Northern Lake Michigan Coastal Regional Master Plan

Draft Master Plan and Environmental Analysis

WISCONSIN
DEPT. OF NATURAL RESOURCES

July 2018
Pub-LF-108 (2018)

Wisconsin Department of Natural Resources

Daniel L. Meyer – Secretary

Natural Resources Board

Terry N. Hilgenberg, Chair

Dr. Frederick Prehn, Vice-Chair

Julie Anderson, Secretary

William Bruins

Preston D. Cole

Gregory Kazmierski

Gary Zimmer

101. S. Webster Street, P.O. Box 7921

Madison, WI 53707-7921

DNR-PUB-LF-108 (2018)

This publication is available on the Internet at http://dnr.wi.gov/, keyword search “master planning”, then choose “Northern Lake Michigan Coastal Ecological Landscape”.

The Wisconsin Department of Natural Resources provides equal opportunity in its employment, programs, and services, and functions under an Affirmative Action Plan. If you have any questions, please write to the Equal Opportunity Office, Department of the Interior, Washington D.C. 20240. This publication is available in alternative formats (large print, Braille, audio tape, etc.) upon request. Please contact the Wisconsin Department of Natural Resources, Bureau of Facilities and Lands at 608-266-2135 for more information.

Cover photo credit: Ann Freiwald

MASTER PLAN TEAM MEMBERS

Core Team

Michael Bergum	Area Parks Supervisor
Dave Boyarski	Fisheries Manager
Erin Brown Stender	Property Supervisor (Potawatomi State Park and Whitefish Dunes State Park)
Katie Godding	Master Planning GIS Specialist and Cartographer
Joe Henry	District Ecologist
John Huff	Wildlife Area Manager
Dan Lekie	Wildlife Area Manager
Katherine Lenz	Forestry Specialist
Jeff Pritzl	Wildlife District Supervisor – Northeast District
Missy Vanlanduyt	Section Chief – Public Relations and Partnerships, Bureau of Parks and Recreation
Curt Wilson	District Forestry Leader (Retired)
Ann Freiwald	Planner

Support and Consultant Team

Craig Anderson	Parks Ecologist
Jennifer Birkholz	Property Supervisor (Peninsula State Park)
Brian Hefty	Deputy Director, Bureau of Parks and Recreation
Michelle Hefty	Park Manager (Newport State Park, Rock Island State Park)
Kaylin Helm	Real Estate Transaction and Policy Specialist
Maggie Kailhoffer	Property Supervisor (Copper Culture Mounds State Park)
Beth Kienbaum	Planner
Joseph Klang	Real Estate GIS Specialist
Brian Markowski	Property Supervisor (Peninsula State Park)
Joshua Martinez	Wildlife Biologist
Kelly Raleigh Moses	Parks and Recreation Specialist
Fred Viste	Park Manager (Whitefish Dunes State Park)
Caroline Ward	Wildlife Biologist
Tom Watkins	Planner

Additional Support

Jim Lemke	Real Estate Section Chief
Shelly Allness	Tribal Liaison

TABLE OF CONTENTS

CHAPTER 1: OVERVIEW OF PLAN AND PROPERTIES 1
Purpose and Management Authority 1
Northern Lake Michigan Coastal Ecological Landscape 1
CHAPTER 2: MANAGEMENT, DEVELOPMENT AND USE 6
Section One: Property Specific Management 9
State Parks 9
State Public Access Sites 62
State Trails 64
State Wildlife Areas 65
State Habitat Areas 75
State Natural Areas 81
Administrative Properties 87
Section Two: Real Estate Section 87
CHAPTER 3: REGIONAL AND PROPERTY ANALYSIS 102
Northern Lake Michigan Coastal 102
Natural Resources 106
Ecological Priorities - Considering Species of Greatest Conservation Need 112
Social and Cultural Context 114
Recreational Resources: Existing Conditions and Future Opportunities 116
CHAPTER 4: ANALYSIS OF IMPACTS 121
Impacts from Proposed Management Activities 121
Cumulative Effects, Risk and Precedent 125
Impacts associated with recreation activities 126
Possible impacts associated with recreation facilities and recreation participation on department properties 129
Possible cumulative effects of recreation participation on department properties 137
Possible risks associated with recreation participation on department properties 137
Possible precedents associated with providing opportunities for recreation participation on department properties 137
Degree and nature of controversy associated with recreation participation on department properties 137

WEPA Compliance 138
CHAPTER 5: ANALYSIS OF ALTERNATIVES 139
Land Management Alternatives 139
Public Use Alternatives 139
CHAPTER SIX: PUBLIC INPUT SUMMARY 141
Summary of public comments and response to comments for the Draft Northern Lake Michigan Coastal Regional Master Plan 141
Summary of public comments identifying important issues to be considered during the planning process 144
REFERENCES 145
APPENDIX A: HABITAT MANAGEMENT COMMON ELEMENTS FOR NLMC PROPERTIES 146
General Management 146
APPENDIX B: RECREATION ACTIVITIES AND FACILITIES 187
Introduction 187
Recreation activity descriptions 187
Recreation facility descriptions 250
APPENDIX C: GENERAL PROPERTY ADMINISTRATION AND MANAGEMENT POLICIES AND PROVISIONS 254
General Property Management Practices 254
Resource Management 258
APPENDIX D: REAL ESTATE TABLES 265

LIST OF ACRONYMS

CTH	County Highway
COA	Conservation Opportunity Area
DNR	Department of Natural Resources
EL	Ecological Landscape
NLMC	Northern Lake Michigan Coastal
NHI	Natural Heritage Inventory
NR 44	Chapter NR 44, Wisconsin Administrative Code, Master Planning for Department Properties
NRB	Natural Resources Board
ROA	Recreation Opportunities Analysis
SCORP	Statewide Comprehensive Outdoor Recreation Plan
SGCN	Species of Greatest Conservation Need
SNA	State Natural Area
ULMC	Upper Lake Michigan Coastal SCORP Region

CHAPTER 1: OVERVIEW OF PLAN AND PROPERTIES

PURPOSE AND MANAGEMENT AUTHORITY

The purpose of this master plan is to guide management and use of department properties in the Northern Lake Michigan Coastal Ecological Landscape. A master plan establishes the levels and types of public uses that are permitted on a property as well as the authorized resource management and facility development that will take place there. Master plans are developed according to guidelines set forth in Wisconsin Administrative Code Chapter NR 44, which is known as the 'master plan rule'. When establishing management, development and public use for department lands included in this regional plan, staff considered NR 1.60 Wis. Admin. Code standards. The DNR properties in this region 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, parks and fisheries program guidance, and habitat and biotic inventory work conducted over the last several decades. The planning process considers comments received during public meetings and public comment periods, including involvement with federal, state, county, town and local units of government, local agencies and Indian tribes as appropriate.

NORTHERN LAKE MICHIGAN COASTAL ECOLOGICAL LANDSCAPE

The Northern Lake Michigan Coastal (NLMC) Ecological Landscape encompasses portions of Marinette, Oconto, Brown, Shawano, Outagamie, Kewaunee, Waupaca and Door counties. Descriptions of natural resources, socio-economic characteristics and recreational resources for this region are provided in extensive detail in Chapter 15 of *The Ecological Landscapes of Wisconsin* (WDNR 2015a). Chapter 15 is incorporated by reference in this planning document. All chapters of this reference compendium are accessible on the Wisconsin DNR website (dnr.wi.gov) keywords "Ecological Landscapes" then "Northern Lake Michigan Coastal." A summary of these aspects is provided in Chapter 3 of this master plan.

HISTORY, ECOLOGY AND LAND USE SIGNIFICANCE

The two most prominent features are the Lake Michigan shoreline and the Niagara Escarpment. Door County peninsula and west shore of Green Bay provide about 330 miles of shoreline in this landscape. Both hold great importance to Wisconsin and the United States because of the critical role they play in maintaining Wisconsin's unique biological diversity. Soils in this Ecological Landscape range from excessively-drained sandy and stony; to well-drained, fertile loam; to poorly-drained clay. Vegetation is equally varied. Forests include maple, basswood and beech throughout the landscape. Beech are generally limited to this region of the state.

Habitats associated with the Lake Michigan shore such as alkaline rock shores, coastal estuaries, ridge and swale wetland complexes, beaches and dunes, support many species endemic to the Great Lakes; including dwarf lake iris, Lake Huron locust, dune thistle, and Hine's emerald dragonfly. These habitats

also provide critical nesting, feeding and resting habitat for a wide variety of migratory songbirds and shorebirds. Small islands along the Door Peninsula and in Green Bay host enormous rookeries of terns, herons and gulls.

Green Bay supports an impressive warmwater fishery. Wetlands along the west side of the bay, and lining the many streams and rivers that flow into the bay from the west, provide the majority of fish spawning habitat. Protecting these spawning locations and the water quality is critical to maintaining the perch, walleye, lake sturgeon and pike populations of Green Bay. Large Rivers that flow through this landscape are the Oconto, Peshtigo and Menominee Rivers.

Significant management opportunities for the Northern Lake Michigan Coastal Ecological Landscape include:

- Lake Michigan, Great Lakes shoreline features, and the Grand Traverse Islands;
- Green Bay's west shore;
- Niagara Escarpment;
- Extensive wetlands north and east of Lake Noquebay
- Warmwater streams entering Green Bay

425 million years ago deposition from large inland seas formed the Niagara Escarpment; a long outcropping of dolomite (hard limestone). The sickle-shaped ridge has a steep face on one side (an escarpment) and gently slopes on the other. It begins in south-central Wisconsin, forms the Door Peninsula, arches through the Garden Peninsula (Upper Michigan), the Bruce Peninsula (Canada), and eventually reaches Niagara Falls (New York/Canada). Bluffs and rocky slopes of the escarpment harbor cool springs and microhabitats that support many rare species. The unique habitat allows ancient cedar trees to grow, though they only do so at a rate of one inch every 15 years. One such tree, a northern white cedar, was aged in Peninsula State Park to be over 500-years-old.

This Ecological Landscape's historic vegetation was primarily forested. American beech and hemlock were primary components of extensive northern hardwood forests. Lowland forests included conifer swamps with spruce, tamarack, and northern white cedar. The forests in the cool, moist climatic zones near Lake Michigan resembled the boreal forests of more northern Ecological Landscapes. Floodplain forests were present along the western shores of Green Bay.

Current vegetation is more than 60% non-forested land. This non-forested land is mostly agricultural crops, but also urban-industrial areas such as the cities of Green Bay and Sturgeon Bay. Remaining forested lands are dominated by maple-basswood, with small amounts of lowland hardwoods, aspen-birch, and lowland conifer forests. The interior of the Door Peninsula is now mostly agricultural or residential in nature. A coastal strip on the east side of the Door Peninsula remains heavily forested, though it is rapidly becoming fragmented due to residential developments. The largest forest remnants in the Door Peninsula are mostly wet, conifer or hardwood swamps. The west shore of Green Bay still supports extensive areas of second-growth lowland forest, now dominated by hardwoods rather than the historical conifers. Dry forest remnants are locally common in Oconto and Marinette counties.

RECREATIONAL SIGNIFICANCE

The Northern Lake Michigan Coastal Ecological Landscape properties feature resources that attract visitors from Wisconsin and Illinois, especially from the Milwaukee/Chicago metropolitan areas. Door

County is a major vacation destination for people throughout the Midwest and is nationally recognized as a premier vacation destination. While the region's population density is slightly less than half that of the state average its recreational resources receive heavy use.

Demand for the unique recreation opportunities in this landscape exceeds the capacity of existing department lands. Although the region contains diverse outdoor recreation opportunities provided by state, federal and county lands, only about 5% of the Ecological Landscape is public land (70,000 acres). This is significantly less than the statewide average of 19% and ranks this Ecological Landscape 12th (out of 16) in the percentage of public ownership of land. Even so, Door County has an above average number of state parks and recreation areas.

Lake Michigan and its shoreline are the foundation of much of the recreation in this part of the state. Boating, fishing and sailing are popular summertime pursuits, while snowmobiling, cross-country skiing and ice fishing draw visitors in the winter. The Niagara Escarpment offers tremendous views of Green Bay and Lake Michigan throughout the year. Although five state parks and several local and private campgrounds are in the region, demand for camping far exceeds current supply.

In the western section of this Ecological Landscape little public recreation land exists. State-owned lands are concentrated along the west shore of Green Bay and, although they provide popular hunting opportunities, their significant amounts of wetlands limit the variety of recreation activities that can be accommodated.

INTRODUCTION TO THE PROPERTIES

The regional master plan for the Northern Lake Michigan Coastal (NLMC) Ecological Landscape contains over 30,000 acres of department managed lands. These properties include wildlife areas, state parks, natural areas, state forests and fishery areas within five counties: Oconto, Marinette, Waupaca, Shawano and Door. An overview of these properties is provided in Table 1. Property designations in this region include state parks, state wildlife and fishery areas, and state natural areas.

The NLMC master plan is a regional plan for all department properties within this landscape. Department-managed properties are portrayed along with other nearby public conservation lands in the Regional Locator map series (Map A-1; Maps B-1 through B-4). Management for approximately 17,000 acres of department properties, just over half the total acreage in this Ecological Landscape, is specifically addressed in the body of this document (Chapter 2). Properties in this Ecological Landscape with NR 44 compliant master plans (seven plans noted in Table 1 below) are hereby incorporated by reference into the NLMC regional master plan.

Properties that share boundaries of more than one Ecological Landscape (i.e. Peshtigo State Forest and Lower Wolf River Bottomlands) will be planned in the Ecological Landscape in which most of their acreage resides. These properties are not planned as part of NLMC.

Table 1: Northern Lake Michigan Coastal Properties at a Glance

Property Name	County	Acreage*
Major Properties		
Copper Culture Mounds State Park	Oconto	42.30
Newport State Park	Door	2,372.99
Peninsula State Park	Door	3,827.52
Potawatomi State Park	Door	1220.50
Rock Island State Park	Door	912.23
Whitefish Dunes State Park	Door	863.88
Grand Traverse Islands State Park	Door	26.67
Gardner Swamp Wildlife Area	Door	1,180.58
Lake Noquebay Wildlife Area	Marinette	1298.08
Mud Lake Wildlife Area	Door	2365.40
Seagull Bar Wildlife Area	Marinette	90.00
North Branch Beaver Creek Fishery Area	Marinette	1161.37
Jung Hemlock-Beech Forest State Natural Area	Shawano	80.00
Kroenke Lake State Natural Area	Shawano	150.67
Tellock's Hill Woods State Natural Area	Waupaca	52.00
State Public Access Sites		
Rowleys Bay State Public Access	Door	3.25
Bay Road State Public Access	Door	0.69
County Highway P Peshtigo River State Public Access	Marinette	4.13
Rieboldt Creek State Public Access	Door	121.00
Cox Landing Menominee River State Public Access	Marinette	1.10
Pensaukee River State Public Access	Oconto	1.21
George K. Pinney State Public Access	Door	10.68
Baileys Harbor State Public Access	Door	0.72
Menomonie River (CTH JJ) State Public Access	Marinette	1.37
Minor State Habitat Areas		
Barkhausen State Habitat Area	Brown	45.89
Big Creek State Habitat Area	Door	19.92
Bass Lake Marinette State Habitat Area	Marinette	39.14
Little River State Habitat Area	Marinette	53.17
Cowyard Rips State Habitat Area	Shawano	47.10
Pensaukee River State Habitat Area	Oconto	15.34
Big and Little Marsh State Habitat Area	Door	10.42
Egg Harbor Cliffs State Habitat Area	Door	0.86
Suamico River State Habitat Area	Brown	10.88
Strawberry Creek State Habitat Area	Door	74.00
Montana Lake Fishery Area	Marinette	105.73
Sister Islands Habitat Preserve	Door	1.94
Minor State Natural Areas		
North Bay State Natural Area	Door	2.50

Property Name	County	Acreage*
Administrative Properties		
Sturgeon Bay Service Center	Door	1.30
Strawberry Creek State Hatchery	Door	6.0
Gresham Station	Shawano	4.68
Oconto Falls Ranger Station	Oconto	5.39
Properties with NR-44 Compliant Master Plans		
Coffey Swamp State Natural Area	Door	186.49
Big and Little Marsh State Natural Area	Door	308.80
Baileys Harbor Boreal Forest and Wetland State Natural Area	Door	482.03
Moonlight Bay Bedrock Beach State Natural Area	Door	98.25
Thorp Pond State Natural Area	Door	80.00
Cave Point Clay Banks State Natural Area	Door	443.42
Green Bay West Shores Wildlife Area	Brown, Oconto, Marinette	9809.10

*Acreages in this table represent property deed legal descriptions and were obtained from DNR's Land Records System. These acreages may differ from those calculated from the DNR Managed Lands GIS spatial database.

CHAPTER 2: MANAGEMENT, DEVELOPMENT AND USE

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

Section One contains a brief description of the individual properties with property-specific management elements.

Section Two presents the real estate action items proposed in this draft master plan.

Common Elements that generally apply to all Northern Lake Michigan Coastal properties, such as habitat management by cover type and recreation types and general management practices that occur on all DNR lands, can be found in Appendices A, B and C**.**

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.

REGIONAL VISION AND GOALS

The NLMC Ecological Landscape properties are a vital contributor to the preservation of the Niagara Escarpment and the Lake Michigan shoreline (Door County peninsula and west shore of Green Bay). This landscape plays a key role in protecting water resources along the Peshtigo, Wolf, Oconto and Menominee rivers. Recreational opportunities provided by department properties include enjoyment of unique Lake Michigan coastal scenery and recreational pursuits, abundant watercraft uses, camping, multiple trail uses, hunting, fishing, trapping, gathering, wildlife watching and educational opportunities. The abundance and diversity of natural resources along the Niagara Escarpment, including the rare dwarf lake iris, Hines emerald dragonfly, and spectacular bird migrations throughout this majestic landscape, attract visitors from afar who appreciate the grand scale of the Lake Michigan coastal region.

Recreational opportunities on these properties and in this landscape, are supported in part by community, regional and government partnerships that support wildlife and sustainable habitat management for current and future generations.

Goals

- Provide opportunities for hunting, fishing, trapping and gathering.
- Provide opportunities for high-quality nature-based recreational activities; such as wildlife viewing, scenic viewing, nature study, trail-based activities and paddling as compatible with the properties' capabilities, and regional habitat and recreation goals.
- Accommodate research and provide educational activities that are consistent with the primary management purposes of the properties and with user safety.
- Improve accessibility for mobility-impaired individuals where feasible.
- Restore, manage and perpetuate the major natural community habitats that support an intact Ecological Landscape, using principles of ecosystem management and sustainable forestry. Protect the integrity of the Niagara Escarpment.

- Protect the Lake Michigan shoreline and its tributaries through sound property and watershed management practices. Provide habitat for the unusual number of migratory birds that are dependent on Lake Michigan's coastal communities, and for wildlife associated with inland wetlands and rivers.
- Manage in ways that contribute to the protection and preservation of the Outstanding and Exceptional Resource Waters, wetlands and lakes in this landscape.
- Maintain and enhance ecological connectivity between natural community habitats, and on a landscape scale, promote their sustainability in partnership with nearby town, county, state, federal and tribal land managers.
- Contribute to the local and regional economies through management of sustainable recreational opportunities, and sustainably produced forest products.

Unique, property-specific resource management, recreation management and public use objectives and prescriptions are included in the individual property sections of this chapter.

LAND MANAGEMENT CLASSIFICATIONS

Management of department properties generally is described by a specific land management classification, per NR 44, 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. Parcels purchased after master plan approval will likely be assigned the same classification as the adjacent area unless an evaluation indicates that a different classification is more appropriate. A plan amendment will be pursued if warranted.

The department lands in the NLMC regional plan have been assigned the following land management classifications:

Habitat Management Area (HMA) (NR 44.06(5)): The primary objective for HMAs is to provide integrated upland, wetland and/or aquatic habitat management that meets critical life-cycle needs for a variety of plant and animal species. Typically, the emphasis is to provide habitats needed to sustain productive game species populations. 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 (NCMA) (NR 44.06(6)): NCMAs 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 a set of physical characteristics. 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 traditional recreational uses, such as hunting, fishing, trapping, and nature enjoyment, are allowed on NCMAs unless an area needs to be closed to protect a rare species during breeding season or to protect a very fragile habitat.

Recreation Management Area (RMA) (NR 44.06(8)) with Type 3 and 4 Recreational Use Settings: Lands in this classification are managed to provide and maintain land and water areas and facilities for outdoor

public recreation and education. Recreational use setting subclassifications define the compatible management and use activities and the appropriate recreational facilities for four general recreational settings.

Special Management Area (SMA) (NR 44.06(7)): Lands in this classification are managed to provide and maintain areas or facilities for special uses not included under other land management classifications.

Table 2 summarizes the land management classifications assigned to major properties in the Northern Lake Michigan Coastal Ecological Landscape. Land management classification acreages are calculated using GIS and are assigned for the entire project boundary. Consequently, acreages in Table 2 will usually not equal the deed acres provided in Table 1. More detailed information about land management classifications for the entire landscape is provided in Chapter 2.

Table 2: Land Management Classifications, in acres, for major properties in the Northern Lake Michigan Coastal Region.

Property	HMA	NCMA	SMA	Recreation Management Area	
				Type 3	Type 4
Copper Culture Mounds State Park				56	14
Newport State Park		1,760	8	690	37
Peninsula State Park		1,364	8	864	1490
Potawatomi State Park		557	9		643
Rock Island State Park		856		119	6
Whitefish Dunes State Park		402	1	419	146
Grand Traverse Islands State Park	936				
Gardner Swamp Wildlife Area	1222				
Lake Noquebay Wildlife Area	587	662			
Mud Lake Wildlife Area - Door	394	2460			
Seagull Bar Wildlife Area		116			
North Branch Beaver Creek Fishery Areas	1940	177			

Property	HMA	NCMA	SMA	Recreation Management Area	
Jung Hemlock-Beech Forest State Natural Area		79			
Kroenke Lake State Natural Area		361			
Tellock's Hill Woods State Natural Area		116			

SECTION ONE: PROPERTY SPECIFIC MANAGEMENT

STATE PARKS

COPPER CULTURE MOUNDS STATE PARK (OCONTO COUNTY)

Property Designation	State Park
DNR and Other Lands	Map C-1
DNR Fee Acres	42.3
DNR Easement Acres	0.0
Total DNR Acres	42.3
NRB Acquisition Goal	42.3

Copper Culture Mounds State Park is on the north side of the Oconto River, on the west side of the city of Oconto near the waters of Green Bay. It occupies the site of a prehistoric cemetery of the Old Copper Complex people who lived in the northern Midwest from ca. 4000 – 2000 BC. The Old Copper Complex is considered a Late Archaic (hunting and gathering, pre-pottery, pre-agriculture) manifestation. The copper tools and the technology of hammering and annealing are among the earliest examples of metalworking in the world.

The park's museum is housed in a traditional Belgian farm house, built in 1911 by Charles and Emma Werrebroeck. A small kiosk with a roof provides information to visitors and is located near the museum.

The museum, its grounds and the picnic area is managed by the Oconto Historical Society, under an agreement with the department. It is a National Historic Landmark. The trails and the adjacent statewide public access lands are managed by the department.

In addition to the state park land, about 27 acres of state fishery land is located adjacent to the park and to the west. The trails and the access to the Oconto River provided by this land adds to the visitor's experience.

Park Niche

Copper Culture Mounds State Park provides a unique opportunity to learn about the Old Copper Complex people that inhabited the area from about 4000 - 2000 BC, and it provides access to the Oconto River for hiking and shore fishing.

Existing Recreation Conditions

Camping

Copper Culture Mounds State Park is a day use park. Camping facilities are not provided.

Day Use Areas

Day use areas typically provide activities like picnicking, outdoor games and family gatherings. CCMSP provides a modern picnic area with an open sided shelter, a grassy play area, a 20-car parking lot and a flush toilet.

The park has about 2,300 linear feet of shoreline along the north bank of the Oconto River, providing shore fishing opportunities to park visitors.

Trails

The property offers 1.5 miles of lightly to moderately developed hiking trails. The trails traverse both the park lands (42 acres) and the adjacent 27 acres of statewide public access and easement lands (currently state fishery area). The trails include some short sections of boardwalk in wetland areas. The trails are open in the winter; snowshoeing and skiing are allowed uses.

Roads and Parking Lots (See Map C-2)

Copper Culture Mounds State Park has a paved driveway (fully developed) and a gravel drive and parking lot (moderately developed).

Recreational Land Use Agreement

The department has an agreement with a local unit of government to manage the museum and the grounds around the museum. They also provide tours and staff the museum.

Property Management, Development and Use

NR44 Land Management Classification

Copper Culture Mounds State Park is divided into two NR 44 land management classifications (Map C-4). They are Recreation Management Area – Type 3 (56 acres) and Recreation Management Area – Type 4 (14 acres). The acreage totals for the land management classifications include the park, the public access lands and the easement lands adjacent to the park.

Recreation Management

Recreation Objectives (Entire Property)

- Provide opportunities for hiking, snowshoeing and cross-country skiing on an interconnected network of lightly to moderately developed trails.
- Provide access to the Oconto River for fishing and nature enjoyment.
- Provide a variety of opportunities to learn about the Old Copper Culture People as well as more recent history of the site and the surrounding area.

Recreation Prescriptions (Entire Property)

- Maintain existing facilities at current development levels to continue to provide existing recreation opportunities.
- The level of development, open and closed status, and miles of roads will not change for Copper Culture Mounds State Park.
- Working with partners, provide education and interpretive activities, services and features.
- To reflect existing program management efforts, expand the park project boundaries to encompass the public access land adjacent to the park on its western boundary.

The objectives and prescriptions below apply to Type 4 Recreational Use Setting only.

Recreation Objectives (Type 4 Recreational Use Setting Only)

- Provide day use recreational activities, including picnicking.
- Provide a dog park area on the old landfill.

Recreation Prescriptions (Type 4 Recreational Use Setting Only)

Short Term Prescriptions

- Working with local units of governments and the friends group, maintain the museum building and its exhibits.

Long Term Prescriptions

- Provide year-round, all season toilet facilities.
- Working with cooperating partners, add facilities at the day use area to meet the needs of park visitors.
- If NR45 is changed to allow dogs in Copper Culture Mounds State Park, the department will provide signs to designate the fenced area of the landfill site as a dog park.

Resource Management

The land cover for Copper Culture Mounds State Park can be found on Map C-3.

Table 3: Copper Culture Mounds State Park Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Coniferous Forest	6	13
Upland Grass	20	45
Forested Wetland	19	45
Total	**45**	**100**

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map C-4.

Area 1: Copper Culture Recreation Management Area – Type 4

Classification: Recreation Management Area
Recreational Use Setting: Type 4
Size: 14 acres

Management Objective

- Provide and maintain attractive and safe grounds for intensive outdoor recreation activities.

Management Prescriptions

- In forested locations maintain a healthy tree canopy. Where feasible, promote the growth and retention of larger trees.
- Remove hazardous, diseased and defective trees.
- In appropriate locations maintain and promote native shrubs for screening.
- Provide and maintain turf areas as appropriate.
- Conduct other management and maintenance activities as needed, such as mowing, brushing, erosion control, and maintaining landscaping associated with public use facilities.
- The former City of Oconto Landfill (located on the property) will be managed under a Landfill Management Plan and may contain practices such as native prairie restoration, mowing, brushing and tree removal from the landfill cap.
- Any applicable, approved management practice or tools may be used.

Area 2: Copper Culture Recreation Management Area – Type 3

Classification:	Recreation Management Area
Recreational Use Setting:	Type 3
Size:	56 acres

Management Objective

- Maintain and enhance the character of the area to provide a high quality, natural appearing recreational setting while providing valuable wildlife habitat and sustain native community values as an important secondary benefit.

Management Prescriptions

- Areas of archeological interest may be maintained in native grassland species to protect the site.
- Use passive and active management techniques to maintain the existing types of native cover types, overall. The extent and location of the various cover types may change as conditions and management opportunities change over time.
- Actively convert or allow the natural conversion of cover types to more suitable native types where conversion is appropriate for achieving the long-term management objectives.
- On suitable forested sites, use active and passive management techniques with extended rotation to develop and maintain older forest characteristics, including larger diameter trees (follow the DNR's Managed Old Growth and Old Forest Handbook (2480.5) guidelines). Where possible, favor longer-lived tree species and use uneven-aged management approaches, particularly single-tree and small group harvests. Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- To the degree feasible and practicable, design and conduct vegetation and other land management activities to maintain and enhance an attractive, natural appearing landscape. Use visual quality management techniques to minimize and rapidly reduce secondary, negative visual quality impacts of management activities.
- Remove hazard trees near trails and other designated public use facilities as necessary.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done after consultation and direction by the district ecologist, forester and property manager. Pay special attention to scenic quality concerns along trails and adjacent to public use sites.

NEWPORT STATE PARK (DOOR COUNTY)

Newport State Park, established in 1964, is located near the tip of the Door Peninsula, east of Ellison Bay off State Hwy 42. The park was established to preserve, for future generations, its great natural scenic beauty and wild, undeveloped character with outstanding opportunities for solitude and primitive natural types of recreation, as well as ecological and geological values. The management intent expressed in the original 1972 master plan was to manage the park to maintain its wild character by conducting no vegetation management, except necessary protective activities; allowing no motors, except for management activities; and allowing no permanent roads or structures, except for the area developed for day use activities.

Property Designation	State Park
DNR and Other Lands	Map K-1
DNR Fee Acres	2,372.78
DNR Easement Acres	0.21
Total DNR Acres	2,372.99
NRB Acquisition Goal	2,390.60

In 2017, the park was designated as an International Dark Sky Park. Only 48 parks in the world have received this designation. A Dark Sky Park is defined as a "land possessing an exceptional or distinguished quality of starry nights and a nocturnal environment that is specifically protected for its scientific, natural, educational, cultural heritage, and/or public enjoyment."

Newport State Park has 11 miles of Lake Michigan shoreline (both sand and rock) and about 5,500 feet of sand frontage on Europe Lake. Twenty-four miles of trails, hike-in campsites, and an accessible shelter in the picnic area exist in the park. The park offers interpretation of the natural and cultural history as well as the ecological importance of preservation of the on-site resources. Its location provides Lake Michigan and Europe Lake fishing opportunities. Conifer and hardwood forests, wetlands and upland meadows are also present on the landscape. State Natural Areas embedded within this property include Europe Bay Woods (200 acres) and Newport Conifer-Hardwoods (140 acres).

Park Niche

When Newport State Park was established in the 1960s, the intent was to preserve the park's natural features and to provide quiet recreation in a wilderness setting. Today, with its simple and minimal development, visitors are provided a quiet alternative to the surrounding busy Door County experience. Its recent International Dark Sky Park designation speaks to the park's continued effort to carry on its original intent.

Existing Recreation Conditions

Camping

Newport State Park provides 16 pack-in semi-primitive sites, two of which are group campsites. The sites are scattered along the shore of Lake Michigan, save for two on Europe Lake. Existing walk-in, semi-primitive sites (group and family sites) offer a tent pad, fire ring and box latrine or vault toilet. All sites are non-electric and access is limited to foot travel or bicycle.

Day Use Areas

Day use areas typically provide activities like picnicking, sunbathing, and swimming. The Newport modern day use area also provides scenic vistas and serves as a trailhead for many of the hiking and biking trails in the park. The shelter has a capacity of 80 people. The partially enclosed area has a fireplace, the open section has a large grill. A nearby vault toilet serves the day use area.

Trails

A designated trail is one that is designed, maintained and limited to specific uses. Currently, trails in Newport are available for hiking, biking, cross-country skiing and snowshoeing. Designated trails are identified by signage and are shown on the official map of the park. All trails in the park are open for cross-country skiing. Five miles are open for snowshoeing.

Table 4: NR 44 Trail Development Classifications for Newport State Park

Trail Name	Summer Use	Miles (Approximate)	Trail Classification
Europe Bay/Hotz loop trail	Hike/Bike	7.0	Lightly Developed
Lynd Point/Fern loop trail	Hike	2.2	Primitive to Lightly Developed
Newport loop trail	Hike/Bike	5.0	Lightly Developed
Ridge trail	Hike	1.0	Primitive
Rowleys Bay loop trail	Hike/Bike	4.0	Lightly Developed
Sugarbush trail	Hike	1.0	Primitive
Upland loop trail	Hike	2.0	Primitive

Park Support Facilities

- Park Entrance Visitor Station (PEVS)
    - The objective of the PEVS facility is to serve park operations/administration needs, to provide visitor service facilities and to support nature interpretation/education programs. The PEVS building includes a visitor service area, multi-purpose room, accessible restroom and the park office.
- Maintenance Area
    - The shop building, service road and associated parking and outdoor storage areas serve to provide facilities for repair, maintenance and storage of park equipment and infrastructure. It is an area not open for public use
- Roads and Parking Lots (See Map K-2)

- Newport has slightly less than two miles of moderately developed roads. Newport currently maintains four parking lots to serve its visitors.

Recreational Land Use Agreements

A local snowmobile club has a land use agreement with the department for the use and maintenance of the snowmobile trail in the park that provide connections to a larger county wide trail system.

Property Management, Development and Use

NR44 Land Management Classification

Newport State Park is divided into four NR 44 land management classifications (Map K-4). They are Recreation Management Area – Type 3 Recreational Use Setting (689 acres), Recreation Management Area – Type 4 Recreational Use Setting (36 acres), a small Special Management Area (8 acres), and four separate Native Community Management Areas totaling 1,760 acres. Type 3 Recreational Use Setting shall be applied to all land management classification areas. Land management areas with Type 4 Recreational Use Setting Subclassification will have the additional objectives and prescriptions described in the Recreation Objectives for Type 4.

Recreation Management

Recreation Objectives (Entire Property)

- Maintain and enhance the wild character of the property to provide recreational experiences of solitude and remoteness while accommodating a range of low-impact, non-motorized recreational uses; particularly hiking, canoeing/kayaking, biking, snowshoeing, skiing and camping.
- Expand recreational opportunities by adding equestrian trails.
- Provide semi-primitive camping opportunities by maintaining and upgrading existing camping facilities and by establishing new semi-primitive campsites as space allows.
- Support water access and fishing by providing carry-in access to Lake Michigan and Europe Lake.
- Provide a system of non-motorized recreational trails.

Recreation Prescriptions (Entire Property)

Short Term Prescriptions

- Maintain existing facilities at current development levels to continue to provide existing recreation opportunities.
- The level of development, open and closed status, and miles of roads will not change for Newport State Park.

Long Term Prescriptions

- Develop up to two remote, semi-primitive campsites in the park and locate them to best serve the paddlers using the Lake Michigan State Water Trail. Access will be limited to those arriving by water. Sites will have a minimum of 400 feet separation and development will be limited to a level and firm tent pad, a fire ring and box latrine.
- Add up to five semi-primitive walk-in sites with similar accommodations as the existing campsites presuming suitable locations are identified.
- Work with partners to develop 4 to 6 miles of primitive to lightly developed equestrian trails east of Newport Lane, south of the Europe Bay State Natural Area and north of the Park Office. Improve Lot 4 to accommodate up to 6 vehicle/horse trailers. Add toilet facilities and 4 to 6 hitching posts and a mowed grass area near Lot 4.

Recreation Objectives (Type 4 Recreational Use Setting only)

- Provide a modern day use area for activities such as picnicking, boating, swimming as well as passive recreation activities.

Recreation Prescriptions (Type 4 Recreational Use Setting Only)

- Add electrical service to the existing picnic shelter near Lot 3.

Resource Management

The land cover for Newport State Park can be found on Map K-3.

Table 5: Newport State Park Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Broad-leaved Deciduous Forest	1359	56
Upland Coniferous Forest	367	15
Upland Grass	189	8
Oak	83	3
Forested Wetland	446	18
Total	**2445**	**100**

State Natural Areas of Newport State Park

SNA Name	Existing Acres	Proposed Acres	Total Proposed Acres
Europe Woods State Natural Area	191.21	250.50	441.71

SNA Name	Existing Acres	Proposed Acres	Total Proposed Acres
Newport Conifer-Hardwoods State Natural Area	143.02	400.52	543.54
Newport Mink River Estuary State Natural Area	0.00	330.50	330.50

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map K-4.

Area 1: Recreation Management Area – Type 4 Setting

Classification: Recreation Management Area
Recreational Use Setting: Type 4
Size: 37 acres

Management Objective

- Provide and maintain attractive and safe grounds for intensive outdoor recreation activities.

Management Prescriptions

- In forested locations maintain a healthy tree canopy. Where feasible, promote the growth and retention of larger trees.
- Remove hazardous, diseased and defective trees.
- In appropriate locations maintain and promote native shrubs for screening.
- Provide and maintain turf areas as appropriate.
- Conduct other management and maintenance activities as needed, such as mowing, brushing, erosion control, and maintaining landscaping associated with public use facilities.
- Any applicable, approved management practice or tools may be used, as described in the common elements.

Area 2: Recreation Management Area – Type 3 Setting

Classification: Recreation Management Area
Recreational Use Setting: Type 3
Size: 690 acres

Management Objective

- Maintain and enhance the natural appearing character of the management area to provide opportunities for solitude and remoteness.

Management Prescriptions

- Use active and passive management techniques to develop and maintain older forest characteristics, including larger diameter trees, on suitable sites. Allow for natural recruitment of

coarse woody debris (large diameter timber) and standing snags. Favor longer-lived tree species and uneven-aged management approaches. Manage hazard trees along trails and other use areas.

- To the degree feasible and practicable, design and conduct vegetation and other land management activities to maintain and enhance an attractive, natural appearing landscape. Use visual quality management techniques to minimize and rapidly reduce secondary, negative visual quality impacts of management activities.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done after consultation and direction by the district ecologist, forester and property manager. Salvage operations should focus on safety and meeting overall vegetation management goals.
- Using ecologically appropriate native species, re-forest old fields and other human created open areas to enhance the surrounding forest habitat by increasing the extent of forest and reducing the amount of forest edge.

Area 3: Europe Bay Woods

Classification:	Native Community Management Area
Size:	205 acres
SNA Overlay:	191 acres

Site Description: This site consists of the Europe Bay Woods State Natural Area (SNA) within Newport State Park. Located on an undeveloped isthmus between Lake Michigan and Europe Lake, it was once the ancient shoreline of Lake Michigan. The isthmus was created through wave action resulting in sand and gravel deposition.

The site contains Northern Dry-mesic Forest dominated by red pine and red oak with scattered hemlock, American beech, and red maple. Also present is a mature mesic forest consisting of American beech, sugar maple, red oak, and yellow birch on undulating topography. On gently sloping sandy soils is a Boreal Forest of balsam fir, northern white cedar, quaking aspen, white birch, and white spruce with white and red pine as the site grades into a Great Lakes Ridge and Swale community.

Along Lake Michigan is an undeveloped sand beach and low dunes grading into cobblestone beach and finally dolomite bedrock. The dunes contain extensive mats of bearberry and creeping juniper intermingled with buffalo berry, sand cherry and the state threatened sand reed grass.

Significance: Numerous rare species and high-quality natural communities are present.

Management Considerations: Europe Bay Woods SNA is managed for wetland protection and restoration, and as an ecological reference area.

Management Objectives

- Protect and enhance rare species populations and their habitats. Passively manage the Boreal Forest, Great Lakes Ridge and Swale, Northern Dry-mesic Forest, and Great Lakes Dune communities to provide ecological reference areas, allowing the natural development of old forest characteristics where obtainable.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Management Prescriptions

- Allow natural processes to shape the structure of the forest communities.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads and other infrastructure for human safety after consultation and direction by the Parks and district ecologists, forester and property manager.

Area 4: Newport Woods and Cliffs

Classification:	Native Community Management Area
Size:	582 acres
SNA Overlay:	251 acres (Europe Bay Woods SNA Expansion)

Site Description: Located adjacent to Europe Bay Woods State Natural Area (SNA) within Newport State Park, this site includes habitat for state threatened and endangered species that are not found within the existing SNA boundary. A mix of Boreal Forest and Northern Mesic Forest with low dolomite cliffs, this site harbors rare terrestrial snails, old beach ridges, and a small area of Hardwood Swamp dominated by black ash. Along the lakeshore is a Great Lakes Alkaline Rockshore.

Significance: State threatened and endangered species warrant long-term protection, including several species that are also federally threatened. This site also includes globally rare natural communities. The forests represent opportunities to develop old-growth characteristics and to promote species diversity, including northern white cedar and hemlock, which is lacking in the landscape.

Management Considerations: Management is recommended to include protections for the state threatened and endangered species, including the several that are also federally threatened, and to protect the globally rare natural communities. The forests represent opportunities to develop old-growth characteristics and to promote species diversity, including northern white cedar and hemlock, which is lacking in the landscape. Bird and natural community inventory surveys need updating to better describe the composition and structure of the forest. Invasive species control is necessary.

Management Objectives

- Passively manage the Boreal Forest, Great Lakes Alkaline Rockshore, and Northern Mesic Forest communities to provide ecological reference areas.
- Allow for the development and maintenance of old forest characteristics on suitable sites.
- Protect and enhance rare species populations and their habitats.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Management Prescriptions

- Allow natural processes to shape the structure of the forest communities.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and removing canopy cover for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, campsites and other infrastructure for human safety after consultation and direction by the district ecologist, forester and property manager.

Area 5: Newport Conifer Hardwoods

Classification:	Native Community Management Area
Size:	522 acres
SNA Overlay:	522 acres

Site Description: This site includes the Newport Conifer-Hardwoods State Natural Area (SNA) and additional area within Newport State Park.

The SNA features Northern Mesic Forests composed of white birch, sugar maple, American beech, and ash; Boreal Forests of hemlock, balsam fir, white spruce, and northern white cedar; and 3 to 8-foot-high stretches of dolomite outcroppings.

Significance: This site warrants long-term protection for state threatened and endangered species, including several that are also federally threatened, and globally rare natural communities.

Management Considerations: The SNA boundary is recommended to be expanded to the entirety of this native community management area. It includes numerous rare plants that are not found within the current SNA boundary, including the state endangered Lake Huron tansy (historic record) and the state threatened dune goldenrod, elk sedge, thickspike, and dwarf lake iris (also federally threatened). The site offers opportunities to protect rare species and natural communities and to promote old-growth characteristics in a large site.

Invasive species control is necessary. Trail maintenance and recreational use should minimize impacts to the rare species and high quality natural communities within the site.

Management Objectives

- Passively manage the Northern Mesic Forest community to provide an ecological reference area.
- Protect and enhance rare species populations and their habitats.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- Manage for non-native invasive and aggressive native species.

Management Prescriptions

- Allow natural processes to shape the structure of the forest communities.
- Monitor trail use and gauge impacts to rare species. Reroute trails if necessary.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, campsites, and other infrastructure for human safety after consultation and direction by the district ecologist, forester and property manager.
- Follow standard department practices for invasive plant and animal management.

Area 6: Mink River Estuary

Classification:	Native Community Management Area
Size:	452 acres
SNA Overlay:	331 acres

Site Description: This site contains a Great Lakes Ridge and Swale community complex, Boreal Forest, and Great Lakes Alkaline Rockshore.

Significance: Together with the adjacent Mink River Estuary SNA, this site contains one of the most pristine freshwater estuaries in the country and the natural communities provide habitat for state and federally threatened species.

Management Considerations: Site warrants long-term protection due to the opportunities it provides to increase the habitat available for rare species found within the adjacent Mink River Estuary SNA. It is recommended to expand the Mink River Estuary SNA to include a portion of this site, for protection of numerous rare species and globally imperiled Great Lakes natural communities. The Mink River Estuary SNA is relatively small and this expansion is proposed to improve the size and structure of habitat patches, which have been shown to be important predictors of understory species richness, diversity, and composition.

Management Objectives

- Passively manage the Boreal Forest, Great Lakes Alkaline Rockshore, Great Lakes Ridge and Swale communities to provide ecological reference areas.
- Attain and maintain old forest characteristics on suitable sites.
- Protect and enhance rare species populations and their habitats.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Management Prescriptions

- Allow natural processes to shape the structure of the forest communities
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, campsites, and other infrastructure for human safety after consultation and direction by the district ecologist, forester and property manager.

Area 7: Administration and Maintenance

Classification:	Special Management Area
Size:	8 acres

The management objective is to provide and maintain areas and facilities for the administration and maintenance support of the property. Additional administrative policies and directives may apply.

PENINSULA STATE PARK (DOOR COUNTY)

Property Designation	State Park
DNR and Other Lands	Map L-1
DNR Fee Acres	3,827.52
DNR Easement Acres	0.0
Total DNR Acres	3,827.52
NRB Acquisition Goal	3,785.34

Peninsula State Park, established in 1909, is one of Wisconsin's first state parks. This Door Peninsula park is known for its panoramic views from majestic coastline bluffs that rise 150 feet above the waters of Green Bay, that form an integral part of the Niagara Escarpment. Its beaches are composed mostly of rounded dolomite cobbles rather than the sand that typifies the eastern side of the Door Peninsula (Dott & Attig, 2004).

For its captivating history and extensive recreation amenities, it is often described as one of the state's most 'complete' parks; it provides a summer theater, an 18-hole golf course, beaches, bike trails, 468 campsites, three group camps, a lighthouse, and eight miles of Door County shoreline. Winter opportunities includes cross-country skiing, snowshoeing, sledding and snowmobiling. The 1868 Eagle Bluff Lighthouse on the property is listed on the National Register of Historic Places. The lighthouse is managed by the Door County Historical Society. The park also offers hunting, fishing and boat access to Lake Michigan and sensational sunset views.

Horseshoe Island (38 acres), a part of Peninsula State Park located one mile north of the park's popular Nicolet Bay swimming beach, is accessible only by boat.

The park harbors a long stretch of the Niagara Escarpment, a feature that provides home to unique animal and plant communities. In 1952, two State Natural Areas were established within this state park: Peninsula Park Beech Forest (83 acres) and Peninsula Park White Cedar Forest (64 acres).

Park Niche

Peninsula State Park is considered Wisconsin's most complete park and one of the top park destinations in the state. Peninsula offers five campgrounds, group camps, sandy beach, bike trails, nature center, outdoor theater, golf course and lighthouse. Located in Door County, it includes eight miles of Lake Michigan shoreline and has scenic overlooks from 150-foot bluffs of the Niagara Escarpment.

Existing Recreation Conditions

Camping

With six campgrounds Peninsula State Park offers a variety of camping locations throughout the park. Table 6 provides a summary of the camping facilities at Peninsula State Park and their assigned NR 44 Development Classification.

Table 6: Camping Opportunities at Peninsula State Park

Campground Name	Facility Description	Development Classification
Group Camps	Three group campsites, Lakeshore, Orchard and Meadow. Tent camping only, no electric hookups, two vault toilet buildings.	Rustic
North Nicolet Bay	42 sites, no electric, one shower and flush toilet building, one flush toilet building and vault toilets	Modern
South Nicolet Bay	143 sites/53 with electric, two shower/flush toilet buildings, two ADA sites, vault toilets	Modern
Tennison Bay	188 sites, 95 with electric, two ADA sites, two shower/flush toilets buildings and three additional flush toilet buildings, vault toilets, a playground and one carry-in launch site	Modern
Weborg Point	12 sites, all electric, one shower and flush toilet building	Modern
Welcker's	81 sites, no electric, two shower/flush toilet buildings, and one vault toilet	Modern

Day Use Areas

Peninsula State Park offers a variety of day use areas scattered around the park. Those that have shelters and picnic areas associated with them have been assigned a NR 44 Development Classification. Table 7 provides an overview of the day use facilities found at the park.

Table 7: Day Use Areas of Peninsula State Park

Day Use Area Name	Facility Descriptions	Development Classification
Fish Creek	Outdoor picnic area with vault toilets, a playground and 66 parking spaces	Rustic
Weborg Point	Shelter (capacity 50) is an enclosed building on a scenic point overlooking the shores of Green Bay. Amenities include electricity, a fireplace and flush toilets. Site also has twelve parking stalls, picnic tables and a fishing pier.	Modern
Nelson Point	Outdoor picnic area with vault toilets and 19 parking spaces	Rustic
Welcker's Point	Shelter (capacity 50) is an enclosed building with a fireplace overlooking the bay of Green Bay. Site also includes vault toilets and 10 parking stalls, and outside picnic tables	Rustic

Day Use Area Name	Facility Descriptions	Development Classification
Nicolet Beach	Picnic shelter, concessions, shower and flush toilet building, one vault toilet, playground and rental concession, camp store and parking for 134 cars	Modern
Eagle Terrace	Outdoor picnic tables, a vault toilet and parking for 32 cars	Rustic
Winter Sled Hill	Sled hill and parking area	N/A
Sven's Bluff	Overlook and trail head with 10 parking spaces	N/A
Skyline	Overlook and trail head with 8 parking spaces	N/A
Nicolet Bay Overlook	Overlook	N/A
Eagle Panorama	Overlook and trail head with 16 parking spaces	N/A
Lot 5	Unpaved large lot that serves as a trail head for ski and mountain biking trails, with a 125' by 165' parking area in the winter and a 125' by 65' parking area in all other seasons	N/A

Trails

Peninsula State Park is known for its trail opportunities with over 30 miles of trails and a variety of designated uses. Table 8 is a list of trails and their classifications. Please note that some trails overlap each other with differing uses for the winter and the summer and some trail use occurs on park roads that are closed in the winter. A designated trail is one that is designed, maintained and limited to specific uses. Currently, trails in Peninsula are available for hiking, biking, cross-country skiing, snowmobiling and snowshoeing. Designated trails are identified by signage and are shown on the official map of the park.

Table 8: NR 44 Trail Development Classifications for Peninsula State Park

Trail Name	Miles	Trail Classification
Sunset Bike Route	9.6	Moderately Developed
Off-road biking trails	12	Primitive to Lightly Developed
Eagle Trail	2.0	Primitive to Lightly Developed
Hemlock Trail	1.8	Primitive to Lightly Developed

Trail Name	Miles	Trail Classification
Lone Pine Trail	0.5	Primitive to Lightly Developed
Minnehaha Trail	0.7	Primitive to Lightly Developed
Nicolet Bay Trail	2.2	Primitive to Lightly Developed
Sentinel Trail	2.0	Primitive to Lightly Developed
Skyline Trail	3.0	Primitive to Lightly Developed
Trail Tramper's Delight Trail	0.5	Primitive Developed
Vita Course trail	1.0	Lightly Developed
White Cedar nature trail	0.5	Moderately Developed
Cross-country ski trails (all mileage measured from parking lots)		
Parking Lot 1		
· **White Loop**	1.5	Lightly Developed
· **Black Loop**	3.0	Lightly Developed
· **Brown Loop**	3.5	Lightly Developed
Parking Lot 3		
· **Purple Loop**	3.0	Lightly Developed
Parking Lot 5		
· **Yellow Loop**	1.0	Lightly Developed
· **Orange Loop**	3.0	Lightly Developed
· **Red Loop**	3.5	Lightly Developed
· **Green Loop**	5.6	Lightly Developed
· **Blue Loop**	7.0	Lightly Developed

Trail Name	Miles	Trail Classification
Snowshoe trails (all mileage measured from parking lots)		
· **Nature center**	1.4	Lightly Developed
· **Nicolet Bay**	1.0	Lightly Developed
· **Eagle Tower**	2.8	Lightly Developed
Snowmobile trails	17.0	Lightly Developed to Moderately Developed

Boat Launches

Table 9: Boat Launches at Peninsula State Park

Boat Launch Name	Facility Description
Nicolet Beach Launch and Fishing Pier	Asphalt, 140' by 180' launch access with 3 staging spaces and 19 vehicle/trailer parking spaces
Tennison Bay Canoe/Kayak Launch	Gravel, 78' by 44' launch access area with 12 parking spaces

Other Recreation Facilities

Peninsula State Park offers many other recreational facilities. These are described briefly below.

Table 10: Other Recreation Facilities at Peninsula State Park

Facility Name	Facility Descriptions
Vita Course	13 to 15 exercise stations with a mix of native soil tread and gravel tread
Tennis Court	Single tennis court
Amphitheater	675-seat outdoor amphitheater, vault toilets and 4 small support buildings, parking is provided at the Overflow Lot.
Overflow Lot	125 cars parking lot, capacity decreases when trailer/vehicles combinations use the lot.

Facility Name	Facility Descriptions
Golf Course	An eighteen-hole course plus a six-hole short course, club house, parking lots and other support facilities.
Horseshoe Island	Small pier and two vault toilets, no designated uses or trails
Eagle Tower	Due to its age, an in-depth inspection of Eagle Tower was conducted in the spring of 2015. The inspection included core sampling to determine the general internal condition of the structural components and overall load-bearing capacity of the structure. The tower inspection report indicated the structure was in poor condition and should be razed. On May 20, 2015 the tower was closed for public use. A stakeholders group, made up of Friends members, community members, legislators, U.S. Forest Products Lab staff and DNR staff, worked with a consultant to develop three concept options that best meet the goals for a new tower at Peninsula State Park. The DNR received more than 650 comments on the design concepts. A tower with an accessible ramp through the tree canopy connecting to the top viewing deck received the greatest support and was selected as the concept for the new Eagle Tower.
Eagle Bluff Lighthouse	Small parking lot with paved trail to the lighthouse and scenic overlook

Support Facilities

Table 11: Support Facilities at Peninsula State Park

Park Entrance Visitor Station (PEVS)	The PEVS is located at the Fish Creek park entrance and currently provides a visitor service area, various displays, accessible restroom, and the park office. Outside area includes informational signage, parking lots, entrance/exit roads, and appropriate native landscaping to provide screening and improved aesthetics.
White Cedar Nature Center	Meeting and display space, vault toilets located nearby, and two parking lots – one asphalt with 12 parking spaces and one gravel overflow lot.
Firewood Yard and Camper Dump Station	A concessionaire uses the firewood yard to sell firewood to campers. It is currently located next to the camper sanitation dump facility.
Terrace Contact Station	This station has a small office building and vault toilet where park visitors can pay for their park sticker as they enter the park on Shore Road.

Land Use and Partner Agreements

Amphitheater – The 675-seat outdoor amphitheater is currently managed by Northern Sky Theater, Inc. Outdoor performances are offered from Memorial Day through Labor Day as weather permits, serving approximately 30,000 patrons annually. The amphitheater area currently includes public support buildings such as concession buildings, vault toilets, open area seating and a multi-leveled stage. This area also includes theater staff support areas including backstage dressing, technical and storage facilities.

Golf Course – The existing 18-hole golf course (and six-hole practice course) is operated by the Peninsula Golf Associates. It includes public support areas such as restroom facilities, open-air shelter and a clubhouse and staff support areas including a shop facility and irrigation pump house. Currently the underground irrigation system is being replaced.

Eagle Bluff Lighthouse – The Eagle Bluff Lighthouse is currently being operated by the Door County Historical Society (DCHS). Paid tours are currently offered during the summer season. The department acknowledges DCHS's request to include the restoration of the outbuildings at Eagle Bluff Lighthouse. The department will work with partners to continue to educate visitors about the history of Eagle Bluff Lighthouse through interpretation and education of the lighthouse, site and support facilities. The department may do this cooperatively through an agreement with partner(s) outlining specific management, use and operation of the lighthouse area.

Eagle Tower – The tower was inspected in the spring of 2015. The inspection included core sampling to determine the general internal condition of the structural components and overall load-bearing capacity of the structure. The tower inspection report indicated the structure was in poor condition and should be razed. In May of 2015 the tower was closed for public use. A new Eagle Tower will be constructed to include a new viewing tower, accessible ramp access, connections to existing trails near the site, improved parking and accessible walking trails from the parking areas to the tower site.

Snowmobile Trail – The department has an agreement with a local snowmobile club to assist with the maintenance of the snowmobile trails in the park.

Roads and parking lots (See Map L-2)

Peninsula State Park has 26 miles of roads. About nine miles are open year-round to the public, while another 17 are open on a seasonal basis. Table 12 provides a summary of the roads maintained by the DNR in the park.

Table 12: Peninsula State Park Road Classifications

Road Classification	Miles of Public Roads	Miles of Closed Roads	Miles of Seasonal Roads
Primitive	0	0.29	0
Lightly Developed	0	0.21	0.37
Moderately Developed	7.86	0.08	17.23
Fully Developed	0	0	0

Property Management, Development and Use

NR 44 Land Management Classification

Peninsula State Park is divided into four NR 44 land management classifications (Map L-4). They are Recreation Management Area – Type 3 Recreational Use Setting (864 acres), Recreation Management Area – Type 4 Recreational Use Setting (1,490 acres), a small Special Management Area (9 acres) and three Native Community Management Areas totaling 1,364 acres. Type 3 Recreational Use Setting shall be applied to all land management classification areas. Land management areas with Type 4 Recreational Use Setting Subclassification will have the additional objectives and prescriptions described in the Recreation Objectives for Type 4.

Recreation Management

Recreation Management Objectives (Entire Property)

- Continue to provide a wide range of recreation opportunities including camping, beach and water access, hunting and fishing, boating of all types, winter and summer trails and sledding.
- Continue to protect and interpret the long stretch of the Niagara Escarpment that runs through the park and its unique animal and plant communities.
- Continue to work the Friends of Peninsula State Park to make this destination unique in its recreational offerings.
- Provide education and interpretation regarding the cultural and natural history of the park and its current flora and fauna.
- Provide a system of recreational trails, where uses include hiking, mountain biking, bike touring, horseback riding, cross-country skiing (both classic and skate), snowmobiling and snowshoeing.
- Redesign the park's trail system to improve the visitors experience and trail sustainability. Equestrian and fat tire (winter) biking will be additional allowed uses when the trail system is redesigned.

Recreation Prescriptions (Entire Property)

Short Term Prescriptions

- Maintain existing facilities including roads at current development levels to continue to provide existing recreation opportunities.
- Working with partners, provide education and interpretive activities, services and features.

Long Term Prescriptions

- The existing trails for Peninsula State Park will be redesigned to create a more efficient and sustainable trail system. The department will enter into an agreement with a consultant to produce the trail system design and design standards for each trail use. The allowed uses for the trail system will be hiking, mountain biking, bike touring, horseback riding, cross-country skiing (both classic and skate), snowmobiling, snowshoeing and fat tire biking. Parking lots and trail head support facilities will also be improved as needed to serve the new trail system.
- Working with the Wisconsin Department of Transportation, local governmental bodies and other partners, install a multi-use, non-motorized trail parallel to State Highway 42 that serves to connect the park to Fish Creek to the south and Ephraim to the north.
- Build a small observation platform at the Nicolet Bay Overlook to protect sensitive vegetation in the area from foot traffic.
- Parking Lot Improvements or Expansions
    - Add a 5 to 10-stall parking lot near Sven's Bluff
    - Add trailer/vehicle stalls across the road from Nicolet Beach Launch
    - Add 25 to 50 parking stalls at the beach day use area
    - Fill and level the parking lot that serves the sledding hill
    - Improve the adjacent parking lot and the lot located nearby to accommodate 10 to 15 additional cars
    - Redesign the amphitheater overflow lot to use the space more efficiently, including paving and striping parking stalls, and adding another 50 to 100 stalls if space allows

- Add 20 to 30 new parking stalls at Eagle Terrace, as space allows

Recreation Management Objectives (Type 4 Recreational Use Setting Only)

- Continue to work with the various partners who make this destination unique in its recreational offerings including Northern Sky Theater, Inc., Peninsula State Park Golf Course, Eagle Bluff Lighthouse and Friends of Peninsula State Park.
- Provide areas for camping and day uses by maintaining and upgrading existing facilities.
- Remove facilities that are not consistent with the park's mission to allow staff to focus maintenance and management on the core purpose of the park.

Recreation Prescriptions (Type 4 Recreational Use Setting Only)

Short Term Prescriptions

- Add electrical hookups to up to 25 existing campsites in South Nicolet Bay.
- Allow pets at Nelson Point Day Use Area.
- Continue to work with the friends group and other local partners to build the new Eagle Tower and support facilities.
- Work with partners to expand and redevelop the White Cedar Nature Center building and outdoor space to accommodate use.

Long Term Prescriptions

- Additional electric sites may be added to the family campgrounds within the limits of the state statutes regarding state park campgrounds.
- Install an open-air shelter with a maximum capacity of 50 people at Fish Creek and Nelson Point Day Use Areas. Shelters will not have electrical service and therefore, the NR 44 classification will remain rustic.
- Install an open-air shelter with electricity and a maximum capacity of 50 people at Eagle Terrace Day Use Area. Add 10 to 25 parking stalls. The shelter will have electrical service and therefore, the NR 44 classification will convert to modern.
- Redesign the beach area and associated parking and picnic areas for improved flow of visitors and more efficient use of space. Add a pet area and an accessible kayak launch.
- Improve the Lot 5 Trailhead (Highland Road) with a partially enclosed shelter that can serve as a warming hut in the winter. Add toilets to serve the trailhead. The shelter with electric service will convert this parking lot to a modern day use area.
- Remove the vita exercise course and the tennis court, and restore sites to a natural setting.
- Working with partners, the department will pursue the following projects on facilities managed by others in Peninsula State Park:
    - Amphitheater – Improvement of public support areas, concession facilities and new restroom facilities.
    - Golf Course – Replacement of vault toilet facilities and the expansion and improvement of the interior and exterior clubhouse area.
    - Eagle Lighthouse – Facility and exhibit improvements to the interior and exterior of the lighthouse and minor site improvements including repair to the stone wall, wood fence, replacement of the vault toilet and parking improvements.

- Eagle Tower – Additions and improvements to interpretive elements of the structure.

Resource Management

The land cover for Peninsula State Park can be found on Map L-3.

