Regional & Property Analysis:

Columbia County Planning Group

Wildlife Areas

- French Creek
- Lodi Marsh
- Mud Lake
- Paradise Marsh
- Peter Helland
- Pine Island
- Swan Lake

Fishery Areas

- Rocky Run
- Rowan Creek

State Natural Areas

- French Creek Fen
- Lodi Marsh
- Empire Prairies
- Springvale Wet Meadow
- Pine Island Savanna
- Rocky Run Oak Savanna

July 2011 _Final Version
Wisconsin Department of Natural Resources
Publication # 059

Table of Contents

INTRODUCTION AND OVERVIEW **1**

Purpose of Regional and Property Analysis *1*
Introduction to the Properties *1*
Overview of the Columbia County Planning Group *2*

ANALYSIS OF THE REGIONAL CONTEXT **3**

BIOLOGICAL RESOURCES AND ECOLOGICAL CAPABILITY 3
Defining the Region *3*
Central Sand Hills Ecological Landscape (EL) *3*
Water Resources *3*
VegetationTrends *4*
Species of Greatest Conservation Need *4*
Natural Community Management Opportunities *5*
LAND USE AND SOCIO-ECONOMIC CHARACTERISTICS 7
Defining the Region *7*
Population *7*
Land Use and Ownership *7*
Economic Issues *8*
RECREATION RESOURCES, USE AND DEMAND 9
Defining the Region *9*
Hunting and Trapping *9*
Fishing and Water-based Activities *10*
Wildlife Viewing and Outdoor Education *10*
Camping *10*
Trails *10*

ANALYSIS OF THE PROPERTIES **12**

COLUMBIA COUNTY PLANNING GROUP PROPERTIES 12
GENERAL PROPERTY GROUPING CHARACTERISTICS 13
Vegetation and Natural Communities and Habitats *13*
Wildlife Resources *15*
Threatened, Endangered, and Special Concern Species *15*
Sites of High Conservation Significance – Primary Sites *19*
Priority Conservation Actions *19*
Wisconsin Wildlife Action Plan Conservation Opportunity Areas *20*
Opportunities and Considerations for Biodiversity Conservation *20*
Threats to Biodiversity Conservation on the CCPG *21*
Social/Cultural Resources *23*
PROPERTY DESCRIPTIONS: RESOURCES, HISTORY & USE 23
French Creek State Wildlife Area *24*
Lodi Marsh Wildlife Area *27*
Mud Lake Wildlife Area *30*
Paradise Marsh Wildlife Area *33*
Peter Helland Wildlife Area *35*
Pine Island Wildlife Area *35*
Swan Lake Wildlife Area *41*
Rocky Run Fishery Area *44*
Rowan Creek Fishery Area *47*

FINDINGS AND CONCLUSIONS **49**

ECOLOGICAL SIGNIFICANCE AND CAPABILITY 49
RECREATIONAL SIGNIFICANCE AND CAPABILITY 51
SUMMARY 53
LITERATURE OR SOURCES CITED *54*

Appendix A Maps, Table and Figures

Map A: Regional Locator and Public Lands

Map B: Columbia County Properties

Cover Type Maps
C-1 French Creek Wildlife Area Land Cover Type
C-2 Lodi Marsh Wildlife Area Land Cover Type
C-3 Mud Lake State Wildlife Area Land Cover Type
C-4 Paradise Marsh Wildlife Area Land Cover Type
C-5 Peter Helland Wildlife Area Land Cover Type
C-6 Pine Island Wildlife Area Land Cover Type
C-7 Swan Lake Wildlife Area Land Cover Type
C-8 Rocky Run Fishery Area Land Cover Type
C-9 a Rowan Creek - West and Hinkson Creek FA Land Cover Type
C-9 b Rowan Creek Fishery Area – East Land Cover Type

Infrastructure Maps
D-1 French Creek Wildlife Area Infrastructure
D-2 Lodi Marsh Wildlife Area Infrastructure
D-3 Mud Lake State Wildlife Area Infrastructure
D-4 Paradise Marsh Wildlife Area Infrastructure
D-5 Peter Helland Wildlife Area Infrastructure
D-6 Pine Island Wildlife Area Infrastructure
D-7 Swan Lake Wildlife Area Infrastructure
D-8 Rocky Run Fishery Area Infrastructure
D-9 a Rowan Creek Fishery Area – West and Hinkson Creek FA Infrastructure
D-9 b Rowan Creek Fishery Area – East Infrastructure

State Natural Areas, Primary Sites and Closed/Refuge Area Maps
E-1 French Creek Fen State Natural Area
E-2 Lodi Marsh State Natural Area
E-3 Empire Prairie State Natural Area - Mud Lake State Wildlife Area
E-4 Springvale Wet Meadow State Natural Area - Peter Helland Wildlife Area
E-5 Pine Island Savanna State Natural Area
E-6 Rocky Run Oak Savanna State Natural Area

Property Boundary Maps
F-1 French Creek Wildlife Area
F-2 Lodi Marsh Wildlife Area
F-3 Mud Lake State Wildlife Area
F-4 Paradise Marsh Wildlife Area
F-5 Peter Helland Wildlife Area
F-6 Pine Island Wildlife Area
F-7 Swan Lake Wildlife Area

F-8 Rocky Run Fishery Area
F-9 Rowan Creek Fishery Area and Hinkson Creek Fishery Area

Columbia County Properties Arch/Historical Maps
ARCH – 1 Mud Lake Wildlife Area
ARCH – 2 Pine Island Wildlife Area
ARCH – 3 Swan Lake Wildlife Area
ARCH – 4 Rocky Run Fishery Area
ARCH – 5 Rowan Creek Fishery Area

List of Tables

Table 1 Species of Greatest Conservation Need in the CCPG and Central Sand Hills EL 5
Table 2 Central Sand Hills Ecological Landscape Opportunities on the CCPG 6
Table 3 High Demand Recreational Activities in the Southern Gateways Region 9
Table **4** Trail Opportunities in Columbia County and Surrounding Counties 11
Table 5 Planning Group Properties 12
Table 6 Documented Rare Plant Species for the CCPG 15
Table 7 Documented Rare Animal Species for the CCPG 16
Table 8 French Creek Wildlife Area Cover Types 25
Table 9 Lodi Marsh Wildlife Area Cover Types 27
Table 10 Mud Lake Wildlife Area Cover Types 30
Table 11 Paradise Marsh Wildlife Area Cover Types 33
Table 12 Peter Helland Wildlife Area Cover Types 35
Table 13 Pine Island Wildlife Area Cover Types 38
Table 14 Swan Lake Wildlife Area Cover Types 41
Table 15 Rocky Run Creek Fishery Area Cover Types 45
Table 16 Rowan Creek Fishery Area Cover Types 47

List of Figures

Figure 1 Central Sand Hills Ecological Landscape Region 3
Figure 2 Process for identifying Ecological Priorities in the Wisconsin Wildlife Action Plan 19

Introduction and Overview

Purpose of Regional and Property Analysis

A regional and property analysis (RPA) is required by Chapter NR 44, Wisconsin Administrative Code, when developing a master plan, plan revision, or plan amendment. The RPA is the foundation of the master plan, providing the baseline information for these properties as well as information on how these properties fit into or relates to their larger ecological and social context. Functionally, it identifies the characteristics of these properties and highlights those elements in a regional context that are most important to consider when planning the properties.

Regional Analysis

The Regional Analysis component of this document describes the broader biological/ecological, cultural, economic, and recreational environment that affects the Columbia County Planning Group properties and their uses. It identifies significant ecological and recreational needs within the planning group region. It also describes existing and potential social demands or constraints that affect these properties and should be considered during the planning process.

Property Analysis

The Property Analysis component of this document describes the existing resources, uses, management opportunities, limitations, and needs on these properties. This section also describes surrounding and adjacent lands, indicating how the character of these lands may affect these properties or their uses.

Findings and Conclusions

The Findings and Conclusions component is the most important section of the RPA. Based on all the regional and property data in the body of the document, the Findings and Conclusions section outlines the best probable future role or niche for these properties. It helps focus the planning process and becomes the foundation for building the plan's vision and goals, and action strategies.

Introduction to the Properties

The planning group properties include seven state wildlife areas and two state fisheries areas. Five state natural areas have been designated within the boundaries of the wildlife areas and one has been designated within the boundary of a fisheries area. The scope of use and management of a state property is governed by its official designation.

Wildlife and Fishery Areas

Wildlife and Fishery Areas are acquired and managed under the authority of Sec. 23.09(2)(d)3 Wis. Statutes and Administrative Code NR 1.51. Wildlife and Fishery Areas are designated to provide places where people can hunt, trap or fish. Wildlife and Fishery Areas are also open for traditional outdoor uses of walking, cross country skiing, snow shoeing, nature study, berry picking and nature enjoyment. As directed by NR 1.51 and NR 1.61, other recreational uses may be allowed by the Master Plan if those uses do not detract from the primary purpose of these properties.

State Natural Areas

Natural Areas are defined and authorized in State Statute 23.27-23.29 and Administrative Code NR 1.32 as "an area of land or water which has educational or scientific value or is important as a reservoir of the state's genetic or biological diversity and includes any buffer area necessary to protect the area's natural value". Section 23.27(1) defines natural areas as "reserves for native biotic communities...habitat[s] for endangered, threatened, or critical species...or areas with highly significant geological or archaeological features". Section 23.28(1) provides authority to designate areas as State Natural Areas and Section 23.29 provides authority to legally dedicate and protect these areas in perpetuity.

The intent of the Natural Areas program is to preserve the best examples of the state's diverse natural communities, but other recreational uses may be allowed if they do not threaten those natural values.

Overview of the Columbia County Planning Group

Collectively, the Columbia County Planning Group described in this Regional Property Analysis includes nine properties that comprise 21,949 acres of state protected and managed land: 20,551 acres in State Wildlife Area and 1,398 acres of Fishery Area (**Map A**). A total of 2,390 acres of this land has been designated as State Natural Area. These properties are located primarily in Columbia County and will be referred to as the Columbia County Planning Group (CCPG).

The planning group includes the following Wildlife Areas, Fishery Areas and State Natural Areas (SNAs):

- French Creek Wildlife Area (French Creek Fen State Natural Area)
- Lodi Marsh Wildlife Area (Lodi Marsh State Natural Area)
- Mud Lake Wildlife Area (Empire Prairies State Natural Area)
- Paradise Marsh Wildlife Area
- Peter Helland Wildlife Area (Springvale State Natural Area)
- Pine Island Wildlife Area (Pine Island Savanna State Natural Area)
- Swan Lake Wildlife Area
- Rocky Run Fishery Area (Rocky Run Oak Savanna State Natural Area)
- Rowan Creek Fishery Area

Property	Acreage	SNAs	Acreage
Wildlife Areas			
French Creek	3,570	French Creek Fen	196
Lodi Marsh	1,275	Lodi Marsh	545
Mud Lake	2,350	Empire Prairies	139
Paradise Marsh	1,588	--	
Peter Helland	3,586	Springvale Wet Meadow	271
Pine Island	5,848	Pine Island Savanna	798
Swan Lake	2,334	--	
Fishery Areas			
Rocky Run	743	Rocky Run Oak Savanna	441
Rowan Creek	655	--	

Analysis of the Regional Context

BIOLOGICAL RESOURCES AND ECOLOGICAL CAPABILITY

Defining the Region

Ecological characteristics of the CCPG are defined using the Ecological Landscape (EL) classification system. This system divides the state into 16 ecologically similar regions based on soils, existing and pre-European settlement vegetation, topography, and types of aquatic features present. The CCPG properties lie within the Central Sand Hills Ecological Landscape except for Paradise Marsh Wildlife Area that is located in the Southeast Glacial Plains Ecological Landscape (WDNR ELOCA a. and b.). The ecological characteristics of the Southeast Glacial Plains are discussed specifically in the Paradise Marsh property analysis.

Background information on the region is largely reproduced from the *Ecological Landscapes of Wisconsin Handbook* (WDNR in Prep.). This Handbook was developed by the WDNR Ecosystem Management Planning Team (EMPT) and identifies the best areas of the state to manage for natural communities, key habitats, aquatic features, native plants, and native animals from an ecological perspective.

Central Sand Hills Ecological Landscape

Figure 1 Central Sand Hills Ecological Landscape

The Central Sand Hills Ecological Landscape is located in central Wisconsin at the eastern edge of what was once Glacial Lake Wisconsin (Figure 1). The landforms in this Ecological Landscape are a series of glacial moraines that were later partially covered by glacial outwash.

The area is characterized by a mixture of farmland, woodlots, wetlands, small kettle lakes, and cold water streams, all on sandy soils. The mosaic of glacial moraine and pitted outwash throughout this Ecological Landscape has given rise to extensive wetlands in the outwash areas, and the headwaters of coldwater streams that originate in glacial moraines. The growing season is long enough for agriculture, but the sandy soils somewhat limit agricultural productivity.

The total land area for the Central Sand Hills Ecological Landscape is approximately 1.4 million acres, of which 28% is classified as timberland. Only about 4% of the Ecological Landscape is in public ownership. Although soils are predominantly dry and sandy, the Central Sand Hills Counties are primarily agricultural. Agriculture is successful in this sandy area with use of irrigation; but there also is a considerable amount of marginal and idle agricultural land. There is one State Park (Hartman Creek) in the Ecological Landscape, as well as 26 State Natural Areas, and 24 State Fishery and State Wildlife Areas. Federal lands include: Fox River National Wildlife Refuge, Waterfowl Production Areas of the Leopold Wetland Management District including the Lower Baraboo River Waterfowl Production Area, as well as several segments of the Ice Age Trail.

Water Resources

There are numerous small kettle lakes and ponds associated with the glacial outwash in the Central Sand Hills. There are many softwater lakes with sand bottoms that have been or are being developed for recreational uses. Green Lake is found here and is the deepest natural lake in the state. Large, shallow impoundments include Lake Wisconsin on the Wisconsin River and Buffalo Lake and Lake Puckaway on the Fox River. Important rivers are a segment of the Wisconsin River, the lower Baraboo River, and the upper Fox River. Water quality in free-flowing rivers and streams is generally good. Water quality in these streams is enhanced by spring flows, the absence of point source discharges,

and either minimal agricultural activity or well-maintained stream buffers. Urban non-point runoff, sedimentation, excess nutrients, and heavy recreational boating use impact lake water quality and habitat.

