should seek to maintain structural variability from brush prairie to savanna to patches of closed woodland.

Amsterdam Sloughs Sedge Meadow

Approximate Size: 723 acres

Description of Site

This site is dominated by a Northern Sedge Meadow wetland complex on glacial, water-washed plain. There are numerous low-lying, small upland rises within this shallow wetland matrix and upland peninsulas in the southern part of the site. The Northern Sedge Meadow continues outside of this site, with the site boundaries attempting to include the highest-quality areas. The low quality areas outside of, and on the edge of, the site are dominated by reed canary grass (*Phalaris arundinacea*) with common reed grass (*Phragmites australis*).

The Northern Sedge Meadow within this site is generally high-quality, large, and includes a diverse herbaceous layer. Species present include common tussock sedge (*Carex stricta*), fen star sedge (*C. sterilis*), other sedges (*Carex spp.*), swamp loosestrife (*Lysimachia thyrsiflora*), marsh fern (*Thelypteris palustris*), spotted Joe-Pye-weed (*Eupatorium maculatum*), horsetail (*Equisetum spp.*), swamp milkweed (*Asclepias incarnata*), tall cotton-grass (*Eriophorum viridi-carinatum*), and marsh marigold (*Caltha palustris*). Shrubby areas are present with willow (*Salix spp.*), speckled alder (*Alnus incana*), bog birch (*Betula pumila*), and bridal-wreath (*Spiraea spp.*).

Significance of Site

Wetland management within the GLG has favored open-water flowages for waterfowl production. This large, wiregrass sedge-dominated site diversifies the habitat within the GLG and provides habitat for several declining bird assemblages. Grassland bird species of greatest conservation concern were detected during surveys along with rare marsh bird species



Northern Sedge Meadow at Amsterdam Sloughs Sedge Meadow Primary Site. Photo by Rich Staffen.

including one state listed species. The scattered pockets of shrub swamp at the site are important features for a suite of uncommon lowland shrub birds requiring scattered brush for nesting structures, perching opportunities, and escape cover.

Several uncommon raptor species and rare waterbirds utilize the flowage adjacent to the site for foraging and nesting. The primary site buffers and filters these waterbodies improving water-quality and protecting this area and the species depending upon it. A significant population of wetland reptiles is known from the property and likely utilizes the sedge meadow habitat existing within this primary site.

Management Considerations

Control of invasive species on the edge of this site and scattered populations within it will help protect the integrity and diversity of this large Northern Sedge Meadow dominated site.

Blomberg Lake and Woods

Approximate Size: 821 acres

Description of Site

This site, in the southwest part of Amsterdam Sloughs Wildlife Area contains Blomberg Lake State Natural Area. Located within a sandy glacial plain, Blomberg Lake is a 68-acre bog lake surrounded by a Tamarack (poor) Swamp. The shallow lake (4 foot maximum depth) supports only a few aquatic plants including white (*Nymphaea odorata*) and yellow water-lily (*Nuphar advena*), and large-leaved pondweed (*Potamogeton amplifolius*). Around Blomberg Lake and a small, un-named lake is a narrow floating peat mat with a narrow rim of tamarack (*Larix laricina*), black spruce (*Picea mariana*), speckled alder, and bog birch with varying densities over sphagnum moss, cranberry (*Vaccinium sp.*), tawny cotton-grass (*Eriophorum virginicum*), pod-grass (*Scheuchzeria palustris*), and three-way sedge (*Dulichium arundinaceum*).

The surrounding Tamarack (poor) Swamp is minerotrophic with a canopy dominated by tamarack with red maple (*Acer rubrum*) and a shrub layer of speckled alder. The understory varies locally, from Labrador-tea (*Ledum groenlandicum*) to three-fruited sedge (*Carex trisperma*), to speckled alder. Sphagnum and other mosses cover woody-peat hummocks with abundant cinnamon fern (*Osmunda cinnamomea*) and royal fern (*O. regalis*).

A small lake in the northwest part of the site is surrounded by a floating peat mat that is 6 to 12 feet wide with a narrow rim of tamarack and black spruce that is 65 feet wide.

Northern Mesic Forests are very rare on the GLG and the best example is in the southwest part of this site. This area has of a 90% canopy cover of sugar maple (*Acer saccharum*) and red maple, with lesser amounts of northern red oak (*Quercus rubra*), white oak (*Quercus alba*), basswood (*Tilia americana*), trembling aspen (*Populus tremuloides*), and white birch (*Betula papyrifera*). All canopy trees are 4 - 18 in. dbh. The understory is quite open and dominated by hop-hornbeam (*Ostrya virginiana*) and red maple saplings, with occasional Hill's (*Quercus ellipsoidalis*) and northern red oak saplings. The ground layer has areas of Pennsylvania sedge (*Carex pensylvanica*), round-lobed hepatica (*Anemone americana*), bracken fern (*Pteridium aquilinum*), maidenhair fern (*Adiantum pedatum*), black snakeroot (*Sanicula marilandica*), bottlebrush grass (*Elymus hystrix*), hairy sweet cicely (*Osmorhiza claytonii*), and blueberry (*Vaccinium sp.*). Scarce amounts of coarse and fine woody debris are present and very old tip up mounds are common. Ephemeral ponds are scattered, with standing water resulting from late season rain. The ponds are dominated by broad leaf sedges, some ponds have speckled alder and black ash (*Fraxinus nigra*) also. Also within the site is a large area of sedge meadow with scattered upland islands and shrub patches.



Lake margin on floating sphagnum/shrub mat surrounding small lake northwest of Blomberg Lake. Within the Blomberg Lake and Woods Primary Site. Photo by Barbara Delaney.

Significance of Site

Forested wetlands are uncommon in the GLG. These wetlands are high-quality and within a State Natural Area. Ephemeral Ponds are very uncommon in this area and are important microhabitat sites that provide habitat for common and uncommon amphibians. In addition, these ponds can represent a significant proportion of the biomass in an ecosystem. Salamanders convert primary production from invertebrates feeding upon decomposing plant material into larger energy packets (their bodies), which in turn are preyed upon by hawks, owls, shrews, snakes, songbirds, and many other vertebrates (Casper 2010).

Records of rare amphibians, reptiles, and raptors are known from the property and adjacent to the site. Specialized habitats for these species exist within the primary site and it is likely these species utilize these areas for important life history requirements including foraging, basking, and possibly breeding.

Management Considerations

Ephemeral Ponds offer management opportunities to promote habitat for rare species. Minimizing soil compaction within 300 meters of Ephemeral Ponds and maximizing the abundance of decomposing coarse woody debris, including larger logs (>8 inch diameter) are important management considerations for amphibians breeding in Ephemeral Ponds and utilizing adjacent moist forested uplands for the remainder of their life cycles. Additionally, maintaining the closed canopy Northern Mesic Forest and allowing it to mature would protect an uncommon plant community type in this part of state and provide habitat for forest birds including forest raptors known historically from the property.

Fish Lake Northern Dry-mesic Forest

Approximate Size: 169 acres

Description of Site

The main feature of this site is a Northern Dry-mesic Forest characterized by a canopy of white pine (*Pinus strobus*), red oak, red maple, and trembling aspen. Canopy white pine are commonly >15 inches dbh. The sapling layer includes red maple and white pine. Prickly ash (*Zanthoxylum americanum*) is common in the tall shrub layer. Characteristic species in the herbaceous/low shrub layer are hairy sweet cicely, blueberry, American starflower (*Trientalis borealis*), and broad-leaf enchanter's-nightshade (*Circaea lutetiana*).

Previous management history has resulted in varying quality throughout the site. Some managed areas are dominated by northern pin (scrub) oak with canopy gaps common. Previous management may have also resulted in the low abundance of herbaceous species and low graminoid diversity.

Significance of Site

Although recent surveys indicated that Fish Lake Pines SNA has a better native plant species diversity, this site is larger and surrounding forests provide a buffer and room for expansion of the white pine. This site supports habitat for forest interior birds, including least flycatcher (*Empidonax minimus*), ovenbird (*Seiurus aurocapillus*), scarlet tanager (*Piranga olivacea*), veery (*Catharus fuscescens*), and yellow-throated vireo (*Vireo flavifrons*).

Management Considerations

Mature Northern Dry-mesic Forests are very rare at Fish Lake Wildlife Area and across the GLG. This site has important characteristics such as diverse horizontal stratification, large snags and deadfalls, and small, wet areas that provide habitat for unique species. Management resulting in abundant downed coarse woody debris at this site will maximize salamander, snake and lizard habitat quality. This site deserves special management consideration because of the restoration opportunities for Northern Dry-mesic Forest and forest interior birds.

Fish Lake Meadows, Prairies, and Forests

Approximate Size: 13,388 acres

Description of Site

This site, in Fish Lake Wildlife Area, includes Fish Lake Meadow and Fish Lake Pines State Natural Areas. The highest quality natural communities at this site are Northern Sedge Meadows, pine-oak barrens, and Northern Dry-mesic Forests.

Significance of Site

Large sedge meadows at this site provide habitat for numerous rare birds and Oak Barrens provide habitat for a State Threatened plant. One of the most important features of this site is the connectivity of the large meadows and brush prairies. This effectively increases the overall size of the grassland habitat allowing for many area sensitive bird species to thrive here. Larger habitat patches increase the viability of bird populations by supporting larger, healthy populations and diminishing the amount of unfriendly habitats that increase nest predators. In addition, the broad spectrum of habitats and habitat structures present increases the diversity of birds found at the site by meeting the needs of a large number of bird groups. This diversity of habitats adds to the overall size and importance for grassland birds making this property one of the highest priorities for grassland bird management in Wisconsin. Additionally, this connection of diverse habitats make the site attractive to numerous rare herptiles that use wetlands for foraging and wintering but need uplands for nesting sites or basking. These large acreages of heterogeneous habitats meet all the requirements for supporting large populations of many regionally significant reptiles (Casper 2010).

Management Considerations

Management resulting in abundant downed coarse woody debris at Fish Lake Pines SNA will maximize salamander, snake, and lizard habitat quality. A significant amount of turtle nesting occurs on or along dirt or gravel roadways within the site and at busier roads adjacent the site. Nest monitoring could occur to better estimate the impacts of direct road mortality to adults and nests, as well as nest predators. Of high importance to herptiles at this and the Crex Meadows primary site is the existing connection of habitat with little or no barriers to movements for nesting, foraging, and overwintering. Maintaining or enhancing this landscape connectivity is an important consideration when restoring or enhancing these habitats (Casper 2010). Maintaining this connectivity of habitats will positively impact numerous other species of various taxa including mammals, birds, and butterflies and moths. If road mortality is found to be a major problem for herptiles near the site, the development of ecopassages or wildlife tunnels could be explored.

Socio-Economic Characteristics

Information below is mostly from the “Northwest Sands Ecological Landscape” chapter (WDNR, 2015). This includes population data, which is primarily from 2012 U.S. Census Bureau.

Archaeological Resources

A cultural review indicates the presence of several recorded Euro-American buildings and cemeteries within Crex Meadows and Fish Lake wildlife areas. All sites relate to original attempts at settling the area in the late 1800’s – early 1900’s and to the operations of the Crex Carpet Co. Some sites are designated with signage. A Wisconsin State Historical Marker overlooking the Crex Meadows refuge was erected in 1977. It was the first state historical marker in Burnett County and commemorates attempts at settling Crex and the restoration of the marshes as wildlife habitat. DNR maintains this marker. Management policy in Wis. Stats. 44.40 and Manual Code 1810.10 requires that any activities with the potential to disturb archaeological sites will only be undertaken after consultation with the department archaeologist (Dudzic 2013).

Ceded Territory and Tribal Resources

The Glacial Lake Grantsburg properties are within the ceded territory of the Ojibwe Tribes. Native American tribes are independent, sovereign nations, as they were prior to the arrival of Europeans in North America. The Ojibwe Tribes ceded

some lands in the northern one-third of Wisconsin to the United States Government in the Treaties of 1837 and 1842 (Appendix C). In those treaties, they reserved their rights to hunt, trap, fish and gather within various publicly-owned lands. Treaty rights are currently being exercised and implemented.

Wild Rice: Consultation and Conservation – To the Ojibwe, wild rice is “manoomin,” the “food that grows on water.” Wild rice has been a central component of Native American culture for hundreds of years. Within Wisconsin’s ceded territory, prior to any actions that could affect wild rice abundance or habitat, federal law requires that consultation occur with tribal government leaders via the Voigt Task Force. GLG property staff annually develop a wetland management plan for DNR Northern District and Voigt Task Force review.

Population

The population density of the Northwest Sands counties is about one-fifth that of Wisconsin as a whole. At 21 persons per square mile, the area is rural in relation to the statewide population density of 105 persons per square mile, according to 2012 U.S. Census Bureau information. The city of Spooner (pop, 2680) is the only urban center within the ecological landscape (defined by the U.S. Census as cities with population over 2,500).

The area is racially homogeneous, with a 92% white population. However, compared to the rest of the state, a significant population of Native Americans (9.6%) resides in nearby Bayfield County, and 1.2% reside in Washburn County (USCB, 2012). The tribal headquarters of the St. Croix band of Ojibwe is in Big Sand Lake, a Burnett County reservation community near the unincorporated village of Hertel.

Land Use and Ownership

Land use patterns will partly determine the type of recreation that is available to the public. For instance, in the Northwest Sands Ecological Landscape, there is a much higher percentage of forest land and a much lower proportion of agricultural land compared to the rest of the state (“Comparison of Ecological Landscapes”, Chap 3, WDNR, 2013). The surface area in water is third highest as is the proportion of that water in lakes.

Forty-eight percent of the land and water in the Northwest Sands Ecological Landscape is in public ownership. Federal lands include parts of the Chequamegon-Nicolet National Forest and the St. Croix National Scenic Riverway. Important state-owned lands include Crex Meadows, Fish Lake, Amsterdam Sloughs, and Douglas County Wildlife Areas, and parts of the Brule River and Governor Knowles State Forests. Extensive county forests are owned and managed by Bayfield, Burnett, Douglas, and Washburn counties. Wisconsin DNR leases county land for the Namekagon Barrens Wildlife Area explicitly for barrens management. Almost 608,700 acres or 49% of all land and water in the region is publicly owned. This is significantly higher than the statewide average of 20% and ranks second among 16 ecological landscapes in the proportion of public ownership. There are about 69,100 acres of water, 107,300 acres of state recreational lands, 151,800 acres of federal and 280,500 acres of county lands.

The total area of the Northwest Sands Ecological Landscape is approximately 1.2 million acres, of which 76% is forested. About 53% of all forested land is privately owned, 33% belongs to state, counties, or municipalities, and 14% is federally owned (USDA 2009). Agriculture is not a major factor in the economy, ranking 13 out of 16 categories in the percent of land area in agriculture.

Economic Issues

The economy of the Northwest Sands counties is depressed when compared with the rest of the state. Per capita income and average wage are third lowest, and the rates of poverty and unemployment are third and fifth highest among the state’s 16 ecological landscape approximations. The top four economic sectors in terms of employment within the Northwest Sands Counties are: Government, Tourism-related, Retail trade, and Health care and social assistance. Although forestry does not have a large impact on the number of jobs, it is the sector that has the largest impact on the natural resources in the ecological landscape.

The 39,535 jobs in Northwest Sands counties represent only 1.1% of total employment in Wisconsin in 2007. The top four economic sectors (for definitions of economic sectors, see <http://www.census.gov>) in terms of the number of jobs provided to

the local economy within the Northwest Sands Counties are: Government employment (18.7%), Tourism-related (15.8%), Retail trade (10.7%), and Health care and social assistance (9.7%). Service sector jobs dominate the economy. Approximately 20% of jobs are in Manufacturing, Transportation and Warehousing, and Construction combined. Figures for Agriculture, Fishing & Hunting (4.0% of Northwest Sands employment) and Forest Products & Processing (2.7%) are only slightly higher than statewide averages, and do not greatly contribute to Northwest Sands Counties' employment (MIG 2009).

Northwest Sands counties have high levels of service jobs with low wages and few benefits, a high proportion of part-time and seasonal jobs, a narrow economic activity base with high reliance on the volatile recreation sector; and low representation of important agriculture, manufacturing and technology sector jobs in the Northwest Sands Counties. This contributes to high unemployment, low per capita income, and generalized economic stress.

Recreation Resources: Use and Potential

Information on outdoor recreation in Wisconsin comes from multiple sources: 1) Wisconsin DNR Ecological Landscapes Handbook (WDNR, 2015); 2) the Statewide Comprehensive Outdoor Recreation Plan (SCORP) (WDNR 2006a) a national template that describes the status, trends and needs for outdoor recreation in Wisconsin; includes 2010 recreational updates; and 3) information in the Land Legacy Report, (WDNR, 2006b).

For planning purposes, this Regional Analysis focuses on “nature-based” and motorized activities that generally take place in natural or undeveloped settings. These include traditional activities (e.g., hunting, trapping, fishing, berry picking, camping, hiking, wildlife watching, canoeing, swimming in lakes and rivers, horseback riding), non-traditional activities (e.g., geocaching, kayaking, and off-road biking) and motorized activities (e.g., ATV, snowmobile riding). These properties have been purchased or managed with funds from the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act). Statutes and applicable federal regulations prohibit a state fish and wildlife agency from allowing recreational activities and related facilities that would interfere with the purpose for which the State acquired, developed, or is managing the land. This analysis does not include outdoor activities associated with developed settings, facilities, and infrastructure.