Table 13: Peninsula State Park Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Broad-leaved Deciduous Forest	1706	47
Upland Coniferous Forest	684	19
Upland Grass	85	2
Oak	284	8
Forested Wetland	430	12
Open Wetland/Marsh	68	2
Shrub Wetland	2	0
Developed	392	11
Total	**3652**	**100**

State Natural Areas of Peninsula State Park

Table 14: Peninsula State Park State Natural Areas

SNA Name	Existing Acres	Proposed Acres	Total Proposed Acres
Peninsula Park Beech Forest	82.44	0.00	82.44
Peninsula Niagara Escarpment State Natural Area	0.00	242.26	242.26
White Cedar Forest State Natural Area	64.41	65.53	129.94

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map L-4.

Area 1: Recreation Management Area – Type 3 Setting

Classification: Recreation Management Area
Recreational Use Setting: Type 3
Size: 864 acres

Management Objective

- Maintain, protect and enhance the area's natural features, including the Niagara Escarpment and old forest character, to provide a high quality scenic setting for non-motorized recreational use and snowmobiling.

Management Prescriptions

- Overall, maintain existing native cover types. Convert or allow the natural conversion of cover types to more suitable native types where conversion is appropriate for achieving the management objective, particularly long-term.
- On suitable sites, use active and passive management techniques to develop and maintain older forest characteristics, including larger diameter trees. Where possible, favor longer-lived tree species and use uneven-aged management approaches. Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- To the degree feasible and practicable, design and conduct vegetation and other land management activities to maintain and enhance an attractive, natural appearing landscape. Use visual quality management techniques to minimize and rapidly reduce secondary, negative visual quality impacts of management activities.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done after consultation and direction by the district ecologist, forester and property manager.

Area 2: Recreation Management Area – Type 4 Setting

Classification:	Recreation Management Area
Recreational Use Setting:	Type 4
Size:	1,490 acres

Management Objective

- Provide and maintain attractive and safe grounds for intensive outdoor recreation activities.

Management Prescriptions

- In forested locations maintain a healthy tree canopy. Where feasible, promote the growth and retention of larger trees.
- Remove hazardous, diseased and defective trees.
- In appropriate locations maintain and promote native shrubs for screening.
- Provide and maintain turf areas as appropriate.
- Conduct other management and maintenance activities as needed, such as mowing, brushing, erosion control, and maintaining landscaping associated with public use facilities.
- Any applicable, approved management practice or tools may be used.

Area 3: Peninsula Niagara Escarpment and White Cedar Forest

Classification:	Native Community Management Area
Size:	372 acres
Overlay:	372 acres (SNA)

Site Description: This site encompasses Peninsula Park White Cedar Forest State Natural Area (SNA) and a significant portion of the Niagara Escarpment within Peninsula State Park.

This area features a continuum of five distinct community types that change with elevation away from Green Bay:

- A one-acre open marsh dominated by blue-joint grass, common reed grass and rushes;
- An open calcareous meadow in a wet swale between beach ridges;
- A Northern Wet-mesic Forest dominated by northern white cedar and black and white spruce; vertical cliffs of Niagara dolostone; and
- A mixed upland forest dominated by northern white cedar, white birch, and sugar maple at the summit of the escarpment.

Significance: This site provides habitat for a diverse group of rare terrestrial snails associated with the Niagara Escarpment since the last Ice Age. Talus slopes contain vents that carry cold air, moisture, and nutrients that some snail species depend on. These vents, located throughout the slope and on bedrock outcrops on top of the cuesta, are vulnerable to compaction and filling-in.

Management Considerations: The rare snails found here have restricted ranges, limited dispersal ability, very specific biotic and abiotic habitat requirements, and are vulnerable to management activities that alter temperature, moisture, and/or food supplies. Impacts from activities that disturb the soil or open the forest canopy can create warmer and drier conditions, increase sedimentation, introduce invasive plant species, and cause vent compaction. Therefore, to minimize potential impacts of activities above and below the escarpment face a 200-foot buffer zone is proposed for this SNA.

Creating buffer zones with allowed uses that do not negatively impact the core area of the Niagara Escarpment is one technique outlined in the Niagara Escarpment Plan, which guides management of the Niagara Escarpment in Ontario, an area designated in 1990 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Biosphere Reserve. Management of invasive species is necessary.

Management Objectives

- Passively manage the Northern Wet-mesic Forest and associated wetland communities to provide ecological reference areas.
- Protect the Niagara Escarpment rare species habitat by minimizing the potential impacts of activities above and below the escarpment face.
- Promote the development of old forest characteristics where applicable.
- Protect and enhance rare species populations and their habitats.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Management Prescriptions

- Allow natural processes to shape the structure of the forest communities.
- Within a 200-foot buffer zone of the escarpment face, do not conduct management or development (e.g., timber harvesting, new parking lot or building construction), or allow uses that would disturb soil and forest canopy cover and negatively impact the core habitat area of the Niagara Escarpment.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.

- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the Parks and district ecologist, forester and property manager.

Area 4: Peninsula Park Beech Forest

Classification: Native Community Management Area
Size: 82 acres
Overlay: 82 acres (SNA)

Site Description: This site represents the Peninsula Park Beech Forest State Natural Area (SNA) within Peninsula State Park.

It features a continuum of forest types from the dry edge of the Niagara Escarpment to rolling uplands forested with mesic species. The Northern Mesic Forest is old second-growth, with sugar maple, American beech, hemlock, yellow and white birch, and ironwood. Some trees are nearly two feet in diameter. To the east, between Shore Road and the bluff edge, is a young Northern Dry-mesic Forest dominated by red oak and white pine. The bluff drops 150 feet to several terraces, which are forested with northern white cedar and hardwoods.

The base of the bluff along Green Bay supports many ferns including bulblet fern, fragile fern, polypody, slender cliff brake, walking fern, and wood ferns. The beach is composed of dolomite cobblestones with little vegetation. Rare plants are present at the site.

Significance: Peninsula Park Beech Forest SNA is managed as a reserve for the Northern Mesic Forest natural community and as an ecological reference area.

Management Considerations: Future management should be focused on developing old forest characteristics.

Management Objectives

- Passively manage the Northern Wet-mesic Forest and associated wetland communities to provide ecological reference areas and a Northern Mesic Forest natural community ecological reference area.
- Protect the Niagara Escarpment by minimizing the potential impacts of activities above and below the escarpment face.
- Promote larger blocks of older mixed conifer-hardwood forest.
- Protect and enhance rare species populations and their habitats.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Management Prescriptions

- Within a 200-foot buffer zone of the escarpment face, do not conduct management or development (e.g., timber harvesting, new parking lot or building construction), or allow uses that would disturb soil and forest canopy cover and negatively impact the core habitat area of the Niagara Escarpment.
- Allow natural processes to shape the structure of the forest communities.

- In consultation with the Parks and NHC ecologists, use uneven-aged, extended rotation techniques to accelerate the development of large diameter trees where appropriate.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the Parks and district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.

Area 5: Northern Mesic Forest

Classification:	Native Community Management Area
Recreational Use Setting:	Type 3
Size:	909 acres

Site Description: This site contains a mature Northern Mesic Forest and rare species. The Northern Mesic Forest is diverse, with sugar maple, American beech, hemlock, and northern white cedar as common canopy trees. Wet areas with northern white cedar, black ash, and shallow pools are found on the low topography in the middle of the site.

Significance: Mature Northern Mesic Forests with conifer species are uncommon in this landscape and rare species such as red-shouldered hawks are present. Forests here provide a vital migratory bird stopover site for up to 10,000 neo-tropical migrant bird species each spring and fall.

This management area comprises a substantial portion of the park and it has significant recreational values in addition to the ecological values. The area plays a highly important, integral role in supporting the park's dispersed recreational trail systems, i.e. non-motorized types and snowmobiling. Recreational uses and trails here are similar to those in Area 1: Recreation Management Area – Type 3 Setting.

Management Considerations: Management opportunities exist to promote old-growth characteristics and provide habitat for rare species. Invasive species control is necessary. In addition, given the area's high recreational value and benefits, it is important to continue to provide for these uses and carefully locate, design, and manage the recreational trails in a sustainable way that does not degrade the ecological values.

Resource Management Objectives

- Maintain, protect and enhance the area's natural features and old forest character to provide a high quality, scenic setting for non-motorized recreational uses.
- Protect and enhance rare species populations and their habitats.
- Promote larger blocks of older mixed conifer-hardwood forest.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Resource Management Prescriptions

- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.

- In consultation with the Parks and NHC ecologists, use uneven-aged, extended rotation techniques to accelerate the development of large diameter trees following guidelines for old forest management in the Old Growth and Old Forest Handbook 2480.5.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.

Recreation Management Objectives

- Provide and maintain a system of compatible primitive to lightly developed trails for hiking, mountain biking, horseback riding, cross-country skiing, snowshoeing, fat-tire biking (winter biking), and snowmobiling.
- Manage the area consistent with the recreational use standards for a Type-3 Recreational Use Setting.

Recreation Management Prescriptions

- Maintain the current trail system and uses until such time as the park's trail system is redeveloped. Follow the redevelopment plan after approval.

Area 6: Administration and Maintenance

Classification: Special Management Area
Size: 9 acres

The management objective is to provide and maintain areas and facilities for the administration and maintenance support of the property. Additional administrative policies and directives may apply.

POTAWATOMI STATE PARK (DOOR COUNTY)

Potawatomi State Park, established in 1928, is the most southerly of the five Door County State Parks. It is located just outside the City of Sturgeon Bay and is a popular camping destination for Door County visitors.

Property Designation	State Park
DNR and Other Lands	Map M-1
DNR Fee Acres	1,141.64
DNR Easement Acres	78.86
Total DNR Acres	1,220.50
NRB Acquisition Goal	1,259.00

The park has 1,200 acres of gently rolling upland terrain bordered by steep slopes and rugged dolomite cliffs. The park features about 2.5 miles of shoreline on the Bay of Sturgeon Bay and Sawyer Harbor. The boat landing and shore fishing are very popular.

Potawatomi State Park is home to nine miles of walking/hiking trail, eight miles of off-road bike trail, approximately 8.5 miles of snowmobile trail, approximately eight miles of groomed cross-country ski trail, and 2.5 miles of winter hiking/snowshoe trail. The Eastern Terminus of the Ice Age Trail, a 1,000-mile National Scenic Trail, is located within Potawatomi State Park.

From the cliffs of the Niagara Escarpment at the north and east sides of the park, one can see across Sawyer Harbor and the bay of Green Bay.

Park Niche

Potawatomi State Park, located on the shores of Sturgeon Bay, is the gateway to Door County. The park is a popular family destination for hiking, biking, camping, boating, fishing and more. The park features miles of trails, camping opportunities, miles of shoreline, and bluffs of the Niagara Escarpment.

Existing Recreation Conditions

Camping

Daisy Field Campground (NR 44 Development Classification: Modern)

The two loops of the campground offer a total of 123 sites, 40 with electricity. Showers, flush toilets and a sanitary dump station are provided during the camping season. Overflow parking for campers is currently insufficient, and the shower building is undersized since it has seen increased use with the addition of the Group Campground.

Group Campsites (NR 44 Development Classification: Modern)

Four group sites, all non-electric, are available in the park; they can accommodate up to 36 people each. Two of the group sites can accommodate trailers and motor homes; the others can accommodate tents only.

Accessible Camping Cabin (NR 44 Development Classification: Modern)

The fully accessible cabin, which may only be rented to people with disabilities and their guests, can accommodate up to six people. Amenities include a bathroom with wheel-in shower, two hospital beds and a Hoyer lift, heating, air conditioning and a screened porch.

Day Use Areas

South Shore Picnic Area (NR 44 Development Classification: Modern)

The shelter at the Picnic Area on the south shore has two fireplaces and electrical service. The shelter may be partially opened in warmer months. This modern day use area also provides picnic tables, a vault toilet, water, a playground and four small parking lots. This area also serves as a trailhead for the off-road bike trail through the park and the Hemlock hiking trail. A fishing pier was damaged in 2014 and removed.

Campground Shelter Area (NR 44 Development Classification: Modern)

The Campground Shelter has a fireplace and electricity. Nearby parking lots and a playground are available for use.

Ice Age Trail Day Use Area (NR 44 Development Classification: Rustic)

Nearby parking and a vault toilet are provided along the eastern terminus of the Ice Age Trail. A 75-foot-tall wooden observation tower is located here as well. The tower was recently inspected for decay by engineers and wood structure specialists. It was found to be unsafe and will be dismantled in the future. The area will be maintained as a trailhead for the Ice Age Trail.

Trails

Visitors to Potawatomi State Park enjoy its extensive system of trails. Table 15 is a list of trails and their classifications. Note that some trails overlap each other with differing uses for the winter and the summer and some trail use occurs on park roads that are closed in the winter. A designated trail is one that is designed, maintained and limited to specific uses. Currently, trails in Potawatomi are available for hiking, biking, cross-country skiing, snowmobiling and snowshoeing. Designated trails are identified by signage and are shown on the official map of the park.

Table 15: NR 44 Trail Development Classifications for Potawatomi State Park Trail

Trail Name	Miles	Trail Classification
Ancient Shorelines Nature Trail	0.5 miles	Moderately Developed
Ice Age Scenic Trail	2.8 miles	Primitive
Hemlock Trail	2.6 miles	Primitive
Tower Trail	3.6 miles	Primitive
Off-Road Bike Trail	8.0 miles	Moderately Developed
Cross-country Ski Trails	8.5 miles	Primitive
Winter hiking/Snowshoe Trails	2.5 miles	Primitive
Snowmobile Trails	8.0 miles	Primitive

Boat Launch

The Potawatomi State Park Boat Launch on Sawyer Harbor provides two paved boat launch lanes and has 13 parking stalls for cars and approximately 70 stalls for trailer/vehicle combinations. Up to three launching piers are provided. One vault toilet is provided.

Roads and Parking Lots (See Map M-2)

Potawatomi State Park has approximately 11 miles of roads. About 4.5 miles are open year-round to the public, while another five miles are open on a seasonal basis. Table 16 provides a summary of the roads maintained by the DNR in the park.

Table 16: Potawatomi State Park Road Classifications

Road Classification	Miles of Public Roads	Miles of Closed Roads	Miles of Seasonal Roads
Primitive	0	0.85	0.09
Lightly Developed	0	0.03	0
Moderately Developed	4.42	0.1	5.29
Fully Developed	0	0	0

Support Facilities

Park Entrance Visitor Station (PEVS)	The PEVS is located at the park entrance and currently provides a small visitor services area, staff office space and a private employee bathroom. Outside area includes a self-registration station, signage, parking lot, entrance/exit roads, and landscaping
Camper Dump Station	The sanitary dump station is located across the exit road behind the PEVS.

Other Recreational Facilities

Nature Center and Park Store

- The Nature Center is maintained and operated by Park staff. It is mostly a self-guided experience. The Park Store is operated through a subcontract with the friends group. Both are housed in the same building, which is centrally located relative to the north and south campground loops. They are popular destinations for campers and park visitors, providing nature information, camping necessities and bike and watercraft rentals. However, the building and the associated parking lot are too small for the current use, and the building needs repair.

Amphitheater

- This outdoor theater seats up to 70 people. Seasonal park staff and outside guest speakers present programs regarding nature study and local history as well as other related topics. The facility includes a stage, wooden bench seating, electrical outlets and lights. The adjacent parking stalls are generally held for presenters and those with disabilities. Additional parking is located at the nearby Nature Center and Park Store.

Property Management, Development and Use

NR 44 Land Management Classification

Potawatomi State Park is divided into three NR 44 land management classifications (Map M-4). They are Recreation Management Area – Type 4 (643 acres), three Native Community Management Areas totaling 557 acres, and a small Special Management Area (9 acres). Type 3 Recreational Use Setting shall be applied to all land management classification areas. Land management areas with Type 4 Recreational Use Setting Subclassification will have the additional objectives and prescriptions described in the Recreation Objectives for Type 4.

Recreation Management

Recreation Management Objectives (Entire Property)

- Provide access to Sturgeon Bay and Green Bay for fishing and boating of all kinds.
- Provide education and interpretation regarding the natural and cultural history of the park and its current flora and fauna.
- Provide a system of recreational trails (uses include snowmobiling, cross-country skiing (classic and skate), snowshoeing and winter/fat tire biking, hiking and biking), including the eastern end of the Ice Age Trail, by maintaining existing trails.
- Redesign the park's trail system to improve the visitor's experience and trail sustainability.
- Provide views of Sturgeon Bay, Sawyer Harbor and Green Bay, and the Door County shoreline.

Recreation Management Prescriptions (Entire Property)

Short Term Prescriptions

- Maintain existing roads and parking lots at current development levels to provide access to existing recreation opportunities.
- Maintain and repair the Nature Center and Park Store to allow the building to continue serving in its current capacity.
- Continue to provide a wide range of recreational opportunities, including various trail recreation experiences, boating, fishing, picnicking and winter uses such as snowmobiling, cross-country skiing and snowshoeing.
- Continue agreements with friends group to enhance the park visitor's experiences.
- Working with partners, provide education and interpretive activities, services and features.

Long Term Prescriptions

- The existing trails for Potawatomi State Park will be redesigned to create a more efficient and sustainable trail system. The department will enter into an agreement with a consultant to develop the trail system design, including recommended trail alignments and design standards for each trail use. The allowed uses for the summer trail system will be hiking, mountain biking and bike touring. Winter trail uses will include snowmobiling, cross-country skiing (classic and skate), snowshoeing and winter/fat tire biking. Parking lots and trailhead support facilities will also be improved as needed to serve the new trail system.

- The level of development, open and closed status, and miles of roads will remain consistent with the Land Management Classification. Add an observation platform at one of the existing scenic overlooks; the exact location will be determined in the future.

Recreation Management Objectives (Type 4 Recreational Use Area)

- Provide overnight camping opportunities to address needs in the region.
- Provide areas for day use by maintaining and upgrading existing facilities.

Recreation Management Prescriptions (Type 4 Recreational Use Area)

Short Term Prescriptions

- Dismantle the observation tower. The area, including the parking lot and vault toilets, will continue as a modern day use area.
- Modify nine existing campsites to include electrical hookups.
- Working with partners, add an accessible fishing pier to the South Shore Picnic Area.

Long Term Prescriptions

- A new Park Entrance Visitor Station (PEVS) will be built at Potawatomi State Park. The exact location for the new PEVS has not been determined. The new PEVS will provide similar but expanded programing to meet the needs of the park visitors.
- Construction of a new Nature Center/Park Store has been proposed. The exact location for the new building has not been determined, but it is key that the new location be a central location relative to the campgrounds. Further study is necessary before a specific location is selected. The new building will provide similar but expanded programing to meet the needs of the park visitors.
- Reconstruct shower/toilet building in the campground to provide an expansion of toilet and shower facilities.
- Existing campsites may be converted to electrical sites, within the limits of the state statutes regarding state park campgrounds.
- Develop an open-air shelter at the old ski hill overlook (capacity up to 50 people). When the shelter is developed, the old ski hill overlook will be considered a modern day use area.
- Develop an enclosed shelter (capacity 50 people) with fireplace and paved parking for up to 20 vehicles at the Group Camp. In addition to serving campers, this facility will serve as the cross-country ski trailhead and a winter warming shelter.
- Continue to work with local partners to study the redevelopment of the old ski hill into a winter use area.
- Add 10 to 20 parking stalls in the campground area.

Resource Management

The land cover for Potawatomi State Park can be found on Map M-3.

Table 17: Potawatomi State Park Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Broad-leaved Deciduous Forest	339	31
Upland Coniferous Forest	275	26
Upland Grass	81	8
Oak	24	23
Forested Wetland	137	13
Total	**1079**	**100**

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map M-4.

Area 1: Recreation Management Area – Type 4

Classification: Recreation Management Area
Recreational Use Setting: Type 4
Size: 643 acres

Management Objective

- Provide and maintain attractive and safe grounds for intensive outdoor recreation activities.
- Maintain, protect and enhance the area's natural features, including the Niagara Escarpment and old forest character, to provide a high quality scenic setting for non-motorized recreational use and snowmobiling.

Management Prescriptions

- In forested locations maintain a healthy tree canopy. Where feasible, promote the growth and retention of larger trees.
- Remove hazardous, diseased and defective trees.
- In appropriate locations maintain and promote native shrubs for screening.
- Provide and maintain turf areas as appropriate.
- Conduct other management and maintenance activities as needed, such as mowing, brushing, erosion control, and maintaining landscaping associated with public use facilities.
- Any applicable, approved management practice or tools may be used.

Area 2: Potawatomi Niagara Escarpment

Classification: Native Community Management Area
Size: 147 acres

Site Description: This site represents a significant portion of the Niagara Escarpment within Potawatomi State Park.

Below the steep escarpment face, the forest of white birch and northern white cedar provides habitat for rare plants, such as climbing fumitory, and rare snails, including state threatened and endangered species. Unlike other places within the forest, there is a well-developed shrub layer of mountain maple and red-berried elder on these talus slopes. These areas provide habitat for the least flycatcher and veery, both Species of Greatest Conservation Need (SGCN) (WDNR 2005).

Significance: This site provides habitat for a diverse group of rare terrestrial snails that have occupied the area since the last Ice Age. These snails have restricted ranges, limited dispersal ability, very specific biotic and abiotic habitat requirements, and are vulnerable to management activities that alter temperature, moisture, and/or food supplies. Talus slopes contain vents that carry cold air, moisture, and nutrients that some snail species are dependent on. These vents, located throughout the slope and on bedrock outcrops on top of the escarpment, are vulnerable to compaction and filling-in.

Management Considerations: Impacts from activities that disturb the soil or open the forest canopy, can create warmer and drier conditions, increase sedimentation, introduce invasive plant species, and cause vent compaction, all of which adversely affect the rare snails. To minimize the potential impacts of activities above and below the escarpment face, this site includes a 200-foot buffer for the escarpment face.

Creating buffer zones that allow uses that do not negatively impact the core area of the Niagara Escarpment is one technique outlined in the Niagara Escarpment Plan. This Niagara Escarpment Plan guides management of the Niagara Escarpment in Ontario, an area designated in 1990 by the United Nations Educational, Scientific and Cultural Organization (UNESCO) as a World Biosphere Reserve.

Additional management considerations include invasive species control, reducing off-trail use, and road and trail maintenance that minimizes impacts to the endangered and threatened species at the site. A lookout tower is located within the site near the old ski hill.

Management Objectives

- Passively manage the forests to provide ecological reference areas.
- Protect the Niagara Escarpment by minimizing the potential impacts of activities above and below the escarpment face.
- Attain and maintain old forest characteristics on suitable sites.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- Protect and enhance rare species populations and their habitats.

Management Prescriptions

- Within a 200-foot buffer zone of the escarpment face, do not conduct management or development (e.g., timber harvesting, new parking lot or building construction), or allow uses

that would disturb soil and forest canopy cover and negatively impact the core habitat area of the Niagara Escarpment.

- Allow natural processes to shape the structure of the forest communities.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the Parks and district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.

Area 3: Northern Mesic Forest

Classification:	Native Community Management Area
Recreational Use Setting	Type 3
Size:	235 acres

Site Description: This site features a Northern Mesic Forest with sugar maple, red oak, American beech, white birch, and hemlock. Also present are low dolomite cliffs, scattered boulders, and Northern Dry-mesic Forests dominated by white pine, red oak, and white birch.

Exposed bedrock within this site can contain vents that provide moisture and nutrients to rare terrestrial snails on the face of the Niagara Escarpment.

Significance: This site provides vital migratory bird stopover habitat for up to 10,000 neo-tropical land birds each spring and fall, harbors exposed bedrock with vents that provide moisture and nutrients to rare species on the Niagara Escarpment. The site offers opportunities to promote older forest characteristics in a landscape dominated by agriculture and small woodlots. One rare species was located within the site.

Management Considerations: This site warrants special management consideration including invasive species control.

Management Objectives

- Protect the Niagara Escarpment by minimizing the potential impacts of activities above and below the escarpment face.
- Maintain, protect and enhance the area's natural features, including the old forest characteristics, to provide a high quality, scenic setting for non-motorized recreational uses and snowmobiling.
- Promote the development of old forest characteristics where applicable, particularly northern red oak stands.
- Allow interior white birch stands to succeed to northern hardwoods.
- Protect and enhance rare species populations and their habitats.
- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- Invasive species objective

Management Prescriptions

- Within a 200-foot buffer zone of the escarpment face, do not conduct management or development (e.g., timber harvesting, new parking lot or building construction), or allow uses that would disturb soil and forest canopy cover and negatively impact the core habitat area of the Niagara Escarpment.
- In consultation with the Parks and NHC ecologists, use intermediate thinnings or other selective harvest techniques of northern hardwoods to accelerate the development of old forest characteristics where appropriate.
- Use uneven-aged, extended rotation techniques to accelerate the development of large diameter timber where appropriate
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the Parks and district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.
- Invasive species prescription

Area 4: Northern Dry-mesic Forest

Classification:	Native Community Management Area
Recreational Use Setting	Type 3
Size:	175 acres

Site Description: This site is located at the southern end of Potawatomi State Park. It features a forest with red and white pine, red oak, and big-tooth aspen. Deer herbivory has impacted the shrub and saplings layers with few tree or shrub species less than five feet tall.

Significance: Older pine forests provide a unique opportunity for conservation within this landscape. The site provides migratory bird stopover habitat for up to 10,000 neo-tropical land birds each spring and fall.

Management Considerations: There is an opportunity for managing older pine forests. Invasive species control is necessary.

Management Objectives

- Protect the Niagara Escarpment by minimizing the potential impacts of activities above and below the escarpment face.
- Maintain, protect and enhance the area's natural features, including the old forest characteristics, to provide a high quality, scenic setting for non-motorized recreational uses and snowmobiling.
- Manage the Northern Dry-mesic Forest to promote larger blocks of older mixed conifer-hardwood forest.
- Protect and enhance rare species populations and their habitats.

- Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.

Management Prescriptions

- Within a 200-foot buffer zone of the escarpment face, do not conduct management or development (e.g., timber harvesting, new parking lot or building construction), or allow uses that would disturb soil and forest canopy cover and negatively impact the core habitat area of the Niagara Escarpment.
- In consultation with the Parks and NHC ecologists, use uneven-aged, extended rotation techniques to accelerate the development of large diameter timber where appropriate.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the Parks and district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.

Area 5: Administration and Maintenance

Classification: Special Management Area
Size: 9 acres

The management objective is to provide and maintain areas and facilities for the administration and maintenance support of the property. Additional administrative policies and directives may apply.

ROCK ISLAND STATE PARK (DOOR COUNTY)

Rock Island State Park makes up the entirety of Rock Island, the outermost island off the tip of the Door County Peninsula in Lake Michigan. It is located northeast of Washington Island. Dolomite cliffs compose much of the island, except for sand dunes and a beach on the eastern and southern side (Dott & Attig, 2004). Lower dolomite cliffs are found in the interior. The park features the oldest lighthouse in Wisconsin, which was built in 1836, close to ten miles of hiking trails, 40 primitive campsites and 2,000 feet of beach.

Property Designation	State Park
DNR and Other Lands	Map N-1
DNR Fee Acres	912.33
DNR Easement Acres	0.0
Total DNR Acres	912.23
NRB Acquisition Goal	912.47

Rock Island provides a rustic camping experience with views of Lake Michigan. Visitors may only access the island by personal or chartered watercraft or by local ferry service. Vehicles are not allowed on the island, providing an experience unlike any other Wisconsin state park. A visitor center and exhibits are housed in stone

buildings dating to the early 1900s and constructed in an Icelandic style. Rock Island Woods State Natural Area overlays a majority of the property.

Park Niche

Rock Island provides a unique slow-paced experience for visitors whether they are camping or visiting for the day. Beaches, views and an interesting history, including many historical buildings, add to the visitor's experience.

Existing Recreation Conditions

Camping

Rock Island State Park provides 35 campsites in a rustic setting, which includes two group campsites. They are scattered along the southwestern shore of the island. In addition, the park offers five semi-primitive hike-in sites along the northeast shore of the island. All campsites are accessed by foot only.

Summary of Existing Camping Sites

- Site development for the five remote semi-primitive sites is limited to a level and firm tent pad, a fire ring and shared vault toilet.
- Existing walk-in campgrounds (group and family sites) provide a tent pad, a fire ring and picnic table. All sites, except the host site, are non-electric. Five vault toilets are scattered around the campground.

Table 18: Camping Opportunities at Rock Island State Park

Site Types or Campground	Development Classification	Existing Sites
Hike- In Sites	Semi-primitive	5
Rock Island Family Sites	Rustic	33
Group Sites	Rustic	2

Day Use Areas

Day use areas typically provide activities like picnicking, sunbathing, and swimming. Rock Island has two main day use areas, the area near the boat house (NR 44 Development Classification: Modern) and the beach one half mile from the boat house (NR 44 Development Classification: Rustic).

The boat house day use area serves as the arrival and departure location for most visitors to the park. A large concrete pier provides a landing for the public ferry and for transient boat mooring. Water and flush toilets are located nearby.

The boat house day use area provides picnic tables, three shelters and flush toilets. The largest shelter is the historic boat house which has a larger fireplace, seating and tables. It also houses a collection of artifacts from previous denizens of the island. In addition to the historic boat house, other buildings in the area include a pagoda-shaped open-sided picnic shelter, a greeting shed and an old outbuilding that serves as a shelter. A stone fence, left over from the island's days as an estate, serves to divide the campground from the day use area. The day use area provides scenic vistas of Lake Michigan and Washington Island. Finally, the large open field of short grass provides a gathering and play area for campers and day visitors and it serves as a trailhead for the 11 miles of hiking trails located on the island. The outbuilding shelter has a capacity of 20 people; it is fully enclosed with a wood burning stove.

Though extremely popular and heavily used during the summer, the beach day use area provides only a changing room. Toilet facilities are provided by the vault toilet in the nearby campground.

Trails

Rock Island State Park offers about 11 miles of designated trails. The phrase "designated trails" refers to trails that are designed, maintained and limited to specific uses, such as hiking or interpretive nature trails. Designated trails are identified by signage and are shown on the official map of the park.

The development class of most of these trails is primitive. A section of trail from the boat house to the campground is moderately developed with a gravel surfacing.

Table 19: NR 44 Trail Development Classifications for Rock Island State Park

Trail Classification	Existing Miles of Trail
Primitive	7.4
Lightly Developed	1.6
Moderately Developed	1.8
Fully Developed	0

Support Facilities

- Jackson Harbor
  - Most visitors to Rock Island State Park depend on Jackson Harbor which provides a parking lot, boat launch and private ferry to reach the island. The Park Entrance Visitor Station (PEVS) is also located at Jackson Harbor. This building includes flush toilets. This area is considered a day use area (NR 44 Development Classification: Modern).
- Road and Parking Lots (See Map N-2)
  - Rock Island State Park is closed to cars. DNR staff use UTVs to perform maintenance tasks and use the trail system for access. At Jackson Harbor, there is a large paved parking lot and a short moderately developed driveway and boat launch. This area serves as the ferry landing site and allows for private boat launches.

Recreational Land Use and Cooperative Agreements

Snowmobile Trail: The Washington Island snowmobile club has a land use agreement with the department for the use and maintenance of a snowmobile trail in the park.

Pottawatomie Lighthouse: Rock Island is home to the Pottawatomie Lighthouse, the oldest lighthouse in the Wisconsin. A friends group provides seasonal tours and interpretation of island and regional cultural history.

The department has an agreement with the U.S. Coast Guard to allow it to manage a light structure on the north end of the island for ship guidance.

The DNR has an agreement with the ferry operator to provide passenger service to and from the island.

Property Management, Development and Use

NR 44 Land Management Classification

Rock Island State Park is divided into three NR 44 land management classifications (Map N-4). They are Recreation Management Area – Type 3 (119 acres), Recreation Management Area – Type 4 (6 acres) and a Native Community Management Area (856 acres). Type 3 Recreational Use Setting shall be applied to all land management classification areas.

Recreation Management

Recreation Objectives

- Provide remote rustic and semi-primitive camping opportunities by maintaining and upgrading existing camping facilities.
- Provide areas for day uses such as picnicking, boating, swimming as well as passive recreation activities by maintaining and upgrading existing facilities.
- Provide access for the ferry, motor and sail boats at the landing by maintaining the existing pier, the boat house and the adjacent facilities to serve arriving and departing campers and day users.
- Provide a system of non-motorized recreational hiking trails by maintaining existing trails.

Recreation Prescriptions

Short Term Prescriptions

- Maintain existing facilities at current development levels to continue to provide existing recreation opportunities.
- The level of development, open and closed status, and miles of roads will not change for Rock Island State Park.

Long Term Prescriptions

- If land becomes available, the parking lot at Jackson Harbor will be enlarged to accommodate up to an additional 20 to 30 cars.
- Upgrade or replace the renewable energy equipment that provides electric power to the island as needed.

- Rock Island State Park has numerous historic buildings (see list below). The department will restore and preserve existing registered buildings as appropriate.

Table 20: Rock Island State Park's Historic Buildings

Boat House
Maintenance Shed
Ranger House
Light House
Pagoda Shelter
Enclosed Shelter with Wood Burning Stove
Old Water Tower

Resource Management

The land cover for Rock Island State Park can be found on Map N-3.

Table 21: Rock Island State Park Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	760	78
Upland Grass	13	1
Oak	47	5
Forested Wetland	131	12
Developed	22	2
Total	**974**	**100**

State Natural Areas of Rock Island State Park

SNA Name	Existing Acres	Proposed Acres	Total Acres
Rock Island Woods State Natural Area	557.79	167.74	725.53

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map N-4.

Area 1: Rock Island Woods Native Community Management Area

Classification:	Native Community Management Area
Size:	856 acres
Overlays:	State Natural Area (726 acres)

Site Description: The expanded Rock Island Woods State Natural Area (SNA) overlays most but not all the NCMA.

The SNA features a variety of plant community types including a Southern Mesic Forest, Boreal Forest, forested seeps, and shaded cliff community. The interior plateau of Rock Island contains a mature Southern Mesic Forest dominated by American beech and sugar maple. Canopy associates include basswood and red oak.

Several moist swales and Forested Seeps are found on north-facing depressions. Dolomite cliffs and ledges occur on the margins of the forest and Boreal Forest of nearly pure northern white cedar with some balsam fir and white birch along the rocky coastline. Low, moist, shaded dolomite cliffs are found in the interior of Rock Island.

Significance: The portion outside the current SNA boundary includes Boreal Forests dominated by northern white cedar, small Forested Seeps, a bald eagle nest, rare plants, and rare land snails that have not been located yet within the current SNA boundary. This site warrants long-term protection for state threatened and endangered species, including several that are also federally threatened, and globally rare natural communities.

Management Considerations: Rock Island Woods SNA is managed as an ecological reference area and a reserve for high-quality natural communities. This plan recommends the SNA boundary be expanded to overlay the area noted on Map N-4.

Management Objectives

- Manage and maintain the area to provide an ecological reference area and reserve and to protect and enhance rare species populations and their habitats.

Management Prescriptions

- Largely passively manage the forest communities (Southern Mesic Forest and Boreal Forest), allowing natural processes to shape the structure of the forest communities. Enhance or protect habitat for rare species by doing such things as: rerouting trails away from sensitive sites, installing cordwalks, and selectively removing canopy cover for increased sunlight for rare species management.

Area 2: Recreation Management Area – Type 3

Classification:	Recreation Management Area
Recreational Use Setting:	Type 3
Size:	119 acres

Management Objective

- Maintain and enhance the natural appearing character of the management area to provide recreational setting of solitude and remoteness.

Management Prescriptions

- Overall, maintain existing native cover types. Convert or allow the natural conversion of cover types to more suitable native types where conversion is appropriate for achieving the management objective, particularly long-term.
- On suitable sites, use active and passive management techniques to develop and maintain older forest characteristics, including larger diameter trees. Where possible, favor longer-lived tree species and use uneven-aged management approaches. Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- To the degree feasible and practicable, design and conduct vegetation and other land management activities to maintain and enhance an attractive, natural appearing landscape. Use visual quality management techniques to minimize and rapidly reduce secondary, negative visual quality impacts of management activities.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done after consultation and direction by the district ecologist, forester and property manager.

Area 3: Recreation Management Area – Type 4

Classification:	Recreation Management Area
Recreational Use Setting:	Type 4
Size:	6 acres

Management Objective

- Provide and maintain attractive and safe grounds for arriving and departing visitors to Rock Island State Park.
- Provide a picnic area and interpretive displays.

Management Prescriptions

- Remove hazardous, diseased and defective trees.
- In appropriate locations maintain and promote native shrubs for screening.
- Provide and maintain turf areas as appropriate.
- Conduct other management and maintenance activities as needed, such as mowing, brushing, erosion control, and maintaining landscaping associated with public use facilities.
- Any applicable, approved management practice or tools may be used.

WHITEFISH DUNES STATE PARK (DOOR COUNTY)

Whitefish Dunes State Park showcases the fragile dune environment of the Door Peninsula on the western shore of Lake Michigan. Situated between Lake Michigan and Clark Lake, this park features one mile of sand beach, two miles of rocky shore, and the highest sand dunes in Wisconsin.

Property Designation	State Park
DNR and Other Lands	Map Q-1
DNR Fee Acres	863.78
DNR Easement Acres	0.10
Total DNR Acres	863.88
NRB Acquisition Goal	901.00

Whitefish Dunes State Park is on the National Register of Historic Places for eight sites, dating from 100 BCE to 1800 CE. A popular boardwalk meanders the wetlands and many trails exist throughout the forested sand dunes and beech forest. The park's nature center features seasonal programs, plus exhibits and displays on ecology, geology and human history.

Cave Point County Park is embedded in the northern section of this state park, along with an impressive rocky outcropping, 10 to 20-feet high of Silurian dolomite (Dott & Attig, 2004) .

Whitefish Bay Creek is annually stocked with steelhead/rainbow trout, providing fishing opportunities to park visitors.

Several rare, threatened, or endangered plants are found within the unique environment of Whitefish Dunes. In 1980, Whitefish Dunes State Natural Area (256 acres) was established within this state park to preserve the largest and most significant Great Lakes dunescape in Wisconsin.

Park Niche

The highlight of Whitefish Dunes State Park is the more than mile-long sandy beach on Lake Michigan. Whitefish Dunes State Park protects a unique dune environment, and is a popular destination for beach-goers and nature enthusiasts.

Existing Recreation Conditions

Camping

Whitefish Dunes State Park is a day use park and is open from 6 AM to 8 PM daily. It currently does not provide camping opportunities.

Day Use Areas

Day use areas typically provide activities like picnicking, sunbathing, and swimming. Whitefish Dunes day use areas include the beach area (NR 44 Development Classification: Rustic) and the picnic shelter near the main parking lot (NR 44 Development Classification: Rustic).

The beach is extremely popular and heavily used during the summer. It has three access points, one set of changing rooms and three sets of vault toilets.

The shelter at Whitefish Dunes has an interior finished with locally milled eastern white cedar siding. Two sliding glass doors on the Lake Michigan side of the building allow a view of the water and towering cedars. Two casement windows on the north side of the building allow cooling cross ventilation and a view of the trees and trail bordering the picnic area.

A large fieldstone fireplace is the focal point of the enclosed portion of the shelter. The shelter is used year-round, serves as a warming shelter during the ski season and can be rented to groups in the spring, summer and fall. The shelter cannot be reserved during ski season.

Trails

Whitefish Dunes State Park offers a variety of designated trails. The phrase "designated trails" refers to trails that are designed, maintained and limited to specific uses, such as hiking or interpretive nature trails. Designated trails are identified by signage and are shown on the official map of the park.

The park has 10.8 miles of trails. The development class of most of these trails is primitive to lightly developed. The trails that allow bicycle traffic are classified as lightly developed due to the wider cleared area. The authorized uses include bicycling, hiking, cross-country skiing and snowshoeing.

Support Facilities

The building containing the park's main office and nature center is located to the west of the main road. It houses offices, a nature center, an auditorium and flush toilets.

Maintenance Shed

The park uses a small shed located off site on West Shore Drive for storage and maintenance purposes.

Road and Parking Lots (See Map Q-2)

Whitefish Dunes State Park has less than half a mile of moderately developed road in the entire park and most of the roadway is open to the public.

Whitefish Dunes currently maintains two parking lots to serve its visitors. A large parking lot is located on the east side of the park, near the beach, the nature center and the shelter. A smaller lot is located on the west side of the park at the intersection of South Lake and Clark Lake Road.

Boat launch and safe harbor feasibility study

The department is committed to boater safety and supports the need for a feasibility study to identify a location for a safe boat launch ramp on Lake Michigan between Sturgeon Bay and Baileys Harbor. However, at this time the department does not support identifying Whitefish Dunes State Park as the location for this launch until a thorough feasibility study and appropriate approvals are completed. The feasibility study should look at all sites between Sturgeon Bay and Baileys Harbor and include considerations such as the short- and long-term environmental and financial impacts associated with construction and maintenance. It should also consider impacts on existing uses, traffic and safety. The department will take steps outlined in Chapter NR 44, Wis. Admin. Code to notify interested parties of the

intent to modify the plan through a variance or amendment, and seek all necessary approvals to proceed following a completed feasibility study for the preferred location.

Recreational Land Use Agreements

The department has a recreational land use agreement to provide parking for the town park located on Clark Lake.

Property Management, Development and Use

NR 44 Land Management Classification

Whitefish Dunes State Park is divided into four NR 44 land management classifications (Map Q-4). They are Recreation Management Area – Type 3 (419 acres), Recreation Management Area – Type 4 (146 acres), two Native Community Management Areas totaling 402 acres and a Special Management Area (1 acre). Type 3 Recreational Use Setting shall be applied to all land management classification areas. Land management areas with Type 4 Recreational Use Setting Subclassification will have the additional objectives and prescriptions described in the Recreation Objectives for Type 4.

Recreation Management

Recreation Objectives (Entire Property)

- Provide access to Lake Michigan and its sandy beaches for day use including swimming, sunning, bird watching and other beach activities.
- Maintain the fishery along Whitefish Bay Creek.
- Provide education and interpretation regarding the natural history of the park and its current flora and fauna.
- Provide a system of non-motorized recreational trails by maintaining existing trails.

Recreation Prescriptions (Entire Property)

Short Term Prescriptions

- Maintain existing facilities including roads at current development levels to continue to provide existing recreation opportunities.
- Continue agreements with local units of government.
- Working with partners, provide education and interpretive activities, services and features.

Long Term Prescriptions

- The trail system will remain at its current development level, number of miles and authorized uses.
- A non-designated trail runs parallel to Schauer Road, connecting Cave Point County Park to the day use area and beach in the state park. People traveling on foot from the county park to the beach have worn in a series of trails running parallel to the bluff. These unnecessarily wide trails are eroding the top of the bluff and compacting soils around trees in their path. To protect the natural resources around this trail, it will become a designated trail (therefore be officially mapped), and a surface of limestone chips (or similar materials) will be added to direct traffic to

one route (four to six-foot-wide tread) verses many routes. The new trail's NR 44 development classification is "lightly developed".

- Develop one to three miles of snowshoe trails near Whitefish Bay Creek (NR 44 development classification is primitive). The western parking lot will serve as a trailhead.
- Develop a parking area south of CTH WD (Clarks Lake Road) across from Park Road to provide access to the third beach access. The parking lot will have a gravel surface and accommodate up to 30 cars.
- The level of development, open and closed status, and miles of roads will not change for Whitefish Dunes State Park.

Recreation Objectives (Type 4 Recreational Use Setting Only)

- Provide overnight camping opportunities to address needs in the region.
- Provide areas for day uses by maintaining and upgrading existing facilities.

Recreation Prescriptions (Type 4 Recreational Use Setting Only)

- Develop a small (20 to 35 sites) rustic campground on the west end of the park in the existing pine plantation. The sites will not have electricity, and will be served by a vault toilet and a water pump.
- Showers may be provided at a remodeled nature center or at an improved beach changing, shower and toilet facility.
- If space allows provide one to two more bays of parking to the east of the main parking lot.

Resource Management

The land cover for Whitefish Dunes State Park can be found on Map Q-3.

Table 22: Whitefish Dunes State Park Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	460	54
Upland Coniferous Forest	117	14
Upland Grass	70	8
Forested Wetland	149	18
Open Wetland/Marsh	1	0
Shrub Wetland	31	4
Great Lakes Coastal	16	>2
Developed	17	>2
Total	**850**	**100**

State Natural Areas of Whitefish Dunes State Park

SNA Name	Existing Acres	Proposed Acres	Total Acres
Whitefish Dunes State Natural Area	255.56	153.83	409.39

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map Q-4.

Area 1: Recreation Management Area – Type 4 Setting

Classification: Recreation Management Area
Recreational Use Setting: Type 4
Size: 146 acres

Management Objective

- Provide and maintain attractive and safe grounds for intensive outdoor recreation activities.
- Maintain, protect and enhance the area's natural features to provide a high quality scenic setting for non-motorized recreational use.

Management Prescriptions

- In forested locations maintain a healthy tree canopy. Where feasible, promote the growth and retention of larger trees.
- Remove hazardous, diseased and defective trees.
- In appropriate locations maintain and promote native shrubs for screening.
- Provide and maintain turf areas as appropriate.
- Conduct other management and maintenance activities as needed, such as mowing, brushing, erosion control, and maintaining landscaping associated with public use facilities.
- Any applicable, approved management practice or tools may be used.

Area 2: Recreation Management Area – Type 3 Setting

Classification: Recreation Management Area
Recreational Use Setting: Type 3
Size: 419 acres

Management Objective:

- Maintain and enhance the natural appearing character of the management area to provide a high quality recreational experience.

Management Prescriptions

- Overall, maintain existing native cover types. Convert or allow the natural conversion of cover types to more suitable native types where conversion is appropriate for achieving the management objective, particularly long-term.

- On suitable sites, use active and passive management techniques to develop and maintain older forest characteristics, including larger diameter trees. Where possible, favor longer-lived tree species and use uneven-aged management approaches. Allow for natural recruitment of coarse woody debris (large diameter timber) and standing snags.
- To the degree feasible and practicable, design and conduct vegetation and other land management activities to maintain and enhance an attractive, natural appearing landscape. Use visual quality management techniques to minimize and rapidly reduce secondary, negative visual quality impacts of management activities.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done after consultation and direction by the district ecologist, forester and property manager.

Area 3: Whitefish Dunes Woods

Classification:	Native Community Management Area
Size:	69 acres
Overlay	SNA expansion (69 acres)

Site Description: This site is located within Whitefish Dunes State Park, north of Clark Lake Road. Air photos indicate open dunes and hardwood forests with a significant conifer component.

Significance: This site provides good habitat for Northern Goshawks and Red-shouldered hawks. Four state threatened plants exist here.

Management Considerations: More surveys are needed at this site to determine to the quality of habitat available to rare species. Opportunity exists to promote habitat for Northern Goshawk and Red-shouldered Hawks.

Management Objectives

- Passively manage the Northern Dry-mesic Forest to provide ecological reference areas.
- Attain and maintain old forest characteristics on suitable sites.
- Protect and enhance rare species populations and their habitats.

Management Prescriptions

- Allow natural processes to shape the structure of the forest communities.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads, and other infrastructure for human safety after consultation and direction by the Parks and district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.

Area 4: Whitefish Dunes

Classification:	Native Community Management Area
Size:	333 acres
Overlay:	333 acres (State Natural Area)

Site Description: This site includes Whitefish Dunes State Natural Area (SNA) and additional area within Whitefish Dunes State Park.

This complex of active and stabilized dunes by Whitefish Bay along Lake Michigan contains a rich flora particularly adapted to this dynamic habitat. It contains all stages of succession, from open beach through Northern Mesic and Wet-mesic Forest. The lakeside fore dune is open, sandy, and vegetated with common milkweed, beach wormwood, beach pea, sand cress, and several beach grasses, including the state-threatened thickspike and sand reedgrass. Wisconsin's most viable population of the federally threatened dune thistle exists here. The backside of the fore dune is forested with white birch, balsam fir, and northern white cedar and contains an abundant ground cover of Canadian yew. The dunes farther from the lake are more stabilized and heavily wooded with Northern Mesic Forest of sugar maple, big-tooth aspen, hemlock, and American beech. There is a small bog lake with associated sedge meadow and frontage on Clark Lake.

Significance: This site represents the largest and most significant Great Lakes dunescape in Wisconsin. The area outside of the current SNA boundary also includes open and stabilized dunes, and forested areas along Clark Lake that potentially support a similar assemblage of rare species found within the SNA; it has an opportunity to support old growth forest management.

Management Considerations: The SNA boundary is recommended for expansion to include the entirety of this primary site. Surveys for rare species are needed outside of the current SNA boundary. Air photos indicate that a Great Lakes Ridge and Swale natural community may be present in the area close to Clark Lake. This globally rare natural community type typically supports rare species, and may warrant limiting foot traffic. Management of invasive species is necessary.

Management Objectives

- Protect and enhance the Great Lakes dune community.
- Maintain the health of the dune thistle population associated with weevil feeding damage.
- Passively manage the Northern Mesic Forest and Northern Wet-mesic Forest associated wetland communities to provide ecological reference areas.
- Attain and maintain old forest characteristics on suitable sites.
- Protect and enhance rare species populations and their habitats.

Management Prescriptions

- Protect the Great Lakes dune community from erosion, particularly from park users. Install signage encouraging visitors to stay on the boardwalks. Conduct regular inspections of dunes to determine if erosion is occurring.
- Assist researchers with thistle monitoring and any abatement strategies.
- Allow natural processes to shape the structure of the forest communities.
- Rare species habitat enhancement could include: rerouting trails, installing cordwalks, and selectively removing canopy cover by hand felling trees for increased sunlight.
- Following a catastrophic event (e.g. wind, fire, ice damage, forest pests), salvage may be done along trails, access roads and other infrastructure for human safety after consultation and direction by the district ecologist, forester and property manager. Additional salvage may be conducted if it fits with the ecological considerations for the site.

Area 5: Administration and Maintenance

Classification: Special Management Area
Size: 1 acre

The special management area for Whitefish Dunes includes the small shed on Erdman Lane and the maintenance area located just north of the park's main parking lot. The management objective is to provide and maintain areas and facilities for the administration and maintenance support of the property. Additional administrative policies and directives may apply.

GRAND TRAVERSE ISLANDS STATE PARK (DOOR COUNTY)

In 1978, the NRB voted to establish the Grand Traverse Islands State Park. The NRB action directed acquisition to include acquisition in fee title or perpetual easement of Detroit Island, and acquisition or lease of Plum Island, Pilot Island and Fish Island. The project included Fisherman Shoal which is currently managed in public trust by the state as part of the bed of Lake Michigan. In addition, the 1978 board action proposed incorporating the existing Rock Island State Park into Grand Traverse Islands State Park.

Property Designation	**State Park**
DNR and Other Lands	Map E-1
DNR Fee Acres	26.67
DNR Easement Acres	0.0
Total DNR Acres	26.67
NRB Acquisition Goal	1080.39

The purpose of the proposed land acquisition, development and management of the Grand Traverse Islands State Park is to provide that certain islands off the tip of Door County in Lake Michigan "…be preserved in their near wilderness state for the perpetual enjoyment of the present and future generations."

Aside from Rock Island (which was DNR owned and managed at the time this park was created) the only acquisition that has occurred since the inception of the park is about 27 acres on Detroit Island. Plum Island, Pilot Island and Fish Island are managed by the US Fish and Wildlife Service.

There are three seasonal, primitive road segments totaling 0.24 miles associated with this park.

<u>Property Management, Development and Use</u>

NR 44 Land Management Classification

The NR 44 Land Management Classification for the entire project boundary (936 acres) is Habitat Management Area (Map E-4).

Recreation Management

Recreation Objective

- Provide opportunities for hunting, fishing, trapping, walking, wildlife watching and nature study and other compatible nature-based outdoor recreation activities.

Recreation Prescription

- Maintain public access to provide opportunities for hunting, fishing, trapping, walking, wildlife watching and nature study and other compatible nature-based outdoor recreation activities.

Resource Management

The land cover for Grand Traverse Islands State Park can be found on Map E-3.

Table 23: Grand Traverse Islands State Park Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	7.5	65
Forested Wetland	2.3	23
Open Wetland/Marsh	1.2	11
Total	**11.5**	**100**

Resource management on DNR lands is organized by land management classification areas. The area described below is depicted on Map E-4. Recreation management objectives and prescriptions (see above) apply to all land management classifications in the park.

Area 1: Habitat Management

Classification: Habitat Management Area
Size: 936 acres

Management Objective

- Maintain and enhance the quality of the existing habitats for the benefit of resident and migratory wildlife and fish.

Management Prescription

- Overall, maintain existing native cover types. Convert or allow the natural conversion of cover types to more suitable native types where conversion is appropriate for achieving the management objective, particularly long-term.

STATE PUBLIC ACCESS SITES

The Northern Lake Michigan Coastal region has many state public access sites (boat landings) which provide access to waterways. As required in Administrative Code NR 1.90 [exit DNR], it is the goal of the state of Wisconsin to provide, maintain and improve access to the state's navigable lakes, rivers and streams for the public. Public access facilities allow for public rights of navigation, related incidental uses and other uses which are appropriate for the waterway.

The land for the public access sites discussed below is owned by the DNR. However, on several sites the boat access facilities, such as parking lots, launch lanes and other infrastructure were built and are managed by either the local county or town. Table 24 lists the state public access sites in the region and who manages them.

NR 44 LAND MANAGEMENT CLASSIFICATION

All state public access sites are designated as Recreation Management Area – Type 4 Recreational Use Setting.

Objectives

- Provide, maintain and improve access to the region's navigable lakes, rivers and streams for the public commensurate with the ability of individual waters to support such access.
- DNR, alone or in cooperation with local government, exercises its management and regulatory responsibilities to assure that levels and types of use of navigable waters are consistent with protection of public health, safety and welfare, including protection of natural resources.

Prescriptions

Prescriptions are provided only for public access sites owned and managed by the DNR. The existing conditions at each public access site are discussed below, along with prescriptions for each site.

- ***Rieboldt Creek State Public Access*** is a carry-in access at the south end of Mud Lake Wildlife Area where Rieboldt Creek intersects CTH Q. Boaters may access Mud Lake by putting in on the north side of CTH Q, or Moonlight Bay and Lake Michigan by putting in on the south side of CTH Q.
    - Replace the existing native surface lot with a gravel parking lot.
    - Add a gravel base or a geo-textile base to the canoe launch.
- ***Rowleys Bay State Public Access*** provides over 800 feet of frontage on Lake Michigan's Rowleys Bay. The site has a deep-water pier, a marina with 16 slips, two docks currently available for use by the public and a put-in for small watercraft. It is located just south of the Mink River Estuary State Natural Area and Newport State Park. Recent improvements include a new kiosk and property identification sign.
    - Maintain existing public access facilities.
    - Remove all but one of the remaining cabins left over from previous land use to provide more open shore land for recreation.
    - Remodel remaining cabin into a flush toilet building with water and electricity.
    - Develop a parking lot for 15 to 35 cars north of CTH ZZ.
- ***Bay Road State Public Access*** is currently undeveloped.
    - Build a small parking lot (3 to 6 cars) for carry-in launching of small watercraft.
    - Add a sign to identify the access site from the road.
- ***County Highway P Peshtigo River State Public Access*** was recently acquired by the department.
    - Maintain a small parking lot (3 to 6 cars) for carry-in launching of small watercraft.
    - Add a sign to identify the access from the road.

Table 24: State Public Access Sites of the NLMC Region

Map Reference	Proposed or Existing Landing Name	County	Managed By
AP-5	Rowleys Bay State Public Access	Door	DNR
AS-5	Bay Rd. State Public Access	Door	DNR
AN-5	County Highway P Peshtigo River State Public Access	Marinette	DNR
N/A	Rieboldt Creek State Public Access	Door	DNR
AC-5	Cox Landing Menominee River State Public Access	Marinette	County
AI-5	Pensaukee River State Public Access	Oconto	County
AE-5	George K. Pinney State Public Access	Door	County
AM -5	Baileys Harbor State Public Access	Door	Town
N/A	Menomonie River State Public Access (CTH JJ)	Marinette	County

STATE TRAILS

The state's trail network mainly consists of rail-based trails and utility corridors that occasionally employ road connections. State trails located on converted rail corridors in the planning region include: the Ahnapee, Mountain-Bay, Newton Blackmour, Nicolet and Oconto River state trails. These state trails are developed and operated through a partnership model or cooperative management agreement with a local unit of government. In this partnership model, the department typically holds the land ownership or trail interest right, while the partners develop, maintain and operate the trail. The managing partner conducts the planning processes by agreement to determine which recreational uses will be allowed on the property based on the physical characteristics of the trail, compatibility of users, local ordinances, and public input. Trail management is not discussed in this plan because the trails are managed and operated by local units of government through agreements with the DNR.

The State Trails of the Northern Lake Michigan Coastal Ecological Landscape

- Ahnapee Trail
- Mountain-Bay Trail
- Newton Blackmour Trail
- Nicolet Trail
- Oconto River Trail

The Wisconsin 2003 State Trails Network Plan, which was approved by the Natural Resources Board, provides authorization for the DNR to pursue acquisition of any abandoned rail grade or other corridor identified in the plan. As a result, corridor extensions and connections are authorized through that plan rather than through individual master plans.

The State Trails Network Plan identifies Northern Door County (Segment 1) as an opportunity or priority corridor to connect to and extend the Ahnapee State Trail off-road from Sturgeon Bay to the tip of the county. An extension corridor currently being planned will incorporate various existing and proposed shared use trail corridors, paths, bike lanes, proposed paved shoulder improvements, and existing and proposed signed routes, including existing and proposed facilities in northern Door County on both sides of Sturgeon Bay. The State Trails Network Plan notes the "*long-term objective* (of extending the Ahnapee State Trail to the tip of the county) *will become more difficult to accomplish as more of the Door County landscape is developed."* The Northern Door County segment is *"intended as a safe, scenic travel alternative to busy roads."* The department acknowledges the importance of the extension project and is committed to expanding the trail network within the defined corridors. While the specific trail segments within the corridors change over time, we will continue to work with our partners to acquire, develop and realize the larger extension project.

STATE WILDLIFE AREAS

GARDNER SWAMP WILDLIFE AREA (DOOR COUNTY)

Gardner Swamp Wildlife Area, located in southwestern Door County, was acquired in 1958 to provide land for public hunting and waterfowl production. Support was strong from local property owners and sportsmen, since the property was subject to frequent flooding caused by beavers. The extensive marsh with wetland forest (very limited uplands) provides habitat for waterfowl, deer, beaver, woodcock, shorebirds, and bald eagle. It provides critical habitat for the federally endangered Hines emerald dragonfly.

Property Designation	**Wildlife Area**
DNR and Other Lands	Map D-1
DNR Fee Acres	1,180.58
DNR Easement Acres	0.0
Total DNR Acres	1,180.53
NRB Acquisition Goal	1,169.16

Keyes Creek, a Class II trout stream, bisects the property as it flows north into Little Sturgeon Bay/Green Bay on the west side of the Door Peninsula. Northern pike and white sucker use Keyes Creek for spawning during the spring. It is unknown if they migrate to the creek within the Wildlife Area or if their use is restricted to downstream locations.

Gardner Swamp Wildlife Area is recognized as a Conservation Opportunity Area (COA) because of its high-quality wetlands (WDNR 2015).

Existing Conditions

Gardner Swamp Wildlife Area is managed to provide opportunities for public hunting, trapping, fishing, bird watching, nature study and other compatible forms of outdoor recreation. The property is also managed to protect and perpetuate its unique mix of natural communities and their associated wildlife

and plant species. These communities are representative of Sedge Meadow, Wetland, and Northern Wet-Mesic Forest communities in the Northern Lake Michigan Coastal Ecological Landscape. Thinning and improvement cutting is used to maintain the white cedar and swamp hardwood types. Early successional management of aspen stands occurs within the property, and should be continued where appropriate. The marsh, shrub-carr, and grasslands are maintained with brushing, mowing and prescribed fire. See Common Elements in Appendix A for more information on general habitat management practices.

Property Management, Development and Use

NR 44 Land Management Classification

Gardner Swamp Wildlife Area is designated as a Habitat Management Area (Map D-4).

Recreation Management

Recreational opportunities at Gardner Swamp Wildlife Area include hunting, trapping, gathering wild edibles, birding and wildlife viewing. Though there are no designated trails, cross-county skiing and hiking are allowed.

Gardner Swamp Wildlife Area has one short stretch of lightly developed DNR managed roads and three parking lots (Map D-2). Public access to this site will remain the same.

Recreation Objectives

- Provide opportunities for hunting, fishing, trapping, walking, wildlife watching and nature study and other compatible nature-based outdoor recreation activities.
- Provide an appropriate level of public access to support public use, consistent with the physical capability of the property.

Recreation Prescription

- Maintain the three existing public parking lots and the DNR managed access road at their current location, size and level of development.

Resource Management

The land cover for Gardner Swamp Wildlife Area can be found on Map D-3.

Table 25: Gardner Swamp Wildlife Area Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	65	6
Upland Grass	72	6
Forested Wetland	442	38
Open Wetland/Marsh	352	30
Shrub Wetland	232	20
Total	**1163**	**100**

Resource management on DNR lands is organized by land management classification areas. The area described below is depicted on Map D-4.

Area 1: Habitat Management Area

Classification: Habitat Management Area
Size: 1222 acres

Management Objective

- Maintain and enhance the quality of the existing habitats, including wildlife openings, for the benefit of resident and migratory wildlife to sustain hunting, trapping, wildlife watching, fishing and other wildlife-focused recreational activities.
- Protect and monitor the critical habitat for the Hine's emerald dragonfly.

Management Prescriptions

- Follow the common element management prescriptions for each habitat and forest type.
- Over time, managers may modify the extent and/or distribution of the various habitats to respond to changing conditions, opportunities, and needs.
- Conduct presence/absence surveys for Hine's emerald dragonfly.
- Manage the old quarry site to reduce the incidents of unauthorized and unsafe firearm shooting.