The water resources in Columbia County include fifty-six lakes, totaling 11,982 acres, 75 miles of trout streams, and 35 miles of the Wisconsin River. Lake Wisconsin, an impoundment of the Wisconsin River, is the largest water body at 9,000 acres, and is a very popular destination for fishing and recreational boating. The Wisconsin, Fox, Baraboo, and Crawfish Rivers flow through the County. It also includes many other streams, springs, and ponds enhancing Columbia County's water resources.

Vegetation Trends

Historic upland vegetation consisted of oak forest, oak savanna, and tall grass prairie. Fens were common in this Central Sand Hills Ecological Landscape and occurred along with Wet-mesic Prairie, Wet Prairie, and rare Coastal Plain Marshes. Current vegetation is composed of more than one-third agricultural crops, and almost 20% grasslands with smaller amounts of open wetland, open water, shrubs, barren, and urban areas. The major forested type is oak-hickory, with smaller amounts of white-red-jack pine, maple-basswood, lowland hardwoods, aspen-birch and spruce-fir. A remnant black spruce community is a component of the wetland complex in the northwestern corner of Columbia County - Corning-Weeding Lakes. This is one of the southernmost locations for black spruce in the Upper Midwest.

In the Central Sand Hills, almost all of the prairie and oak savanna and some of the sedge meadow have been converted to agricultural uses. In some areas tamarack swamps were drained and the lands used for muck farming. Farming occurs on about 33% of all land in this Landscape. Widespread agriculture has created a matrix of farm fields, with small, scattered patches of forest and wetland. This benefits common and widely distributed species such as white-tailed deer and Wild Turkey, but does not provide habitat for rare area-sensitive grassland or forest interior species.

Fire, the dynamic force responsible for shaping and maintaining much of the forest, savanna, prairie, and some wetland vegetation, has been all but eliminated from the present ecological landscape. Dams, dikes, ditches, and groundwater withdrawals have altered the abundance, composition, and structure of many wetland communities, as well as the hydrologic regimes that supported them. Grazing, along with increased sediment and nutrient loads, has reduced or eliminated many native herbs and favored the dominance and spread of invasive species such as reed canary grass.

The amount of forest and other communities dominated by trees has decreased significantly. Savannas are now virtually absent, though restoration is feasible in some areas. The losses are due to agricultural conversion, residential development, and in the case of savannas, vegetative succession in the absence of periodic fire. Over time, the nature of the forests will also change, as the fire-adapted oaks are replaced by species such as white pine or red maple. In areas with abundant buckthorn, there may be little tree regeneration. A portion of prairies, savannas, woodlands, and marginal agricultural lands have been planted to red pine monotypes.

Species of Greatest Conservation Need

Many native wildlife species in the state, for various reasons, have low or declining populations. These species are known as Species of Greatest Conservation Need (SGCN) and have been identified in the *Wisconsin Wildlife Action Plan* (WDNR 2006b). These are the species that are most at risk of no longer being a viable part of Wisconsin's fauna and are in need of management and protection to prevent them from becoming endangered or threatened. While some of these species are officially listed as threatened or endangered by the state of Wisconsin, many of them are not.

Numerous SGCN are associated with natural community types present on the CCPG. **Table 1** lists the SGCN associated with the Central Sand Hills Ecological Landscape, with those species that have been documented on the CCPG indicated in bold font. The other species listed have the potential to occur at the CCPG due to their association with the landscape, but have not been documented there (WDNR 2010b). See the *Wisconsin Wildlife Action Plan* (WDNR 2006b) for more information on Species of Greatest Conservation Need and their habitats. Appendix B of the

Rapid Ecological Assessment for the Columbia County Planning Group (June 2010, Second Version) lists the wildlife SGCN that may benefit from management within the CCPG and their association with natural community types.

Table 1 Species in Greatest Conservation Need in the CCPG and Central Sand Hills Ecological Landscape (species in bold have been documented on the CCPG)		
Species that are Significantly Associated with the Landscape and CCPG		
Acadian Flycatcher	**Eastern Meadowlark**	**Red-headed Woodpecker**
American Bittern	**Field Sparrow**	**Red-Shouldered Hawk**
American Woodcock	Forster's Tern	Shoal Chub (Speckled Chub)
Bald Eagle	Franklin'S Ground Squirrel	Short-billed Dowitcher
Black Buffalo	**Grasshopper Sparrow**	**Veery**
Black Tern	**Henslow's Sparrow**	**Vesper Sparrow**
Black-billed Cuckoo	Lake Sturgeon	Western Meadowlark
Blanding's Turtle	Least Darter	Western Sand Darter
Blue-winged Teal	**Least Flycatcher**	**Western Slender Glass Lizard**
Blue-winged Warbler	**Midland Smooth Softshell Turtle**	**Whip-poor-will**
Bobolink	**Northern Bobwhite**	Whooping Crane
Brown Thrasher	**Northern Harrier**	**Willow Flycatcher**
Cerulean Warbler	**Ornate Box Turtle**	**Wood Thrush**
Dickcissel	Paddlefish	**Yellow-billed Cuckoo**
Species that are Moderately Associated with the Landscape and CCPG		
American Golden Plover	Hudsonian Godwit	Short-eared Owl
Banded Killifish	Lark Sparrow	**Silver-haired Bat**
Bullsnake	Northern Goshawk	Solitary Sandpiper
Dunlin	Northern Long-eared Bat	Upland Sandpiper
Eastern Red Bat	**Osprey**	Water Shrew
Four-toed Salamander	**Pickerel Frog**	Yellow Rail
Gray Wolf	Prairie Vole	Yellow-bellied Racer
Hoary Bat	Red Crossbill	
Source: WDNR 2010b		

Natural Community Management Opportunities

Management needs and opportunities for any ecological landscape are often described in terms of “natural communities”. They are assemblages of native plants and animals that consistently occur together under similar conditions. The Ecosystem Management Handbook describes the best opportunities for sustaining certain natural communities by ecological landscape. “Sustaining natural communities” means ensuring that a given natural community type will be present and has high potential to maintain its characteristic composition, structure, and ecological function over a long period of time (e.g. 100 years).

General ecological management opportunities exist in the Central Sand Hills Landscape as follows:

- Fire-adapted ecosystems, such as Oak Savanna, constitute a major management opportunity in the Central Sand Hills.
- The globally rare Coastal Plain Marsh community supports numerous rare species and is better represented here than in any Wisconsin Landscape.

- The concentration of springs, coldwater streams, and associated wetlands is highly significant.
- Alkaline wetlands, such as fens, sedge meadows, and tamarack swamps, are well represented and harbor many sensitive plant and animal species.
- Large rivers and their floodplains offer unique management opportunities.
- Bedrock communities such as glades, talus slopes, and cliffs may harbor rare species and should be thoroughly surveyed.
- Miscellaneous opportunities include scattered forests, savannas, prairies, wetlands, native grasslands, and populations of rare species.

A detailed listing of the major and important opportunities for sustaining specific natural communities within the Central Sand Hills is provided in **Table 2**. The bolded community types are present on the CCPG properties.

- A major opportunity (for Natural Community Management) exists when a community type is represented by many significant occurrences within an Ecological Landscape, or the Ecological Landscape is appropriate for major restoration activities.

- An important opportunity means that a community type is not extensive or common in an ecological landscape, but has a minimum of one to several significant intact occurrences that should be considered for preservation and/or management. Or, it means that the natural community type is restricted to just one or a few ecological landscapes within the state and should be considered for management there because of limited geographic distribution and a lack of better opportunities elsewhere.

The table below describes opportunities for the Central Sand Hills Ecological Landscape. Two natural community types from the Southeast Glacial Plains Ecological Landscape that present important ecological landscape opportunities include Emergent Marsh - Wild Rice and Submergent Marsh.

Table 2 Central Sand Hills Ecological Landscape Opportunities on the CCPG
(Community Types in bold have been documented on the CCPG)

Major Opportunities		
Calcareous Fen	**Impoundments/Reservoirs**	**Southern Sedge Meadow**
Central Sands Pine-Oak Forest	Inland Lakes	Submergent Marsh
Coastal Plain Marsh	Northern Wet Forest	**Warmwater Rivers**
Coldwater Streams	**Shrub Carr**	**Wet-mesic Prairie**
Emergent Marsh	Southern Dry Forest	
Important Opportunities		
Alder Thicket	Moist Cliff	**Southern Dry-mesic Forest**
Bedrock Glade	Northern Hardwood Swamp	**Southern Tamarack Swamp (rich)**
Bog Relict	Northern Sedge Meadow	**Surrogate Grasslands**
Coolwater Streams	**Oak Barrens**	**Warmwater Streams**
Dry Prairie	Open Bog	**Wet Prairie**
Floodplain Forest	Pine Barrens	
Inland Beach	**Sand Prairie**	
Source: http://dnr.wi.gov/landscapes/index.asp?mode=detail&Landscape=10&Section=opportunity		

LAND USE AND SOCIO-ECONOMIC CHARACTERISTICS

Defining the Region

The properties in this planning group are located primarily in Columbia County, with portions of three wildlife areas located in the border counties of Dane, Sauk, and Marquette Counties. Since nearly all population, economic, and land use information that is currently available is organized and presented by county, the "region" for this part of the analysis will focus on Columbia County *Regional Profile: Region 9* (Winkler, 2010). When necessary, the "region" will be expanded to a nine county area to best describe certain socio-economic characteristics. The other regional counties include: Dane, Dodge Green, Iowa, Jefferson, Lafayette, Rock and Sauk Counties

The region surrounding the CCPG has an excellent network of roads, including Interstate Highways 90/94 and 39, which connects the region to the major metro areas of the Midwest (Twin Cities, Madison, Milwaukee, and Chicago). Several major state highways bisect the region and connect it to many small and mid-sized urban areas. Nearly all state, county and local roads are paved.

Population

The population living in the nine county region (including Columbia, Dane, Dodge, Green, Iowa, Jefferson, Lafayette, Rock, and Sauk Counties) surrounding the CCPG has been growing over the last several years. Between 2000 and 2005, the region grew 5.7%. Between 2005 and 2008, the population grew by another 2.5%. Overall, the region added an estimated 76,487 people between 2000 and 2008, growing faster in recent years than the state of Wisconsin overall.

The City of Madison (population 218,915), the second largest city in the State, is by far the largest population center within the region, and lies within a 45 minute drive to the south of the CCPG. Other major population centers in the region include the cities of Beaver Dam (population 15,169), Baraboo (population 10,711), Columbus (population 4,479) and Portage (population 9,728).

The population of Columbia County is projected to grow by 21% over the 30 years between 2000 and 2030, from 52,468 to 63,510 residents (Columbia County LWCD 2006). This population increase is anticipated to come largely from migration from the rapidly growing Dane County and the City of Madison.

In 2008, the Census Bureau estimated the median age in Columbia County to be 40.0 years of age, slightly higher than the statewide median of 37.9 years of age. Residents under 18 years of age make up 22.6% of Columbia County's population compared to a statewide average of 24.5%. Those of retirement age (65 and over) make up 14.4% of the county's population compared to a statewide average of 13.2%.

Land Use and Ownership

Columbia County has a total land area of almost 774 square miles (~495,300 acres) containing a diverse mix of agricultural land, forests, and wetlands, The predominant land use is agriculture, encompassing about 296,000 acres and representing 60% of the total area (Columbia County LWCD 2006). Field crops (especially corn, soybeans and hay), dairy, cattle and calves, poultry products, and vegetables are the primary commodities produced in the county. Farm numbers have risen by 4% over the period 2002 to 2007 but the total acres of land in farms declined by 9% over the same period. Woodlands and wetlands (i.e. farmed and unfarmed) comprise 19% and 15% of the total area respectively (USDA 2007).

Residential development in Columbia County has been primarily located in and around the four cities and ten smaller villages. However, proximity to the Madison metropolitan area is increasing development pressure on the southern portions of Columbia County.

Population growth adds to housing and infrastructure development which impacts both the supply and the demand for outdoor recreation. Housing development, especially in unincorporated rural areas, can fragment and reduce the supply of land available for recreational purposes and broaden the demand for outdoor recreational opportunities. At the most basic level, housing development in an area generally means more people in that area who are likely to participate in some form of recreation nearby.

During the 2000 to 2008 time period the total number of housing units in Columbia County increased by 11.6%. This is slightly higher than the statewide average of 10.7%. From 2000 to 2009 housing units in Dane County, located immediately to the south of Columbia County, increased by 17.3%, and this ranks as the sixth fastest growing county in the State.

Recreational activities on lands, both privately and publicly owned, are important uses. Privately held lands provide owners and their guests with many recreational opportunities. The majority of the land in Columbia County is privately owned and these lands provide a significant amount of recreational opportunities. Public land holdings for recreational uses are much smaller, but they provide valuable outdoor recreational opportunities for the public and habitat for a diverse array of fish and wildlife.

The public agencies with the greatest ownership of recreational lands in Columbia County are the DNR and the federal Fish and Wildlife Service (see Appendix A Map A: Regional Locator and Public Lands). The DNR is the principle recreational land holder with more than 23,500 acres in eighteen state wildlife and fishery areas. The U.S. Fish and Wildlife Service owns over 3,200 acres in eleven Waterfowl Production Areas (WPAs). These fish and wildlife properties collectively represent about 5% of the total land area of Columbia County. These properties provide public opportunities for hunting, fishing, trapping, wildlife observation, and outdoor education.