The department is committed to providing exceptional outdoor recreation opportunities for people of all abilities. All new construction and renovation of infrastructure will follow guidelines set forth within the Americans with Disabilities Act and also be done in a manner consistent with Wisconsin Ch. NR 44 standards for land use classification, at the site where the development is located.

The property manager has the authority to make reasonable accommodations for people with disabilities, consistent with the requirements of the area's land use classification. Property managers may also allow the use of power-driven mobility devices (PDMDs) on trails consistent with federal law for PDMDs located in 28 CFR s. 35.137.

Opportunities and Needs

The Northwest Sands Ecological Landscape has the second highest proportion of public lands, combining federal, state, and county ownerships. The density of campgrounds and multi-purpose trails is above average and the number of visitors to state properties (in 2004) below average. The density of multi-purpose trails is the highest in the state. The number of legacy sites in general is low but the number with high recreation potential is above average.

Opportunities

Land and water - The Northwest Sands Ecological Landscape comprises 3.4% of Wisconsin's total land area and 5.4 % of the state's acreage in water (see Chapter 3, “Comparison of Ecological Landscapes” of the Handbook). Streams and rivers make up only 6% of the surface water area of the Northwest Sands Ecological Landscape whereas lakes and reservoirs make up over 93% of the area. The largest rivers are the Namekagon, Yellow and Saint Croix rivers. Yellow Lake and the Saint Croix Flowage cover over 2,000 acres each while the Minong Flowage, Big Sand Lake, Clam Lake, Spooner Lake and McKenzie Lake are each over 1,000 acres (WDNR 2003).

Recreation along, on, and in our waters is important to the character and quality of life in Wisconsin and supports a vital tourism industry. In Burnett, Polk, Washburn and Barron, the counties surrounding the GLG properties, there are over 100,000 acres of lakes, 6,000 acres of flowages and 3,500 miles of inland shoreline, trout streams and canoe/kayak miles. The St Croix National Scenic Riverway is a sizeable and significant river resource in Wisconsin. It meanders 154 miles southward from the St. Croix Flowage, in Douglas County, through Burnett, Polk, and St. Croix Counties to its confluence with the Mississippi River at the southern edge of Pierce County. The St. Croix River was designated as a National Scenic Riverway in 1968 for its outstandingly remarkable scenic, recreational and geologic values. It is one of the last undisturbed, large floodplain rivers in the upper Mississippi River System. The Riverway is an unrivaled combination of exceptional natural and cultural resources and scenic, aesthetic and recreational values.

A number of river based paddle sport opportunities exist within the region. High quality water resources and a network of glacial watersheds throughout northern Wisconsin provide water recreation of all types. The St. Croix, Namekagon, Flambeau and Bois Brule Rivers vary in character, size, flow, and surrounding vegetation and land forms.

Public Lands - Public access to recreational lands is vital to many types of recreational activity. In the Northwest Sands Ecological Landscape, almost 608,700 acres or 48.6% of all land and water is publicly-owned (based on FIA data; USDA FS 2009). This is significantly higher than the statewide average of 19.5% and ranks second out of 16 ecological landscapes in the proportion of public ownership. There are about 69,100 acres of water, 107,300 acres of state recreational lands, 151,800 acres of federal and 280,500 acres of county lands (USDA FS 2009).

State-owned lands and facilities are important to recreation in the Northwest Sands. There are over 36,900 acres of state forest including parts of the Brule River and Governor Knowles state forests. In addition, there are 59,300 acres in fisheries and wildlife management lands. The largest of these, Crex Meadows and Fish Lake State Wildlife Areas, each provides over 13,000 acres of recreational land (WDNR 2005c).

Trails - The Northwest Sands Counties have almost 2,900 miles of recreational trails (Table 4) and rank sixth (out of 16 ecological landscapes) in trail density (miles of trail per mi² of land). Compared to the rest of the state, there is a higher density of mountain-biking, ATV and cross-country ski trails (Prey 2010). The Grantsburg Nordic Ski trail is located just a couple miles southwest of the Crex Meadows Wildlife Area in the Village of Grantsburg. There are 10.5 km of groomed classic and skating trails along the shores of Memory Lake, Wood River and Hay Creek, through forest and wetland areas. Nearby, the Governor Knowles State Forest provides trails for hiking, cross-country skiing and horseback riding.

Trail Type	Northwest Sands (miles)	Northwest Sands (miles/100 square mile)	Wisconsin (miles/100 square mile)
Hiking	66	1.5	2.8
Road biking	104	2.4	4.8
Mountain biking	144	3.3	1.9
ATV: summer & winter	895	20.4	9.3
X-country skiing	426	9.7	7.2
Snowmobile	1,206	27.5	31.2

The Gandy Dancer State Trail runs through Burnett, Douglas, and Polk counties in Wisconsin and Pine County in Minnesota. In Wisconsin, the Gandy Dancer trail is managed by county recreation departments. Built on a former railroad bed, it is 98 miles long, and provides opportunities for seasonal hiking, bicycling, cross-country skiing and snowmobiling. Snowmobiling is a popular winter pursuit, with groomed trails maintained by local snowmobile clubs. These trails cross both private and public land. Snowmobile trail access is available in most portions of the Northwest Sands counties, and provides links to cities and village amenities.

Camping – There are 129 public and privately-owned campgrounds which provide about 4,300 campsites in the Northwest Sands Counties. With 7% of the state’s campgrounds, this ecological landscape ranks 6th (out of 16 ecological landscapes) in terms of the number of campgrounds and ranks 2nd in campground density (campgrounds per mile² of land) (Prey 2010).

Land Legacy Sites – The Land Legacy project identified over 300 places of significant ecological and recreational importance in Wisconsin, with 13 places either partially or totally located within the Northwest Sands Ecological Landscape. Three of them, the Crex Meadows wildlife area, the Bois Brule River, and the Chequamegon-Nicolet National Forest were rated highest in both recreation and conservation significance. In addition, the nearby Danbury to Sterling Corridor, the Namekagon-Brule Barrens, the Namekagon River and the St. Croix River all received ratings of highest conservation significance (WDNR 2006a).

State Natural Areas – The Northwest Sands has about 13,748 acres of State Natural Areas, all of which is publicly-owned (including government and educational institutions). The largest State Natural Areas in this ecological landscape include Reed Lake Meadow (3,568 Burnett County), Brule Glacial Spillway (2,656 acres, Douglas County), Fish Lake Meadow (1,881 acres, Burnett County), Buckley Creek and Barrens (899 acres, Douglas County), and Mott’s Ravine (655 acres, Douglas County) (WDNR 2003b).

Metro vs. Non-Metro Recreation Counties – Johnson and Beale (2002) classified Wisconsin counties according to their dominant characteristics. One classification is “Non-Metro Recreation County.” This type of county is characterized by high levels of tourism, recreation, entertainment, and seasonal housing. Three of the four Northwest Sands Counties are classified as “Non-Metro Recreation”: Bayfield, Burnett and Washburn counties.

Needs

Visitors to state lands – The Glacial Lake Grantsburg properties are among the most popular, frequently visited DNR properties in Wisconsin. This region contains some of Wisconsin’s most attractive and diverse outdoor recreation opportunities with the blending of federal, state and local recreation resources. While this region’s population density is low, its recreational resources are used by an active resident base along with in-state and out-of-state visitors. Travel for the purposes of outdoor recreation is an integral part of the state’s tourism industry and a key economic sector within this region.

Nature-Based Recreation – Outdoor recreation demand is defined by the Statewide Comprehensive Outdoor Recreation Plan (SCORP) according to the reported desires of users of outdoor recreational facilities within a region. As part of the national SCORP template, outdoor recreation participation surveys were conducted by the National Survey on Recreation and the Environment. The surveys examined 62 recreational uses by region. Table 5 shows the percentage of responders participating in each recreational activity in northwest Wisconsin. The recreational uses were selected from 62 uses in the survey as the top 10 uses in the Northwest region of Wisconsin that are nature-based activities.

Rank	Recreational Uses*	Region (%)	State (%)
1	Visit a Wilderness or Primitive Area	62.2%	38.3%
2	Picnicking	60.9%	56.6%
3	Boating	56.2%	47.6%
4	Swimming in Lakes, Streams, etc.	52.9%	45.8%
5	Freshwater fishing	49.4%	40.7%
6	Visit a beach	48.8%	47.3%
7	Snow/ice activities	48.7%	44.4%
8	Fishing	44.1%	36.4%
9	Day hiking	42.7%	35.0%
10	Bicycling	42.6%	49.3%

Out-of-State Recreation Interest – Recreational demand is largely determined by Wisconsin residents but is also influenced by out-of-state visitors. Minneapolis and St. Paul, Minnesota are about a 1 ½ hour drive from GLG properties. Although more than 300 miles away, residents from the Chicago, Illinois area also recreate here. Popular regional recreational pursuits among these groups include: fishing, sightseeing, camping, picnicking, hiking, birding, boating, and canoeing.

In 2004, the Wisconsin Department of Tourism surveyed the Chicago and Minneapolis-St. Paul Designated Market Areas (DMAs) to gauge out-of-state recreation interest. The five most popular activities identified by the study for the Great Northwest SCORP region are shown in Table 6.

Rank	Chicago DMA	Twin Cities DMA
1	Fishing	Fishing
2	Bird watching	Sightseeing
3	Camping	Camping
4	Boating	Picnicking
5	Hiking	Hiking

Hunting and Fishing

There are over 500,000 acres of lands available for public hunting in the four county region surrounding the properties. Hunting is allowed on all undeveloped public property, private Managed Forest Law (MFL) land designated as open, and on industry owned forest lands in the region. This includes the GLG properties and county forests. Burnett County alone has around 150,000 acres of public land open to hunt. Common species in the area include black bear, Canada geese, ducks, ruffed grouse, white-tailed deer, wild turkey and woodcock.

Fishing and hunting license sales – Of all license sales, the highest revenue producers for the Northwest Sands Counties were non-resident fishing (41% of total sales), resident hunting licenses (22% of total sales), non-resident hunting licenses (17% of total sales) and resident fishing licenses (15% of total sales). Table 7 shows a breakdown of various licenses sold in the Northwest Sands Counties in 2007. Burnett County accounts for both the highest number of licenses sold and the highest revenue from sales. This ecological landscape accounts for about 4% of total license sales in the state. However, persons buying licenses in the Northwest Sands counties may travel to other parts of the state to use them.

County	Resident Fishing	Non-resident Fishing	Misc. Fishing	Resident Hunting	Non-resident Hunting	Stamps	Total
Douglas	8,092	4,638	902	12,630	1,377	7,158	34,797
Washburn	7,900	11,729	171	9,485	773	2,630	32,688
Bayfield	5,421	6,206	960	5,854	592	5,274	24,307
Burnett	6,308	16,861	214	8,185	1,810	2,319	35,697
	27,721	39,434	2,247	36,154	4,552	17,381	127,489
Sales (\$)	\$637,206	\$1,725,402	\$36,331	\$947,103	\$728,397	\$159,335	\$4,233,774

Source: Wisconsin Department of Natural Resources, FY2007 Sales per County.

Wildlife Viewing, Outdoor Education and Interpretation

Facilities for nature education and interpretation in the region include Crex Meadows Wildlife Education and Visitor Center, Interstate State Park Ice Age Interpretive Center, and the St. Croix River National Scenic Riverway Visitor Center. The National Park Service Visitor Center in St. Croix Falls is 30 miles away. Also nearby are the Hunthill Audubon Sanctuary near Spooner, Wisconsin and the Northern Great Lakes Visitor Center in Ashland, Wisconsin.

[Friends of Crex](#) is a 501(c)(3) non-profit corporation organized for the sole charitable purpose of supporting, assisting, and promoting the Wisconsin Department of Natural Resources with wildlife education and management activities at the Crex Meadows Wildlife Area and the other GLG properties in Burnett County (Appendix B, Memorandum of Agreement). The Friends of Crex support education and interpretation by funding a full-time educator. Opportunities exist to educate visitors,

hunters, bird watchers, and nature enthusiasts about conservation and management practices, property regulations and safety. For more information, see <http://www.crexmeadows.org/Education.html>

Approximately 75% of Crex visitors come to view the wildlife and landscape. Visitors range from casual observer to serious birder and naturalist. The Crex plant list includes over 700 species, including more than 200 with prairie affinities. Mammals include nearly every mammal found in Wisconsin, with a good variety of reptiles, amphibians, and invertebrates found on the properties. The future of wildlife is best assured by raising the public's awareness and understanding of wildlife conservation. This can be done effectively on public lands where visitors can see for themselves the connections between people and wildlife, habitat, and land management. Well-designed interpretive signs and exhibits would explain wildlife's needs and DNR management actions. While helping to instill a land ethic, these properties can also show landowners how to make sustainable use of their lands and leave room for wildlife (USFWS, 1999).

Birding in Wisconsin and the United States

Bird watching is a more popular and growing recreational activity, both in Wisconsin and nationally, than hunting and fishing. Wisconsin ranks second nationally in the proportion of citizens considered birders, with one-third of residents 16 and older reporting they travel to watch birds, or actively watch and identify birds around their home (USFWS, 2011). By the numbers, Wisconsin boasts 1.7 million birders, compared to 1.2 million residents who fish and 895,000 residents who hunt. Over 270 species of birds use the GLG properties. Wisconsin features both northern and southern breeding species and sits astride a major migration pathway, allowing birders easy access to one of the most diverse collections of bird life in the United States. The report, "Birding in the United States: A Demographic and Economic Analysis," indicates that nationally about 47 million birders annually spend an estimated \$41 billion on trip-related expenditures, and generate a total economic impact of \$106 billion. This December 2013 report is a significant addendum to the 2011 U.S. Fish & Wildlife National Survey of Fishing, Hunting and Wildlife Associated Recreation. Additional information is available at <http://www.census.gov/prod/2013pubs/fhw11-wi.pdf>.

Recreational Challenges

Results of a statewide survey of Wisconsin residents indicate that a number of current issues are affecting outdoor recreation opportunities within Wisconsin. Many of these issues, such as increasing ATV usage, overcrowding, increasing multiple-use recreation conflicts, loss of public access to lands and waters, invasive species, and poor water quality, are common across many regions of the state (WDNR 2006a).

Competing Interests - Over the next decade the most dominant recreation management issues will most likely revolve around conflicts between motorized and non-motorized recreation interests. From a silent sport perspective, noise pollution from motorized users is one of the higher causes for recreation conflict (WDNR 2006a). Recreational motorized vehicles include snowmobiles, ATVs, motor boats and jet skis. ATV use is especially contentious. ATV riding has been one of the fastest growing outdoor recreational activities in Wisconsin. Many ATV riders feel there is a distinct lack of ATV trails and are looking primarily to public lands for places to expand their riding opportunities.

Timber Harvesting - A high percentage of people across the state are concerned about timber harvesting in areas where they recreate. They are most opposed to large-scale visual changes (e.g., openings) in the forest landscape. Forest thinning and harvesting that creates small openings are more acceptable. Silent-sport enthusiasts (e.g. hikers, bird watchers) as a group are the most concerned about the visual impacts of harvesting, while hunters and motorized users are somewhat less concerned (WDNR 2006a). However, the attitudes of people within this ecological landscape may differ some from the statewide perspective because of the open nature of many natural communities within this ecological landscape.

Littering - is an ongoing problem, especially on public parking lots and roadways. Avoiding disposal fees for tires, appliances, and electronic devices have caused these items to be dumped on public lands. Demands on time and funds for clean-up continue to increase.

Findings and Conclusions

This section presents the findings and conclusions from the Regional and Property Analysis for the Glacial Lake Grantsburg Properties. Two parts summarize existing conditions and trends on the properties and in the region: 1) the ecological significance and capability of the property, and 2) the property's recreational needs, opportunities, limitations and significance. A summary of the major findings and conclusions is not meant to include every issue.

These findings and conclusions will help guide future management, use and development of GLG properties by highlighting significant opportunities and limitations on these properties, and setting the stage for a reasonable range of management alternatives that may be considered during the master planning process. As planning continues, these conclusions help define the future Vision and Goals.

The GLG Properties: Regional Opportunities

The Glacial Lake Grantsburg properties contain a rich mosaic of nearly 48,000 acres of oak/pine barrens and wetlands within the St. Croix River watershed, in a predominantly remote setting in Burnett County.

Highly scenic with vast open expanses, these properties attract both Midwestern and international visitors to hunt, trap and observe wildlife. A once vast glacial lake for which this region is recognized, was created when the last advance of the Wisconsin glacier blocked the St. Croix River. After the ice dam melted, a series of shallow lakes and extensive marshes remained. This area of northwestern Wisconsin contains some of the largest sedge marshes in the upper Midwest that provide critical open habitat for sensitive species. An impressive diversity of rare birds now exists due to the abundance of large, high-quality wetland habitats for which these properties are managed. Connection to open upland grasslands and barrens makes this one of the premiere open landscapes in the entire state for birds. The “barrens” extends from northern Polk County to southern Bayfield County and covers 1,900 square miles. Now considered a rare ecological community, pine and oak barrens historically covered 7% of Wisconsin’s landscape. This fire-adapted savanna system typically occurs on sandy, glacial outwash soil, dominated by grasses, low-growing shrubs and trees, and scattered large trees (Curtis 1959, WDNR 2015). The importance of this landscape for preserving species biodiversity cannot be overstated.