LAKE NOQUEBAY WILDLIFE AREA (MARINETTE COUNTY)

Lake Noquebay Wildlife Area is known for its lake, stream (Inlet Creek), and wetland attributes that support abundant wildlife diversity, including a cedar swamp. Located in Marinette County, 23 miles northwest of the city of Marinette and 64 miles north of Green Bay, the property was acquired in a land exchange with the county in 1960. It lies adjacent to Marinette County Forest lands.

Property Designation	Wildlife Area
DNR and Other Lands	Map H-1
DNR Fee Acres	1298.08
DNR Easement Acres	0.0
Total DNR Acres	1298.08
NRB Acquisition Goal	1,300.39

About 70% of the wildlife area is composed of sedge meadows, emergent marsh vegetation, and lowland shrubs. The wooded portion of the area has aspen and northern hardwoods. About 1/3 of the wooded portion is a cedar swamp. Less than 30% of the property has merchantable timber.

Development of two flowages occurred in the 1960s. One control structure and the dike on a 60-acre flowage have subsequently been removed.

Lake Noquebay Sedge Meadow State Natural Area (662 acres) is located within the property. It includes a portion of the shoreline of Lake Noquebay and the large sedge meadow downstream from Upper Inlet Creek. A dike contributes support to this wetland.

Property Management, Development and Use

NR 44 Land Management Classification

Lake Noquebay Wildlife Area is divided into two NR 44 land management classifications (Map H-4). They are a Habitat Management Area (587 acres) and a Native Community Management Area (662 acres)

Recreation Management

Recreational opportunities at Lake Noquebay Wildlife Area include fishing, hunting, trapping, gathering wild edibles, birding and wildlife viewing. A club maintained snowmobile trail (part of a regional trail network) traverses the property. Although the DNR does not maintain any designated trails on this property, hiking and cross-country skiing are allowed.

On the adjacent county forest land, the county maintains a network of "silent sport" trails (skiing/snowshoeing in the winter and hiking/mountain biking in the summer), which partially traverses onto the wildlife area on the eastern boundary. A county boat ramp that provides access to Lake Noquebay is located adjacent to the property at the end of Pines Rd.

As shown on Map H-2 the DNR maintains public road access into and across the property. The portion on the northern part of the property is a primitive seasonal road with one segment of it located on a dike. The road on the southeastern portion of the property is lightly developed and has two parking lots.

Recreation Objectives

- Provide opportunities for hunting, fishing, trapping, walking, wildlife watching and nature study and other compatible outdoor recreation activities.
- Provide an appropriate level of public access to support public use, consistent with the physical capability of the property.

Recreation Prescription

- Maintain the two existing public parking lots and the DNR managed access roads at their current location, size and level of development.

Resource Management

The land cover for Lake Noquebay Wildlife Area can be found on Map H-3.

Table 26: Lake Noquebay Wildlife Area Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	128	10
Forested Wetland	272	22
Open Wetland/Marsh	374	30
Shrub Wetland	431	35
Water	20	1
Developed	1	0

Land Cover	Current	
	GIS Acres	**% Cover**
Cliffs/Outcrops	1	0
Total	**1229**	**100**

State Natural Areas of Lake Noquebay Wildlife Area

SNA Name	Existing Acres	Proposed Acres	Total Acres
Lake Noquebay Sedge Meadow State Natural Area	662.0	0.0	662.0

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map H-4.

Area 1: Habitat Management Area

Classification: Habitat Management Area
Size: 587 acres

Management Objective

- Maintain and enhance the quality of the existing habitats, including wildlife openings, for the benefit of resident and migratory wildlife to sustain hunting, trapping, wildlife watching, fishing and other wildlife-focused recreational activities.

Management Prescriptions

- Follow the universal management prescriptions for each habitat and forest type.
- Over time, managers may modify the extent and/or distribution of the various habitats (including wildlife openings) to respond to changing conditions, opportunities and needs.

Area 2: Lake Noquebay Native Community Management Area

Classification: Native Community Management Area
Size: 662 acres
Overlays: State Natural Area (662 acres)

Management Objectives

- Manage the site as a boreal rich fen and northern wet-mesic forest preserve, as an aquatic preserve and wetland protection area, and as an ecological reference area.
- Allow natural processes to determine the structure and function of the northern wet-mesic forest.

Management Prescriptions

- Conduct prescribed fire and mechanical control of brush as needed to maintain the boreal rich fen community; otherwise, allow natural processes to determine the structure and function of the fen community.
- Passively manage the northern wet-mesic forest

MUD LAKE WILDLIFE AREA (DOOR COUNTY)

Mud Lake Wildlife Area, located in northeastern Door County near Moonlight Bay, provides opportunities for public hunting, fishing and wildlife watching while protecting qualities of its unique native communities and species, such as Boreal Forest. Within the property lies Mud Lake, a 155-acre shallow (5 feet maximum) drainage lake surrounded by an extensive shrub and timber swamp. Surrounding the lake's open water is a narrow zone of shrubby northern sedge meadow dominated by sedges, willows, dogwoods and sweet gale. The open zone grades into second-growth wet-mesic forest of white cedar, white spruce, balsam fir and black ash.

Property Designation	Wildlife Area
DNR and Other Lands	Map I-1
DNR Fee Acres	2,283.19
DNR Easement Acres	82.21
Total DNR Acres	2,365.40
NRB Acquisition Goal	2,690.00

Rieboldt Creek bisects the property and flows southward from Mud Lake to Moonlight Bay (Lake Michigan). The creek, including the mouth where it enters Moonlight Bay, is a popular fishing area for smallmouth bass, northern pike, yellow perch, rainbow trout (Steelhead), and brown trout. The creek, lake, and associated wetlands provide spawning and rearing habitat for northern pike which depend upon the flooded grasses and vegetation to deposit their eggs. The creek is not stocked with Great Lakes trout and salmon but some trout and salmon do use the stream in their annual spring and fall spawning migrations.

Wildlife habitat at this property is exceptional and supports an abundance of species. Waterfowl use of the lake is occasionally heavy. The wetlands and lake provide habitat for the federally-endangered Hine's emerald dragonfly and many other rare wildlife and plant species. Nesting sites for common goldeneye and other species associated with the rare boreal forest community type, which occurs on the property, have been documented. A State Natural Area overlays most of the State Wildlife Area and some adjacent private parcels. The presence of the extensive SNA is a testament to the significant ecological features here. Mud Lake SNA in total covers 2,556 acres. The majority (2,317 acres) lies within the Mud Lake Wildlife Area, while the remaining acreage extends onto adjacent private lands. This plan only applies to the portion on state land.

In 2014 The Door Peninsula Coastal Wetlands (which includes Mud Lake Wildlife Area) was designated as a Ramsar Wetland of International Importance. In addition, Mud Lake SNA also has Important Bird Area (IBA) status. The Toft Point-Ridges Sanctuary-Mud Lake Important Bird Area provides high quality habitat

for breeding birds, especially wetland birds, and provides a significant stopover site for migratory birds. This property is a designated Land Legacy Place, a Conservation Opportunity Area, and a Wetland Gem, described in the Wisconsin Wildlife Action Plan (WDNR 2015b).

Property Management, Development and Use

NR 44 Land Management Classification

Mud Lake Wildlife Area is divided into two NR 44 land management classifications (Map I-4). They are a Habitat Management Area (394 acres) and a Native Community Management Area (2,460 acres.

Recreation and Public Access

Recreational opportunities at Mud Lake Wildlife Area include canoeing, fishing, hunting, trapping, gathering wild edibles, birding and wildlife viewing. Although there are no designated trails, cross-county skiing and hiking are allowed. The DNR-managed Rieboldt Creek Public Access, located at the confluence of Rieboldt Creek and Moonlight Bay, provides watercraft access to Moonlight Bay and Lake Michigan. (Currently the access site is classified as a "statewide access program" site and is not part of the Mud Lake Wildlife Area, but this plan recommends it be included within the wildlife area (see the Real Estate section of this plan.)

Due to the lack of upland on the property, very few roads exist on the property. Old Lime Kiln Road (a town road) crosses the northern end of this portion of the property. Four parking lots, located on the periphery of the property, provide public recreational access. There is a very limited amount of primitive management road, some of which are closed to public vehicle access. The location of these roads and parking lots are shown on Map I-2.

Management roads and access lanes are closed to public vehicles. However, while they are not specifically maintained for public use they provide access-ways for recreational access by foot. Informal access trails (non-designated) that have developed over years of use also support recreational use access on the property.

Recreation Objectives

- Provide opportunities for hunting, fishing, trapping, walking, wildlife watching and nature study and other compatible outdoor recreation activities.
- Provide an appropriate level of public access to support public use, consistent with the physical capability of the property.

Recreation Prescriptions

- Maintain public parking lots and their access roads at their current location, size and level of development.
- Improve Rieboldt Creek Public Access by replacing the existing native surface lot with a gravel parking lot and adding a gravel base or a geo-textile base to the canoe launch.
- Continue to support the regional snowmobile trail network by providing a route for a trail at an appropriate location with a cooperating land use agreement.

Resource Management

Table 27: Mud Lake Wildlife Area Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	57	3
Upland Coniferous Forest	377	17
Upland Grass	33	1
Forested Wetland	1458	64
Open Wetland/Marsh	175	8
Shrub Wetland	116	6
Water	19	1
Total	**2266**	**100**

State Natural Areas of Mud Lake Wildlife Area

SNA Name	Existing Acres	Proposed Acres	Total Acres
Mud Lake State Natural Area	2,317.0	0.0	2,317.0

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map I-4.

Area 1: Mud Lake Native Community Management Area

Classification: Native Community Management Area
Size: 2460 acres
Overlay: State Natural Area (entire management area)

Management Objectives

- Protect and perpetuate the unique mix of natural communities (Northern Wet-Mesic Forest, Sedge Meadow, Wetland and Stream) and maintain the area as an ecological reserve.
- Protect and monitor the critical habitat for the Hine's emerald dragonfly.

Management Prescriptions

- Passively manage the management area, except for control of invasive species.
- Follow standard department practices for invasive plant and animal management.
- Do not salvage trees following a catastrophic event (e.g. wind, fire, ice damage, forest pests).
- Perform biannual SNA site inspections and conduct presence/absence surveys for Hine's emerald dragonfly.

Area 2: Mud Lake Habitat Management Area

Classification: Habitat Management Area
Size: 394 acres

Management Objective

- Maintain and enhance the quality of the existing habitats for the benefit of resident and migratory wildlife and fish.

Management Prescriptions

- Maintain some appropriate areas in early successional habitats (aspen and grasslands); the location and acreage is to be determined by wildlife management and forestry staff.
- Regenerate aspen by coppice harvesting. Where harvests are large enough, follow Green Tree Retention Guidelines by leaving 5-15% cover via individual trees, groups or a combination thereof. Prescribed fire is utilized to maintain open grassland habitat within these management areas.
- In the Cedar type (outside of the SNA overlay), primarily use thinning from below or free thinning as the primary intermediate treatment. Apply intermediate thinning based on an assessment of residual stand density and site characteristics for feasibility/wind throw risk. Regenerate cedar if possible; it is recognized that reliable regeneration of cedar presents future silvicultural challenges. Forestry BMPs for water quality and habitat protection for endangered, threatened and special concern species limit most forest management activities to frozen ground conditions.

Resource Management Infrastructure

- Maintain the existing primitive management roads at the at their current level.

SEAGULL BAR WILDLIFE AREA (MARINETTE COUNTY)

Seagull Bar is a sand spit and marsh off the shore of the City of Marinette, in Marinette County. It contains the only true dune complex along Green Bay and is an important migratory bird staging area. The sand spit shelters a lagoon and large area of shallow water with emergent vegetation. The eastern edge of the bar has a system of sand ridges and dunes that have resulted from wave action and sand deposition. The acreage of exposed land is always changing due to the bay's fluctuating water level. The area is a noted bird migration stopping point on Green Bay. During some spring and fall migrations, shorebirds by the thousands congregate here. The lagoon is attractive to waterfowl.

Property Designation	Wildlife Area
DNR and Other Lands	Map O-1
DNR Fee Acres	90.00
DNR Easement Acres	0.0
Total DNR Acres	90.00
NRB Acquisition Goal	90.00

Seagull Bar Wildlife Area is managed by DNR and the entire property was designated a State Natural Area in 1962.

Property Management, Development and Use

Recreation Management

There are no designated trails or roads or parking lots on this property. Foot access is via Red Arrow Park in Marinette.

Management Objective

- Provide opportunities for birding.

Management Prescription

- Provide foot access from Red Arrow Park in Marinette. Manage access and use to be consistent and compatible with the native community management objectives for the property. Limit public access as necessary to protect habitat and nesting activity.

NR 44 Land Management Classification

Seagull Bar is designated as a Native Community Management Area (Map O-4).

Resource Management

The land cover for Seagull Wildlife Area can be found on Map O-3.

Table 28: Seagull Bar Wildlife Area Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	7	17
Upland Grass	32	83
Total	**39**	**100**

Area 1: Seagull Bar Native Community Management Area

Classification: Native Community Management Area
Size: 116 acres
Overlay: State Natural Area (entire management area)

The property is managed to protect and perpetuate a unique Great Lakes Beach and Dune native community and the associated plant and wildlife species that are representative of this community in the Northern Lake Michigan Coastal Ecological Landscape.

Management Objectives

- Provide and protect a Great Lakes Beach and Dune Community reserve.

- Promote and protect habitat and nesting conditions suitable for successful nesting for the federally endangered Piping Plover.

Management Prescriptions

- Install predatory excluder devices if Piping Plovers attempt nesting.
- Limit access to the beach as necessary during the nesting time for Piping Plover.
- Passively manage the Great Lakes Beach and Dune Community.

STATE HABITAT AREAS

NORTH BRANCH BEAVER CREEK FISHERY AREA (MARINETTE COUNTY)

North Branch Beaver Creek Fishery Area provides an excellent brown and brook trout stream, conducive to high productivity.

Property Designation	Fishery Area
DNR and Other Managed Lands	Map J-1
DNR Fee Acres	1161.37
DNR Easement Acres	12.09
Total DNR Acres	1173.46
NRB Acquisition Goal	1,699.99

The trout stream is 11.9 miles long (9.1 miles are Class 1; 2.8 miles are Class 2 trout fishery). It has an average width of 15 feet. Walker Creek is one of two tributary streams to the North Branch. Both streams have natural reproduction of trout and the area has numerous springs providing cold water to the system. There are also two small, ephemeral tributaries.

The North Branch of Beaver Creek is a tributary of the Beaver Creek watershed, flowing into the lower Peshtigo River basin. Located in the southwest corner of Marinette County, the North Beaver drains a 23-square mile area of Beaver Township.

Establishment of this fishery area grew out of a partnership between the department, local sporting groups, and Marinette County in 1959. Projects focused on fencing to reduce livestock damage to the stream. A town road was re-routed to avoid an area known as Williston Springs and to traverse a less sensitive portion of the area. In-stream habitat projects were implemented to improve habitat for brook and brown trout.

Existing Conditions

The objective for this project is to manage and protect the area to perpetuate the trout population within the North Branch of Beaver Creek, manage habitat for fish (primarily trout) and wildlife, implement sustainable forest management, and provide opportunities for wildlife, fishing and other nature-based recreation. Forest management is informed by stand type and location relative to the stream corridors of the North Branch Beaver Creek and Walker Creek. Much of the area along the streams is in passive management or in extended rotation to preserve canopy cover and avoid soil compaction. Type conversion along the stream corridors is occurring naturally or by design in places; forest management that would encourage use of the streams by beaver is not conducted. Within the sites available for silvicultural management, the primary management objective is to ensure the regeneration and future productivity of mature, over-mature, and declining stands. Aspen, oak, and red maple stands will be managed on an even-aged basis to regenerate these forest types.

Recent work that replaced a perched culvert at 21st Rd (Holley's Hole) changed the nature of the stream. Consequently, continued maintenance of the accessible fishing platform at this site needs to be conducted. In 2012, a sand trap was constructed below 21st Road (Holley's Hole) to collect sediment impounded by the perched culvert. This trap was maintained for a few years. Two stream segments (25th and 21st Roads) are surveyed every other year to detect trends and assess natural reproduction of the brook and brown trout populations.

Most of this property is forested. Of the 1,152 acres, only 72 acres are non-forest cover types. The remaining 1,080 acres are split almost equally between stands scheduled for management and those where passive management is prescribed. Forest management has focused on upland portions of the Fishery Area and longer-lived mid-tolerant species have been encouraged along the stream corridor. A 200-foot buffer has been delineated along the stream to prevent soil compaction and ensure water quality is maintained. This buffer strip is primarily composed of swamp conifers on organic soils, particularly cedar, and is passively managed.

Approximately 70% of the forested acres on the property are lowland cover types, and most of the passive management prescriptions are in these stands. Upland timber types include aspen, oak, red maple, and northern hardwoods with minor inclusions of pine and birch. Even-aged management of aspen and oak will be implemented unless the location of aspen stands is such that beaver are likely to benefit. Even–aged management or all-aged management will be prescribed in the red maple or northern hardwoods depending on landscape location and site characteristics. Management in the pine types will generally emphasize long rotations and large tree development in red and white pine. Jack pine will be managed with an even-aged prescription.

The white cedar and tamarack stands adjacent to Beaver Creek meet the criteria for consideration as High Conservation Value Forest Area and will be designated as a Native Community Management Area.

• Biotic Inventory status: No comprehensive biotic inventory has been conducted on this property. Fish population assessments and incidental observations of rare species have been conducted.

• Rare species: A Natural Heritage Inventory (NHI) query of the North Branch of Beaver Creek property yielded two rare species, one reptile and one invertebrate.

Wildlife populations are monitored using a variety of surveys to determine harvest levels, evaluate management practices, and determine levels of public use. Invasive species threats and control opportunities are described in section one of this chapter.

Property Management, Development and Use

NR 44 Land Management Classification

North Branch Beaver Creek Fishery Area is divided into two NR 44 land management classifications (Map J-4). They are two Habitat Management Areas totaling 1940 acres and a Native Community Management Area (177 acres). Management for each is described below.

Recreation Management

Recreation Objectives

- Provide high quality fishing opportunities, manage habitat for fish (primarily trout) and wildlife, and provide opportunities for hunting and other wildlife and nature-based recreational activities.
- Provide an appropriate level of public access to support public use, consistent with the physical capability of the property.

Recreation Prescriptions

- Improve and maintain visitor access to the stream by developing and maintaining signed primitive trails from the parking areas.
- Place informational kiosks at designated parking lots or other suitable locations on the trails. These should include a property map, what activities are lawful on the property, and fisheries related information.
- Maintain the seven public parking areas and their access roads shown on Map J-2. The property does not have any management roads.

Resource Management

North Branch Beaver Creek land cover is depicted on Map J-3.

Table 29: North Branch Beaver Creek Fishery Area Land Cover

Land Cover	Current	
	GIS Acres	**% Cover**
Upland Broad-leaved Deciduous Forest	191	17
Upland Coniferous Forest	28	3
Upland Grass	18	2
Oak	71	6
Forested Wetland	734	67
Open Wetland/Marsh	6	1
Shrub Wetland	42	4
Developed	4	0
Total	**1092**	**100**

Resource management on DNR lands is organized by land management classification areas. The areas described below are depicted on Map J-4.

Area 1: Fishery and Stream Corridor

Classification: Habitat Management Area
Size: 549 acres

This management area is a zone within 200 feet of each bank of North Branch Beaver Creek and Walker Creek, shown on Map J-4.

Management Objectives

- Improve, maintain and construct additional in-stream habitat infrastructure as needed in appropriate locations to provide and maintain high quality trout habitat and fishing opportunities.
- Manage the stream corridor to protect water quality.

Management Prescriptions

- Passively manage the forest within 200 feet of the stream, providing a buffer area to protect water quality and prevent soil compaction. Encourage longer-lived mid-tolerant tree species along the stream corridor.
- As needed, conduct stream and streambank habitat and fishing access maintenance and enhancement activities. This may be in the form of stream crossings (i.e. culverts and bridges), bank cover and wing deflector combinations (20), brush bundling (2 miles), spawning habitat enhancement, fishability brushing (2 miles), and shoreline stabilization. Habitat work should be coordinated by the property manager and local fisheries biologist.
- Use standard department practices to manage invasive plants and animals.
- Remove the remnants of the "Evergreen Hatchery", located on 33rd Rd. Items to be removed include an old shed/lean-to and other miscellaneous materials (i.e. dock and I-beams). Remove the old culvert on Walker Creek that provided access to the hatchery (T31N, R19E, S14). Walker Creek is approximately 1 meter wide at this location.
- Regularly monitor for beaver activity (i.e. dams and colonies). Conduct beaver control and management within the fishery area to maintain free flowing conditions that are essential for trout migration during their upstream fall spawning migration.
- In cooperation with Trout Unlimited, repair the fishing platform at 21st Rd and install a bank cover and wing deflector to attract and hold fish for anglers utilizing the platform.

Area 2: Backland

Classification: Habitat Management Area
Size: 1390 acres

Management Objectives

- Protect water quality and trout habitat.
- Provide long-term opportunities for wildlife and nature-based recreation through the application of sustainable forest management techniques to ensure the regeneration and future productivity of mature, over-mature, and declining stands.

Management Prescriptions

- Passively manage lowland cover types where appropriate to maintain and protect hydrology and stream water quality.
- Do not conduct any forest management activity that would encourage beaver use of the streams.

- Use even-aged management or all-aged management in the red maple or northern hardwoods depending on landscape location and site characteristics.
- For red and white pine, manage for long rotations and large tree development. Use even-aged management for Jack pine.
- For other management actions, follow the universal management prescriptions.

Area 3: White Cedar and Tamarack Woods

Classification: Native Community Management Area
Size: 177 acres

Management Objective

- Passively manage lowland conifer cover types to maintain and protect hydrology and stream water quality.

Management Prescription

- Allow natural processes to shape the structure and function of this area.

MINOR STATE HABITAT AREAS

Habitat management areas may be managed for a wide variety of purposes, including focused species production and protection. Habitat areas also provide opportunities for compatible recreational uses, particularly those that are nature-based, such as hunting, hiking, bird-watching, photography and nature study. The DNR has authority to acquire habitat management lands around the state and there are 13 small habitat management areas located in the NLMC region.

NR 44 Land Management Classification

All minor state habitat areas designated as Habitat Management Areas.

Management Objectives

- Maintain and enhance the habitats and landscapes to sustain game and other fish and wildlife populations and to support related recreational activities.

Management Prescription

- For each specific habitat and forest type, follow the management prescription found in the common elements prescription library (Appendix A).
-

Table 30: Minor State Habitat Areas

Map Reference	Proposed Property Name	Acres	Public Access
X-5	Barkhausen State Habitat Area*	45.89	Closed to Public Access
Z-5	Big Creek State Habitat Area	19.92	Open to Public Access

Map Reference	Proposed Property Name	Acres	Public Access
Y-5	Bass Lake Marinette State Habitat Area*	39.14	Closed to Public Access
AF-5	Little River State Habitat Area**	53.17	Open to Public Access
AG-5	Little Suamico State Habitat Area	11.97	Open to Public Access
AB-5	Cowyard Rips State Habitat Area	47.10	Open to Public Access
AI-5	Pensaukee River State Habitat Area	15.34	Open to Public Access
AA-5	Big and Little Marsh State Habitat Area	10.42	Open to Public Access
AD-5	Egg Harbor Cliffs State Habitat Area	0.86	Open to Public Access
AL-5	Suamico River State Habitat Area	10.88	Open to Public Access
AK-5	Strawberry Creek State Habitat Area	74.00	Open to Public Access
N/A	Montana Lake Fishery Area**	105.73	Open to Public Access
N/A	Sister Islands Habitat Preserve	1.94	Open to Public Access

*Note that Barkhausen and Bass Lake Marinette State Habitat Areas are closed to public access because they are protective easements on private property.

**Note that Montana Lake Fishery Area and Little River State Habitat Area have public access sites located on them. The NR 44 land management classification for the launch sites is Recreation Management Area – Type 4. The launch on the north shore of Montana Lake is managed by the Town of Pound. This access site will continue to be managed as it has been in the past. The remaining 90 acres is classified as Habitat Management Area and will be managed as such. The Little River launch will also continue to be managed as it has been in the past.

STATE NATURAL AREAS

JUNG HELMLOCK-BEECH FOREST STATE NATURAL AREA (SHAWANO COUNTY)

Size: 80 acres

Existing Conditions

Description of Site

The outstanding features of the site are its uniformity and the presence of hemlock seedlings and saplings, which is unlike most sites where the young hemlocks are heavily damaged by browsing deer. Shrubs include American fly honeysuckle, eastern leatherwood, and maple-leaved viburnum with sharp-lobed hepatica, common oak fern, yellow bluebead-lily, Indian cucumber-root, wintergreen, American starflower, and beech-drops, a root parasite of beech trees. Within the site are several small sedge-sphagnum bogs with scattered tamarack and black spruce. Also present are bog-laurel, leather-leaf, bog rosemary, and mountain holly with cotton grass, small cranberry, blueberry, pitcher plant, and sundew. At the south end is abandoned agricultural land now succeeding naturally to forest. Common nesting birds include wood thrush, red-eyed vireo, ovenbird, eastern wood pewee, and rose-breasted grosbeak. Jung Hemlock-Beech Forest is owned by the DNR, is a stand-alone SNA, and was designated a State Natural Area in 1976.

Significance of Site

Jung Hemlock-Beech Forest is a remnant of the extensive Northern Mesic Forest that once covered millions of acres in northeastern Wisconsin. It is one of the best remaining forests of its type in the northeast region. The woods contain old-growth hemlock, American beech, and sugar maple with yellow birch and scattered white pine. Beech is near the western limit of its range here. Tree size indicates the stand is between 180 and 230 years old.

Management Considerations

This old-growth Northern Mesic Forest is currently passively managed, except for invasive species control. No invasive species have been found on the site, however garlic mustard is a concern, as is beech bark disease (problematic in Door County, and known from other counties adjacent to Jung Hemlock-Beech Forest SNA) as well as hemlock wooly adelgid (not yet known in Wisconsin). Hunting should continue to be encouraged on this site, as deer browsing is a significant potential threat to hemlock seedlings and saplings as well as the rest of the forest understory.

Property Management, Development and Use

NR 44 Land Management Classification

Jung Hemlock-Beech Forest State Natural Area is designated as a Native Community Management Area.

Recreation Management

The only public facility on this property is a small native surface parking lot. Recreational opportunities at Jung Hemlock-Beech Forest include birding, hunting, trapping, gathering wild edibles and wildlife viewing.

Access will be maintained at its current size and level of development. Recreational opportunities will remain the same.

Resource Management

Jung Hemlock-Beech Forest State Natural Area land cover is depicted on Map F-3.

Table 31: Jung Hemlock-Beech Forest State Natural Area Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Coniferous Forest	74	96
Open Wetland/Marsh	3	4
Total	**77**	**100**

Management Objective

- Maintain the site as an old-growth Northern Mesic Forest ecological reference area.

Management Prescriptions

- Passively manage the site, except for invasive species control.
- Encourage deer hunting on the site to help control deer numbers.

KROENKE LAKE STATE NATURAL AREA (SHAWANO COUNTY)

Size: 150.67 acres

Existing Conditions

Description of Site

Kroenke Lake features a variety of natural community types including Northern Dry-mesic Forest, Wet-mesic Forest, and an undeveloped seepage lake. Situated on rough morainal ridges near the lake is a mature Dry-mesic Forest of variable composition. The canopy is composed of large red oak, red maple, and white ash with white pine. Associate species are basswood, white oak, big-tooth aspen, black cherry, paper birch, and butternut. The more mesic lower slopes support species such as beech, hemlock, balsam fir, yellow birch, and a small amount of upland white cedar. Both hemlock and cedar are reproducing. The sub-canopy sapling layer is composed of red maple, ironwood, eastern hop-hornbeam, and beech. The shrub layer varies in density with species including leatherwood, alternate-leaved dogwood, and beaked hazelnut.

The ground layer of Kroenke Lake SNA is comprised of bracken fern, elliptic shin-leaf, interrupted fern, intermediate wood fern, Canada anemone, and Canada mayflower. West of the lake is a Wet-mesic Forest which is part of a larger swamp complex that extends north into the Menominee Indian Reservation. The swamp is dominated by white cedar with hemlock, tamarack, black spruce, and black ash. Trees are primarily small to medium sized though patches of larger cedar and hemlock are present. White cedar, hemlock, and yellow birch are reproducing well in places. The ground layer includes yellow bluebead lily, three-leaved goldthread, leatherleaf, and Labrador tea. Alder is common in some areas, as is marsh

marigold, indicating probable groundwater movement. Birds include pileated woodpecker, common raven, wood duck, Cooper's hawk, yellow warbler, yellow-rumped warbler, brown creeper, pine grosbeak, and northern harrier. Kroenke Lake is owned by the DNR and was designated a State Natural Area in 2006.

Significance of Site

Kroenke Lake is a remnant of the extensive patchwork of lowland and Northern Dry-mesic Forest that once covered millions of acres in northeastern Wisconsin. Along with other small SNAs in the region, it is one of the best remaining forests of its type in northeast Wisconsin. The forest contains large diameter sugar maple, red oak, white pine, and hemlock.

Management Considerations

The Northern Mesic Forest community is comprised of numerous large diameter trees, especially red oak. In these stands, forest management is encouraged to accelerate the development of old-growth characteristics. The cedar and tamarack stands will be passively managed, except for invasive species control. Approximately 18 acres of sharecropping fields will be converted to fenced tree plantings over time. Hunting should continue to be encouraged on this site, as deer browsing is a significant potential threat to oak seedlings and saplings as well as the rest of the forest understory.

Property Management, Development and Use

NR 44 Land Management Classification

Kroenke Lake State Natural Area is designated as a Native Community Management Area.

Recreation Management

There is a small native surface parking lot on this property (Map G-2). In addition to informal hiking and snowshoeing trails, other recreational opportunities at Kroenke Lake include birding, hunting, trapping, gathering wild edibles and wildlife viewing. Access will be maintained at its current size and level of development. Recreational opportunities will remain the same.

Resource Management

Kroenke Lake State Natural Area land cover is depicted on Map G-3.

Table 32: Kroenke Lake State Natural Area Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Broad-leaved Deciduous Forest	34	24
Upland Coniferous Forest	2	2
Oak	43	30
Forested Wetland	40	28
Water	7	5
Farmland	18	12

Land Cover	Current	
	GIS Acres	% Cover
Total	**144**	**100**

Management Objectives

- White cedar and tamarack stands (Stands 4, 8, 11, 12): passively manage as a reserve for swamp conifers; allow natural processes to determine the structure of these older forests and wetlands.
- Red Pine (Stand 7): the long-term objective is to convert it to a mixed deciduous cover type.
- Aspen stands (Stand 5): convert to longer lived species cover types.
- Oak and mixed deciduous stands (Stands 1, 3, 4): the long-term objective is to create old-growth characteristics.
- Mixed Deciduous tree plantings (Stand 12): promote natural cover type diversity for the area. Use timber harvests to increase initial growth and vigor of species with the long-term goal of creating old-growth characteristics.

Management Prescriptions

- White Cedar and Tamarack: conduct no active management in these stands.
- Red Pine Plantation: apply even-aged management following the standard order of removal guidelines. Evaluate invasive species prior to timber harvesting. Harvest dates may need to be deferred until invasive species are addressed.

[Note: This two-acre stand has never been thinned and is in danger of being lost to wind or disease if not thinned soon. The trees have very poor crown ratios and many have already died or tipped over from insect infestation or wind. The intent of the initial thinning is to thin following the even-aged order of removal to maintain vigor. The average basal area measured in 2007 was 230 sq.ft./acre. No more than 1/3 of the volume should be removed in this thinning to prevent more shock to this stand. Eventually this stand will be replaced naturally by hardwood regeneration from below, but proper thinning to maintain vigor will allow for some of these trees to live out their natural lifespan as scattered sentinel trees through time.]

- Aspen: these stands are small and scattered. Selectively harvest individual aspen and non-desirable trees such as boxelder and black locust to promote conversion to oak or mixed deciduous.
- Oak and Mixed Deciduous: Use uneven-aged selection harvests to encourage long-term multi-aged diversity. Use basal area guidelines recommended for managed old growth.

[Note: Create gaps to encourage age class diversity and edge cover. Retain snags, cavity trees, or other trees having special value to wildlife. Where there is a shortage of standing dead snags (based on managed old growth guide) poorer quality large diameter trees that normally would be harvested in a timber sale could be girdled to create the desired condition. Leaving some ash instead of liquidating ash when emerald ash borer does reach this area would also provide a source of live and dead snag trees for the foreseeable future. Black locust and other undesirable tree species will be removed in first harvest.]

- *Mixed Deciduous (tree plantings):* Maintain and plant native hardwoods with scattered white pine to restore the site to species associated with climax northern hardwoods that would normally be seen on this soil type such as sugar maple, basswood and beech.

[Note: Maintain the existing tree plantings through spraying and fencing until seedlings reach a height where they will not be detrimentally browsed by deer. As current plantings reach established conditions, establish new plantings adjacent to them and fence (reuse fencing when possible).]

TELLOCK'S HILL WOODS STATE NATURAL AREA (WAUPACA COUNTY)

Size: 52 acres

Existing Conditions

Description of Site

Tellock's Hill Woods is an old-growth Northern Mesic Forest on the north-facing slope of a drumlin. The drumlin, a hill with a streamlined ovoid shape formed by advancing glacial ice, has an unusual sandstone core exposed in a deep ravine. On the gentle north-facing slope is a relatively undisturbed beech-maple forest with a nearly complete canopy cover. Other species include hemlock and basswood. The ground layer is rich with an abundance of spring ephemerals and woodland wildflowers such as spring beauty, Dutchman's-breeches, blue cohosh, large-flowered trillium, nodding wake robin, downy yellow violet, maidenhair fern, false rue anemone, and rosy twisted stalk. The steeper northern slope is strewn with large boulders and wooded with nearly pure hemlock although sugar maple and an occasional yellow birch are present. The understory is sparse due to the near complete shading of the hemlock. The lower and more level bottomlands at the hill's base contain ash and elm with irregularly spaced, low wet areas. Red-backed and blue spotted salamanders, yellow-throated vireo, ovenbird, wood thrush, pileated woodpecker, and broad-winged hawk are common inhabitants of the forest. Tellock's Hill Woods is owned by the DNR and was designated a State Natural Area in 1972.

Significance of Site

Tellock's Hill Woods is a remnant of the extensive Northern Mesic Forest that once covered millions of acres in northeastern Wisconsin. Along with other small SNAs in the region, it is one of the best remaining forests of its type in northeast Wisconsin. The woods contain old-growth American beech and sugar maple, along with hemlock, yellow birch and basswood. Beech is near the western limit of its range here.

Management Considerations

This old-growth Northern Mesic Forest is currently passively managed, except for invasive species control. No invasive species have been found on the site, however garlic mustard is a concern, as is beech bark disease (known in Door County) and hemlock wooly adelgid (not yet known from Wisconsin). Hunting should continue to be encouraged on this site, as deer browsing is a significant potential threat to hemlock seedlings and saplings as well as the rest of the forest understory.

Property Management, Development and Use

NR 44 Land Management Classification

Tellock's Hill Woods State Natural Area is designated as a Native Community Management Area.

Recreation Management

The only public facility on this property is a small native surface parking lot. Recreational opportunities at Tellock's Hill Woods include hunting, trapping, gathering wild edibles, birding and wildlife viewing. Access will be maintained at its current size and level of development. Recreational opportunities will remain the same.

Resource Management

Tellock's Hill Woods State Natural Area land cover is depicted on Map P-3.

Table 33: Tellock's Hill Woods State Natural Area Land Cover

Land Cover	Current	
	GIS Acres	% Cover
Upland Broad-leaved Deciduous Forest	33	67
Upland Coniferous Forest	14	27
Oak	3	6
Total	**50**	**100**

Management Objective

- Maintain the site as an old-growth Northern Mesic Forest ecological reference area.

Management Prescriptions

- Passively manage the site, except for invasive species control.
- Encourage deer hunting on the site to help control deer numbers.

MINOR STATE NATURAL AREAS

There is only one minor DNR owned state natural area in the region. This 2.5-acre site is embedded within the much larger, non-profit owned and managed, North Bay State Natural Area (1,259 acres). The DNR will collaborate with the managers of the larger parcel in the management of our small parcel.

NR 44 Land Management Classification

All minor State Natural Areas are designated as Native Community Management Areas.

Table 34: Minor State Natural Areas

Map Reference	Proposed Name	Acres
AH-5	North Bay State Natural Area	2.5

ADMINISTRATIVE PROPERTIES

The DNR owns scattered properties in the region that serve internal administrative needs only. This master plan does not control the specific operations or development of facilities within these areas. Administrative and operational facilities are managed under separate state administrative processes.

NR 44 Land Management Classification

All administration areas are designated as Special Management Areas.

The management objective is to provide and maintain areas and facilities for the administration and maintenance support of the property. Additional administrative policies and directives may apply.

Table 35: Administration Areas

Map Reference	Existing or Proposed Property Name	NR 44 Land Management Classification
AR-5	Sturgeon Bay Service Center	Special Management Area
AK-5	Strawberry Creek State Hatchery	Special Management Area
N/A	Gresham Station	Special Management Area
N/A	Oconto Falls Ranger Station	Special Management Area

SECTION TWO: REAL ESTATE SECTION

OVERVIEW

The Wisconsin Department of Natural Resources (department) purchases land to manage and protect natural resources and to provide recreational opportunities to all residents and visitors to the State of Wisconsin. Through the land acquisition program, wetlands, forests, scenic areas, prairies, savannas, wildlife and fish habitat, rare species habitat, glacial features and other resources are being protected and managed.

The Real Estate Section within the department's Bureau of Facilities and Lands acquires land through fee title, easements, donations and leases. The section also conveys leases, easements, agreements and permits associated with land ownership. The section also manages the selling of land no longer necessary for the state's use for conservation purposes. It implements the payment in lieu of tax system (PILT), resolves trespass settlements and engages in other activities aimed at preparing the land for long-term public use and benefit.

REAL ESTATE MANAGEMENT AND MASTER PLANNING

Through master planning, the department's entire real estate portfolio is reviewed and analyzed. The topics listed below are all considered and reviewed during a planning process. This analysis allows the department to identify future real estate management goals, which are then included as a part of the master plan.

Land Acquisition

The department acquires lands under the authority of sec. 23.09(2)(d), Wis. Stats., from willing sellers. At times, it is in the best interest of the department and landowner for the department to acquire partial rights to a property (easement or lease). Acquisition priorities are identified in the master plan and are, in most cases, visually represented through the department's project boundaries.

Acquisitions for department properties vary from year to year and are based on several factors, such as resource management or recreation needs and the availability of funding, which may be from a variety of sources.

Land Sales

The department's Natural Resources Board (NRB), at times, may sell lands and structures under its jurisdiction, except central or district office facilities, when the NRB determines that those lands are no longer necessary for the state's use for conservation purposes (sec. 23.15 (1), Wis. Stats.). Upon receiving payment, the department deposits the funds into the conservation fund to be used exclusively for purchasing other land for the creating and establishing of public hunting and fishing grounds, wildlife and fish refuges, state parks, and/or land in the Lower Wisconsin State Riverway (sec. 23.15 (4), Wis. Stats.).

Conveyed Easements, Access Permits, and Land Use Agreements

Conveyed Easements provide access across state property for utilities, town roads, county highways and in some cases individuals. Easements are permanent and cannot be changed by a master plan. Access Permits provide access across state property to private land owners adjacent to department lands. Land use agreements provide for a variety of uses on a department property that are consistent with the property's master plan, such as bike trails.

Payment in Lieu of Taxes

The department makes an annual payment in lieu of taxes (PILT) under ss. 70.113 and 70.114, Wis. Stats., to the appropriate municipality for all property it owns in fee title. More detailed information on how the department pays PILT may be found at dnr.wi.gov by searching for the keyword "PILT".

Project Boundaries and Stream Bank Eligible Streams

Project boundaries and stream bank eligible streams (SBES) are established areas on the landscape, created by a Natural Resources Board (NRB) action, as a preferred area where the department may acquire land. Through the planning process, changes on the landscape and changing recreation and resource needs are identified. These factors may lead to proposed changes to the boundary or SBES in a master plan, under the authority in Manual Code (MC) 2212, MC 2105.2, MC 2210.03, sec. 23.094, Wis. Stats and s. NR 51.60 Admin. Code.

Acquisition Authority

An acquisition authority is created by the NRB, which allows the department to acquire land for a specific purpose/land use. An example of this is the authority to purchase land for Devil's Lake State Park. This authority identifies a targeted area on the landscape within a project boundary to be used for state park purposes. Another example is the Statewide Public Access authority, which allows the department to acquire lands adjacent to rivers and lakes to provide public access to waterways. This authority does not have specific project boundaries; it is statewide in nature. As such, it allows lands to be acquired along these water features anywhere in the state. New, or changes to, existing acquisition authorities are sometimes proposed as a part of the master plan.

Acquisition Goal

When an acquisition authority is created by the NRB, an acquisition acreage goal for that authority is also established. This is the total acreage that can be acquired by the department under that specific acquisition authority. Acquisition goal changes are sometimes proposed as a part of the master plan.

Property Naming

Under the authority of MC 2281.1, the NRB has the authority to name a property that has not been expressly named by the Legislature. Property name changes are sometimes proposed during a master plan.

Property Redesignation

Under the authority of s. NR 1.415, Wis. Admin. Code, the NRB has the authority to periodically review land use designations (acquisition authorities) to determine whether a redesignation will secure better management. Property redesignations are sometimes proposed during a master plan.

REAL ESTATE ACTIONS

Clean up of Project Boundaries

Project boundaries in the past may have been developed using parcel maps or aerial photographs rather than the Geographic Information Systems (GIS) tools that exist today. This GIS technology has improved in accuracy over time. In some cases, it is clear the original intent of the project was to follow the nearest river, road or existing department ownership, but because of changing technology, a boundary line may be slightly "off" from these features. With NRB approval of this plan, where applicable, some project boundaries included in this master plan will be snapped to, or aligned to better define these boundaries. These snapped areas are very small in size, usually less than 0.1 acres, or are snapped a few feet to the nearest feature.

Statewide Scattered Acquisition Property Naming

Included in the Northern Lake Michigan Coastal master plan are unnamed properties purchased under a variety of statewide scattered acquisition authorities (Extensive Wildlife, Scattered Wildlife, etc.). These parcels do not currently have a NRB approved (official) local name identifying them. The master plan team used MC 2281.1 as well as internal draft naming guidance to propose names for these properties. Those

naming and property grouping recommendations are included as a part of this plan and are described, as applicable, below, as well as in Appendices D and E, and map series 5.

Property Specific Real Estate Actions

Seagull Bar Wildlife Area (Map O-5) – Proposed name Seagull Bar State Natural Area

- Redesignate the Seagull Bar Wildlife Area to the Statewide Natural Areas authority.
- Transfer 90 acres of acquisition goal from Seagull Bar Wildlife Area to Statewide Natural Areas.
- Establish an official local name of Seagull Bar State Natural Area for these parcels.

The purpose of this redesignation is to secure better management. Currently the Natural Heritage Conservation Bureau is the primary manager this property even through it is currently a Wildlife property. A State Natural Area (SNA) overlay encompasses the entire property. The nature of the property and the current management would be better suited to be housed with the SNA program.

Heins Creek Fishery Area

This project currently has no department ownership (acquisition) within it. It encompasses Heins Creek, which connects Kangaroo Lake and Lake Michigan.

- The acquisition goal of the project will be increased by 16.55 acres.

The purpose of the acquisition goal increase is to have the existing project boundary acreage, excepting lands already owned by Door County Land Trust, match the acquisition goal acreage. If available, acquisition in the full extent of the project boundary is proposed.

Stony Creek Fishery Area (Map AV-5)

This project currently has no department ownership (acquisition) within it.

- Create a SBE eligible line from end of the existing project boundary to CTY J.
- No change to acquisition goal.

Stony Creek is tributary to Lake Michigan that supports an annual steelhead spawning run and fishery, supported primarily by stocking. This creek is 13.6 miles long, with a 54-square mile watershed comprised primarily of agricultural (64%), wetland (22%), forested (6%), and other (8%) land uses. The upper nine miles are classified as a warm-water forage fishery, while the lower five miles are classified as a cold-water fishery with a steeper gradient and rocky substrate. Native brook trout have been documented in Stony Creek. With habitat improvements, there is potential to support an improved cold-water trout fishery. Wild produced steelhead have also been documented in Stony Creek, and although Wisconsin tributaries produce relatively low numbers of wild salmonids for Lake Michigan, Stony Creek is one of Wisconsin's best tributaries for wild steelhead production. The lower stretch of Stony Creek, which is accessible via limited road crossings, is commonly accessed by anglers targeting Great Lakes salmon and trout during annual spawning runs. SBE authority is being requested for Stony Creek to protect the stream, expand public access for the important salmonid fishery, and to allow potential for future habitat improvement work.

North Branch Beaver Creek Fishery Area (Map J-5)

- Expand the project boundary to include lands owned by the department not currently in the project boundary (two parcels) in Township 31 North, Range 19 East, Section 11.
- Expand the project boundary to include land owned by the department not currently in the project boundary (one parcel) in Township 31 North, Range 2 East, Section 18.
- Expand the project boundary to include the easement held by the department in Township 31 North, Range 19 East, Section 13.
- No change in acquisition authority.

These actions are considered clean up, these parcels outside the project boundary are currently being managed and utilized by the public as a part of the larger Fishery Area.

Rieboldt Creek Public Access (Map I-5)

- Redesignate these parcels from Rieboldt Creek Public Access to Mud Lake Wildlife Area (Door).
- Transfer 121 acres of acquisition goal from Statewide Public Access to Mud Lake Wildlife Area (Door).
- This redesignation and transfer will decommission the Rieboldt Creek Public Access project.

This parcel is adjacent to the wildlife area and the current management and public use of the parcel indicate that it should be included as a part of the larger wildlife area. These actions will improve management functions by having one department program being the primary manager of the larger property area. Public access to the creek will still be maintained as a part of the wildlife area.

Mud Lake Wildlife Area-Door (Map I-5)

- Expand the project boundary to include Rieboldt Creek Public Access parcels (to be redesignated to Mud Lake Wildlife Area (Door)).
- Expand the project boundary to include fee and easement lands providing public access to the property off Birch Road and Sunset Drive in Township 31 North, Range 28 East, Section 34.
- Change in acquisition goal is as noted above in the Rieboldt Creek section.

The project boundary expansions are considered clean up, this parcels outside the project boundary are being redesignated to the Wildlife Area. These areas are currently being managed and used by the public as a part of the larger Wildlife Area.

Green Bay West Shores Wildlife Area (Charles Pond Unit) (Map U-5)

- Redesignate the Green Bay West Shores Wildlife Area parcel in this unit (Township 26 North, Range 21 East, Section 3) to the Statewide Natural Areas authority.

- Transfer 108 acres of acquisition goal from the Green Bay West Shores Wildlife Area to the Statewide Natural Area authority.

This entire unit is currently being managed as a state natural area (SNA) and is a dedicated SNA. Even though it is included in the Green Bay West Shores Wildlife Area project boundary, it will secure better management if the parcel is redesignated to the SNA program. This will more accurately reflect current and proposed future management of this unit.

Green Bay West Shores Wildlife Area (Peshtigo Harbor Unit) (Maps AQ3-5 and AQ1-5)

- Expand the project boundary around the Gift Lands (Map AQ1-5) parcel that is proposed to be redesignated into the Green Bay West Shores Wildlife Area.
- Expand the project boundary around the recently accepted gift lands from the Department of Transportation (Map AQ1-5) adjacent to the north portion of the Green Bay West Shores (Peshtigo Harbor Unit).
- Expand the project boundary around the Statewide Habitat Areas (Map AQ3-5) parcel.
- Change in acquisition goal is as noted below in the Gift Lands and Statewide Habitat Areas sections (Maps AQ1-5 and AQ3-5).

These actions are considered clean-up. These parcels are currently being used by the public and managed as a part of the larger Green Bay West Shores Wildlife Area. The project boundary expansion around the recently accepted Department of Transportation parcel is also considered clean up, since the Natural Resources Board has recently accepted this gift of land for the Green Bay West Shores Wildlife Area (Peshtigo Harbor Unit).

Gift Lands (Map AQ1-5)

- Redesignated this parcel from Gift Lands to Green Bay West Shores Wildlife Area (Peshtigo Harbor Unit).
- Transfer 0.53 acres of acquisition goal from Gift Lands to Green Bay West Shores Wildlife Area.

This small strip of land was gifted to the department and is currently being used by the public and managed as a part of the larger Green Bay West Shores Wildlife Area. The redesignation and acquisition goal transfer is a clean-up action to secure better management.

Gift Lands (Map AQ2-5)

- Redesignated the parcel from Gift Lands to Green Bay West Shores Wildlife Area (Rush Point Unit).
- Transfer 2.82 acres of acquisition goal from Gift Lands to Green Bay West Shores Wildlife Area.

This land was gifted to the department and is currently being used by the public and managed as a part of the larger Green Bay West Shores Wildlife Area. The redesignation and acquisition goal transfer is a clean-up action to secure better management.

Statewide Habitat Areas (Map AQ3-5)

- Redesignated the parcel from Statewide Habitat Areas to Green Bay West Shores Wildlife Area (Peshtigo Harbor Unit)
- Transfer 85.27 acres of acquisition goal from Statewide Habitat Areas to Green Bay West Shores Wildlife Area.

This parcel is currently being used by the public and is managed as a part of the larger Green Bay West Shores Wildlife Area. The redesignation and acquisition goal transfer is a clean-up action to secure better management by bringing the entire area under one program's administrative ownership.

Statewide Habitat Areas (Map AQ4-5)

- Redesignate the parcel from Statewide Habitat Areas to Green Bay West Shores Wildlife Area (Pecor Point Unit)
- Transfer 47.64 acres of acquisition goal from Statewide Habitat Areas to Green Bay West Shores Wildlife Area.

This parcel is currently being used by the public and managed as a part of the larger Green Bay West Shores Wildlife Area and is within the project boundary. The redesignation and acquisition goal transfer is a clean-up action to secure better management.

Gardner Swamp Wildlife Area (Map D-5)

- Expand the project boundary to include lands owned by the department not currently in the project boundary (one parcel) in Township 27 North, Range 24 East, Section 28.
- Increase acquisition goal by 92.84 acres to match the project boundary acreage, bringing the total acquisition authority acreage to 1222 acres.

The parcel proposed to be included in the project boundary was originally identified by the NRB to be held for sale or exchange. However, this parcel contains the headwaters to Keyes Creek and is important to both the Fish and Wildlife programs. This parcel historically has been managed by the department and is utilized by the public as a part of the larger Wildlife Area.

The wildlife program would like to increase the acquisition goal to match the project boundary to allow for the opportunity to acquire the three small remaining parcels in the project area.

Oconto Falls Ranger Station

- Increase acquisition goal by 4.36 acres to equal the current department acres owned for this property.
- Assign Forestry as the administrative land owner of this property.

The acquisition goal increase is considered clean up. This ranger station was comprised of two different parcels, one located off Wheelock Ave, was the historic ranger station and is in the process of being sold. The other parcel to the north, located off Marks Drive is the current ranger station site. When the new

parcel was acquired, the acreage goal was never approved to be updated to reflect the current ownership of the new parcel.

Forestry has acted as the administrative owner of this property. As such, this master plan will establish Forestry as the administrative manager of this property.

Gresham Station

- Assign Forestry as the administrative land owner of this property.
- No change to acquisition goal.

Forestry has acted as the administrative owner of this property. As such, this master plan will establish Forestry as the administrative manager of this property.

Statewide Public Access (Map C-5)

- Redesignate this parcel from Statewide Public Access to Copper Culture Mounds State Park.
- Transfer of 21.40 acres of acquisition goal from Statewide Public Access to Copper Culture Mounds State Park.

This Statewide Public Access parcel is currently being managed by parks, as a part of the park. There is a boat launch site on the parcel. The Fisheries program would like to redesignate this parcel to officially become part of the Park, with the understanding that the boat launch site continues to be maintained and utilized for public access purposes.

Copper Culture Mounds State Park (Map C-5)

- Expand the project boundary to encompass the Statewide Public Access parcel, to be redesignated to Copper Culture Mounds State Park.
- Change in acquisition goal is as noted above in the Statewide Public Access section (Map C-5).

This Statewide Public Access parcel is currently being managed by parks, as a part of the park. There is a boat launch site on the parcel, which will remain. This action will secure better management by clarifying current management and use of this parcel and will create efficiencies in management with one land holding program as the administrative owner in this area.

Europe Bay State Natural Area (SNA) (Map K-5)

- Contract the SNA project boundary, where it overlaps the Newport State Park project boundary, so that the two boundaries are adjacent to each other. Contract the SNA project boundary around other developed areas for a total contraction of 498.56 acres.
- Expand the SNA project boundary by 7.59 acres to include lands that are of SNA quality for potential acquisition for the SNA project.
- No change to acquisition goal.

These changes are considered clean-up actions. Currently the State Park and SNA project boundaries are overlapping each other. Since lands in the overlap area are already acquired for the Park, the Natural Heritage Conservation program has determined that a contraction of their project boundaries will result in improved data management. The other contraction and expansion of the SNA project boundary is to remove developed lands from the project boundary and include a small area of SNA quality lands for possible acquisition in the future.

Peninsula State Park (Map L-5)

- Expand the project boundary in three locations around lands that are a part of the state park in T31N, R27E, Sec 29, T31N R27E, Sec 32 and T31N, R27E, Sec 10.
- No change to acquisition goal.

This is a clean-up action. These three areas are already considered a part of the Park and are managed and utilized by the public as such.

Rock Island State Park (Map N-5)

- Expand the project boundary around the existing department ownership in T34N, R30E, Sec 28.
- Expand the project boundary around parcel to the south of existing department ownership in T34N, R30E, Sec28.
- Increase acquisition goal by 5.96 acres to allow for the acquisition of land in the expanded project boundary area.

This property is where the ferry lands to get to Washington Island. Inclusion of this property in the project boundary is a clean-up action. The expansion to the south of existing ownership is so, if acquired in the future, a larger parking area could be developed.

Whitefish Dunes State Park (Map Q-5)

- Expand the project boundary around the existing department ownership in T28N, R27E, Sec2.
- Expand the project boundary in two areas, one in T 28N, R27E, Sec10 and one area in T28N, R27E, Sec3.
- Change in acquisition goal is as noted below in the Scattered Forestlands section (Map Q-5).

The expansion around existing department ownership is considered a clean-up action, the property is already being used by the public, and is being actively managed as a part of the park. The other two expansion areas would be to acquire lands along the Whitefish Bay Creek, creating a corridor from Clark Lake to Lake Michigan.

Scattered Forest Lands (Map Q-5)

- Redesignate this parcel from Scattered Forest Lands to Whitefish Dunes State Park

- Transfer 0.5 acres of acquisition goal from Scattered Forest Lands to Whitefish Dunes State Park.

This property is currently being used by the Parks program for storage, for Whitefish Dunes State Park. There is currently a garage on the property. These actions are considered clean-up actions to reflect current use and management.

Statewide Habitat Areas (Map X-5) – Proposed Name Barkhausen State Habitat Area

- Redesignate this parcel from Statewide Habitat Areas to Habitat Area
- Acquisition goal transfer is not needed, since this is a closed to public access easement.
- Establish an official local name of Barkhausen State Habitat Area for this parcel

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of Barkhausen is a locally recognized name for this parcel. Since the easement the department holds on this parcel is closed to public access, the establishment of the unique name will primarily be for management and information technology systems efficiencies.

Statewide Habitat Areas (Map Y-5) – Proposed Name Bass Lake Marinette State Habitat Area

- Redesignate this parcel from Statewide Habitat Areas to Habitat Area.
- Acquisition goal transfer is not needed, since this is a closed to public access easement.
- Establish an official local name of Bass Lake Marinette State Habitat Area for this parcel.

The redesignation is a clean-up action related to the naming of this property. The name of Bass Lake and Marinette County is a locally recognized name for this parcel. Since the easement the department holds on this parcel is closed to public access, the establishment of the unique name will primarily be for management and information technology systems efficiencies.

Gift Lands (Map Z-5) – Proposed Name Big and Little Marsh State Habitat Area

- Redesignate this parcel from Gift Lands to Habitat Area
- Transfer 10.42 acres of acquisition goal from Gift Lands to Habitat Area
- Establish an official local name of Big and Little Marsh State Habitat Area
- Assign Parks as the administrative land owner of this property.
- Offer this parcel for sale to the general public. At the time of gift acceptance, the NRB approved that this parcel could be offered for sale, with the proceeds of said sale being deposited into the Parks account for future land acquisition. The department has re-affirmed the intent to offer this parcel for sale, as the parcel is no longer necessary for the state's use for conservation purposes.

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of Big and Little Marsh is a locally recognized name for this parcel.

Statewide Habitat Areas (Map AA-5) – Proposed Name Big Creek State Habitat Area

- Redesignate this parcel from Statewide Habitat Areas to Habitat Area

- Transfer 19.92 acres of acquisition goal from Statewide Habitat Areas to Habitat Area
- Establish an official local name of Big Creek State Habitat Area

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of Big Creek a locally recognized name for this parcel.

Statewide Habitat Areas (Map AB-5) – Proposed Name Cowyard Rips State Habitat Area

- Redesignate this parcel from Statewide Habitat Areas to Habitat Area
- Transfer 47.06 acres of acquisition goal from Statewide Habitat Areas to Habitat Area
- Establish an official local name of Cowyard Rips State Habitat Area

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of Cowyard Rips is a locally recognized name for this parcel.

Statewide Public Access (Map AC-5) – Proposed Name Cox Landing State Public Access

- Establish an official local name of Cox Landing Public Access
- No change to acquisition goal.

Cox Landing is a locally recognized name for this parcel(s).

Gift Lands (Map AD-5) – Proposed Name Egg Harbor Cliffs State Habitat Area

- Redesignate this parcel from Gift Lands to Habitat Area.
- No transfer of acquisition goal acreage is needed since this is a closed to public access easement.
- Establish an official local name of Egg Harbor Cliffs State Habitat Area
- Assign Natural Heritage Conservation (NHC) the administrative land owner of this property.

This easement was donated to the department to protect a Glacial Relic Snail on a small segment of the Niagara Escarpment, as such this is a recognizable name for staff. Since the easement the department holds on this parcel is closed to public access, the establishment of the name will primarily be for management and information technology systems efficiencies.

Statewide Public Access (Map AE-5) – Proposed Name George K. Pinney State Public Access

- Establish an official local name of George K. Pinney State Public Access
- No change to acquisition goal.

The name of George K. Pinney is a locally recognized name for this parcel(s).

Statewide Public Access (Map AF-5) - Proposed Name Little River State Habitat Area

- Redesignate these parcels from Statewide Public Access to Habitat Area.

- Transfer 10.11 acres of acquisition goal from Statewide Public Access to Habitat Area.
- (Along with the Little River Rearing Pond Parcels) Establish an official local name of Little River State Habitat Area for these parcels.

This statewide public access site is larger than most and provides good habitat and recreation opportunities. While the parcel is adjacent to Lake Michigan and the Little River and can be used for public access, the primary use and management of the parcel is habitat area. The name of Little River is a locally recognized name for these parcels. Public access to Lake Michigan and the Little River will be maintained on this property.

Little River Rearing Pond (Map AF-5) – Proposed Name Little River State Habitat Area

- The acquisition goal of the Little River Rearing Pond will be increased by 3.06 acres.
- Redesignate these parcels from Little River Rearing Pond to Habitat Area.
- Transfer 43.06 acres of acquisition goal from Little River Rearing Pond to Habitat Area.
- Along with the Statewide Public Access (Map AF-5 parcels) establish an official local name of Little River State Habitat Area for these parcels.

The actual owned acres for the Little River Rearing Pond is 3.06 acres more than the current acquisition goal. To accurately redesignate and transfer acquisition goal acres for these parcels (from Little River Rearing Station to Little River State Habitat Area) the total owned acres need to be accounted for in the acquisition goal. This parcel is not being used as a rearing station, but rather provides good habitat and recreation opportunities and should be designated as such. The name of Little River is a locally recognized name for these parcels.

Statewide Habitat Areas (Map AG-5) – Proposed Name: Little Suamico State Habitat Area

- Redesignate these parcels from Statewide Habitat Areas to Habitat Area.
- Transfer 11.97 acres of acquisition goal from Statewide Habitat Areas to Habitat Area.
- Establish an official local name of Little Suamico State Habitat Area for these parcels.

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of Little Suamico a locally recognized name for this parcel.

Gift Lands (Map AH-5) – Proposed Name: North Bay State Natural Area

- Redesignate these parcels from Gift Lands to Statewide Natural Area.
- Transfer 2.50 acres of acquisition goal from Gift Lands to Statewide Natural Area.
- Establish an official local name of North Bay State Natural Area for these parcels.
- Assign NHC as the administrative land owner of this property.
- Offer this parcel for sale to the adjacent property owner (The Nature Conservancy (TNC)), for inclusion into their dedicated North Bay State Natural Area. This will secure more efficient management of the entire SNA. If TNC is not interested, retain the parcel due to its SNA quality and adjacency to the dedicated North Bay SNA.

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of North Bay a locally recognized name for this parcel.

Statewide Public Access (AI-5) – Proposed Name Pensaukee River State Habitat Area

- Redesignate these parcels from Statewide Public Access to Habitat Area.
- Transfer 15.34 acres of acquisition goal from Statewide Public Access to Habitat Area.
- Establish an official local name of Pensaukee River State Habitat Area for these parcels.

This property has poor road access and is not being utilized as a public access site, due to its adjacency to HWY 41. The property's primary purpose is for habitat and public recreation. The name of Pensaukee River is a locally recognized name for this parcel.

Statewide Public Access (Map AJ-5) – Proposed Name Pensaukee River State Public Access

- Establish an official local name of Pensaukee River Public Access for these parcels.
- No change to acquisition goal.