Other important regional public lands include:

- Devil's Lake State Park (about 10,000 acres) in nearby Sauk County,
- Mirror Lake State Park (about 2,200 acre) in the Wisconsin Dells area (Adams County).
- Horicon Marsh (about 33,000 acres) in nearby Dodge County

Economic Issues

In the 9-county region, average monthly earnings in these industries vary from $1,119 for accommodation and food services employees to $4,953 for professional, scientific, and technical employees. Employment change is calculated as the percent change in the average number of employees across four quarters in 2008 in comparison to the average number of employees across four quarters in 2000. Manufacturing employs more people than any other industry, but employment in the manufacturing sector declined by 21% over this time period. There was also some decline in retail trade employment. Strong employment gains occurred in the health care and social assistance and professional, scientific, and technical industries.

The 2009 Columbia County Workforce Profile (Grosso 2009) indicates that the most prominent industry in Columbia County is also in manufacturing. Trade, Transportation and Utilities, and Education and Health are the second and third highest employing industries. However, the three industry sectors each experienced an approximate 2% decline in employment levels between 2007 and 2008. The professional and business services sector was the highest-growth industry during that same period, with employment growing by 13% during that same period.

Extractive Industry Employment

Agriculture, forestry, fishing, hunting, and mining require extracting value from the earth's natural resources for profit. Employment in these industries is a proxy indicator of the extent to which these industries shape land use in the region. In the 9-county region, the extractive industries employ about 24,500 people. This accounts for about 4.4% of total employment in the region compared with 4.2% for the state as a whole. Columbia County employs about 7.5% of its workforce in the extractive industries, with the vast majority working as farm operators and hired farm laborers.

RECREATION RESOURCES, USE AND DEMAND

Defining the Region

For analysis of the recreation resources, the "region" will first be described utilizing the findings from the Statewide Comprehensive Outdoor Recreation Plan (SCORP), and then will focus on the recreation opportunities offered specifically in Columbia County. For purposes of evaluation, the State is broken into eight regions of similar size. The Columbia County Planning Group lies within the **Southern Gateways** which includes: Columbia, Dane, Dodge, Green, Iowa, Jefferson, La Fayette, Richland, Rock and Sauk Counties.

SCORP

The primary source of information on outdoor recreation in Wisconsin is the *Statewide Comprehensive Outdoor Recreation Plan* (WDNR 2006a). The Department revises the plan periodically to determine status, trends and needs for outdoor recreation in Wisconsin. The current plan is for the period 2005-2010. Information for the document is obtained through public surveys, listening sessions and interviews.

Relative participation rates (percent population participating) is fairly consistent across the state for most outdoor recreational uses. **Table 3** shows the exceptions for the Southern Gateways region that include higher participation rates for some non-consumptive outdoor activities.

Table 3 High Demand Recreational Activities in the Southern Gateways Region

Wisconsin Residents	Non-residents
Walking for pleasure	Sightseeing
Picnicking	Bird watching
Nature-based educational programming	Hiking
Walk pets at a dog park	Picnicking
Kayaking	Camping
Source: SCORP, WDNR 2006	

The SCORP report identified the following regional nature-based recreational supply shortages or needs in the Southern Gateway Region:

- Backcountry/walk in-camping
- Boat launches – carry in
- Natural Areas
- Parks
- Public Water Access
- Trails – hiking
- Trails – horseback riding

One of the major recommendations in the SCORP report is the preservation and protection of the larger areas that provide space for popular regional outdoor recreational activities. Specific recommendations are based on information from the Land Legacy Report (Pohlman et. al. 2006). The report identifies the most important remaining sites in Wisconsin that warrant protection for their natural resource and outdoor recreation values. The *Wisconsin Land Legacy Report* (WDNR 2006) lists the Baraboo River as the ninth highest statewide priority for recreational lands in need of near term protection. The **Southern Gateways** region rankings indicated the Middle Wisconsin River and Baraboo River tied for fifth priority in terms of need for protection.

Hunting and Trapping

The oak-hickory dominated forest land and the large areas of wetlands provide excellent wildlife habitat for many species including white-tailed deer and wild turkey. Annually, Columbia County ranks in the top half of Wisconsin counties for deer harvest. These resources provide ample opportunity for hunting, particularly for waterfowl, white-tail deer, wild turkey, and small game. Many excellent waterfowl hunting opportunities exist on the natural and restored wetlands and flowages which are present on the Wildlife Areas and Waterfowl Production Areas. Small game hunting, pheasant hunting in particular, is very popular on the grasslands of the region. The Department supplements the wild

pheasant population with stocking of game farm raised pheasants on some public lands. Hunting and trapping of fur-bearing animals is also popular on these diverse habitat types. The public lands are heavily used for hunting and competition and crowding can be an issue, especially for deer, waterfowl, and pheasant hunting. Of all license sales in 2007, hunting license revenues were the highest for the Central Sand Hills Counties, comprising 48% of total license sales. In Columbia County, hunting license sales generated $14,600 in revenue (WDNR In Prep.).

Fishing and Water-based Activities

Water resources in Columbia County include fifty-six lakes, totaling 11,982 acres, almost 75 miles of trout streams, 35 miles of the Wisconsin River and many other streams, springs, and ponds. There are about fifteen miles of Class 1, forty eight miles of Class 2 and eleven miles of Class 3 trout waters in Columbia County. Lake Wisconsin, an impoundment of the Wisconsin River, is the largest water body at 9,000 acres, and is a very popular destination for fishing and recreational boating. In addition to the Wisconsin, the Fox, Baraboo, and Crawfish are the rivers that flow through the County. The CCPG fishery properties support abundant, self-sustaining populations of cold and warmwater game and native fish species. These fisheries are heavily utilized by resident and out of state anglers.

The lakes and large wetlands in the region with easy access are popular destinations for canoers and kayakers.

In the Central Sand Hills counties, resident fishing license sales make up 27% of total license sales and non-resident fishing licenses made up 14%. In Columbia County, 2007 resident and non-resident fishing license sales generated about $12,500 *(WDNR In Prep.)*.

Wildlife Viewing and Outdoor Education

Birding is becoming more popular in the Southern Gateway region. The Great Wisconsin Birding and Nature Trail (WDNR 2008), a mapped auto trail that reaches into every area of the state, is a project of the Wisconsin Bird Conservation Initiative (a collaborative effort that includes the DNR). Columbia County is included in the Southern Savanna Region of the trail, and six sites within the county are identified as exceptional birding areas. In addition, three sites within the county have been approved or nominated as Wisconsin Important Bird Areas, a designation reserved for select areas that have extreme importance to bird life. They include the Northern Empire Prairie wetlands, Pine Island savanna, and French Creek marsh/grasslands (http://www.wisconsinbirds.org/iba/sitemap.htm).

Camping

Camping opportunities in the Southern Gateway region exist at both public (state and county parks) and private facilities. Devils Lake State Park offers over 407 campsites, which offer both tent and RV style camping experiences. Mirror Lake State Parks maintains 151 campsites, and provides camping experiences that range from tent camping at walk-in sites to cottage style camping at two reservable cabins, one of which is ADA accessible. The majority of privately operated campgrounds cater to RV or travel trailer style camping and offer rustic cabins to their guests, but tent camping is also accommodated. State and federally-owned public fish and wildlife lands within Columbia County are not open to overnight camping.

Trails

The Ice Age National Scenic Trail is the premier hiking venue in the region. There are six segments of the trail in Columbia County that provide over 16 miles of maintained trail that traverses both public and private lands. The trail segments offer diverse settings, ranging from the wooded dolomite ridges on Lodi Wildlife Area to routes along the historic Portage Canal in the city of Portage. Both Devil's Lake and Mirror Lake State Park maintain networks of designated hiking, off-road biking and cross country skiing trails.

In addition to opportunities on the Ice Age Trail and at the State Parks, hiking, cross country skiing, and snow shoeing are commonly pursued on private lands and are also permitted on most of the public lands in the region. These opportunities are provided on multi-purpose service roads, trails and dikes or "bushwhacking" rather than designated trails. Public and private trail availability in Columbia County and the surrounding counties are shown in **Table 4**.

The CCPG fish and wildlife lands have and will continue to provide access for traditional hunting, fishing and nature enjoyment. These properties have not provided trails for certain potentially high demand recreational pursuits identified for the SCORP Southern Gateway region.

Table 4 Trail Opportunities in Columbia County and Surrounding Counties

Property/County	Hiking	XC Skiing	Off Road bike	Horse trails (public)	Horse trails (private)
CCPG *1*	32	32	0	0	
Columbia *2*	8 - 12	8 - 12	0	0	35
Surrounding *3*	160	266	41	29	Not calculated

All units in miles

1 = includes only services roads and designated trails on CCPG properties

2 = SCORP 2006 data for Columbia County villages, towns, cities and counties and non-CCPG DNR properties

3 = includes trail lengths from SCORP 2006 county level supply data, Ice Age Trail Association and designated trails in state parks/trail systems and federal wildlife refuges. It does not include hiking opportunities provided on access/service roads and trails located on state/federal fish and wildlife areas (e.g., public hunting grounds and waterfowl production areas). The surrounding counties include: Dane. Dodge, Green Lake, Marquette, Adams and Sauk.

Snowmobiling is a popular winter pursuit in the region. Nearly 300 miles of groomed trails are maintained by eight local snowmobile clubs. These trails cross both private and public land. Snowmobile trails provide access to most portions of the county, and although they are predominantly located in rural areas, many links to cities and villages exist to make amenities available to riders.

Analysis of the Properties

COLUMBIA COUNTY PLANNING GROUP PROPERTIES

The properties in the Columbia County Planning Group (**Table 5**) are shown in **Map-B** and include**:**

French Creek Wildlife Area (3,570 acres) is located in both Columbia and Marquette Counties, about six miles northeast of the City of Portage, and encompasses parts of French Creek and Dates Millpond. French Creek Fen State Natural Area is found within this property.

Lodi Marsh Wildlife Area (1,275 acres) is located on the Columbia and Dane County border just south of the City of Lodi along Spring Creek. Lodi Marsh State Natural Area is found within this property.

Mud Lake Wildlife Area – Columbia County (2,350 acres) is located about two miles southwest of the Village of Rio, and encompasses most of Mud Lake. Empire Prairies State Natural Area is located within this property.

Paradise Marsh Wildlife Area (1,588 acres) is located about two miles northeast of the Village of Doylestown along Beaver Creek.

Pine Island Wildlife Area (5,848 acres) is located in both Columbia and Sauk Counties and lies just west of the City of Portage along the Baraboo and Wisconsin Rivers. Pine Island Savanna State Natural Area is located within this property.

Swan Lake Wildlife Area (2,334 acres) lies directly east of the City of Portage and encompasses parts of the Fox River and Swan Lake.

Table 5 Planning Group Properties

Property	Acreage	SNA	Acreage
Wildlife Areas			
French Creek	3,570	French Creek Fen	196
Lodi Marsh	1,275	Lodi Marsh	545
Mud Lake	2,350	Empire Prairies	139
Paradise Marsh	1,588	--	
Pine Island	5,848	Pine Island Savanna	798
Swan Lake	2,334	--	
Peter Helland	3,586	Springvale Wet Meadow	271
Fishery Areas			
Rocky Run	743	Rocky Run Oak Savanna	441
Rowan Creek	655	--	

Peter Helland Wildlife Area (3,586 acres) is located about two miles east of the Village of Pardeeville along the North Branch of Duck Creek. Springvale Wet Meadow State Natural Area is located on this property.

Rocky Run Fishery Area (743 acres) lies about three miles southwest of the Village of Wyocena along Rocky Run Creek. The Rocky Run Oak Savanna State Natural Area lies adjacent to this fishery area.

Rowan Creek Fishery Area (655 acres) stretches east, south and west of the Village of Poynette along Rowan Creek.

Some of these properties were purchased by the Wisconsin Conservation Commission (precursor to the DNR) dating back to the 1940s. State and local interest continue to pursue opportunities for managing and preserving the wetlands, forests and streams for wildlife conservation, hunting, fishing and outdoor recreation in Columbia County.

GENERAL PROPERTY GROUPING CHARACTERISTICS

Vegetation and Natural Communities and Habitats

The current vegetation for the CCPG is a mosaic of wetland natural communities with upland natural communities providing important habitat connections. The wetland natural communities on the CCPG include: Calcareous Fens, Southern Sedge Meadow, Wet and Wet-mesic Prairies, Emergent Marsh, Submergent Aquatic, Shrub-carr, and Southern Tamarack Swamp (rich). The upland natural communities on the CCPG include: Oak Opening, Southern Dry-mesic Forest, Native Prairie Remnants, and Surrogate Grassland. Open water, including Coldwater and Warmwater Streams, lakes, and impoundments, are common on the properties.

The *Wisconsin Wildlife Action Plan* (WDNR 2006b) and the *Ecological Landscapes of Wisconsin Handbook* (WDNR in Prep. a) identify the best landscapes for sustaining various natural communities and includes a table with opportunity ranks for each Ecological Landscape / Natural Community combination. Those landscapes and properties falling within the CCPG were used to identify conservation opportunities and describe the natural communities and habitats.

Wetland Natural Communities

Calcareous Fens on the CCPG are typically small areas of gently sloping mounds with springs. Characteristic plant species include fen star sedge (*Carex sterilis)*, shrubby cinquefoil (*Pentaphylloides floribunda*), edible valerian (*Valeriana edulis*), swamp thistle (*Cirsium muticum*), sage-leaved willow (*Salix candida*), narrow-leaved cottongrass, marsh fern (*Thelypteris palustris*), and tussock sedge (*Carex stricta*). Glossy buckthorn (*Rhamnus frangula*) is present, but not common.

Southern Sedge Meadows of the CCPG are influenced by calcium-rich groundwater and have species characteristic of Calcareous Fens within them. They are generally high quality, with large areas of few to no invasive species. Characteristic species include tussock sedge, woolly sedge (*Carex lasiocarpa*), blue-joint grass (*Calamagrostis canadensis*), spotted Joe-pye weed (*Eupatorium maculatum*), blue flag (*Iris virginica*), and swamp milkweed (*Asclepias incarnata*). Reed canary grass (*Phalaris arundinacea*) is present and sometimes dominant within degraded Southern Sedge Meadows.

Within Southern Sedge Meadows and Calcareous Fens, small areas of Wet to Wet-mesic Prairie can be found. Species characteristic of these areas include prairie cordgrass (*Spartina pectinata)*, big blue-stem (*Andropogon gerardii*), blue-joint grass, prairie blazing-star (*Liatris pycnostachya*), and saw-tooth sunflower (*Helianthus grosseserratus*).