The oak/pine barrens community represented in the GLG properties is a rare, geographically restricted and globally imperiled habitat. In North America, pine barrens exist primarily in the upper Midwest, especially in Wisconsin, Michigan, and Minnesota. Pine barrens with similar vegetation in the northeastern United States are also globally rare, but are composed of an entirely different assemblage of species and completely lack the prairie plant component present in Wisconsin barrens communities. Wisconsin has the most significant (and possibly the best) opportunity in North America to preserve, restore, and manage large scale barrens communities.

The Glacial Lake Grantsburg properties provide an important recreational and economic resource to the region. The Crex Meadows Wildlife Education and Visitor Center has over 13,000 annual visitors. This is a small subset of all the visitors who use the property. These lands are among the most popular and frequently visited DNR properties in Wisconsin. Travel for the purposes of outdoor recreation is an integral part of the state’s tourism industry and a key economic sector within this region.

Native American tribes continue to use the areas for hunting and gathering. Sedge marshes, jack pine-scrub oak, and prairie savanna once maintained by wildfires are now maintained by prescribed burning. Drained wetlands and fire suppression by European settlers has largely been reversed through DNR management, following state purchase (with federal financing) of tax delinquent lands to restore the original wetlands and uplands as public wildlife areas. The sandy soils are low in productivity and highly erodible. Care must be taken to avoid causing damage to slopes and fragile vegetation.

The population density of the Northwest Sands counties is about one-fifth that of Wisconsin. At 21 persons/square mile, the area is rural compared to 99 persons/square mile in Wisconsin as a whole, according to 2012 US Census Bureau information. Government Service, Tourism/Outdoor Recreation, Retail Trade and Health care are the top four contributors to the economy of the Northwest Sands region.

Ecological Significance and Capability

The following sections describe the most significant regional attributes to benefit from protecting high quality and/or rare ecological landscapes. Protecting or restoring habitat at the landscape level maintains the widest variety of species. Discussion begins with protection opportunities for rare, threatened, and endangered species and closes with threats posed by invasive species. These are the major ecological attributes of the GLG landscape of plant and animal communities to be addressed during the Master Planning process.

Large Wetlands

Wetlands here are extensive, provide habitat for many sensitive species and represent major management opportunities. The open sedge meadows, flowages, marshes and fens in this southwestern part of the Northwest Sands are particularly important because of their size, condition, hydrology, and the presence of numerous habitat specialists. The large wetlands provide habitat for many rare species, including birds and amphibians. Their connection to the open upland grasslands and barrens makes this one of the premiere open landscapes in the entire state for birds, as well as for other taxa including reptiles, insects (especially moths and butterflies), and mammals.

Oak and Pine Barrens

The Northwest Sands is the best place in Wisconsin to manage for the globally rare oak and pine barrens community. Management is generally a continuum extending from open and brush/oak grub-dominated, to oak savanna, to oak woodland. Large-scale barrens management is possible here because of the ecological suitability of the land, the presence of an intact ecosystem, and substantial public ownership, as in the GLG properties. Opportunities exist to connect existing barrens remnants and restoration projects with corridors, and manage them with a mosaic of compatible vegetation types; management critical for sharp-tailed grouse. Prescribed fire and other management tools can be used to develop more diverse structural characteristics, and to enhance or restore species composition in the pine-oak barrens communities.

Migratory Birds

The diversity of habitats on the GLG properties offers important resources for numerous bird groups. The restored wetlands and vast impoundments and flowages on which they depend all need to be maintained.

Large emergent wetlands and associated open water areas provide important foraging areas for migratory birds such as waterfowl, shorebirds, songbirds, and waterbirds. Important features include emergent aquatic plants such as wild rice, bidens, hard and soft-stem bulrush, cat-tails, smartweed, and arrowheads; open water areas that team with amphibians, and aquatic invertebrates; and mudflats with abundant invertebrates and insect larvae. These areas are important to sandhill cranes, with more than 10,000 staging here during the fall migration. Other species that gather in large numbers are Canada geese, tundra and trumpeter swans. Migratory raptors use these open areas to hunt waterfowl, shorebirds, and other species.

Expanses of upland barrens communities provide nesting and foraging habitats for other migratory birds, including upland sandpipers, golden-winged warblers, and whip-poor-whills.

Numerous birds from the arctic and boreal regions winter here, including golden eagle, short-eared owl, rough-legged hawk, northern hawk owl, northern shrike, snow bunting, and common redpoll. These birds depend on the vast GLG grasslands and wetlands. Other wintering birds of conservation importance include lapland longspurs, horned larks, and snow buntings.

Rare Plants and Animals

Five important tracts identified as “primary sites” present the greatest opportunity for biodiversity conservation. These sites warrant consideration for special management or protection because of their native community representation and for the rare and/or Species of Greatest Conservation Need that are present on them:

- Crex Meadows Wildlife Area (27,996 acres)
- Amsterdam Sloughs Sedge Meadow: (723 acres)

- Blomberg Lake and Woods (821 acres)
- Fish Lake Northern Dry-mesic Forest (169 acres)
- Fish Lake Meadows, Prairies, and Forests (13,388 acres)

Some of the species present are rare because of their sensitivity to disturbance, while others rely on disturbance. Many benefit from specific management and large contiguous tracts of intact habitat.

Herptiles

The connection of diverse habitats make these properties attractive to numerous rare herptiles that use wetlands for foraging and wintering but need uplands for nesting sites or basking. The large acreages of heterogeneous habitats meet all the requirements for supporting populations of many regionally significant reptiles. Fish Lake Pines State Natural Area management has potential to maximize salamander, snake, and lizard habitat quality. A significant amount of turtle nesting occurs on or along dirt or gravel roadways of the properties. Nest monitoring could better estimate the impacts of direct road mortality to adults and nests, as well as nest predators. Of high importance to herptiles at the primary sites is the existing connection of habitat with little or no barriers to movements for nesting, foraging, and overwintering. Maintaining or enhancing this landscape connectivity is for restoring or enhancing these habitats. Several uncommon frog species have been documented in the lakes and streams.

Wildlife and Game Species

In addition to habitat for rare and sensitive wildlife species, GLG properties provide high-quality habitat for many common wildlife species. Primary wildlife game species include white-tailed deer, American black bear, bobcat, ruffed grouse, waterfowl and small game. The demand for wildlife-based recreation is high and opportunities exist on the properties to improve habitat for these common wildlife species. In addition to wildlife for hunting, these properties provide excellent birdwatching and wildlife viewing opportunities.

Wild Rice

Wild rice beds on the properties are an important feature in the wetland ecology of the properties and serve as an important food source to wildlife.

Invasive Species and Other Biodiversity Threats

Invasive species are a significant and growing threat to native communities. Invasive species thrive in newly disturbed areas because they establish quickly, tolerate a wide range of conditions, are easily dispersed, and are no longer limited by the diseases, predators, and competitors that kept their populations in check in their native range.

Invasive plant species, although well-established in some areas of the GLG, are generally restricted to trails, roadsides, and low quality habitats. Many of the high-quality areas and areas managed for wildlife habitat are not heavily infested. Widespread invasive plant species with the greatest impact to native species diversity, rare species habitats, or high-quality natural communities are spotted knapweed, reed canary grass, common reed grass, Canada thistle, purple loosestrife, leafy spurge, and narrow-leaved cat-tail. Early detection with rapid control of new and/or small infestations will be essential. Additional threats to maintaining current levels of biodiversity include habitat fragmentation, altered ecological processes, and deer herbivory.

Recreational Significance and Capability

The Glacial Lake Grantsburg properties are among the most popular, frequently visited DNR properties in Wisconsin. The region contains some of Wisconsin's most attractive and diverse outdoor recreation opportunities with the blending of federal, state and local recreation resources. While this region's population density is low, its recreational resources are used by an active resident base, along with in-state and out-of-state visitors, especially from the Minneapolis Saint Paul metropolitan area. A 24-mile self-guided [auto tour](#) is a popular attraction, with instruction from a guidebook including maps, available at the visitor center and on the Friends of Crex web site. It offers an opportunity to observe multiple land management techniques and numerous watchable wildlife opportunities.

Birdwatching, Wildlife Viewing, and Nature Study

Birdwatching, wildlife viewing and nature study on the significant and diverse wetland and oak/pine barrens habitat are perhaps the most popular activities on the GLG properties. Approximately 75% of Crex visitors come to view the wildlife and landscape. Visitors range from the casual observer to serious birder and naturalist. Bird watching is a more popular and growing activity than hunting and fishing, both in Wisconsin and nationally. Over 270 species of birds use the GLG properties. Numerous bird species congregate in the region during migration due to the proximity of Lake Superior and the Mississippi River Flyway. Crex Meadows Wildlife Area is a recognized Important Bird Area, (WDNR, 2007), that draws significant numbers of visitors to view high populations of wetland species, barrens and grassland species and thousands of migratory waterfowl, shorebirds, and sandhill cranes. The Crex Meadows plant list includes over 700 species, including more than 200 with prairie affinities. Mammals include nearly every mammal found in Wisconsin, with a good variety of reptiles, amphibians, and invertebrates found on the properties.

The Friends of Crex Meadows provides significant support and contributions for public awareness, education, and hands on opportunities for conservation and enjoyment of the properties. There are endless opportunities for expanding these types of non-consumptive property uses.

Hunting, Trapping, Gathering, and Fishing

Hunting and trapping are major recreational activities on the GLG properties, with opportunities to pursue waterfowl, white-tailed deer, American black bear, bobcat, fisher, snowshoe hare, American beaver, North American river otter, and small game –including just about every mammal known in Wisconsin. Wild rice beds have become important harvest areas for both tribal and non-tribal ricers. Fishing opportunities are limited due to freeze-out conditions in many years.

Boating

Waterfowl hunters and other recreationists use a variety of motorized and non-motorized watercraft on GLG flowages depending on water levels and conditions. Wild rice harvesters are restricted by state statute to use canoes that are hand propelled by paddle or pole.

Cross-Country Skiing, Snowshoeing and Hiking,

Cross-country skiing, snowshoeing, and hiking are all pursued, with little impact on the property or other recreational uses.

Camping

Primitive camping, primarily for hunting purposes, is allowed only during fall (Sept – Dec) and is restricted to a small number of primitive sites located at the rest area on the north end of Crex Meadows Wildlife Area. Campers are required to register at the Visitor Center. The density of campgrounds that exist at nearby state parks, county, and federal locations in the region is above average for Wisconsin.

Horseback Riding and Mountain Biking

Horseback riding and mountain biking off of roads designated for vehicle travel are not authorized uses on the properties. Physical limitations of the properties such as the predominance of wet soils and limited contiguous uplands are not conducive to trail development. Opportunities for horse and bike uses on these properties are limited by the requirement that non-primary uses not significantly detract from the primary purposes of the property (ch. NR 1.51). There are significant opportunities for these forms of recreation on other public lands in the region.

Motorized Sports

Segments of regional snowmobile trails traverse some parts of all GLG properties. The trails are maintained by local snowmobile clubs. ATV use is allowed during winter on approximately 22 miles of designated snowmobile trails.

Summary

The Glacial Lake Grantsburg Properties (GLG) are Crex Meadows, Fish Lake, and Amsterdam Sloughs state wildlife areas, located in northwest Wisconsin's Burnett County. The properties contain a rich mosaic of nearly 48,000 acres of oak/pine barrens, wetlands, forest, and streams within the St. Croix River watershed. A once vast glacial lake, for which this region is recognized, was created when the last advance of the Wisconsin glacier blocked the St. Croix River. When the ice dam melted, a series of shallow lakes and extensive marshes remained.

The properties provide an important recreational resource and economic benefit to the region. The Crex Meadows Wildlife Education and Visitor Center, supported in part by the [Friends of Crex](#), has well over thirteen thousand annual visitors, which is only a subset of the hundreds of thousands of visitors who use the property. Funds primarily from sales of Wisconsin hunting and trapping licenses, from the Federal Aid in Wildlife Restoration Act (Pittman-Robertson Act), and donations from the Friends of Crex contribute to the purchase and management of the GLG properties. These lands are among the most popular and frequently visited DNR properties in Wisconsin. They are an important destination for birding, which in Wisconsin, ranks second in the nation in popularity, with 1.7 million residents participating. Travel for the purposes of outdoor recreation is an integral part of the state's tourism industry and a key economic sector within this region.

The Glacial Lake Grantsburg properties are a vital contributor to the preservation of oak/pine barrens, a rare and globally imperiled natural community, in the Northwest Sands Ecological Landscape. The barrens extend from northern Polk County to southern Bayfield County and cover 1,900 square miles. These properties provide abundant hunting, trapping, gathering, wildlife watching and educational opportunities. The abundance and diversity of wildlife, including rare bird species that inhabit this landscape attracts an international constituency who appreciate not only the wildlife, but the grand scale of wetlands and oak/pine barrens found here.

Thoughtful planning and management will be needed to be able to manage the GLG properties so they continue to provide high-quality natural resources, wildlife recreational experiences, and timber resources for present and future generations.

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Appendix A: Excerpts from Rapid Ecological Assessment

Species of Greatest Conservation Need

The following are vertebrate Species of Greatest Conservation Need (SGCN) associated with natural community types that are present on the Glacial Lake Grantsburg Planning Group (GLG) in the Northwest Sands Ecological Landscape. Only SGCN with a high or moderate probability of occurring in the Northwest Sands Ecological Landscape are shown. Communities shown here are limited to those identified as “Major” or “Important” management opportunities in the Wisconsin Wildlife Action Plan (WDNR 2006b). Letters indicate the degree to which each species is associated with a particular habitat type (S=significant association, M=moderate association, and L=low association). Animal-community combinations shown here that are assigned as either “S” or “M” are also Ecological Priorities, as defined by the Wisconsin Wildlife Action Plan (see dnr.wi.gov/org/land/er/WWAP/ for more information about these data). **Shaded** species have been documented for the GLG.

	Major										Important				Present		
	Emergent Marsh	Emergent Marsh - Wild Rice	Inland lakes	Northern Dry Forest	Northern Dry-mesic Forest	Northern Sedge Meadow	Northern Wet Forest	Oak Barrens	Pine Barrens	Submergent Marsh	Surrogate Grasslands	Alder Thicket	Impoundments/Reservoirs	Northern Hardwood Swamp	Northern Wet-mesic Forest	Ephemeral Pond	Shrub Carr
Species that are Significantly Associated with the Northwest Sands Landscape																	
American Bittern	S	L				S					L	L					L
American Woodcock				L	L	L	L	L	L		L	S		M	L	L	S
Bald Eagle		L	S						M			S					
Banded Killifish			M														
Black Tern	S	M	M			M			M			M					
Black-backed Woodpecker				M	L		S		L					L			
Black-billed Cuckoo				L	L	L	L	M	M		S		L				S
Blanding's Turtle	S	S	S			M		S	S	S	M	S			S	M	
Blue-winged Teal	S	M	M			M			M	M		M			L		
Bobolink						S				S							
Boreal Chorus Frog	S		S			S		S	S			S			S		
Brown Thrasher				L				S	S		M						
Bullsnake								S	S								
Connecticut Warbler				S	L		M		M								
Field Sparrow								M	M		M						
Franklin's Ground Squirrel								S	S		M						
Golden-winged Warbler				M	M		M		L		S		M	L		S	
Gray Wolf				M	S	L	S	M	M		S		M	S		M	
Species that are Significantly Associated with the Northwest Sands Landscape																	
Greater Redhorse			M									M					
Le Conte's Sparrow						S				S							
Least Darter			M														
Least Flycatcher				M	M								M	L		L	
Lesser Scaup	L	M	M							S		M					
Nelson's Sharp-tailed Sparrow						S											
Northern Flying Squirrel				M	S		S		L					M	S		

	Major											Important				Present	
	Emergent Marsh	Emergent Marsh - Wild Rice	Inland lakes	Northern Dry Forest	Northern Dry-mesic Forest	Northern Sedge Meadow	Northern Wet Forest	Oak Barrens	Pine Barrens	Submergent Marsh	Surrogate Grasslands	Alder Thicket	Impoundments/Reservoirs	Northern Hardwood Swamp	Northern Wet-mesic Forest	Ephemeral Pond	Shrub Carr
Northern Harrier	L	L				S		M	M		S	L					L
Northern Prairie Skink				M	M			S	S								
Osprey		L	S							L		S					
Pugnose Shiner			M														
Red Crossbill				S	S		L		M								
Red-headed Woodpecker				L	L			M	L								
River Redhorse																	
Sharp-tailed Grouse						M		S	S		M						L
Short-billed Dowitcher	S									L		M					
Trumpeter Swan	S	S	M			L				S		M					
Upland Sandpiper						L		M	M		S						
Veery				L	M		M				S		S	L			S
Vesper Sparrow								S	S		L						
Water Shrew			M			L	S				M	L	S	S			L
Whip-poor-will				M	M			M	M								
Wood Turtle						M	M	S	S	S		S		M	M	M	S
Yellow Rail						S											
Species that are Moderately Associated with the Northwest Sands Landscape																	
American Golden Plover	M					L					M		M				
Blue-winged Warbler				L				L									M
Canada Warbler				L	M		M					M		S	S		L
Canvasback	L	M	M							S		M					
Dunlin	M											M					
Eastern Meadowlark											S						
Four-toed Salamander	S					M	M					S		M	S	S	S
Gilt Darter																	
Grasshopper Sparrow								M	L		S						
Hudsonian Godwit	S									L			L				
Species that are Moderately Associated with the Northwest Sands Landscape																	
Lake Sturgeon			S										S				
Marbled Godwit	S									L	M		L				
Mink Frog	S	M	S			S	L			S		M	S	L	L	M	M
Mudpuppy			S										S				
Northern Goshawk				L	M									L	L		
Olive-sided Flycatcher				L	L		S		L			L			M		L
Pickereel Frog	S		M			S	M			S		M	S		M	S	M
Red-necked Grebe	S	L								M							
Red-shouldered Hawk				L	M									L	L	S	
Rusty Blackbird	M											M				M	M
Solitary Sandpiper	S					L						L				S	L
Wilson's Phalarope	S					S				M							
Wood Thrush					L		L							L	L		

	Major											Important			Present		
	Emergent Marsh	Emergent Marsh - Wild Rice	Inland lakes	Northern Dry Forest	Northern Dry-mesic Forest	Northern Sedge Meadow	Northern Wet Forest	Oak Barrens	Pine Barrens	Submergent Marsh	Surrogate Grasslands	Alder Thicket	Impoundments/Reservoirs	Northern Hardwood Swamp	Northern Wet-mesic Forest	Ephemeral Pond	Shrub Carr
Woodland Jumping Mouse				L	L	L	M		L			L		M	M	M	L

Wisconsin Natural Heritage Working List Explanation

Scientific Name: Scientific name used by the Wisconsin Natural Heritage Inventory Program.