The name of Pensaukee River is a locally recognized name for this parcel.

Statewide New Hatcheries (Map AK-5) – Proposed Strawberry Creek State Habitat Area

- Redesignate these parcels from Statewide New Hatcheries to Habitat Area.
- Transfer 74 acres of acquisition goal from Statewide New Hatcheries to Habitat Area.
- Establish an official local name of Strawberry Creek State Habitat Area for these parcels.

This portion of the Statewide New Hatchery parcel is not needed for hatchery purposes and could be utilized by the public for recreation, including hunting if redesignated. The name of Strawberry Creek is a locally recognized name for this parcel.

Statewide New Hatcheries (Map AK-5) – Proposed Name Strawberry Creek State Hatchery

- Establish an official local name of Strawberry Creek State Hatchery for these parcels.
- Changes in acquisition goal are as described above (proposed Strawberry Creek State Habitat Area)

This portion of the Statewide New Hatchery parcel is needed for hatchery purposes. The name of Strawberry Creek is a locally recognized name for this hatchery.

Statewide Habitat Areas (Map AL-5) – Proposed Name Suamico River State Habitat Area

- Redesignate these parcels from Statewide Habitat Areas to Habitat Area.
- Transfer 10.88 acres of acquisition goal from Statewide Habitat Areas to Habitat Area.

- Establish an official local name of Suamico River State Habitat Area for these parcels.

The redesignation and acreage goal transfer are clean-up actions related to the naming of this property. The name of Suamico River a locally recognized name for this parcel.

Statewide Public Access (Map AM-5) – Proposed Name Baileys Harbor State Public Access

- Establish an official local name of Baileys Harbor Public Access for these parcels.
- No change to acquisition goal.

The name of Baileys Harbor is a locally recognized name for this parcel.

Statewide Public Access (Map AP-5) – Proposed Name Rowleys Bay State Public Access

- Establish an official local name of Rowleys Bay Public Access for these parcels.
- No change to acquisition goal.

The name of Rowleys Bay is a locally recognized name for this parcel.

Statewide Public Access (Map AS-5) – Proposed Name Bay Rd. State Public Access

- Establish an official local name of Bay Rd. Public Access for this parcel.
- No change to acquisition goal.

The name of Bay Rd. is a locally recognized name for this parcel.

Statewide Public Access (Map AN-5) – Proposed Name: County P Peshtigo River State Public Access

- Establish an official local name of County P Peshtigo River State Public Access for this parcel.
- No change to acquisition goal.

The name of County P and Peshtigo River is a locally recognized name for this parcel.

Statewide Public Access (Map AR-5) – Proposed Name: Sturgeon Bay Service Center

- Create a new acquisition authority named Sturgeon Bay Service Center. This new acquisition authority is for correctly identifying and coding this parcel of land. No new acquisition goal will be needed for this new acquisition authority, as existing acquisition goal will be transferred from Statewide Public Access to Sturgeon Bay Service Center.
- Redesignate these parcels from Statewide Public Access to Sturgeon Bay Service Center
- Transfer 1.3 acres of acquisition goal from Statewide Public Access to Sturgeon Bay Service Center.
- Establish an official local name of Sturgeon Bay Service Center.

The name of Sturgeon Bay is a locally recognized name for this parcel. This parcel appears to have been incorrectly coded as a statewide public access parcel at the time of acquisition. Since the parcel's use is for the service center, the parcel redesignation and acquisition goal changes are proposed.

Proposed Bear Creek SBE Eligible Project Line (Map AU-5)

- Establish a SBE eligible line along Bear Creek from Lake Michigan to Midway Road.

Bear Creek is considered a cool-warm headwater stream and is a tributary to Lake Michigan. The stream is 4.6 miles long, situated within the 54-square mile Stoney Creek watershed comprised primarily of agricultural (64%), wetland (22%), forested (6%), and other (8%) land uses. The stream originates in marshland and flows through a marshland valley, thus providing habitat used by suckers and northern pike during spring spawning runs. Access is provided at the river mouth and at several road crossings. Historically, Bear Creek was stocked with steelhead and although not recently stocked, there is a spring run of steelhead and fall run of salmon that contribute to a fishery. It is unknown whether natural reproduction is occurring in Bear Creek or if these trout and salmon runs are a result of straying from nearby streams such as Stoney Creek. A 2003 fish survey on Bear Creek documented rainbow trout, brook stickle back, mud minnows, and mottled sculpin, which suggest potential for a cold-water fishery. SBE authority is being requested for Bear Creek to protect the stream, expand public access for the seasonal salmonid fishery, and to allow potential for future habitat improvement work.

Proposed Hibbard Creek SBE Eligible Project Line (Map AX-5)

- Establish a SBE eligible line along Hibbard Creek from Lake Michigan the entire length of the stream.

Hibbard Creek is a quality cold-water stream with brook trout in the upstream sections and seasonal runs of Great Lakes trout and salmon throughout. Hibbard Creek is in an agriculturally dominated watershed and has limited public access. The stream is 5.4 miles long, located in the 287-square mile Upper Door County watershed comprised of agricultural (41%), wetland (24%), forested (22%), and other (12%) land uses. Fish populations consist primarily of warm water species including northern pike, yellow perch, and smallmouth, but the upper stretches also support brook trout. Stocked salmon and trout swim upstream from Lake Michigan during annual spawning runs, and provide important seasonal fishing opportunities. We would like to establish SBE authority along this stream to protect this cold-water resource, expand public access to this great fishery, and to allow for the potential of future habitat improvement work.

Nicolet State Trail (Map AW-5)

- Redesignated parcels currently coded as Wiouwash State Trail located in Section 24, T 27 N, R 18 E, a part of real estate transaction file P 1547 to Nicolet State Trail.

Due to historical changes in the configuration and establishment of these two trails, this redesignation will clean up the parcels in this area to be associated with the correct trail project.

CHAPTER 3: REGIONAL AND PROPERTY ANALYSIS

The Regional Analysis component of this planning document describes the biological/ecological, cultural, economic, and recreational environment that affects the properties and their uses. It characterizes the property resources within the Ecological Landscape in which they exist and highlights their degree of significance 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: Natural Resources, Socio-economic Characteristics, and Recreational Resources.

The Ecological Landscapes of Wisconsin (WDNR 2015a), is a reference compendium that delineates the 16 Ecological Landscapes in Wisconsin that have similar ecology and management potential. For each 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 the best suited management opportunities.

NORTHERN LAKE MICHIGAN COASTAL

This master plan addresses the DNR properties located in the Northern Lake Michigan Coastal (NLMC) Ecological Landscape. Map A-1 shows the NLMC landscape in relation to state and county borders. Descriptions of natural resources, socio-economic characteristics and recreational resources for this region are provided in detail in Chapter 15 of *The Ecological Landscapes of Wisconsin*. The entirety of that chapter is incorporated by reference for purposes of this planning document. All chapters of *The Ecological Landscapes of Wisconsin* are accessible on the Wisconsin DNR website (dnr.wi.gov) keywords "Ecological Landscapes" then "Northern Lake Michigan Coastal."

Table 36, extracted from *The Ecological Landscapes of Wisconsin,* provides a concise overview of the NLMC Ecological Landscape.

Table 36: Northern Lake Michigan Coastal Ecological Landscape at a Glance

Physical and Biotic Environment
Size 2,004 square miles (1,282,877 acres), representing 3.6% of the land area of the State of Wisconsin.

Climate	Cold winters and warm summers are moderated by the thermal mass of Lake Michigan, especially in coastal areas. The mean growing season is 140 days, mean annual temperature is 42.8°F, mean annual precipitation is 32.1 inches, and mean annual snowfall is 46 inches. Lake effect snow can be significant, especially along Lake Michigan. Rainfall and growing degree days are adequate to support agricultural row crops, small grains, hay and pastures. Warmer temperatures near Lake Michigan in fall and early winter and slightly cooler temperatures during spring and early summer are favorable for growing cherries, apples, and other fruits on the Door Peninsula.
Bedrock	Primarily underlain by Silurian dolomite but with some sandstone, also igneous and metamorphic rocks. Generally, the land is covered by a layer of soils of glacial origin; in some places, such as on the Door Peninsula and in the Grand Traverse Islands, the depth to bedrock is only a few feet or less from the surface.
Geology and Landforms	The Niagara Escarpment is a prominent bedrock ridge of Silurian dolomite that is exposed as cliffs and ledges along the western edge of the Door Peninsula and in the Grand Traverse Islands. The same bedrock is also exposed at many locations along the east side of the northern Door Peninsula, where it forms broad, nearly level bedrock shorelines. A broad, level lacustrine plain occurs in areas bordering the west shore of Green Bay, where an extensive delta has been created at the mouth of the Peshtigo River. Landforms along the Lake Michigan shore include beaches, dunes, baymouth bars, and complex ridge and swale topography. Embayment lakes and freshwater estuaries are also characteristic of the Lake Michigan shore. Elsewhere in this Ecological Landscape, ground moraine is the dominant landform.
Soils	Soils are diverse; in some areas, lacustrine sands are found overlying clays, or bedrock which is within a few feet of the surface. On the Door Peninsula soils are calcareous, typically stony loamy sands to loams. Shallow soils and exposures of dolomite bedrock are frequent near the Lake Michigan and Green Bay coasts. Poorly drained sands are common in the lake plain west of Green Bay and in depressions between dunes and beach ridges. Beyond the lake plain west of Green Bay, the ground moraine is composed mostly of moderately well-drained, rocky sandy loams, interspersed with lacustrine sands and clays. Peats and mucks are common along the west shore of Green Bay and in the northwestern part of the Ecological Landscape. There is an area of sandy soils between Stiles and Oconto Falls west of Green Bay. Chambers Island has sandy, gravelly, clayey soils.
Hydrology	Lake Michigan is cold, deep, oligotrophic, and relatively clean. Green Bay, an estuary that is also the largest bay on Lake Michigan, is warm, shallow, productive, and dynamic. It has been heavily polluted, especially by industries that formerly dumped wastes into the Fox River at the head of the bay (which is within the Central Lake Michigan Coastal Ecological Landscape). The larger rivers that flow through this Ecological Landscape into Green Bay include the Menominee, Oconto, Peshtigo, and Pensaukee. These rivers and their tributaries drain the uplands west of Green Bay before passing through the extensive wetlands along Green Bay's west shore. Several large embayment lakes (e.g., Clark, Europe, and Kangaroo lakes) occur along the east side of the northern Door Peninsula. There are few large inland lakes. Several impoundments constructed on rivers west of Green Bay had been

subjected to high levels of pollution from past industrial activity. On the Door Peninsula there have been serious groundwater contamination problems from agricultural pesticides and manure. These pollutants were able to reach the groundwater through the fractured dolomite bedrock. The lower Wolf River drains the westernmost part of this Ecological Landscape.
Current Landcover Historically, the uplands were almost entirely covered by forest. Today, more than 64% is non-forested. Most of this land is now in agricultural crops (51%), with smaller amounts of grassland (5.6%), non-forested wetlands (6.1%), shrubland (0.1%), and urbanized areas (0.8%). The most abundant cover type in the forested uplands (262,119 acres or 20.4% of the Ecological Landscape) is maple-basswood, with smaller amounts of aspen-birch. Forested wetlands (mostly lowland hardwoods, with some conifer swamps) cover slightly over 14% of the area. Other cover types are comparatively scarce but of high importance ecologically, and include maple-beech, hemlock-hardwoods, white pine, and mixtures of boreal conifers (dominants include white spruce-balsam fir-white pine-white cedar). Important non-forested wetland communities include marsh, sedge meadow, and shrub swamp.
Socioeconomic Conditions – Based on data from Marinette, Oconto, Shawano, and Door counties
Population 148,920, 2.7% of the state total. 39 persons per square mile.
Per Capita Income $29,661
Economic Sectors The largest employment sectors are: tourism-related, manufacturing (non-wood), government, and retail trade sectors. Although forestry, agriculture, and development do not have as large an impact on the economy or in the number of jobs they produce, they are the sectors that have the largest impact on the natural resources in the Ecological Landscape.
Public Ownership Only about 3.5% of the Northern Lake Michigan Coastal Ecological Landscape is public land. Some smaller islands are managed by the U.S. Fish and Wildlife Service for colonial nesting birds as part of the National Wildlife Refuge System. State ownership includes five state parks—four on the Door Peninsula and one in the Grand Traverse Islands—as well as lands administered and/or managed by the Wisconsin DNR's Wildlife Management, Fisheries, and State Natural Areas programs. Door County Parks System owns several ecologically significant tracts along the Green Bay and Lake Michigan shores. An extensive area of county forest (Marinette and Oconto counties) occurs near the Green Bay west shore, and another is in the sandy area in Oconto County along the Oconto River.
Other Notable Ownerships The Wisconsin Chapter of The Nature Conservancy has a major conservation project on the Door Peninsula. Several land trusts are active across this landscape; the Door County Land Trust has a number of active projects.

CONSIDERATIONS FOR PLANNING AND MANAGEMENT

Conservation plans must be highly adaptive, coordinated, and integrated as the ecosystems of Lake Michigan, Green Bay, and the Green Bay west shore wetlands have changed dramatically over recent decades. Increasing development, skyrocketing land prices, and increasing recreational pressure on a limited land base place serious pressure on conservation efforts on the Door Peninsula. Pollutants in Green Bay have created serious management problems, especially for fish and fish-eating birds. This pollution also has potential to cause public health issues. The shallow soils and fractured bedrock of the Door Peninsula and Grand Traverse Islands makes sustainable development and water management challenging and expensive.

The rapid spread of invasive species over the past several decades has overwhelmed managers and agency budgets. The issue is exacerbated by the large number and high mobility of visitors (including tourists and ocean-going commercial ships), especially to the Door Peninsula, Grand Traverse Islands, and Green Bay west shore. Browse pressure from high populations of white-tailed deer is having negative impacts on many of the native ecosystems and plant communities in this Ecological Landscape, especially on the biologically diverse Door Peninsula.

MANAGEMENT OPPORTUNITIES

The Northern Lake Michigan Coastal Ecological Landscape borders Lake Michigan and Green Bay, encompassing about 330 miles of Great Lakes coast. The shorelines and related habitats, some of them unique to the Great Lakes, are used during the spring and fall by large numbers of migratory birds. Tens of thousands of diving ducks winter in offshore Lake Michigan habitats. Large rookeries of colonial fish-eating birds occur on islands in Green Bay and Lake Michigan. Green Bay's low lying west shore features extensive wetlands of marsh, sedge meadow, shrub swamp, and hardwood swamp. The remnant conifer-hardwood forests on the Door Peninsula's margins support diverse populations of breeding birds and are also heavily used by many migrant species.

The northern Door Peninsula and associated Grand Traverse Islands present conservation opportunities offered nowhere else in Wisconsin. Unusual physiographic features such as ridge-and-swale complexes, embayment lakes, and freshwater estuaries are rich in rare natural communities, including beach, dune, bedrock shore, coastal fen, and boreal forest. These, in turn, support one of Wisconsin's greatest concentrations of rare species, some of them endemic to Great Lakes shoreline environments.

The dolomite Niagara Escarpment is a dominant geological feature of this landscape. On the west side of the Door Peninsula, the escarpment is exposed as cliffs, ledges, and talus slopes. Springs and seeps are present, and some of Wisconsin's oldest trees grow on the escarpment. To the east, along Lake Michigan, the same bedrock forms extensive horizontal rock beaches. Scattered features of ecological importance include a stretch of the Menominee River at the northern edge of the landscape; a concentration of rich conifer swamps in the poorly drained terrain east and north of Lake Noquebay; extensive dry forests of aspen, oak, and pine on sandy soils in southern Oconto County; warmwater rivers and streams entering Green Bay from the west; and the northernmost stretch of the lower Wolf River.

NATURAL RESOURCES

The natural resource attributes of the Northern Lake Michigan Coastal Ecological Landscape that are most closely associated with the master planning properties are described in this section of the master plan. The information below is from *The Ecological Landscapes of Wisconsin*, property Rapid Ecological Assessments and other plans, and interpretation specific to the properties of interest for planning purposes. The natural resource descriptions that follow are derived from these Wisconsin DNR publications.

Existing Natural Heritage Inventory (NHI) data are often the starting point for conducting a biotic inventory to support master planning. Prior to this project, NHI data for these properties were limited to 1) the Statewide Natural Area Inventory, a county-by-county effort conducted by DNR'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 Coastal Wetlands Assessment (Epstein, 2002); 4) surveys for the Niagara Escarpment Report (Anderson, 2002); and 5) taxa-specific surveys.

The most recent taxa-specific field surveys for the study area were conducted in 2008. 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 these surveys were used, along with other information, to identify ecologically important areas (Primary Sites) on the properties.

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 the properties, key inventory considerations included the identification of high quality boreal forests and other wetland communities, including ecologically significant stands of hardwood swamp, sedge meadows, and the location of habitats with the potential to support rare species. Private lands surrounding the properties were not surveyed.

PAST STUDIES

Various large-scale research and planning efforts have identified a number of locations within Northern Lake Michigan Coastal Ecological Landscape properties as being ecologically significant. The following are examples of such projects and the significant features identified.

<u>Land Legacy Report</u>

The Land Legacy Report (Pohlman et. al 2006) was designed to identify Wisconsin's most important conservation and recreation needs for the next 50 years. The following "Legacy Places" received the highest ranking (5 stars) in a category for outstanding ecological qualities, with adequate size to meet the needs of the critical components, and/or harbor natural communities or species of global or continental

significance. This category implies that if restoration efforts are needed for the area, conservation actions would have a high likelihood of long-term success.

• The Niagara Escarpment
• Grand Traverse, containing Grand Traverse Islands State Park and Rock Island State Park
• Mink River Estuary – Newport State Park – Europe Lake
• Shivering Sands
• North Bay to Baileys Harbor Corridor (Moonlight Bay, Mud Lake)
• Eagle Harbor to Tuft Point Corridor

Additional places identified for "very good ecological qualities with very good chances of restoration success" include:

• Peninsula State Park to Jacksonport corridor
• Peninsula State Park

Important Bird Area

Important Bird Areas (Steele 2007) are critical sites for the conservation and management of Wisconsin's birds. Three of them are encompass properties covered in the NLMC master plan:

- The Whitefish Dunes – Shivering Sands IBA (1,235 acres) is important for breeding birds and as a migratory bird stopover site.
- The Mink River Estuary – Newport State Park IBA (4,200 acres) provides high quality habitat for breeding birds, including wetland birds.
- The Toft Point - Ridges Sanctuary - Mud Lake IBA includes Mud Lake SNA, Mud Lake Wildlife Area, and Moonlight Bay Bedrock Beach SNA and was recognized because it provides a significant stopover site for migratory birds and high-quality habitat for numerous breeding birds.

Wisconsin Wildlife Action Plan: Conservation Opportunity Areas

The Wisconsin Wildlife Action Plan (WDNR 2015) identifies Conservation Opportunity Areas (COA) in Wisconsin that contain ecological features, natural communities, and/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 Great Lakes, their shorelines and the Niagara Escarpment are identified as being globally significant.

The Conservation Opportunity Areas in this Ecological Landscape include:

• The Potawatomi State Park COA
• Whitefish Dunes to Sturgeon Bay COA
• Baileys Harbor to Peninsula COA
• Mink River to Europe Bay COA
• Detroit Harbor COA, containing Grand Traverse Islands State Park
• Rock Island COA
• Hardwood Swamps COA (includes Gardner Swamp Wildlife Area)

Ice Age National Scenic Trail

The eastern terminus of the 1,000-mile-long footpath, the Ice Age National Scenic Trail, is at Potawatomi State Park.

Niagara Escarpment Final Report: Inventory Findings 1999-2001 and Considerations for Management

Anderson et al. (2002) recognized the importance of the Niagara Escarpment within Door County as a prominent feature in the county and as habitat for numerous rare species. The Door County state parks were included within the study area for the project.

Coastal Wetlands Assessment

Moonlight Bay Bedrock Beach SNA, Mud Lake SNA, Mud Lake Wildlife Area, and Baileys Harbor Boreal Forest and Wetlands SNA were surveyed as part of the Coastal Wetlands Assessment (Epstein et al. 2002).

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

The Door County properties within this regional plan were recognized as part of larger sites that are significant to Door County as wildlife habitat and natural areas by the Bay Lake Regional Planning Commission. The large sites described in this report often connect lands protected for conservation purposes with other regionally important areas to create landscape-level planning units.

NATURAL COMMUNITIES

The Wisconsin Wildlife Action Plan (WDNR 2015b) and *The Ecological Landscapes of Wisconsin* (WDNR 2015) identify 33 natural communities with "Major" or "Important" opportunities for protection, restoration, or management in the Northern Lake Michigan Coastal Ecological Landscape. Twenty-four of these natural communities are present on department properties in the Ecological Landscape:

• Boreal Forest	• Northern Mesic Forest
• Boreal Rich Fen	• Northern Sedge Meadow
• Dry Cliff*	• Northern Wet Forest*
• Emergent Marsh*	• Northern Wet-mesic Forest
• Great Lakes Alkaline Rockshore	• Shrub Car
• Great Lakes Beach	• Southern Sedge Meadow
• Great Lakes Dune	• Surrogate Grasslands*
• Great Lakes Ridge and Swale*	• Southern Mesic Forest
• Lake Michigan	• Warmwater Rivers
• Moist Cliff	• Warmwater Streams
• Northern Dry-mesic Forest	• Coolwater Streams
• Northern Hardwood Swamp*	• Inland Lakes

LANDSCAPE LEVEL PRIORITIES

The following is a list of Outstanding Ecological Opportunities identified in Chapter 15 of *The Ecological Landscapes of Wisconsin* (WDNR 2015a)

- The cold waters and dynamics of Lake Michigan have a strong influence on climate, geology, landform, and vegetation all along the eastern side of the Door Peninsula and throughout the Grand Traverse Islands.
- The lake and the bay provide significant spawning areas for fish, and shoreline habitats and nearshore waters host large numbers of migrating, wintering, and resident birds.
- Door County's embayment lakes are associated with coniferous forests, marshes, and fen-like wetlands and provide significant habitat for rare plants, invertebrates, and many wildlife species.
- The Niagara Escarpment runs along the west side of the Door Peninsula and through the Grand Traverse Islands. Dolomite cliffs, talus slopes, spring seeps, bedrock ledges, and ancient forests are among the escarpment habitats that support highly specialized plants and animals, including global rarities.
- The northern Door Peninsula provides the setting for a unique assemblage of landforms, natural community complexes, and species assemblages.
- Shoreline complexes such as beach and dune, ridge and swale, freshwater estuary, and bedrock shore support many rare natural communities, which in turn provide habitat for numerous habitat specialists, including rare species.
- This Ecological Landscape supports a major concentration of rare plants and animals, including species that occur nowhere else in Wisconsin, and some that are Great Lakes endemics.
- The west shore of Green Bay features extensive wetlands of marsh, sedge meadow, shrub swamp, and hardwood swamp.
- Green Bay is shallow, highly productive, and dynamic. Its size, funnel-like shape, and water level fluctuations have created unusual conditions, which have produced distinctive landforms and influenced the extent, location, configuration, and structure of the bay's extensive wetlands.
- Lowland forests of white cedar, tamarack, and ash are abundant in the poorly drained terrain east and north of Lake Noquebay.
- At a few locations there is potential to connect the narrow but critically important strips of coastal forest on the edges of the Door Peninsula via wetlands that occupy some of the larger transverse valleys that cross this land.
- Warmwater rivers and streams flow into Green Bay from the west and contribute to the maintenance of the extensive west shore wetlands as important spawning areas for fish, while providing feeding and nesting areas for many waterbirds.
- The lower Wolf River corridor merits additional protection as it is highly significant for many rare species and common species here and in Ecological Landscapes downstream. It also provides a major conduit of forested habitat through intensively developed landscapes from which most of the natural vegetation has been removed.

Table 37: Natural communities, aquatic features, and selected habitats associated with each ecological feature within the Northern Lake Michigan Coastal Ecological Landscape.

Ecological features	Natural communities, aquatic features, and selected habitats
Lake Michigan shoreline features	Boreal Forest
	Northern Dry-mesic Forest
	Northern Mesic Forest
	Northern Sedge Meadow
	Shore Fen
	Emergent Marsh
	Interdunal Wetland
	Clay Seepage Bluff
	Great Lakes Alkaline Rockshore
	Great Lakes Barrens
	Great Lakes Beach
	Great Lakes Dune
	Great Lakes Ridge and Swale Complex
	Embayment Lake
	Grand Traverse Islands
	Great Lakes Estuary
Green Bay's west shore	Southern Dry-mesic Forest
	Southern Hardwood Swamp
	Floodplain Forest
	Northern Wet-mesic Forest
	Alder Thicket
	Shrub-carr
	Northern Sedge Meadow
	Southern Sedge Meadow
	Emergent Marsh
	Submergent Marsh
	Riverine Mud Flat
Niagara Escarpment	Northern Dry-Mesic Forest
	Northern Mesic Forest
	Southern Mesic Forest
	Talus Forest
	Alvar

	Dry Cliff Moist Cliff
Lower Wolf River Corridor	Northern Hardwood Swamp Floodplain Forest Alder Thicket Shrub-carr Southern Sedge Meadow Emergent Marsh Wild Rice Submergent Marsh
Rare species	Plants Animals: dragonflies, land snails, birds Among the plants and insects are several Great Lakes endemics.
Critical habitat for migrating, wintering, and breeding birds	Grand Traverse Islands Shoreline and nearshore habitats along Lake Michigan and Green Bay Major river and stream corridors, e.g., those of the Menominee, Peshtigo, Oconto, and Wolf
Extensive wetlands north and east of Lake Noquebay	Northern Hardwood Swamp Northern Wet-Mesic Forest Tamarack Swamp Alder Thicket Northern Sedge Meadow Open Bog Emergent Marsh
Warmwater streams entering Green Bay	Warmwater River Warmwater Stream
Miscellaneous (scattered) opportunities to protect and manage more isolated occurrences of natural communities, aquatic features, and rare species	All forest communities Boreal rich fen Ephemeral Pond

populations	Coldwater Stream
	Coolwater Stream
	Inland Lake

GAME SPECIES

Properties in the Northern Lake Michigan Coastal Ecological Landscape provide good opportunities for hunting, trapping, and fishing. The deer populations in this Ecological Landscape are large compared to populations prior to Euro-American settlement. Relatively mild winters have increased winter survival and allowed the deer herd to increase. Overbrowsing is becoming common.

The lower Wolf River and its major tributaries provide highly significant spawning habitat for lake sturgeon. This basin supports the largest self-sustaining lake sturgeon population in North America.

Economically important commercial fisheries for lake whitefish, yellow perch, rainbow smelt and ciscoes occur on Lake Michigan. Recreational fishing on Lake Michigan and Green Bay for yellow perch, walleye, northern pike, smallmouth bass, rainbow trout, brown trout, Chinook salmon, and coho salmon is also an important industry. A major effort has been made to reestablish the Great Lakes form of muskellunge in the Green Bay ecosystem. Many large stocked fish are present, and pursuing them has become extremely popular with anglers. Warmwater streams and rivers emptying into Green Bay support walleye, bluegill, yellow perch, and other panfish populations sought by anglers.

MIGRATORY BIRDS

The Lake Michigan shoreline on both sides of the Door Peninsula and the west shore of Green Bay are important migratory corridors for millions of birds, including hawks, waterbirds, and passerines. Raptors and passerines use the shoreline as a landmark and as feeding and resting places during migration. Waterfowl use the waters along the Lake Michigan shoreline during migration and as wintering habitat, including some species with limited distribution within the state such as Greater Scaup, Common Goldeneye, Common and Red-breasted Mergansers, Long-tailed Duck, and Black, Surf, and White-winged Scoters. Surveys of open water habitats in Lake Michigan indicate that tens of thousands of diving ducks and other waterbirds are using offshore habitats.

ECOLOGICAL PRIORITIES - CONSIDERING SPECIES OF GREATEST CONSERVATION NEED

The Wisconsin Wildlife Action Plan identifies ecological priorities within each Ecological Landscape. Priorities represent the natural communities in each Ecological Landscape that are most important to sustaining the Species of Greatest Conservation Need (SGCN). SGCN are native wildlife species with low

or declining populations that are most at risk of no longer being a viable part of Wisconsin's fauna. For detailed information specific to the Northern Lake Michigan Coastal Ecological Landscape and these properties, including lists of species and the habitats with which they are associated, please see Table 8 in the Wildlife Action Plan (WDNR 2015b) and the appendices in the Rapid Ecological Assessments (WDNR 2010; WDNR 2011).

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 November 2009, NHI documented 106 rare fauna within the Northern Lake Michigan Coastal Ecological Landscape including two mammals, 29 birds, seven herptiles, 12 fishes, and 56 invertebrates. These include two U.S. Endangered species, 14 Wisconsin Endangered species, 16 Wisconsin Threatened species, and 76 Wisconsin Special Concern species.

Hine's Emerald Dragonfly

The Ridges Sanctuary in Door County has the world's largest documented population of the Hine's emerald, a globally rare, U.S. Endangered dragonfly, that occurs in the coastal ridge and swale habitats. Other sites include Big Marsh on Washington Island and Three Springs Creek, Mud Lake Wildlife Area, and Piel Creek on the Door Peninsula. The Hine's emerald uses calcium-rich wetlands, and the larvae use crayfish burrows to overwinter and to survive periods of low water. The only other known populations occur in Wisconsin's Southeast Glacial Plains and Western Coulees and Ridges Ecological Landscapes, in northern Michigan, northeastern Illinois, and in Missouri.

Rare Snails

Globally rare land snails such as the Wisconsin Endangered Midwest Pleistocene vertigo and six-whorl vertigo are found on the Niagara Escarpment. Other rare snails associated with the Niagara Escarpment include the Wisconsin Threatened cherrystone drop and the Wisconsin Special Concern mystery vertigo, dentate supercoil, and black striate. Most are cliff dwelling species, though a few inhabit woodlands or wetlands. These rare snails are very small, with shell diameters of only a few millimeters.

Rare Plants

There are 94 species of rare plants recorded in the NHI database for the NLMC Ecological Landscape. Of these, 16 are State Endangered, 22 are State Threatened, and 56 are State Special Concern.

RAPID ECOLOGICAL ASSESSMENTS

Text in the following section is from (1) Rapid Ecological Assessment for the Door and Kewaunee County State Wildlife and Natural Areas Planning Group (WDNR 2011); and (2) Rapid Ecological Assessment for the Door County State Parks Planning Group (WDNR 2010). The objectives of these projects were to collect biological inventory information relevant to the development of a master plan and to analyze, synthesize

and interpret this information for use by the master planning team. The efforts focused on assessing areas of documented or potential habitat for rare species and identifying natural community management opportunities.

Primary Sites are identified by the department for special consideration in planning processes, because they generally encompass the best examples of 1) rare and representative natural communities and 2) documented rare species populations with opportunities for restoration or connections. These sites warrant high protection and/or restoration consideration during the development of a new master plan. Fifteen Primary Sites have been identified within the NLMC. All Primary Sites can be considered High Conservation Value Forests for Forest Certification.

1) Rock Island Woods
2) Europe Bay Woods (Newport SP)
3) Newport Woods and Cliffs
4) Newport Conifer-Hardwoods
5) Mink River Estuary; a Mink River Estuary SNA proposed expansion (Newport SP)
6) Mud Lake State Natural Area
7) Peninsula Niagara Escarpment and White Cedar Forest
8) Peninsula Park Beech Forest
9) Peninsula Northern Mesic Forest
10) Whitefish Dunes
11) Whitefish Dunes Woods
12) Potawatomi Niagara Escarpment
13) Potawatomi Northern Mesic Forest
14) Potawatomi Northern Dry-mesic Forest
15) Lake Noquebay Sedge Meadow SNA

SOCIAL AND CULTURAL CONTEXT

Information in this section is mostly from *The Ecological Landscapes of Wisconsin* (WDNR 2015a). Some excerpts are also included in Table 36 earlier in this chapter. This includes population data, which is primarily from 2012 U.S. Census Bureau. For more information, see pages 53-68 of Chapter 15 (Northern Lake Michigan Coastal Ecological Landscape)and pages 47-60 of Chapter 3 (Comparison of Ecological Landscapes).

NATIVE AMERICAN TRIBES

Evidence of inhabitation dates to the Paleo-Indian. One location in Door County (the Cardy site), mostly destroyed by the expansion of the City of Sturgeon Bay, yielded fluted points that are diagnostic of early Paleo-Indian peoples (Mason 1997). This site was on high ground on top of the Niagara Escarpment,

apparently on or near the shoreline of Glacial Lake Algonquin, the predecessor of current Lakes Michigan and Huron.

A remarkable cemetery in Oconto County, associated with the Middle Archaic Tradition, is one of only four excavated sites in Wisconsin that was exceptionally rich in copper artifacts, associating it with the Old Copper complex (Stoltman 1997). Once considered its own culture, the Old Copper complex is now considered a technological phase associated with many cultural affiliations during the Archaic Tradition. Known today as a National Historic Landmark, interpreted by Copper Culture Mounds State Park, the Oconto County cemetery site itself was destroyed by development.

By the time of the transition between the Archaic and Woodland Traditions, the Northern Lake Michigan Coastal Ecological Landscape began to be more heavily occupied. Several excavated sites with Woodland Tradition characteristics lie on the shorelines of Door County, including on Rock Island (Stevenson et al. 1997). Approaching historical times, the Northern Lake Michigan Coastal Ecological Landscape was heavily occupied by Oneota peoples, especially in Door County (Overstreet 1997). By the time of Euro-American contact, the Oneota had largely abandoned their holdings in eastern Wisconsin and moved further south and west. It is generally accepted that the Oneota are the forbearers of the Ho-Chunk, but direct evidence of this relationship is elusive.

The Menominee Tribe ceded large areas of land to the United States government. In 1854 the tribe was “awarded” their current reservation, adjacent to the Stockbridge-Munsee reservation in Shawano County, in the Forest Transition Ecological Landscape. The Menominee Reservation today comprises more than 230,000 acres, and its boundaries are congruent with Menominee County, almost all of which is just outside of the Northern Lake Michigan Coastal Ecological Landscape.

The Potawatomi arrived in Wisconsin in the mid-17th century during the Iroquois wars. The Potawatomi, or “keepers of the sacred fire people,” settled originally around Green Bay and the Door Peninsula as well as on some of the Grand Traverse Islands. By 1820, about 10,000 Potawatomi lived in 100 villages throughout eastern Wisconsin (The Wisconsin Cartographers’ Guild 1998). Lands ceded to the United States through the 1829 Treaty of Prairie du Chien and the 1833 Treaty of Chicago, greatly diminished the tribe’s land holdings in the state. Currently, a portion of the Potawatomi Reservation, established officially in 1988, lies in the Northern Lake Michigan Coastal Ecological Landscape. (WDNR 2015)

SOCIOECONOMIC CONDITIONS

The Northern Lake Michigan Coastal counties (Marinette, Oconto, Shawano, and Door) are traditionally rural with relatively low population and housing density. However, these counties have increasing dependency on both urban centers and tourism hot spots for economic output. The largely homogenous white population of the Northern Lake Michigan Coastal counties is growing in urban areas, while the rural areas are losing population and experiencing decreased economic activity, especially in places where tourism is less prevalent.

The Northern Lake Michigan Coastal counties have been experiencing a net in-migration of retirement-age adults and a net out-migration of young adults. Door County, with its scenic location and associated

tourism dollars and higher property values, is distinct from its fellow Northern Lake Michigan Coastal counties in terms of many socioeconomic metrics.

RECREATIONAL RESOURCES: EXISTING CONDITIONS AND FUTURE OPPORTUNITIES

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 motorized activities (e.g., ATV and snowmobile riding). Statutes and applicable federal regulations prohibit a state fish and wildlife agency from allowing recreational activities 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 Recreational Opportunities Analysis (ROA) for the Upper Lake Michigan Coastal Region (the region that includes much of the NLMC Ecological Landscape) was completed in 2018. A summary of the ROA conclusions is included in the following sections. This information guided the planning team regarding improving or increasing recreational offerings on DNR lands in this region. As the recreation region is larger than the Ecological Landscape discussed in this plan, recreational needs not addressed here may be addressed in future master plans.

TYPICAL RECREATION ON DNR LANDS

All department-owned lands within the Northern Lake Michigan Coastal (NLMC) Ecological Landscape are open to traditional outdoor recreational uses including hunting, fishing and trapping, except for refuges that are closed to all hunting, closed to hunting during the waterfowl season, or closed to entry during the nesting season. Other activities allowed on these lands include wildlife viewing, hiking, paddling, cross-country skiing, snowshoeing, collection of wild edibles and nature study.

Foot travel (including skiing and snowshoeing) is allowed on all service roads, dikes, berms and firebreaks unless restricted during habitat management activities (e.g., temporary closure during a prescribed burn) or due to safety concerns (e.g., flooding).

Motorized vehicle access is available on designated public access roads and parking lots (see Map Series 2 for all major properties, for example Map C-2, Map D-2, etc.). Snowmobiles and ATVs/UTVs are allowed only on trails designated for their use. There are allowances for motorized use by individuals with mobility impairments under the power-driven mobility device regulations of the Americans with Disabilities Act. For more information on these allowances, please refer to specific language under "Disabled Accessibility" in the General Administration Management Policies and Provisions section of this chapter.

Information on rules governing public use of department-owned lands is found in Chapter NR 45, Wisconsin Administrative Code.

FUTURE RECREATIONS NEEDS IN THE UPPER LAKE MICHIGAN COASTAL REGION

The Upper Lake Michigan Coastal SCORP Region has an abundance of existing opportunities for most types of outdoor recreation, as evidenced in part by the large number of visitors the region receives each year. These opportunities are related to the diversity of public land ownership in the region. Even with the existing supply of opportunities available in the region, the public identified several future recreational needs. The public also expressed strong support to leverage existing opportunities to provide better and more recreational experiences for residents and visitors.

The department used the following sources to identify which recreation opportunities are most needed in the region:

- Public input on recreation needs submitted during the comment period (August 3 to September 8, 2017).
- Data on recreation participation and needs gathered in a 2016 survey as part of the development of the 2017- 2022 SCORP.
- Data gathered in previous SCORP planning efforts.

From this information, department staff grouped the relative needs for recreation activities as high, medium or low. The groupings are as follows:

Future recreation needs in the Upper Lake Michigan Coastal Region – High	Future recreation needs in the Upper Lake Michigan Coastal Region - Medium	Future recreation needs in the Upper Lake Michigan Coastal Region - Low
Bicycling - bicycle touring/road riding	ATV/UTV riding	Bicycling - fat tire/snow biking
Bicycling - mountain biking/off-road biking	Cross country skiing	Dog sledding/skijoring
Bird or wildlife watching	Dog walking	Dog training
Camping - developed	Four-wheel vehicle driving	Dog trialing
Camping - primitive	Hunting - big game	Fishing - ice fishing
Canoeing or kayaking	Hunting - small game	Gather mushrooms, berries, etc.
Fishing - lake fishing from a boat, canoe, or kayak	Hunting - turkey	Geocaching
Fishing - lake fishing from shore or a pier	Nature photography	Horse cart driving
Fishing - river fishing from a boat, canoe, or kayak	Off-highway motorcycle riding	Hunting - migratory birds
Fishing - stream or river fishing from shore or wading	Participating in nature-based education programs	Rock climbing
Hiking, walking, trail running, backpacking	Picnicking	Scuba diving/snorkeling
Horseback riding	Sailing, windsurfing, rowing, stand-up paddling	Snowshoeing
Motorboating (waterski/tubing, personal watercraft)	Snowmobiling	Trapping
Visiting a beach, beach walking	Swimming in lakes and rivers	Whitewater rafting
	Target shooting - archery	
	Target shooting - firearms	

OPPORTUNITIES TO MEET FUTURE RECREATION NEEDS IN THE UPPER LAKE MICHIGAN COASTAL REGION ON DEPARTMENT MANAGED LANDS

On behalf of Wisconsin residents, the department owns and manages properties in the Upper Lake Michigan Coastal Region to meet a variety of ecological and recreation goals. These properties provide a range of settings and experiences – from developed sites with flush toilets and hot showers to remote places that provide wilderness settings. Some properties offer a wide variety of recreational activities and developed facilities while others provide fewer or more focused opportunities with simpler facilities.

Applying the regional future recreation needs listed above, the department evaluated the properties it manages in the Upper Lake Michigan Coastal Region to identify places where it could potentially incorporate some activities or enhance existing opportunities to meet these needs. The identification of department-managed lands that appear to be "good fits" to provide different activities will be used to help focus the department's work developing and updating property master plans. A description of opportunities to meet recreation needs in the Upper Lake Michigan Coastal Region (on department-managed lands) follows.

Non-Motorized Trail Recreation

Non-motorized trail recreation has been and continues to be a primary outdoor activity throughout the year in the Upper Lake Michigan Coastal SCORP Region. From hiking and biking in the summer to cross-country skiing in the winter, the region's residents and visitors take advantage of the numerous opportunities that currently exist.

Participation in mountain biking has grown recently in the region and demand exists for trails suitable for a variety of skill levels. As opposed to recreational bicycle touring, where there are benefits to creating multiple connecting linkages, meeting the growing need for mountain biking and off-road biking opportunities can be created or expanded at multiple, stand-alone sites throughout the region. Mountain biking trails are constructed, narrow trails less than two feet wide.

Hiking, walking, and running on trails in the region remain very popular activities. Many opportunities currently exist on department properties throughout the region. Additional trails near population centers are likely to be most frequently used. Linking cities and villages to each other and to state and local parks will continue to create new experiences and increase economic activity in the area.

Cooperatively Managed Trail

It should be noted that the department owns several state trails in the region. However, these trails are cooperatively managed by local governments, usually counties. In these partnerships, the department typically holds the land ownership while the partners develop, maintain and operate the trail. Also, the managing partner conducts planning processes to determine which recreational uses will be allowed on the property. Since use decisions are planned by the trail partners, cooperatively managed trails will not be listed below as potential "good fits" in this analysis. However, the information collected will be provided to the partners for their use in future planning efforts.

For the Upper Lake Michigan Coastal SCORP Region, cooperatively managed trails include:

- Oconto River State Trail
- Ahnapee State Trail
- Devil's River State Trail
- Fox River State Trail
- Mountain-Bay State Trail
- Nicolet State Trail

Horseback riding is in demand in the region and opportunities potentially exist to develop trails on department properties that link to other riding opportunities on adjacent lands.

Other Forms of Recreation

In addition to trail-based activities, there is considerable demand for many other types of outdoor recreation in the Upper Lake Michigan Coastal Region, including camping, fishing, and a variety of types of boating.

Camping was one of the area's early draws and remains one of the region's most popular activities due to the Door County parks and the wilderness opportunities. Camping has evolved over the years and there has been a shift in demand both for more developed and rustic experiences. The department currently provides a range of camping opportunities from primitive, isolated sites with only a fire ring and box latrine to densely grouped campgrounds with flush toilets and hot showers. Although many of the department's campgrounds are full on summer weekends, most are only partially at capacity during the week and in the spring and fall.

Given Lake Michigan, Green Bay, and the abundance of streams and rivers in the region, fishing and boating have long been among the most popular outdoor activities here. Although there are many existing boat launches (both sites that accommodate trailers with motorboats as well as carry-in access for canoes and kayaks) there are several opportunities for additional access sites on underserved waterways on department properties to meet the demand.

Summary of the Upper Lake Michigan Coastal Region ROA

With a diversity of public conservation lands, the Upper Lake Michigan Coastal Region has been an outdoor recreation destination for those looking for a mix of developed recreation facilities, Great Lakes scenery, and remote excursions. A wide range of recreation opportunities are currently provided in the region, from quiet wilderness areas to modern campgrounds with hot showers to constructed mountain biking trails and many miles of snowmobile trails.

Although the region is rich in current opportunities, several needs were expressed by residents. Topping the list of needs are hiking, walking and running trails, horseback riding, and bicycle touring and mountain biking trails.

The department believes there are opportunities to meet many of the desired recreational experiences on some of the properties it manages in the Upper Lake Michigan Coastal Region. In particular, the department believes the following property groups are well-suited to provide the identified needs in the region:

State Parks and Forest

- Hiking/walking/running loop trails of varying lengths. Properties in proximity to cities and villages likely would be most popular.
- Surfaced bicycle trails that expand the existing network linking cities, villages, and campgrounds.
- Developed camping, including adding electrified sites to some campgrounds or significant portions of campgrounds.
- Primitive camping, particularly at the large parks.

- Equestrian trails that either connect a network and/or are loop trails contained wholly in the property.
- Walk-in trails to expand access to waterbodies with canoes or kayaks.
- Developed boat access sites to provide access to Lake Michigan and Green Bay.

State Wildlife and Fishery Areas

- Hiking/walking/running loop trails of varying lengths. Properties in proximity to cities and villages likely would be most popular.
- Surfaced bicycle trails that expand the existing network linking cities and villages and campgrounds.
- Mountain biking trails that expand existing opportunities and create new destinations. These would be single-track, constructed trails of varying difficulties, including potentially technical skills areas.
- Primitive camping that would serve the hunter, wilderness adventurer and water recreationist.
- Walk-in trails to expand access to waterbodies with canoes or kayaks.

Additional Recreational Resource Information

Additional Information on outdoor recreation in Wisconsin may be found in multiple sources:

1) *The Ecological Landscapes of Wisconsin* (WDNR 2015b);

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;

3) information in the Land Legacy Report, (WDNR 2006b); and

4) The Upper Lake Michigan Coastal Region Recreational Opportunity Analysis (DNR 2018)

CHAPTER 4: ANALYSIS OF IMPACTS

IMPACTS FROM PROPOSED MANAGEMENT ACTIVITIES

This analysis discloses the environmental impacts, both positive and negative, of the management actions recommended in this master plan to decision-makers and the public. This analysis focuses on the actions that are new or are changes to the current management, development and use of the property. Based on the information presented in this master plan, the proposed actions are anticipated to have many net beneficial environmental effects and are not anticipated to cause significant adverse environmental effects.

IMPACTS TO NATURAL RESOURCES

Soils

The probability of significant short-term or long-term cumulative impacts due to soil erosion is low for the management activities prescribed in the NLMC Master Plan. This is due to the relatively low percentage of land in the plan area that is disturbed by management activities at any given time. A high percentage of the acreage is wetland that would not be disturbed or are community types or timber types that are under limited or long-rotation management.
Soil erosion on parcels during timber harvesting operations will be minimized using the Best Management Practices (BMPs) for Water Quality guidelines. BMPs contain strict standards for road construction, water crossings, skid trails and logging landings. All trails and primitive roads will be monitored for signs of excessive soil erosion caused by management activities or recreational use and actions will be taken (e.g., BMPs or trail closings) to minimize the erosion potential.

Geological Resources and Landforms

One of the functions of this plan is to protect important geological resources, such as the Niagara Escarpment, and glacial landforms. The actions proposed in this plan will not have a detrimental effect on these resources.

Air Quality

Potential impacts to air quality would come primarily from prescribed burns. Local landowners and units of government will be notified prior to management burns. Prescribed burns will occur seasonally (typically spring and fall). The burn plan contains best management practices and procedures to safely manage the fire and includes measures to minimize nuisance smoke impacts.

Vehicle emissions generated by motor vehicles and motorized equipment used in management activities, such as timber harvesting, will be minimal, much less than those from traffic on adjacent roadways and agricultural activities in the area.

Water Resources

Sanitary Systems and Vault Toilets

Existing and new sanitary systems will be maintained or constructed to meet all applicable building codes. No adverse impacts from sanitary systems on the property are anticipated.

Water Quality of Surface* W*aters and Wetlands

Maintaining permanent vegetative cover and the application of BMPs during management activities will have an overall positive impact on both surface waters and wetlands. The impacts of stormwater runoff during timber harvesting will be mitigated by implementing appropriate best management practices (BMPs). These practices are described in the "Wisconsin's Forestry Best Management Practices for Water Quality" field manual and are part of every timber harvest on the CMSRA.

Impervious surface, which has the effect of preventing infiltration and increasing water runoff, will be kept to a minimum. Pervious road and pathway surfaces will be used where impervious surfaces are not needed. Runoff from roadways and other impervious surfaces will not drain directly into nearby streams and lakes, minimizing water pollution risks.

Vegetation

The vegetation management strategies in this master plan (described in Chapter Two) are intended to maintain or improve the quality of native and restored habitats. Primary objectives of this plan are to maintain and enhance forests; particularly larger blocks of closed canopy, older forest; and to protect and enhance lakes, flowages, and wetlands.

Vegetation management objectives outlined in the NLMC Master Plan include:

- On the state parks; protect and enhance their natural, scenic character. Provide an attractive, natural appearing forest with old forest characteristics for aesthetic and native plant and animal community values, and protect and maintain high quality wetlands and other unique habitats and rare or sensitive species.
- On habitat or native community management focused properties; maintain or enhance wildlife habitat and important native communities (upland, wetland and aquatic).
- Monitor and control invasive plants, insects, and forest pests and diseases as practicable.

Most of the planned changes to the composition and structure for habitats or communities will occur slowly over the next 50 years such that short-term impacts will be minimal. In many areas the changes to vegetative cover types will generally be incremental and heavily influenced by natural succession processes.

DNR policies that address the monitoring, inspection and control of invasive species will be followed. Control measures may include mechanical control, use of herbicides, and fire. The effect would be the maintenance of native biotic communities and protection from future invasions.

Wildlife and Fisheries

The actions proposed in this master plan will have positive impacts on resident and migratory wildlife. The habitat management activities will enhance the quality and extent of habitat for wildlife, birds particularly, that favor larger blocks of older forest. This type of habitat is limited in the region and state. Maintaining and protecting the abundant, high quality wetlands also provides significant and important habitat for a variety of wetland-dependent species including herptiles, invertebrates, and certain species of birds, many of which are rare, threatened or endangered.

The management objectives and prescriptions outlined in Chapter Two will create or maintain the diverse forest, wetland, shrub, and aquatic habitats needed by the game and non-game wildlife populations found on the NLMC properties. The proposed management would strive to maintain and enhance fishing opportunities through maintaining and enhancing high quality waters and habitats. Where appropriate, fish stocking would be used to maintain or enhance fishing opportunities.

Endangered, Threatened and Rare Species, Native Communities and Scarce Ecological Resources

The proposed management objectives and prescriptions are expected to cause few, if any, negative impacts to endangered, threatened and rare species while yielding significant medium to long-term benefits. Protection, maintenance, or enhancement of the important native communities and unique habitats on the NLMC properties will continue to provide benefits to a wide range of rare, threatened or endangered resident and migratory species.

Visual/Scenic Resources

Within the state parks, the proposed management activities would maintain and enhance the high natural visual quality and natural character of the property. Overall, small changes in the visual qualities and aesthetics of the plant communities will occur over time as the forest matures and develops older forest characteristics, such as larger diameter trees and dead and down trees. The proposed habitat and community management of the non-park properties would, over time, maintain or enhance the visual quality on there as well.

When forest and other management activities occur on or near high use recreational properties or areas, the management activity will be visible in the short-term. Wherever possible, such activities will be conducted during periods of lower public use and through other actions to lower their visibility. Even so, at times there may be temporary disruptions of recreational activities by management actions such as prescribed burns and forest management activities (e.g., timber harvest).

SOCIO-ECONOMIC IMPACTS

Timber Products

Timber production as part of sustainable forest management is an important tool for meeting plan objectives. In addition, timber management is a secondary purpose of most of these properties. While not a primary goal, timber production has value and provides multiple benefits, including employment in forest-based industries, revenues for property managers, and habitat improvement. Commercial timber harvests will continue to be an integral part of management on the NLMC properties under this master plan.

Transportation

Traffic on public highways due to proposed management activities is not expected to change from the current, minimal, level.

Noise

Noise impacts on property neighbors and users will continue to be minimal under the proposed management activities. Most noise impacts would be generated primarily from land management, forestry and construction and maintenance activities. Such noise will be generated by chainsaws, skidders, machinery, and trucks. These noises will occur primarily during daylight hours and would be peak (high level, short duration) rather than continuous in nature. The noise often will be seasonal and transient (i.e., once the activity is completed the noise source will be eliminated).

Public Safety

There are no management elements of the NLMC Master Plan that are anticipated to have a negative effect on public safety. Designated use areas (such as parking lots) are inspected semi-annually to locate and remove hazardous trees. Safety precautions are taken when using herbicides, pesticides, fire, and in other property management activities. Any prescribed fires would follow DNR safety and burn procedures.

Land Use

As the proposed plan continues the general, overall conditions and management strategies that have been in place on the properties the plan does not change on-property land use or influence new land use changes on adjacent lands.

ECONOMIC EFFECTS AND THEIR SIGNIFICANCE

Implementation of the proposed plan would not generate any significant economic impact. Forest management on the property contributes to the local logging industry. Timber harvests that occur will contribute to the local supply of wood products. These harvests will add to the local economy through cash to the landowners and wages for laborers in the field, and primary and secondary forest products industries.

Fiscal Effects on Local Government

This plan would not generate any change in the fiscal effects on local government expenses or revenues.

State law requires the department to make payments in lieu of property taxes (PILT) to ensure the affected town's property base is not adversely affected. There are two separate state statutes, and several formulas under each, that dictate the amount of these payments.

Wisconsin Statute 70.113 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 70.114 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 to determine individual payments varies depending on when the property was acquired and how it was acquired.

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. For further details, please refer to the applicable state statutes or visit the department web site at http://dnr.wi.gov/ and perform a search for "Payment in Lieu of Taxes".

IMPACTS ON ENERGY CONSUMPTION

Due to the limited amount of infrastructure development and renovation proposed, no significant impacts to energy consumption are expected.

CUMULATIVE EFFECTS, RISK AND PRECEDENT

SIGNIFICANCE OF CUMULATIVE EFFECTS

Overall, the proposed actions are anticipated to have positive long-term effects on the quality of the natural environment and recreational users. Over time, management to protect and enhance blocks of older growth, closed canopy forest, a limited habitat type within the region and state, will benefit wildlife that depends this community.

SIGNIFICANCE OF RISK

Management of the NLMC properties poses a low overall potential for risk to the environment. Proposed habitat management activities are similar to those used over the last several decades and these activities typically have less negative and more positive environmental impact than the surrounding residential and agricultural lands.

Only a small percentage of the total NLMC land acreage will be actively managed (e.g., timber harvesting or prescribed burns) in any given year. No new, high-risk actions are proposed, nor are any actions which involve an irretrievable commitment of resources, or actions that could not be reversed in the future.

The presence of motor vehicles and other equipment during construction and logging may pose a slight but insignificant risk from spills and erosion. These risks would be mitigated by best management practice requirements and at preconstruction meetings with contractors.

Fire has been identified as one of the most effective vegetative management tools for management of grasslands and some wetlands and forests. Necessary precautions and DNR procedures are always followed during prescribed burns, including having an approved burn plan and adequate fire-fighting equipment and personnel present on site. During periods of high fire danger, burning restrictions are put into effect and a complete burning ban may be implemented. Herbicide/pesticide use will strictly follow label instructions to protect the environment and public safety.

SIGNIFICANCE OF PRECEDENT

Approval of this master plan revision would not directly influence future decisions on other department property master plans. Implementation of the actions contained in this master plan would not be precedent-setting, primarily because the proposed land management, development, and recreational activities have largely been conducted on this property in the past.

IMPACTS ASSOCIATED WITH RECREATION ACTIVITIES

Wisconsinites participate in a wide range of outdoor activities throughout the state, most of which have substantial positive social benefits and only minimal adverse social or environmental impacts. Impacts associated with recreation arise from the construction and management of facilities (including trails) as well as their use. This assessment addresses both types of impacts, focusing on those activities that have the potential to have substantive social or environmental impacts. Participation in all outdoor activities has some economic costs and benefits, which are described here, too.

The department follows a series of best management practices (BMPs) in developing and operating facilities that support recreational use. These practices are designed to minimize impacts throughout the construction, use and management process. As such, when BMPs are followed only minor, if any, impacts are expected. Best management practices are described in the following documents:

- Design Standards Handbook (8605.1)
- Trails Handbook (2540.5)
- DNR property managers guidance (internal website)
- Best management practices to prevent and minimize the spread of invasive species: http://dnr.wi.gov/topic/Invasives/bmp.html

GENERAL CONCERNS

Although the social and environmental impacts associated with most outdoor recreation activities are usually minor, temporary and localized, some impacts can be more problematic, including:

Invasive species

The spread of invasive species is an increasingly challenging issue for native habitats. As people and goods are transported greater distances in greater frequency, the introduction of aquatic and terrestrial species into new areas has grown substantially. In many cases, these newly established plants and animals will die out or have minimal impact to the local ecosystem. However, in some instances these individuals spread rapidly and have large effects on the structure and composition of the flora and fauna in an area. In some cases, these problematic species are native to a region but become invasive due to altered

ecological conditions; in others, the species are introduced from distant environments with no natural means to control their population growth.

Invasive species can be spread by a wide range of means related to recreation including clothing, boots, hooves, paws, tires, decoys, anchors, boat trailers, live wells, firewood, and various other ways. As such, participants in all outdoor activities can inadvertently spread invasive species. Techniques to minimize impacts include education and signage, wash stations for ATVs, UTVs, OHMs, and mountain bikes, boot cleaning brushes, and boat and trailer washing areas and monitors and signage at popular launch sites.

Environmental impacts

Other impacts that occur as a result of people participating in these activities can include such things as: soil compaction, inadvertent disturbance to breeding animals and other sensitive resources, air emissions resulting from people traveling in vehicles to their recreation destination, and littering. These impacts are nearly always minor, temporary and localized. For example, people seeking a geocache can inadvertently walk through sensitive areas and damage plants. Campers can accidentally start small wildfires. Or, anglers can cause inadvertent mortality to non-target fish due to poor hook sets.

The potential for inappropriate participation in any activity can occur which can cause more substantive impacts, but given the nature of most recreation activities, these instances tend not to cause long-lasting harm to the environment. For example, mountain bikers, horseback riders, ATV riders, and snowmobilers that leave designated trails can cause impacts, in some cases considerable, to habitats and species. Bird watchers wanting to get a close up view of a rare bird can repeatedly disturb the very target they seek. Although some of these impacts can be substantial, they are typically confined to a small area or narrow window of time.

Social conflicts

Given the wide variety of recreation activities that take place on department lands and the frequency of visitation, it is somewhat surprising the relatively few conflicts between and among recreationalists that occur. But conflicts do happen. Most occur because of a simple lack of recognition that others are nearby. For example, sounds of gunfire can upset hikers, bikers, or others in an area that didn't realize hunting was taking place. Or, hikers or geocachers can disturb hunters that are patiently waiting for game to come close. In addition, crowding and overuse can be a problem (e.g., at popular boat launches). In some cases, visitors to department lands leave state-owned land and enter private property.

Other conflicts can be more pronounced and are often rooted in a personal dislike for a particular activity. Some people do not support hunting, trapping, fishing, motorized activities, dog training, and other activities and are especially opposed to them occurring on public lands.

RECREATION ACTIVITIES WHERE PARTICIPATION HAS MINIMAL ADVERSE SOCIAL OR ENVIRONMENTAL IMPACTS

When education, signage, enforcement of regulations and best management practices are used in developing and managing recreation facilities (including trails), the following activities are considered to have minimal environmental or social impacts:

Trail-based activities in upland settings

- Hiking, walking, or running
- Bicycling – bicycle touring, off-road bicycling, mountain biking, and winter/fat-tire biking
- Cross-country skiing and snowshoeing
- Dog walking, dog sledding and skijoring

Non trail-based activities in upland settings

- Gathering wild edibles
- Geocaching
- Hunting
- Nature photography and education
- Rock climbing
- Trapping
- Wildlife (including bird) watching

Activities that take place at dedicated places

- Camping
- Target shooting – archery

Water-based activities

- Fishing
- Canoeing and kayaking
- Motor boating
- Swimming in lakes and rivers

Although substantial impacts from these activities are unlikely, if an activity is proposed in a way or at a location that appears likely to result in extensive or sizeable social or environmental impacts, the department will evaluate options and their associated outcomes to identify an appropriate course of action. The amount of public interest and controversy will be an important factor in determining if additional review is needed.

RECREATION ACTIVITIES WHERE PARTICIPATION HAS THE POTENTIAL FOR SUBSTANTIAL ADVERSE SOCIAL OR ENVIRONMENTAL IMPACTS

People's participation in the activities listed here has the potential to cause negative social or environmental impacts or be controversial depending on site-specific circumstances. To be clear, participation in these activities has the potential for adverse impacts; through appropriate design and management of trails and other facilities, signage and education, in many cases adverse outcomes can be minimized to the extent that any impacts are minor, temporary or localized.

- ATV/UTV riding
- Off-highway motorcycle riding
- Four-wheel drive vehicle driving
- Snowmobiling
- Horseback riding
- Dog training and trialing
- Target shooting - firearms

An impact assessment will be conducted for major new facilities that have been generally authorized in the master plan but have not been sited and designed. The impact assessment (and public input opportunity) will be completed at the design and construction approval stages.

POSSIBLE IMPACTS ASSOCIATED WITH RECREATION FACILITIES AND RECREATION PARTICIPATION ON DEPARTMENT PROPERTIES

IMPACTS TO THE PHYSICAL ENVIRONMENT

Land and geologic resources

Construction and operation related impacts:

For nearly all types of recreation facilities – from campgrounds to observation decks to boat launches – the construction process will result in some soil disturbance and compaction. The level to which this occurs is dependent on the activity. For example, when a new camping area (especially a developed or rustic campground) is created, the soil disturbance area can be many acres in size to provide campsites, drives, sanitation stations, and other facilities. The department follows all statutes regarding waterways, wetlands, stormwater runoff on construction sites, and revegetates all non-building and non-impervious surfaces. Electrical, sewer, and water service requires ground disturbances.