This matrix of open wetland types typically grades into, and mixes with, Shrub-carr. Shrub-carr of the CCPG is characterized by red osier dogwood (*Cornus stolonifera*), meadow-sweet (*Spiraea alba)*, willows (*Salix sp*), and bog birch (*Betula pumila*).

In some areas of the CCPG, a loose canopy composed of tamaracks (*Larix laricina*) occurs over the Shrub-carr or the open wetland types. In other areas, the Southern Tamarack Swamp (rich) is more defined, with a broken to closed canopy over a tall shrub layer of poison sumac (*Toxicodendron vernix*), speckled alder (*Alnus incana*), or bog birch, with an herbaceous layer of Southern Sedge Meadow species.

Emergent Marshes of the CCPG are typically dominated by the invasive narrow-leaved cattail (*Typha angustifolia*), but can also include common bur-reed (*Sparganium eurycarpum*), common reed grass (*Phragmites australis*), soft-stem bulrush (*Schoenoplectus tabernaemontani*), pickerel-weed (*Pontederia cordata*), and wild rice (*Zizania sp*). Many of these wetlands are associated with structures such as dikes, ditches, or impoundments. Submergent Aquatics, typically occurring in deeper water than emergents, include coon's-tail (*Ceratophyllum demersum*), common bladderwort (*Utricularia vulgaris*), pondweeds (*Potamogeton sp*), water-shield (*Brasenia schreberi*), water-milfoil (*Myriophyllum sp*), and water-marigold (*Megalodonta beckii*). The invasive curly pondweed (*Potamogeton crispus*) is dominant in some deep water marshes.

Floodplain Forests are found along the streams and rivers of the CCPG. These areas are typically small and may be mixed with Southern Sedge Meadow. Characteristic species include silver maple (*Acer saccharinum*), river birch (*Betula nigra*), and green ash (*Fraxinus pennsylvanica*). Along some of the streams are wet-mesic forests with a canopy of basswood (*Tilia americana*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), and swamp white oak

(*Quercus bicolor*). The shrub layer is open. The ground flora is a mix of rich, mesic species [bloodroot (*Sanguinaria canadensis*), wild leek (*Allium tricoccum*), red baneberry (*Actaea rubra*), Canadian wood-nettle (*Laportea canadensis*), and sharp-lobed hepatica (*Anemone acutiloba*)] and species more typical of a floodplain [reed canary grass, moneywort (*Lysimachia nummularia*), cut-leaved coneflower (*Rudbeckia laciniata*), and stinging nettle (*Urtica dioica*)]. Exposed soil is present where water was pooled in the spring. Springs emanate from these areas into streams.

Upland Natural Communities

Southern Dry-mesic Forests of the CCPG are red and white oak-dominated with red maple (*Acer rubrum*), black cherry (*Prunus serotina*), and shagbark hickory (*Carya ovata*). In the best examples of this type, trees are typically 10-15 inches diameter at breast height (dbh), with some up to 25 inches dbh. The shrub layer is moderately dense with prickly ash (*Zanthoxylum americanum*), common buckthorn (*Rhamnus cathartica*), brambles (*Rubus sp*), and honeysuckle (*Lonicera sp*). The herbaceous layer has pointed tick-trefoil (*Desmodium glutinosum*), jack-in-the-pulpit (*Arisaema triphyllum*), broad-leaf enchanter's-nightshade (*Circaea lutetiana*), Virginia creeper (*Parthenocissus quinquefolia*), lady fern (*Athyrium filix-femina*), hog-peanut (*Amphicarpaea bracteata*), and the invasives garlic mustard (*Alliaria petiolata*) and Japanese hedge-parsley (*Torilis japonica*). Ponds, including some that are ephemeral, are present in some Southern Dry-mesic Forests of the CCPG.

Oak Openings, Oak Woodland, and Oak Barrens (all types of savanna) of the CCPG vary from floodplain savannas to restored Oak Openings. Oak Openings described as floodplain savannas are found at Pine Island Wildlife Area and consist of open grown swamp white oak over prairie grasses and forbs. Oak Openings that have had some restoration management are typically open grown bur oak (*Quercus macrocarpa*) over restored Dry-mesic Prairie. There are numerous small Oak Openings and areas of Oak Woodland that are in need of restoration and are typically composed of bur oak over shrubs, including brambles and common buckthorn; invasive herbaceous species, including common burdock (*Arctium minus*), smooth brome (*Bromus erectus*), Canada thistle (*Cirsium arvense*), and wild parsnip (*Pastinaca sativa*); and remnant prairie species, including big blue-stem, June grass (*Koeleria macrantha*), and common spiderwort (*Tradescantia ohiensis*). Oak Barrens are rare on the CCPG, but are generally black oak (*Quercus velutina*) dominated with a dense cover of Pennsylvania sedge (*Carex pensylvanica*). Other species present include lead-plant (*Amorpha canescens*), black-eyed Susan (*Rudbeckia hirta*), round-headed bush-clover (*Lespedeza capitata*), horsemint (*Monarda punctata*) and June grass.

Prairies of the CCPG are diverse and occur along the entire moisture gradient from wet to dry. Wet and Wet-mesic Prairie are often part of a large open wetland. Mesic Prairies, Dry-mesic Prairies, Dry Prairies, and Sand Prairies are generally described as having a mix of native prairie species and weedy or invasive species. These prairies, along with Surrogate Grasslands, are typically part of a larger upland Oak Savanna or Southern Dry-mesic Forests.

Grassland can refer to native vegetation community types (e.g., prairies, sand barrens, fens) as well as to non-native habitats such as pastures, hay fields, small grains fields, and brome/alfalfa fields planted for nesting cover. The non-native grasslands are often referred to as Surrogate Grasslands. Surrogate Grasslands may meet the needs of some native birds and mammals, but not the needs of some invertebrates.

Invasive Species

Many invasive plants are present on the CCPG properties and some are well-established in disturbed areas. Documented invasive plants include Bell's honeysuckle (*Lonicera X bella*), black locust (*Robinia pseudoacacia*), common buckthorn, cow vetch (*Vicia* cracca), crown vetch (*Coronilla* varia), curly pondweed (*Potamogeton cripus*), Tatarian honeysuckle (*Lonicera tatarica*), bouncing-bet (*Saponaria officinalis*), Canada bluegrass (*Poa compressa*), common mullein (*Verbascum thapsus*), common reed grass, garlic mustard, glossy buckthorn, Japanese hedge parsley, Japanese knotweed (*Polygonum cuspidatum*), leafy spurge (*Euphorbia esula var. esula)*, narrow-leaf cattail, purple loosestrife (*Lythrum salicaria*), reed canary grass, spotted knapweed (*Centaurea biebersteinii*), yellow toadflax (*Linaria vulgaris)* and wild parsnip. Common dewberry (*Rubus flagellaris*), an aggressive native species, is present in significant numbers at Pine Island Wildlife Area.

Wildlife Resources

Primary game species on these properties include white-tailed deer, eastern wild turkey, ring-necked pheasants, Canada goose, mallards, wood ducks, blue-winged teal, mourning doves, and woodcock. Bobwhite quail and ruffed grouse may still be found on some properties, as well as various waterfowl species. Popular furbearing animals found on these properties are raccoon, striped skunk, coyotes, foxes, opossum, muskrat, mink, and beaver.

Other wildlife species occasionally reported in the county are otter, bobcat and fisher. Increasingly, species such as black bear and gray wolves are using the Wisconsin River corridor as a dispersal route and are spotted in the county.

The area is well known for birding. People come from long distances to observe tundra swan, pelicans and other waterfowl associated with the Mississippi flyway during migration. The Wisconsin River serves as a major staging area for sandhill crane and hundreds will roost on the sandbars in the fall. Whooping Cranes have also been known to use the CCPG and surrounding properties. Since the recovery of the bald eagle in the Midwest, large numbers over winter along the Wisconsin River below the Prairie du Sac Dam as the water remains open through the winter. Osprey populations are also recovering in Columbia County, with six nests identified in mid-April and three nests identified that produced young in 2010. There is also good quality American woodcock nesting habitat on the CCPG, especially on the Lodi Marsh WA and French Creek WA.

Fish Communities

The CCPG contains diverse coldwater and warmwater fish communities. Eight trout streams are located in Columbia County and seven flow through state fish management or wildlife areas. The state fishery and wildlife areas described in this document include four miles of Class 1, 14 miles of Class 2 and two miles of Class 3 trout waters. These waters sustain both brown and brook trout populations. A variety of native forage species including mottled sculpin (a coldwater indicator species), white sucker, blacknose dace, brook stickleback, central mudminnow, black bullhead, creek chub, bluntnose minnow, fantail darter, Johnny darter common shiner, American brook lamprey (a native, non-parasitic lamprey), and fathead minnow.

Northern pike, walleye, largemouth and smallmouth bass are the major game species in warmwater rivers and lakes.

Threatened, Endangered, and Special Concern Species

Numerous rare plant and animal species have been documented on the Columbia County Planning Group properties (**Tables 6 and 7**) *Rapid Ecological Assessment for the Columbia County Planning Group* (WDNR, 2010b). Of these species, eight plant and 16 animal species are designated as threatened or endangered. Special Concern (SC) species are plants and animals where abundance or distribution is a concern but not yet proven.

Table 6 Documented Rare Plant Species for the CCPG

Common Name	Scientific Name	Last Sighted	State Rank	Global Rank	State Status
Brittle Prickly-pear	*Opuntia fragilis*	1987	S3	G4G5	THR
Buttonweed	*Diodia teres var. teres*	2009	S1	G5T5	SC
Common Bog Arrow-Grass	*Triglochin maritima*	1988	S3	G5	SC
Fire Pink	*Silene virginica*	2008	S1	G5	END
Flodman Thistle	*Cirsium flodmanii*	2011	S1	G5	SC
Georgia Bulrush	*Scirpus georgianus*	1960	SH	G5	SC
Hill's Thistle	*Cirsium hillii*	2006	S3	G3	THR
Lesser Fringed Gentian	*Gentianopsis procera*	1988	S3	G5	SC
Livid Sedge	*Carex livida*	2011	S2	G5T5	SC
Prairie False-dandelion	*Microseris cuspidata*	2006	S2	G5	SC

Table 6 Documented Rare Plant Species for the CCPG (continued)					
Prairie Parsley	*Polytaenia nuttallii*	1974	S3	G5	THR
Showy Lady's slipper	*Cypripedium reginae*	1983	S3	G4	SC
Slender bulrush	*Scirpus heterochaetus*	1977	S1	G5	SC
Small White Lady's-slipper	*Cypripedium candidum*	2009	S3	G4	THR
Sticky False Asphodel	*Tofieldia glutinosa*	1988	S2S3	G4G5	THR
Sweet-scented Indian-plantain	*Cacalia suaveolens*	2009	S3	G4	SC
Tufted Bulrush	*Scirpus cespitosus*	1988	S2	G5	THR
Whip Nutrush	*Scleria triglomerata*	1993	S2S3	G5	SC
Woolly Milkweed	*Asclepias lanuginosa*	2011	S1	G4?	THR

Endangered Plants

- Fire pink (*Silene virginica*) is found in rich deciduous forests, dry to mesic oak woods, best in partial shade.

Threatened Plants

- Brittle prickly-pear (*Opuntia fragilis*) is found in thin dry soil over rock, as well as Sand Prairies.
- Hill's thistle (*Cirsium hillii*) is found in Dry Prairies and Pine and Oak Barrens.
- Prairie parsley (*Polytaenia nuttallii*) is found in prairies and in savanna remnants.
- Small white lady's-slipper (*Cypripedium candidum*) is found in Calcareous Fens and prairies.
- Sticky false asphodel (*Tofieldia glutinosa)* is found in marshes and wet meadows with calcareous soils.
- Tufted bulrush (*Scirpus cespitosus)* is found in fens, sedge meadows, and wet swales of old beach ridges.
- Woolly milkweed (*Asclepias lanuginosa*) is found in dry, sandy or gravelly prairies.