Common Name: Standard, contrived, or agreed upon common names.

Global Rank: Global element rank. See the rank definitions below.

State Rank: State element rank. See the rank definitions below.

US Status: Federal protection status in Wisconsin, designated by the Office of Endangered Species, U.S. Fish and Wildlife Service through the U.S. Endangered Species Act. LE = listed endangered; LT = listed threatened; XN = non-essential experimental population(s); LT,PD = listed threatened, proposed for de-listing; C = candidate for future listing.

WI Status: Protection category designated by the Wisconsin DNR. END = endangered; THR = threatened; SC = Special Concern. WDNR and federal regulations regarding Special Concern species range from full protection to no protection. The current categories and their respective level of protection are SC/P = fully protected; SC/N = no laws regulating use, possession, or harvesting; SC/H = take regulated by establishment of open closed seasons; SC/FL = federally protected as endangered or threatened, but not so designated by WDNR; SC/M = fully protected by federal and state laws under the Migratory Bird Act.

Special Concern species are those for which some problem of abundance or distribution is suspected but not yet proved. The main purpose of this category is to focus attention on certain species before they become threatened or endangered.

Global & State Element Rank Definitions

Global Element Ranks:

G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extinction.

G2 = Imperiled globally because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extinction throughout its range.

G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range (e.g., a single state or physiographic region) or because of other factors making it vulnerable to extinction throughout its range; in terms of occurrences, in the range of 21 to 100.

G4 = Apparently globally secure, though it may be quite rare in parts of its range, especially at the periphery.

G5 = Demonstrably secure globally, though it may be quite rare in parts of its range, especially at the periphery.

GH = Of historical occurrence throughout its range, i.e., formerly part of the established biota, with the expectation that it may be rediscovered.

GU = Possibly in peril range-wide, but their status is uncertain. More information is needed.

GX = Believed to be extinct throughout its range (e.g. Passenger pigeon) with virtually no likelihood that it will be rediscovered.

G? = Not ranked.

Species with a questionable taxonomic assignment are given a "Q" after the global rank.

Subspecies and varieties are given subranks composed of the letter "T" plus a number or letter. The definition of the second character of the subrank parallels that of the full global rank. (Examples: a rare subspecies of a rare species is ranked G1T1; a rare subspecies of a common species is ranked G5T1.)

State Element Ranks

S1 = Critically imperiled in Wisconsin because of extreme rarity (5 or fewer occurrences or very few remaining individuals or acres) or because of some factor(s) making it especially vulnerable to extirpation from the state.

S2 = Imperiled in Wisconsin because of rarity (6 to 20 occurrences or few remaining individuals or acres) or because of some factor(s) making it very vulnerable to extirpation from the state.

S3 = Rare or uncommon in Wisconsin (21 to 100 occurrences).

S4 = Apparently secure in Wisconsin, with many occurrences.

S5 = Demonstrably secure in Wisconsin and essentially ineradicable under present conditions.

SA = Accidental (occurring only once or a few times) or casual (occurring more regularly although not every year); a few of these species (typically long-distance migrants such as some birds and butterflies) may have even bred on one or more of the occasions when they were recorded.

SE = An exotic established in the state; may be native elsewhere in North America.

SH = Of historical occurrence in Wisconsin, perhaps having not been verified in the past 20 years, and suspected to be still extant. Naturally, an element would become SH without such a 20-year delay if the only known occurrence were destroyed or if it had been extensively and unsuccessfully looked for.

SN = Regularly occurring, usually migratory and typically non-breeding species for which no significant or effective habitat conservation measures can be taken in Wisconsin. This category includes migratory birds and bats that pass through twice a year or, may remain in the winter (or, in a few cases, the summer) along with certain lepidoptera which regularly migrate to Wisconsin where they reproduce, but then completely die out every year with no return migration. Species in this category are so widely and unreliably distributed during migration or in winter that no small set of sites could be set aside with the hope of significantly furthering their conservation.

SZ = Not of significant conservation concern in Wisconsin, invariably because there are no definable occurrences in the state, although the taxon is native and appears regularly in the state. An SZ rank will generally be used for long-distance migrants whose occurrence during their migrations are too irregular (in terms of repeated visitation to the same locations), transitory, and dispersed to be reliably identified, mapped, and protected. Typically, the SZ rank applies to a non-breeding population.

SR = Reported from Wisconsin, but without persuasive documentation which would provide a basis for either accepting or rejecting the report. Some of these are very recent discoveries for which the program hasn't yet received first-hand information; others are old, obscure reports that are hard to dismiss because the habitat is now destroyed.

SRF = Reported falsely (in error) from Wisconsin but this error is persisting in the literature.

SU = Possibly in peril in the state, but their status is uncertain. More information is needed.

SX = Apparently extirpated from the state.

State Ranking of Long-Distance Migrant Animals:

Ranking long distance aerial migrant animals presents special problems relating to the fact that their non-breeding status (rank) may be quite different from their breeding status, if any, in Wisconsin. In other words, the conservation needs of these taxa may vary between seasons. In order to present a less ambiguous picture of a migrant's status, it is necessary to specify whether the rank refers to the breeding (B) or non-breeding (N) status of the taxon in question. (e.g. S2B,S5N).

Rare Species and High Quality Natural Communities Documented on the Glacial Lake Grantsburg Properties (WDNR, 2011a)

The following paragraphs give brief summary descriptions for some of the rare species and high quality natural communities documented on the Glacial Lake Grantsburg properties and mapped in the NHI Database. More information can be found on the Natural Heritage Conservation Web site (www.dnr.wi.gov) for several of these species and natural communities.

Rare Animals

A Tiger Beetle

A Tiger Beetle (*Cicindela patruela patruela*), a State Special Concern beetle, has been found in Semi open pine/oak barrens, jack and red pine stands with open areas on sandy soil, sandy firelanes or trails. Understory usually dominated by *Vaccinium*, bracken fern, and with a ground cover of moss patches. Optimal identification period is in the spring/fall with diminished numbers in mid-summer.

American Bullfrog

American Bullfrog (*Rana catesbeiana*), a State Special Concern frog, may be found throughout Wisconsin in any permanent body of water - lakes, ponds, rivers, and creeks, although they have a very patchy distribution. In Wisconsin, bullfrogs appear to favor oligotrophic to mesotrophic waters, often breeding where dense submergent vegetation filters out the majority of the suspended solids. Adult bullfrogs overwinter in water to avoid freezing. Bullfrogs are active from April through mid-October. They breed from mid-May through late July or later. Larvae overwinter before transforming the following year or, in rare situations, in their second full year.

Bald Eagle

Bald Eagle (*Haliaeetus leucocephalus*), a bird listed as Special Concern in Wisconsin and Federally protected by the Bald & Golden Eagle Protection Act, prefers large trees in isolated areas in proximity to large areas of surface water, large complexes of deciduous forest, coniferous forest, wetland, and shrub communities. Large lakes and rivers with nearby tall pine trees are preferred for nesting. The breeding season extends from February through August. Favored wintering and roosting habitat includes wooded valleys near open water and major rivers from December through March.

Black Tern

Black Tern (*Chlidonias niger*), a bird listed as Special Concern, prefers large shallow marshes with abundant vegetation adjacent to open water. Nesting occurs from May through the end of July.

Blanding's Turtle

Blanding's turtles (*Emydoidea blandingii*) are listed as a Threatened species in Wisconsin. They utilize a wide variety of aquatic habitats including deep and shallow marshes, shallow bays of lakes and impoundments where areas of dense emergent and submergent vegetation exists, sluggish streams, oxbows and other backwaters of rivers, drainage ditches (usually where wetlands have been drained), and sedge meadows and wet meadows adjacent to these habitats. This species is semi-terrestrial and individuals may spend a good deal of time on land. They often move between a variety of wetland types during the active season, which can extend from early March to mid-October. They overwinter in standing water that is typically more than 3 feet in deep and with a deep organic substrate but will also use both warm and cold-water streams and rivers where they can avoid freezing. Blanding's generally breed in spring, late summer or fall. Nesting occurs from about mid-May through June depending on spring temperatures. They strongly prefer to nest in sandy soils and may travel well over a mile to find suitable soils. This species appear to display nest site fidelity, returning to its natal site and then nesting in a similar location annually. Hatching occurs from early August through early September but hatchlings can successfully overwinter in the nest, emerging the following late April or May. This species takes 17 to 20 years or more to reach maturity.

Dusted Skipper

Dusted skipper (*Atrytonopsis hianna*), a State Special Concern butterfly, has been found in dry, open sandy areas, dry prairie, pine barrens. Its host plants are big bluestem (*Andropogon gerardii*) and little bluestem (*Schizachyrium scoparius*). This species is univoltine with adults in flight from late May to early June in Wisconsin when few other skippers are present. Fully grown caterpillars hibernate and pupate in a sealed case 1-3 inches above the ground at the base of the host plant.

Franklin's Ground Squirrel

Franklin's Ground Squirrel (*Spermophilus franklinii*), a mammal listed as Special Concern, this semi-colonial species prefers brushy and partly wooded areas, dense grassy, shrubby marshland, as well as, prairie edges, rather than open prairie. Mating occurs from the late April to mid-May and young are born between late May to mid-June.

Gophersnake

Bullsnake (*Pituophis catenifer*), a species of Special Concern and a Protected Wild Animal, prefer sand prairies, bluff prairies, oak savannas and pine and oak barrens. Overwintering can occur in sand prairies, where they often den singly by using mammal burrows or other structures to get below the frost line or they may den communally using deep rock fissures on southerly exposed bluff prairies. This species is active from late March through early October, breeds mid-April through May and lays its eggs in sand cavities they create or under large flat rocks in late June to early July. The eggs hatch in late August to early September.

Gorgone Checker Spot

Gorgone checker spot (*Chlosyne gorgone*), a State Special Concern butterfly, is found in barrens, dry fields and prairies, sandy ridges, glades in woodlands, and open pine forests. This species has two flight periods, one from late May through June and again in early August to early September.

Henry's Elfin

Henry's elfin (*Callophrys henrici*), a State status taxagroup, has been found in pine barrens and oak savanna, occasionally in boggy areas.. Adults are usually present from mid-May to early June, sometimes emerging earlier in abnormally advanced seasons.

Karner Blue

Karner blue butterfly (*Lycaeides melissa samuelis*), listed as Federally Endangered and Special Concern in Wisconsin, occurs in pine barrens and oak savanna in close association with its larval host plant lupine (*Lupinus perennis*). In Wisconsin, also found along utility and road right-of-ways, abandoned agricultural fields, and managed forests. This butterfly has two flight periods: adults are present from late May through late June and again from late July through late August.

Lake Darner

Lake darner (*Aeshna eremita*), a State Special Concern dragonfly, has been found in bog or marsh-bordered ponds and lakes. The flight period extends from late July through early October.

Least Bittern

Least Bittern (*Ixobrychus exilis*), a Special Concern bird in Wisconsin. This species prefers freshwater marshes where cattails and reeds predominate in swamps and marshes and dense emergent vegetation. Breeding occurs from mid-May to mid-July.

Leonard's Skipper

Leonard's Skipper (*Hesperia leonardus leonardus*), State Special Concern butterfly, has been found in pine barrens, oak savanna, and dry prairies. Its host plants are little bluestem (*Schizachyrium scoparium*), blue grama (*Bouteloua gracilis*), and panic grass (*Panicum* spp.). This is a univoltine species with adults in flight from early August to early September. Caterpillars hibernate soon after hatching and overwinter.

Long-eared Owl

Long-eared Owl (*Asio otus*), a bird listed as Special Concern, prefers conifer plantations and deciduous forests. Its breeding season extends from late March through late May.

Mink Frog

Mink frogs (*Rana septentrionalis*), a species of special concern, prefer rivers and lakes with bog shoreline habitats. They are a shoreline-dependent species but also forage on and around floating mats of vegetation away from the shoreline in the littoral zone. They may sometimes be found in permanent waters where no bog characteristics exist, although they are usually associated with tannin-stained waters. Mink frogs overwinter in water to avoid freezing. They are active from April through October and breed from June through July. Larvae overwinter before transforming the following summer.

Mottled Dusky Wing

Mottled dusky wing (*Erynnis martialis*), a State Special Concern butterfly. This skipper is found in scrub forest, pine/oak barrens and oak savanna. It is a bivoltine species, the spring flight occurs from mid-May to mid-June and the summer flight from mid-July to mid-August. Larvae feed only on members of the plant genus *Ceanothus*.

Osprey

Osprey (*Pandion haliaetus*) prefer large trees in isolated areas in proximity to large areas of surface water, large complexes of deciduous forest, coniferous forest, wetland, and shrub communities. Large lakes and rivers with nearby tall pine trees are preferred for nesting. The breeding season extends from late April through August.

Phlox Moth

Phlox Moth (*Schinia indiana*), a State Endangered lepidopteran, are about 0.6 inches long as adults and can often co-occur with Karner Blue Butterflies. Phlox Flower Moths appear pink and their forewings are pink as adults are pink to reddish with triangular violet median areas and slender violet margins. The hind wings, which are rarely visible, are black with yellowish fringe. The wingspan is about 1.3 inches (33mm). Larvae are unlikely to be found but the head is dark or orange and the body is green suffused with reddish-brown and marked with light lateral stripes. This species is most often found on the brightest or "freshest" blossoms of its host plant, the downy phlox which occurs in pine/oak barrens and scrub oak habitat as well as prairies and roadsides on sandy soils. The downy phlox requires open, sunny sites with some shade and doesn't appear to colonize new openings very quickly. The critical period of the downy phlox's growth from the end of April through July coincides with adult emergence and larval development. It is therefore critical to time spring burns or mowing so that it doesn't disrupt the flowering of the downy phlox, which is needed by the moths. Management is best conducted after mid-July once the moths have become pupae.

Pygmy Shrew

Pygmy Shrew (*Sorex hoyi*), a state Special Concern mammal. This species is found in among debris and heavy vegetation in woods, clearings, and meadows, particularly those grown to high grass. Avoiding swampy or excessively wet areas, though can be found in cold sphagnum or tamarack bogs.

Red-necked Grebe

Red-necked Grebe (*Podiceps grisegena*), a bird listed as Endangered in Wisconsin, prefers seasonally or permanently flooded wetlands with extensive beds of aquatic plants and large beds of softstem bulrush in open country. Nesting habitat includes wetlands with patches of open water and stands of bulrush (*Scirpus validus*, *S. acutus*) or similar emergents.

Red-shouldered Hawk

Red-shouldered Hawk (*Buteo lineatus*), a bird listed as Threatened in Wisconsin. This species prefers larger stands of medium-aged to mature lowland deciduous forests, dry-mesic and mesic forest with small wetland pockets. Breeding occurs from mid-March through early August.

Sharp-tailed Grouse

Sharp-tailed grouse (*Tympanuchus phasianellus*), a Special Concern bird in Wisconsin, requires a mosaic of dense grass and shrubs with rich forb and insect foods during nesting and brood-rearing and a bare open area for lekking. During winter often relies on riparian areas and other sites that support deciduous trees and shrub for feeding, roosting, and escape cover; also utilizes non-native cultivated grains and hedgerow species.