The impacts associated with any given road are dependent on the classification. Primitive road construction and maintenance entails few impacts during construction beyond minor amounts of vegetation clearing and small amounts of fill being used. Fully developed roads require extensive grading, surface modification and vegetation clearing.

Soil erosion can be a concern during both the construction and management of trail facilities. The department is subject to all stormwater control and erosion statutes, and prepares erosion control plans

as required.[1] During construction, soils exposed to erosion will be minimal. In sloped or otherwise vulnerable areas, the department installs armoring measures to reduce erosion potential.

Water stations available at trailheads, picnic areas, campgrounds and other facilities will require small wells that will tap bedrock or aquifer layers. Wells will not be high capacity and will be permitted in accordance with administrative code.[2]

Construction of a shooting range typically includes extensive grading and berming soil. Maintenance may include periodically removing spent casings and projectiles from the range.

PARTICIPATION RELATED IMPACTS

All types of trails can have problems with soil compaction, erosion, and run-off if not well designed and maintained.

Depending on soils and topography, trails and routes for ATVs, UTVs, OHMs, and 4WD vehicles can be susceptible to erosion and displacement of materials, especially in curves. These impacts can generally be addressed by reducing speeds and through design and maintenance. ATV, UTV, OHM and 4WD riders that leave designated trails can cause extensive and long-lasting resource and habitat damage. Although the number of riders that illegally enter these areas and cause damage is typically very small, the magnitude of the impacts can warrant special attention to locating trails and routes distant from sensitive sites to the degree possible. The use of trail ambassadors and monitoring can be an effective management approach to minimize problems.

Snowmobiles can cause impacts to soil and trail surfaces where they are used when there is inadequate snow cover. Machines with studded tracks can cause damage to wood bridges or asphalt surfaces.

The impacts of camping are directly correlated with the number of campsites at a campground and the level of development of supporting facilities. Modern campgrounds at poplar state properties can essentially become small villages on summer weekends with hundreds of people staying in a relatively small area. Rustic and primitive camping have fewer impacts given the smaller number of campers, additional spacing, and more limited facilities provided.

Air resources

Construction and operation related impacts:

Equipment used in the construction of recreation facilities can generate air emissions, dust and various amounts of sound.

Participation related impacts:

[1] Ch. NR 216.46, Wis. Adm. Code

[2] Ch. NR 812, Wis. Adm. Code

ATVs, UTVs, OHMs, and 4WD vehicles can generate dust and emissions that affect air quality. Snowmobiles also generate emissions. Exhaust emission standards for street-legal and motorized recreation vehicles are established by the U.S. Environmental Protection Agency.

Shooting ranges can have impacts to air quality and can be a source of lead in the environment. Periodic lead reclamation can address some concerns and can be a source of material to recycle into new munitions.

Campgrounds can generate sounds, emissions from generators, campfires and barbeque grills.

Water and wetland resources

Construction and operation related impacts:

The development and maintenance of boat launches can have a variety of impacts on the environment. Motorized boat launches tend to have larger impacts than non-motorized boat launches due to the larger extent of facilities associated with them. Motorized boat launches typically have paved approach pads and concrete or gravel launch areas. Additional facilities may include parking areas, vault or portable toilets, picnic areas and docks.

The construction of swimming beaches may alter the shoreline of the waterbody. Both riparian and shallow water habitat may be lost where swimming beaches are constructed. Due to these potential impacts, a permit is required for the placement of a sand blanket in a navigable water way.[3] The visual aesthetic of the shoreline is also changed when a swimming beach is constructed. Additional facilities associated with swimming beaches (e.g., parking lots, picnic areas, toilets and changing areas) may have additional environmental impacts. Large swimming beaches may require additional analysis during the planning and design phase.

Department guidelines to avoid and minimize impacts at wetland and waterway crossings of motorized recreational vehicle trails are described in the design standards handbook.

Participation related impacts:

Trail riders that leave designated trails and enter wetlands and waterbodies can cause extensive and long-lasting damage. Although the number of riders that illegally enter these areas and cause damage is typically very small, the magnitude of the impacts can warrant special attention to locating some types of trails and routes away from wetlands and waterbodies. The use of trail ambassadors and monitoring can be an effective management approach to minimize problems.

[3] Wis. Stat. s. 30.12

IMPACTS TO BIOLOGICAL RESOURCES

Terrestrial resources

Construction and operation related impacts:

Construction and maintenance of trails, campgrounds, parking areas, observation decks, shelters, or similar structures can have an impact on wildlife due to vegetation clearing and the sounds generated by machinery. New trail development through previously undisturbed areas can lead to minor habitat fragmentation which may lead to impacts on species distribution.

Construction and maintenance of trails raises the risk of invasive vegetation spreading. Seeds or cuttings of invasive plants on equipment may be transported to areas not yet colonized. Mowing trails may also aid in the spread invasive species. Maintenance such as vegetation mowing and clearing also has potential to destroy nesting or other important sites for wildlife.

Participation related impacts:

Motorized recreation activities can generate sounds and commotion that can affect wildlife. These impacts are mostly an issue near trails and routes but can affect nearby wildlife by causing them to leave an area. This can be a particular concern during the breeding season. Depending on the number, frequency, and speed of riders passing by an area, this activity can cause outcomes such as nest abandonment.

Participants in all types of recreation can inadvertently spread seeds and other material of invasive species. The establishment of wash-stations, boot scrubbing brushes and other techniques at sites that receive intensive use can be effective at reducing these impacts.

Conventional wisdom has associated horse use with the spread of invasive plants. Although certainly possible, the vast majority of horse owners work to ensure that their animals don't eat or spread invasive plants, in large part motivated by a desire to prevent these species spreading to their pastures and lands. Only a limited amount of research has been conducted on this topic; however, the initial results suggest that horse droppings are not a meaningful source in the spread of invasive plants.[4]

Dog training at designated sites can displace wildlife species from the immediate area. In cases where training is allowed from April 15 to July 31, it is likely that the displacement can affect breeding success of birds and small mammals in the immediate area.

---

[4] See: (1) Gower, Stith T. 2008. Are horses responsible for introducing non-native plants along forest trails in the eastern United States? *Forest Ecology and Management* 256(2008):997-1003. (2) Campbell, Jonathan E. and David Gibson. 2001. The effect of seeds of exotic species transported via horse dung on vegetation along trail corridors. *Plant Ecology* 157(1): 23–35. (3) Quinn, Lauren D., Adda Quinn, Mietek Kolipinski, Bonnie Davis, Connie Berto, Mark Orcholski, and Sibdas Ghosh. 2010.

Role of horses as potential vectors of non-native plant invasion: an overview. *Natural Areas Journal* 30(4): 408-416. (4) Wells, Floye H. and William Lauenroth. 2007. The potential for horses to disperse alien plants along recreational trails. *Rangeland Ecology and Management* 60(6):574-577. (5) Pickering, Catherine M. 2008. *Literature review of horse riding impacts on protected areas and a guide to the development of an assessment program*. Environmental Protection Agency: Brisbane.

Dog trials involve the use of horses for judges, trainers, marshals, and sometimes spectators. Horses may trample soil and vegetation, particularly in wet conditions. The presence of many dogs, horses and people can cause impacts to wildlife and cause some to be displaced.

The sounds generated from shooting ranges are related to use levels, facility design, types of firearms discharged, and the surrounding vegetation and topography. The sounds generated can displace wildlife and affect the distribution and abundance of animals near the range.

Aquatic and wetland resources

Construction and operation related impacts:

Boat launches, canoe access points, and fishing piers alter the shoreline of waterbodies. Erosion during construction can cause minor impacts to the waterbody. Stormwater runoff from impervious surfaces associated with these facilities can enter waterbodies. Department design standards and best management practices limit the impact of these facilities on water resources.

Participation related impacts:

Trail riders that leave designated trails and enter wetlands and waterbodies can cause extensive and long-lasting ecological damage. This can be a particular problem with ATV, UTV, OHM and 4WD riders that leave designated routes and trails. The use of trail ambassadors and monitoring can be an effective management approach to minimize problems.

As with terrestrial resources, invasive species are a substantial problem in aquatic habitats. Lake associations throughout the state sponsor a range of activities and educational measures to minimize the spread of aquatic invasive species.

IMPACTS TO CULTURAL, HISTORIC OR ARCHAEOLOGICAL RESOURCES

Construction and operation related impacts:

The development of recreation facilities has the potential to unearth archaeological sites. During the facility design phase, the DNR Archaeologist is consulted to assess the design and siting for any potential impacts. If an archaeological resource is discovered during the clearing or grading process for facility development, all appropriate actions are taken in accordance with applicable laws and regulations.

Participation related impacts:

Trail users that leave designated trails and enter areas with cultural, historic or archaeological resources can cause damage. Motorized uses can cause extensive and long-lasting damage. The use of trail ambassadors and monitoring can be an effective management approach to minimize problems.

IMPACTS TO RECREATION PARTICIPATION

Others participating in the same activity

Participation related impacts:

In most activities, participants rarely affect other participants in the same activity. Rather, most participants enjoy interacting with others and sharing experiences and stories. The few situations where conflicts among participants in the same activity can occur are when the activity involves some form of consumption (e.g., hunting, fishing, or gathering edibles).

Others participating in different recreation activities

Participation related impacts:

There can be many ways that participants in different activities affect each other. In most cases these interactions are positive or at least neutral. Occasionally, there are adverse impacts, many of which are resolved over time through revised management, design and enforcement.

People participating in motorized recreation can adversely impact participants in other types of non-motorized recreation activities. Conflicts can be particularly acute with people pursuing activities that benefit from quiet settings (e.g., hunting, bird watching, nature study & appreciation, horseback riding, and primitive camping). This conflict can be amplified in situations where motorized riding opportunities are concentrated in an area (such as with a series of loop trails) rather than a longer-distance trail passing through an area.

Conflicts between ATV/UTVs and snowmobiles can also arise related to impacts to the snow base of snowmobile trails. In addition, in some cases snowmobile trails on private lands do not allow ATV/UTV use.

Conflicts between snowmobiling and cross-country skiing often occur if these uses are placed on the same trail. Many rail-trails that allow bicycling during warm weather months are designated as snowmobile trails in the winter. With the growing popularity of winter/fat-tire biking, many of these rail-trails are now also used by bicyclists in the winter. When both snowmobiles and fat-tire bikes use the same trail, conflicts and safety issues can be a serious concern.

In situations where horseback riding and other uses are allowed on the same trail some conflicts can emerge. The most common conflicts are caused by off-road and mountain bikers approaching horses too quickly and scaring them. These situations can be minimized through education, trail design, and orienting horse and other trail users in opposite directions.

Dog trials are competitive events that require larger areas (up to and sometimes greater than 1,000 acres) and are not compatible with other types of recreation occurring in the same location during these events. As such, they require an area to be essentially closed to other uses, which some visitors may oppose.

IMPACTS TO LOCAL AND STATE ECONOMY

Construction and operation related impacts:

Construction and operation of recreation facilities generates economic activity in the surrounding communities. In some cases, facilities (especially trails) are constructed and maintained by volunteers. The amount and duration of the economic impact associated with facility construction and maintenance is a function of its scale and nature.

Participation related impacts:

All types of participation in outdoor recreation result in some costs and benefits. Costs to providers include items such as land acquisition and facility development, maintenance, and ongoing management. Costs to participants include items such as fees, equipment, and travel expenses. It should be noted that one entity's costs are another's benefit. That is, spending that occurs throughout the outdoor recreation "ecosystem" – on construction supplies, hunting licenses, mountain bikes, hotel rooms, bait and the myriad of other items that are associated with participation – pumps money through the local and state economy. This direct spending also generates indirect economic activity (for example, restaurants that feed anglers stopping for lunch buy food and other supplies from local farmers and distributers) and induced activity (the salary of the construction worker who builds a fishing pier at a state forest that is spent on food, clothes, rent, and other daily expenses).

This description of economic impacts focuses on those that are *travel-related*. Considerable economic activity is also associated with purchasing and maintaining equipment (e.g., boats and trailers, firearms, mountain bikes, fishing rods, kayaks, skis, sleeping bags, etc.), acquiring land or recreational properties, purchasing and boarding horses, and a wide assortment of other things such as joining clubs and organizations, insurance, and taking classes to become proficient. These can be considerably harder to quantify and assign appropriately to one's participation in outdoor recreation. As a result, these economic outcomes are not included here.

Many studies have evaluated the travel-related economic impact of different types of public recreation properties as well as the economic impact of specific activities. There are wide ranges in the economic benefits that different properties and activities generate. Properties that draw many people from longer distances (and thus generate more multi-day trips) tend to have substantially higher economic benefits on nearby communities than properties that typically draw local residents for shorter visits.

Similarly, participants in some outdoor pursuits tend to generate more travel-related economic activity than others. This difference is commonly a function of the activity and the length of typical outings. As an example, camping is at least a two-day (and often longer) event. One's willingness to travel is often tied to the length of their stay and thus people engaging in multi-day events often travel several or many hours to reach their destination. The longer their trip, the more travel expenses they will incur (fuel, food, accommodations) and the more likely they will spend money away from home. Similarly, participants in motorized activities tend to spend more than non-motorized recreationists because they incur fuel costs as well as costs associated with their machines.

In general, people spend about $25/day on travel-related expenses (fuel, food & drinks, firewood, fees, bait, and other similar supplies) on most types of outdoor recreation trips. It should be noted that there is a wide range in this figure depending on how far people travel, the expensiveness of places they visit while on their trip, and the types of supplies associated with the activity. At the low end of the spectrum,

someone who drives 10 minutes to a property for a 45-minute walk with their dog might incur expenses less than $2. At the higher end, participants in motorized activities are estimated to spend between $40 and more than $100/day.

People that go on multi-day trips incur costs associated with their lodging. These costs vary considerably depending on where they spend the night(s). Some stay in hotels, inns or similar accommodations while others sleep in tents or RVs at campgrounds.

SOCIAL IMPACTS

Participation related impacts:

Participation in outdoor recreation can affect nearby property owners and residents. For example, in instances where motorized recreation routes and trails are located near residential properties, the sounds and exhausts generated by riders can cause adverse impacts. Similarly, shooting ranges generate sounds that, depending on a number of factors including site design, topography, wind direction and shooting direction, can be noticeable for miles. This can have substantial negative impacts on surrounding landowners and residents. Mitigating measures can include time of day limits, use of shooting sheds with baffles and limits on the types of arms and munitions allowed. Potential new shooting ranges are often opposed by nearby residents over concerns about how the sounds will impact their quality of life and the value of their property.

Dog training can involve the discharge of firearms. In some cases, blanks are fired to acclimate the dog to the sounds of firearms. In other cases, licensed trainers can bring, release and shoot captive-raised animals (usually partridges, pheasants, or ducks) for their dogs to practice retrieving. Generally, the level of use at any given time at dog training grounds is low since people prefer to train their dogs with few distractions. If there are more than a couple of people using a training ground, others that arrive will typically find a different location or return at a different time rather than attempt to train in a crowded situation. The noise of occasional gun shots can be upsetting to some neighbors or other people visiting the property. Most dog training grounds on department lands are between 40 and 200 acres and are located on State Wildlife Areas.

Participation in outdoor recreation can have many positive social benefits as well. Participation in group activities brings together friends and families, including multi-generational gatherings. Dog training and trialing are critical components of ensuring that well-trained dogs are used in different types of hunting. Horseback riding is one of the oldest forms of outdoor recreation and travel. Opportunities for riding help secure a link to previous ways of life and the traditions associated with the state's earliest days. And in addition to the benefits of providing gun owners with opportunities to practice gun safety, shooting ranges allow hunters to improve marksmanship and sight in their firearms.

POSSIBLE CUMULATIVE EFFECTS OF RECREATION PARTICIPATION ON DEPARTMENT PROPERTIES

A positive cumulative impact of the public's recreational use of department properties is the improvement in their physical and mental health. Numerous studies have shown the health benefits of outdoor recreation, including the consumption of wild fish and game. Although many people enjoy combining multiple activities within a trip (for example, camping and hunting, fishing and canoeing, or bird watching and hiking) these rarely result in cumulative impacts that are noticeable.

Negative cumulative impacts on the physical environment and to wildlife can occur if an area is used by many people continually (e.g., a popular campground), or for many types of activities concurrently, or over time (e.g., an area that provides hiking, mountain biking, horseback riding and OHM riding on separate trail systems within close proximity).

POSSIBLE RISKS ASSOCIATED WITH RECREATION PARTICIPATION ON DEPARTMENT PROPERTIES

Participants in all outdoor activities bear the risk of physical injury. Some activities such as mountain biking and rock climbing can be riskier than others (e.g., hiking, bird watching and canoeing).

POSSIBLE PRECEDENTS ASSOCIATED WITH PROVIDING OPPORTUNITIES FOR RECREATION PARTICIPATION ON DEPARTMENT PROPERTIES

Department properties have provided high-quality experiences for a wide range of outdoor recreation activities for over 100 years. Occasionally, in response to public demand, the department provides new or different opportunities at properties. Similarly, new recreation activities are continually developed (e.g., winter "fat tire" biking or geocaching) and the department responds by providing opportunities. These changes set a precedent at a property and are typically supported by some and opposed by others. In many cases, opposition is driven by a desire on the part of existing users to "keep things the way they are" and a lack of information on the demand for new recreational uses and their actual impacts (positive and negative).

DEGREE AND NATURE OF CONTROVERSY ASSOCIATED WITH RECREATION PARTICIPATION ON DEPARTMENT PROPERTIES

Few aspects related to the management of department lands generates more controversy and disputes than the recreational uses allowed and provided for. By design, the master planning process is the venue for the public discussion and debate on the future uses of department properties. The process is designed to provide an open forum for the full spectrum of advocates, neutral parties and opponents to articulate their perspectives and, hopefully, to better understand others' viewpoints.

Some recreation activities draw more controversy than others. Opposition to proposed activities may arise from environmental concerns (e.g., noises generated by motorized recreation and shooting ranges), social/cultural concerns (e.g., ethical considerations related to hunting and trapping), or economic concerns (e.g., the potential impact of a rail-trail on adjacent property values).

In cases where existing or proposed recreation uses are controversial the department must still make decisions about what activities should and should not be allowed. As such, these outcomes will disappoint some and please others.

WEPA COMPLIANCE

Property planning under Ch. NR 44, Wis. Admin. Code, is an integrated analysis action under NR 150.20(2)(a)1., Wis. Admin Code, and therefore complies with the Wisconsin Environmental Policy Act, s. 1.11, Stats.

CHAPTER 5: ANALYSIS OF ALTERNATIVES

This chapter describes the alternatives and anticipated impacts of alternatives *considered but not selected* during the development of this master plan.

LAND MANAGEMENT ALTERNATIVES

The resource assessment of these properties that the department conducted prior to initiating the master planning process for the NLMC master plan determined that overall current land management objectives and actions on the properties were appropriate and should generally be continued. No new resource management objectives (alternative management purposes) were identified for consideration in the planning process.

During the planning process the planning team evaluated the assessment data and determined the most appropriate actions for protecting and perpetuating high-value resources and general habitats, and recreational environments. The proposed master plan maintains the overall current resource management focus on each property and adds enhancements to provide additional protection or enhancement of high-value natural resources that were identified in the resource assessment process. The result is that these resources are now more precisely defined and managed under the proposed plan. Thus, the planning team did not consider any significant land management alternatives.

PUBLIC USE ALTERNATIVES

ATV/UTV TRAILS

The Upper Lake Michigan Coastal Recreation Opportunities Analysis ranked needed recreational activities for the region into high, medium, and low categories. The analysis ranked ATV/UTV riding as a 'medium' need for the region; nonetheless, the planning team evaluated opportunities to expand ATV/UTV recreation on properties in the Northern Lake Michigan Coastal master plan. Many of the properties are relatively small and do not offer opportunity for new trails or route connections. Most of the larger properties are unsuited to motorized trails due to extensive wetlands or wet soils. Thus, the planning team did not find any opportunities to expand ATV/UTV trails in the region.

The Upper Lake Michigan Coastal region contains portions of five other Ecological Landscapes – North Central Forest; Northeast Sands; Forest Transition; Central Lake Michigan Coastal; and Southeast Glacial Plains. Opportunities to expand ATV/UTV recreation may be found in future planning processes for those landscapes.

BOAT LAUNCH AND BREAKWATER AT WHITEFISH DUNES STATE PARK

The department was asked to consider installing a boat launch and a breakwater that would serve as a harbor of refuge at Whitefish Dunes State Park. The proposed facility would be located east of the existing picnic shelter, and would include four launch lanes, a breakwater and harbor area, and 8 to 10

new parking stalls for boat trailers. A new road connecting the marina to the existing parking area would extend south from the easternmost parking lot.

A harbor of refuge is defined by the Code of Federal Regulations as "a port, inlet, or other body of water normally sheltered from heavy seas by land and in which a vessel can navigate and safely moor. The suitability of a location as a harbor of safe refuge shall be determined by the cognizant Officer in Charge, Marine Inspection, and varies for each vessel, dependent on the vessel's size, maneuverability, and mooring gear." (46 CFR 175.400)

The Lake Michigan shoreline in Door County has several existing launch sites, including at Sturgeon Bay, Whitefish Bay Town Park, Schauer Town Park, and Baileys Harbor. Only Sturgeon Bay and Baileys Harbor are considered harbors of refuge. The citizens requesting this facility feel strongly that an additional harbor of safe refuge is needed for boater safety along the shore between Sturgeon Bay and Baileys Harbor.

In evaluating this request, the department considered various factors including need, physical capability, existing uses, engineering and construction feasibility, and permitting requirements. The department takes concerns about boater safety seriously. However, a facility of this scale on a Great Lake would entail a considerable amount of engineering, permitting, and approval process before any construction could begin. The feasibility of the proposed facility at the proposed location has not been determined.

As with many sites on the Lake Michigan shoreline, this site has complex geology, challenging topography, drainage concerns, structural conditions, and/or wave characteristics that require careful consideration, planning, and design. This park area contains the largest, most significant Great Lakes dunescape in the state, and protects many rare plant species including Wisconsin's largest and most viable population of the federally threatened dune thistle. Two existing hiking trails would be interrupted by the proposed facility and would need to be re-routed along the cliff face. Finally, the main road into the park contains two curves, one right at the entrance and another at the nature center/office, that would be difficult or impossible for vehicles hauling large boats to navigate. Portions of this road would potentially need to be reconfigured to provide access to the new facility, and a new section of road may need to be constructed to create a loop from the proposed facility back out to the park entrance.

After considering the extensive modifications to unique and globally significant Great Lakes shoreline features that the proposed facility would require, the undetermined feasibility, and the significant costs entailed, the planning team decided not to include this proposal in the master plan.

CHAPTER SIX: PUBLIC INPUT SUMMARY

SUMMARY OF PUBLIC COMMENTS AND RESPONSE TO COMMENTS FOR THE DRAFT NORTHERN LAKE MICHIGAN COASTAL REGIONAL MASTER PLAN

The public comment period for the Draft NLMC Regional Master Plan was May 15 through June 12, 2018. Two public open-house-style meetings were held with 53 persons signing the register in Sturgeon Bay and only two at the Peshtigo meeting.

At the close of the public comment period, 17 persons wrote out comment forms or handed in letters at the meetings, and 72 additional persons and organizations sent in emails and letters. Two petitions were also received. One with 78 signatures of residents and business owners was in support of the regional master plan, particularly the proposed horse trails in Newport and Peninsula. The other was from the Door County Historical Society regarding redevelopments at the Eagle Bluff Light Station. It has 1,370 signatures.

All the public comments focused specifically on the state parks. No written comments were received on the wildlife and fishery areas or other non-park property plans in the region.

As for the comments on the Door County parks, most focused on Peninsula, Potawatomi and Whitefish Dunes. Here is a summary of the primary points:

<u>Peninsula State Park</u>

- A majority of comments voiced opposition to relocating the entrance at Peninsula SP.
- Of those few who commented on redesigning/redeveloping the Peninsula trail system all were in favor; no one questioned the need for that proposal.
- Horse trails were one of the popular subjects with people feeling strongly in favor and opposed both at Peninsula and Newport.
- The Door County Historical Society and a few others not included in the petition advocated adding authorization to the Peninsula Park plan for the summer kitchen and barn structures to be rebuilt on the Eagle Bluff Lighthouse grounds to restore the historic Light Station site.

<u>Potawatomi State Park</u>

- Maintaining (redeveloping) an observation tower or platform at Potawatomi was the primary comment for this park.

<u>Whitefish Dunes State Park</u>

- A number of people commented on the proposal to add camping here; currently it is only a day-use park, with there being a fairly even split in support and opposition to the change. Also, there were a few advocates proposing separate use-specific snowshoe

trails be designated due to conflicts occurring on the ski trails. And several people gave supporting comments to developing a trail linking the park with Cave Point.

- On April 9, 2018, a citizen resolution was introduced and passed by those in attendance at the Door County Spring Hearing. The resolution was in support of including a boat launch and safe harbor as an option in the master plan at Whitefish Dunes State Park and exploring the feasibility of this project. On May 12, 2018, the full body of the Wisconsin Conservation Congress voted to support this resolution at their annual convention in Green Bay.
- There was a request from at least two individuals at the Sturgeon Bay meeting to include in the plan a feasibility study for a boat launch and safe harbor at Whitefish Dunes State Park. Opposition was also stated against considering any proposal for developing a harbor of refuge at the park. Additionally, several people advocated taking additional action to protect the undeveloped shoreline of the park, such as by designating it as a State Natural Area.

Other comments:

- Several commenters urged increasing mountain bike trails in all the Door County parks.
- Many other comments were also received offering support or opposition or suggesting changes to various more minor plan elements. While these types of comments cannot be readily summarized, they are important and the department is considering them as staff move forward in drafting the final plan for approval by the Natural Resources Board.

RESPONSE TO COMMENTS

Overall the draft regional master plan has strong public support. All the comments were focused on the Door County State Parks and overall, on the primary issues, comments were well-balanced. The following are plan changes that will be made in response to comments or reasons why changes are not recommended:

<u>Peninsula State Park</u>

- Entrance at Peninsula SP: The department clarified the long-term proposal is to construct a new Park Entrance Visitor Station (PEVS) building at a different location that has yet to be determined; the location of the current PEVS is not being considered as a site for future PEVS construction due to natural resource issues. Given the concern over the proposed language, the department will remove the PEVS bullet from the Long-term Recreation Prescriptions.

- Horse trails: As stated above, there is both strong support and concern over adding horse trails to the park. In the redesign and development effort for the whole park trail system an attempt will be made to include horse trails provided siting requirements can be met. There will be additional opportunities for the public to continue to be involved through that process.
- Eagle Bluff Light Station: The plan will acknowledge that the department will work with partners to continue to educate visitors about the history of Eagle Bluff Lighthouse through interpretation and education of the lighthouse, site and support facilities. The department may do this cooperatively through an agreement with partner(s) outlining specific management, use and operation of the lighthouse area.

Potawatomi State Park

- Observation tower or platform: The observation tower at Potawatomi State Park is permanently closed. Significant wood decay has been found in the observation tower creating unsafe conditions and requiring removal of the tower. The department is planning for deconstruction of the tower with the intention to remove it as soon as practicable. There are no plans to replace the tower at this time. However, other viewing opportunities at the park include the Old Ski Hill Overlook and pull-offs along Shoreline Road.

Whitefish Dunes State Park

- Camping: Whitefish Dunes State Park is currently a day-use park and does not provide camping opportunities. As a result of the planning process, the department sees an opportunity to accommodate rustic camping, which is underrepresented in Door County. The plan includes language authorizing overnight camping at a small rustic campground to address needs in the region.
- Designated snowshoe trail: The department appreciates demand on the non-motorized recreation system and will continue to accommodate designated uses while striving for a quality experience.
- Boat launch and safe harbor feasibility study: The department is committed to boater safety and supports the need for a feasibility study to identify a location for a safe boat launch ramp on Lake Michigan between Sturgeon Bay and Baileys Harbor. However, at this time the department does not support identifying Whitefish Dunes State Park as the location for this launch until a thorough feasibility study and appropriate approvals are completed. The feasibility study should look at all sites between Sturgeon Bay and Baileys Harbor and include considerations such as the short- and long-term environmental and financial impacts associated with construction and maintenance. It

should also consider impacts on existing uses, traffic and safety. The department will take steps outlined in Chapter NR 44, Wis. Admin. Code to notify interested parties of the intent to modify the plan through a variance or amendment, and seek all necessary approvals to proceed following a completed feasibility study for the preferred location.

SUMMARY OF PUBLIC COMMENTS IDENTIFYING IMPORTANT ISSUES TO BE CONSIDERED DURING THE PLANNING PROCESS

The purpose of the initial fall 2017 public comment period was to announce the department's intent to develop a regional plan for department properties within the Northern Lake Michigan Coastal Ecological Landscape, make available the public participation plan, and identify issues to be evaluated during the planning process.

Based on comments received, the department compiled the following issues to be considered: general resource management support for forest regeneration and large blocks of habit with focus on invasive species management; balance recreation conflicts including overcrowding; support for infrastructure improvements; and increase recreation opportunities for camping, single track bicycle trails, horseback riding, cross-country skiing and snowshoe trails; and identification and preservation of cultural resources. Property-specific issues included: support for the preservation of the Eagle Bluff Light Station at Peninsula State Park; interest in re-opening the ski hill at Potawatomi Park; and a desire for a boat launch and breakwater (Harbor of Refuge) between Baileys Harbor and Sturgeon Bay to be located at Whitefish Dunes State Park.

Summary of Public Involvement:

Phase 1: initiating the planning process

Public comment period: Oct. 31, 2017-Nov. 28, 2017
comments received: 163
Public open house meetings: Nov. 14, 2017 @ Stone Harbor Resort & Conference Center, Sturgeon Bay
Nov. 15, 2017 @ Community Center, Crivitz
in attendance: 51

Phase 2: draft plan review

Public comment period: May 15, 2018-June 12, 2018
comments received: 89 including petition w/ 78 signatures and petition w/ 1,370 signatures
Public open house meetings: May 29, 2018 @ Stone Harbor Resort & Conference Center, Sturgeon Bay
May 30, 2018 @ DNR Service Center, Peshtigo
in attendance: 55

REFERENCES

Dott, Robert H. and John W. Attig. 2004. *Roadside Geology of Wisconsin*. Mountain Press Publishing. University of Michigan.

Institute for New Hampshire Studies. 2004. *The impact of spending by ATV/trailbike travel parties on New Hampshire's economy during July 2002 to June 2003*. Plymouth State University.

Lindberg, Kreg. 2009. *The economic impacts of off-highway vehicle (OHV) recreation in Oregon*. Oregon State University, Cascade Campus, Bend, OR. 16 pages plus appendices.

Pohlman, John D., Gerald A. Bartelt, Andrew C. Hanson III, Paul H. Scott, and Craig D. Thompson (Editors). 2006. Wisconsin Land Legacy Report: An inventory of places to meet Wisconsin's future conservation and recreation needs. Wisconsin Department of Natural Resources, Madison, WI.

Otto, Daniel. 2008. *The economic impact of off-highway vehicles in Iowa*. Prepared for the Iowa Off-Highway Vehicle Association. Strategic Economics Group, Des Moines, Iowa.

Schneider, Ingrid E. and Tony Schoenecker. 2006. *All-terrain Vehicles in Minnesota: economic impact and consumer profile*. University of Minnesota Tourism Center.

Steele, Y. (ed.). 2007. *Important Bird Areas of Wisconsin: Critical Sites for the Conservation and Management of Wisconsin's Birds*. Wisconsin Department of Natural Resources PUB-WM-475-2007, Madison, WI.

WDNR. 2015a. *The Ecological Landscapes of Wisconsin: An Assessment of Ecological Resources and a Guide to Planning Sustainable Management*. Wisconsin Department of Natural Resources PUB-SS-1131 2015, Madison, WI.

WDNR. 2018. *Recreation Opportunities Analysis: Upper Lake Michigan Coastal Region*. Wisconsin Department of Natural Resources, Madison, WI.

WDNR. 2005. Wisconsin's Strategy for Wildlife Species of Greatest Conservation Need. Madison, WI.

WDNR. 2015b. 2015-2025 Wisconsin Wildlife Action Plan. Madison, WI.

Wisconsin Department of Tourism. 2004. *Economic & demographic profile of Wisconsin's ATV users: results of an economic survey conducted between June-October 2003*. In conjunction with Wisconsin ATV Association and University of Wisconsin-Madison Department of Urban & Regional Planning and UW-Madison Extension.

APPENDIX A: HABITAT MANAGEMENT COMMON ELEMENTS FOR NLMC PROPERTIES

GENERAL MANAGEMENT

GENERAL FISHERIES MANAGEMENT

Warmwater Fisheries

Warmwater rivers, streams, lakes, and flowages can host a rich variety of game and nongame fish. Among the various species pursued by anglers are walleye, sturgeon, catfish, northern pike, muskellunge, smallmouth bass, largemouth bass, white bass, bluegill, crappie, pumpkinseed, and yellow perch. Forage and non-game species are important components of these ecosystems, providing forage for larger game fish, upward transfer of energy in the food web, and serving as host species for mussels, among other roles. A number of endangered, threatened, or special concern species also may be present. All these species are dependent on diverse habitats for their survival.

Log jams and submerged trees create complex habitat that serves a variety of fish life history needs, including spawning cover and/or substrate, hiding/resting cover for adult and juvenile fish, and substrate for periphyton and invertebrates – important food items for fish. Trees located at multiple depths within a stream or river channel can accommodate annual variation in water levels. Numerous management and research studies have shown that fisheries diversity and abundance tends to be higher in areas that contain large amounts of coarse wood habitat.

Small perennial or seasonal interconnected streams and wetlands along rivers and their old oxbows provide very productive habitat for native fish such as walleye and northern pike that use them for spawning and nursery areas, as well as for other aquatic organisms. Soft-stemmed vegetation such as grasses, sedges, and rushes, and suitable water flow (inlets and outlets) are important characteristics of these spawning and nursery areas. Shallow, rocky areas with moving current, such as rock and cobble riffle areas (and now rock riprap along river banks), are important spawning areas for lake sturgeon. Other features, like deep lateral scour pools with well-defined eddy areas or slow-moving backwaters, can be important for other times or stages in fish lifecycles (e.g., wintering habitat or larval stages).

Free passage is important for species that migrate along rivers, streams, and other waterways such as ditches to spawning habitats each year.

Management Objective

- Maintain and enhance existing native fish populations and diversity and fishing opportunity through habitat management, restoration, enhancement, gamefish stocking, control of non-native fish, research, and monitoring.

Management Prescriptions

- Monitor game and nongame fish populations using standardized fish surveys to detect long-term trends and establish management objectives.
- Allow natural hydrologic processes to occur wherever possible, or restore where feasible.
- Identify and remove barriers to fish passage.
- Actively manage selected sites for fish spawning and nursery habitat.
- Maintain open water habitat in sloughs, oxbows, and river channels.
- Where necessary, enhance or restore riparian corridors and degraded shorelines to improve streambank and in-stream habitats and angler access.
- Maintain existing coarse woody habitat and conduct woody habitat development (e.g., tree drops, creation of log-jams, etc.) as needed to improve cover, food supply, and spawning areas.
- Consult with appropriate staff from other programs (e.g., Natural Heritage Conservation, Wildlife Management, etc.) during the planning of in-stream and streambank fish habitat enhancement projects.
- Obtain all necessary water permits and/or floodplain hydrologic and hydraulic analyses pursuant to NR 116, Wisconsin Administrative Code, before conducting in-stream or streambank enhancements.
- Stock fish in flowages as needed to maintain or restore a game fishery.

Coldwater Fisheries

Coldwater streams support fish communities adapted to cold, oxygen-rich flowing water conditions. These communities contain relatively few species but are dominated by trout, which are very important game fish. Important coldwater species include game species like brook trout, brown trout, and rainbow trout, as well as species such as white sucker, mottled sculpin, and various minnows.

Stream morphology (channel width and gradient, bank slope, etc.), water depth and flow, temperature, degree of shading, bottom material, and cover are important factors affecting habitat quality for coldwater fish. Habitat enhancements can increase carrying capacity, growth, and natural recruitment of desired fish species and improve angler access. As with warmwater fisheries, addressing barriers that impair fish passage and degrade habitat quality is an important component of habitat management.

Management Objectives

- Maintain, or increase as practicable, the extent and quality of Class 1 and Class 2 trout streams for brown and brook trout populations.
- Maintain and improve natural trout reproduction, abundance, and size distribution.
- Maintain and enhance riparian and instream conditions to provide quality trout habitat and angler access and fishability.

Management Prescriptions

- Assess the condition of riparian and instream habitats and the health of fish populations to determine the type and intensity of management needed.
- Apply primarily passive management to sites that are high-quality and stable.
- Address fish passage impairments (e.g., beaver dams, culverts) to reconnect stream reaches and to maintain the free-flowing, coldwater environment required to maintain robust populations of aquatic species.
- In the 132-foot riparian corridor (66 feet on either side of the center line of the stream), manage vegetation to maintain high quality trout habitat and self-sustaining trout populations. Activities include planting of appropriate native species and removal of understory and young successional vegetation such as speckled (tag) alder, aspen, box elder, black willow, and invasive species to minimize bank erosion excessive stream shading, or degraded habitat quality.
- When necessary, install and maintain department-approved stream habitat enhancements at appropriate sites. These can include bank stabilization using rock rip-rap or vegetation root systems, lunker and boom cover installations, revetments and current deflectors, and brush bundling to protect or enhance habitat quality and diversity.
- Consult with appropriate staff from other programs (e.g., Natural Heritage Conservation, Wildlife Management, etc.) during the planning of in-stream, streambank, and riparian habitat enhancement projects.
- Obtain all necessary water permits and/or floodplain hydrologic and hydraulic analyses pursuant to NR 116, Wisconsin Administrative Code, before conducting in-stream or streambank enhancements.
- Continue to conduct electrofishing and netting surveys according to statewide monitoring protocols, and provide results to the public.
- Follow Bureau of Fisheries Management guidance on fish stocking rates.

GENERAL FOREST MANAGEMENT

Forest management activities follow the *Wisconsin Forest Management Guidelines* (PUB-FR-226-2011) as well as the DNR *Silviculture and Forest Aesthetics Handbook* (2431.5), the *Public Forest Lands Handbook* (2460.5), the *Timber Sale Handbook* (2461), the *Old-growth and Old Forests Handbook* (2480.5), and Forestry Best Management Practices (BMPs) for water quality and invasive species. Consult these resources for additional detail and management considerations.

Forest management activities also follow all applicable Broad Incidental Take Permits/Authorizations.

The following considerations apply generally across all forest types.

Management Considerations

- Retain snags, living and dead cavity trees, and coarse woody habitat whenever their retention does not conflict with other management objectives or pose a danger.

- Leave long-lived reserve trees as individuals or in groups to provide timber, wildlife, and aesthetic value whenever their retention does not conflict with other management objectives.
- Salvage of trees damaged by wind, ice, fire, insects, and disease may occur where it is not restricted by land classification or management objectives for the area.
- Provide a diversity of size and age classes across forest types. Where appropriate, extend the rotation age for some stands of oak, central hardwood, bottomland hardwood, swamp hardwood, northern hardwood, red pine, white pine, yellow birch, and swamp conifer in order to increase the abundance of older-aged forest habitat. Allow old-growth and old forest to develop in some areas through natural processes, passive management, or active management to encourage old-growth characteristics.
- Use intermediate forest treatments such as release or crown thinning as appropriate to develop young stands, improve species composition, and increase timber quality.
- Maintain site hydrology for lowland forest types (e.g., bottomland hardwood, swamp hardwood, white cedar, tamarack); restore where feasible.
- Follow DNR and Wisconsin Council on Forestry *Wisconsin's Forestland Woody Biomass Harvesting Guidelines* when conducting forest management in cases where biomass harvesting is compatible with site objectives.
- Require loggers to utilize established best management practices for all aspects of conducting timber harvest and removal, and require logging equipment to be cleaned prior to entry to and exit of state lands in order to prevent the spread of invasive plants.
- Apply silvicultural practices in a manner that reduces the spread of harmful insects, diseases, and invasive species.
- Control of invasive species, non-commercial forest manipulation, and prescribed fire may occur.
- Use research and monitoring information on regeneration and changes in composition and structure to aid in future management decisions.

GENERAL WILDLIFE HABITAT MANAGEMENT

The following general wildlife habitat management objectives and prescriptions apply, as appropriate, across all habitat types.

Management Objectives

- Maintain, enhance, and restore native plant communities (at a landscape scale whenever possible) to support a diversity of wildlife and fish, including both game and non-game species.
- 0Where possible, manage for larger blocks of habitat and a continuum of habitats from lowland to upland. Also, establish and maintain linkages, including hydrologic connections, between habitat blocks to create travel corridors for species movements over time.
- Monitor, maintain, and enhance game species habitat to support populations at levels that allow sustainable regulated harvest.

- Protect and enhance habitats and populations of rare species, including endangered, threatened, and special concern species and Species of Greatest Conservation Need (SGCN).
- Monitor, prevent, and control populations of invasive species and eradicate them where feasible.
- Protect cultural sites and features from disturbance and degradation when conducting habitat management.
- Provide opportunities for habitat and wildlife research and public education consistent with management and public use objectives.

Management Prescriptions

- Evaluate non-forested areas within or adjacent to larger blocks of forested habitat for suitability to convert to forest to increase forest block size. Convert these areas to a forest type appropriate for the site where feasible and where conversion does not conflict with an existing management objective.
- Maintain native upland brush on sites where it exists that are at a transitional stage between grassland and forest habitat.
- Actively manage old fields and pastures to create larger grassland blocks by removing fence lines, encroaching brush, and isolated patches of trees.
- Convert cropped land to native cover types or surrogate grasslands except where farming practices are being used to aid habitat restoration efforts or enhance wildlife populations and hunting opportunities.
- Enhance existing habitats through seeding and planting.
- Maintain shrub wetlands at appropriate sites, particularly in areas that do not have high potential for management as sedge meadow, wet prairie, or wet-mesic prairie.
- Use water level manipulations at flowages and impoundments to manage wetland vegetation and improve wildlife habitat.
- Fill or plug, ditches, break drain tiles, and construct scrapes to improve water level management and aid wetland restoration efforts, except where these are being used for fish spawning, fish nursery, or migratory passage.
- Maintain existing dikes and water control structures. However, some structures may be removed, and others added, where necessary after evaluation and consultation between appropriate programs.
- Use nest boxes, platforms or similar devices as appropriate to enhance reproduction of desired wildlife. Where natural nesting substrate develops, transition away from artificial nesting support.
- Comply with NR 40 (invasive species rule) regulations and guidelines for preventing the arrival of new invasive species to Wisconsin and slowing the spread of those already here. Follow invasive species BMPs.
- Control populations of established invasive species using appropriate techniques including prescribed fire, flooding, mechanical control (e.g., mowing, cutting, pulling), chemical control (e.g., herbicide application), or biocontrol.

- Follow all applicable Broad Incidental Take Permits/Authorizations, including those for bats, common activities, grassland and savanna management, and no/low impact activities.
- Maintain current maps of known cultural sites and features. Follow appropriate regulations (e.g., Section 44.40, State Statutes, Manual Code 1810.10) when proposing or planning any management activity that has the potential to disturb a cultural site.

MIGRATORY BIRD STOPOVER HABITAT

The great majority of Wisconsin's birds do not spend the whole year here but migrate to other states or other countries during the non-breeding season. Thus, they are regularly moving between summer breeding grounds and non-breeding wintering areas, which can be anywhere from hundreds to thousands of miles apart. Most birds complete their migrations in stages, stopping to feed and rest at various points along their migratory path. These sites are known as stopover sites. Stopover sites can generally be thought of as places that provide birds with resources they need to continue on their migratory journey – food, water, shelter, and protection from predators. Stopover sites vary widely in size, quality, and the degree to which they furnish these needed resources.

Migration is a very energetically demanding and risky time in a bird's lifecycle. Migration itself is physically very taxing, and birds must also navigate many dangers during their migratory journeys, including unfamiliar terrain, bad weather, predators, loss or degradation of stopover habitats, and various anthropogenic hazards (e.g., collisions with tall buildings or other structures, reflective glass, transmission lines, etc.). Mortality during migration can be quite high; for some species, such as wood-warblers, mortality rates during migration can be higher than at any other point in their lifecycle. The recognition over the past two decades that migration is a time of elevated vulnerability for many birds has led to increased conservation attention on stopover sites and on the need to provide a network of sites along migratory flyways that birds can use.

High quality stopover sites are large, intact natural areas with a diversity of habitats (both upland and wetland) that consistently provide abundant resources to large numbers of birds. However, even small, resource-poor sites not often thought of as having conservation value can be critical to acutely stressed migrants seeking shelter from predators or storms. Research throughout the Great Lakes region has highlighted the importance of stopover sites along the shorelines of the Great Lakes. These coastal sites may be disproportionately important to a successful migration for many species because they represent the first available landfall for birds negotiating large ecological barriers (i.e., the lakes). Sites within five miles of the shoreline of Lake Michigan is especially valuable for many birds (the closer to the shoreline, the more valuable). Other important sites are forested river and stream corridors or shorelines of inland lakes, particularly those with a north-south orientation, and large wetland complexes. In heavily altered landscapes (e.g., urban or agricultural areas), even small green spaces like city parks or fragmented woodlots can be valuable.

Management Objective

- Manage habitats on DNR lands to provide benefits to migrating birds.

Management Prescriptions

- Maintain and enhance the quality, extent, and connectivity of native habitats, particularly on properties within five miles of the shore of Lakes Michigan.
- Manage forests to maintain or increase species and structural diversity by encouraging a variety of appropriate native species (including masting and fruiting species), providing a range of size and age classes, and retaining structural features like snags and coarse woody debris.
- Transitional areas between different habitat types (e.g., between forests and grasslands or wetlands) provide opportunities to enhance habitat, as migrating birds often concentrate at these edges. Manage these areas as gradual or "soft" transitions between habitats by retaining or planting native small trees, shrubs, and herbaceous plants. Favor appropriate masting, fruiting, nectaring, and seed-bearing species (e.g., oaks; hickories; hackberry; cherries; hemlock; white spruce; eastern red cedar; willows; dogwoods; serviceberry; nannyberry; viburnums; elderberry; wild grape; wild columbine; beebalm; coneflowers; asters; goldenrods, etc.).
- Maintain forested corridors along streams and rivers.
- Where appropriate and feasible, manage flowages and impoundments with drawdowns to provide mudflat habitat for migrating shorebirds.
- Manage open wetlands to maintain a mix of emergent native vegetation and open water to benefit migrating waterfowl and waterbirds.
- Use native species when landscaping around public use or administrative areas such as visitor centers, campgrounds, and office buildings. Favor high-value tree species including oaks, hickories, willows, and elms, fruiting shrubs and vines, and nectaring and seed-bearing herbaceous plants.
- Control non-native invasive plants.

MANAGEMENT BY COVER TYPE

Aspen

This cover type is comprised of >50% basal area in aspen. Principal species are trembling aspen (also known as quaking aspen) and bigtooth aspen. Aspen occurs throughout the state, though is more abundant in northern Wisconsin than in the south. It grows on a wide variety of landforms and soil conditions, with a variety of other tree and shrub species as a dominant or an associate. Within the aspen cover type, the most common associates currently are red maple, white birch, balsam fir, red oak, and white pine. Most other major tree species occurring in Wisconsin can be found as occasional associates in aspen stands, and vice versa. The shrub layer is variable, depending on the moisture regime and age of the stand, but typically is absent to sparse when stands are young and comprised of dense "dog-hair" thickets of saplings, and gradually increases in density over time. Some clonal species such as American and beaked hazelnut, can persist under moderate shade. The ground layer is similarly variable depending on soil type, moisture regime, past disturbance, and other factors. Aspen is a "pioneer" species that generally grows in even-aged stands regenerated following a major disturbance such as stand-replacing fire, blow-down, or clearcut harvest. It often outgrows other associated species

and can form nearly pure stands. In undisturbed or unmanaged stands, aspen is replaced over time by more shade-tolerant associates through succession.

Aspen-dominated forests currently make up a significant proportion of the forested landscape in northern Wisconsin, and aspen is the second most common forest cover type in that region after northern hardwoods. However, virtually all these aspen forests originated due to human-caused disturbance after Euro-American settlement, and occur on sites formerly occupied by very different communities. Historically, aspen would have been a relatively minor component of forests in northern Wisconsin, patchily distributed in areas with moderate fire regimes where fire disturbance would have regenerated aspen clones and exposed mineral soil for seed germination. Aspen occupied only about 4% of northern Wisconsin's forests in the early 1800s. However, the very hot slash fires that burned all over the north following the widespread heavy logging of the Cutover period eliminated seedlings of many tree species just as harvest had eliminated the seed sources. Aspen's abundant, wind-dispersed seed allowed it to invade large areas formerly occupied by forest types ranging from spruce-fir to pine barrens. Aspen abundance reached a historic peak in the 1930s and has declined somewhat since then, though it remains far more abundant than in presettlement times.

Young aspen stands provide feeding and hiding cover for a variety of wildlife species, and may provide important post-fledging habitat for mature forest-breeding birds where they occur adjacent to mature forest. Aspen currently receives high management emphasis due to its importance to the forest products industry and to game species such as ruffed grouse, American woodcock, and white-tailed deer.

Management Techniques

- Coppice (simple; coppice with standards)
- Overstory removal
- Clearcut
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Consider landscape composition and structure (forest type and species composition; successional stage; age structure; stand/patch size; degree of fragmentation, etc.) when planning individual management actions. A variety of age classes and stand sizes provide wildlife and aesthetic value.
- Within extensively forested landscapes with low 'natural fragmentation' (i.e., heterogeneous landscape with various habitat types, wetlands, waterbodies, etc.), particularly within or adjacent to large forest patches with older age-class structure, consider employing actions (e.g., managing for larger stand and larger blocks, increasing connectivity with surrounding forest, aggregating individual cuts) that will reduce the amount of hard edge to minimize fragmentation and reduce impacts on edge-sensitive species.

- Simple coppice or coppice with standards are often used for regeneration. Thinning can help reduce pulpwood rotations and improve sawtimber yields.
- In mixed stands, maintain or increase tree species diversity, especially of conifers. Retain and encourage longer-lived species such as oaks, white pine, red pine, and hemlock.
- Aspen stands along flowages, lake and stream borders, or as islands in wetlands may require management modifications for aesthetic or ecological (e.g., potential rise in water table if all trees are cut) reasons. Passive management may be employed in some situations.

Balsam Fir and White Spruce

This upland forest community is dominated by white spruce and balsam fir. Associated species include white birch, trembling aspen, red maple, northern white cedar, eastern white pine, eastern hemlock, red pine, black spruce, and balsam-poplar. Mountain ash may occur frequently as a tall shrub or small tree, and other characteristic shrubs include thimbleberry, American fly honeysuckle, beaked hazelnut, and dwarf red raspberry. Large-leaf aster, blue-bead lily, Canada mayflower, wild sarsaparilla, and bunchberry are common understory herbs.

This forest type was associated historically with the Great Lakes, particularly the clay plain of Lake Superior and the eastern side of the northern Door Peninsula on Lake Michigan, and this is where the most extensive and best developed natural stands still occur. Many stands were clear-cut and severely burned in the late 19th and early 20th centuries, resulting in forests dominated by trembling (quaking) aspen and white birch.

Management Techniques

- Clearcut
- Overstory removal
- Shelterwood
- Group selection
- Patch selection
- Seed tree
- Single tree selection
- Planting or direct seeding
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Manage natural stands of balsam fir and/or white spruce to perpetuate these species, using the prescriptions outlined in the DNR *Silviculture and Forest Aesthetics Handbook*.
- Manage to maintain or increase the conifer component (white spruce, balsam fir, white pine, white cedar, hemlock) in these stands. Hand planting of white spruce, balsam fir, and white pine may be considered as a means of maintaining and increasing these species.
- In aspen-birch stands where white spruce and balsam fir are well represented in the understory as seedlings, saplings, or small trees, consider converting the stand to fir-spruce.
- Manage to increase structural diversity (large trees, snags, coarse woody debris, etc.) within stands.
- Whenever possible, manage for larger stands and connectedness to surrounding forest.

Bottomland Hardwoods

Bottomland hardwoods occur along rivers and streams, mainly in the southern half of the state but also at scattered locations in the north. The largest tracts are found along the Mississippi and lower Wisconsin Rivers, with significant stands also occurring on the Chippewa, Black, Yellow, Baraboo, Wolf, Sugar, Rock, St. Croix, and lower Peshtigo. Small tracts are found along many smaller rivers and streams. Important canopy species include silver maple, green ash, river birch, swamp white oak, red maple, black willow, cottonwood, and hackberry. American elm, formerly an important canopy species in these forests, has been greatly reduced by Dutch elm disease and now rarely reaches the canopy before succumbing, although young trees are still fairly common. Common understory species, often occurring in a patchy distribution, are wood nettle, jewelweed, sedges and grasses, green dragon, cardinal flower, and green-headed coneflower. Vines such as Virginia creeper, poison ivy, wild grape, moonseed, and wild cucumber can be prominent. Canopy openings may be invaded by thickets of native shrubs such as prickly ash and dogwoods, while sloughs and the margins of oxbow ponds often have the water-loving buttonbush. Northern occurrences tend to be less extensive than those in the south, often discontinuous, and comparatively species-poor, though they do support species that are rare or absent elsewhere in northern Wisconsin. Silver maple and green ash remain among the dominant canopy species, with balsam-poplar, bur oak, and box elder replacing some of the associated southern tree species.

Bottomland hardwoods and other floodplain habitats are adapted to – and driven by – disturbance. Periodic flooding, particularly in spring, is the primary natural disturbance that historically has shaped this community. The frequency, timing, duration, and extent of flooding can alter floodplain topography and influence the species composition and structure of both canopy and understory vegetation layers. Flooding can cause scouring effects from water, ice, and debris that damage or remove vegetation and expose sand or mud on spits or slough margins, can leave tangles of dead branches and other detritus, and can deposit sediments containing nutrients and organic matter that alter the microtopography of the floodplain. Floods can also carry in seeds and other propagules of plant species. Many bottomland tree species are early-successional and are adapted to exploit the conditions created by periodic floods and frequent disturbance.

Management Techniques

- Coppice

- Group selection
- Overstory removal
- Shelterwood
- Patch selection
- Direct seeding and planting
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Maintain and protect existing large, contiguous tracts of bottomland hardwoods, particularly where they exist adjacent to large tracts of upland forest. High-quality tracts of any size should be protected.
- Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding forest, and to soften sharp transitions between habitat types.
- Manage bottomland hardwood forests as part of an existing natural mosaic of floodplain habitats and ecological gradients from lowlands to uplands.
- Maintain or restore site hydrology whenever feasible.
- Use buffers to protect floodplain systems from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Carefully consider both landscape (watershed; surrounding land uses and vegetation; patch size, etc.) and site (hydrology; species composition; soils and topography; stand history; age structure, etc.) features when deciding on a management technique. Several management techniques may be applied depending on the management objectives, including both uneven-aged and even-aged systems. Use an adaptive management approach, and monitor results.
- Follow DNR Forestry management guidelines for emerald ash borer.
- Manage to maintain or increase tree species diversity, favoring non-ash associates such as silver maple and swamp white oak.
- In areas with a heavy ash component, succession to lowland brush or sedge meadow may occur with the absence of ash. Any management strategy should focus on maintaining potential to reforest the site and preventing conversion to reed canary grass.
- Manage stands for composition and structural diversity by: retaining some large-diameter trees, living and dead cavity trees, snags, and coarse woody debris; creating canopy gaps of varying sizes; creating and maintaining a diversity of age and size classes; and applying extended rotation or managed old-growth management to some stands.
- Conduct timber harvests only under frozen-ground or dry conditions to prevent rutting and soil damage and to protect site hydrology.

- Increase representation of older trees and older stands.
- Protect special features such as riparian areas, oxbows, running sloughs, cut-off sloughs, backwaters, open sandbars, mudflats, and unvegetated vertical banks.
- Plant bottomland hardwood species to increase corridor width of this habitat when opportunities present themselves.
- Limit permanent fragmentation caused by development (roads, parking areas, etc.).
- Consider management for aesthetic and ecological values where this forest type occurs within important recreational corridors and riparian zones.
- Control and limit deer herbivory.

Coldwater Streams

Coldwater streams are flowing waters with maximum summer temperatures typically below 22 degrees Celsius (72 degrees Fahrenheit). The watersheds of these streams are usually less than 100 square miles, and the streams exhibit mean annual flow rates of less than 50 cubic feet per second. Coldwater streams can be found statewide, but are concentrated in the southwest and in parts of central and northern Wisconsin. Streams in the unglaciated Driftless Area of the southwest exhibit a classic branched pattern and sharper, more eroded terrain. The rest of the state, smoothed by glaciers, has less topographic relief, creating sinuous streams with less average elevation drop.

Coldwater streams are dominated by groundwater inputs and sustain fish communities adapted to cold, oxygen-rich, flowing water conditions. These communities contain relatively few fish species and are dominated by trout and sculpins. Important coldwater species include game species like brook trout, brown trout, and rainbow trout, as well as species such as white sucker, mottled sculpin and various minnow species. Coldwater streams will often support diverse communities of invertebrates as well as environmentally sensitive mayflies, stoneflies and caddis flies.

Coldwater streams often rely on external sources of energy for the aquatic food web. Small streams are often shaded by trees and grasses so the invertebrates are adapted to eating leaves and detritus from terrestrial sources. Management of the streamside vegetation can increase productivity by allowing sunlight to penetrate directly into the stream to increase the production of algae and phytoplankton. This increases the invertebrate and fish populations, while balancing the need to remain sufficiently cold to sustain trout populations.

The physical habitat of a trout stream can be quite variable and is generally determined by watershed and landscape characteristics, specifically soils and geologic parent material as well as watershed size and gradient. Larger, lower-gradient streams are often sinuous and have bottom material composed of fine grained sands and silts. Smaller higher-gradient streams tend to be characterized by riffles and runs with gravel and rock substrate.

The quality of coldwater stream habitats and their fisheries can vary widely across the state, and not every stream needs the same type or intensity of management. In-stream and riparian habitats and the health of trout populations should be assessed for coldwater streams and used to classify them into three categories for habitat management purposes: protection; angler enhancement; and rehabilitation.

Many coldwater streams, particularly in the extensively forested northern part of the state, are high-quality, healthy systems. The goal for these streams is to protect and maintain existing conditions, so management of these is primarily passive, with limited active management to address any fish passage impairments. Some streams require management primarily to enhance angler access and fishing conditions. In these cases, manipulation of riparian vegetation (e.g., brushing) may be applied, as well as streambank practices such as bank sloping if necessary. Other streams, particularly in the southern part of the state, require rehabilitation to recover instream and riparian habitat and conditions for trout. These streams may need the full range of management techniques, including more intensive and ground-disturbing streambank and in-stream practices. All applicable water permits and/or hydrologic and hydraulic analyses pursuant to NR 116, Wisconsin Administrative Code, must be obtained before work begins.

Management Techniques

- Passive management
- Fish passage practices
- In-stream practices
- Pesticide treatments
- Streambank practices

Management Prescriptions

- Wherever possible, manage coldwater streams as part of a complex of interconnected, related habitats (e.g., open, shrub, or forested wetlands, grasslands, upland forests, etc.).
- Maintain site hydrology; restore where appropriate and feasible.
- Where possible, use buffers to protect streams from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Assess the condition of riparian and instream habitats and the health of fish populations to determine the type and intensity of management needed.
- Apply primarily passive management to sites that are high-quality and stable.
- Consider site and landscape context when conducting vegetation restoration in riparian corridors, favoring appropriate native species.
- Address fish passage impairments (e.g., beaver dams, culverts) to reconnect stream reaches and to maintain the free-flowing, coldwater environment required to maintain robust populations of aquatic species.
- Consult with Natural Heritage Conservation staff during the planning of in-stream and riparian habitat enhancement projects.
- Attempt to prevent the spread of non-native invasive species into streams where they currently do not occur. Employ chemical and mechanical methods to control them where they are present.

- Consider potential impacts on streams when conducting management in adjacent areas, including impacts on groundwater recharge areas, springs, etc.
- Follow Bureau of Fisheries Management guidance on fish stocking rates.

Conifer Plantation

Conifer plantations occur throughout the state, although they are especially abundant in the Central Sands, Northwest and Northeast Sands and Northern Highland. They are a significant part of forested landscapes in many areas and receive a high degree of management attention. Red pine is the most common planted species but plantations can also contain white pine, jack pine, white spruce, and the non-native Scots pine, Norway spruce, and European larch.

The compositional and structural diversity of plantations typically is low, although this can vary depending on presence of secondary species (non-target trees, shrubs, and herbaceous plants), as well as on site history, site preparation, and management regime. Conifer plantations can provide coniferous cover in areas where this has been diminished, as well as reduce the amount of 'hard edge' (sharp transitions between cover types) and increase effective forest patch size in areas with significant forest fragmentation.

Management Techniques

- Clearcut
- Direct seeding and planting
- Overstory removal
- Seed Tree
- Shelterwood
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- If converting conifer plantations to deciduous species, use seed tree, shelterwood, or overstory removal harvests at rotation age to allow advanced hardwood regeneration to re-vegetate the stand. While the stands are retained, use even-aged practices and thinnings to maintain stand health, vigor, and quality.
- If maintaining plantations, thin on a recurring basis (8-20-year intervals) according to guidance in the *Silviculture and Forest Aesthetics Handbook*.
- Use lateral branch pruning to improve sawlog quality.

- Plant conifer plantations as needed to maintain conifers on sites. Hand or machine plant nursery stock seedlings following site preparation by mechanical and herbicide application if required. Use hand or herbicide release following planting to maintain growth and vigor of planted pine trees and increase survival of planted trees. Regeneration checks will be made following planting at 3-, 5-, 10-, and 20-year intervals.
- When maintaining existing plantations or establishing new ones, consider using management techniques that will increase compositional and structural diversity to benefit wildlife, including rare species. This can include planting or maintaining an appropriate mix of species; using variable density thinning with gap creation to encourage recruitment of multiple layers of vegetation; retention of large trees, cavity trees, snags, and coarse woody debris; and applying extended rotation management to some stands or portions of stands.