Table 7 Documented Rare Animal Species for the CCPG					
Common Name	**Scientific Name**	**Last Sighted**	**State Rank**	**Global Rank**	**State Status**
A Lepidostomatid Caddisfly	*Lepidostoma libum*	2009	S1?	G3G4	SC/N
A Predaceous Diving Beetle	*Hydroporus pseudovilis*	2009	S1S2	GNR	SC
A Water Scavenger Beetle	*Laccobius agilis*	2009	S2S2	GNR	SC
Abbreviated Underwing Moth	*Catocala abbreviatella*	1997	S3	G4	SC/N
Acadian Flycatcher	*Empidonax virescens*	2009	S3	G5	THR
American Bittern	*Botaurus lentiginosus*	2009	S3	G4	SC
American Bullfrog	*Lithobates catesbeianus*	2009	S3	G5	SC
American Woodcock	*Scolopax minor*	2009	--	G5	--
Arctic Shrew	*Sorex arcticus*	1998	S3S4	G5	SC/N
Bald Eagle	*Haliaeetus leucocephalus*	2009	S4B,S2N	G5	SC/P
Banded Killifish	*Fundulus diaphanus*	1980	S3	G5	SC/N
Bell's Vireo	*Vireo bellii*	2009	S2B	G5	THR
Black Tern	*Chlidonias niger*	2009	S2	G4	SC
Black-billed Cuckoo	*Coccyzus erythropthalmus*	2009	--	G5	--
Black-crowned Night Heron	*Nycticorax nycticorax*	2009	S2	G5	SC
Blanding's Turtle	*Emydoidea blandingii*	2009	S3	G4	THR
Blue-winged Teal	*Anas discors*	2009	--	G5	--
Blue-winged Warbler	*Vermivora pinus*	2009	--	G5	--
Bobolink	*Dolichonyx oryzivorus*	2009	--	G5	--
Broad-winged Skipper	*Poanes viator*	1991	S3	G5	SC/N
Brown Thrasher	*Toxostoma rufum*	2005	--	G5	--

Table 7 Documented Rare Animal Species for the CCPG (continued)					
Cerulean Warbler	*Dendroica cerulea*	2009	S2S3	G4	THR
Common Moorhen	*Gallinula chloropus*	2009	S2	G5	SC
Dickcissel	*Spiza americana*	2005	S3	G5	SC
Dunlin	*Calidris alpina*	2009	--	G5	--
Eastern hog-nosed Snake	*Heterodon platirhinos*	2009	S3	G5	SC
Eastern Massasauga[3]	*Sistrurus catenatus catenatus*	1976	S1	G3G4	END
Eastern Meadowlark	*Sturnella magna*	2009	--	G5	--
Eastern Pipistrelle Bat	*Pipistrellus subflavus*	2009	S3S4	G5	SC
Eastern Red Bat	*Lasiurus borealis*	2009	--	G5	--
False Map Turtle	*Graptemys pseudogeographica*	1976	S4	G5	SC/H
Field Sparrow	*Spizella pusilla*	2009	--	G5	--
Golden-winged Warbler	*Vermivora chrysoptera*	2009	--	G4	--
Grasshopper Sparrow	*Ammodramus savannarum*	2009	--	G5	--
Henslow's Sparrow	*Ammodramus henslowii*	2009	S3B	G4	THR
Hickory Hairstreak	*Satyrium caryaevorum*	1991	S2	G4	SC/N
Hoary Bat	*Lasiurus cinereus*	2009	--	G5	--
King Rail	*Rallus elegans*	2006	S1B	G4	SC/M
Lake Chubsucker	*Erimyzon sucetta*	1980	S3	G5	SC/N
Least Flycatcher	*Empidonax minimus*	2009	--	G5	--
Loggerhead Shrike	*Lanius ludovicianus*	1985	S1B	G4	END
Longear Sunfish	*Lepomis megalotis*	1925	S2	G5	THR
Mulberry Wing	*Poanes massasoit*	2009	S3	G4	SC/N
Northern Bobwhite	*Colinus virginianus*	2009	S3	G5	SC
Northern Harrier	*Circus cyaneus*	2009	--	G5	--
Northern Marbled Locust	*Spharagemon marmorata*	2009	--	G5	--
Ornate Box Turtle	*Terrapene ornata*	2009	S1	G5	END
Osprey	*Pandion haliaetus*	2005	S4	G5	
Pickerel Frog	*Lithobates palustris*	2009	S3S4	G5	SC/H
Pygmy Shrew	*Sorex hoyi*	1977	S3S4	G5	SC/N
Redfin Shiner	*Lythrurus umbratilis*	1925	S2	G5	THR
Red-headed Woodpecker	*Melanerpes erythrocephalus*	2005	--	G5	--
Red-necked Grebe	*Podiceps grisegena*	1997	S2	G5	END
Red-shouldered Hawk	*Buteo lineatus*	2005	S3S4B	G5	THR
Red-tailed Prairie Leafhopper	*Aflexia rubranura*	1963	S2	G2	END
Regal Fritillary	*Speyeria idalia*	2006	S1	G3	END
Silphium Borer Moth	*Papaipema silphii*	1995	S2	G3G4	END
Silver-haired Bat	*Lasionycteris noctivagans*	2009	--	G5	--
Slender Glass Lizard	*Ophisaurus attenuatus*	2009	S1	G5	END
Smooth Softshell	*Apalone mutica*	1979	S3	G5	SC/H
Swamp Darner	*Epiaeschna heros*	2009	S1?	G5	SC/N
Veery	*Catharus fuscescens*	2009	--	G5	--
Vesper Sparrow	*Pooecetes gramineus*	2005	--	G5	--
Weed Shiner	*Notropis texanus*	1925	S3	G5	SC/N
Whip-poor-wil	*Caprimulgus vociferus*	2009	--	G5	--
Whitney's Underwing Moth	*Catocala whitneyi*	1997	S3	G3G4	SC/N
Willow Flycatcher	*Empidonax traillii*	2009	--	G5	--
Wood Thrush	*Hylocichla mustelina*	2009	--	G5	--
Yellow-billed Cuckoo	*Coccyzus americanus*	2009	S3B	G5	SC/M

Endangered Animals

- The Eastern massasauga rattlesnake (*Sistrurus catenatus*) is Wisconsin's most endangered reptile. This medium-sized rattlesnake is a State Endangered Species and a Federal Candidate Species. The species lives in river bottom lowland forests and associated open wetlands. Massasaugas primarily eat small rodents but occasionally feed on amphibians.
- Loggerhead shrike (*Lanius ludovicianus*) inhabits open, grassy country with scattered shrubs or small trees. Within their range, shrikes prefer "edge" habitat, nesting along roadsides and hedgerows in agricultural regions.
- Ornate box turtle (*Terrapene ornata*) is strictly associated with sandy soils, Dry prairies, and Oak Savannas. They prefer southern and western exposures where temperatures are higher and soils are drier. This species requires deep sandy soil to burrow into for hibernation in the winter. The dry floodplain prairies of the lower Wisconsin and Sugar rivers allow burrowing below frost line in winter. Ornate box turtles will use Oak Savannas and edges of oak woods in the summer, to avoid excessively warm temperatures.
- Red-tailed prairie leafhopper (*Aflexia rubranura)* inhabits dry to Wet-mesic Prairies with the host plant, prairie dropseed (*Sporobolus heterolepis*).
- Red-necked grebe (*Podiceps grisegena*) prefers seasonally or permanently flooded wetlands with extensive beds of aquatic plants and large beds of softstem bulrush (*Schoenoplectus tabernaemontani*) in open country. Nesting habitat includes wetlands with patches of open water and stands of bulrush or similar emergents.
- Regal fritillary (*Speyeria idalia)* is found in large grassland areas with prairie remnants or lightly grazed pasture lands containing prairie vegetation where topography often includes hills and valleys.
- Silphium borer moth (*Papaipema silphii)* prefers sunny areas where host plants (*Silphium* species) exist in good numbers. Habitat is generally Wet to Dry-mesic Prairie.
- Slender glass lizard (*Ophisaurus attenuatus*) is found in Oak Savannas or open oak woods, Sand Prairies, dry-mesic grasslands such as old agricultural fields, and Pine Barrens in central Wisconsin.

Threatened Animals

- Acadian flycatcher (*Empidonax virescens*) requires large tracts of mature mesic forest, with semi-open understory, and prefers forested streamsides and ravines.
- Bell's vireo (*Vireo bellii*) prefers dense vegetation characteristic of mid-successional habitats, or any successional stage exhibiting dense understory vegetation, particularly upland and lowland carr, riparian areas, brushy fields, and young second-growth forest or woodland.
- Blanding's turtle (*Emydoidea blandingii*) utilizes a wide variety of aquatic habitats including deep and shallow marshes, shallow bays of lakes and impoundments where areas of dense emergent and submergent vegetation exists, sluggish streams, oxbows and other backwaters of rivers, drainage ditches (usually where wetlands have been drained), and sedge meadows and wet meadows adjacent to these habitats.
- Cerulean warbler (*Dendroica cerulea*) prefers mature mesic deciduous woodlands, including maple, basswood, and especially oak in both uplands and lowland or Floodplain Forests. Often found near small canopy openings in large continuous forest tracts; prefer medium and large tracts over small tracts (less than 40 acres).
- Henslow's sparrow (*Ammodramus henslowii*) prefers old fields, open grasslands, wet meadows, unmowed highway right-of-ways, undisturbed pastures, timothy *(Phleum pratense)* hay fields, and fallow land grown up to tall weeds
- Longear sunfish (*Lepomis megalotis*) prefers clear, shallow, moderately warm, still waters of streams and occasionally in lakes. Found in or near vegetation.
- Redfin shiner (*Lythrurus umbratilis*) prefers turbid waters of pools in low-gradient streams over substrates of boulders, cobble, sand, silt or detritus.
- Red-shouldered hawk (*Buteo lineatus*) breeding habitat includes bottomland hardwoods, mesic deciduous or mixed deciduous-conifer forests, and wooded margins of marshes.

Sites of High Conservation Significance – Primary Sites

A Primary Site generally encompass the best examples of 1) both rare and representative natural communities, and 2) sites harboring rare species populations that have been documented to date within the CCPG. Twelve Primary Sites for biodiversity conservation are identified in the *Rapid Ecological Assessment for the Columbia County Planning Group* (WDNR, 2010b).

Primary Site descriptions are included in the individual property descriptions and are intended to be considered along with other information when identifying opportunities for various management alternatives during the master planning process. The site boundaries and acreages provided are first approximations and will be further refined during the master planning process. The descriptions for the primary sites located on the CCPG are included in the individual property descriptions that follow.

Priority Conservation Actions

Several ecological priorities from the *Wisconsin Wildlife Action Plan* (WDNR 2006b) are present on the CCPG. These priorities were developed from three primary sources:

1) Ecological Landscape Opportunities (see page 5),

2) Degree of association between a SGCN and a natural community,

3) Probability a given SGCN occurs in a given Ecological Landscape (**Figure 2**).

These priorities highlight both the ecologically important natural communities and vertebrate animal species for a given landscape, along with their relationships to each other. Priority Conservation Actions identified in the Wisconsin Wildlife Action Plan for the CCPG properties include:

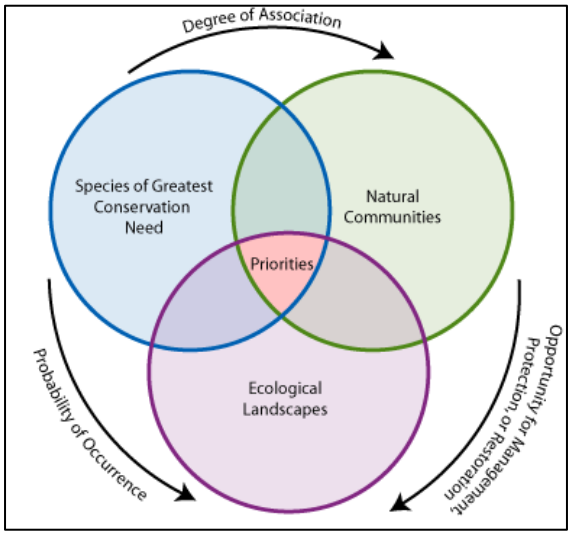

Figure 2 Process for identifying Ecological Priorities in the Wisconsin Wildlife Action Plan.

- Identify and restore Oak Barrens and Oak Forest on appropriate sites, such as old fields and pasture lands, to expand and connect existing stands.
- Manage oaks as a large-scale mosaic of patches along a successional gradient that includes oak forest, Oak Woodland, Oak Opening, and native or Surrogate Grassland.
- Work with private land owners to promote the creation of smaller savanna restorations that provide habitat for Red-headed Woodpeckers.
- Preserve remaining relict older growth oak forest patches.
- Develop cost-sharing incentives for private landowners to burn, remove invasive exotic species, and regenerate oak forests, Oak Woodlands, and Oak Openings.
- Preserve and manage Wet-mesic Prairie, Wet Prairie, Calcareous Fen, and Southern Tamarack Swamp sites; restore degraded sites (emphasizing restoration of hydrology), and manage for area-sensitive species in a matrix of Surrogate Grasslands, Sedge Meadow, Shrub-carr, and savanna habitats. Monitor restored sites to determine whether the restoration is maintaining sensitive species.
- Develop educational tools and demonstration/training areas that promote prescribed fire and other Oak Barrens management practices.
- Develop a practical “toolkit” for maintaining structural and compositional characteristics of Oak Barrens ecosystems.

- Continue head starting program for ornate box turtles at appropriate sites.
- Long-term ornate box turtle monitoring is needed to evaluate population status and track trends, especially in light of climate change.

Wisconsin Wildlife Action Plan Conservation Opportunity Areas

The Central Sand Hills Ecological Landscape encompasses a significant portion of the CCPG and is recognized in the *Wisconsin Wildlife Action Plan* (WDNR 2006b) as having a number of Conservation Opportunity Areas (COAs). These areas are places that contain ecological features, natural communities, or Species of Greatest Conservation Need habitat for which Wisconsin has a unique responsibility to protect when viewed from the global, continental, upper Midwest, or state perspective. The following COAs are within or close to the CCPG properties:

Fox River Marsh COA - contains the French Creek Wildlife Area and is of Upper Midwest significance because of its medium-sized rivers and streams.

Lower Baraboo River and Pine Island COA - of statewide significance because of its Floodplain Forest natural communities, contains Pine Island Wildlife Area and Swan Lake Wildlife Areas.

Puckaway and Grand River Marsh COA - of Upper Midwest significance because it contains large wetlands embedded with upland natural communities and is immediately adjacent to the CCPG in Marquette and Green Lake Counties,

Opportunities and Considerations for Biodiversity Conservation

Rare Reptiles and Amphibians

Reptile and amphibian populations have declined significantly in Wisconsin over the last few decades, due in large part to habitat modification and fragmentation. Most species exhibit poor dispersal capabilities; hence there is an urgent need to protect sites where these species occur at population sizes large enough to remain viable (Lorch 2009). The CCPG provides crucial habitat for three state-listed species: Blanding's turtle (THR), slender glass lizard (END), and ornate box turtle (END). The CCPG provides an excellent opportunity for the conservation of Blanding's turtles due to an abundance of habitat and the presence of dispersal corridors between areas suitable for habitation. French Creek Wildlife Area is one of the few state-owned properties that have the potential to support a viable population of slender glass lizards. The CCPG also includes one of only seven sites in Wisconsin for the recovery of ornate box turtles. Other herptile species known from the CCPG include: American bullfrog (SC), Eastern hog-nosed snake (SC), Eastern massasauga (END) (last observed in 1927), false map turtle (SC), pickerel frog (SC), and smooth softshell (SC).

Threats to herptile populations of the CCPG include the succession of open habitat, invasive plant species resulting in habitat simplification, road mortality as habitats become increasingly fragmented, and egg predation from meso-predators.