Trumpeter Swan

Trumpeter Swans (*Cygnus buccinators*) are a Special Concern bird in Wisconsin. Adults have all white plumage, a black bill with a narrow, salmon-red stripe along the base of lower bill, and a wingspan of nearly 8 feet. Birds weigh 21-30 pounds (some males may exceed 35 pounds), and have a lifespan of 20-30 years. Juveniles are sooty gray with black-tipped, pink bills. They do not become all white with a black bill until about a year old. Trumpeters are often confused with other white waterfowl, especially Tundra Swans (*Cygnus columbianus*). They are migratory, arriving on breeding grounds soon after ice melt in early spring and departing for northern wintering grounds shortly before waters freeze. Pairs mate for life and normally choose a 6-150 acre nesting territory near where the female (pen) hatched. If a pair nests two consecutive summers in the same location, they form an almost unbreakable site attachment. Pairs begin building a 6-ft diameter nest in mid-April on top of muskrat or beaver lodges, or on mounds of emergent vegetation. The pen lays a clutch of 5-9 off-white eggs between late April and early May. She incubates the 4 ½ inch by 3 inch eggs for 33-34 days while the male (cob) defends the nest. Cygnets hatch in June and fledge around 14 weeks of age. They spend the rest of the summer preparing for migration with their parents. Ideal habitat for Trumpeters includes shallow wetlands 1-3 feet deep in isolated areas away from human disturbance, with a diverse mix of emergent vegetation and open water that support a rich variety of submergent plants.

Upland Sandpiper

Upland Sandpiper (*Bartramia longicauda*), listed as Special Concern, prefers tallgrass prairies, sedge meadows, unmowed alfalfa/timothy fields and scattered woodlands. The breeding season extends from early May through late September.

Yellow Rail

Yellow Rail (*Coturnicops noveboracensis*), a State Threatened bird, is a rare migrant as well as a rare summer resident in both the north and east of Wisconsin. Yellow Rails are approximately the size of a sparrow, about 6-7 inches long. They have short bills and are a deep tawny-yellow in color with dark stripes crossed by white bars. In flight, the yellow rail is the only rail with a white patch on the trailing edge of each wing. These birds lay their 8-10 pinkish eggs from late May through mid-June in nests that are woven cups of dead grass placed above the water on tussocks. Parents incubate the eggs for approximately 17 days and the following fledgling period is about 35 days long. Yellow Rail habitat is primarily extensive meadows of "wiregrass" sedge and sometimes bluejoint, with little or no shrub encroachment.

Rare Plants

Adder's-tongue

Adder's-tongue (*Ophioglossum pusillum*), a State Special Concern plant, is found in meadows and woods or, rarely, on sandy beaches. The optimal identification period for this species is late June through early September.

Dwarf Milkweed

Dwarf Milkweed (*Asclepias ovalifolia*), a State Threatened plant, is found in periodically brushed areas, rights-of-way. Blooming occurs early June through early July; fruiting occurs late June through late August. The optimal identification period for this species is throughout June.

Prickly Hornwort

Prickly Hornwort (*Ceratophyllum echinatum*), a State Special Concern plant, is found in soft-water lakes, ponds, and reservoirs. Blooming occurs throughout July; fruiting occurs early August through late September. The optimal identification period for this species is early August through late September.

Silky Prairie-clover

Silky Prairie-clover (*Dalea villosa* var. *villosa*), a State Special Concern plant, is found on dry sandy river terraces and hillside prairies (often being invaded by red cedar) near the St. Croix and Mississippi Rivers. Blooming occurs late July through early September; fruiting occurs throughout September. The optimal identification period for this species is early August through late September.

Sparse-flowered Sedge

Sparse-flowered Sedge (*Carex tenuiflora*), a State Special Concern plant, is found in open- to closed canopy cold, wet, coniferous forests, usually on neutral to calcareous substrates. Blooming occurs late May through early June; fruiting occurs late June through late July. The optimal identification period for this species is early June through late July.

Whip Nutrush

Whip Nutrush (*Scleria triglomerata*), a State Special Concern plant, is found on the sunny margins between jack pine/Northern pin (scrub) oak barrens and wet acid ditches with coastal plain species. Blooming occurs late June through late July; fruiting occurs early July through late August. The optimal identification period is late June through late August.

Natural Communities

Alder Thicket

The alder thicket is a minerotrophic wetland community dominated by tall shrubs, especially speckled alder. Shrub associates may include red-osier dogwood, nannyberry, cranberry viburnum, wild currants, and willows. Among the characteristic herbaceous species are Canada bluejoint grass, orange jewelweed, asters, boneset, rough bedstraw, marsh fern, arrow-leaved tearthumb, and sensitive fern. This community type is sometimes a seral stage between northern sedge meadow and northern conifer swamp or northern hardwood swamp, but occurrences can be stable and persist at given locations for long periods of time. This type is common and widespread in northern and central Wisconsin, but also occurs at isolated locales in the southern part of the state. Alder thicket often occurs as a relatively stable community along streams and around lakes, but can occupy large areas formerly covered by conifer swamps that were logged during the Cutover and/or where water tables were raised. Stands of alder that originated following logging and/or wildfire will usually revert to forest, although on heavy, poorly drained soils, forest re-growth can be problematic owing to “swamping” effects.

Groundwater seepage is an important attribute of alder thickets. Seepage areas are often indicated by the presence of skunk-cabbage, marsh-marigold, swamp saxifrage, American golden saxifrage, and marsh pennywort.

Northern Dry Forest

This forest community type occurs on nutrient-poor sites with excessively drained sandy or rocky soils. The primary historic disturbance regime was catastrophic fire at intervals of ten to one hundred years. Dominant trees of mature stands include jack and red pines and/or Northern pin (scrub) oak. Large acreages of this forest type were cut and burned during the catastrophic logging of the late 19th and early 20th century. Much of this land was then colonized by white birch and/or quaking aspen, or converted to pine plantations starting in the 1920s. Today’s forests have a greatly reduced component of pines, and a greater extent of aspen, red maple, and oaks as compared to historic conditions. Common understory shrubs are hazelnuts, early blueberry, and brambles (*Rubus spp.*); common herbs include bracken fern, starflower, barren-strawberry, cow-wheat, trailing arbutus, and members of the shinleaf family (*Chimaphila umbellata*, *Pyrola spp.*). Vast acreages of cutover land were also planted to pine, or naturally succeeded to densely stocked “dry” forests.

Northern Dry Forest communities occur on large, continuous glacial outwash or lake plain landforms. On these extensive xeric plains, historic fires were less likely to be halted by wetlands or mesic hills. Here, burns could be large and intense, creating ideal conditions for establishment of Northern Dry Forest.

Northern Dry-mesic Forest

In this forest community, mature stands are dominated by eastern white and red pines, sometimes mixed with northern red oak and red maple. Common understory shrubs are hazelnuts, blueberries, wintergreen, and partridge-berry. Among the dominant herbs are wild sarsaparilla, Canada mayflower, and cow-wheat.

Typical locations are on irregular glacial topography (e.g., heads-of-outwash, tunnel channel deposits), or in areas with mixed glacial features (e.g., pitted outwash interspersed with remnant moraines). Soils are loamy sands or sands, and less commonly, sandy loams. Some occurrences are in areas where bedrock is close to the surface. Areas of northern dry-mesic forest that were historically dominated by red and white pines were considered the great "pineries" before the Cutover.

Today, the extent of red and white pine stands is greatly decreased, while red maple, sugar maple, aspen, and oaks have increased. Historically, fire disturbance was key to maintaining the northern dry-mesic forest type.

Northern Mesic Forest

Prior to Euro-American settlement, the northern mesic forest covered the largest acreage of any Wisconsin vegetation type. It is still very extensive, but made up of second-growth forests that developed following the Cutover. It forms the matrix for most of the other community types found in northern Wisconsin, and provides habitat for at least some portion of the life cycle of many species. It is found primarily north of the Tension Zone (Figure 2-2), on loamy soils of glacial till plains and moraines deposited by the Wisconsin glaciation. Sugar maple is dominant or co-dominant in most stands. Historically, eastern hemlock was the second most important species, sometimes occurring in nearly pure stands with eastern white pine; both of these conifer species are greatly reduced in today's forests. American beech can be a co-dominant with sugar maple in the counties near Lake Michigan. Other important tree species were yellow birch, basswood, and white ash. The groundlayer varies from sparse and species poor (especially in hemlock stands) with woodferns, blue-bead lily, club-mosses, and Canada mayflower, to lush and species-rich with fine spring ephemeral displays. Historically, Canada yew was an important shrub, but it is now absent from nearly all locations. Historic disturbance regimes were dominantly gap-phase windthrow; large windstorms occurred with long return periods. After old-growth stands were cut, trees such as quaking and big-toothed aspens, white birch, and red maple became abundant 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

This open wetland community is dominated by sedges and grasses and occurs primarily in northern Wisconsin. There are several common, fairly distinctive, subtypes: Tussock meadow, dominated by tussock sedge and Canada bluejoint grass; Broad-leaved sedge meadow, dominated by the robust sedges (*Carex lacustris* and/or *C. utriculata*); and Wire-leaved sedge meadow, dominated by woolly sedge and/or few-seeded sedge. Frequent associates include blue flag, marsh fern, marsh bellwort, manna grasses, panicked aster, Joe-Pye weed, and the bulrushes (*Schoenoplectus tabernaemontani* and *Scirpus cyperinus*). Sphagnum mosses are either absent or they occur in scattered, discontinuous patches. Sedge meadows occur on a variety of landforms and in several ecological settings that include depressions in outwash or ground moraine landforms in which there is groundwater movement and internal drainage, on the shores of some drainage lakes, and on the margins of streams and large rivers.

Oak Barrens

Black oak is often the dominant tree in this fire-adapted savanna community of xeric sites, but white oak, bur oak, northern pin oak, and occasionally red oak, may also be present. Common understory species include lead plant, black-eyed susan, round-headed bush-clover, goats rue, June grass, little bluestem, flowering spurge, frostweed, false Solomon's-seal, spiderwort, and wild lupine. Some of the oak barrens remnants also contain patches of heath-like vegetation in addition to the prairie understory, with bracken fern, blueberries (*Vaccinium angustifolium* and *V. myrtilloides*), bearberry, and sweet fern locally common or dominant. This community's distribution is in southwestern, central and west central Wisconsin.

The pine barrens and oak barrens communities described by Curtis (1959) share many similarities. In general, prairie species are better represented in the more oak-dominated barrens to the south, and pines and some of their characteristic associates

are more prominent in the north. However, jack pine is an important component of some of Wisconsin's southernmost barrens occurrences (e.g., Gotham Jack Pines on the Wisconsin River in Richland County), and both red pine savanna and jack pine barrens were described in the Public Land Survey notes for Juneau County. Frequent fires can reduce the oaks to short, multi-stemmed "grubs", and result in the elimination of scattered large oaks that were formerly important in and characteristic of some areas.

Barrens communities occur on several landforms, especially outwash plains, lake plains, and on the broad sandy terraces that flank some of the major rivers of southern Wisconsin. Soils are usually excessively well-drained sands, though thin-soiled, droughty sites over bedrock can also support this community. Similar communities include pine barrens, oak openings (drier sites), sand prairie, southern dry forest, Central Sands pine - oak forest, and bedrock glade.

Sand Barrens

Sand Barrens are herbaceous upland communities that develop on unstable or semi-stabilized alluvial sands along major rivers such as the Mississippi and Wisconsin. They are partly or perhaps wholly anthropogenic in origin, occurring on sites historically disturbed by plowing or very heavy grazing. Unvegetated "blow-outs" are characteristic features. Barrens, Dry Prairie and Sand Prairie species such as false-heather (*Hudsonia tomentosa*), bearberry (*Arctostaphylos uva-ursi*), sedges (*Cyperus filiculmis* and *C. schweinitzii*), sand cress (*Arabis lyrata*), three-awn grasses (*Aristida* spp.), rock spikemoss (*Selaginella rupestris*), and the earthstar fungi (*Geaster* spp.) are present in this community. Many exotics are present, and rare disturbance dependent species such as fame flower (*Talinum rugospermum*) occur in some stands.

Sand Prairie

Sand prairie is a dry native grassland community dominated by grasses such as little bluestem, J junegrass, panic grasses, and poverty-oat grass. Common herbaceous associates are sand cress, field sage-wort, western ragweed, several sedges (e.g., *Carex muhlenbergii*, *Cyperus filiculmis*, and *Cyperus schweinitzii*), flowering spurge, frostweed, round-headed bush-clover, western sunflower, false-heather, long-bearded hawkweed, stiff goldenrod, horsebalm, and spiderwort. Drought-adapted fungi, lichens, and mosses are significant components of sand prairie communities.

At least some stands classified as sand prairie are oak or pine barrens remnants that now lack appreciable woody cover. Extensive stands may have occurred historically on broad sand terraces bordering the Mississippi, Wisconsin, Black, and Chippewa Rivers. Sand prairie may be more prevalent now in some areas than it was in historical times. Failed attempts to farm many of these prairies created blowouts, and may have even reactivated small dunes once the prairie sod was removed. We have included the 'sand barrens' community described by Curtis (1959) with this type.

Tamarack (poor) Swamp

These weakly to moderately minerotrophic conifer swamps are dominated by a broken to closed canopy of tamarack (*Larix laricina*) and a frequently dense understory of speckled alder (*Alnus incana*). The understory is more diverse than in Black Spruce Swamps and may include more nutrient-demanding species such as winterberry holly (*Ilex verticillata*) and black ash (*Fraxinus nigra*). The bryophytes include many genera other than Sphagnum. Stands with spring seepage sometimes have marsh-marigold (*Caltha palustris*) and skunk-cabbage (*Symplocarpus foetidus*) as common understory inhabitants. These seepage stands have been separated out as a distinct type or subtype in some nearby states and provinces.

Rare Species and High Quality Natural Communities of the Glacial Lake Grantsburg Properties

Numerous rare species and high-quality examples of native communities have been documented within the GLG properties. The table on the next pages shows the rare species and high-quality natural communities currently known and listed by property.