Emergent Wetland and Shallow Lake/Deep Marsh

Emergent, floating-leaved, and submergent wetlands/marshes are open, permanent or semi-permanent wetland communities dominated by robust aquatic plants. They occur statewide in poorly drained basins created by the actions of past glaciers, protected bays and shorelines of lakes, impoundments, streams, riverine lakes, and river backwaters. Many factors can influence the extent and composition of these wetlands, including basin or floodplain morphology, hydrologic regime, current water velocity, water chemistry, and water clarity. In general, emergent vegetation grows in the shallow water closest to shore and submergent plants occupy the deepest waters capable of supporting rooted plants, while floating-leaved species occur at intermediate depths. However, there is high variability in water depths occupied by these different types of aquatic plants, and considerable spatial overlap.

Beds of emergent marsh are generally established in permanent standing water less than 6.5 feet deep. Many of the dominant plants form clones and the vegetation may be strongly zoned by water depth. It can be common for a single species to dominate large areas of more-or-less equal depth. Dominant species include cat-tails, bulrushes, bur-reeds, spike-rushes, water sedge and common lake sedge. Other common species include arrowheads, American water-plantain, pickerel weed, water horsetail, sweet-flag and pond sedge.

The floating-leaved marsh community is characterized by species with leaves that rest on and cover at least 25-50% of the water's surface. Common species include white water-lily, bull-head pond-lily, water-shield, water smartweed, floating-leaf bur-reed, common water-starwort, and pondweeds having both floating and submersed leaves. The pond-lilies have large leaves and, when dominant, can cover most or all the water surface, inhibiting the development of submergent or emergent plants by casting heavy shade.

Submergent marsh species are an assemblage of permanently inundated aquatic plants where most of the plant biomass occurs beneath the surface. Water depth is highly variable but often exceeds 1.6 feet and can reach depths of several meters in very clear waters. Fluctuation in water depth can be an important process as some submergent species reproduce by seed only when water levels are low. Pondweeds and naiads are among the dominant species, including large-leaved pondweed, grass-leaved pondweed, Illinois pondweed, small pondweed, Richardson's pondweed, fern pondweed, flat-stem pondweed, and slender naiad. Other common species are sago pondweed, common waterweed,

coon's-tail, American eelgrass, water star-grass, water bulrush, common bladderwort, water-marigold, horned-pondweed, white water crowfoot, yellow water crowfoot, and water-milfoils.

Aquatic plants, both submergent and emergent, form the foundation of healthy and flourishing aquatic systems within lakes and rivers and on the shores and wetlands around them. They protect water quality, produce oxygen, and help clarify water by absorbing nutrients like phosphorus and nitrogen that cause algal blooms. Plant beds stabilize soft lake and river bottoms and reduce shoreline erosion by absorbing effects of waves and currents. Aquatic plants also provide critical spawning habitat for fish and amphibians, shelter for various life stages of many species, and nesting habitat for birds. Plant beds support aquatic insects that serve as a food base for other species. Seeds and other plant parts are important food sources for waterfowl and other birds. Healthy native aquatic plant communities also help prevent establishment of non-native invasive plants like Eurasian water-milfoil.

Management Techniques

- Prescribed fire
- Mowing/brushing and haying
- Pesticide treatments
- Water level manipulation

Management Prescriptions

- Wherever possible, manage emergent wetlands as part of a complex of interconnected, related habitats (e.g., wet prairie, fen, sedge meadow, peatlands, shrubs swamp, bottomland or swamp hardwoods or swamp conifers, etc.).
- Protect and maintain large and/or high-quality examples of emergent wetlands and marshes, particularly when adjacent to other intact habitats. Maintain or increase size of habitat blocks and connectivity with surrounding native habitats, and soften sharp transitions between habitat types.
- Maintain site hydrology; restore where appropriate and feasible.
- Use buffers to protect wetlands from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Use prescribed fire, brushing, tree cutting, mowing, pesticide treatments, and biological control to control invasive species and remove encroaching woody vegetation in wetlands.
- Where appropriate and feasible, strive for a 1:1 ratio of open water to emergent vegetation (often referred to as "hemi-marsh"), as this is considered optimal for many breeding migratory birds such as ducks, terns, and rails.
- On appropriate sites where water level manipulation is possible, seasonally manipulate water levels to improve and enhance habitat for waterfowl and shorebirds and to facilitate vegetation management practices. Partial or complete drawdowns can promote desirable emergent and submergent aquatic species such as smartweeds and arrowheads.

Impoundments and Flowages

Impoundments, also known as reservoirs or flowages, are artificially created standing waterbodies produced by dams on streams, rivers, or other drainages. Dams can either be a result of beaver activity or constructed by humans for various purposes (electricity generation, navigation, recreation, etc.). The state of Wisconsin defines impoundments as waterbodies for which over one-half of the maximum depth is due to the presence of a dam. Impoundments vary greatly in size, configuration, flow patterns, water chemistry, and biota due to the diverse nature of streams, rivers, and dams.

Impoundments, particularly large ones, are popular for recreation and heavily used for boating, swimming, fishing, hunting, and trapping. Many have developed shorelines, with homes, businesses, and tourist destinations. The larger and more southerly ones have the richest fish faunas. Most impoundments are dominated by warmwater fishes.

Most impoundments on state lands were constructed during the 20th century to create waterfowl habitat and places for waterfowl hunting.

Management Techniques

- Water level manipulation
- Pesticide treatments
- Fish passage practices
- Lake aeration
- Nearshore practices

Management Prescriptions

- Wherever possible, manage impoundments as part of a complex of interconnected, related habitats (e.g., open, shrub, or forested wetlands, upland forests, etc.).
- Maintain dikes and water control structures in good condition.
- Attempt to prevent the spread of non-native invasive species into impoundments where they currently do not occur. Employ chemical and mechanical methods to control them where they are present.
- Where possible, use buffers to protect impoundments from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- On appropriate sites where water level manipulation is possible, seasonally manipulate water levels to improve and enhance habitat for waterfowl and shorebirds and to facilitate vegetation management practices.

- Install impoundments in high priority areas when they will help meet clear and achievable management objectives. Strategically design impoundments to enable efficiencies while limiting resource investments and demand on staff time.
- Remove impoundment infrastructure in lower priority areas when there are high costs and low returns on investment. Restore natural hydrology and appropriate native plant communities following dam abandonment.

Lakes

Inland lakes are naturally occurring bodies of water that exhibit a great diversity in size, configuration, water chemistry, and biota. A wide range of factors, including glaciation, post-glacial water flow, soil characteristics, topography, bedrock composition, land cover, and land use, can combine to determine the physical and chemical characteristics of any given lake.

The Wisconsin Wildlife Action Plan has divided inland lakes into multiple types using the following four characteristics: size; water depth; alkalinity; and water source. These are described below.

Size, Small or Large: Small lakes typically are less than 10 acres and large lakes are greater than 10 acres.

Water Depth, Deep or Shallow: Water depth is one characteristic that influences stratification, or the variations in temperature at different depths of a lake throughout the season. Various other factors also influence stratification, including surface area, water source, and water clarity. In stratified lakes (typically deeper lakes), a thermocline develops in summer and winter. In spring and fall, this zone of marked temperature differences breaks down. Bottom and surface waters mix, and oxygen and nutrients are redistributed. Lakes that don't stratify thermally (typically shallow lakes) can become oxygen-depleted as water warms and decomposition exceeds primary production. This can also occur in the winter when ice and snow cover the surface and inhibit photosynthesis, causing "freezeout" conditions. In this classification, deep lakes (and their associated plant and fish species) are those greater than 18 feet in depth, and shallow lakes are those less than 18 feet in depth.

Alkalinity, Hard or Soft: Hard water lakes are those with total alkalinity equal to or greater than 50 parts per million (ppm). These lakes are less susceptible to acidification due to high concentrations of hydroxyl, carbonate, and/or bicarbonate ions, which buffer acids. Soft water lakes have a total alkalinity less than 50 ppm, and have a low capacity to buffer acids.

Water Source, Drainage or Seepage or Spring: **Drainage** lakes have both an inlet and an outlet and their main water source is from streams. Most of Wisconsin's major rivers have drainage lakes along their course. Drainage lakes that obtain half their maximum depth from a dam are considered artificial lakes or impoundments. **Seepage** lakes are landlocked waterbodies with no inlet or outlet. Their main source of water is precipitation or runoff, supplemented by groundwater from the immediate drainage area. Because of this, water levels in seepage lakes may fluctuate seasonally. Seepage lakes are the most common lake type in Wisconsin. **Spring** lakes have an outlet, but no inlet. Their primary source of water is groundwater flowing into the bottom of the lake from inside and outside the immediate drainage area. Spring lakes are the headwaters of many streams, and are fairly common in northern Wisconsin.

These four major characteristics can be combined to describe multiple lake types (e.g., “Large lake, shallow, hard, seepage”, or “Large lake, deep, soft, drainage”).

Plant communities associated with inland lakes fall into two general categories: submergent marsh and floating-leaved aquatic. Both communities can be found within a single lake. In general, submergent species tend to occur in deeper water than floating-leaved species, although there is considerable overlap. Many factors influence the type and abundance of aquatic plants present in a given lake, including water clarity, chemistry, substrate, and stratification. Of these, water chemistry is perhaps the most important.

Management Techniques

- Passive management
- Pesticide treatments
- Lake aeration
- Nearshore practices

Management Prescriptions

- Wherever possible, manage lakes as part of a complex of interconnected, related habitats (e.g., open, shrub, or forested wetlands, upland forests, etc.).
- Maintain site hydrology; restore where appropriate and feasible.
- Attempt to prevent the spread of non-native invasive species into lakes where they currently do not occur. Employ chemical and mechanical methods to control them where they are present.
- Where possible, use buffers to protect lakes from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Consider potential impacts on lakes when conducting management in adjacent areas, including impacts on groundwater recharge areas, springs, inlet/outlet streams, etc.

<u>Northern Hardwoods</u>

Northern hardwoods occur throughout the state, but are more common north of the Tension Zone. In northern Wisconsin, northern hardwood forest forms the ‘matrix’ within which most other habitat types are found. It occurs on loamy soils of glacial till plains and moraines deposited by the Wisconsin glaciation. In presettlement times it covered the largest acreage of any Wisconsin vegetation type and still occurs extensively today, although its character is different from what existed historically.

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 species are greatly reduced in today’s forests. American beech, basswood, white ash, and yellow birch

are important associates. Beech can be co-dominant with sugar maple in the counties near Lake Michigan. Many other species can be found as occasional associates in northern hardwood stands. Species such as aspen, red maple, and birch have become more common in many stands after slash fires that affected many areas after the Cutover (late 1800s to 1932).

Characteristic tree species found in the sub-canopy include balsam fir, ironwood, and American elm. Alternate-leaved dogwood, beaked hazelnut, leatherwood, American fly honeysuckle, prickly gooseberry, red elderberry, and maple-leaved arrowwood are typical shrub species. Canada yew was an important shrub historically but is now absent from most of its former range due to excessive deer browse. The ground layer can vary from sparse and species-poor under hemlock stands, with wood ferns, blue-bead lily, club-mosses, and Canada mayflower, to lush and species-rich with many spring ephemerals such as large-flowered trillium, Dutchman's-breeches, spring beauty, and trout lilies. Other species include white baneberry, downy Solomon's-seal, wild sarsaparilla, rose twisted stalk, starflower, maidenhair fern, and lady fern.

Management Techniques

- Group selection
- Overstory removal
- Shelterwood
- Single-tree selection
- Passive management
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Consider landscape composition and structure (species composition; successional stage; age structure; stand/patch size; degree of fragmentation, etc.) when deciding on a management technique. Uneven-aged systems are generally recommended for northern hardwoods. However, a variety of management techniques may be applied depending on the management objectives, including old-growth reserves, managed old forest, extended rotation, un-even-aged management, even-aged management, and maintenance of reserve trees.
- Where possible, manage for larger stands, larger blocks, and to increase connectivity with surrounding forest.
- Limit permanent fragmentation caused by development (roads, landings, etc.).
- Increase species diversity where possible, especially to increase representation of hemlock, yellow birch, white pine, and basswood. Employing a variety of canopy opening sizes with single-tree and group selection can encourage diversity in tree species regeneration.

- Retain hemlock in mixed hemlock-hardwoods stands. Manage these stands using primarily passive management. Encourage hemlock by selectively thinning to remove competing species.
- For hemlock inclusions of >50% hemlock (hemlock, white pine-hemlock, hemlock–hardwood, or hemlock–yellow birch), including sites with regeneration potential, manage according to the recommendations in the Hemlock chapter of the *Old-growth and Old Forests Handbook*.
- Increase representation of older trees and older stands.
- Increase structural diversity within stands (large trees, cavity trees, snags, downed woody debris, variable gap sizes, pit-and-mound microtopography) through retention, selective harvesting, and extended rotation or old-growth management.
- Protect special features such as ephemeral ponds, seeps, riparian areas, cliff faces, and rock outcrops.
- Control and limit deer herbivory.

Oak and Oak-dominated Mixed Forest

Oak forests are those in which oak species comprise 50% or more of the basal area. Dominant species are red oak, white oak, black oak, bur oak, or Northern pin oak (also called scrub oak), with shagbark hickory, red maple, aspens, basswood, paper birch, white pine, and black cherry as common associates. Oak can occur on a wide variety of dry to mesic sites, with species composition and successional pathways influenced by site conditions, disturbance regimes, and land use history. Oak-dominated forests are more common south of the Tension Zone.

Historically, oak forests were common and widespread throughout much of the state. In northern Wisconsin, oaks historically were an important component of the white pine, red pine, and jack pine forests that were once widely distributed across the north. Most of these forests were cut and burned during the widespread heavy logging of the late 19th and early 20th centuries. The forests that grew back from this cutover have a much lower proportion of conifers and tend to be dominated by early-successional deciduous species such as trembling aspen and white birch. Much of the current oak in northern Wisconsin developed following the cutover. Red oak is the most common species on dry-mesic to mesic sites and can sometimes be dominant in stands formerly dominated by white or red pine. White oak can be locally important. Mixed stands often contain aspen, white birch, white pine, and northern hardwoods. Northern pin oak (also called scrub oak) and red oak are the dominant oak species on dry sites, sometimes with bur oak and white oak. Common associates include aspen, white pine, red pine, jack pine, red maple, and white birch.

Oaks have very high wildlife value, providing resources through mast production, nesting, denning, and roosting habitat, and cover for a wide variety of game and nongame species. Oaks also host a high diversity and abundance of insect populations, particularly lepidopterans (butterflies and moths), making them a critical food resource for migrating landbirds in the spring.

Management Techniques

- Coppice

- Overstory removal
- Shelterwood
- Clearcut
- Patch selection
- Direct seeding and planting
- Prescribed fire
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Consider landscape composition and structure (species composition; successional stage; age structure; stand/patch size; degree of fragmentation, etc.) when deciding on a management technique. A variety of management techniques may be applied depending on the management objectives.
- Limit permanent fragmentation caused by development (roads, landings, etc.).
- Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding forest, and to soften sharp transitions between habitat types.
- Where appropriate and feasible, manage oak forests as part of a natural gradient from forest to woodland to savanna/barrens.
- Coppice or shelterwood methods are often used to regenerate oak in conjunction with site preparation techniques and intermediate treatments. Patch selection and clearcutting or shelterwood with planting may have application in some sites. Given the current challenges in managing oak, a commitment to long-term management is required to successfully regenerate and establish new oaks.
- Strongly consider using prescribed fire in combination with silvicultural prescriptions (e.g., shelterwood, group selection, thinning) to regenerate oak. These techniques have shown substantial benefits for oak regeneration in other parts of the U.S. and Midwest, including in Wisconsin and on productive sites.
- Promote a diversity of oak species.
- In stands containing mature oaks where management to regenerate oak is not feasible, consider deferring management, or apply extended rotation or old-growth management to retain oaks as long as possible.
- In mixed stands, manage for an increased oak component where feasible, and for tree species diversity, favoring longer-lived species. On dry northern sites, favor oaks, pines, and white birch over aspen and red maple.
- Manage stands for composition and structural diversity by: retaining some large-diameter trees, living and dead cavity trees, snags, and coarse woody debris; creating canopy gaps of varying sizes;

maintaining or increasing tree species diversity; creating and maintaining a diversity of age and size classes; and applying extended rotation or managed old-growth management to some stands.

- Increase representation of older trees and older stands.
- Protect special features such as ephemeral ponds, seeps, riparian areas, cliff faces, glades, and rock outcrops, and savanna, barrens, and prairie remnants.
- Control and limit deer herbivory.
- Retain openings created by oak wilt where beneficial.

Red Maple

This cover type is comprised of >50% basal area in red maple. Red maple is a generalist species, able to thrive on a wider range of soil types, moistures, textures, pH, and elevation than any other forest species in North America. In Wisconsin, it occurs throughout the state growing in a wide range of dry to wet sites, although it tends to be most abundant in dry-mesic and wet-mesic sites (bimodal distribution) and is more abundant in northern and central Wisconsin than in the south. It can be found as a component in a variety of forest types. Its most common associates include balsam fir, white pine, sugar maple, beech, yellow birch, paper birch, eastern hemlock, eastern hophornbeam, northern white cedar, aspens, black ash, pin cherry, black cherry, red oak, American elm, and swamp white oak.

Historically, red maple was a relatively minor component of most forests. Its dominance on any one site likely would have been short-lived, as it would either be replaced by more shade-tolerant species or set back by disturbance. It was previously not considered a separate cover type independent of the northern hardwood cover type. The widespread logging that removed much of northern Wisconsin's conifer forests following Euro-American settlement, followed by fire suppression, created conditions that allowed red maple to greatly increase in abundance. The decline of American elm to Dutch elm disease, selective removal of higher-value species such as red oak, yellow birch, and sugar maple, and, particularly in the south, lack of oak regeneration due to fire suppression, excessive herbivory, competition from native and non-native species, and unsustainable logging also have contributed to the increasing proportion of red maple in many stands.

Management Techniques

- Coppice
- Group selection
- Overstory removal
- Patch selection
- Shelterwood
- Clearcut (strip)
- Single-tree selection
- Site preparation

- Intermediate treatments
- Pesticide treatments

Management Considerations

- Consider landscape composition and structure (species composition; successional stage; age structure; stand/patch size; degree of fragmentation, etc.) when deciding on management alternatives and techniques. Both uneven-aged and even-aged systems can be used to manage red maple. A variety of techniques may be applied depending on the management objectives. Conversion to another cover type also is an option.
- Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding forest, and to soften sharp transitions between cover types.
- If converting red maple to another cover type, consider oak (especially in central and southern Wisconsin), aspen, or conifers.
- If managing to maintain red maple, manage for compositional and structural diversity by: increasing species diversity (especially to increase representation of conifers such as white pine and hemlock, yellow birch, and oaks); retaining some large-diameter trees, living and dead cavity trees, snags, and coarse woody debris; creating canopy gaps of varying sizes; creating a diversity of age and size classes; and applying extended rotation or managed old-growth management to some stands.
- Protect special features such as ephemeral ponds, seeps, riparian areas, cliff faces, and rock outcrops.
- Limit permanent fragmentation caused by development (roads, landings, etc.).
- Control and limit deer herbivory.

<u>Sedge Meadow</u>

Sedge meadows are minerotrophic, open wetlands dominated by sedges with some grasses and forbs. They are most common in glaciated landscapes. In Wisconsin, there are northern and southern types that differ somewhat in species composition, although they also have species in common.

Northern sedge meadows occur most commonly on glaciated terrain north of the Tension Zone. They are found on the shores of some drainage lakes, along the margins of low-gradient streams and rivers, and in shallow depressions in outwash and ground moraine where there is ground movement and internal drainage. Near the Great Lakes, they are often part of the wetland mosaic of coastal estuaries. Northern sedge meadows commonly form discrete patches or zones between wetter communities such as marshes and somewhat drier areas that support woody wetland vegetation like shrub swamps, hardwood swamps, or stands of swamp conifers. There are several sedge meadow subtypes recognizable by their dominant plants. Wire-leaved sedge meadows are dominated by narrow-leaved species such as woolly-fruit sedge and few-seeded sedge. Broad-leaved sedge meadows are dominated by broad-leaved species like robust lake sedge and common yellow lake sedge, and tussock sedge meadows are dominated by tussock sedge and Canada bluejoint grass. Common associates are

northern blueflag, marsh fern, marsh bellwort, manna grass, panicled aster, spotted Joe-Pye-weed, and wool-grass. Sphagnum mosses typically are absent or occur in scattered, discontinuous patches.

Northern sedge meadows are influenced by direct contact with ground or surface water, with a hydrologic regime that can vary from seasonally flooded to permanently saturated. Site hydrology is the most important factor in the persistence of sedge meadows, although periodic wildfires likely played a key role historically in maintaining sedge dominance in certain landscapes (e.g., Northeast and Northwest Sands, Northern Highland) by creating niches used by less competitive plants and by limiting tree and shrub encroachment.

Management Techniques

- Prescribed fire
- Mowing/brushing and haying
- Pesticide treatments
- Water level manipulation

Management Prescriptions

- Consider landscape context (surrounding land uses and habitat types, watershed, etc.) and site factors (site hydrology, suitability to support sedge meadow vegetation, likelihood of reestablishment, etc.) when deciding whether restoration of sedge meadow through actions such as ditch filling, tile breakage, restoration of stream meanders, and modification or elimination of dams that maintain artificially elevated water levels is appropriate and feasible.
- Wherever possible, manage sedge meadows as part of a complex of interconnected, related habitats (e.g., wet prairie, fen, emergent marsh, peatlands, shrubs swamps, forested wetlands).
- Maintain site hydrology; restore where appropriate and feasible.
- Where possible, use buffers to protect sedge meadows from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Use prescribed fire, brushing, tree cutting, mowing, and pesticide treatments to remove encroaching woody vegetation in sedge meadows.
- Reduce competition to native vegetation from reed canary grass using prescribed fire, mowing, herbicide treatments, or water level manipulation. Where opportunities exist, flooding can eliminate solid stands of reed canary grass, allowing native vegetation to reestablish. Mid-summer mowing followed by an intensive, hot fire after the grass has dried has also proved effective in reducing reed canary grass and increasing native sedges in some sites.

<u>Surrogate Grasslands (Planted Prairie/Warm-season Grass and Cool-season Grass)</u>

Approximately 2.1 million acres of native prairie habitats existed in Wisconsin at the time Europeans arrived some 150 years ago. Over 99% of these native habitats have been lost, largely due to conversion to agriculture (farming and grazing), woody encroachment due to fire suppression, and residential and industrial development. "Surrogate grasslands" is the term used for anthropogenic habitats that are similar in structure to the prairies that formerly existed, and that provide usable habitat for some grassland species, particularly mammals and birds. Surrogate grasslands now represent the vast majority of the grassland habitat remaining in the state. They include agricultural habitats such as hayfields, small grains (wheat, oats, and barley), fallow fields, old field (formerly cropped fields), pastures, and set-aside fields (e.g., Conservation Reserve Program (CRP)) planted to non-native cool-season grasses such as smooth brome, timothy, redtop, orchard grass, bluegrass, and quack grass, or native warm-season grasses such as big bluestem, little bluestem, Indian grass, switch grass, and side-oats grama. Young conifer plantations, orchards, parks, golf courses, airports, roadsides, cut-over or burned-over forest, and mossed bogs (bogs from which sphagnum moss has been removed commercially) can also serve as surrogate grasslands. Surrogate grasslands also include idle grasslands on public or private land managed for wildlife. These are usually composed of non-native grasses and forbs but can also be plantings of native species (restorations), though typically falling far short of the species diversity of the original prairie.

Management Techniques

- Prescribed fire
- Mowing/brushing and haying
- Pesticide treatments
- Grazing

Management Prescriptions

- Wherever possible, manage surrogate grasslands within a complex of interconnected, related habitats (e.g., native prairie, oak barrens or savanna, sedge meadow, emergent marsh), preferably with a lowland-to-upland continuum.
- Use surrogate grasslands to buffer native habitats from surrounding land uses.
- Strive to enlarge and connect small or disjunct grassland patches. As a general rule, the larger the patch, the more beneficial to grassland-dependent species.
- When conducting restorations, plant a diversity of native species, especially forbs, from local seed sources whenever feasible.
- Where possible, use prescribed fire to improve or maintain structure and function in surrogate grasslands, to suppress the encroachment of woody species, and in some cases to control non-native invasive plants.
- Use grazing, cutting, mowing, brushing and herbicides (when necessary) to remove trees, shrubs, and invasive species. Management should recognize that virtually all grassland species will tolerate a small amount of woody vegetation, and that some scattered shrubs or shrub patches can benefit certain grassland species (e.g., Bell's vireo; brown thrasher; field sparrow).

- Where possible, remove treelines, hedgerows, fence lines, and other linear features that fragment grasslands and inhibit species movements.
- Follow all applicable Grassland and Savanna Management protocols to minimize negative impacts of management practices on rare/sensitive species.
- Follow soil and water quality BMPs to minimize adverse impacts of excess nutrients and sedimentation on surrogate grasslands.

Swamp Hardwoods

Swamp hardwood is a deciduous forested wetland that occurs along lakes, streams, or in isolated lowland basins in poorly drained morainal landscapes. It is more common in northern Wisconsin than in the south. Silviculturally, a stand where any combination of black ash, green ash, red maple, silver maple, swamp white oak, or elms comprises 50% or more of the basal area is typed as swamp hardwood.

Black ash often is the dominant tree in the north, sometimes occurring in almost pure stands. Red maple, yellow birch, and American elm are important in some stands. Silver maple occurs occasionally and red maple-silver maple hybrids are locally common in certain regions. Conifers such as northern white cedar, tamarack, white spruce, black spruce, and balsam fir are sometimes present. Tall shrubs such as speckled alder, common winterberry, and mountain maple may be locally common. The herbaceous flora can be diverse and may include many species also found in alder thickets. Typical species are marsh-marigold, swamp raspberry, skullcap, orange jewelweed, and many sedges. Microtopography is an important feature of swamp hardwoods, contributing to species and habitat diversity within stands.

Though related to bottomland hardwoods, swamp hardwoods are influenced by standing water (seasonally high-water table or inundation during spring runoff or major precipitation events) rather than by flood waters that flow through the stand, a hydrologic difference that leads to growth rates and understory composition distinct from bottomland hardwoods. Some streamside tracts have characteristics that are intermediate between these two major forest types (e.g., dominated by swamp white oak and black ash). Natural disturbances in hardwood swamps include flooding, windthrow, and drought. Of these, periodic inundation, typically occurring annually following snowmelt and spring rains, is the most important. This inundation is variable in extent, duration, and magnitude and influenced by local basin features, topography, soil type, and elevation with respect to the water table.

Management Techniques

- Clearcut (progressive strip)
- Group selection
- Overstory removal
- Patch selection
- Shelterwood (strip)

- Single-tree selection
- Coppice (with standards)
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Carefully consider both landscape (watershed; surrounding land uses and vegetation; patch size, etc.) and site (hydrology; species composition; soils and topography; age structure, etc.) features when deciding on a management technique. A variety of management techniques may be applied depending on the management objectives, including both uneven-aged and even-aged systems. Use an adaptive management approach, and monitor results.
- Protect and maintain large and/or high-quality examples of swamp hardwoods, particularly when adjacent to other intact native habitats. Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding native habitats, and to soften sharp transitions between habitat types.
- Maintain or restore site hydrology whenever feasible.
- Where possible, use buffers to protect swamp hardwoods from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Follow DNR Forestry management guidelines for emerald ash borer.
- Manage to maintain or increase tree species diversity as appropriate. In mixed conifer-hardwood stands, manage to increase the conifer component (white cedar, tamarack, hemlock, spruce, balsam fir). In hardwood stands, manage to maintain or increase silver maple, swamp white oak, yellow birch, hackberry, white birch, basswood, or red maple.
- In areas lacking conifers or other hardwoods, succession to lowland brush or sedge meadow may occur with the absence of ash. Any management strategy should focus on maintaining potential to reforest the site and preventing conversion to reed canary grass.
- Manage stands for composition and structural diversity by: retaining some large-diameter trees, living and dead cavity trees, snags, and coarse woody debris; creating canopy gaps of varying sizes; creating and maintaining a diversity of age and size classes; and applying extended rotation or managed old-growth management to some stands.
- Protect special features such as ephemeral ponds, seeps, riparian areas, and hummocks.
- Conduct timber harvests only under frozen-ground or very dry conditions to prevent rutting and soil damage and to protect site hydrology.
- Consider management for aesthetic and ecological values where this forest type occurs within important recreational corridors and riparian zones.
- Control and limit deer herbivory.

Tamarack

Tamarack is a forest type that occurs statewide, with southern and northern types. It is comprised of >50% swamp conifers with tamarack predominating. Tamarack is Wisconsin's only native deciduous conifer. It is a short-lived species, shallow-rooted, and reproduces from seed on favorable substrates which historically were created by wildlife. Tamarack is a pioneering species, fast-growing and shade-intolerant, and may form relatively pure stands after natural disturbances such as flooding, severe windthrow, drought, or severe insect infestations, especially when these are followed by fire.

Tamarack in northern Wisconsin is widespread and moderately common. It is weakly to moderately minerotrophic and occurs in depressions on poorly drained outwash plains, glacial lakebeds, and ground moraine, or, in smaller stands, in glacial kettles. Larger stands can cover hundreds of acres and sometimes occur in peatland complexes of several communities that are much larger in extent. Tamarack is the dominant tree, growing in stands that often are even-aged, with a broken to closed canopy. Coniferous associates include black spruce, northern white cedar, balsam fir, and, less commonly, white spruce or white pine. Deciduous species such as black ash, yellow birch, white birch, or red maple are sometimes present and can be important in some stands. The tall shrub layer is variable in density and composition and includes members of the heath family as well as speckled alder, common winterberry, mountain holly, alder-leaved buckthorn, bog birch, swamp fly honeysuckle, cranberry viburnum, and several gooseberries and currants. Ericaceous shrubs such as Labrador tea and blueberries are sometimes present. A variety of sedges, grasses, and mosses are present in the ground layer. Stands with spring seepage can have species like marsh-marigold, skunk-cabbage, and swamp saxifrage in the understory. Tamarack has declined in the north due to hydrologic disruption, logging of mature trees, fire, outbreaks of native and non-native insects, and succession to other cover types in the absence of fire.

Management Techniques

- Clearcut (progressive strip)
- Overstory removal
- Patch selection
- Passive management
- Seed tree
- Shelterwood
- Direct seeding and planting
- Site preparation
- Pesticide treatments
- Prescribed fire

Management Considerations

- Wherever possible, manage tamarack as part of a complex of related and interconnected forest and wetland habitats.
- Protect and maintain large and/or high-quality examples of tamarack swamp, particularly when adjacent to other intact habitats. Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding native habitats, and to soften sharp transitions between habitat types.
- Where possible, use buffers to protect tamarack from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Carefully consider both landscape (watershed; surrounding land uses and vegetation; patch size, etc.) and site (hydrology; species composition; soils and topography; stand age, etc.) features and develop a management approach based on this assessment. Use an adaptive management approach, and monitor results.
- Apply silvicultural techniques that consider effects on surrounding forests. For example, strip cutting can create high-contrast edge and minimize or eliminate larger patches of forest-interior habitat.
- Passive management may be employed for tamarack, particularly where trees are small, slow-growing, non-merchantable, or where site conditions preclude active management without damage to hydrology, soils, or wildlife habitat.
- Maintain or restore site hydrology whenever feasible.
- Use management practices that limit soil damage, erosion, sedimentation, and hydrologic changes to the stand and to adjacent areas.
- Consider using prescribed fire as a tool to aid regeneration where feasible and safe.
- Conduct timber harvests only under frozen-ground or very dry conditions to prevent rutting and soil damage and to protect site hydrology.
- Consider leaving tops and branches for further seeding opportunities from remaining cones.

Upland Shrub

Upland shrub habitats are upland sites with fewer than 10% trees and 50% or more of the area in tall, persistent shrubs. A variety of shrub species may be present, including hazels, dogwoods, juneberry, sumac, ninebark, and prickly ash. Alder may be found on upland soils along wetland fringes and abandoned pastures. In Wisconsin, most upland shrub habitats represent a successional stage between grasslands and forests. These habitats often are temporary, following disturbances such as logging or burning events. In some situations, frequent burning or mowing (every 3-5 years) may create conditions in which shrubs and sprouts (“grubs”) from trees such as oaks are maintained as the dominant plants. These areas may be important to an array of native plants and animals, particularly where the vegetation had been dependent on periodic wildfire. In other upland situations, assemblages of native shrubs, saplings, or stunted trees may persist on cliff margins, bedrock escarpments, or rocky shorelines (e.g., Niagara Escarpment).

Most upland shrub habitats are small or linear, interspersed among other habitats, scattered across former pastures, or along old fence lines, unmanaged woodlands, or utility corridors. Various wildlife species, including important game animals like deer, pheasant, and woodcock, use these sites for cover, feeding, and nesting. In an otherwise forested matrix, such sites can provide nesting habitat for shrub-nesting songbirds (e.g., blue-winged warbler, chestnut-sided warbler, etc.). However, these communities can also become infested with non-native invasive plants such as honeysuckles, buckthorns, and garlic mustard, and facilitate their spread into adjacent habitats.

Management Techniques

- Mowing/brushing
- Prescribed fire
- Pesticide treatments

Management Prescriptions

- Maintain native shrub communities on appropriate sites to provide habitat for wildlife, including game species, particularly where it helps to create a gradual transition, or "soft edge" between forested and more open habitat types.
- Use prescribed fire, mowing, and brushing to maintain the vigor and diversity of desirable native shrubs, managing for a variety of structures and age classes.
- Where upland shrub areas are infested with non-native invasive plants, covert to an appropriate native habitat using cutting, fire, herbicide or other techniques.

<u>Warmwater Rivers and Streams</u>

Warmwater rivers are flowing waters with maximum water temperatures typically greater than 25 degrees Celsius (77 degrees Fahrenheit). They usually have watershed areas greater than 500 square miles and mean annual flow rates of more than 200 cubic feet per second. Warmwater rivers occur statewide and include some of the state's largest rivers, such as the Mississippi, Wisconsin, Chippewa, Fox, Wolf, and Rock, as well as smaller rivers such as the Sugar, Baraboo, Milwaukee, Flambeau, and Yellow. Warmwater rivers host a rich fish fauna, dominated by warmwater species in the Cyprinidae, Catostomidae, Ictaluridae, Centrarchidae, and Percidae families.

The floodplains of some of the state's warmwater rivers, particularly free-flowing and/or relatively undisturbed segments, are home to a diverse and sometimes extensive and high-quality mosaic of habitats that can include bottomland and swamp hardwood forests, open-water habitat such as sloughs and oxbows, a variety of open, shrub, or conifer wetlands, barrens, savannas, prairies, and upland forests, as well as features such as islands, sand terraces, bluffs, cliffs, and gorges. These habitats are major repositories of terrestrial and aquatic biodiversity. Natural, periodic flood flows, most often driven by spring snow melt and rains, are important to the health of warmwater river floodplain forests

and wetlands and to the maintenance of self-sustaining populations of wetland-spawning fish like walleye and northern pike. The aquatic life dependent on these rivers and their floodwaters also supports a variety of mammalian and avian species. Free-flowing, undammed rivers are a critical factor in the existence and perpetuation of widely distributed populations of certain species, especially sturgeon and several species of mollusks that require a far-ranging fish host to complete their lifecycle. Dams established for a variety of purposes (power generation, navigation, flood control, recreation) have caused notable declines in some mollusks by blocking movements of their fish hosts.

Warmwater streams are flowing waters with maximum water temperatures typically greater than 25 degrees Celsius (77 degrees Fahrenheit) and watershed areas smaller than 500 square miles, with mean annual flow rates of less than 200 cubic feet per second. Warmwater streams are common statewide. Warmwater streams host a rich fish fauna, dominated by species in the Cyprinidae, Catostomidae, Centrarchidae, and Percidae families. Streams modified by dams, agricultural drainage, or increased flows due to changes in land cover have lost varying degrees of their original biological productivity and diversity.

Management Techniques

- Fish passage practices
- In-stream practices
- Pesticide treatments
- Streambank practices

Management Prescriptions

- Wherever possible, manage warmwater rivers and streams as part of a complex of interconnected, related habitats (e.g., open, shrub, or forested wetlands, grasslands, upland forests, etc.).
- Maintain site hydrology; restore where appropriate and feasible.
- Where possible and feasible, restore a more natural channel morphology and alignment to streams altered by channelization.
- Where possible, use buffers to protect rivers and streams from negative impacts of surrounding land uses (e.g., sedimentation, pollution).
- Consider site and landscape context when conducting vegetation restoration in riparian corridors, favoring appropriate native species.
- Where necessary, install and maintain department-approved stream habitat enhancements (e.g., bank stabilization, tree-drops) at appropriate sites.
- Address fish passage impairments (e.g., beaver dams, culverts, etc.) to reconnect stream reaches, maintain water flow and fish passage, and to prevent increased water temperatures and sedimentation.
- Consult with Natural Heritage Conservation staff during the planning of in-stream and riparian habitat enhancement projects.

- Obtain all necessary water permits and/or floodplain hydrologic and hydraulic analyses pursuant to NR 116, Wisconsin Administrative Code, before conducting in-stream or streambank enhancements.
- Attempt to prevent the spread of non-native invasive species into rivers and streams where they currently do not occur. Employ chemical and mechanical methods to control them where they are present.
- Consider potential impacts on rivers and streams when conducting management in adjacent areas, including impacts on groundwater recharge areas, springs, etc.
- Follow Bureau of Fisheries Management guidance on fish stocking rates.

Wetland Shrub – Alder

Wetland shrub communities are wetland sites with <10% trees and 50% or more persistent shrubs. Alder shrub wetlands have greater than 50% alder. These communities often are minerotrophic and dominated by tall shrubs, especially speckled alder (also known as "tag" alder), with red-osier dogwood, nannyberry, cranberry viburnum, wild currants, and willows among the shrub associates. Sapling or seedling trees of species such as northern white cedar, black ash, American elm, yellow birch, balsam fir, tamarack, and white pine may be present. Characteristic herbaceous species include orange jewelweed, Canada bluejoint grass, asters, boneset, rough bedstraw, spotted Joe-Pye-weed, marsh fern, sensitive fern, and arrow-leaved tear-thumb. Groundwater seepage is an important attribute of alder communities. Seepage areas often are indicated by the presence of species such as skunk-cabbage, marsh-marigold, swamp saxifrage, American golden saxifrage, and marsh pennywort.

Alder is common and widespread throughout the glaciated portions of northern Wisconsin, where it occurs on lake and stream margins and in basins experiencing lateral movement of oxygenated and nutrient-enhanced groundwater. Alder can be a stable community that persists in some locations for long periods of time. In other locations, it may succeed to more forested cover types, most commonly conifer swamp or hardwood swamp. It can also occupy large areas formerly vegetated with conifer swamps that were logged during the Cutover (1880s-1920s) and/or where water tables rose or fell as a result of logging, beaver activity, or drainage. Alder is therefore likely more common now than it was historically.

Alder is an important component of grouse and woodcock habitat in Wisconsin.

Management Techniques

- Passive management
- Mowing/brushing
- Pesticide treatments

Management Prescriptions

- When deciding on a management strategy, consider whether occupancy of the site by alder has been long-term and apparently stable or whether it is a shorter-term successional stage (e.g., caused by the removal of a beaver dam or heavy logging of a conifer swamp). Alder likely will not require active management to be self-sustaining on sites with stable/natural hydrology. The decision of whether to maintain alder on successional sites or sites with altered/compromised hydrology should be made after considering the landscape context of the site, suitability of the site to support other native communities and likelihood of reestablishment, and the need to prevent any further deterioration of the site.
- Maintain site hydrology; restore where appropriate and feasible.
- Alder shearing for woodcock habitat has become a more common practice in recent years. Using heavy equipment to implement this practice can damage sensitive soils, disrupt hydrology, and facilitate invasion of the site by exotic plants. Assess the proximity of invasive plants, especially reed canary grass, glossy buckthorn, and European marsh thistle, and the likelihood of inadvertently aiding their spread, before introducing heavy equipment to a site, and conduct management only under frozen-ground or very dry conditions to prevent rutting and soil damage and to protect site hydrology. Sites with standing water, saturated soils throughout the year, or heavy sedge growth are likely too wet and are unsuitable for this management practice.
- In stands being managed for woodcock:
    - Cut alder on a 20-year rotation; mow or shear strips that are 50-100 feet wide, or cut alder in blocks if necessary.
    - Position strips so that an adjacent strip can be cut every 5 years. If near a water source, orient strips perpendicularly to provide a soil moisture gradient for woodcock feeding opportunities.
    - Leave some areas of alder uncut, particularly in sites adjacent to mature forest, for species that prefer tall shrubs for nesting.

<u>Wetland Shrub – Dogwood</u>

Wetland shrub communities are wetland sites with <10% trees and 50% or more persistent shrubs. Dogwood shrub wetlands have greater than 50% dogwoods. These communities are minerotrophic and dominated by tall shrubs, especially red-osier dogwood or silky dogwood, with white meadowsweet, various willows, ninebark, swamp rose, and currants and gooseberries as shrub associates. The flora is similar to that found in alder shrub wetlands and tussock-type sedge meadows. Canada bluejoint grass often is very common, and other characteristic species include orange jewelweed, giant goldenrod, marsh violet, tall meadow-rue, American water-horehound, spotted Joe-Pye-weed, marsh fern, and sensitive fern. Sites with pools or spring runs may support broad-leaved cat-tail, arrowheads, American water-plantain, and bulrushes, while sites with springs and seepages may have great angelica, low-water parsnip, swamp saxifrage, American golden saxifrage, and golden ragwort.

Dogwood shrub wetlands occur at scattered locations in the north. They often occur in bands around lakes or ponds, on the margins of river floodplains, or, more extensively, in glacial lakebeds, and are often associated with cat-tail marshes. The dogwood shrub wetland type occupies areas that are transitional between open wetlands such as wet prairie, fen, or sedge meadow, and forested wetlands such as bottomland or swamp hardwoods. It can persist at a given site for long periods of time if natural hydrologic cycles are maintained.

Management Techniques

- Prescribed fire
- Mowing/brushing
- Pesticide treatments

Management Prescriptions

- When deciding on a management approach, consider whether dogwood shrub wetland stands at a site are of natural origin or are a result of factors such as drainage or fire suppression that have allowed shrub wetlands to increase at the expense of rarer wetland or prairie communities like fen, sedge meadow, or wet prairie. Dogwood shrub wetlands can persist and be relatively self-sustaining long-term in sites with stable/natural hydrologic cycles, but active management may be required to maintain them and/or to reverse or prevent their encroachment into adjacent open communities in the absence of natural disturbances (wildfires, natural hydrologic fluctuations). The decision of whether to maintain dogwood shrub wetlands on successional sites or sites with altered/compromised hydrology should be made after considering the landscape context of the site, suitability of the site to support other native communities and likelihood of reestablishment, and the need to prevent any further deterioration of the site.
- Maintain site hydrology; restore where appropriate and feasible.
- Wherever possible, manage dogwood shrub wetlands as part of a complex of interconnected, related habitats (e.g., bottomland or swamp hardwoods, wet prairie, sedge meadow, fen, emergent marsh, etc.).
- Use prescribed fire, tree cutting, chemical treatments, and mowing to maintain dogwood shrub wetlands.

<u>White Birch</u>

This cover type is comprised of >50% basal area in white birch (also called paper birch). White birch occurs throughout the state, though is more abundant in northern Wisconsin than in the south. It grows on a wide range of soils, though tends to develop best on well to moderately drained loamy soils and grows comparatively poorly in both dry and wet sites. The most common associates in white birch-dominated stands are aspen and red maple. Other common associates include red oak, white oak, balsam fir, white pine, red pine, white cedar, and sugar maple. Many other species occur as occasional associates in white birch stands.

White birch is an early-successional, opportunistic species adapted to disturbance. Historically, it was found as a strong associate in red and white pine dominated forests of the Northern Highland and less frequently as an associate in boreal forests in mesic sites along Lake Superior and Lake Michigan. It was also widespread as a component of several other forest types (e.g., northern hardwoods, mixed coniferous-deciduous forests), but likely not abundant. Its bark is thin and very flammable and thus very

susceptible to top-killing from fire, but it can sprout vigorously from the root collar and has abundant, light, wind-dispersed seeds. These characteristics enable it to quickly colonize burned areas where fire has exposed the mineral soil that white birch seeds need to germinate. In these situations, it is capable of forming pure or nearly pure stands. It is shade-intolerant, however, and in older forests would have been restricted to openings created by fire or windthrow.

Currently, most white birch occurs as part of the aspen (often referred to as aspen-birch) cover type and, to a lesser extent, the northern hardwood type. The aspen-birch cover type is now abundant and widespread in northern Wisconsin, but virtually all these forests are anthropogenic in origin and occupy sites formerly vegetated with very different communities. The hot slash fires that burned both during and after the widespread heavy logging that followed Euro-American settlement eliminated seedlings of many tree species as harvest was eliminating the seed sources. This allowed "pioneer" species like aspen and birch to invade large areas formerly occupied by forest types ranging from spruce-fir to pine barrens. The aspen-birch cover type peaked in abundance in the 1930s and has declined somewhat since then, though it remains far more abundant than in pre-settlement times. However, white birch is less abundant than aspen and is regenerating poorly or not at all in many parts of northern Wisconsin. The volume of white birch has declined significantly in the state since the early 1980s as a result of both natural succession and increased mortality (high mortality relative to growth). White birch has the highest ratio of mortality to growth and the lowest ratio of growth to volume of any species in the state.

White birch is a valuable wildlife tree, used for food and shelter by a wide variety of species. Its leaves, twigs, and bark provide food for browsing and gnawing mammals in summer, fall, and winter. Its seeds, buds, and catkins are important winter food for birds and small mammals. Migrating landbirds feed on insects attracted to white birch flowers in the early spring. It is a short-lived tree with soft wood and is prone to forming cavities, which are used by cavity-dependent species, and its flaking bark is used for nesting material and shelter by birds and small mammals.

White birch is considered a "cultural keystone species" to the Great Lakes Ojibwe, who have used primarily the bark of the tree but also the leaves, branches, roots, and sap for a variety of purposes including crafts, shelter, medicines, ceremonial purposes, and food sources.

Management Techniques

- Shelterwood
- Clearcut (with standards; progressive strip)
- Seed tree
- Direct seeding and planting
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Consider landscape composition and structure (forest type and species composition; successional stage; age structure; stand/patch size; degree of fragmentation, etc.) when planning individual management actions. A variety of age classes and stand sizes provide wildlife and aesthetic value.
- Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding forest, and to soften sharp transitions between cover types.
- The shelterwood method is most often used for natural regeneration, in conjunction with scarification. Clearcut and seed tree methods may apply in some situations. For both shelterwood and seed tree, it is important to leave the best dominant seed producers to maximize seeding opportunities. Site preparation techniques to provide a suitable seedbed, in conjunction with a good seed crop, are often necessary to promote germination.
- Use ground disturbance during harvest, mechanical scarification, or prescribed fire to prepare a suitable seedbed for white birch seed germination. Anchor chain, salmon, or straight blade are recommended equipment to use for scarification.
- Where white birch is the objective and is associated with aspen, do not cut or disturb the aspen until white birch successfully competes.
- In mixed stands, maintain or increase tree species diversity. Retain and encourage longer-lived species such as oaks, white pine, red pine, and hemlock.
- Increase structural diversity within stands by retaining some large trees, cavity trees and snags, downed woody debris, and by creating canopy gaps of variable sizes.
- Consider extended rotation of some vigorous stands or individual trees on good sites.

<u>White Cedar</u>

White cedar swamp is a lowland minerotrophic conifer forest community comprised of >50% swamp conifers, with white cedar predominating. Cedar swamps occur on rich, neutral to alkaline peats and mucks throughout much of northern Wisconsin. They are relatively common in depressions that receive mineral-enriched groundwater, and can be associated with both ground moraine and outwash landforms. White cedar is the dominant species. A variety of canopy associates may occur, including tamarack, black spruce, white spruce, balsam fir, yellow birch, black ash, white birch, red maple, hemlock, balsam poplar, trembling aspen, American elm, and white pine. A tall shrub layer may be well developed and include speckled alder, alder-leaved buckthorn, wild currants, and mountain maple. Canada yew formerly was an important tall shrub in white cedar swamps but has greatly declined due to deer herbivory and is now rare or local. The understory is rich in mosses, lichens, liverworts, ferns, sedges, orchids, wildflowers such as goldthread, fringed polygala, and naked miterwort, and woody herbs or “sub-shrubs” such as twinflower and creeping-snowberry. A number of rare plants occur more frequently in white cedar swamps than in any other habitat.

White cedar is a shallow-rooted species, prone to windthrow, but is able to root from its branches (this is known as “layering”) and thus can continue growing following windthrow, as lateral branches oriented away from the ground continue growing vertically. These characteristics, along with those of diverse canopy associates, some of which grow taller than white cedar and have spreading crowns (e.g., yellow birch) and others (conifers) with narrow, spire-shaped crowns that protrude from the canopy, provide structural complexity. Similarly, the ground layer can be lush and hummocky, interspersed with pools of water that collect in hollows between hummocks, seeps, spring runs, and pit-and-mound

microtopography created when large trees tip over. These smaller-scale structural features are used by many species of mammals, birds, herps, invertebrates, and some plants. Older stands of white cedar swamp are among the most structurally complex forest communities in Wisconsin and are major repositories of botanical diversity.

Management Techniques

- Clearcut (progressive strip)
- Overstory removal
- Shelterwood
- Group selection
- Passive management
- Patch selection
- Seed tree
- Single-tree selection
- Site preparation
- Intermediate treatments
- Pesticide treatments

Management Considerations

- Wherever possible, manage white cedar as part of a complex of related and interconnected forest and wetland habitats.
- Protect and maintain large and/or high-quality examples of white cedar swamp, particularly when adjacent to other intact habitats. Where possible, manage for larger stands, larger blocks, to increase connectivity with surrounding native habitats, and to soften sharp transitions between habitat types.
- Reliable techniques to manage and regenerate white cedar need to be further researched and developed. Establishing advanced cedar regeneration is critical, and partial harvest methods such as strip shelterwood or group selection show the most promise. Consideration must be given to deer herbivory and impacts of interfering vegetation on regeneration.
- Carefully consider both landscape (watershed; surrounding land uses and vegetation; patch size, etc.) and site (hydrology; species composition; soils and topography; stand age, etc.) features and develop a management approach based on this assessment. Use an adaptive management approach and monitor results.
- Passive management may be employed for white cedar, particularly where trees are small, slow-growing, non-merchantable, or where regeneration is unlikely due to deer densities. Retain all white cedar in mixed stands.

- In stands with a large component of black ash, consider how management to mitigate emerald ash borer damage (i.e., pre-salvage or salvage) may affect the ability to maintain white cedar.
- Maintain or restore site hydrology whenever feasible.
- Use management practices that limit soil damage, erosion, sedimentation, and hydrologic changes to the stand and to adjacent areas.
- Conduct timber harvests only under frozen-ground or very dry conditions to prevent rutting and soil damage and to protect site hydrology.

White Pine

This forest type is comprised of >50% white pine. It can occur on a wide range of soils, moisture and nutrient gradients but occurs most commonly in areas of irregular glacial topography or mixed glacial features on dry, nutrient-poor soils (loamy sands or sands). Historically, white pine occurred in forests co-dominant with red pine (the "pineries"). These forests were widely distributed across northern Wisconsin but were most abundant in areas where lakes, rivers, streams, wetlands, or other natural barriers prevented wildfires from advancing unimpeded across large areas at frequent intervals. Periodic, lower-intensity fire that maintained pine dominance and reduced the abundance of competing hardwoods in the understory was the primary disturbance regime, with severe, stand-replacing fires occurring at intervals of many decades to several centuries. Canopy associates could include red oak, red maple, big-tooth aspen, trembling aspen, and white birch, with black cherry, white oak, northern pin oak, balsam fir, and jack pine occurring less commonly or rarely. The great "pineries" were heavily targeted during the severe, widespread logging that followed Euro-American settlement of Wisconsin in the mid-to-late 1800s, and were virtually gone by the end of the 19th century. The slash fires that followed this logging often burned stands of young, uncut pines, leaving limited or no pine seed source to recolonize the cut-over areas.

Today, white pine-red pine forests are greatly reduced in extent. The former "pineries" are now composed largely of the early-successional species that proliferated after the Cutover, particularly trembling aspen and white birch. Old-growth examples of white pine-red pine-dominated forest are exceedingly rare. Where second-growth stands occur, they are sometimes dominated by red oak. Other canopy associates in white pine-red pine forests are red maple and occasionally sugar maple, with paper birch, trembling aspen, and big-tooth aspen sometimes present. Common understory shrubs include hazelnuts and blueberries along with low-growing species like wintergreen and partridge-berry. Common herbs include wild sarsaparilla, Canada mayflower, and cow-wheat.

The most common associates in white pine stands are red pine, jack pine, aspen, white birch, red maple, red oak, northern pin oak, black oak, white oak, balsam fir, white spruce, and eastern hemlock. White pine can be found growing as a common to occasional associate in most of Wisconsin's major forest types. It is also grown in plantations.

Management Techniques

- Overstory removal
- Seed Tree

- Shelterwood
- Group selection
- Patch selection
- Direct seeding and planting
- Site preparation
- Intermediate treatments
- Pesticide treatments
- Prescribed fire

Management Considerations

- Consider landscape context and pattern when managing for white pine. Where possible, manage for larger blocks; attempt to match stand boundaries to physiographic or edaphic features; increase connectivity between forest patches; and soften sharp transitions between forest types.
- Maintaining seedling and sapling stands at 700 stems per acre or greater can promote correcting of tip weevil damage.
- Pruning is recommended where managing for sawlogs is the objective, to increase sawlog grade and reduce blister rust infection.
- Shelterwood and seed tree methods often are used in conjunction with site preparation techniques for natural regeneration. Scarification to expose mineral soil in conjunction with a good seed crop may be necessary to promote germination.
- Increase species diversity in white pine stands by creating canopy openings, retaining other species at rotation to serve as seed sources, or including other species in plantings.
- In mixed pine stands containing a large percentage of trees other than pines, use group or patch selection harvest, shelterwood, or overstory removal of the other species to promote pine dominance.
- Leave scattered large white pine in many harvest areas if they are healthy and do not pose a risk to human or forest health.
- Use variable density thinning to increase structural complexity within stands, considering openings and patches of different ages and composition.
- Develop and maintain supercanopy trees, large trees, large cavity trees, large snags, and coarse woody debris to increase structural complexity within stands.
- Encourage and retain large white pine near wetlands and open water for use by eagles, ospreys, herons, and other birds.
- Reintroduce fire where feasible and safe. Prescribed fire can be an effective way to eliminate shrub and hardwood competition, reduce thick duff layers, and prepare mineral seedbeds.
- Consider natural regeneration methods.
- Apply extended rotation and managed old-growth techniques to some stands.

- Protect old-growth and relict stands.

APPENDIX B: RECREATION ACTIVITIES AND FACILITIES

INTRODUCTION

This document summarizes the common recreation activities that occur or could occur on department properties, the facilities that enable the activities, and general impacts and outcomes associated with these facilities and uses. The descriptions of the activities and facilities are based on the department's cumulative experiences providing a wide range of activities at properties throughout the state.

RECREATION ACTIVITY DESCRIPTIONS

ATV/UTV RIDING

Desired experiences and site selection considerations

All-terrain vehicle (ATV) and utility task vehicle (UTV) riding occurs in two fundamental ways on public lands: as a recreation endeavor (primarily on trails) or as a transportation method (primarily on routes). Opportunities, needs and impacts associated with these two uses differ and will be described separately here.

Recreational uses

ATV and UTV riders seeking recreational experiences typically prefer trails that meander through natural settings, similar in many regards to the trails sought by mountain bikers, horseback riders, and hikers. Riders often prefer combinations of longer distance trails and shorter loop trails. Because they can travel long distances in an outing, riding opportunities that are tens of miles in length (or longer) are preferred. Linking together trails with ATV/UTV routes on local roads can be an effective way to create high quality, long-distance experiences. This approach can also connect recreational riders to restaurants, gas stations, and other services in local communities.

Varied terrain is preferable for ATV/UTV trails but steep slopes and unstable soils can affect trail development and maintenance costs and cause unnecessary resource damage. Areas with slopes exceeding 12% should be avoided, as should areas of sandy soils or peat and organic soils that are saturated for portions of the year. Trail segments with adverse conditions should be kept to a minimum for both long term costs and for environmental reasons.

Some riders desire specific areas designed for ATV/UTV use for more challenging opportunities. These can be located on dedicated sites that are already disturbed or areas within a property designed specifically for higher intensity ATV/UTV use.

Transportation uses

Public roads where ATV/UTV use is allowed must be designated as "ATV/UTV routes" by the controlling authority, usually the county, town or DNR. Routes can serve as short or long travel opportunities to access services and connect communities, and serve to connect private residences and businesses to trail networks. Routes can also provide a means for people to use ATVs and UTVs to access places for other recreational activities (e.g., hunting, fishing, gathering firewood or edible plants, and sightseeing).

Although ATVs and UTVs can run on asphalt and other hard materials, their wheels are not intended for these surfaces and to the degree possible routes on gravel or native-materials are preferred.

Site selection on department lands

Most department lands are not intended to provide stand-alone motorized recreational opportunities. However, depending on location, topography, vegetation, recreational uses, and other factors, many department lands can help provide connections in larger regional networks of trails and routes for motorized vehicles (including snowmobiles, ATVs, UTVs, and Off-highway Motorcycles). If ATV/UTV use does not conflict with the primary purpose of the property, the department may designate trails or routes across lands it manages to help facilitate regional trail systems. Typically, these trails or routes are located on existing department roads.

In conjunction with local communities, larger department properties such as state forests may also be able to provide loop trails or routes that extend riding opportunities.

Designated ATV/UTV trails may be placed on lands with most DNR land classifications but are not compatible with Type 1 or Type 2 recreation management sub-classifications (NR44.07). Recreational trail settings for ATV/UTV trails will always be Type 3 or Type 4 (NR44.07(3)), when those sub-classifications apply.

The department's approach to locating, designing, constructing and maintaining ATV/UTV trails are described in:

- Manual Code 2527.9, All-Terrain Vehicle Trails on Department Lands
- Department Design Standards Handbook (8605.1), Chapter 30 - Trails
- Trails Handbook (2540.5) for trail and support facility design guidance and best practices to minimize environment damage.
- "So You Want To Build an ATV Trail: A practical guide for evaluating potential for trail grant sponsors" (PUBCF-018 2005) (http://dnr.wi.gov/aid/documents/atv/buildatvtrail.pdf)

Notable differences in participation or opportunities across state

Most of the longer-distance riding opportunities are located on public lands with the vast majority in the northern half of the state. There are over a thousand miles of trails and routes on county and federal lands, with much less on department lands. The Richard Bong State Recreation Area in Racine County is an example of a smaller scale, shorter trail opportunity. Several state trails on former railroad beds are mixed-use and allow ATV/UTVs, but that availability varies across the state. These trails provide connections to other trail and road networks.

Notable times of the year of high or low participation

Use is seasonal and occurs mostly between late spring and fall. Many roads and trails are closed in the spring due to soft trail treads during the spring thaw. Late summer and fall can be a very enjoyable recreation and tourism period with fall colors and cooler temperatures. Winter ATV/UTV riding is growing in interest; some snowmobile trails allow ATV/UTVs while others do not.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 16% of adult Wisconsin residents participate in ATV/UTV riding. This ranked #38 out of 64 activities evaluated.

In terms of frequency, participants that engaged in ATV/UTV riding did so about in line with participants in other types of recreation (ATV/UTV riding ranked #28 in frequency out of 64 activities evaluated).

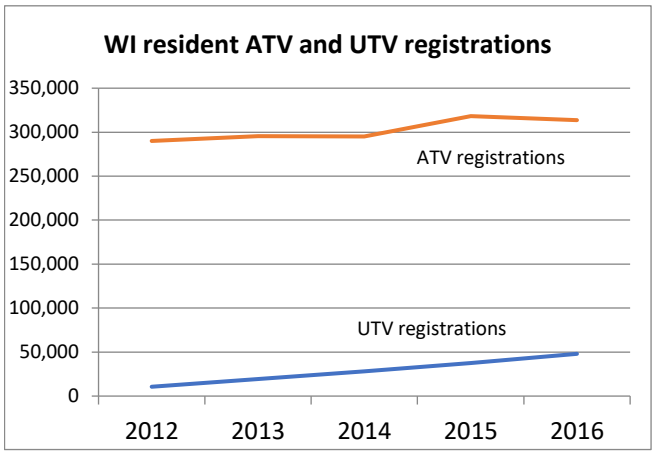
Days/year	% of ATV/UTV riders
1 to 2	35
3 to 9	36
10 to 29	17
30 or more	12
TOTAL	*100%*

Estimated trends:

The popularity of motorized activities has grown over the last several decades, in part driven by advances in technology and the state's aging population. In particular, the growth in UTVs has been substantial in the last several years. Nationally, the number of UTVs sold is now nearly twice the number of ATVs sold. In Wisconsin, the number of UTVs registered since 2012 (when registration became required) has increased over 40% annually while the number of ATVs registered has increased just 2% per year.