Open Wetlands

The open wetlands of the CCPG are diverse and include Calcareous Fen, Emergent Marsh, Southern Sedge Meadow, Wet Prairie, and Wet-mesic Prairie. These wetland complexes can cover over 1,000 acres. The open wetlands of the CCPG occur within larger landscapes of prairie, Surrogate Grassland, and oak dominated savannas and forests.

Many acres of these wetlands remain high quality because of their lack of invasive species and minimal impacts from draining. Still, numerous areas are heavily impacted by previous disturbances including ditching and grazing that have led to invasive species and shrub invasion. Invasive species impacting these areas include reed canary grass, common reed grass, narrow-leaved cattail, and purple loosestrife.

The mixed emergent wetlands and large size (>25 acres) make the open wetlands at French Creek Wildlife Area and Swan Lake Wildlife Area an important shorebird stopover site (*Grveles et al. In Review*). The open wetlands of the CCPG also provide habitat for breeding grassland birds, breeding marsh birds, rare reptiles and amphibians, and invertebrates. Opportunities exist to enhance rail and heron habitat.

Oak Savanna Restoration

Oak savannas, including Oak Openings and Oak Woodlands, are critically imperiled globally because of their extreme rarity (WNHI 2009). Historically, oak savannas covered 5.5 million acres in Wisconsin. Today, because of clearing and plowing, overgrazing, and invasion by dense tree or shrub growth, intact examples now cover less then 500 acres. Oak barrens, considered a type of savanna occurring on sandier soils, are also a rare community.

Although the *Wisconsin Wildlife Action Plan* (2006b) does not list the Central Sand Hills Ecological Landscape as the best place to restore oak savannas, it has been noted as a critical need *Ecological Landscapes of Wisconsin* (WDNR In Prep. a) in Wisconsin. The Central Sand Hills Ecological Landscape is identified, however, as an important area for protection and management of Oak Barrens. Several important oak savanna, woodland or barrens areas were identified through the biotic inventory of the properties at Rocky Run Fishery Area, Pine Island Wildlife Area, Lodi Marsh Wildlife Area, and Rowan Creek Fishery Area. Oak Openings and Oak Woodlands are noted as a major management opportunity in the Southeast Glacial Plains Ecological Landscape, although only one property from the CCPG is present within that landscape, Paradise Marsh Wildlife Area, and initial surveys don't indicate any large restoration opportunity.

Restoration and expansion of oak savanna remnants, such as the site located at Pine Island, can enhance the habitat for numerous threatened and endangered species and SGCN currently known from the CCPG.

Grassland Birds

Grassland bird species are exhibiting one of the most significant declines of any suite of bird species in Wisconsin and across the Midwest (Herkert 1995). The major cause for this decline has been the alteration and loss of breeding habitat (Robbins et al. 1996). The CCPG presents opportunities for addressing several area sensitive bird species that require large grassland patches to provide for good nest success and persistence of viable populations. Promoting good nest success and the persistence of viable populations of area-sensitive grassland birds requires maintaining patch sizes of greater than 100 hectares (247 acres) (pers. comm. D. Sample). The context of the surrounding landscape should be assessed to determine whether larger areas of grass could be connected through appropriate management. Maintaining Surrogate Grasslands, removing brushy edges and fencerows, and connecting larger grassland areas would benefit grassland birds.

The sedge meadows, Dry-mesic Prairie remnants, marshes, and Surrogate Grasslands of Dane and Columbia Counties were recognized by the WDNR as a priority landscape for grassland bird management because of the opportunity for savanna restoration and prairie and Surrogate Grassland expansion (Sample and Mossman 1997). Pine Island grasslands were also recognized as a priority landscape for grassland bird management because of the restoration potential for Sand Prairie, savanna, and river barrens (Sample and Mossman 1997).

The grasslands at Pine Island Wildlife Area support several conservative grassland obligate species such as the Henslow's sparrow, eastern meadowlark, bobolink, field sparrow, vesper sparrow, and dickcissel. These species have the potential to increase in density and potentially improve nest productivity if the grasslands are maintained and connected to open wetlands.

Additional important grassland habitats on the CCPG include Southern Sedge Meadow, Wet Prairie, Calcareous Fen, and Emergent Marsh. Suitable open areas could also include pastures, hayfields (cut late summer), idle grasslands, prairie plantings, and even row crops which can be a suitable buffer when compared to woodlots or hedgerows.

Threats to Biodiversity Conservation on the CCPG

Ecological Simplification

A major conclusion of the DNR Division of Forestry *Statewide Forest Assessment* (WDNR 2010a) is that the composition and structure of our forests are changing and becoming more simplified. Ecological simplification can be seen in the change in herbaceous species composition, the decline of native herbaceous species diversity and the increase in non-native plants, as well as simplification of forested overstory composition (Rooney et al. 2004). Factors contributing to ecological simplification include invasive species, altered ecological processes, and, for forests, the amount of non-forested habitat surrounding a forest patch and deer herbivory (Rogers et al. 2009; Rooney et al. 2004; WDNR 2010a).

Structural characteristics such as large trees, cavity trees, snags, and coarse woody debris provide habitat for rare and declining species. Wisconsin's forests are showing a continuing decline in old forests, old-growth forests and oldest age classes of trees (WDNR 2010a). Rogers et al. (2009) showed that rates of ecological simplification and loss of native plant species are slower in large forest patches within less fragmented landscapes than smaller, more isolated patches.

Wisconsin's wetlands, including those that are extensively present on the CCPG, have also suffered from ecological simplification. Factors contributing to ecological simplification that impact wetlands include invasive species, altered hydrology, conversion to agriculture, and sediment/nutrient-laden runoff from croplands.

All fire-adapted habitats in southern Wisconsin have become simplified due to the inability of fire to move across the landscape through both wetlands and uplands. Habitat edges have become more of a hard boundary, instead of a continuum of types, resulting in the loss of species habitat.

Habitat Fragmentation

The CCPG contains blocks of forests, grasslands, and wetlands that offer opportunities within this area to enhance habitat for area-sensitive forest and grassland species and to reduce the impact of habitat fragmentation. Within the region, much of the habitat is fragmented by roads, residential developments and agricultural uses. Although little can be done to remove existing infrastructure, minimizing the impacts of habitat fragmentation is important.

Grassland, wetland, and forest fragmentation results in remaining patches being too small, too isolated, and too influenced by edge effects to support viable populations of breeding birds (Johnson 2001). While the research is not as extensive on the effects of habitat fragmentation on grassland and wetland dependent flora and fauna as it is on forests, it is clear that many species that use these habitats are area sensitive, requiring large areas of appropriate habitat.

Forest fragmentation results in an increase in forest edge and an increase in nest failure in ground and shrub-nesting forest birds, including neotropical migrants (Donovan et al. 1995; Knutson et al. 2004). The forest edge can be an "ecological trap" for ground and shrub-nesting forest bird species. Flaspohler et al. (1999) showed that the zone around a cleared area in a forest can extend up to 300 meters into the intact forest. Within this zone, ground-nesting bird nest density increases, but the nest success decreases. The decrease in nest success could be due to the increase in edge-adapted predators such as raccoons, skunks, and crows; nest-parasitizing cowbirds; and competition from edge-adapted species. New research has also shown the impacts of fragmentation to native forest floral species diversity. Rogers et al. (2009) found that large forest patches in mostly minimally fragmented landscapes lost few native species, were more likely to recruit new species, and experienced slower rates of ecological simplification over the past 55 years than did smaller and more isolated patches.

Altered Ecological Processes

The vegetation that historically occurred within the CCPG developed within a complex environment comprised of both elements that are static over ecological time (e.g., soils, underlying landforms) and dynamic ecological processes (e.g., hydrological cycles, nutrient cycles, and wildfires). Many of the dynamic ecological processes that shaped the landscape of the CCPG have been altered by humans. Hydrological manipulation and degradation occurs through many means, including damming, ditching, draining, sedimentation, and erosion, all actions that took place in the CCPG region. Dams affect aquatic species and habitats by fragmenting them into disjunct segments, preventing the movements of some species between different stretches of streams. Increased water-levels associated with dams can displace small mammals due to prolonged flooding and restrict dispersal corridors and foraging areas of upland small mammals (Bautz 2010). In addition, natural hydrological fluctuations associated with free-flowing rivers and streams are integral to wetlands formed under fluctuating water levels and the many species that depend upon them, including amphibians that rely on a specific hydrological regime to complete certain life-stages (PARC 2002).

Land use changes, poorly managed agricultural practices, and mineral or timber extraction can result in an increase in suspended solids, sedimentation and reduced groundwater flow to rivers and streams (Wood & Armitage 1997). Fire is an essential ecological process to many natural communities and rare species within the CCPG. Without regular fire, native woody species can invade and dominate these communities. By volatilizing elevated soil nitrogen, fire also indirectly influences nutrient cycling; shifting conditions to favor native plants and to disfavor non-natives. In woodlands, fire facilitates seedling establishment, controls tree species that are not adapted to fire, and prevents smothering of short statured plants through the removal of leaf litter. In grasslands, fire promotes growth, flowering and overall diversity of native plants by removing excess thatch among other things.

Invasive Species

Invasive species will limit the success of natural community regeneration on many of the CCPG properties if not adequately controlled. Buckthorn, honeysuckle and garlic mustard are the most detrimental species in wooded areas, with Japanese hedge parsley and emerald ash borer (*Agrilus planipennis)* also as looming threats. Reed canary grass, hybrid cattails, phragmites and purple loosestrife are a threat to the CCPG wetlands. Spotted knapweed, wild parsnip, black locust, and various others are threatening the savanna and grassland areas of the properties.

Deer Herbivory

Herbivory by white-tailed deer has been identified as having major impacts on tree and herb species in northern forests of the Lake States. In addition to direct impacts on plants, deer density has been shown to negatively impact species richness and abundance levels of songbirds that nest in the intermediate canopy layer. Excessive deer herbivory is known to inhibit reproduction of certain trees, especially those species that are preferred forage. Heavy herbivory can also subject several forest herbs and shrubs to pressures they cannot withstand such as increased invasive plants, resulting in loss of vigor, population size and reducing the number of species present through extirpation of species from the site (WDNR 2010c).

Social/Cultural Resources

The CCPG properties contain numerous prehistoric and early historic archaeological sites (including protected burial areas) and early historic structures (Dudzik 2010). Some of these sites are eligible for the National Register of Historic Places (NRHP).

Purchased in whole or part with federal funds, development of these parcels is subject to cultural resource review by DNR under provisions of Section 106 of the federal National Historic Preservation Act, as well as applicable sections of Wisconsin statutes.

Proposed impacts to identified sites or structures may necessitate research to identify, evaluate, and mitigate project impacts. This research can be an important consideration when project facilities and budgets are developed.

Maps of archaeological sites for the relevant CCPG properties are found in Appendix A.

Property Descriptions: Resources, History & Use

French Creek State Wildlife Area

Current State Ownership:	3,570 acres
Current Fee Simple Ownership:	3,505 acres
Current Project Boundary:	4,849 acres
Approved Property Master Plan:	None

In 1947, the Wisconsin Conservation Commission began acquiring land to establish the French Creek Wildlife Area (WA). The initial land acquisitions were in Fort Winnebago Township adjacent to the French Creek Marsh. In 1966, with 1,700 acres already under state ownership, the Department established a public hunting land lease program which included approximately 1,300 acres of lands adjacent to the property. In 1969, the French Creek WA property boundary was expanded to include Dates Millpond and the portion of French Creek north of County Trunk Highway CM in Buffalo Township, Marquette County (**MAP F-1**).

Prior to the establishment of the French Creek WA, the marsh was devoted to the production of “wire-grass”, native wetland plants used in the manufacture of grass rugs and matting. Later the marsh was subject to grazing and occasional wild hay harvest by farmers. Early settlers regularly hunted prairie chickens in the French Creek area. As farming practices changed, pheasants, waterfowl, and furbearing animals became the primary species pursued.

French Creek, approximately 10.8 miles in total length, originates from a marsh area in Marquette County, then flows southwesterly before entering the property. It is impounded above County Trunk Highway CM to form Dates Millpond (215 acres). Much of the shoreline of the millpond is privately owned however a good portion of the northeast shoreline is state-owned land. On the western boundary of the French Creek WA the creek is again impounded just upstream from its confluence with the Fox River. This dam creates French Creek Impoundment, a wetland flowage of approximately 900 acres. A 240 acre waterfowl refuge has been established on this impoundment.

Spring Creek, a small, spring-fed tributary to French Creek, originates approximately southeast of the property and flows northwest into the marsh. A dam and dike near the southeast corner of the property create the Spring Creek Impoundment (50 acres). A third small wetland impoundment exists on the Marquette County portion of the property and a dike and water control structure creates a small managed wetland.

Development of dikes and dams on the property created the opportunity to manipulate water levels on the marsh. The water levels of these impoundments are on periodic drawdown rotations for vegetation management and waterfowl production. The development of these impoundments also brings about management challenges. Dikes and dams require expensive maintenance and repair to withstand flood events and continuous muskrat damage. With the development of the flowages, carp populations increased dramatically causing habitat degradation which reduces the suitability of the marsh for waterfowl. Additionally, rapid expansion of dense stands of cattails has reduced the value of the marsh for waterfowl and makes navigation difficult on the impoundments.

Soils, Geology and Hydrology

The region of the French Creek WA was formed by the Green Bay Lobe of the Wisconsin glacier. The glacial material left in the area was derived mainly from the local bedrock formations, sandstone and limestone. The floodplain of French Creek has a maximum width of one mile. The soils of the floodplain area are of the Houghton series that are primarily very poorly drained organic material of 14 to 60 inches in depth. The adjacent upland soils are of the Lapeer-Wyocena series which are well drained and of the loamy and sandy types. These glaciated uplands are rolling hills with many stones which limited them to pasture and rotational crop use. The two streams within the wildlife area flow into the Fox River basin which lies immediately to the west.

Habitat and Vegetative Cover

French Creek WA is dominated by wetlands with a mix of grassland and forest cover types in the upland areas (**Map C-1**). **Table 8** has a breakdown of current land cover types.