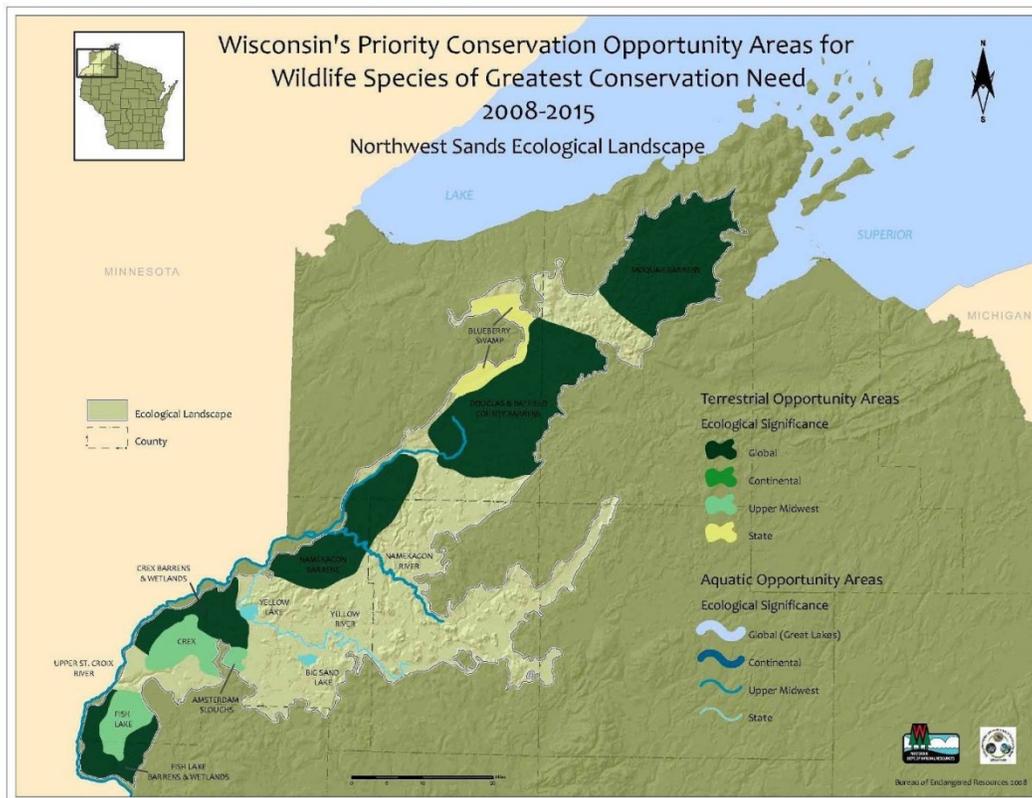
Common Name	Scientific Name	Amsterdam Sloughs	Crex Meadows	Fish Lake	State Rank	Global Rank	State Status	Federal Status	SGCN	Tracked by NHI
Animal										
a crawling water beetle	<i>Haliplus leopardus</i>		2010	2010	S1S3	GNR	SC/N		Y	Y
a long-horned casemaker caddisfly	<i>Triaenodes nox</i>		2010		S1S3	G5	SC/N		Y	Y
A Predaceous Diving Beetle	<i>Rhantus Sinuatus</i>	2004			S3S4	GNR	SC/N		Y	W
A Tiger Beetle	<i>Cicindela patruela patruela</i>			1999	S2	G3T3	SC/N		Y	Y
An Issid Planthopper	<i>Fitchiella robertsoni</i>		2006		S1	GNR	SC/N		Y	Y
American Bittern	<i>Botaurus lentiginosus</i>	2008	2007	2010	S3B	G4	SC/M		Y	Y
American Bullfrog	<i>Lithobates catesbeianus</i>		1989		S3	G5	SC/H		N	Y
American Woodcock	<i>Scolopax minor</i>			2010	S4B	G5	SC/M		Y	W
An Issid Planthopper	<i>Fitchiella robertsoni</i>		2006		S1?	GNR	SC/N		Y	Y
Bald Eagle	<i>Haliaeetus leucocephalus</i>	1995	2008	2010	S4B,S2N	G5	SC/P		Y	Y
Black Tern	<i>Chlidonias niger</i>	2008	2010	2010	S2B	G4	SC/M		Y	Y
Black-billed Cuckoo	<i>Coccyzus erythrophthalmus</i>			2010	S4B	G5	SC/M		Y	W
Blanding's Turtle	<i>Emydoidea blandingii</i>	2010	2010	2006	S3	G4	THR		Y	Y
Blue-winged Teal	<i>Anas discors</i>			2010	S4B	G5	SC/M		Y	W
Blue-winged Warbler	<i>Vermivora pinus</i>			2010	S4B	G5	SC/M		Y	W
Bobolink	<i>Dolichonyx oryzivorus</i>			2010	S4B	G5	SC/M		Y	W
Broadwinged Skipper*	<i>Poanes viator</i>		2010		S3	G5	SC/N		N	W
Brown Thrasher	<i>Toxostoma rufum</i>			2010	S4B	G5	SC/M		Y	W
Canada Warbler	<i>Wilsonia canadensis</i>			2010	S3B	G5	SC/M		Y	Y
Club-horned Grasshopper	<i>Aeropedellus clavatus</i>		2006		S2	G5	SC/N		Y	Y
Columbine Dusky Wing	<i>Erynnis lucilius</i>		1988		S2	G4G5	SC/N		Y	Y
Dickcissel	<i>Spiza americana</i>			1992	S3B	G5	SC/M		Y	Y
Dusted Skipper	<i>Atrytonopsis hianna</i>		2010		S3	G4G5	SC/N		N	Y
Eastern Meadowlark	<i>Sturnella magna</i>				S4B	G5	SC/M		Y	W
Field Sparrow	<i>Spizella pusilla</i>			2010	S4B	G5	SC/M		Y	W
Franklin's Ground Squirrel	<i>Spermophilus franklinii</i>		2010		S2	G5	SC/N		Y	Y
Golden-winged Warbler	<i>Vermivora chrysoptera</i>			2010	S4B	G4	SC/M		Y	W

Common Name	Scientific Name	Amsterdam Sloughs	Crex Meadows	Fish Lake	State Rank	Global Rank	State Status	Federal Status	SGCN	Tracked by NHI
Gophersnake	<i>Pituophis catenifer</i>		2010	2010	S2S3	G5	SC/P		Y	Y
Gorgone Checker Spot*	<i>Chlosyne gorgone</i>		2009	2010	S3	G5	SC/N		N	Y
Grasshopper Sparrow	<i>Ammodramus savannarum</i>		1993	2010	S4B	G5	SC/M		Y	W
Gray Copper	<i>Lycaena dione</i>		1995		S2	G5	SC/N		N	Y
Gray Wolf	<i>Canis lupus</i>	2008	2008	2008	S2	G4	SC/FL	LE	Y	Y
Great Blue Heron	<i>Ardea herodias</i>		2010	2010	S4B	G5	SC/M		N	W
Henry's Elfin*	<i>Callophrys henrici</i>		1989 2010		S1S2	G5	SC/N		N	Y
Karner Blue	<i>Lycaeides melissa samuelis</i>	2010	2010	2010	S3	G5T2	SC/FL	LE	Y	Y
Lake Darner	<i>Aeshna eremita</i>		2002		S3	G5	SC/N		N	Y
Lakota Crescent	<i>Phyciodes batesii lakota</i>		1978		S3	G4T4	SC/N		N	Y
Le Conte's Sparrow	<i>Ammodramus leconteii</i>		2006	2010	S2S3B	G4	SC/M		Y	Y
Least Bittern	<i>Ixobrychus exilis</i>			2010	S3B	G5	SC/M		N	Y
Least Flycatcher	<i>Empidonax minimus</i>			2010	S4B	G5	SC/M		Y	W
Leonard's Skipper*	<i>Hesperia leonardus</i>		2009		S3	G4	SC/N		N	Y
Long-eared Owl	<i>Asio otus</i>		2003		S2B	G5	SC/M		N	Y
Mink Frog	<i>Lithobates septentrionalis</i>	2009	2010		S3S4	G5	SC/H		Y	Y
Mottled Dusky Wing	<i>Erynnis martialis</i>		2010		S2	G3	SC/N		Y	Y
Mulberry Wing*	<i>Poanes massasoit</i>			2010	S3	G4	SC/N		N	W
Nelson's Sparrow	<i>Ammodramus nelsoni</i>		2007	2010	S1B	G5	SC/M		Y	Y
Northern Harrier	<i>Circus cyaneus</i>		2010	2010	S3B,S2N	G5	SC/M		Y	W
Osprey	<i>Pandion haliaetus</i>	2008	2010*	2010*	S4B	G5	SC/M		Y	Y
Persius Dusky wing	<i>Erynnis persius</i>		2010		S2	G5	SC/N		Y	Y
Phlox Moth	<i>Schinia indiana</i>		2010		S2S3	G2G4	END		Y	Y
Prairie Skink	<i>Plestiodon septentrionalis</i>		2010		S3	G5	SC/H		Y	Y
Pygmy Shrew	<i>Sorex hoyi</i>		1997*		S3S4	G5	SC/N		N	Y
Red-headed Woodpecker	<i>Melanerpes erythrocephalus</i>			1991	S3B	G5	SC/M		Y	W
Red-necked Grebe	<i>Podiceps grisegena</i>		2007	1987	S1B	G5	END		Y	Y
Red-shouldered Hawk	<i>Buteo lineatus</i>	1978			S3S4B,S1N	G5	THR		Y	Y

Common Name	Scientific Name	Amsterdam Sloughs	Crex Meadows	Fish Lake	State Rank	Global Rank	State Status	Federal Status	SGCN	Tracked by NHI
Sedge Wren	<i>Cistothorus platensis</i>		1993	2010	S4B	G5	SC/M		N	W
Sharp-tailed Grouse	<i>Tympanuchus phasianellus</i>		2010		S1B,S2N	G4	SC/H		Y	Y
Short-eared Owl	<i>Asio flammeus</i>			2010	S1B	G5	SC/M		Y	Y
Slender Clearwing	<i>Hemaris gracilis</i>		2010		S3	S3G4	SC/N		Y	Y
Spotted-winged Grasshopper	<i>Orphulella pelidna</i>	2004			S2S3	G5	SC/N		Y	Y
Trumpeter Swan	<i>Cygnus buccinator</i>		2010*	2010	S4B	G4	SC/M		Y	Y
Two-Spotted Skipper*	<i>Euphyes bimacula</i>		2010	2010	S3	G4	SC/N		N	W
Upland Sandpiper	<i>Bartramia longicauda</i>		2010		S2B	G5	SC/M		Y	Y
Veery	<i>Catharus fuscescens</i>		2010	2010	S4B	G5	SC/M		Y	W
Vesper Sparrow	<i>Pooecetes gramineus</i>		2010	2010	S4B	G5	SC/M		Y	W
Whip-poor-will	<i>Caprimulgus vociferus</i>		2007	2010	S3B	G5	SC/M		Y	W
Wild Indigo Duskywing*	<i>Erynnis baptisiae</i>		1996		S2S3	G5	SC/N		Y	W
Willow Flycatcher	<i>Empidonax trailli</i>			2010	S4B	G5	SC/M		Y	W
Wilson's Phalarope	<i>Phalaropus tricolor</i>		2002	1993	S1B	G5	SC/M		Y	Y
Wood Thrush	<i>Hylocichla mustelina</i>			2010	S4B	G5	SC/M		Y	W
Yellow-billed Cuckoo	<i>Coccyzus americanus</i>				S3B	G5	SC/M		Y	Y
Yellow Rail	<i>Coturnicops noveboracensis</i>	2005	2007	1992	S1B	G4	THR		Y	Y
Plant										
Adder's-tongue	<i>Ophioglossum pusillum</i>		1966		S2	G5	SC		N/A	Y
Brook grass*	<i>Catabrosa aquatica</i>		1991							
Cross-leaf milkwort*	<i>Polygala cruciata</i>		1971							
Downy willow-herb*	<i>Epilobium strictum</i>	1979								
Dwarf Milkweed	<i>Asclepias ovalifolia</i>		2010	2010	S3	G5?	THR		N/A	Y
Large-flowered Ground-cherry	<i>Leucophysalis grandiflora</i>		2010		S1	G4?	SC		N/A	Y
Prickly Hornwort	<i>Ceratophyllum echinatum</i>		1955		S2	G4?	SC		N/A	Y
Purple bladderwort*	<i>Utricularia purpurea</i>	1991								
Silky Prairie-clover	<i>Dalea villosa</i> var. <i>villosa</i>			2010	S2	G5	SC		N/A	Y
Slender bulrush*	<i>Schoenoplectus</i>		1955							

Common Name	Scientific Name	Amsterdam Sloughs	Crex Meadows	Fish Lake	State Rank	Global Rank	State Status	Federal Status	SGCN	Tracked by NHI
	<i>heterochaetus</i>									
Sparse-flowered Sedge	<i>Carex tenuiflora</i>		2007		S3	G5	SC		N/A	Y
Vasey's rush*	<i>Juncus vaseyi</i>		2008							
Whip Nutrush	<i>Scleria triglomerata</i>		2010	2010	S2S3	G5	SC		N/A	Y
Yellow screw-stem*	<i>Bartonia virginica</i>		2009							
Natural Community										
Alder Thicket					S4	G4			N/A	Y
Lake--Soft Bog		1979			S4	GNR			N/A	Y
Northern Dry Forest			2010		S3	G3?			N/A	Y
Northern Dry-mesic Forest				2010	S3	G4			N/A	Y
Northern Mesic Forest		2010			S4	G4			N/A	Y
Northern Sedge Meadow		2010	2010	2010	S3	G4			N/A	Y
Oak Barrens			2010	2010	S2	G2?			N/A	Y
Sand Barrens				1977	SU	GNR			N/A	Y
Sand Prairie			2010		S2	GNR			N/A	Y
Tamarack (Poor) Swamp		2010			S3	G4			N/A	Y
Other										
Bird Rookery		2008			SU	G5	SC		N/A	Y

Priority Conservation Opportunity Areas—Northwest Sands



Future Needs

This project was designed to provide a rapid assessment of the biodiversity values for GLG. Although the report should be considered adequate for master planning purposes, additional efforts could help to inform future adaptive management efforts, along with providing useful information regarding the natural communities and rare species contained in GLG.

- Continued invasive species monitoring and control is needed. State wildlife areas and many other public lands throughout Wisconsin are facing major management problems because of serious infestations of highly invasive species. Some of these species are easily dispersed by humans and vehicles; others are spread by birds, mammals, insects, water, or wind. In order to protect the important biodiversity values of the GLG, a comprehensive invasive species monitoring and control plan will be needed for detecting and rapidly responding to new invasive threats. Citizens, such as trail users or hunters, could be encouraged to report new sightings of invasive plants and animals and, perhaps, cooperate with property managers in control efforts.
- Quantitative vegetation data should be collected from the barrens, prairies, and wetlands in this region. Establishing baseline vegetation plots or transects will help to better understand these unique and diverse natural communities, help to determine how best to maintain these transitional natural communities, and better classify the brush-prairie phase of Oak Barrens.
- Establishing snake and skink monitoring programs is recommended for the GLG, especially for gophersnakes, eastern hog-nosed snakes, and skinks.
- Conducting surveys for the Special Concern four-toed salamander (*Hemidactylum scutatum*) is recommended for the GLG to determine presence or absence. This species is expected to be especially sensitive to climate change.
- Locations and likely habitats should be identified for conducting additional rare plant and animal surveys during appropriate seasons. This should include additional vertebrate and invertebrate animal taxon groups.

Research is needed on the response of the butterfly and moth community to current management practices.

Appendix B: MOA with Friends of Crex Association

AGREEMENT BETWEEN
THE DEPARTMENT OF NATURAL RESOURCES
AND THE
FRIENDS OF CREX ASSOCIATION

This Memorandum of Agreement is between the Department of Natural Resources (hereinafter referred to as the "DNR"), acting through the Secretary, and the Friends of Crex Association (hereinafter referred to as "Association"), acting through the Chairman of its Board of Directors or the Board's designee.

WITNESSETH:

WHEREAS, it is the purpose of the DNR to preserve, interpret, and manage the wildlife area system for the benefit, education, and enjoyment of the people of the state; and

WHEREAS, the DNR desires to provide facilities and cooperating services for the sale of materials of interpretive and educational value, and for the presentation of specified programs relating to the interpretive themes of the wildlife area system; and

WHEREAS, the Association has the education, historical, scientific, and nonprofit purposes of assisting historical, scientific, educational, wildlife management, and interpretive activities of the DNR.

NOW, THEREFORE, pursuant to authority contained in Chapter 23, Wis. Stats., and in consideration of the mutual benefits which will accrue to the DNR and the Association, the parties agree as follows:

1. AUTHORIZATION

The DNR authorizes the Association to provide, and the Association agrees to provide, the hereinafter described interpretive and educational services to the visiting public for a period of five years commencing on the day following the ratification of this Agreement by the DNR. This Agreement will automatically renew for another five year period on July 1 of the last year, unless reasonable notice of cancellation is given by either party before the date of renewal. While the DNR reserves the right to terminate the Agreement, or any part thereof, at any time upon reasonable notice without the necessity of any legal process, the DNR will hold a meeting with the Association prior to the termination setting forth the reasons for termination.

The management and operation of the concession is subject to all applicable Wisconsin Statutes and the Wisconsin Administrative Code.

2. ASSOCIATION RESPONSIBILITIES

The Association may use facilities within the wildlife area for the sale of educational and interpretive items for the benefit of the visiting public.

A. Sales Items

- (1) The Association may sell only publications, maps, visual aids, handicrafts, and other objects directly related to the interpretive, educational, and management themes of the wildlife area and wildlife area system. This does not prohibit granting of a concession permit to an Association authorizing the sale of other items.
- (2) The Association is not by this Agreement granted the right to sell items, the sale of which would infringe on applicable contract rights of a concessionaire.
- (3) The Association shall maintain a high standard of quality in all items produced or sold.
- (4) The Association shall not sell any item which has not been approved by the DNR. The Association shall allow publications to be reviewed by the DNR for editorial and design quality.
- (5) The Association shall sell items at fair market value provided that such prices shall be approved in advance by the DNR.
- (6) The Association shall display the sales items in good taste and in keeping with the general design and decor of the wildlife area.

B. Facilities

- (1) The Association may redesign and renovate existing sales facilities as necessary, including renovation of display structures, furnishing, equipment, signing, display lighting, and lighting in the immediate area of the facility, provided that all plans are approved in advance by the DNR.
- (2) The Association shall keep the sales facility clean and presentable throughout the work day.
- (3) The Association shall exercise reasonable care to prevent damage to any DNR property used by it during its operation and shall, insofar as possible, protect all such property.
- (4) The erection of signs and advertising or display materials relating to the Association is not allowed unless authorized in writing by the Department. All signs, advertising or display materials, and all publications, stationery, printed or promotional material, and exhibits issued by or used by the Association shall be paid for by the Association.

C. Records and Accounting

- (1) The Association shall conduct its fiscal operations in accordance with accepted business practices, utilizing purchase orders, receipts, invoices, and inventory records.
- (2) The Association shall submit to the DNR, through the superintendent, annually within 90 days following the end of each calendar year a complete financial report. The report shall be accompanied by a written summary of Association activities for the year.
- (3) The DNR may review the records of the Association at any time during the term of this Agreement.
- (4) The Association shall maintain a checking account in its name, and shall deposit proceeds from sales, etc., in the account at least once a month. Only the treasurer, or his or her designee may make the deposits.