Demographics:

As can be seen from the SCORP survey results in the table below, participants in ATV and UTV riding in Wisconsin tend to be rural men. As UTVs have become more popular, older age groups have increased their participation, a trend that is likely to continue. Because of the upfront costs as well as the expenses associated with use and maintenance, ATV and UTV riding can require more of a financial investment than many other outdoor activities. This is also likely to shift participation to older age groups, which typically have more disposable income.



Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	23	30
	30-39	19	21
	40-49	17	15
	50-59	16	18
	60-69	11	11
	70 and older	6	4
	TOTAL	--	*100*
Gender	Female	12	38
	Male	20	62
	TOTAL	--	*100*
Residence	Rural	21	63
	Urban	12	37
	TOTAL	--	*100*

OFF-HIGHWAY MOTORCYCLE (OHM) RIDING

Desired experiences and site selection considerations

There is a wide range of motorcycles that can be driven "off-highway," including those that are licensed, street-legal vehicles (sometimes referred to as dual-sport motorcycles) and those that are not registered with the Wisconsin Department of Transportation (WDOT) (and thus not street-legal) but are registered with the DNR as recreational motorcycles (e.g., dirt bikes). Licensed, off-highway (dual-sport) motorcycles are allowed on all roads open to street-legal vehicles; motorcycles not licensed with the WDOT are not. A new registration program is in place to allow unlicensed OHMs on certain classifications of roads. Some public lands have specific trails designated for OHMs.

Desired experiences for OHMs range from gravel roads to primitive roads ("two-tracks") to narrow "singletrack" trails similar to those used by mountain bikers. Generally, riders prefer native-material roads and trails less than 4 feet in width. "Off-highway" does not mean "off-trail riding" or "free riding," which is allowed on some designated portions of some public properties (notably in western states). Many dual-sport motorcycle riders piece together longer-distance tours that combine stretches on private and public roads and trails.

There is demand for both close-to-home experiences that can be smaller sized and still provide desirable experiences as well as large expansive areas with significant miles of trails for single or multi-day riding opportunities. Participants that travel to a destination for off-highway riding seem to prefer a minimum of 75 miles of roads and trails. Long linear roads and trails are acceptable to access other trail systems, services, and scenic areas.

The trail or road bed has a significant influence on experience and, if poorly designed, can create a negative experience. There is a slightly higher desire for hilly terrain and scenic rides with views of forests, open natural areas, lakes and streams. Highly disturbed areas can provide high quality challenge-style riding within a small area.

Although not as desirable as trails designed and dedicated for OHM use, there can be opportunities to include OHMs on designated ATV trails. There may be conflicts in passing width for trails, whether one-way or two-way. Consideration should be made in the design of trails and the mixed speeds that people may be recreating.

From a planning perspective consideration should be given to regional trail systems and town road designations as connections for access and services. Trail and road systems should be considered to address riders' desired experiences including remote riding opportunities on closed loop systems and larger, more regional road and trail systems.

Characteristics of desirable riding experiences include the following:

- A minimum of 60 miles of trails should be provided, with 15 or more miles of connector routes or trails. Shorter trails providing access to a point of interest are acceptable.
    - Loop trails are typically 10 miles long or more. An OHM area usually provides a series of loop trails providing a variety of recreational riding experiences that return the participant to the trailhead.
    - Regional trails are point to point trails that can be several hundred miles long and traverse multiple jurisdictions and a combination of land ownership types. This trail corridor is often shared with other recreational uses.
- Varied terrain is preferable for this recreation experience but steep slopes and unstable soils can affect development and maintenance costs and cause unnecessary resource damage. Areas with slopes exceeding 12% should be avoided as should areas of sandy soils or peat and organic soils that are saturated for portions of the year. Trail segments with adverse conditions should be kept to a minimum for both long term costs and for environmental reasons.

- A designated use trail is necessary for this facility type. A designated OHM trail may be placed on lands with most DNR land classification but recreational trail setting for ATV trails will always be Type 3 (NR44.06) or Type 4 (NR44.07) Recreational Areas. Note that this use may not occur on land with the classification of Type 3 Non-Motorized Recreation Area (NR44.07(6)(h)) and is not compatible with Recreation Management Areas Type 1 and Type 2.

Notable differences in participation or opportunities across state

The majority of the longer riding opportunities are on public lands with the vast majority in the northern half of the state. There are thousands of miles of primitive roads in northern Wisconsin on state, county and Federal lands that allow street-licensed vehicles (i.e. dual-sport motorcycles). There is a cluster of designated OHM trails in Jackson and Clark counties. The Richard Bong State Recreation Area is an example of the smaller scale, shorter trail opportunities in southeast Wisconsin. Some state trails on old railroad beds allow OHM use, many of which provide connections to other trail and road networks.

Notable times of the year of high or low participation

Use is very seasonal in nature occurring mostly between late spring and fall. Many roads and trails are closed in the spring due to seasonal thawing and there is no winter use. Late summer and fall can be a very enjoyable recreation and tourism period with fall colors and cooler temperatures.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 7% of adult Wisconsin residents participate in OHM riding. This ranked #56 out of 64 activities evaluated.

In terms of frequency, participants that engaged in OHM riding did so with considerably more frequency than participants in other types of recreation (OHM riding ranked #8 in frequency out of 64 activities evaluated).

Days/year	% of OHM riders
1 to 2	33
3 to 9	20
10 to 29	22
30 or more	25
TOTAL	*100%*

Estimated trends:

As the number of riding opportunities has risen there has been an associated rise in the number of OHM riders and motorcycles purchased, especially dual-sport machines. Although Wisconsin-specific data are not available, nationally the number of dual-sport motorcycles sold grew 7.8% in 2015 while off-highway (dirt bikes) increased 1.9%.[5]

An indicator of the growth in dual-sport motorcycle riding in Wisconsin is the growing interest in organized riding events and GPS-guided rides. Since dual-sport machines can be ridden on public roads, a popular activity is for clubs to develop organized tours that combine riding off-road (on forest and farm roads or along agricultural fields) with connections on local roads. These tours are often up to 100 miles in length and require

[5] https://www.statista.com/statistics/252267/change-in-us-motorcycle-sales-by-type/

pre-registration (and a limited number of riders). As dual-sport riding has increased in popularity, enrollment in these events has grown and it is now common for available slots to fill up in less than a day.

Another form of dual-sport motorcycle riding that has also substantially increased in popularity is following a tour based on a GPS-guided route. The GPS coordinates for different tours are available for download from several sources on the internet allowing riders to pursue an outing at their leisure. While this activity has seen much growth, as of late, it has been predicted to see a decrease in overall participation rates due to the aging population and increase in Hispanic population.[6]

Demographics:

As can be seen from the SCORP survey results in the table, participants in OHM riding in Wisconsin tend to be younger, rural men. Because of the upfront costs as well as the expenses associated with use and maintenance, OHM riding can require more of a financial investment than many other outdoor activities. This likely shifts some participation to older age groups that typically have more disposable income.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	17	44
	30-39	6	14
	40-49	7	13
	50-59	7	17
	60-69	6	12
	70 and older	1	1
	TOTAL	--	*100*
Gender	Female	6	42
	Male	8	58
	TOTAL	--	*100*
Residence	Rural	9	59
	Urban	6	41
	TOTAL	--	*100*

[6] White, E.M., Bowker, J.M., Askew, A.E., Langner, L.L., Arnold, J.R., English, D.B.K. (2016). *Federal Outdoor Recreation Trends: Effects on Economic Opportunities*. United States Department of Agriculture.

FOUR-WHEEL DRIVE VEHICLE DRIVING

Desired experiences and site selection considerations

As with motorcycles, there is a wide range of four-wheel drive vehicles (4WD) that are used in this activity; some are licensed and street legal, others are not. Similarly, there is a range of desired experiences. Some participants wish to drive on rough, primitive roads in remote areas enjoying the views and the secluded experience. Some 4WD drivers use their vehicles to access areas for hunting, fishing, trapping, gathering firewood and wild edibles, and sight-seeing.

Others seek challenging, slow-moving, steep climbing adventures that test their driving abilities and their vehicle's performance. These drivers can spend hours at a site slowly navigating routes up a hill. Places that provide a range of difficulties are desired.

Notable differences in participation or opportunities across state

There are very few opportunities on department lands. Most of the existing opportunities are in the northern part of the state on federal and county forest lands.

Notable times of the year of high or low participation

Use is seasonal and occurs mostly between late spring and fall. Many remote roads are closed in the spring due to seasonal thawing. Late summer and fall can be an enjoyable recreation and tourism period with fall colors and cooler temperatures.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	17	42
	30-39	8	18
	40-49	7	12
	50-59	7	16
	60-69	4	7
	70 and older	4	5
	TOTAL	--	*100*
Gender	Female	6	36
	Male	11	64
	TOTAL	--	*100*
Residence	Rural	11	65
	Urban	6	35
	TOTAL	--	*100*

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 8% of adult Wisconsin residents participate in 4WD vehicle driving. This ranked #54 out of 64 activities evaluated.

In terms of frequency, participants that engaged in 4WD vehicle driving did so about in line with participants in other types of recreation (4WD vehicle driving ranked #32 in frequency out of 64 activities evaluated).

Days/year	% of 4WD drivers
1 to 2	44
3 to 9	25
10 to 29	17
30 or more	15
TOTAL	*100%*

Demographics:

As can be seen from the SCORP survey results in the table, participants in 4WD vehicle driving in Wisconsin tend to be younger, rural men.

SNOWMOBILING

Desired experiences and site selection considerations

Riding snowmobiles occurs on over 22,000 miles of interconnected groomed trails across the state. The trails are open to the public and located on both private and public property with most trails maintained and groomed by volunteer members of over the 600 snowmobile clubs in the state. Participation is weather (snow) dependent and trails in the southern part of the state have recently been open relatively less than average.

Public properties with trails include county forests, national forests and various state properties. DNR properties often provide connections between trail networks on surrounding lands. Participants range from casual to highly dedicated with some participants riding short distances to a destination (e.g., a local supper club) while others prefer long-distance riding and often cover hundreds of miles in a day. Long-distance riders will both “base camp” (stay in one location and ride back to that location each night) and move from one place of lodging to the next for multiple nights.

Funding from machine registration, fuel tax and snowmobile trail passes is available for maintenance on state-designated trails. Construction and maintenance is often performed by local snowmobile clubs. Refer to the Department Design Standards Handbook (8605.1, Chapter 30 (Trails) and Chapter 90 (Parking)) and the Trails Handbook (2540.5) for further design guidelines.

Characteristics of snowmobile trails on department lands include the following:

- Trails need to be 12’ wide at a minimum with bridges engineered to support grooming equipment, which can weigh up to 25,000 pounds.
- Rolling terrain is acceptable but grades and slopes should not exceed 25%.
- Trails are generally not routed over bodies of water or in or near areas of anticipated conflict (e.g., wilderness areas, game preserves, residences and other sensitive areas).

Notable differences in participation or opportunities across state

Participation is weather-dependent and as such participants often travel (trailering machines) to better snow conditions and more extensive trail systems. In particular, northern Wisconsin’s consistent snow cover and vast network of trails draws many snowmobilers from the southern part of the state and Illinois.

Notable times of the year of high or low participation

This activity is entirely dependent on weather and snowfall with participation taking place in winter months.

Participation

Participation rate and frequency:

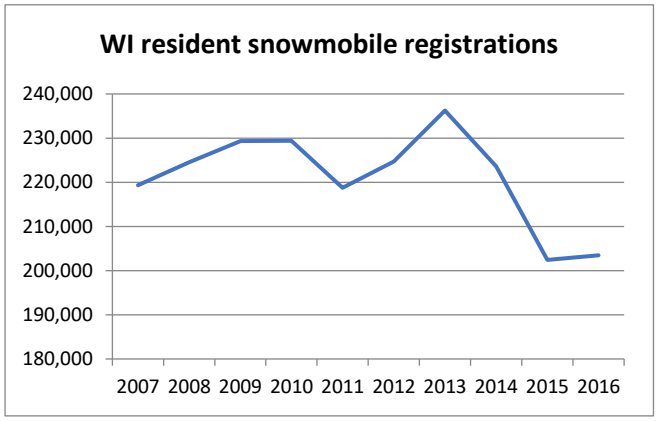
Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 15% of adult Wisconsin residents participate in snowmobiling. This ranked #39 out of 64 activities evaluated.

Days/year	% of snowmobilers
1 to 2	39
3 to 9	34
10 to 29	17
30 or more	11
TOTAL	*100%*

In terms of frequency, participants that engaged in snowmobiling did so about in line with participants in other types of recreation (snowmobiling ranked #33 in frequency out of 64 activities evaluated). Given that the snowmobiling season is limited, this participation frequency may indicate that snowmobilers participate frequently when conditions are good.

Estimated trends:

From 1998 to 2016, average cumulative snowfall in Eau Claire, Wausau, Green Bay and Madison was compared to resident snowmobile registrations. This data showed some correlation between snowfall and snowmobile registrations. For example, registrations dropped over 10,000 from the 2010-2011 to the 2011-2012 season when the snowfall dropped 47 inches and rose by nearly 6,000 in the 2012-2013 season when snowfall was up by 45 inches. This correlation suggests that snowfall has an impact on snowmobiling participation.



Nationally, snowmobiling is expected to see the largest decline in participation rate among all major recreation activities. By 2030, the rate is projected to drop by over 10%, if climate change is incorporated into this data, there is a projected average net decrease of near 40%, due to lack of snow throughout the country.[7]

Demographics:

As can be seen from the SCORP survey results in the table, participants in snowmobiling in Wisconsin tend to be younger, rural men. Because of the upfront costs as well as the expenses associated with use and maintenance, snowmobiling can require more of a financial investment than many other outdoor activities. This likely shifts some participation to older age groups that typically have more disposable income.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	24	34
	30-39	18	22
	40-49	19	19
	50-59	13	18
	60-69	7	6
	70 and older	3	2
	TOTAL	--	*100*
Gender	Female	12	41
	Male	18	59
	TOTAL	--	*100*

[7] White, E.M., Bowker, J.M., Askew, A.E., Langner, L.L., Arnold, J.R., English, D.B.K. (2016). *Federal Outdoor Recreation Trends: Effects on Economic Opportunities*. United States Department of Agriculture.

HIKING, WALKING OR RUNNING ON TRAILS

Desired experiences and site selection considerations

These related activities are a form of recreation and exercise. Experiences can range from short periods of time to multiple days (backpacking), sometimes to reach a destination, sometimes for the pleasure of being outside. The terms "hiking" and "walking" are often used interchangeably; however, hiking generally refers to longer trips that cover rougher terrain. Walking is a leisure activity for some participants while for others the physical exercise and or endurance aspects are more important. For recreationists pursuing many other activities, walking/hiking is involved to some extent.

Hiking and walking on trails are activities with low barriers to participation as they do not require special equipment. Trail running requires minimal equipment; backpacking requires a significant amount of equipment. Backpacking also requires significant continuous mileage of trails and amenities such as water and campsites.

The identified need for additional facilities to support hiking, walking and running on trails is highest in the northwest, south central and southeast counties. Enhancements to facilities for these activities will benefit other recreational activities.

Notable differences in participation or opportunities across state

Walking is a popular activity statewide; however, the need for developed locations to pursue these activities differs. Participation is highest in south central and southeast counties of the state

Notable times of the year of high or low participation

Participation is highest in spring, summer, and fall and lowest in winter. Distance travelled may be impacted by weather (e.g. fewer miles travelled in winter).

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 68% hike, walk or run on trails. This ranked #5 out of 64 activities evaluated.

In terms of frequency, participants that engaged in hiking, walking or running on trails were the 6th most frequent participants of any activity (out of 64 activities evaluated).

Demographics:

As can be seen from the SCORP survey results in the tables, participants tend to be represented across the age spectrum, and are somewhat more urban.

Days/year	% of hikers, walkers, or runners on trails
1 to 2	24
3 to 9	33
10 to 29	24
30 or more	19
TOTAL	*100%*

Hike, walk, or run on trails

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	80	25
	30-39	81	22
	40-49	77	17
	50-59	66	18
	60-69	52	13
	70 and older	38	6
	TOTAL	--	*100*
Gender	Female	67	50
	Male	69	50
	TOTAL	--	*100*
Residence	Rural	65	47
	Urban	70	53
	TOTAL	--	*100*

BICYCLING – TOURING

Desired experiences and site selection considerations

Bicycle touring includes riding on roads (particularly those with wide shoulders and bike lanes), rail-trails, and other paved or crushed stone-surfaced paths or trails. Bicycle touring is generally appropriate for all ability levels and bikes with narrow tires. Participants often choose locations based on associated amenities such as campgrounds, parks, interesting sites, and restaurants & taverns. Length of trips can range from a few hours to a few weeks. There is some cross-over with people using these same facilities for bicycle transportation (non-recreation) purposes.

Notable differences in participation or opportunities across state

Availability of bicycle facility infrastructure ("bikeways") vary across the state, with stronger infrastructure investment generally located closer to urban areas. Wisconsin has more than 1,000 miles of rail-trails, which are found in many parts of the state. Rail-trails in the northern part of the state tend to also allow motorized vehicles such as ATVs and UTVs.

Notable times of the year of high or low participation

Summer and fall are generally higher participation due to favorable weather, although late spring, depending on trail conditions for non-paved facilities, can also be popular. Winter participation will depend largely on the maintenance (snow removal) of facilities; but regardless will be low compared to other times of the year.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 48% of adult Wisconsin residents participate in bicycling on roads while 34% participate on bicycling on rail-trails or other developed trails (note: there is overlap in these participants). These ranked #12 and #20, respectively, out of 64 activities evaluated.

In terms of frequency, participants that engaged in bicycle touring were among the most frequent participants of any activity (it ranked #4 in frequency out of 64 activities evaluated).

Days/year	% of bicyclists on roads	% bicyclists on rail-trails/ developed trails
1 to 2	20	28
3 to 9	30	34
10 to 29	25	23
30 or more	25	15
TOTAL	*100%*	*100%*

Estimated trends:

According to the National Household Travel Survey, the number of trips made by bicycle more than doubled from 2001 to 2009, another national survey shows a near 63% increase in bicycle participant rate, increase of

34.9 million participants, from 1982 – 2009.[8] These upward trends in bicycling participation are projected to continue; specifically, growth in bicycling on trails is anticipated as the population ages.[9]

Demographics:

As can be seen from the SCORP survey results in the tables, participants in bicycling on roads and rail-trails & other developed paths and trails in Wisconsin are similar, tend to be represented across the age spectrum, and are somewhat more urban.

[8] Internet Research Information Series (IRIS) (2009). *Long-term National Trends in Outdoor Recreation Activity Participation --- 1980 to Now.* https://srs.fs.usda.gov/trends/pdf-iris/IRISRec12rptfs.pdf

[9] Grabow, M., Hahn, M., Whited, M. (2010). *Valuing Bicycling's Economic and Health Impacts in Wisconsin*. The Nelson Institute for Environmental Studies Center for sustainability and the Global Environment University of Wisconsin-Madison.

Bicycling on roads

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	54	24
	30-39	62	23
	40-49	59	18
	50-59	50	19
	60-69	33	11
	70 and older	20	5
	TOTAL	--	*100*
Gender	Female	44	46
	Male	53	54
	TOTAL	--	*100*
Residence	Rural	47	46
	Urban	50	54
	TOTAL	--	*100*

Bicycling on rail-trails & other developed paths

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	41	25
	30-39	43	23
	40-49	44	19
	50-59	36	19
	60-69	23	11
	70 and older	11	4
	TOTAL	--	*100*
Gender	Female	32	47
	Male	37	53
	TOTAL	--	*100*
Residence	Rural	31	44
	Urban	37	56
	TOTAL	--	*100*

BICYCLING – "MOUNTAIN BIKING" ON SINGLE-TRACK TRAILS AND OFF-ROAD TRAILS

Desired experiences and site selection considerations

Mountain and off-road biking involves riding bicycles over varying terrain, using purpose-built bicycles with enhanced durability and performance for rough terrain. Mountain biking is technically challenging and physically strenuous and can include constructed courses with a range of obstacles. Off-road biking occurs on more gently rolling trails or primitive roads and is more suitable for a broader range of abilities. Off-road biking can be done with a variety of bicycles with wider tires, including hybrids. Recently, the development of bikes with very wide tires – "fat bikes" – has enabled cyclists to enjoy the activity during winter. Although they can be ridden in any season, fat-tire bike riding in the winter has grown rapidly recently as their price has decreased and the number of trails groomed for their use in the winter has grown.

The speed of mountain and off-road bicycles can be a source of conflict with slower recreationalists (e.g., hikers) and their quiet nature can be a source of conflict with horses that can be spooked by silent, quick movements.

Notable differences in participation or opportunities across state

Participation rates of mountain and off-road bicycling are higher near more populated areas with most participants travelling some distance to access trails. Constructed mountain bike trails meet layout and design specifications that require they be built by hand or with specialized equipment and require a close relationship between the land manager and the volunteer groups who build them, or specialized contractors to construct the trails. Thus, availability of trails specifically constructed for mountain biking is limited. However, there are more than 20 chapters of mountain bike-focused volunteer groups across the state, most of whom engage in trail building on public lands to create their desired riding experiences. Off-road trails are often located on different types of primitive roads and are not limited to specific parts of the state.

Days/year	% of mountain bikers
1 to 2	38
3 to 9	32
10 to 29	17
30 or more	14
TOTAL	*100%*

Notable times of the year of high or low participation

Fewer biting insects and lower temperatures in the fall generally drive the highest participation rates of the year for mountain and off-road biking while late spring and summer are also popular. Winter biking on fat-tire bikes in increasingly popular. Bikers are generally discouraged from using trails during the spring thaw, especially in areas with poorly drained soils, to prevent rutting.

Participation

Participation rate:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 11% of adult Wisconsin residents participate in mountain biking (information on off-road bicycling was not collected). This ranked #50 out of 64 activities evaluated.

In terms of frequency, participants that engaged in mountain biking did so about in line with the average of other activities (it ranked #29 in frequency out of 64 activities evaluated).

Estimated trends

Fat-tire biking has seen growth and is projected to continue to grow as the population continues to seek ways to stay active throughout the winter.[10] Another reason for the anticipated growth is the multifunctionality and growth in production of fat-tire bikes. Between 2013 and 2014 the number of companies making fat bikes doubled, creating the fastest-growing market segment in the cycling industry, people were riding them in a variety of settings (e.g., logging roads) and no longer just during winter.[11]

Demographics:

As can be seen from the SCORP survey results in the table below, participants in mountain biking in Wisconsin tend to be young to middle-aged men.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	18	32
	30-39	15	24
	40-49	16	21
	50-59	9	14
	60-69	5	7
	70 and older	2	2
	TOTAL	--	*100*
Gender	Female	9	39
	Male	14	61
	TOTAL	--	*100*
Residence	Rural	11	46
	Urban	12	54
	TOTAL	--	*100*

[10] Sharp, D. (2017). *'Fat bikes' allow cyclists to conquer winter snow*. Associated Press. https://www.apnews.com/4f05ef17318943368b225cc50e22ac46.

[11] Heil, N. (2015). *How Fat Bikes Became the Hottest Trend in Cycling.* Outside. https://www.outsideonline.com/1997971/fat-bike.

DOG EXERCISING (WALKING AND RUNNING) ON TRAILS

Desired experiences and site selection considerations

This activity is a form of recreation and exercise for both the dog owner and the pet, and can occur with the dog on or off leash. Most dog-walking occurs for 0.5 to 2 hours at a time. Preferred settings include walking/hiking trails where dogs are allowed as well as fenced "dog parks" where dogs can be off-leash. A high-quality opportunity would include: at least four miles of trails (2-4'-wide, less than 4' cleared corridor, native surface) in grassland, savanna, or forest habitats with varied terrain (some hills and some flat). Fenced areas that are at least three acres (larger is better) with a mowed grassy area and drinking water are desirable and typically very heavily used. Ponds or lakes are also desirable for pet swimming and retrieving. Over 90% of participation is estimated to take place an hour or less from participants' homes, so locations near population centers are most desirable.

Participants' main concern is motorized vehicles, due to danger to the pet. Impacts to other participants, other property users, or neighboring landowners include pet waste, noise from barking, and poorly-behaved or aggressive dogs. Dogs can also present a safety hazard for bikers. Environmental impacts are minor and similar to hiking (soil erosion or compaction, minor trampling of vegetation).

Benefits include exercise/health benefits for both dogs and owners and the opportunity for dog owners to enjoy their pet in a natural setting.

Notable differences in participation or opportunities across state

Demand is generally highest near more heavily populated areas (south-east, south-central, Fox Valley and Green Bay) and moderate elsewhere in the state.

Notable times of the year of high or low participation

Participation is highest in spring, summer and fall, and low in winter.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 32% of adult Wisconsin residents participate in walking or running dogs. This ranked #24 out of 64 activities evaluated.

Days/year	% of dog walkers/runners
1 to 2	25
3 to 9	33
10 to 29	20
30 or more	22
TOTAL	*100%*

In terms of frequency, participants that engaged in dog walking and running in trails did so much more frequently than participants in most other activities (it ranked #7 in frequency out of 64 activities evaluated). No doubt this is tied to the need to frequently exercise most dogs.

Estimated trends:

While no specific measures of dog walking trends are known, one can anticipate as dog ownership changes there will be a commensurate change in dog walking and exercising. Dog ownership is the highest growing pet

ownership. Pet populations grew 61% in the last decade driven by millennials, baby boomers and the multicultural population.[12]

Demographics:

As can be seen from the SCORP survey results in the table, participants in dog walking and running on trails in Wisconsin tend to be represented quite evenly across the three categories assessed (age, gender and residence).

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	45	29
	30-39	40	23
	40-49	39	17
	50-59	31	18
	60-69	18	10
	70 and older	11	4
	TOTAL	--	*100*
Gender	Female	34	54
	Male	30	46
	TOTAL	--	*100*
Residence	Rural	31	47
	Urban	33	53
	TOTAL	--	*100*

[12] Packaged Facts. (2017). *Pet Population and Ownership Trends in the US: Dogs, Cats and other Pets, 2nd edition.* https://www.researchandmarkets.com/research/f9ws72/pet_population.

HORSEBACK RIDING

Desired experiences and site selection considerations

Horseback riding in Wisconsin occurs on public lands and privately-owned, stables, farms and ranches. Riders need to have a basic understanding of how to handle a horse to safely participate in the activity. Trail riding is most common with a recent study showing that three-quarters of equine owners use their animals for trail riding or recreation. Trail riding trips typically involve significant effort and planning to transport horse(s) to the destination along with supplies and equipment. As a result, multi-day trips are common and access to camping areas or similar accommodations are important for horseback riders. Riders also typically want to be away from population centers and areas with high activity levels to minimize chances that their horses are inadvertently startled. Truck-trailer combinations need larger parking accommodations and loading areas. Drinking water, tie posts/rails and manure disposal areas are also key components to a usable equine recreation area.

Varied forested terrain where riders can challenge their horses and enjoy the landscape, are most desirable. Water features can be helpful for providing water to animals without having to return to base-camp. Riding horses affords trail users a greater range of distances. Generally, trail lengths composed of 15 or more miles of trails make a destination worth the travel. Trails can be technical with a 2-4-foot width of native material, but a cleared height of about 12 feet and width of about 8 feet are needed.

Wisconsin also has an active Endurance Ride program where riders will compete over 10, 25 or 50 miles in a day.

Camaraderie among riders is a key factor in the activity's popularity. Group rides are more common than solo riding. In some cases, there can be issues where hiking and biking occur on the same trails and can startle horses that in turn cause problems with riders. This can often be remedied through signage and education. Sharing of trails provides opportunities for different user groups to interact and better understand each other's needs.

With the weight of the animal, the likelihood for disturbance to a trail's surface exists. If trails are not sustainably designed, this disturbance can lead to erosion and rutting in the trail. Depending on the horse's diet and where it has been recently, there is a potential for spreading invasive plant species.

Days/year	% of horseback riders
1 to 2	55
3 to 9	22
10 to 29	13
30 or more	11
TOTAL	*100%*

Notable differences in participation or opportunities across state

Riding occurs across the state, but is more popular in the following regions: Northwoods, Upper Lake Michigan Coastal, Mississippi River Corridor and Lake Winnebago Waters.

Notable times of the year of high or low participation

The most common times of year include spring and fall when temperatures are cooler for the horses and there are fewer problems with biting insects. Use typically ebbs in the summer when higher temperatures affect both horses and riders. Winter riding occurs but is less popular, especially longer rides.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 7% of adult Wisconsin residents participate in horseback riding on trails, which ranked #55 out of 64 activities evaluated.

In terms of frequency, participants that engaged in horseback riding did so a little less frequently than participants in most other activities (it ranked #49 in frequency out of 64 activities evaluated).

Estimated trends:

Horseback riding is predicted remain static or see a slight decline. One national study predicts a 2% increase by 2030 due to increased income.[13] Another participation study predicts future decline in equine activities as the population of horse owners ages. The study showed horse ownership among those under 54 years old, declining since 2006, with the 35-44-year-old age group taking a large decline, from below 30% in 2006 to below 15% in 2013.[14]

[13] White, E.M., Bowker, J.M., Askew, A.E., Langner, L.L., Arnold, J.R., English, D.B.K. (2016). *Federal Outdoor Recreation Trends: Effects on Economic Opportunities*. United States Department of Agriculture.

[14] Brakke Consulting Inc. (2014). *Brakke Equine Market Mega Study. h*ttps://www.avma.org/News/JAVMANews/Pages/140415g.aspx

Demographics:

As can be seen from the SCORP survey results in the table below, while participants in horseback riding in Wisconsin tend to be young, there is a sizable group in the their 50s. Participants tend to be more rural and about evenly split by gender.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	14	44
	30-39	5	13
	40-49	6	13
	50-59	6	17
	60-69	5	13
	70 and older	1	1
	TOTAL	--	*100*
Gender	Female	7	51
	Male	7	49
	TOTAL	--	*100*
Residence	Rural	7	54
	Urban	6	46
	TOTAL	--	*100*

CROSS-COUNTRY SKIING AND SNOWSHOEING

Desired experiences and site selection considerations

Cross-country skiers propel themselves across snow-covered terrain by either striding forward (classic style) or side-to-side in a skating motion (skate skiing). Skiers are generally treated as pedestrians, meaning they are allowed to traverse anywhere on department lands not posted closed to the public. Other trail uses are not typically allowed on trails designated as and groomed for cross-country skiing. Skiers' experiences are enhanced when trails are located on a mix of hilly and flat topography and debris from surrounding vegetation, rocks, and roots are kept to a minimum. Groomed trails enhance the experience but are not necessary for the activity. Cross-country skiing can be a highly aerobic activity and exhaust from nearby combustion engines can cause conflicts with some skiers.

The types of cross-country skiing that will be accommodated help determine trail width; skate skiing requires a wider trail corridor. Generally, trails should be constructed a minimum of 4' wide with an additional 2' shoulders on either side. Although groomed trails are not required for every type of cross-country skiing, grooming is often the expected experience when it is noted that a property provides cross-country ski trails. Grooming equipment width, height, turning radius, and weight should all be used to determine trail width, layout and bridge design. Grooming and track setting for classic style requires specialized equipment and techniques. Trail preparation employs snow machines that tow snow compaction, texturing and track-setting devices. Groomers must adapt such equipment to the condition of the snow—crystal structure, temperature, degree of compaction, moisture content. Skilled grooming is a key to providing quality cross-country ski trails. Grooming costs should be considered in determining the amount and nature of cross-country trails at properties.

Snowshoers use oval or racket-shaped frames with a network of straps stretched across and attached to a boot. Snowshoeing is most popular in conditions of deep snow that enable participants to walk on top of the snow without breaking through or sinking in. Although some snowshoeing occurs on designated and signed trails, many participants seek experiences off-trail. Opportunities in forests that hold deeper snow for longer periods are desired.

Cross-country ski and snowshoe trails may be used during non-snow cover conditions for other uses. Larger networks of cross-country ski trails often have shelters or warming huts at trailheads. Lighted trails are growing in popularity in some areas, as are candlelight ski events.

Notable differences in participation or opportunities across state

Participation in both activities is weather-dependent and participants often travel to better snow conditions and more extensive trail systems. In particular, participants travel from southern to northern Wisconsin to take advantage of the deeper and more dependable snow cover. Some participants enter races such as the American Birkebeiner, which necessitate regular training close to home for entrants. Wisconsin has more than 700 groomed cross-country ski trails. There are a few locations in the state where snowmaking equipment is used to enhance or create suitable conditions for groomed cross-country ski trails.

Snowshoe participation occurs across the state in the winter.

Notable times of the year of high or low participation

Winter is typically the only time of year for this use, which is entirely dependent on weather and snowfall.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 13% of adult Wisconsin residents participate in cross-country skiing and 13% participate in snowshoeing, which ranked #44 and #46, respectively, out of 64 activities evaluated.

In terms of frequency, participants that engaged in cross-country skiing and snowshoeing did less often than participants in activities (they ranked #55 and #56, respectively, in frequency out of 64 activities evaluated).

Days/year	% of cross-country skiers	% snowshoers
1 to 2	49	48
3 to 9	35	36
10 to 29	11	13
30 or more	5	6
TOTAL	*100%*	*100%*

Estimated trends

Future participation rates for cross-country skiing are predicted to remain static. However, participation in cross-country skiing requires natural snow, if climate change is factored into future trends there could be a decrease in participation, nationally, of 36% by 2030.[15]

Demographics:

As can be seen from the SCORP survey results in the table, participants in cross-country skiing and snowshoeing in Wisconsin tend to be represented quite evenly across the three categories assessed (age, gender and residence).

[15] White, E.M., Bowker, J.M., Askew, A.E., Langner, L.L., Arnold, J.R., English, D.B.K. (2016). *Federal Outdoor Recreation Trends: Effects on Economic Opportunities*. United States Department of Agriculture.

Cross-country skiing

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	17	28
	30-39	12	17
	40-49	13	15
	50-59	12	18
	60-69	13	17
	70 and older	7	6
	TOTAL	--	*100*
Gender	Female	13	50
	Male	13	50
	TOTAL	--	*100*
Residence	Rural	14	53
	Urban	11	47
	TOTAL	--	*100*

Snowshoeing

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	16	26
	30-39	17	23
	40-49	14	15
	50-59	14	19
	60-69	11	14
	70 and older	4	3
	TOTAL	--	*100*
Gender	Female	13	48
	Male	14	52
	TOTAL	--	*100*
Residence	Rural	16	56
	Urban	11	44
	TOTAL	--	*100*

GATHERING WILD EDIBLES

Desired experiences and site selection considerations

Gathering fruits, nuts, berries, mushrooms and other edible items from the wild is pursued by a wide range of Wisconsinites and visitors. Enthusiasts may spend many hours collecting these items as the seasons' progress, providing a significant amount of food for their family, or selling it to supplement their income. Wild rice, morel mushrooms, and wild ginseng are among the most valuable edibles sought. Frequent and occasional participants may make special excursions to collect wild edibles at the peak of their availability (e.g. maple sap, morels, blueberries), or collect edibles as random opportunities present themselves. Examples include collecting wild asparagus, water cress, blackberries and hickory nuts.

Impacts from collecting to local populations of edible species are typically low. An exception is the illegal over-collection of wild ginseng (legal harvest is regulated and requires a permit). Trespassing onto private lands without permission is also an issue, especially by those seeking morels and ginseng. Trampling of vegetation and transporting invasive plant species propagules into natural areas is a suspected, but unproven, ecological impact. Competition among collectors, and resulting conflict, may be a consideration on small properties.

Notable differences in participation or opportunities across state

Wild edibles are available in all corners of the state, from suburban woods in the southeast to large wilderness areas in the north.

Notable times of the year of high or low participation

Pursuit of wild edibles is closely tied to the seasons. Spring brings a flush of green edible plants such as leeks, nettles, watercress, some fungi and maple sap. Summer brings berries and fruits. Fall is prime season for most nuts, mushrooms and wild rice. Little to no participation occurs in the winter.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 31% of adult Wisconsin residents participate in gathering wild edibles, which ranked #25 out of 64 activities evaluated.

In terms of frequency, participants that engaged in gathering wild edibles did less often than participants in other activities (it ranked #56 in frequency out of 64 activities evaluated).

Days/year	% of people gathering wild edibles
1 to 2	47
3 to 9	38
10 to 29	11
30 or more	5
TOTAL	*100%*

Estimated trends:

A Department of Agriculture study shows from 1999 to 2009 a participation increase in gathering wild edibles of over 28%. Gathering wild edibles can be done while participating in other outdoor so this increase is likely due to the general increase in outdoor recreation participation.

Demographics:

As can be seen from the SCORP survey results in the table, participants in gathering wild edibles in Wisconsin tend to be represented quite evenly across age groups and gender, and tend to live in rural settings.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	31	21
	30-39	34	20
	40-49	30	14
	50-59	34	21
	60-69	27	15
	70 and older	24	9
	TOTAL	--	*100*
Gender	Female	30	49
	Male	32	51
	TOTAL	--	*100*
Residence	Rural	38	59
	Urban	24	41
	TOTAL	--	*100*

GEOCACHING

Desired experiences and site selection considerations

This activity involves placing caches—typically small waterproof boxes—on properties open to the public to test participants' geo-locating abilities. The latitude-longitude of the caches is known to participants, usually through a posting on a website. Caches are often placed in remote locations and those who located the cache record their name and date in a log book inside the cache.

This activity provides excellent health benefits by encouraging participants to get outdoors pursuing a fun, challenging, and often strenuous activity. In addition, this activity has educational value in allowing participants to practice geo-locating using a variety of techniques.

Caches are only to be placed at a property with the approval of the property manager. Depending on the popularity of the cache, impacts from trampling can occur and as a result the placement of caches should avoid sensitive areas. Caches are typically left at a location for a limited number of months or years.

This activity typically does not impact other types of outdoor recreation and does not generate many complaints from other outdoor recreation participants.

Notable differences in participation or opportunities across state

Geocaching is more popular in areas of higher populations in the state. The Madison, Milwaukee and Fox Valley metro areas tend to have more participants and geocache locations.

Notable times of the year of high or low participation

There is generally higher activity in the spring and fall and little to no activity in the winter.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 10% of adult Wisconsin residents participate in geocaching, which ranked #52 out of 64 activities evaluated.

Days/year	% of people geocaching
1 to 2	57
3 to 9	24
10 to 29	10
30 or more	9
TOTAL	*100%*

In terms of frequency, participants that engaged in geocaching did less often than participants in other activities (it ranked #57 in frequency out of 64 activities evaluated).

Estimated trends:

Information about the future trends of geocaching is difficult to find and it will likely be dependent on the future of the app technology. In 2016, a new free application was launched to make it easy to view and find geocaches from cellular devices. This application may boost geocaching participation.

Demographics:

As can be seen from the SCORP survey results in the table, participants in geocaching in Wisconsin tend to be younger age groups and evenly split by gender and residence.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	19	39
	30-39	12	22
	40-49	12	17
	50-59	7	13
	60-69	5	8
	70 and older	1	1
	TOTAL	--	*100*
Gender	Female	10	49
	Male	10	51
	TOTAL	--	*100*
Residence	Rural	10	50
	Urban	9	50
	TOTAL	--	*100*

HUNTING

Desired experiences and site selection considerations

Hunting is part of the Wisconsin's heritage and provides opportunities for building or continuing family traditions. Most hunters prefer to hunt in solitude with few distractions from other outdoor recreation participants or other sounds. Hunting does not require much infrastructure, other than access points (parking areas). Hunter walking trails and woods roads are commonly utilized both as places to hunt from and to move large game to vehicles. Habitat is a key component that affects the quality of the hunt. Weather conditions, such as snow cover, rain and wind, can substantially affect hunting success.

Four types of hunting are described here: big game, small game, migratory bird, and turkey.

Big game

Big game hunting primarily comprises white-tailed deer and black bear. Most Wisconsin deer hunters choose to hunt with a firearm; however, hunting with archery and crossbow equipment continues to gain in popularity. Most deer hunters prefer to hunt in solitude with no interruption from other outdoor recreation participants. Hunting from portable tree stands is common on public and private lands and most hunters prefer to have relatively easy access to their favorite deer hunting spots. Deer hunters are often willing to travel several hours to a favorite hunting spot (and cabin or deer-camp), and the atmosphere, camaraderie, and setting of the hunt are important components of the overall experience.

Bear hunters typically hunt over bait used to attract bears within shooting range, or use hounds to pursue and harvest bears. The amount and type of allowable bait for bear hunting is regulated. Like most other hunters, bear hunters prefer solitude while hunting; however, hunting with hounds can be more of a social experience involving groups of family members and friends. Access to large areas of hunting land is important for bear hunting with hounds, while those that hunt with bait may use smaller tracts of land. Bears can be hunted with firearm, archery, and crossbow equipment.

In the case of deer, populations are managed through hunting harvest to promote tree and plant regeneration that improves ecosystem diversity. Similarly, bear populations are managed through hunting harvest to reduce damage complaints from the public and negative human/bear interactions.

Small game

Small game hunting includes the pursuit of various game birds, mammals, and furbearers. Some hunters utilize dogs to find, track, and retrieve game, particularly grouse and pheasant. Some state lands are stocked with pheasants several times each fall and are very popular destinations.

Migratory bird

Migratory bird hunting includes hunting for waterfowl (ducks and geese) and other game birds such as dove, woodcock, snipe, and rail. Hunters utilize boats and canoes, as well as hunting dogs, to assist in this activity. Migratory game bird hunting does not require much infrastructure for upland sites; waterfowl hunting usually requires boat launches.

Turkey

Turkey hunting includes both spring and fall hunting, and is limited to regulated seasons (periods). Turkey hunters desire opportunities to call-in, ambush or stalk turkeys. Apart from mentoring, most turkey hunters prefer a solitary experience and, given the wary nature of turkeys, few distractions. Even with limited numbers

of harvest tags and staggered hunting periods for spring season, there is still potential for hunter overcrowding in a specific area, particularly in quality habitat areas within less abundant turkey management zones.

Notable differences in participation or opportunities across state

Large game

Deer hunting is very popular in Wisconsin and occurs in every county in the state. Although typically an activity occurring in rural areas, there are increasing opportunities for deer hunting in urban areas to manage high deer numbers. Wisconsin has a traditional 9-day gun deer season that draws nearly 600,000 hunters, and extended archery and crossbow harvest seasons in urban or metro deer management units.

Wisconsin continues to be a leader in providing excellent bear hunting opportunities. Most of Wisconsin's bear hunting occurs on the large tracts of public land in northern Wisconsin; however, the southern two-thirds of the state continue to support an increasing number of bears. Wisconsin uses established bear management zones and harvest permit allocation to manage hunting pressure and achieve bear population goals.

Small Game

With such a diverse array of animals to hunt in this activity, hunting pressure and techniques vary region to region. Many of the species can be found in rural habitats throughout the state. However, some species have limited ranges and habitats. For example, today's pheasant population is most common in the southeast one-third of the state and in a few west central region counties. Similar limitations are true for ruffed grouse, which prefer young, early successional forests typically found in the Central and Northern Forest Regions of the state. There also appears to be a willingness to travel more than 1 hour away from participants of small game hunting for these more select types of species, particularly for pheasant, ruffed grouse, and bobcat.

Migratory game birds

Wisconsin generally ranks in the top 5 for number of waterfowl hunters nationwide. Wisconsin waterfowl hunters range from those seeking the early blue-winged teal and wood duck harvest in northern marshes to the early September Canada goose hunter in the southeast and from the Mississippi River hunter seeking canvasback in November to the later season mallard and Canada goose field hunters in central Wisconsin.

Turkey

Though found statewide, wild turkey numbers are larger in the southern half of the state. Deep, persistent snow cover and extended periods of cold temperatures have great impact on turkey populations. In Wisconsin, turkeys tend to do better where the topography is varied and mature oak/hickory woodlands are interspersed with a variety of agricultural fields.

Turkey hunting is currently divided into seven management zones within Wisconsin. These zones allow wildlife managers to set permit levels appropriate to each area based on local turkey populations, the amount of turkey habitat, and the square miles of huntable land.

Notable times of the year of high or low participation

Large game

Avid deer hunters are planning for the hunting season all year through scouting, equipment maintenance, and habitat management. However, the majority of participation in deer hunting occurs with the onset of the archery and crossbow season in September and ends in early January. Some urban or metro deer management units provide additional archery or crossbow hunting into late January.

The bear hunting season occurs in September and October; however, people are allowed to place bait for bears beginning in mid-April. In addition, people are allowed to train their hunting hounds beginning in July.

Small Game

Highest participation follows hunting seasons and is typically fall through winter. However, there are some opportunities for year-round hunting of some animals classified as "unprotected."

Migratory game girds

This activity is limited to regulated seasons in the fall and early winter. Hunting migratory birds is also restricted to the type of firearm and ammunition allowed and requires permits beyond a small game license.

Turkey

Participation is limited to the hunting seasons in the spring and fall, with spring typically showing higher participation. Scouting for birds may occur outside of the seasons.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 27% of adult Wisconsin residents participate in some form of hunting. As can be seen in the adjacent table, more hunting takes place on private land for all types of hunting. However, since only about 15% of the state is in public conservation land open to hunting, the density of hunters on public land is much higher than on private land.

Hunting type	**% of WI adults that participate**	
	On *public* land	On *private* land
Big game	13%	21%
Small game	10%	14%
Migratory bird	5%	6%
Turkey	6%	11%

In terms of frequency, participants that engaged in big game, small game, and migratory bird hunting did more frequently than participants in most other activities (they ranked #24, #26 and #15, respectively, in frequency out of 64 activities evaluated). Given the fact that the hunting seasons for big game and migratory birds are rather limited, this level of frequency is impressive. Turkey hunters participated less frequently (ranked #45 out

Big game

Days/year	% of hunting on public land	% of hunting on private land
1 to 2	31	21
3 to 9	40	41
10 to 29	18	24
30 or more	12	15
TOTAL	*100%*	*100%*

Small game

Days/year	% of hunting on public land	% of hunting on private land
1 to 2	35	32
3 to 9	33	41
10 to 29	20	17
30 or more	12	10
TOTAL	*100%*	*100%*

Migratory bird

Days/year	% of hunting on public land	% of hunting on private land
1 to 2		39
3 to 9		36
10 to 29		13
30 or more		12
TOTAL	*100%*	*100%*

Turkey

Days/year	% of hunting on public land	% of hunting on private land
1 to 2	38	36
3 to 9	42	51
10 to 29	15	8
30 or more	6	6
TOTAL	*100%*	*100%*

of 64) but given that most people are limited to one week-long opportunity it appears that most participated in many of their available allotted days.

Estimated trends:

Hunting has seen a slight decline in participation rate and this downward trend is predicted to continue. In a 2016 study by the department, three main attributes related to the decline in hunting are: one's perceived lack of time, lack of access and declining health. Other impacts are the future of changing demographics. Increases in minority population are expected to contribute to a decline in the percent of residents that hunt since the overwhelming majority (95%) of hunters are Caucasian.[16]

[16] Holsman, R.H. (2016). *What the Evidence Suggests for the Future of Fishing and Hunting License Sales in Wisconsin.* Wisconsin Department of Natural Resources.

Demographics:

As can be seen from the SCORP survey results in the tables below, participants in all types of hunting in Wisconsin tend to be older, rural men.

Big game

Demographic category	Demographic group	On *public* land		On *private* land	
		% Participation rate within demographic category	**% Composition of demographic category (sums to 100%)**	**% Participation rate within demographic category**	**% Composition of demographic category (sums to 100%)**
Age	18-29	19	30	25	25
	30-39	14	18	26	22
	40-49	13	14	22	16
	50-59	15	21	23	20
	60-69	10	12	14	11
	70 and older	5	4	12	7
	TOTAL	--	*100*	--	*100*
Gender	Female	7	27	10	25
	Male	20	73	32	75
	TOTAL	--	*100*	--	*100*
Residence	Rural	19	67	30	69
	Urban	9	33	13	31
	TOTAL	--	*100*	--	*100*

Small game

Demographic category	Demographic group	On *public* land		On *private* land	
		% Participation rate within demographic category	**% Composition of demographic category (sums to 100%)**	**% Participation rate within demographic category**	**% Composition of demographic category (sums to 100%)**
Age	18-29	16	33	18	26
	30-39	10	19	18	23
	40-49	11	16	16	16
	50-59	10	19	13	18
	60-69	5	8	9	11
	70 and older	5	6	7	6
	TOTAL	--	*100*	--	*100*
Gender	Female	5	25	8	27
	Male	15	75	21	73
	TOTAL	--	*100*	--	*100*
Residence	Rural	14	66	20	69
	Urban	7	34	8	31
	TOTAL	--	*100*	--	*100*

Migratory bird

Demographic category	Demographic group	On *public* land		On *private* land	
		% Participation rate within demographic category	**% Composition of demographic category (sums to 100%)**	**% Participation rate within demographic category**	**% Composition of demographic category (sums to 100%)**
Age	18-29	12	45	15	51
	30-39	5	18	6	17
	40-49	5	13	6	13
	50-59	4	14	3	10
	60-69	1	3	1	4
	70 and older	4	7	3	3
	TOTAL	--	*100*	--	*100*
Gender	Female	3	30	3	27
	Male	8	73	9	73
	TOTAL	--	*100*	--	*100*
Residence	Rural	7	60	8	62
	Urban	4	40	5	38
	TOTAL	--	*100*	--	*100*

Turkey

Demographic category	Demographic group	On *public* land		On *private* land	
		% Participation rate within demographic category	**% Composition of demographic category (sums to 100%)**	**% Participation rate within demographic category**	**% Composition of demographic category (sums to 100%)**
Age	18-29	14	50	17	33
	30-39	6	17	11	19
	40-49	4	11	11	14
	50-59	4	13	11	18
	60-69	2	6	7	11
	70 and older	2	3	5	5
	TOTAL	--	*100*	--	*100*
Gender	Female	3	30	6	27
	Male	8	70	16	73
	TOTAL	--	*100*	--	*100*
Residence	Rural	8	65	15	69
	Urban	4	35	6	31
	TOTAL	--	*100*	--	*100*

NATURE PHOTOGRAPHY AND EDUCATION

Desired experiences and site selection considerations

Participation in photography, both still and video, runs the gamut of experience from professional photographers and cinematographers using expensive, state-of-the-art cameras to those capturing a snapshot with a smartphone or point-and-shoot camera. "Nature" photography covers an extremely broad realm, including images of wild plants and animals, landscapes, and natural phenomena – almost any subject that has a decidedly natural focus.

Nature photography can happen on any type of property and in any sort of habitat, size and configuration of the property is not important as long as access is available and there is something of interest to photograph. The experience is enhanced if the photographer has a chance to capture unusual flora, fauna, landscape, or event. Social benefits of nature photography include physical and mental health of participants who explore the outdoor world.

Nature education occurs in a wide variety of settings and includes a diverse set of activities such as visiting a nature center, attending a naturalist presentation at a state park, and self-study. Many parents participate in various types of nature education with their children. Although many people visit nature centers, they typically do so only a few days annually.

Notable differences in participation or opportunities across state

Nature photography is pursued throughout the state, from backyards to large public lands. Sites that can draw large numbers of participants include those with unusual features, such as waterfalls, bird concentration sites, and uncommon animals and plants, as well as areas with expansive vistas.

Notable times of the year of high or low participation

Nature photography is done year around, but participation is likely highest from spring through autumn.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 37% of adult Wisconsin residents participate in nature photography and 52% visit nature centers. These ranked #18 and #11, respectively, out of 64 activities evaluated.

In terms of frequency, participants that engaged in nature photography did so more frequently than participants in most other activities (it ranked #22 in frequency out of 64 activities evaluated). Visiting nature centers is an activity that participants tended to do just a couple of times a year (it ranked #63 in frequency out of 64 activities evaluated).

Days/year	% of people engaged in nature photography	% people that visited a nature center
1 to 2	32	58
3 to 9	37	31
10 to 29	17	8
30 or more	14	4
TOTAL	*100%*	*100%*

Estimated trends

Nature photography is becoming a more accessible activity as most cell phones have high quality cameras. Many people take photos in nature while participating in other activities, allowing nature photography to remain one of the most popular activities.

Demographics:

As can be seen from the SCORP survey results in the tables below, participants in nature photography and those that visit nature centers in Wisconsin span age groups and are well represented by older residents. Women tend to participate in nature photography more than men. There is about equal participation by both urban and rural residents.

Nature photography

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	45	26
	30-39	39	19
	40-49	42	17
	50-59	35	18
	60-69	27	13
	70 and older	27	8
	TOTAL	--	*100*
Gender	Female	41	57
	Male	32	43
	TOTAL	--	*100*
Residence	Rural	38	50
	Urban	35	50
	TOTAL	--	*100*

Visitors to nature centers

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	52	21
	30-39	66	23
	40-49	56	16
	50-59	51	18
	60-69	45	15
	70 and older	35	8
	TOTAL	--	*100*
Gender	Female	52	51
	Male	52	49
	TOTAL	--	*100*
Residence	Rural	50	46
	Urban	54	54
	TOTAL	--	*100*

ROCK CLIMBING

Desired experiences and site selection considerations

Rock climbing on department land is an activity in which participants climb up, down or across natural rock formations. The goal is to reach the summit of a formation or the endpoint of a usually pre-defined route without falling. Rock climbing is a physically and mentally demanding sport, one that often tests a climber's strength, endurance, agility and balance along with mental control. It can be a dangerous activity and knowledge of proper climbing techniques and usage of specialized climbing equipment is crucial for safe participation.

Rock climbing is an established, traditional recreational activity that may occur on department-owned lands and is consistent with the department's mission to provide outdoor recreational opportunities to the public. Rock climbing is allowed on department-controlled lands on natural rock faces in non-designated use areas unless posted as closed. Some rock climbing within non-designated use areas may be restricted due to impacts on natural resources or user conflict. Climbing on buildings, towers, boardwalks or other department-managed structures or using such structures as anchors for ropes (i.e. fences, railings, and pilings) is prohibited. The department has developed guidance entitled "Rock Climbing Policy for DNR-Managed Properties (February 2000).

Notable differences in participation or opportunities across state

Rock climbing is available in many parts of the state, but the primary opportunities occur in the southern half of the state.

Notable times of the year of high or low participation

Highest use months are April through October.

Participation

Participation rates and frequencies were not evaluated in the 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP). Survey work associated with the 2011-2016 Wisconsin SCORP found that about 3.8% of residents participated in the activity.

A recent study by the Department of Agriculture classifies rock climbing as a challenge activity and projects all challenge activities to see participation increases due to increased income and health. A majority of the climbing in Wisconsin is bouldering, which is a relatively easier entry for those new to the activity.[17]

[17] Adventure Projects Inc. (2018). *Mountain Project: Wisconsin Climbing.* https://www.mountainproject.com/area/105708968/wisconsin

TRAPPING

Desired experiences and site selection considerations

This activity involves regulated harvest of animals using various types of traps in both upland and wetland settings. Trapping for furbearers typically occurs in the winter when pelts are thickest. Trapping is also conducted to capture and remove nuisance animals (e.g., beavers that are building dams in key stretches of trout water) and to reduce predation on desirable nesting/denning wildlife species.

Traps are typical set in areas of low human visitation and use by other types of recreation. High use of an area by other user groups and domestic pets can negatively impact trapper use of an area. Impacts to other users generally are low, but incidental trapping of domestic pets is possible. Most traps need to be checked daily and as a result most trappers pursue this activity on properties in relatively close proximity to their homes. Trapping can provide supplemental income through fur sales.

Notable differences in participation or opportunities across state

Trapping occurs throughout the state. Participants use a range of different habitats and prefer locations away from population centers.

Notable times of the year of high or low participation

Participation is highest in fall and winter, moderate in spring, and low in summer.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 4% of adult Wisconsin residents participate in trapping, which ranked #64 out of 64 activities evaluated.

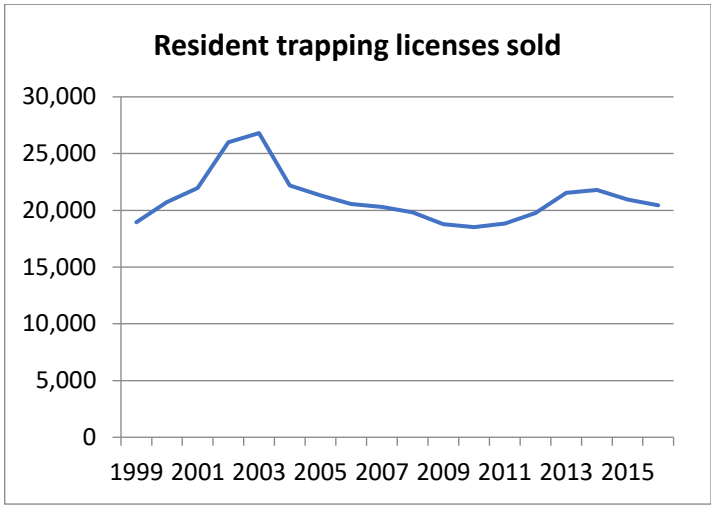
In terms of frequency, participants that engaged in trapping did so about in line with the frequency of participants in most other activities (it ranked #35 in frequency out of 64 activities evaluated).

Days/year	% of trappers
1 to 2	43
3 to 9	32
10 to 29	9
30 or more	16
TOTAL	*100%*

Estimated trends

Participation reports and predictions for trapping has been included under hunting projections, so as predicted for hunting, trapping is likely to see a decline in participation rate. This decline is due to changing demographics, urban sprawl and many other factors that affect hunting land.

Wisconsin offers a trapping only license or a Conservation Patron's license, which includes many of the permits one would need to hunt, fish and trap throughout the year. As a result, tracking trapping participation is difficult. Wisconsin residents that purchased a trapping license jumped to above 26,000 in 2002 and 2003 then leveled in 2004 and has remained near 20,000 since.



Source: DNR registration data

Demographics:

As can be seen from the SCORP survey results in the table, participants trapping in Wisconsin tend to be younger, rural men.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	10	52
	30-39	3	14
	40-49	2	8
	50-59	3	15
	60-69	1	9
	70 and older	1	2
	TOTAL	--	*100*
Gender	Female	3	38
	Male	5	62
	TOTAL	--	*100*
Residence	Rural	5	58
	Urban	3	42
	TOTAL	--	*100*

BIRD AND WILDLIFE WATCHING

Desired experiences and site selection considerations

Wildlife watching – and in particular bird watching – is often characterized as either occurring around the home or away from home (that is, travelling somewhere to watch wildlife). Many people participate in both forms. Bird watching around the home is the second most frequently engaged in outdoor recreation activity by Wisconsin residents.

Days/year	% of people **bird/wildlife watching** around **their home**	% of people **bird/wildlife watching** away from **their home**
1 to 2	16	31
3 to 9	22	36
10 to 29	19	19
30 or more	43	15
TOTAL	*100%*	*100%*

Some birders watch and track birds throughout the year, feed and watch birds at their residences, and take trips throughout the state or country specifically to view birds or add to their "life list." Although such enthusiasts often participate in other silent sports, birding is usually the primary purpose of their outings. High-quality experiences are characterized by uncrowded, quiet conditions where these birders can slowly move through an area with minimal disturbance to wildlife, other birders, and other recreationalists.

Other wildlife watchers participate as a secondary activity while hiking, bicycling, canoeing, horseback riding or other quiet activities. Wildlife watchers, especially enthusiasts, can be impacted by people participating in activities that scare birds away from an area, even if only temporarily.

Apart from possibly walking in sensitive areas, wildlife watchers create few impacts on the environment and typically have very few impacts on people participating in other activities. However, in some cases wildlife watchers can conflict with each other, particularly when people over-zealously pursue birds and other wildlife in ways that cause them to disperse.

Notable differences in participation or opportunities across state

With the Great Lake shorelines and the Mississippi River valley as natural migration corridors, Wisconsin hosts an abundance of excellent birding opportunities. Although opportunities exist throughout the state, settings vary from remote, high-quality ecologically sites to more disturbed sites in agricultural settings. Even large metropolitan areas, most of which in Wisconsin are on water, offer interesting places to watch birds and other wildlife. Due to the number of people living in urban centers, most birding takes place in the southern and eastern parts of the state; however, the participation rate of residents is highest in the northern and western portion.

Notable times of the year of high or low participation

Wildlife watching occurs throughout the year. Bird watching peaks during the spring and fall migration periods. Birding around the home, particularly associated with bird feeding, is popular with many people during the winter.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 55% of adult Wisconsin residents participate in bird/wildlife watching around their home and 39% participate by travelling somewhere away from home. These ranked #9 and #16, respectively, out of 64 activities evaluated.

In terms of frequency, participants that engaged in wildlife/bird watching did so more frequently than participants in most other activities (it ranked #16 in frequency out of 64 activities evaluated).

Estimated trends:

Wildlife watching is projected to remain one of the most popular outdoor recreation activities due to the availability to participate close to home and while doing other outdoor recreation activities. The national participation rate was above 80% in 2008 and it is anticipated to be near 82% in 2030.[18]

Demographics:

As can be seen from the SCORP survey results in the tables below, participants in bird/wildlife watching in Wisconsin are represented across the age spectrum and somewhat more rural. Bird watching is one of the few outdoor activities where participation increases with age and is particularly popular with retirees.

Bird/wildlife watching around home

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	47	18
	30-39	55	18
	40-49	60	16
	50-59	57	19
	60-69	59	18
	70 and older	55	12
	TOTAL	--	*100*
Gender	Female	55	51
	Male	54	49
	TOTAL	--	*100*
Residence	Rural	61	54
	Urban	49	46
	TOTAL	--	*100*

Bird/wildlife watching away from home

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	34	18
	30-39	38	18
	40-49	44	16
	50-59	42	20
	60-69	42	18
	70 and older	35	10
	TOTAL	--	*100*
Gender	Female	38	50
	Male	39	50
	TOTAL	--	*100*
Residence	Rural	41	53
	Urban	38	47
	TOTAL	--	*100*

CAMPING

Desired experiences and site selection considerations

Camping has evolved over the last several decades. In the first half of the 20th century, most campers slept on the ground in canvass tents, cooked over open fires, brought guitars and other musical instruments for entertainment, and arrived in cars. Today's campers increasingly sleep in RVs, pop-ups, and other hard-sided campers, cook on stoves, use various electric devices, and enjoy an experience that is partially "roughing it" and partially "comfort." To be sure, many people still approach camping as a way to take a break from being connected to the internet, cell phones, and other technological gadgets. But a growing number of visitors use various devices and internet connections while camping to keep up at work, find their location and sites to visit, watch movies, and access other forms of entertainment.