The defining features of the French Creek WA are its waters and wetlands. Approximately 2,000 acres of wetland habitat types occur on the property. Two main streams flow into the wildlife area from the east, and several impoundments have been created. The French Creek WA is identified as an important place for large sedge meadows, fens and prairies of Upper Midwest significance in the *Wisconsin Wildlife Action Plan* (WDNR 2006b).

The wetlands transition to upland habitat types which consist primarily of oak woodlands and managed grasslands. Surrogate grasslands dominate the grassland habitat type, and consist of reclaimed agricultural fields that have been reseeded to both native and non-native grasses. The invasive species, spotted knapweed, has a strong hold in many of these fields. A few sharecropped farm fields and food plot areas are interspersed amongst the grasslands. Several small scattered areas of upland conifers also exist on the uplands of the property.

Oak woodlands are the principal upland woodland habitat type. There are degraded oak openings within these oak woodlands that retain remnant understory species and have great potential for restoration activities. Invasive species are common in these woodlands and savanna areas with garlic mustard, buckthorn, honeysuckle and Japanese hedge parsley being the most problematic.

Table 8 French Creek Cover Types

Cover Types	% Cover
Agriculture	3
Aspen	<1
Developed	<1
Grassland	15
Oak	15
Shrub	<1
Swamp Conifer	7
Upland Conifer	1
Upland Hardwood	<1
Water	1
Wetland	57

State Natural Areas

French Creek Fen State Natural Area (WDNR SNA a.) is an ecological reference site (WDNR ERA 2005) and covers about 196 acre. The SNA is a semi-open wetland that includes three Calcareous Fens mixed with Southern Sedge Meadows, Spring Runs, and, near the open water of French Creek and its impoundments, an Emergent Marsh. Wet Prairie and Southern Sedge Meadow are found near the confluence of Spring and French Creeks (**Map E-1**)..

Primary Sites

French Creek North - 1,389 acres (CCPG01)

This site is a large wetland complex with forested uplands and open old fields just north of Dates Millpond on the French Creek WA. French Creek flows through the south end of the site. The main feature of this site is a large wetland with Southern Sedge Meadow, Calcareous Fen, Southern Tamarack Swamp (rich), Shrub-carr, Emergent Marsh, and springs. Reed canary grass is present in small amounts along ditches and in a small impoundment pond.

The upland open fields are dry and sandy, and dominated by grasses. Dominant species include smooth brome, Kentucky bluegrass, June grass, Big bluestem, Indian grass, switchgrass, and little bluestem. Savanna-like areas in the north part of this site and likely provide habitat for slender glass lizards. Forested areas include a small overgrown oak savanna, disturbed oak dominated woods, forested tree-lines, and pine plantations. This site provides habitat for the northern bobwhite (SC), bell's vireo (THR), western slender glass lizard (THR), eastern hog-nosed snake (SC), and Henslow's sparrow (THR).

French Creek Fen - 64 acres (CCPG02)

The Primary Site adjoins the existing SNA and contains a diverse mix of high quality wetland types with important transitions to forested uplands. Southern Sedge Meadow, Emergent Marsh, and Spring Runs are also found within the Primary Site. One Spring Run originates in a disturbed field dominated by reed canary grass, with other wetland plants and is somewhat shaded by a small, mature white oak woodland with American starflower and early low blueberry. The woodland contains Ephemeral Ponds.

The large sedge meadow at this site offers habitat for Blanding's turtles (THR). The deep pools and silt deposits of the impoundment and the springs very likely provide hibernating areas for turtles. Small spring ponds in the Primary Site may serve as hibernacula for snakes. The Primary Site provides habitat for showy lady's-slipper (SC). Future survey needs include herptiles, rare plants, natural communities, and breeding birds.

Administrative Facilities and Access

There is an approximately 1/2 mile long, lightly developed gravel road on the property that provides access to the Spring Creek Impoundment and an additional five miles of primitive service roads. Eleven un-surfaced or gravel parking lots are maintained. In addition, two boat landings/parking lots are maintained on the wildlife area. A boat landing on the east side of County Trunk Highway EE is improved and paved and provides access to the French Creek Impoundment. A second boat landing, also on County Trunk Highway EE, is graveled and provides access to French Creek west of the highway. French Creek Wildlife Area infrastructure is shown on **Map D-1.**

Recreation

Hunting is the primary recreational use of the property. French Creek WA, with its expanses of wetlands, is one of the most popular waterfowl hunting areas in the area. Excellent opportunities for white-tailed deer hunting and turkey hunting are also present and popular. Additional hunting and trapping opportunities exist for many other species of small game, furbearing animals, mourning doves, and pheasant. Pheasant hunting at the property is primarily supported through the pheasant stocking program, and hunter crowding can sometimes be an issue, particularly on weekends, especially opening weekend.

While hunting is the primary public use on the French Creek WA, it is also used by hikers and birders, and especially by canoeists who enjoy exploring the marshes and waterways. Fishing is a popular activity, particularly below the dam of the French Creek impoundment. Bow fishing is also gaining in popularity on this flowage. The heavy use of French Creek WA also comes with some problems including littering, crowding (waterfowl, deer, and pheasant hunting), unauthorized horseback riding, and occasional sign/gate vandalism. Littering is a particular problem associated with firearm target shooting on the property, especially off of Wilcox Road.

Current Management

Current management objectives focus on protecting the watersheds of French and Spring Creeks and managing for pre-settlement vegetation types. This includes maintaining existing prairies, savannas, tamarack bogs and sedge meadows and seeking opportunities to increase these cover types. The property is managed on a landscape scale, creating smooth transitions between cover types.

The property is managed for invasive species such as spotted knapweed and garlic mustard. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grasslands. Wetlands are managed through limited disturbance to prevent the spread of reed canary grass. Flowages are drawn down approximately every five years to stabilize floating cattail bogs and allow vegetation to emerge as a food source for wildlife. Woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of oak, hickory and other desirable woodland species.

Lodi Marsh Wildlife Area

Lodi Marsh Wildlife Area (WA) is located less than one mile southwest of the City of Lodi. The large spring fed marsh and the adjacent timbered hillsides provided cold water for trout and excellent cover for wildlife. The Wisconsin Conservation Department made the first land purchase in 1959. This property straddles the border of Dane County and Columbia County (**Map F-2**).

Current State Ownership:	1,275 acres
Current Fee Simple Ownership:	1,125 acres
Current Project Boundary:	1,477 acres
Approved Property Master Plan:	None

Soils, Geology and Hydrology

Lodi Marsh WA is located near the western terminus of the Wisconsin glacier and the Driftless Area is only nine miles to its west. The Lodi valley of deep fens lined by precipitous bluffs was formed by this ice sheet. The marsh was formed by this glacier when till filled the watershed. On the southern half of the marsh is a knob hill rising 240 feet from the marsh bottom. Along the base of the hill is an extensive seepage area.

The hydrology of the marsh features numerous springs and seepages that flow from the steep hills that rise on either side of the steep valley, and that feed the marsh forming the headwaters of Spring Creek. The creek flows north to the Wisconsin River through a narrow outlet at the City of Lodi. The uplands of the Lodi Marsh WA are alfisols and mollisols with portions formerly used for agricultural purposes. Most of the marsh areas are peat and were too wet to plow.

Habitat and Vegetative Cover

The Lodi Marsh WA has a diverse mix of upland and wetland cover types (**Map C-2**). **Table 9** has a breakdown of current land cover types.

Table 9 Lodi Marsh Cover Types

Cover Types	% Cover
Aspen	1
Developed	2
Grassland	18
Lowland Shrub	3
Oak	21
Shrub	4
Upland Conifer	1
Upland Hardwood	5
Wetland	45

The Lodi Marsh was identified as a wetland of importance in *Wetlands of Dane County* (Bedford et al, 1974). The property is recognized as a public conservation land in the *Land Legacy Report* (WDNR 2006) and a state natural area was formally recognized in 2002 (WDNR-State Natural Areas). The Central Sand Hills Ecological Landscape section of the *Wisconsin Wildlife Action Plan* (WDNR 2006b) also recognizes the marsh as being an ecological reference site (WDNR ERA 2005) with emergent marsh and shrub carr being major opportunity communities.

Lodi Marsh and the surrounding uplands form one of the most intact and diverse lowland upland ecosystems in Dane County. Steep, wooded hills and open bluffs overlook the wetland and its grasslands. The marsh is a large wetland complex with numerous springs and spring runs, Southern Sedge Meadow, fen, shallow marsh, Shrub-carr, cattail marsh and disturbed-low prairie. The large, mostly open wetland borders the headwaters and upper two miles of Spring Creek, which runs northeast through the wetland. Cattails, bulrushes, and sedges comprise much of the vegetation. Shrubs include pussy-willow, red-osier dogwood, and bog birch.

Areas of Southern Sedge Meadow are present and heavily influenced by calcium-rich groundwater and have species characteristic of Calcareous Fens. Small areas of Wet to Wet-mesic Prairie can be found within the wetland, especially near the wetland-upland transition zone. Smaller areas of more open emergent wetland also exist. Shrub-carr type wetland can be found in patches throughout the wetland and are also quite common where the wetland grades into upland areas. The absence of fire and grazing has resulted in an increased shrub component in the southern portion of the marsh.

Oak Woodlands, Oak Openings, Surrogate Grasslands and small remnant prairie are the principal upland habitat types occurring on the property. Oak Openings have benefited from restoration management and are typically composed of open grown bur oak and white oak with restored Mesic and Dry-mesic Prairie understory.

The remaining upland woodlands are primarily of the Southern Dry-mesic Forest type, dominated by red oak. Upland acreage is also managed as prairie or surrogate grassland. Several Dry-mesic Prairie sites have been reclaimed at the property. These sites are often at the top or on the south/southwest facing slopes of the bluffs and are remnant Dry-Prairie sites. Former agricultural fields have been taken out of production and are now seeded to grasses and forbs. The mixture of semi-contiguous woods interlaced with semi-contiguous grassland abutting wetland provides excellent feeding, roosting and travel corridors for bats.

Center Bluff is the knob hill rising 240 feet from the marsh. Its north slope supports a Dry-mesic Forest of red oak, sugar maple and basswood, while a small Dry Prairie is located on the south slope. A second overgrown Dry Prairie is located on the western slope of the bluff. Along the base of the hill is an extensive seepage area with an abundance of skunk cabbage, marsh marigold, marsh fern, northern bedstraw, swamp loosestrife, spring-cress, wild iris, and mountain mint. Two large springs, one on each hill, feed the wetland and creek and provide a steady water flow. Springs permeate the entire wetland. This wooded hill harbors remnant prairie and planted grasslands.

State Natural Area

A 545 acre portion of the Lodi Marsh Wildlife Area was designated a State Natural Area (WDNR SNA b.) and reference site in 2002 (**Map E-2**). The natural area consists of wetlands along Spring Creek or it's tributaries and the goat prairie and oak savanna on Center Bluff. The natural area is high quality and includes a number of springs contributing to the flow of Spring Creek. This wetland has been recognized as one of the best in the state for *Papaipema* (stem-boring) moth species which are regarded as indicators of high-quality prairie and wetland habitat. Recent surveys in 2009 and 2010 have again confirmed the higher insect diversity here including the State-Endangered Silphium Borer Moth. Recent surveys of four springs within the current SNA boundary located numerous specimens of spring and coldwater inhabiting species including a water scavenging beetle (SC), a predaceous diving beetle (SC), and good populations of coldwater caddisflies.

Primary Sites

Lodi Marsh – 159 acres (CCPG16)

This Primary Site, containing Southern Sedge Meadow, Emergent Marsh, and Shrub-carr, is adjacent to the existing SNA and lies downstream along Spring Creek. This complex of wetlands has been recognized as one of the best in the state for *Papaipema* moth species. *Papaipema* moths are generally regarded as indicators of high-quality prairie and wetland habitat. Fourteen species of *Papaipema* moths were identified during a 1994 survey. Follow-up surveys in 2009 and 2010 have found similar diverse populations of stem-boring moths associated with wetlands and prairies.

Administrative Facilities and Access

Three gravel parking lots along Lodi-Springfield Road (Riddle Road on the northern Columbia County portion of the road) are maintained for public access to the property. A fourth mowed parking area is located on Lee Road at the south end of the property. DNR Parks also provides a gravel lot on the south side of Lee Road that reinitiates the Ice Age Trail segment to the greater trail as it continues south through the county. A primitive service road of approximately 3/4 mile in length provides maintenance access from Lodi-Springfield Road to Center Bluff. This service road is closed to public vehicle access and will be abandoned once restoration work is completed. A shared easement off State Highway 113 and Coyle Road allows access to the eastern border of the property and a short service drive onto the property provides room for one or two vehicles. Lodi Marsh Wildlife Area Infrastructure is shown on **Map D-2**.

Recreation

The wildlife area provides excellent hunting opportunities for turkey, deer, squirrel, and rabbit. Pheasant hunting opportunities also exist on the property and are supported by the Department pheasant stocking program. The grassland restoration occurring on the property continues to improve the quality of the property for pheasant hunting. Trapping for muskrat, beaver and otter is also popular at Lodi Marsh.

Significant recreational opportunities in addition to hunting exist at Lodi Marsh WA. A 2.5-mile segment of the 1,000-mile Ice Age Trail (IAT) (www.nps.gov/iatr) crosses the property and is regularly used by hikers and birders who enjoy the many scenic vistas and opportunities for nature study. An additional recreation feature of the wildlife area is a snowmobile trail that enters the property from Coyle Road and traverses the hills and marsh two miles north-west to State Highway 60. The snowmobile trail and associated wooden bridge are maintained by local snowmobile clubs. Erosion on the snowmobile trail has been an issue in the past.

Mushroom hunting, particularly for morels, is also a favorite spring-time activity at the property. Many people also come to collect spring water, which in several places flows from the base of the hills. Lodi Marsh WA is also used by hearty canoe paddlers willing to portage fallen trees in the wetland. Cross country skiing and snowshoeing also occurs on the property even though no groomed trails exist,

Current Management

While not in pristine condition, this property provides opportunities for grassland, wetland, oak savanna and oak woodlands habitat management. Opportunities exist for the expansion of Oak Openings on the property, where open-grown white and bur oak exist in a matrix of invading woody species. Habitat goals are geared toward establishing pre-settlement vegetation with allowance given to global and statewide priorities for rare species and critical habitat. Control of woody and herbaceous invasive species, such as buckthorn and garlic mustard, is a major activity too. Off-site erosion, nutrient loading, and chemical runoff continue to pose serious threat to the springs, creek and wetland.