D. Personnel

- (1) The Association shall provide such personnel as are reasonably necessary to operate the sales facilities as indicated by the level of gross sales. These personnel may include, as necessary, a central business office staff, local facility managers, and sales clerks. Otherwise, DNR personnel may offer sales items to the public as an incidental supplement to their interpretive duties.
- (2) The Association shall designate an association member or employee who is authorized to act as liaison with the DNR.
- (3) All Association employees involved in visitor contact shall be oriented in the wildlife area's visitor service programs and shall be approved by the wildlife area superintendent before assuming such responsibilities.
- (4) An evident and distinct separation shall be maintained between the activities of the Association and those of the DNR. All steps shall be taken to avoid even an appearance that the DNR directs the management or decision-making process of the Association.
- (5) Association personnel are not DNR employees and are not authorized to undertake any DNR function or activity on behalf of the DNR beyond routine visitor information services and participation in visitor center and living history or like programs. Association employees shall not engage in activities which would reasonably lead the visiting public to conclude that they are DNR employees. No Association employee shall wear a DNR uniform. All Association employees shall wear some easily observable

and readily identifiable indicia of Association affiliation while in the wildlife area on Association business.

- (6) Where applicable, the Association shall furnish full worker's compensation coverage for its employees and shall comply with all social security and withholding tax laws and rules. A person claiming that the coverage is not required under Chapter 102, Wis. Stats., shall upon request, provide the basis for such opinion in writing to the Department.

E. Approvals

- (1) Hours of operation, rates and prices, standards of service, and merchandise to be sold shall be subject to the approval of the DNR.
- (2) The Association may at any time make a written request for such necessary approvals. Failure to disapprove within thirty days of receipt of such written request shall be deemed to constitute DNR approval.

F. Interpretive Activities

- (1) Interpretive activities engaged in by the Association must meet DNR standards and be approved by the wildlife area superintendent.

3. DNR RESPONSIBILITIES

The DNR agrees to allow the Association to use those facilities within the wildlife area which are designated for the sale of education and interpretive items for the benefit of the visiting public. (Note: include an exhibit, showing the location.)

A. Sales Items

The DNR shall cooperate with the Association in the planning and design of merchandise appropriate for sale by the Association at the facilities provided therefore by the DNR.

B. Facilities

- (1) The DNR shall provide the Association with such sales and other facilities as are identified in Exhibit B, and such other facilities as may hereafter be deemed necessary or desirable by the DNR, provided that the DNR reserves the right to relocate or withdraw any such facilities in order to meet needs of the DNR upon reasonable notice. All facilities shall be subject to the right of the DNR to make such surveys and inspections as it deems necessary.

- (2) The DNR reserves the right to design and construct any new facilities, and shall allow the Association to review and comment on any plans therefore.
 - (3) The DNR shall provide the Association with incidental utility services at each assigned facility, including water, electricity, heat, air conditioning (if available in the building), to the extent these utilities are required for the operation of the building for Governmental purposes. All other utilities will be provided the Association on a reimbursable basis.
 - (4) The DNR shall provide all general maintenance and repair services for the State-owned buildings.
 - (5) The DNR shall designate an employee who shall act as liaison (wildlife area coordinator) with the Association.
- C. Monies donated by the Association to the DNR shall be expended only for the furtherance of the interpretive and management programs or the construction or renovation of interpretive facilities at Crex Meadows Wildlife Area.

4. SUPPLEMENTAL AGREEMENTS

The DNR and the Association further agree that, by supplemental agreement, the Association may offer additional educational and interpretive services which support the mission of the wildlife area. This includes assisting, planning, and conducting the presentation of interpretive and educational programs, involving as needed, but not limited to, employment of interpreters, purchasing of supplies, and sale of program products.

5. INDEMNIFICATION AND INSURANCE

- A. The Association will not be required to purchase liability insurance as long as their sole purpose is the sale of books and other articles.
- B. In the event of the development of an active volunteer program liability insurance will be required.

6. PATENT INFRINGEMENT

The Association selling the articles described herein guarantees that the sale or use of the articles described herein will not infringe any copyright. The Association covenants that it will at its own expense defend every suit which shall be brought against the State of Wisconsin (provided that the Association is promptly notified of such suit, and all papers therein are delivered to it) for any alleged infringement of any copyright by reason of the sale or use of such articles sold or distributed by the Association, and agrees that it will pay all costs, damages, and profits recoverable in any such suit.

7. ASSOCIATION ORGANIZATION

- A. The Association's Articles of Incorporation and Bylaws shall comply with the requirements of the State of Wisconsin. Non-profit status must be maintained in accordance with State laws and the Association will make available for inspection at the request of the DNR documents demonstrating nonprofit status. This contract will automatically terminate if nonprofit status is lost.
- B. DNR employees will not serve on the Board of Directors. DNR employees shall not represent the Association in any matter between the Association and the DNR.
- C. The role of the wildlife area coordinator is to represent the interests of the DNR and to provide cooperative assistance to the Association. His or her scope of Association responsibility shall be limited to providing assistance in overseeing the day-to-day, routine business of the Association, and serving as liaison between the DNR and the Association.
- D. The Association treasurer shall not be a DNR employee.

8. ASSIGNMENT

No transfer or assignment of this Agreement or of any part thereof or interest therein, directly or indirectly, voluntary or involuntary, shall be made unless such transfer or assignment is first approved by the Secretary or his authorized representative in writing.

9. APPROPRIATIONS

Nothing herein contained shall be construed as binding the DNR to expend in any one fiscal year any sum in excess of appropriations made by the Legislature or administratively allocated for the purposes of this Agreement for the fiscal year, or to involve the DNR in any contract or other obligation for the further expenditure of money in excess of such appropriations or allocation.

10. MISCELLANEOUS

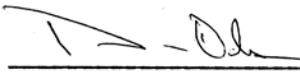
- A. The rights and benefits conferred by this Agreement shall be subject to the laws of the State of Wisconsin governing the DNR and to the rules and regulations promulgated thereunder, whether now in force or hereafter enacted or provided; and the mention of specific restrictions, conditions, and stipulations herein shall not be construed as in any way impairing the general powers of supervision, regulation, and control by the DNR.
-

- B. No member of, or delegate to, Congress, or the State Legislature shall be admitted to any share or part of this Agreement or to any benefit that may arise therefrom, but this restriction shall not be construed to extend to this Agreement if made with a corporation or company for its general benefit.
- C. The Association will not discriminate against any person on the basis of age, race, religion, color, handicap, sex, physical condition, developmental disability as defined in s. 51.05(5), Stats., or national origin in the use of the lands as operated pursuant to this agreement.
- D. Disputes regarding quality and quantity may be settled by arbitration and pursuant to Chapter 788, Wis. Stats., if the party alleging such a dispute notifies the other party in writing thereof, within thirty (30) days after the notifying party became aware of, or reasonably should have become aware of, the dispute.
- E. Both parties agree to keep this agreement in force when signed by both parties hereto until terminated by mutual agreement or at the option of either party upon three months notice given in writing upon any anniversary date hereof. The agreement shall be reviewed by the Department and County every five years and at such other times as may be required by either party on 60 days written notice.

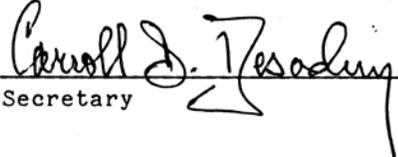
This Agreement is effective between the Association and the DNR with regard to the following specified wildlife area sites, which are collectively referred to throughout this Agreement as the "Wildlife Area," to wit:

- (1) Crex Meadows
 - (2) Fish Lake
 - (3) Amsterdam Sloughs
 - (4) Danbury
- etc.

IN WITNESS WHEREOF, the Association has caused this Agreement to be executed this 4~~th~~ day of NOV, 1985.

By: 
Chairman, Board of Directors

IN WITNESS WHEREOF, the Service has caused this Agreement to be ratified this 7th day of November, 1985.

Department of Natural Resources
By: 
Secretary

Appendix C: Natural Resources Used By Local Native American Tribes

The Ojibwe¹ had long lived in the Lake Superior region (portions of modern-day Minnesota, Wisconsin, Michigan, and Canada) by the time European explorers first entered the area. At that time, the Ojibwe lived a semi-nomadic lifestyle, moving seasonally from camp to camp, harvesting from the earth (aki²) vital foods, medicines, utility supplies, and ceremonial items.

As more Europeans moved into the Lake Superior region in search of timber and minerals, the United States government obtained vast parcels of land from the Ojibwe through cession treaties. In many of these treaties, the Ojibwe retained the rights to hunt, fish, and gather in the ceded territories to meet economic, cultural, spiritual, and medicinal needs - in essence, to sustain their lifeway. Tribal negotiations for these rights were fastidious and purposeful, and only through the guarantee of these rights, did the tribes agree to sign the treaties. Today, these reserved usufructory rights are often referred to as treaty rights.

Treaties that reserved these rights include the Treaty of 1836, ceding land in Michigan's Upper and Lower Peninsulas and parts of the Upper Great Lakes; the Treaty of 1837, ceding land in north central Wisconsin and east central Minnesota; the Treaty of 1842 ceding land in northern Michigan and Wisconsin and the western part of Lake Superior; and the Treaty of 1854, ceding land in northeastern Minnesota and creating reservations for many Ojibwe tribes.

For many years following the ratification of these treaties, the Ojibwe continued to hunt, fish, and gather as always. However, over the years, as states passed various conservation laws, state game wardens enforced these laws against tribal members. Members exercising their treaty rights off reservation within the ceded territories were frequently cited and convicted in state courts. Many members paid fines, endured the confiscation of their rifles and fishing gear, and suffered incarceration.

Though the Ojibwe have always believed in the continued existence of their treaty rights, it was not until the 1970's, as part of a general resurgence of tribal self-determination, that Ojibwe governments and their members more aggressively and more formally challenged state conservation laws and enforcement activities. These challenges gave rise to many federal and state court decisions which reaffirmed Ojibwe off reservation treaty rights on public lands in the ceded territories³.

The courts confirmed the Ojibwe's understanding of their treaty rights: The treaties provide a "permanent" guarantee "to make a moderate living off the land and from the waters by engaging in hunting, fishing and gathering as they had in the past."⁴ In essence, the courts found the Ojibwe treaties to be legally binding agreements to be respected within the framework of the United States Constitution, which defines treaties as the "supreme law of the land."

In addition, the courts recognized that by reserving the rights to engage in hunting, fishing, and gathering, the Ojibwe also retained their sovereignty to regulate tribal members exercising these treaty rights. Sovereignty refers to the right of inherent self-government and self-determination. Thus, tribal self-regulation is a requisite of treaty rights implementation. As the courts reaffirmed the Ojibwe's ceded territory treaty rights, a number of tribes⁵ in Michigan, Minnesota and Wisconsin chose to enhance their self-regulatory infrastructures through the formation of the Great Lakes Indian Fish and Wildlife Commission (GLIFWC)...[GLIFWC] assists its member tribes with issues such as the application of tribal self-regulation within the off-reservation ceded territories, identification and condition assessment of treaty resources, negotiations and consultation with state and federal government agencies regarding the management of treaty resources within the ceded territories, and litigation pertaining to the treaties of member tribes.

Excerpted from: Danielsen K.C. and J. H. Gilbert. 2002. Ojibwe off-reservation harvest of wild plants. E.T. Jones, R. J. McLain and J. Weigand. Eds. In Non-timber forest products in the United States. University of Kansas Press. Lawrence, KS. Pg 282-292. Footnotes:

1 There are several terms used in reference to the Ojibwe people. The Ojibwe people often call themselves Anishinaabe which in their language means Indian person or original people. The anglicized word for Ojibwe is Chippewa.

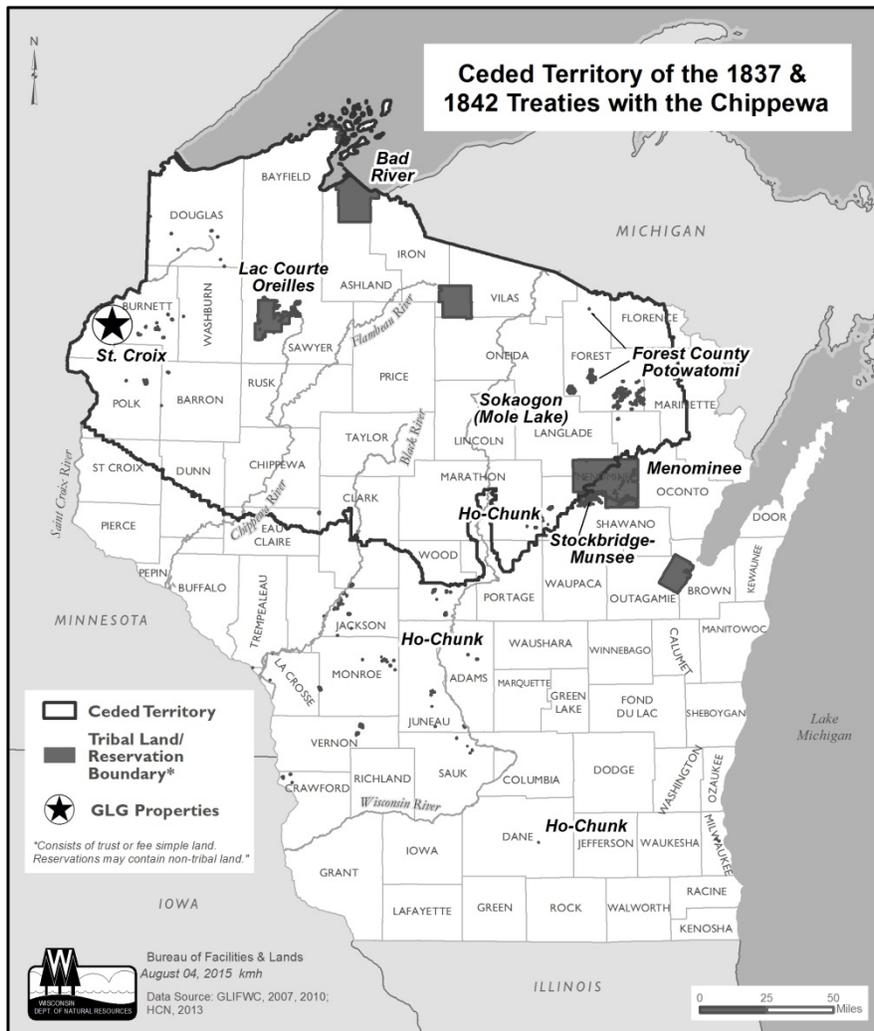
2 Ojibwe language

3 See *People v. Jondreau*, 384 Mich 539, 185 N.W. 2d 375 (1971); *State of Wisconsin v. Gurnoe*, 53 Wis. 2d 390 (1972); *U.S. v. Michigan*, 471 F.Supp. 192 (W.D. Mich. 1979); *Lac Courte Oreilles v. Voigt (LCO I)*, 700 F. 2d 341 (7th Cir. 1983), cert. denied 464 U.S. 805 (1983); *Lac Courte Oreilles v. State of Wisconsin (LCO III)*, 653 F.Supp. 1420 (W.D. Wis. 1987); *Lac Courte Oreilles v. State of Wisconsin (LCO IV)*, 668 F.Supp. 1233 (W.D. Wis.1987); *Lac Courte Oreilles v. State of Wisconsin (LCO V)*, 686 F.Supp. 226 (W.D. Wis. 1988); *Lac Courte Oreilles v. State of Wisconsin (LCO VI)*, 707 F.Supp. 1034 (W.D. Wis. 1989); *Lac Courte Oreilles v State of Wisconsin (LCO VII)*, 740 F.Supp. 1400 (W.D. Wis. 1990);

Lac Courte Oreilles v. State of Wisconsin (LCO VIII), 749 F.Supp. 913 (W.D. Wis. 1990); *Lac Courte Oreilles v. State of Wisconsin (IX)*, 758 F.Supp. 1262 (W.D. Wis. 1991); *Lac Courte Oreilles v. State of Wisconsin (X)*, 775 F.Supp. 321 (W.D. Wis. 1991); *U.S. v. Bresette*, 761 F.Supp. 658 (D. Minn. 1991); *Mille Lacs Band v. State of Minnesota*, 861 F.Supp. 784 (D. Minn. 1994); *Mille Lacs Band v. State of Minnesota*, 952 F.Supp. 1362 (D. Minn. 1997); *Mille Lacs Band v. State of Minnesota*, 124 F.3d904 (8th Cir. 1997); *State of Minnesota v. Mille Lacs Band*, 119 S.Ct. 1187 (1999).

4 LCO III, 653 F.Supp. 1420, 1426 (W.D. Wis. 1987).

5 GLIFWC’s current member tribes include: in Wisconsin -- the Bad River Band of the Lake Superior Tribe of Chippewa Indians, Lac du Flambeau Band of Lake Superior Chippewa Indians, Lac Courte Oreilles Band of Lake Superior Chippewa Indians, Red Cliff Band of the Lake Superior Chippewa Indians, St. Croix Chippewa Indians of Wisconsin, and Sokaogon Chippewa Community of the Mole Lake Band; in Michigan -- Bay Mills Indian Community, Keweenaw Bay Indian Community, and Lac Vieux Desert Band of Lake Superior Chippewa Indians; and in Minnesota -- Fond du Lac Chippewa Tribe and Mille Lacs Band of Chippewa Indians.



Appendix D: Crex-Namekagon Barrens Partnership Corridor

(See Map F)

Optimal protection of the recreation and conservation values of the imperiled barrens ecosystem of the Northwest Sands Ecological Landscape requires adopting management regimes on a scale beyond that of individual properties. While the needs of many area-sensitive wildlife species can be met by appropriate management on large parcels of public land, the continued presence of some species requires improved management and restoration of barrens habitat at the landscape scale.