Because campers seek out interesting places to spend time and typically combine camping with other outdoor activities, most campgrounds are associated with waterbodies, particularly scenic areas, other areas of interest, and opportunities to participate in hiking, biking, riding horses, hunting, fishing, and other activities. The department offers four general types of camp settings:

Modern campgrounds

These developed campgrounds can have many of the comforts of home including hot showers, flush toilets, and electrical hookups. These campgrounds generally have 100 or more campsites with a separation distance of approximately 100 feet between sites. The department is limited by statute in the percent of its campsites within the state park system that can offer electrical hookups in these developed campgrounds. People using modern campgrounds can expect to experience the sounds of surrounding campers and the camaraderie of others.

Rustic campgrounds

These campgrounds have a simpler setting than developed campgrounds and typically provide just vault toilets, hand-pumps for water, picnic tables, and fire rings; they do not have electrical hookups. This remains the most common type of camping the department provides. People using these campgrounds can expect to hear some sounds of surrounding campers, but with fewer campsites in these campgrounds and more space between campsites, they are less active and quieter than the fully-developed modern campgrounds.

Primitive campsites and dispersed camping

These campsites are remote and isolated and typically have just a fire ring, a pit toilet, and a space for a tent. The campsites are not part of a conventional campground but rather are dispersed single sites or remote, small clusters of widely spaced sites. Clustered sites are considered semi-primitive. Campers expect to experience few sights and sounds from other recreational users at these sites.

Camping at sites with no facilities is also allowed from time to time (with a permit) on some properties. This type, often called dispersed camping because it occurs at variable locations on a property, is intended to be for a limited time. Examples include hunting camps and backpack camping, which most commonly occurs on state forests and along the Ice Age Trail. Special purpose camping permits are also issued for dog trials and other special events.

Group campsites

These campsites typically accommodate up to 75 campers in relatively close proximity to each other (e.g., in a large grassy area) and provide a range of facilities similar to those in rustic campgrounds. Group camping is

increasingly popular and draws both organizations (e.g., religious groups, scout troops) as well as family and friend groups.

Notable differences in participation or opportunities across state

Camping takes place throughout the state. The department offers nearly 5,000 campsites distributed over 60 properties. The large county, state, and national forests in the north have a wide array of camping opportunities and draw substantial numbers of visitors.

Notable times of the year of high or low participation

Highest participation in camping occurs from May through October with spikes on summer weekends.

Participation

Participation rate and frequency:

To simplify the identification of the types of camping Wisconsin residents participate in, the 2016 survey conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP) asked about residents' participation in tent camping and RV camping. It is estimated that 32% of adult Wisconsin residents participate in tent camping and 21% in RV/pop-up camping. These ranked #23 and #30, respectively, out of 64 activities evaluated.

In terms of frequency, participants that engaged in tent camping did so less frequently than participants in most other activities while participants in RV/pop-up camping did so more frequently (they ranked #59 and #25, respectively, in frequency out of 64 activities evaluated).

Days/year	% of tent campers	% of RV/pop-up campers
1 to 2	47	33
3 to 9	39	37
10 to 29	10	19
30 or more	4	12
TOTAL	*100%*	*100%*

Estimated trends:

Camping is projected to see increase in participation. In the 2017 American Camper Report, the top three motivations for taking more camping trips were: more vacation time, an inexpensive option and preference to camping over staying at a hotel. As the population has more vacation time, one can predict they are likely to take more camping trips in conjunction with their other outdoor recreation activities.

Demographics:

As can be seen from the SCORP survey results in the tables below, participants in tent camping in Wisconsin tend to be younger age groups while those pursuing RV/pop-up camping are well represented in older age groups. This aligns with other research that has indicated that as people age physical limitations make it harder and less desirable to sleep in tents on the ground.

Tent camping

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	51	33
	30-39	45	25
	40-49	41	19
	50-59	24	14
	60-69	15	8
	70 and older	5	2
	TOTAL	--	*100*
Gender	Female	30	47
	Male	35	53
	TOTAL	--	*100*
Residence	Rural	31	48
	Urban	32	52
	TOTAL	--	*100*

RV/pop-up camping

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	24	24
	30-39	26	23
	40-49	24	17
	50-59	21	19
	60-69	17	13
	70 and older	9	5
	TOTAL	--	*100*
Gender	Female	20	49
	Male	22	51
	TOTAL	--	*100*
Residence	Rural	25	57
	Urban	17	43
	TOTAL	--	*100*

DOG TRAINING AND TRIALING

Desired experiences and site selection considerations

This activity involves training dogs to perform various hunting-related tasks and then applying the training in competitions (trials) or during hunting. Training can include many different aspects such as acclimating dogs to the sounds of gunfire, responding to directional instructions, teaching them how to find, point, flush, and then retrieve game animals, and to follow a scent trail. Dog training is a critical component of successful and safe hunting and the department seeks to provide opportunities for training throughout the state. Currently there are more than 50 designated dog training locations on department properties.

Preferred settings for training are conditions that mimic hunting conditions. Generally, this includes open areas with grasses and forbs of varying heights that allow the trainer and dog to see each other. Since training involves considerable communication between trainer and dog, areas with few distractions are preferred. As a result, training grounds are somewhat self-regulating in terms of numbers of users at any given time. If a trainer arrives at a designated training ground and several others are already working dogs at the site, most trainers will find a different location or return later. Training areas that are 40 to 200 acres are desirable.

Dog trials are competitive events hosted by clubs where dogs are formally evaluated by judges on a range of abilities. Trials typically occur over a weekend and involve dozens of dogs performing over established routes; as a result, trails require considerably more land than a general training ground. Preferred settings are large areas (~1,000 acres) away from population centers with grassland, savanna, or wetland habitats and mostly flat terrain. For most pointing-dog events, judges, marshals, and trainers (and in some cases spectators) ride on horses to identify "points" as they occur.

On department lands, dog trials are only allowed on Class I dog trailing grounds or by special use permit. Ideally, locations have trails (4-8' cleared corridor, native surface), a large mowed grassy area to park trailers and keep horses, drinking water and toilets (portable is fine), and a shelter with walls for bad weather.

Because a lack of distractions is important for both dog training and trial events, people pursuing other activities in the area can present problems. Most often, this conflict arises because people inadvertently find themselves in an area being used.

Notable differences in participation or opportunities across state

Dog training takes place throughout the state. Wisconsin currently has 59 public dog training areas and many dog trialing events, although the statistics of visitation to the areas or participation in these events are not available.

Participation in dog trials is highest in the northwest (probably because of proximity to the Twin Cities) and south-central and southeast parts of the state (where most of the Class I grounds are located), moderate in the central, north-central, and western parts of the state, and lowest in the northeast. Over half of participation in dog trials takes place an hour or more away from participants' homes.

Notable times of the year of high or low participation

Dog training occurs mostly from early spring to the opening of various hunting seasons in the fall. Most of the department's Class II dog training grounds are closed during the spring nesting season (April 15 to July 31).

Participation in dog trials is highest in spring and fall and moderate in summer and winter. It is not desirable to run dogs or horses during the heat of summer or cold of winter. Property managers limit the time of year that dog trials occur to accommodate nesting birds or other environmental concerns.

Participation

Participation rates and frequencies of dog training and trialing were not evaluated in the 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP). The dates that are available on department properties for dog trials are nearly always completely booked and demand to host events is generally considered to exceed the existing opportunities. One of the most popular Class I dog training and trialing sites, Pine Island Wildlife Area, has increasingly been flooded due to some changes in hydrology associated with nearby wetland restoration. With this site less able to host events, demand has shifted to other grounds that are already heavily used.

TARGET SHOOTING - FIREARMS AND ARCHERY

Desired experiences and site selection considerations

This activity involves various forms of target shooting with rifles, pistols, shotguns, bows and crossbows. Targets can be two- or three-dimensional. Gun ranges differ in the opportunities provided; some are limited to just sighting in firearms while others have facilities that accommodate short (25 feet) to long distance (200 yards) shots for pistols and rifles as well as trap, skeet, and sporting clays. In addition, some ranges also have facilities for archery and crossbow target shooting.

Safety is an overarching concern at ranges and is particularly acute at gun ranges. Modern gun ranges use large earthen backstops, side berms, shooting sheds with baffles, and other strategies to minimize sounds and maximize safety. Some facilities are supervised with range monitors while others are not. Ranges are used by people who enjoy the challenge of hitting targets (from bullseyes to clays) and visit ranges to develop better marksmanship skills. Others use ranges to sight in their equipment in preparation for hunting. Both types of users seek safe, well-constructed ranges.

There are two types of archery ranges: spot-style and walk-through ranges. Spot-style ranges provide a series of different distances to stationary two-dimensional targets. These require cleared areas with relatively short grass, including behind the targets to be able to find wayward arrows. Walk-through ranges follow a trail with targets at a variety of distances (10 to 60 yards) and angles. Preferred settings are a 4' to 8' mowed trail about a mile in length through savanna, forest, or river/stream habitats with moderate topographical relief. Trail layout must incorporate a design that makes it safe for all users and thus areas beyond the target must be closed to use.

Gun ranges may be built on department lands where the range is compatible with the surrounding land use. Some considerations[19] to take into account include:

- noise disturbance to residences within 1,000 yards
- avoid wetlands or hydric soils or soils with hydric inclusions
- avoid State Natural Areas
- avoid archeological sites
- direct road access is preferred
- minimize impact on other recreational users
- minimize impact on blocks of wildlife habitat
- topography that is supportive of developing a shooting range

There are 10 firearm ranges on department lands that are open to the public and an additional 52 ranges open to the public operated by other government agencies, clubs, businesses, and other organizations. Although there are ranges in all parts of the state, most people in urban centers need to travel some distance to find a range that fits their needs. Archery target shooting is provided at some ranges.

[19] From the *Shooting Range Guidance for Range Development Considerations on Department Lands*, presented at the May 2014 Natural Resources Board meeting. To see the full document, visit the department web page and search "NRB."

Notable differences in participation or opportunities across state

Target shooting occurs across the state, but demand is strongest and supply most limiting in more populated urban-suburban areas of the state. In particular, there are fewer opportunities for firearm target shooting in southeast Wisconsin.

Notable times of the year of high or low participation

Participation is highest in summer and fall, and less active in the spring.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 29% of adult Wisconsin residents participate in target firearm shooting and 19% participate in target archery shooting. These ranked #26 and #36, respectively, out of 64 activities evaluated.

In terms of frequency, participants that engaged in target firearms shooting and target archery did so more frequently than participants in most other activities (they ranked #23 and #10, respectively, in frequency out of 64 activities evaluated).

Days/year	% of target firearm shooters	% of target archers
1 to 2	33	27
3 to 9	35	31
10 to 29	21	27
30 or more	12	16
TOTAL	*100%*	*100%*

Estimated trends:

A report done for the National Shooting Sports Association states that target shooting continues to grow nationwide. Nearly half of active target shooters introduce a newcomer to the range or field each year. .[20]

Demographics:

As can be seen from the SCORP survey results in the tables below, participants in target firearm shooting in Wisconsin are well represented across age groups, with even participation by gender and relatively even by type of residence. Conversely, participants in target archery shooting tend to be younger, rural men.

[20] Allen, T., Southwick, R., Curcuruto, J., Zwoll, W., Howlett, D., Larrimore, C. (2013). *Target Shooting in America.* National Shooting Sports Foundation.

Target firearm shooting

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	37	26
	30-39	32	20
	40-49	34	17
	50-59	30	19
	60-69	21	13
	70 and older	14	5
	TOTAL	--	*100*
Gender	Female	38	50
	Male	39	50
	TOTAL	--	*100*
Residence	Rural	41	47
	Urban	38	53
	TOTAL	--	*100*

Target archery shooting

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	28	30
	30-39	22	22
	40-49	25	19
	50-59	18	18
	60-69	11	9
	70 and older	6	3
	TOTAL	--	*100*
Gender	Female	13	34
	Male	26	66
	TOTAL	--	*100*
Residence	Rural	26	65
	Urban	13	35
	TOTAL	--	*100*

FISHING

Desired experiences and site selection considerations

Fishing is part of the Wisconsin's heritage and like hunting, provides opportunities for building or continuing family traditions. This activity involves various forms of catching fish using bait, lures, spears, nets, and other means. Fishing is often a solitary or small group activity (typically no more than a couple of people).

Fishing requires little infrastructure, other than access and boat launches on larger waterbodies. Water quality and aquatic habitat are key components that affect the quality of fishing experiences. Fortunately, there is a wide range of fishing opportunities in Wisconsin. From small, cold spring creeks to the Great Lakes, state residents seek out a diversity of angling experiences.

Notable differences in participation or opportunities across state

Fishing is popular throughout the state, but the opportunities available differ from one area to another. Some areas of the state harbor numerous small streams, while others offer numerous lakes, and still others host large rivers. For example, the Driftless Area offers premier trout fishing in the numerous cold and cool water streams, but virtually no lake fishing. The Northwoods region of Oneida and Vilas counties has thousands of clear lakes that provide exceptional fishing for bluegill, walleye, bass, muskie and more. The Great Lakes and Green Bay provide their own unique experiences.

Notable times of the year of high or low participation

There are fishing opportunities year-round, but most angling occurs from the opening of the general season (first Saturday in May) through fall. Ice fishing is popular in many areas.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 55% of adult Wisconsin residents participate in fishing.

In terms of frequency, people fishing in lakes from boats, canoes or kayaks did so more frequently than participants in other forms of fishing (it ranked #14 in frequency out of 64 activities evaluated).

	% of anglers			
Days/year	**Lake fishing from shore or pier**	**Lake fishing from boat/canoe/ kayak**	**Stream/river fishing from shore/wading**	**River fishing from boat/canoe/ kayak**
1 to 2	37	29	40	40
3 to 9	38	36	34	34
10 to 29	16	21	17	16
30 or more	10	14	9	10
TOTAL	*100%*	*100%*	*100%*	*100%*

Estimated trends:

According to Wisconsin DNR license number data, fishing license numbers have increased in Wisconsin over the past 15 years, with a 9% increase from 2002 to 2014. While there is an increase in license sales this does not reflect the participation rate or percent. Nationally, fishing participation rates are expected to decline by about 9 percent by the year 2060.[21] The American Sport Fishing Association suggests that anglers in the Millennial generation may be less committed to fishing than previous generations.[22]

Demographics:

For purposes of presenting demographic information of anglers, all forms of fishing from the SCORP survey results are combined. As can be seen from the in the table, participants in fishing in Wisconsin are well represented across age groups, with more participation by rural men.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	60	25
	30-39	57	21
	40-49	59	17
	50-59	49	18
	60-69	37	13
	70 and older	27	6
	TOTAL	--	*100*
Gender	Female	40	41
	Male	60	59
	TOTAL	--	*100*
Residence	Rural	57	56
	Urban	42	44
	TOTAL	--	*100*

[21] Cordell, K.H. (2012). *Outdoor recreation trends and futures: a technical document supporting the Forest Service 2010 RPA Assessment.* Department of Agriculture Forest Service.

[22] American Sport Fishing Association (2016). *Will Millennials Sustain Sportfishing?* http://asafishing.org/uploads/Technical_Report_Five_-_Millenial_Anglers_and_Cross-over_License_Buying.pdf

CANOEING AND KAYAKING

Desired experiences and site selection considerations

Canoeing and kayaking provide a wide range of experiences from flat water (lakes), to moving water (streams and rivers) to whitewater (streams and rivers with sufficient fall to create rapids and waterfalls). In addition, this activity can take place for a few hours during the day at a local lake or it can be a means of transportation on a tour of a river or a flowage over the course of several days. Canoes and kayaks are also used for fishing, bird watching, collecting wild edibles, and other activities. This type of boating requires little in the way of infrastructure for launching. A clearing on a shoreline with minimal drop to the water level is sufficient.

Notable differences in participation or opportunities across state

Participation occurs all over the state, although the limited number of lakes and larger rivers in the Driftless Area generally limits participation in this area.

Notable times of the year of high or low participation

Late spring, summer and early fall are the most popular times of the year for this activity, with summer being the peak period.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 34% of adult Wisconsin residents participate in canoeing or kayaking. This ranked #21 out of 64 activities evaluated.

In terms of frequency, participants that engaged in canoeing and kayaking did so less frequently than participants in most other activities (it ranked #44 in frequency out of 64 activities evaluated). Given that the season for canoeing and kayaking is limited, this does not represent the actual frequency of participation based on available days.

Days/year	% of canoers/ kayakers
1 to 2	42
3 to 9	34
10 to 29	15
30 or more	9
TOTAL	*100%*

Estimated trends:

Canoeing and kayaking have seen growth throughout the years in Wisconsin and nationally. A recent report stated that paddle sports continued to see some of the greatest participation increases in outdoor participation from 2012 -2015.[23] With Wisconsin's easy access to water, growth in canoeing, kayaking and paddle boarding is anticipated to continue.

Demographics:

As can be seen from the SCORP survey results in the table, Wisconsinites of all ages participate in canoeing or kayaking; these activities are particularly popular with younger men and evenly split by place of residence.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	47	29
	30-39	41	22
	40-49	41	17
	50-59	32	17
	60-69	23	11
	70 and older	11	4
	TOTAL	--	*100*
Gender	Female	30	44
	Male	38	56
	TOTAL	--	*100*
Residence	Rural	35	50
	Urban	33	50
	TOTAL	--	*100*

[23] Topline Report. (2016). *Outdoor Recreation Participation*. https://outdoorindustry.org/wp-content/uploads/2017/05/2016-Topline-Report.pdf.

MOTOR BOATING

Desired experiences and site selection considerations

A motorboat, speedboat, or powerboat is a boat which is powered by an engine. Some motorboats are fitted with inboard engines; others have an outboard motor installed on the rear. An influential component of motor boater's satisfaction is simply the ability to access desirable waterbodies. Popular lakes, especially those near urban centers, draw many boaters and launches are often overcrowded on summer weekends. The state's plentiful water resources have a direct influence on the economy, job market, history, culture and success of the Wisconsin tourism industry.

It is estimated that 90% of boats in Wisconsin are small, towable boats sized at 26 feet or less. This affects department standards on boat access ramp and parking design. In addition, the department is regulated by administrative code[24] on the number of vehicle / trailer parking spots available by the size of the waterbody. There are also a number of state and local laws on the operation and use of motorboats.

Notable differences in participation or opportunities across state

Motor boating is available in all parts of the state and is particularly popular along the Great Lakes, Mississippi and Wisconsin rivers, Lake Winnebago and associated lakes, and at the clusters of lakes found in many parts of the state (e.g., Minocqua, Waupaca, Madison, and Hayward).

Notable times of the year of high or low participation

Highest use months are June, July and August.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 45% of adult Wisconsin residents participate in motor boating. This ranked #14 out of 64 activities evaluated.

In terms of frequency, participants that engaged in motor boating did so more frequently than participants in most other activities (it ranked #18 in frequency out of 64 activities evaluated). Given that the season for boating is limited, this under represents the actual frequency of participation based on available days.

Days/year	% of motor boaters
1 to 2	33
3 to 9	33
10 to 29	20
30 or more	14
TOTAL	*100%*

Estimated trends

[24] NR 1.91, Wis. Adm. Code.

Nationally, motor boating is anticipated to have the highest participation rate of the motorized activities by 2030 (over 25%) and the only motorized sport to have projected increases in participation rate. Growth in income appears to be a significant factor in the participation increase.[25]

Demographics:

As can be seen from the SCORP survey results in the table, participants in motor boating in Wisconsin are represented across age groups and tend to be rural men.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	52	24
	30-39	55	22
	40-49	51	17
	50-59	44	18
	60-69	34	13
	70 and older	25	6
	TOTAL	--	*100*
Gender	Female	39	45
	Male	50	55
	TOTAL	--	*100*
Residence	Rural	51	55
	Urban	39	45
	TOTAL	--	*100*

[25] White, E.M., Bowker, J.M., Askew, A.E., Langner, L.L., Arnold, J.R., English, D.B.K. (2016). *Federal Outdoor Recreation Trends: Effects on Economic Opportunities*. United States Department of Agriculture.

SWIMMING IN LAKES AND RIVERS

Desired experiences and site selection considerations

This activity involves entering waterbodies for swimming, wading or otherwise interacting with the water. Swimming in natural waterbodies can provide cooling on hot summer days, an introduction to water-based recreation and interaction with aquatic plants and animals. Lakes and rivers with good swimming potential have a uniform slope (between a ratio of 1:3 and 1:10) to a water depth of five feet with a sandy bottom. If there is a designated swim area, the associated beach area should be as large or larger than the swim area. A grass area with partial shade is best located in close proximity to the beach.

Poor water quality, sharp rocky substrate, silty/mucky substrate, cold water temps, dense aquatic vegetation can deter swimming. Swimmers can disrupt fishing activities or become and obstacle to boaters and small water craft users. Creating a beach area for swimmer access can eliminate shore habitat for aquatic species.

Notable differences in participation or opportunities across state

This activity occurs in waterbodies across the state, typically at parks with beach access to the water. Higher participation occurs in more populated areas at urban parks and in northern vacation areas.

Notable times of the year of high or low participation

This activity almost exclusively occurs in the summer when water temperatures are favorable.

Participation

Participation rate and frequency:

Based on a 2016 survey of Wisconsin residents conducted for the development of the Statewide Comprehensive Outdoor Recreation Plan (SCORP), it is estimated that 54% of adult Wisconsin residents participate in swimming in lakes and rivers. These ranked #10 out of 64 activities evaluated.

In terms of frequency, participants that engaged in swimming in lakes and rivers did so more frequently than participants in most other activities (it ranked #21 in frequency out of 64 activities evaluated). Given that the season for outdoor swimming is limited, this under represents the actual frequency of participation based on available days.

Days/year	% of lake and river swimmers
1 to 2	29
3 to 9	41
10 to 29	20
30 or more	10
TOTAL	*100%*

Estimated trends

Swimming in lakes and rivers is one of the most popular recreation activities, both in Wisconsin and throughout the country. Nationally, swimming is predicted to remain popular and have an over 3% growth in participation by 2030.[26]

[26] White, E.M., Bowker, J.M., Askew, A.E., Langner, L.L., Arnold, J.R., English, D.B.K. (2016). *Federal Outdoor Recreation Trends: Effects on Economic Opportunities*. United States Department of Agriculture.

Demographics:

As can be seen from the SCORP survey results in the table, participants in lake and river swimming in Wisconsin tend to be well represented across age groups and about evenly split between genders and place of residence.

Demographic category	Demographic group	% Participation rate within demographic category	% Composition of demographic category (sums to 100%)
Age	18-29	69	27
	30-39	70	24
	40-49	63	17
	50-59	51	17
	60-69	33	10
	70 and older	24	5
	TOTAL	--	*100*
Gender	Female	51	48
	Male	56	52
	TOTAL	--	*100*
Residence	Rural	53	49
	Urban	55	51
	TOTAL	--	*100*

RECREATION FACILITY DESCRIPTIONS

This section summarizes the types of facilities associated with recreation on department properties. The design and quality of facilities vary across the state.

BOAT LAUNCH

Boat launches on department properties vary in size and level of development. Launches for motorized boats are generally more developed than those built for non-motorized watercraft. Motorized boat launches incorporate adequate parking areas for vehicles and trailers and access docks to accompany the boat launch ramp. The standards by which these facilities are developed are set in administrative code. [27] Further guidance for property managers developing these facilities are in the department's property managers guidance.

Non-motorized boat launches are generally much less developed. They may only include a canoe or kayak slide. They do not need a ramp for a vehicle to back down, but should include an area where the craft can be safely dragged or carried from the vehicle to the launch point. Parking areas are often associated with these launches, but they are often smaller than motorized launches and may serve multiple recreational uses.

CAMPSITES AND CAMPGROUNDS

Campsites on department lands vary widely in their development level and in other facilities associated with them. The recreational use setting subclassification[28] of the property is the best indicator for the level of development of a campsite. Campsites on Type 1 recreational use setting lands, if present at all, are minimally developed and widely dispersed across the property. Few facilities are associated with these sites except for a box latrine and a fire ring. Conversely, campsites in a Type 4 recreational use setting are highly developed and have many facilities associated with them. Type 4 campsites are organized as campgrounds, typically with at least some of the sites having electric service. These campgrounds can have a range of facilities including paved access roads, parking areas, dumpster stations, vault or flush toilets, showers, picnic areas, shelters, and various administrative buildings. Types 2 and 3 recreational use setting campsites fall on a development spectrum between Types 1 and 4.

DRINKING WATER STATION

Drinking water stations are provided at many department properties. They may be pressurized systems or hand pumps depending on the recreation use setting of the property. Drinking water stations are not high capacity and have few impacts beyond use of small volumes of groundwater resources.

OBSERVATION DECK

Observation decks help the public enjoy the natural setting and provide viewing opportunities at key spots on department lands. These decks may be built in especially scenic areas, such as shorelines or on bluffs, or may be

[27] Ch. NR 1.91 Wis. Adm. Code

[28] Ch. NR 44.07 Wis. Adm. Code

built in ideal areas for viewing wildlife, such as a marsh. Observation decks are typically constructed out of treated wood or recycled plastic decking. Observation decks may have small parking areas, hiking trails, toilet facilities and small shelters associated with them.

OFF-HIGHWAY RECREATIONAL VEHICLE ROUTE

An off-highway recreational vehicle route is a road open to highway-licensed vehicles that is designated by the governmental agency having jurisdiction for use by ATV/UTVs or other off-highway recreational vehicles.[29] Routes must be properly signed. The department can designate routes on department roads. Several towns and counties have designated local roads that cross department properties as ATV/UTV routes.

PARKING AREA

Parking areas on department properties have a variety of development levels from grassy field parking to fully paved parking lots depending on the intended property use. Parking areas must be fairly level with a maximum slope of 5%.

PICNIC AREA

Picnic areas are defined in administrative code[30] as any tract of land developed and maintained for picnicking and containing not less than 5 picnic tables. Included in the definition of picnic area are adjacent playground and play field areas. These areas are generally grassy fields with dispersed trees and have few adverse environmental impacts.

ROADS

Department roads have four classifications: primitive road, lightly developed road, moderately developed road, and fully developed road.[31] Primitive road are minimally developed and have native or primitive materials for their surfacing. Fully-developed roads are smoothly graded and have a hard surface of asphalt, aggregate, or other paving material. Lightly and moderately developed roads have standards that fall between primitive and fully developed.

SHELTER – ENCLOSED AND NOT ENCLOSED

For the purposes of this document, an enclosed shelter refers to any fully enclosed building on department property not otherwise covered in this section. This may include park entrance and visitor services buildings, nature centers, and storage sheds.

---

[29] Wisconsin Department of Natural Resources. 2003. *ATV Route Guideline and Suggestions (A Community Official's Handbook).* Publ # LE-109 4/03

[30] Ch. NR 45.03(17) Wis. Adm. Code

[31] Ch. NR 44.07(3) Wis. Adm. Code,

SHOOTING RANGE

Shooting ranges are defined in administrative code as "a facility designated by the department that has target shooting with firearms, bows, or cross-bows as its major purpose."[32] The exact nature of the facilities will vary based on their use. In general, they include shooting platforms and targets and may also include toilet facilities, a shelter and drinking water. Trap houses may also be installed.

SIGNS

Design and placement of signs on department properties follows the guidance given in department's sign handbook. Sign systems for a property are designed to be appropriate for the area, provide relevant information and bring about visitor action. Signs conform to a uniform system so that procurement costs are reduced and visitors can more easily recognize common signs across department properties. Department guidance seeks to minimize adverse visual impacts while maximizing messaging effectiveness.

SWIMMING BEACH

Swimming beaches are designated sites composed of three elements: water which is marked for swimming, sand, and a grass sunning area. Beaches are ideally at least five feet deep with a wading area from shore edge to a depth of 2.5 feet. The bottom material of a department swimming beach typically is sand to a depth of five feet. Swimming beaches may also have parking areas, picnic areas, concession stands, drinking water, and toilet facilities associated with them.

TOILET FACILITIES

Toilet facilities on DNR properties may be flush, vault, or box latrine. The decision of which type of toilet facility is placed on a property is largely dependent on the recreational use setting designation of the property and the needs of the property. Only Type 4 recreational use setting properties may install flush toilets.

TRAILS

Department trails have four classifications: primitive trail, lightly developed trail, moderately developed trail, and fully developed trail.[33] Primitive trails are minimally developed and have native materials for their surfacing. Fully-developed trails are smoothly graded and have a hard surface of asphalt, aggregate or frozen earth. Lightly and moderately developed trails have standards that fall between primitive and fully developed.

TRAILHEAD

Trailheads are areas where property visitors can gather before using a trail facility and regroup after the activity. Depending on the trail activity type, classification, and level of popularity, trailheads can have a number of other

[32] Ch. NR 45 Wis. Adm. Code

[33] Ch. NR 44.07(3) Wis. Adm. Code

facilities associated with them. Parking areas, drinking water stations, toilet facilities, signs and picnic areas may all make up a trailhead.

APPENDIX C: GENERAL PROPERTY ADMINISTRATION AND MANAGEMENT POLICIES AND PROVISIONS

GENERAL PROPERTY MANAGEMENT PRACTICES

The following pages describe general property administration and management policies and provisions that apply to all DNR managed lands.

GENERAL ADMINISTRATION

All general property administration, resource management, and public use management on DNR lands will follow all applicable statutes, administrative codes, manual codes, and handbooks.

Management objectives and prescriptions for general property management, resource management, and public use management described in master plans will be implemented contingent upon the availability of staff and material resources, and may be modified as needed to respond to unpredictable or catastrophic events (e.g., storm damage, severe insect or disease infestations, new non-native invasive species, etc.).

FUNDING CONSTRAINTS

Implementation of a master plan is dependent upon staffing and funding allocations that are set by a process outside of the master plan. 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. Capital and operational funding for the Department is established by the state legislature. Funds also are provided by federal programs and occasionally from private sources. Development projects similarly 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 the rate at which a master plan will be implemented.

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

FACILITY MANAGEMENT

All infrastructure used for habitat management and public access shall be inspected and maintained as required in program guidance and manual codes. This infrastructure includes, but is not limited to, dikes, spillways, water control devices, roads, gates, parking lots, boat launches and buildings.

Dikes and water control structures are essential for controlling water levels in flowages and enhancing emergent marsh habitats. The following routine activities apply to the maintenance of dikes and water control structures:

- Conduct dike maintenance and approved water manipulation activities.
- Maintain dikes to secondarily provide pedestrian access for hunters and trappers.
- Control beaver and muskrat populations to mitigate burrowing and damming.
- Plan and implement major maintenance of dikes on approximately 20-year rotations.

The property manager may relocate or temporarily close road and trail segments or other public use facilities as deemed necessary to conduct timber harvests or other habitat management activities or for public safety or law enforcement reasons.

All facilities, roads, and structures providing either public recreation or supporting public recreation activities or other administrative services will be designed and constructed in compliance with state building codes and department design standards, including NR 44. The location and design of new structures, roads, or trails must also be consistent with the management objectives and land use classification for the area in which they are located. Significant remodeling or new construction projects will include LEED (Leadership in Energy & Environmental Design) standards for energy efficiency to the greatest extent possible.

INSPECTION OF DESIGNATED USE AREAS

All designated use areas must be inspected semi-annually (s. 23.115, Wis. Stats.). Vegetation inspections in designated use areas must be performed semi-annually with one of the inspections performed by a person trained in the identification of hazard trees. Monitoring will pay particular attention to forest infestations that pose a serious threat to forest resources such as red pine pocket decline, heterobasidiom root disease (formerly known as annosum root rot), oak wilt, pine bark beetles, gypsy moth, forest tent caterpillar, two-lined chestnut borer, and emerald ash borer. Control measures will be performed as needed.

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.

EMERGENCY ACTION PLAN

Each property maintains an emergency action plan on file that describes staff response and coordination with other agencies to natural disasters as they affect public safety and facilities. This plan is reviewed annually.

REFUSE MANAGEMENT

Refuse and recyclables are collected by a private contractor from designated sites at campgrounds and other primary use facilities. Visitors are required to carry out any refuse they bring when no designated refuse or recycling receptacles are available. Burying of refuse is not allowed anywhere on department properties.

RESEARCH

Department properties are diverse in character, located throughout the state and containing examples of all major habitats and landforms as well as many rare features. Many department properties, therefore, may offer strategic locations for experimental trials or research on a wide variety of topics or specific features. The research conducted by department managers, scientists, and educational partners can be beneficial for the properties, the department and the general public. Scientific research that is compatible with the ecological and aesthetic attributes of a property generally is supported. Property managers or supervisors have the authority to approve or deny requests for research projects on department properties. All research activities must be consistent with the land management classifications and management objectives of the area where the project will take place. A Scientific Collectors Permit or Research License Application is required for research involving collection of live fish, nests, or carcasses of wild animals or the taking and possessing of live wild animals from the wild. Additional permits are required for research activities on State Natural Areas and activities involving listed species.

PROPERTY ACCESS

Road Management and Motorized Public Access

Public access roads, service roads, permanent burn breaks, stocking lanes, dikes tops and other temporary roads (e.g., logging roads) are part of the transportation network for each property. Roads open to public vehicles along with their associated parking lots provide vehicle access for visitors to enjoy a variety of non-motorized recreational uses. Management roads provide access to DNR staff for habitat and forest management activities. Additionally, some roads also serve as snowmobile routes in winter

While management roads are not specifically designed or maintained as public use facilities, property visitors may walk, ski or snowshoe on them, unless posted closed to public access.

Federal highways, state highways and county/town roads bordering or passing through department properties are the management responsibility of these respective jurisdictions and are not covered by this road management plan.

All permanently maintained department-managed roads are shown on the appropriate property master plan maps. These maps also indicate each road's prescribed development level (NR 44 road classification) and which roads are open to public vehicle access (street-licensed vehicles).

All roads are closed to ATVs unless designated open for such use. Roads closed to public vehicles are gated, blocked, or signed. However, they are open to foot access for hunting, trapping, hiking and other general recreational uses. Most public-vehicle-access roads managed by the DNR are constructed and maintained to be accessible by all street-licensed vehicles. However, primitive roads may not be accessible by all vehicles. If open, high-clearance four-wheel-drive vehicles may be required.

Property managers may temporarily close a road to public use to conduct habitat management activities (e.g., prescribed burn, timber harvest) or for safety, environmental condition, or law enforcement reasons. In this case the road will be signed and may be gated or otherwise blocked. Property managers may open closed management roads to public vehicles for short-term, special events or activities (e.g., firewood cutting). Property managers also may develop or open temporary roads or access ways as needed to conduct short-term management activities such as timber harvest or invasive species treatment. These access ways shall be closed and appropriately abandoned when the management activity has been completed.

Property managers also are authorized to establish small (2-3 vehicle capacity), primitive, undesignated "pull-off" areas to provide parking at locations frequently used by the public where vehicle parking along a public roadway poses a safety hazard or conflict.

The following management objectives and prescriptions apply to department-managed roads.

Objectives

- Provide vehicle access to meet the management access needs of managers and the recreation access needs of the public in ways that are sustainable and compatible with the property's recreational use and resource management and protection objectives.
- Maintain roads at their designated road standard and in a sustainable condition while minimizing environmental impacts.

Prescriptions

- Maintain permanent roads to their designated NR 44 road classification development standard.
- Route, design, and construct permanent and temporary roads to minimize habitat fragmentation and impacts to endangered, threatened and special concern species.
- Develop a road inspection and maintenance schedule, maintaining all roads in a sustainable condition following Wisconsin's Forestry BMPs for Water Quality.
- Grade roads periodically, as appropriate to their development standard, to maintain proper surface drainage and stable road surfaces. Inspect active roads after heavy storm events. Clear debris as needed from road surfaces, culverts and ditches to decrease unsafe conditions and prevent road and vehicle damage.
- Close and restore temporary access roads to non-erosive conditions in accordance with Wisconsin's Forestry BMPs for Water Quality after the management activity for which they were established is completed.
- Collaborate with municipal, town, and county roadside maintenance crews to protect and enhance the quality of roadside easement areas, especially to control the spread of invasive species.

Disabled Accessibility

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

Property managers have the authority to make reasonable accommodations for people with disabilities, consistent with the requirements of an area's land use classification. Property managers also may allow the use of power-driven mobility devices with a DNR-issued permit, consistent with a March 15, 2011 U.S. Department of Justice ruling. Approval will depend on various factors including: the physical characteristics of the device; the volume of pedestrian traffic at the location; the design and operational characteristics of the site; safety considerations; and whether the proposed use creates substantial risk of serious harm to environmental, natural or cultural resources.

Closures

In the event of an emergency that may threaten public health and safety (e.g., wind storm, tornado, flood, or other safety hazards) or to protect the resource values of a property (e.g., erosion from over-use, trail damage during spring thaw, etc.), property managers are authorized, under NR 45.04(1)(b), Wis. Admin. Code, to temporarily close, by posted notice, any land, land improvement, facility or property owned or administered by the State of Wisconsin and under the management, supervision and control of the DNR, and to take corrective actions as necessary. This applies to department-managed roads but not to Town, County or State roads managed, supervised or controlled by other agencies.

RESOURCE MANAGEMENT

ENDANGERED, THREATENED AND SPECIAL CONCERN SPECIES PROTECTION

Per state and federal laws, all endangered, threatened, and special concern species will be protected. The Natural Heritage Inventory (NHI) Portal will be used to conduct an ER review prior to any management or development activity to ensure that any take associated with protected species is avoided or minimized. All applicable Broad Incidental Take Permits/Authorizations will be followed.

PROTECTION OF CULTURAL RESOURCES

All cultural sites (including both archaeological sites and historic structures) occurring on public lands are protected against unauthorized disturbance under provisions of various federal and/or state laws, and burial sites (including cemeteries and mound sites) are protected on private lands as well.

Any management activities having the potential to disturb archaeological sites will only be undertaken after consultation with the department archaeologist. Any sites with cultural or historical value identified on the department properties or acquired with future land purchases will be managed in accordance with department guidance and statutory requirements (see Wis. Stats. 44.40 and Manual Code 1810.1). Archaeological and other cultural resource investigations may be necessary before a project is approved, and projects should designate funds for required investigations as a component of the project budget.

Property managers shall prevent physical disturbance of archaeological features on properties. This includes controlling woody species invasion. Managers shall follow DNR guidelines outlined in "Burials, Earthworks, and Mounds Preservation Policy and Plan".

Cultural resources may be developed for scientific and educational purposes to the extent that the integrity of the resources is maintained.

TRIBAL CONSULTATION AND OFF-RESERVATION TREATY RIGHTS

Native American tribes are independent, sovereign nations, as they were prior to the arrival of Europeans in North America. The Ojibwe Tribes ceded lands in the northern one-third of Wisconsin (known as the Ceded Territory; see map below) to the United States Government in the Treaties of 1837 and 1842. In those treaties, they reserved their right to hunt, fish, and gather within various publicly-owned lands. In 1983, in what is commonly referred to as the *Voigt* case, the United States Court of Appeals for the Seventh Circuit affirmed the off-reservation hunting, fishing, and gathering rights that the six Ojibwe Tribes of Wisconsin have. Accordingly, members of the Ojibwe Tribes of Wisconsin may hunt, fish, and gather on public lands within the Ceded Territory. These treaty rights are currently being exercised and implemented.

The scope of and regulations regarding these rights are not part of property master plans. However, the exercising of treaty rights relates to resource management which *is* directly within the scope of property master plans. Regarding wild rice specifically, to the Ojibwe wild rice is "manoomin," the "food that grows on water", and has been a central component of Native American culture for hundreds of years. Consultation requirements exist that allow for government to government discussion via the Voigt Task Force prior to any actions that could affect wild rice abundance or habitat within the Ceded Territory. As provided in NR 44.04(7)(c), the department will make tribal governments aware of master planning activity that is located near or adjacent to their reservation/trust lands. For the Ojibwe Tribes, the department will notify the Great Lakes Indian Fish and Wildlife Commission of planning activity in the Ceded Territory.

COLLECTION OF WILD EDIBLES

Edible fruits and nuts, wild mushrooms, wild asparagus, and watercress may be removed from DNR properties by hand without a permit for the personal consumption of the collector.

FOREST PRODUCTS FOR PERSONAL USE

The cutting of willow branches and the collection of firewood for personal use at home is allowed on DNR properties with the permission of the property manager. A Forest Products Permit Form is required.

WATER QUALITY PROTECTION

Best management practices (BMP's) for agriculture (buffer strips along waterways, leaving crop residue on fields, plowing in spring instead of fall, contour plowing, etc.) greatly reduce sediment transport and turbidity problems that negatively affect water quality. Pre- and post-construction BMP's (seeding and mulching, silt fencing, straw bales, detention ponds, etc.) will be used on construction projects.

All forest management activities will comply with the most recent version of Wisconsin Forestry's BMPs for Water Quality, and with appropriate water regulation permitting requirements.

All applicable alterations to waterways, wetlands, or land-disturbing activities will comply with the applicable Wisconsin Administrative Code(s) or State Statute(s).

Maintenance of natural shorelines and a minimum 30-ft-wide associated buffer should be encouraged on state lands to protect water quality and maintain the aesthetic quality of water features for recreational boaters. Buffer strips on developed lots should be encouraged to intercept the runoff from lawns, which can carry excess nutrients, fertilizers, herbicides and pesticides directly to the water. Similarly, careful application of materials such as herbicides, which are used in land management, as well as their safe transport and storage, is important to prevent contamination of surface or groundwater.

The Impaired Waters and Total Maximum Daily Load (TMDL) Program is an important component of the federal Clean Water Act's (CWA) framework to restore and protect rivers, lakes and streams. The program is comprised primarily of a two-part process. First, waterways that are impaired or in danger of becoming impaired are identified and second, for these waters, a calculation for pollutant reduction levels is assigned to meet approved water quality standards.

Impaired waters in Wisconsin are largely addressed through an analysis known as a Total Maximum Daily Load (TMDL). A TMDL is the amount of a pollutant a waterbody can receive and still meet water quality standards. Many waterbodies in the state of Wisconsin are in the process of TMDL plan development or are in the pollutant reduction implementation phase.

Wisconsin has designated many of the state's highest quality waters as Outstanding Resource Waters (ORWs) or Exceptional Resource Waters (ERWs). Waters designated as ORW or ERW are surface waters which provide outstanding recreational opportunities, support valuable fisheries and wildlife habitat, have good water quality, and are not significantly impacted by human activities. ORW and ERW status identifies waters that the State of Wisconsin has determined warrant additional protection from the effects of pollution. ORWs receive the state's highest protection standards, with ERWs a close second. ORWs and ERWs share many of the same environmental and ecological characteristics. They differ in the types of discharges each receives, and the level of protection established for the waterway after it is designated.

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. Objective review is also instrumental in improving how the department cares for the land it manages.

FOREST INVENTORY AND MANAGEMENT PLANNING

The DNR uses a forest inventory system (Wisconsin Forest Inventory and Reporting System, or WisFIRS) to gather and record information about forested and non-forested areas on state-owned lands. "Forest reconnaissance" (often abbreviated as "recon") is a term used to describe the collective attributes of a forest stand. Examples of data collected by the forester include the species present, age, density, volume, height, diameter, ground cover, soil type, and the number of acres in a stand. The forester uses this information to determine an anticipated year in which a forest management treatment is needed. This information is computerized in a tabular format and linked to computerized maps. The data are available locally but the entire public land recon is maintained in a central database. Storing the recon database in a computerized format provides for the annual and long-term allowable harvest calculation and the associated stand harvest scheduling.

Wisconsin DNR lands use **area control** in the determination of sustainable timber harvest levels. Area control is a system whereby a certain number of acres, as opposed to volume, are identified each year for harvest consideration. Annual allowable timber harvest levels under area control determine the number of acres that can be harvested each year, on a sustained basis, without depleting the resource over time. These levels are calculated based on inventoried forest reconnaissance data collected by foresters, in combination with master planning considerations. A property's ecological, economic, and social constraints are considered in this determination. The forester uses this information to determine a predicted year of harvest for each stand of trees. The combination of these stands, and their associated treatments, represents the number of acres to be evaluated for harvest in a particular year. The annual allowable timber harvest is a long-term monitoring figure. Yearly fluctuations are common due to changing conditions created by storms, insect and disease infestations, changing timber markets, fires, or backlogged workload. The long-term allowable harvest acreage goal in the WisFIRS database is a more stable value that disperses highs and lows in the annual harvest schedule over the planning period, and is used to identify the annual allowable timber harvest goal for each property. DNR Forestry staff implement the sustainable harvest levels by conducting field exams to verify whether stands scheduled for management are ready for the prescription. If stands are not yet ready for management, WisFIRS is updated and the stands are rescheduled for future review. For stands that are ready for management, Forestry staff consult with staff in other DNR programs such as Natural Heritage Conservation, Fisheries, and Wildlife Management to ensure an integrated resource approach prior to implementing the proposed practice. When implementing the practice, silvicultural guidelines and BMPs for Water Quality and Invasive Species are followed.

FOREST PEST CONTROL

Wisconsin Statute 26.30 states, "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 relevant management plan, if such exists. Responses to significant infestations from pests (e.g., emerald ash borer) 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 Chief State Forester.

FIRE SUPPRESSION

As stated in Wisconsin Statute 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.

AUTHORIZED RESPONSE TO CATASTROPHIC EVENTS

Catastrophic events are rare, but allowances must be made to provide management flexibility when they occur. These events may include severe flooding, ice and wind storms, insect and disease infestations, wildfires, or other catastrophic occurrences that have major impacts on property natural resources and infrastructure. The immediate management responses to these events will follow existing department protocols.

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 Chief State Forester to prevent a catastrophic incident from spreading to adjacent forest lands.

The appropriate management responses to catastrophic events are determined on a case-by-case basis with consideration of the property's purpose, the objectives of the management area(s), and any authorized response outlined for the management area(s) in the plan. A master plan amendment to establish revised management objectives may be required if the event has altered the resource conditions to the point that the existing management objectives are no longer achievable or desirable.

PRESCRIBED FIRE

Prescribed fire is a management tool that mimics natural fire disturbance and helps control many woody plants and non-native invasives, improves the quality of wildlife habitat, reduces fuels to lessen wildfire hazard, and liberates nutrients tied up in dead plant material. It can help regenerate forest cover types such as oak, and create or maintain grassland/prairie and savanna/barrens habitat. Upland nesting cover used by pheasants, waterfowl, and songbirds is more productive if periodically burned. Some wetlands

also benefit from fire. Prescribed fire may be used as a management tool where feasible and safe and as prescribed in the master plan.

CONTROL OF INVASIVE SPECIES

Invasive non-native species are a major threat to the integrity of most of our native plant communities, and can significantly harm the ecological and recreational value of department lands. Invasive species include terrestrial, wetland, and aquatic plants, animals, and pathogens. In the absence of the competitors and predators that keep them in check in their native ranges, these species can invade natural habitats and proliferate, often dominating a community to the detriment and sometimes the exclusion of native species. In situations where invasive species become dominant, they may even alter ecological processes in a variety of ways. For example, buckthorn can limit or preclude the ability to apply prescribed fire; reed canary grass can alter hydrology by modifying surface water flow and clogging culverts; and non-native earthworms can inhibit tree regeneration. Some invasive species, such as emerald ash borer and the fungal and viral pathogens that cause white-nose syndrome, viral hemorrhagic septicemia (VHS), and sudden oak death, can kill native species outright in a very short amount of time.

Invasive species Best Management Practices (BMPs) have been developed for forestry, urban forestry, recreation, rights-of-way, and wetlands and aquatic systems, and should be incorporated into management practices on DNR properties. Some level of inventory, control, and monitoring should be conducted on an annual basis. Property-wide inspections are ideal, but not always practical. At minimum, inspections should be conducted at entry points and dispersal corridors such as parking areas, campgrounds, trails, roads, waterways, rights-of-way, and areas where soil has been disturbed. If detected, invasive species should be controlled using appropriate and effective methods, including but not limited to the use of bio-control, herbicides, mowing, cutting, smothering, hand removal, or fire. Control methods may be restricted in certain sensitive management areas. Managers should refer to any specific management prescriptions for the property or area being treated before initiating control measures. Control activities should be monitored to assess effectiveness and determine if follow-up is needed.

Chapter NR 40, Wisconsin Administrative Code, the invasive species rule, creates a comprehensive, science-based system with criteria to classify invasive species into two categories: "Prohibited" and "Restricted". This system is aimed at preventing new invasive species from getting to Wisconsin, and enabling quick action to control or eradicate those here but not yet established. Prohibited species must be reported and controlled wherever they are found. Anyone suspecting they have found a Prohibited species should send details to invasive.species@wisconsin.gov. Restricted species are those that are already too abundant or widespread for statewide control, although they may not yet be widespread at the local level. Therefore, prioritizing control of different species in different parts of the state is important. The department is creating a prioritization protocol that field staff will use to determine which invasive species and sites will be managed in different areas of the state.

The NR 40 rule limits the transportation, importation, and transfer of all regulated invasive species. In addition, it limits the possession of Prohibited species, thereby requiring control. It also includes preventive measures that are not species-specific but instead address common pathways that may allow invasives to spread. By following BMPs and other preventive measure, land managers and property users can minimize incidental spread of invasive species.

In addition to control of terrestrial invasives, preventing the movement, introduction, and spread of aquatic invasive species is also important to many department properties, where boating and fishing are popular. Policies and BMPs related to aquatic invasives include: cleaning and disinfecting boats and equipment before transport to another waterbody; prohibitions on transporting live fish or spawn away from waters; and rules governing transportation of bait species and surface water between waterbodies. These policies and BMPs, if followed by all lake and river users, will greatly slow the introduction and spread of undesirable aquatic species. As with terrestrial species, any Prohibited species must be reported and controlled. A permit must be obtained before initiating any vegetation control work in waters of the state or in wetlands.

CHEMICAL USE

Pesticides may be used for various purposes such as the control of invasive plants, controlling plant competition in vegetation regeneration areas, or insect control, except as restricted in the management prescriptions of a master plan. Pesticide use on DNR lands will follow all policies and procedures detailed in the Pesticide Use Manual Code (4230.1), which describes certification/licensing, training, approval, and reporting requirements for pesticide use.

NON-METALLIC MINING

The department may use gravel, sand, fill dirt, or other fill material from DNR-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.”

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 where they would impact geological or ecological features of significance or within any designated State Natural Area.

Department of Transportation (DOT) projects are exempt due to project reclamation requirements.

APPENDIX D: REAL ESTATE TABLES

Scattered Department Property Naming Summary Table for the Northern Lake Michigan Coastal Plan

Proposed Name	Existing Administrative Owner	Proposed Administrative Owner	Existing Acquisition Authority/Name	Acreage	Proposed Redesignation (if Changed)	County	Map Reference	Fee/Easement
Bailey's Harbor State Public Access	Fish	Fish	Statewide Public Access*	0.60		Door	AM-5	Easement
Barkhausen State Habitat Area	Fish	Fish	Statewide Habitat Areas*	45.89	Habitat Area	Brown	X-5	Easement
Bass Lake Marinette State Habitat Area	Fish	Fish	Statewide Habitat Areas*	39.14	Habitat Area	Marinette	Y-5	Easement
Bay RD State Public Access	Fish	Fish	Statewide Public Access*	0.69		Marinette	AS-5	Fee
Big and Little Marsh State Habitat Area	Other	Parks	Gift Lands	10.42	Habitat Area	Door	Z-5	Fee
Big Creek State Habitat Area	Fish	Fish	Statewide Habitat Areas	19.92	Habitat Area	Door	AA-5	Fee
Charles Pond State Natural Area	Wildlife	NHC	Green Bay West Shores Wildlife Area	46.22	Statewide Natural Area	Oconto	U-5	Fee
Copper Culture State Park	Fish	Parks	Statewide Public Access	21.40	Copper Culture State Park	Oconto	C-5	Fee
	Fish		Statewide Public Access*	3.60				Easement
County P Peshtigo River State Public Access	Fish	Fish	Statewide Public Access*	4.13		Marinette	AN-5	Fee
Cowyard Rips State Habitat Area	Fish	Fish	Statewide Habitat Areas	47.06	Habitat Area	Shawano	AB-5	Fee
	Fish		Statewide Habitat Areas*	0.04				Easement
Cox Landing State Public Access	Fish	Fish	Statewide Public Access*	1.10		Marinette	AC-5	Fee
Egg Harbor Cliffs State Habitat Area	Other	NHC	Gift Lands*	0.86	Habitat Area	Door	AD-5	Easement
George K. Pinney State Public Access	Fish	Fish	Statewide Public Access*	10.68		Door	AE-5	Fee
Green Bay West Shores Wildlife Area	Fish	Wildlife	Statewide Habitat Areas	85.27	Green Bay West Shores Wildlife Area	Marinette	AQ3-5	Fee
	Fish		Statewide Habitat Areas	47.64		Oconto	AQ4-5	Fee
	Other		Gift Lands	0.53		Marinette	AQ1-5	Fee
	Other		Gift Lands	2.82		Oconto	AQ2-5	Fee
Gresham Station	Other	Forestry	Gresham Station*	4.68		Shawano	No Map	Fee
Little River State Habitat Area	Fish	Fish	Statewide Public Access	10.11	Habitat Area	Marinette	AF-5	Fee
	Fish		Little River Rearing Pond	43.06				Fee
Little Suamico State Habitat Area	Fish	Fish	Statewide Habitat Areas	11.97	Habitat Area	Oconto	AG-5	Fee
Nicolet State Trail	Parks	Parks	Wiouwash State Trail	29.00	Nicolet State Trail	Shawano	AW-5	Fee
North Bay State Natural Area	Other	NHC	Gift Lands	2.50	Statewide Natural Area	Door	AH-5	Fee
Oconto Falls Ranger Station	Other	Forestry	Oconto Falls Ranger Station*	5.39		Oconto	No Map	Fee
Pensaukee River State Habitat Area	Fish	Fish	Statewide Public Access	15.34	Habitat Area	Oconto	AI-5	Fee
Pensaukee River State Public Access	Fish	Fish	Statewide Public Access*	1.21		Oconto	AJ-5	Fee
Rowleys Bay State Public Access	Fish	Fish	Statewide Public Access*	3.25		Door	AP-5	Fee
Seagull Bar State Natural Area	Wildlife	NHC	Seagull Bar Wildlife Area	90.00	Statewide Natural Area	Marinette	O-5	Fee
Strawberry Creek State Habitat Area	Fish	Fish	Statewide New Hatcheries	74.00	Habitat Area	Door	AK-5	Fee
Strawberry Creek State Hatchery	Fish	Fish	Statewide New Hatcheries*	6.00		Door	AK-5	Fee
Sturgeon Bay Service Center	Fish	Fish	Statewide Public Access	1.30	Sturgeon Bay Service Center	Door	AR-5	Fee
Suamico River State Habitat Area	Fish	Fish	Statewide Habitat Areas	10.88	Habitat Area	Brown	AL-5	Fee
Whitefish Dunes State Park	Wildlife	Parks	Scattered Forest Lands	0.50	Whitefish Dunes State Park	Door	Q-5	Fee

*No redesignation or redesignation will not affect Acreage Goal

Overview of Real Estate Recommendations for the Northern Lake Michigan Coastal Ecological Landscape

*These Changes are outlined in the Draft Master Plan, on the Real Estate Action Items Maps

Property Name(Acquisition Authority)	Fee Title Acres (Statewide)	Easement Acres(Statewid	Existing Project Boundary (Acre	Proposed Project Boundary (Acres	Changes in Project Boundary(Acres)	Existing Acquisition Goal (Acres)	Proposed Acquisition Goal (Acres)	Changes in Acquisition Goal (Acres)	Percent Complete	Parcel Redesignations	Proposed Land Sale (Acres)
BAILEYS HARBOR BOREAL FOREST & WETLANDS - JONATHON ELA UNIT	189.99	0.00	206.11	206.11	0.00	189.99	189.99	0.00	100%	0.00	0.00
BAILEYS HARBOR BOREAL FOREST AND WETLANDS STATE NATURAL AREA	263.41	28.63	1019.13	1019.13	0.00	742.71	742.71	0.00	35%	0.00	0.00
COPPER CULTURE MOUNDS STATE PARK	42.30	0.00	47.61	71.22	23.61	42.30	63.70	21.40	100%	21.40	0.00
GARDNER SWAMP WILDLIFE AREA	1180.58	0.00	1222.47	1262.59	40.12	1169.16	1262.00	92.84	101%	0.00	0.00
GRAND TRAVERSE ISLAND STATE PARK	26.67	0.00	936.40	936.40	0.00	1080.39	1080.39	0.00	2%	0.00	0.00
GREEN BAY WEST SHORES WILDLIFE AREA	9782.00	27.10	19014.19	19095.92	81.73	15715.00	15805.04	90.04	62%	90.04	0.00
GRESHAM STATION	4.68	0.00	NA	NA	NA	0.00	0.00	0.00	0%	0.00	0.00
HEINS CREEK FISHERY AREA	0.00	0.00	48.39	48.39	0.00	9.20	25.75	16.55	0%	0.00	0.00
LAKE NOQUEBAY WILDLIFE AREA	1300.39	0.00	1249.23	1249.23	0.00	1300.39	1300.39	0.00	100%	0.00	0.00
LITTLE RIVER REARING POND	43.06	0.00	NA	NA	NA	40.00	0.00*	-43.06	108%	-43.06	0.00
MENOMONIE RIVER PUBLIC ACCESS	0.00	1.37	NA	NA	NA	1.37	1.37	0.00	0%	0.00	0.00
MONTANA LAKE FISHERY AREA	105.73	0.00	98.46	98.46	0.00	105.73	105.73	0.00	100%	0.00	0.00
MUD LAKE WILDLIFE AREA-DOOR	2283.19	82.21	2754.59	2862.48	107.89	2690.00	2811.00	121.00	85%	121.00	0.00
NEWPORT STATE PARK	2372.78	0.21	2461.95	2461.95	0.00	2390.60	2390.60	0.00	99%	0.00	0.00
NICOLET STATE TRAIL	1299.57	0.00	1285.48	1285.48	0.00	539.40	568.40	29.00	241%	29.00	0.00
NORTH BRANCH BEAVER CREEK FISHERY AREA	1159.90	12.09	2065.04	2116.07	51.03	1699.99	1699.99	0.00	68%	0.00	0.00
OCONTO FALLS RANGER STATION	5.39	0.00	NA	NA	NA	1.03	5.39	4.36	523%	0.00	0.00
PENINSULA STATE PARK	3827.52	0.00	3644.23	3679.59	35.36	3785.34	3785.34	0.00	101%	0.00	0.00
POTAWATOMI STATE PARK	1141.64	78.86	1207.94	1207.94	0.00	1259.00	1259.00	0.00	91%	0.00	0.00
REIBOLTS CREEK PUBLIC ACCESS	121.00	0.00	NA	NA	NA	121.00	0.00	-121.00	100%	-121.00	0.00
ROCK ISLAND STATE PARK	912.23	0.00	975.60	981.56	5.96	912.47	918.43	5.96	100%	0.00	0.00
SEAGULL BAR WILDLIFE AREA	90.00	0.00	111.20	111.20	0.00	90.00	0.00	-90.00	100%	-90.00	0.00
SISTER ISLANDS HABITAT PRESV	1.94	0.00	NA	NA	NA	1.94	1.94	0.00	100%	0.00	0.00
STURGEON BAY SERVICE CENTER	0.00	0.00	NA	NA	NA	0.00	1.30	1.30	0%	1.30	0.00
STONY CREEK FISHERY AREA	0.00	0.00	158.05	137.54	-20.51	33.00	33.00	0.00	0%	0.00	0.00
WHITEFISH DUNES STATE PARK	863.78	0.10	981.42	1024.50	43.08	901.00	901.50	0.50	96%	0.50	0.00
WIOUWASH STATE TRAIL	280.42	3.03	432.13	432.13	0.00	1000.00	971.00	-29.00	28%	-29.00	0.00
GIFT LANDS	1983.21	521.39	NA	NA	NA	4500.00	4483.73	-16.27	44%	-16.27	12.92
NATURAL AREA - DEDICATION	0.00	12725.74	NA	NA	NA	0.00	0.00	0.00	0%	0.00	0.00
SCATTERED FOREST LANDS	6245.60	22.53	NA	NA	NA	5352.61	5352.11	-0.50	117%	-0.50	0.00
STATEWIDE HABITAT AREAS	7197.01	839.08	NA	NA	NA	10172.61	9949.87	-222.74	71%	-222.74	0.00
STATEWIDE NATURAL AREA	29393.52	5911.54	NA	NA	NA	41000.00	41110.50	110.50	72%	138.72	0.00
EUROPE BAY WOODS STATE NATURAL AREA (SNA Project Boundary)	NA	NA	622.09	429.37	-192.72	NA	NA	NA	NA	0.00	0.00
STATEWIDE NEW HATCHERIES	473.76	2.35	NA	NA	NA	318.73	244.73	-74.00	149%	-74.00	0.00
STATEWIDE PUBLIC ACCESS	1218.43	38.18	NA	NA	NA	838.65	790.50	-48.15	145%	-48.15	0.00
HABITAT AREA	0.00	0.00	NA	NA	NA	0.00	242.25	242.25	0%	242.76	0.00
										0	

*The acquisiton goal will first be increased by 3.06 acres to match what is currently owned; 43.06 acres. Once equaled to what is owned, the acquisition goal will be transferred to Habitat Area leaving Little River Rearing Pond's acquisition goal at 0.00 acres.