The voluntary approach below creates and preserves forest habitat diversity for species characteristic of barrens: ruffed grouse, sharp-tailed grouse, American woodcock, wild turkeys, deer, golden-winged and Kirtland's warblers, upland sandpiper and whip-poor-will, many of whose numbers are rapidly declining. The sharp-tailed grouse (*Tympanuchus phasianellus*) is an area-sensitive species dependent on the presence of large (>1000 ac) patches of suitable habitat that are interspersed throughout the landscape so as to allow movement and genetic exchange. This popular game bird also provides a regional boost to ecotourism. Both hunters and wildlife viewers come here to reserve observation blinds in order to experience spring courtship behaviors of males dancing on their territories. Currently, the Wisconsin sharp-tailed grouse population is segregated into isolated subpopulations that are primarily associated with intensively-managed barrens on Crex Meadows, Namekagon Barrens, and Douglas County Wildlife Areas, with smaller remnant populations elsewhere. Recent genetic studies suggest that these subpopulations are genetically isolated, meaning that each subpopulation exhibits unique genetic structure and reduced genetic variability. Sharp-tailed grouse conservation depends upon our ability to link habitat areas that have become isolated, and improve habitat quality on the surrounding landscape.

Wildlife species abundance and diversity would be substantially improved by connecting remaining pine/oak barrens fragments that are too small and isolated by themselves to ensure long-term presence of sharp-tailed grouse (Reetz et. al, 2013, WDNR 2011). While Crex Meadows is managed to support sharp-tailed grouse, their spiraling population decline is likely caused by deteriorating habitat quality on surrounding lands, resulting in a landscape unable to provide demographic or genetic support for the Crex subpopulation. Reconnecting grouse subpopulations to insure their presence into the future requires their movement between areas to allow genetic exchange. The sharp-tailed grouse is an umbrella species. Management practices that ensure their persistence will conserve the full range of wildlife species associated with the barrens ecological landscape.

In planning for sustainable wildlife populations within this barrens landscape, one considers the landscape habitat (described by Reetz et. al. 2013) in the context of its biological, economic, cultural, and recreational values. Within this landscape (Map F), management actions involve stakeholders as partners and develop stepping stones* to facilitate dispersal between existing barrens (Figures 1 & 2). **stepping stone: a barrens habitat patch created by rotational harvest methods*

Forest management may be tailored (see below 'Prescriptions') to increase the habitat value for barrens wildlife species, while meeting or enhancing Burnett County Forest and private lands timber sale and forest regeneration goals. This approach adapts standard silvicultural guidelines, using options described for barrens habitat management (e.g. WDNR Silviculture Handbook, 2014). Once stepping stone areas are identified, area forestry plans may be amended if necessary, for implementation to occur.

The Barnes Barrens (*Forestry*) Plan utilized on the Bayfield County Forest (Bayfield Co, 2011) provides an existing model for establishing 'rolling barrens' around a core barrens habitat patch (Figure 2).

Within the Crex-Namekagon Barrens Partnership Corridor (Map F), regional partners have the flexibility to collaborate and use forest management practices to provide regular rotational harvests that optimize:

- 1) **barrens wildlife habitat and**
- 2) **timber management**

Conservation easements and leases developed by a partnership of government and non-government organizations are tools that may be used to help establish stepping stones of oak/pine barrens management within this corridor.

DNR staff will collaborate with the Burnett County Forestry staff, local forest managers, and private landowners to identify forested areas where timber harvests can be synchronized across current stand boundaries to create temporary open blocks. Barrens cores adjacent to the blocks may be established within the stepping stones in areas less favorable to forest growth. DNR staff will assist as needed, in management of any open barrens core habitat patches.

The Crex-Namekagon Barrens partnership corridor may be similar in management to the strategy used by Bayfield County in their Barnes Barrens Plan. It will incorporate priorities of the Burnett County Forest Fifteen Year Plan, the Northwest Sands Landscape Level Management Plan, DNR Wildlife Action Plan, Sharp-tailed Grouse Management Plan, NW Sands Habitat Corridor Plan, and DNR Land Legacy Report. Collaboration will benefit outdoor recreationists, better address established conservation goals, enhance local partnerships, and support the local timber industry. The partnership corridor provides recreational opportunities described in Chapter 2-1 of this plan, for hunting, trapping, hiking, nature study, bird watching and other wildlife viewing on public lands.

The principles below serve as guidance. In addition, some “Universal Elements for All Properties” including “Barrens Management” and “Recreation Management” in Section One of this chapter may be applied.

Objectives

- Re-establish wildlife habitat connectivity between Crex Meadows Wildlife Area and Namekagon Barrens Wildlife Area with five barrens habitat patches (stepping stones) approximately 3 miles from one another. (Reetz et al, 2013) (Figures 1 and 2 illustrate this concept.)
- Optimize timber regeneration goals while enhancing barrens wildlife habitat, by working with partners from Burnett County Forestry and other government and non-government organizations (see insert), to identify and establish forested barrens management blocks with potential core areas, using conservation easement and lease options, as determined by the partners involved.

Partners

Burnett County Forestry
 Friends of Crex
 Friends of the NW Sands
 Friends of the Namekagon Barrens Wildlife Area
 St. Croix River Association
 St. Croix Watershed Conservation Collaborative
 Steigerwaldt Land Services
 West Wisconsin Land Trust
 Wisconsin Department of Natural Resources
 Wisconsin Sharp-tailed Grouse Society

Prescriptions

- Collaboratively establish five barrens stepping stones to be managed by Burnett County Forestry and other working forest partners.
- Each barrens stepping stone would consist of forest blocks that have a prescribed harvest rotation and interval between harvest (eg. 12-yr interval; 48-yr rotation) (Figure 2)
 - Forest blocks would consist of 500-1000 acres each, with a combined total of 2,000-4,000 acres (Reetz et al, 2013).

- Each barrens stepping stone may have an identified barrens core, as determined by the partners. Core establishment would target areas typically less desirable for forest production (see below). Manage barrens cores (~500 acres) for open, early successional habitat.
- Facilitate establishment of the five barrens stepping stones by harvesting some stands earlier or later than standard Silviculture guidelines (DNR Silviculture handbook).
- Harvest blocks completely, as preferred by wildlife species adapted to open barrens. Do not provide tree retention or leave visual barriers that block the viewshed. (WDNR, 2011b; Sample and Mossman, 1997)
- Use woody biomass/whole tree harvesting options to achieve barrens management and regeneration objectives. (Bronson et al, 2014; Rothstein and Spaulding, 2010)
- Favor jack pine during regeneration (USDA, 2013) and shorter rotations of red pine; use cost-sharing incentives from DNR when available.

Lands (Map F)

The specific locations of the barrens stepping stones will be determined through collaboration with Burnett County forestry staff. Lands that may be considered for establishing core barrens include: 1) areas previously disturbed by storm or wild fire, 2) ‘unproductive forest lands’ (e.g., managed fuel breaks, sedge meadows) or 3) problem sites (e.g., oak wilt disease). Core barrens would have less fuel load and may simultaneously reduce risk and/or management costs for Burnett County. Although local forest managers may embrace having barrens cores, purchase of conservation easements or long term leases by partners may be desirable to offset concerns about potential lost timber revenue. The process for establishing a barrens core will be addressed on a case-by-case basis, through consultation with individual forest managers and partners.

Thoughtful planning for only a small portion of land within the corridor is required to achieve the recreation, conservation and timber productivity goals of this master plan.

Figure 1. The Crex-Namekagon Barrens stepping stones will provide connections for wildlife to properties with barrens habitat, eliminating a prominent gap in the Northwest Sands Ecological Landscape.

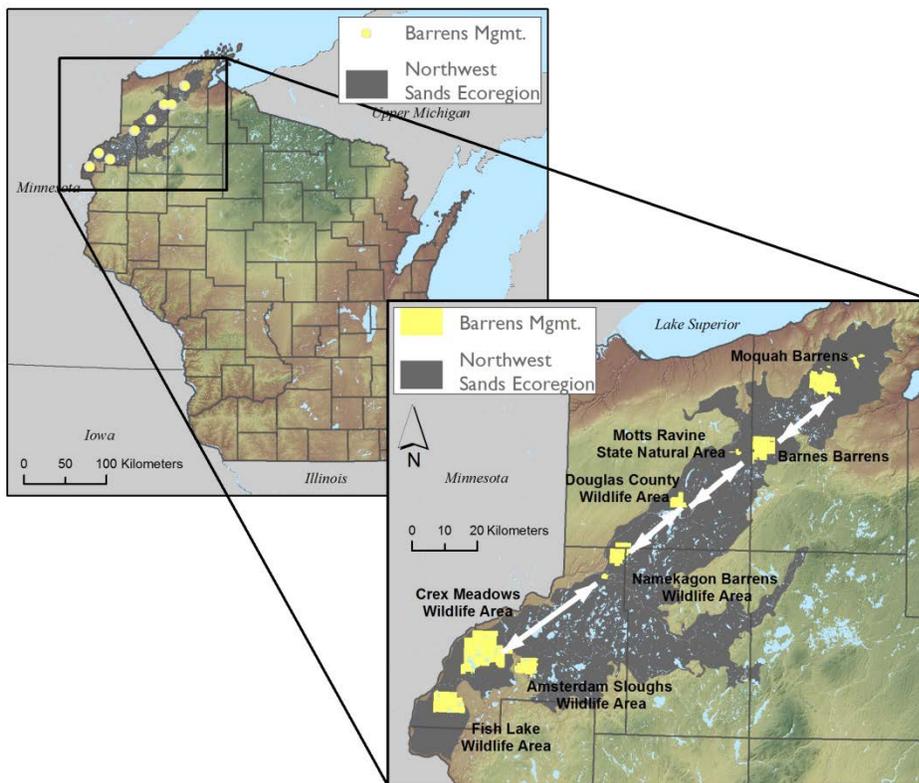
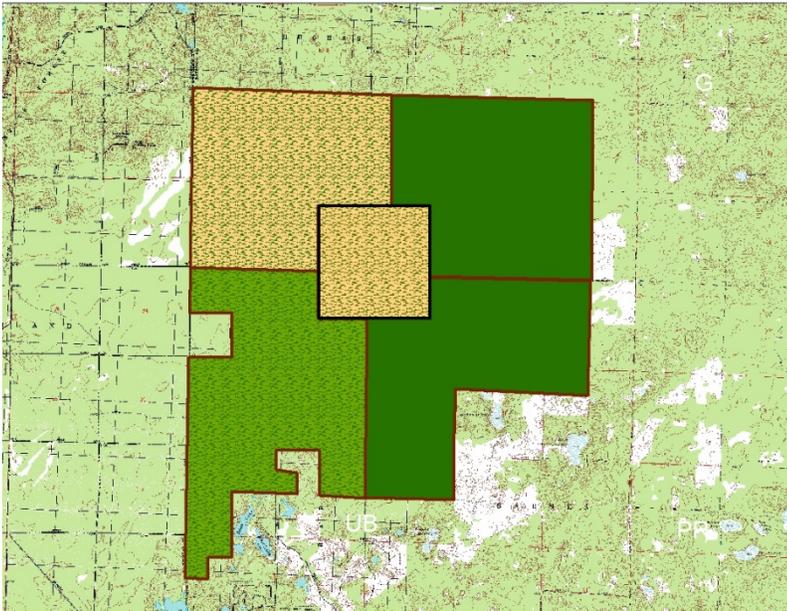


Figure 2. This example illustrates the rolling barrens concept from Bayfield County’s Barnes Barrens Plan. Four blocks of barrens ‘roll’ around a permanent barrens core. Blocks are harvested at 12-year intervals on a 48-year rotation.



Appendix E: Events, Workshops, Courses at Crex Meadows Wildlife Education & Visitor Center	
Special Events	Youth-Specific
Annual Fall Wildlife Fest	
Annual Halloween Happenings Wildlife Hike	
Bird Fest / Birdathon	
Annual Candlelight Snowshoe/Ski Hike	
Friends of Crex Endowment Fund Dinner	
Friends of Crex Land Acquisition Fund Dinner	
Friends of Crex Annual Volunteer Meeting	
5 th Grade Conservation Field Day	x
Hunting Programs	
Archery/Bowhunting	
Deer Processing Workshop	
Learn to Hunt (Pheasant, Duck, Turkey, Deer, Small Game)	
Trapper Education	
Wolf Trapper Education	
Hunter Safety Education	
Waterfowl Hunting Skills Clinic	
Wingshooting Workshop	
Educator / Facilitator Professional Development	
Explore Bowhunting	
National Archery in the Schools Program	x
Project WET	
Project WILD	
Leopold Education Project	
Camps	
Crex for Kids Day Camp	x
Outdoor Skills Day Camp	x
Youth Conservation Camp – NWCEP, Inc.	x
Water Trapping Camp	
Clubs	
Crex Archery Club	
4-H Outdoor Skills Club (Hunting, Trapping, Shooting)	x
Photo Club	
Leopold Book Club	
Workshops	
Becoming an Outdoor Family (Outdoor Skill Topics vary by season)	
WILD Women Workshops (Outdoor Skill topics vary by season)	
Botany Talks and Walks (Topics vary by season)	
Bow Drill Fire Making	
Mushroom Identification	
Wild Rice Ecology and Harvesting	
Wolf Ecology Course	

Carnivore Tracking Course	
Photography Workshop	
Stargazing	
Outdoor Skills Programs	
Challenge Course/Low Ropes Course	
Orienteering & Compass	X
GPS/Geocaching	
Fire Ecology	
Forestry	
Interpretive Hikes (Butterfly Treks, Mug & Mammals Hike, Nocturnal Animal Hikes)	
Interpretive Bike Rides	
Interpretive Snowshoe Hikes	
Kayaking/Canoeing (Paddle Phantom, Dike Paddle)	
Nature Journaling	
Leave No Trace	
Public Wildlife Surveys	
Karner Blue Butterfly Survey	
Waterfowl Banding	
Annual USFWS Crane Count	
Wolf Howl Survey	X
Songbird Banding	X
Carnivore Tracking	
Guided Public Tours	X
Bus Property Tours	X
Sandhill Crane Tours	
Spring Birding Tours	
	X
Programs	
Nature's Little Explorers (Wildlife Topics Vary)	X
Little Wildlifers (Wildlife Topics Vary)	X
Wildlife (Tracking, Adaptations, Ethics, Signs, Wildlife Management, topics vary)	
Wild Birds of Prey	
Dragonflies and Damselflies	
Cultural History of Crex Meadows	
Photo Contests (Photo Club, 4-H)	
Plant Phenology	
Pond Exploratory	X
Prairie Investigation (Seed collection, seed balls, native gardening)	

APPENDIX F: Existing and Planned Recreation Management Infrastructure

Recreation Infrastructure	Crex Meadows	Fish Lake	Amsterdam Sloughs
Water Access			
Boat Landings (developed)	6	2	1
Boat Landings (carry in)	Numerous off-road access areas	Numerous off-road access areas	Numerous off-road access areas
Dikes	18 miles	6.2 miles	2.5 miles
Flowages	34	13	9
Lakes + waterfowl potholes	4: Buggert, Furhman, Rice, Zalesky	1	1 + 75 potholes: Blomberg
Streams/Rivers	3: Hay Cr, Whiskey Cr, N Fork Wood	2: Logging Creek, Canute Creek	1: Black Brook
Parking Areas	36 (plus road shoulders): <i>3 planned</i>	25 (plus road shoulders)	15 (plus road shoulders): <i>2 planned</i>
Road Access (miles)	40 miles	38 miles	10 miles
County/Township	27 miles	30 miles	8 miles
DNR staff and public access	13 miles	8 miles	2 miles
Trails (<i>mileage may overlap</i>)			
Designated Auto trail miles	24 miles	<i>17 miles planned</i>	<i>13 miles planned</i>
Hiking/XC ski trail miles	6.8 (hike) / 3.7 (xc)	7	3: 1 mile planned
Snowmobile/ATV trail miles (county)	12 miles	5 miles	5 miles
Bicycle/Horseback miles	27 miles	30 miles	8 miles
Dispersed Camping (Seasonal; need permit)	yes, also Mgmt Area 3	yes	yes
Disabled Accessible Hunting places/structures (need permit/key) <i>additional 3 miles trails planned</i>	2: 2 planned	2: 1 planned	3: 1 planned
Information/Interpretive Displays	1: 3 planned	0: 1 planned	0: 1 planned
Picnic / Rest Area (sites with facilities)	2: 2 shelters planned	0	0
Observation/lookout Area	4	2: 1 planned	0
Dog Training Area (number and acres)	<i>1 planned (160 acres)</i>	0	0
Buildings (existing)	22	1	0
Buildings (planned)	4 (specifics listed below)		
Mess hall / multi-purpose (replace)	<i>1</i>		
Bunkhouse accommodations (replace)	<i>1</i>		
Unheated storage	<i>1</i>		
Outdoor amphitheater	<i>1</i>		
Property Maps for Visitors (planned)	<i>1</i>	<i>1</i>	<i>1</i>