Cuts and washes exist on the property as a result of previous farming practices. Vegetative restoration efforts on the property have reduced on-site erosion in gullies and further reclamation of current gullies needs to be addressed. Recent conversion of cropland to grassland has reduced erosion at several sites.

IAT and DNR are working with neighbors to coordinate efforts to curb the spread of invasive species. An active habitat management partnership has been developed between the DNR and volunteers associated with the Ice Age Park and Trail Foundation and Friends of Greater Scenic Lodi. This partnership has been successful at targeting invasive species control on the property, promoting prescribed burning, and integrating long term strategic planning.

Burning is a primary habitat management tool. The timing and use of burning takes into account the life-history requirements of invertebrates, reptiles and other species found on the property. Chemical and mechanical means along with hand-work are also used to control invasive species and brush for rejuvenation of native species. Inventories and research have played a significant role in implementing the management strategy for the Lodi Marsh WA.

Mud Lake Wildlife Area

The Mud Lake State Wildlife Area (WA) began as a leased public hunting ground in the early 1940s. In 1940, private landowners at the Mud Lake marsh constructed a ditch to drain the marsh. In response to complaints of the marsh drainage, the Wisconsin Public Service Commission ordered that normal water levels of Mud Lake be re-established. Recognizing the importance of the marsh as attractive habitat for wildlife and as a hunting and trapping destination, the Wisconsin Conservation Commission began to acquire lands in 1948 to provide and improve nesting and wetland habitat for waterfowl. The boundaries of the Mud Lake WA are shown on **MAP F-3.**

Current State Ownership:	2,350 acres
Current Fee Simple Ownership:	2,268 acres
Current Project Boundary:	2,223 acres
Approved Property Master Plan:	None

The dominant habitat feature of the property is Mud Lake. Mud Lake is a wetland complex of open water, hemi-marsh, and emergent wetlands. Wetland drainage that was initiated in the 1940s was reversed beginning in 1958 through a partnership between the Rio Conservation Club and the Department, where an artesian well on the south side of Mud Lake was reopened. This artesian well now allows continuous water flow into and through the marsh, and its flow is largely dependant on groundwater discharge. In addition to the well, several flowing springs, spring runoff and rain are the primary source of water for the marsh. The marsh serves as the headwaters for Rocky Run Creek, which downstream becomes a Class II and III trout stream.

Three flowages are maintained on the Mud Lake WA by dikes and water control structures. The main flowage contains approximately 800 acres of wetlands. There are two smaller flowages as well, the Hagen Road Flowage – approximately 120 acres, and the Tollefson Road Flowage – approximately 110 acres. Water levels on the flowages have been established by the Department at levels to minimize conflicts with adjacent landowners.

Archaeological resource areas found on this wildlife property are shown on **Map ARCH-1** in Appendix A.

Soils, Geology and Hydrology

The history of the marsh dates back to the Ice Age when several glaciers passed through Columbia County. Melting ice formed a lake which in turn filled with decaying vegetation. The surrounding soils are a result of glacial actions that fragmented and pulverized rock and stone, and then mixed them into loamy soils.

The marsh soils are very poorly drained organic soils. In some places, the marsh is underlain by sandy or loamy sediment. These soils are the remains of old glacial lake basins and serve as groundwater storage areas. Immediately to the south and northwest of Mud Lake, the upland soil types are of the Lapeer-Wyocena association, which are well drained loamy sand types. In many places, stones interfere with tillage. Soils north and northeast of Mud Lake vary from well-drained to poorly drained loamy soils and are underlain by sandy loam glacial till, silt and sand.

Table 10 Mud Lake Cover Types

Cover Type	% Cover
Agriculture	1
Bottomland Hardwood	1
Developed	1
Grassland	25
Oak	19
Shrub	5
Swamp Hardwood	2
Upland Conifer	<1
Upland Hardwood	<1
Wetland	45

Habitat and Vegetative Cover

The Mud Lake WA has a diverse mix of wetlands, upland forests and grasslands (**Map C-3**). **Table 10** has a breakdown of current cover types. The timbered uplands are primarily oak woodlands consisting of red, white, and bur oak. There are areas with good examples of oak woodlands (see Primary Site descriptions below) with forb species such as wild geranium and trillium being abundant.

This property has the most extensive invasive species problems in the CCPG. Areas are overrun with multiple exotic species including buckthorn, honeysuckle, Russian olive, garlic mustard and particularly Japanese hedge parsley. The native, but aggressive box elder, is also present in large quantities in the woodlands.

The grasslands of the property are mostly Surrogate Grasslands that exist on former agricultural lands. These areas have been seeded to both native and introduced grasses and forbs. Smaller areas of remnant prairie grasslands also exist on the property. Many of the Surrogate Grasslands are tall grass species dominant (e.g., Indian grass, big bluestem and switchgrass) with associated native forb species.

Cattails and water lily are the dominant plants in the emergent and hemi-marsh (shallow water marsh). Many of the cattail mats tend to break off from larger masses and commonly create floating bogs in the lake. This causes maintenance issues with boat launch and water control structure blockage, and even flattening posted signs in the open water. Smaller areas of sedge marsh exist, that are predominantly overrun with reed canary grass. Small pockets of common reed grass have been observed and are being chemically treated on this property.

State Natural Areas

The Empire Prairies (**Map E-3**) SNA covers 139 acres containing three dry to Dry-mesic Prairie remnants and a small Oak Opening. These are remnants of the extensive Empire Prairie that stretched across southern Columbia and northern Dane Counties (WDNR SNA c.). Two portions of the SNA, the Mud Lake and Hagen Prairie units, are located within the Mud Lake WA. This Hagen Prairie unit site is a Dry-mesic Prairie remnant that contains over 100 Prairie Bush Clover plants, a federally threatened and state endangered species along with many other remnant prairie species. Additional prairie is being planted in the unit.

Primary Sites

Mud Lake Forest and Ponds – 130 acres (CCPG14)

This site is an ecological reference site (WDNR ERA 2005) containing a large block of mature Southern Dry-mesic Forest dominated by white oak 15-25 inch dbh with red oak and shagbark hickory as canopy associates. The white oaks create a tall, sprawling, and closed canopy with large spaces in the subcanopy layer ideal for fly-catching and aerial-sallying birds. The shrub layer is sparse, with evidence of common buckthorn having been removed. The ground flora is dominated by pointed tick-trefoil and the invasive Japanese hedge parsley. Other species include lady fern, hog-peanut, wild-coffee, spreading Jacob's-ladder, and garlic mustard. Within this forest is a series of ponds that appear to be hydrologically connected to Mud Lake. The ponds have receding shorelines, with very little wetland vegetation on the edge. Vegetation within the ponds includes duckweeds and white water-lily. This site provides habitat for Acadian flycatcher (THR), cerulean warbler (THR) and red-shouldered hawk (THR).

Mud Lake Woods – 43 acres (CCPG13)

This site consists of two blocks of forest that are dominated by white oak with black cherry, shagbark hickory, red oak, and red maple as canopy associates. The white oaks create a tall, sprawling, and closed canopy with large spaces in the subcanopy layer ideal for fly-catching or sallying birds. Invasive plant species include common buckthorn and garlic mustard. This site provides habitat for Acadian flycatchers (THR) and cerulean warblers (THR).

Administrative Facilities and Access

Three boat landing are maintained at Mud Lake WA. Improved boat landings at the end of Tollefson Road and off of King Road provide access and parking for vehicles with trailers. An unimproved landing is maintained at the end of a right-of-way south of Traut Road. This landing provides carry-in boat access to the marsh, and parking is very limited. In addition to parking areas at the boat landings, ten surfaced and un-surfaced parking lots are maintained.

There are about 12 miles of town road, and 1.7 miles of Department owned primitive and lightly developed gravel roads that provide public access to the property or act as department service roads. In addition, approximately 2.25 miles of primitive non-gravel service roads on the property allow access by Department staff for property maintenance. These roads are not designated as public use facilities, but are open and used by the public for foot-travel access to the interior of the property. Mud Lake WA infrastructure is shown on **Map D-3**.

Additional infrastructure includes three dikes creating the impoundments on this property. These dikes are collectively about 3,000 feet long and include five water control structures

Recreation

This wildlife area provides excellent hunting opportunities for waterfowl, white-tailed deer, wild turkey, pheasant and other species of small game. Pheasants from the state game farm are stocked on the property and supplement the upland hunting opportunities. Waterfowl hunting is enhanced through the maintenance of a 160-acre closed area in which hunting and trapping are prohibited during the duck hunting season. This property is heavily used and occasional crowding issues can be a problem for hunters, particularly during opening weekends for waterfowl, pheasants and during the nine day deer gun hunting season. Many trapping opportunities for most species of furbearing animals exist at the property, with beaver and muskrat among the most popular species pursued. Fishing also occurs on Mud Lake with species such as Northern Pike, perch and various pan fish present in the lake.

This property is popular for many other recreational activities, especially birding with many people visiting the area during the spring migration. The large wetlands, with easy access, are used by canoers and bird watchers. Mud Lake WA is part of the larger Northern Empire Prairie Wetlands Important Bird Area (IBA) due to the mix of grasslands and wetland potholes and the birds this habitat supports. Madison Audubon Society and the Rio Conservation Club are very supportive of increasing bird populations and have erected and maintain kestrel boxes, bluebird houses, and wood duck houses. Mushroom hunting and berry picking are also seasonal activities. Although no designated trails exist, some snowshoeing and cross country skiing occurs on the property. Geocaching is an increasingly popular use on the wildlife area. Although not allowed on the property, recreational horseback riding occurs illegally and presents a management challenge, especially when it occurs in the state natural area.

Current Management

Current management objectives focus on managing for pre-settlement vegetation types. This includes maintaining existing prairies and savannas and seeking opportunities to increase these cover types. The property is managed on a landscape scale, creating smooth transitions between cover types.

The property is monitored for invasive species such as buckthorn and garlic mustard. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grasslands. Wetlands are managed through limited disturbance to reduce the spread of reed canary grass. Woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of oak, hickory and desirable native species while removing invasive species such as buckthorn and honeysuckle.

Paradise Marsh Wildlife Area

Current State Ownership:	1,588 acres
Current Fee Simple Ownership:	1,588 acres
Current Project Boundary:	2,193 acres
Approved Property Master Plan:	None

Paradise Marsh Wildlife Area (WA) has long provided excellent habitat for a variety of wildlife and migratory waterfowl. During the early 1900s, cutting of marsh hay by farmers was a common practice. Farmers of the 1910-1930 time period indicate prairie chickens were common in the marsh area. In the early 1900s, drainage ditches were dug throughout the marsh and large portions of Beaver Creek were straightened. Some of the ditching efforts were for farming the muck soils underlying the wetland vegetation.

In 1962, the Wisconsin Conservation Commission purchased 425 acres of wetlands in the Paradise Marsh area. The intent of creating the Paradise Marsh WA was to eventually improve habitat conditions for waterfowl and pheasant by reducing further drainage of the marsh and providing undisturbed upland nesting cover. The boundaries of the Paradise Marsh WA are shown on **MAP F-4.**

A 30 acre wetland flowage is maintained north of County Trunk Highway CD at the southern end of the property. This impoundment was created with the installation of a short dike and water levels are managed with the associated water control structure. This impoundment drains west through a ditch, and eventually empties into Beaver Creek.

Soils, Geology and Hydrology

Paradise Marsh WA is located in the Southeast Glacial Plains Ecological Landscape. This landscape is made up of glacial till plains and moraines, moderately steep with northeast and southwest drumlins composed of glacial till materials deposited during the Wisconsin Ice Age. The wetland basin in the wildlife area consists of poorly-drained organic soils of the Houghton series. This soil type likely extends to 50 inches in depth. The uplands in the eastern quarter of the Paradise Marsh area are of the St. Charles-Ossian-Dodge association, which are silty soils, and are underlain by sandy loam glacial till. The low lying areas of the uplands are susceptible to poor drainage. The upland drumlins tend to be wetter than other upland sites as they seep groundwater. Agricultural interests have significantly altered the historic vegetation of the area.

Habitat and Vegetative Cover

Paradise Marsh Wildlife Area is dominated by wetland and grassland habitats with some timbered upland (**Map C-4**). **Table 11** has a breakdown of current cover types.

Table 11 Paradise Marsh Cover Types

Cover Types	% Cover
Agriculture	6
Grassland	26
Oak	4
Shrub	1
Upland Hardwood	6
Water	2
Wetland	55

The uplands at Paradise Marsh WA are composed of a matrix of grasslands, agricultural land, and small oak and upland hardwood woodlots. The grasslands, which have been re-seeded to both native and introduced grasses and forbs to create Surrogate Grasslands, are found on land formerly used for agricultural production. Native tall grass species have not grown well on this property so there are few native grass fields. To keep brush out of Surrogate Grasslands, some of these fields may be harvested for hay. Agricultural activity continues with annual production of row crops.

At least two of the small oak woodlots are overgrown Oak Savannas. The potential exists to convert these areas back to Oak Savanna with timber sales and invasive species management.

The large marsh on the Wildlife Area is bisected by Beaver Creek, which flows north-easterly approximately four miles to its outlet at Beaver Dam Lake. The marsh in the northeast portion of the property is of a shallow emergent type, and water is present during most of the growing season. Here cattails, bulrushes, and sedges dominate the vegetation. The fringe area of the marsh and the part of the marsh located in southwest portion of the property are seasonally flooded and are composed primarily of sedges and grasses, with reed canary grass dominating much of the area.

Administrative Facilities and Access

This property has seven surfaced and native surfaced parking lots serving it. Three lots are maintained on the north side of County Trunk Highway CD, one on the south side of County Trunk Highway G, and three on Paradise Road, a 3/4 mile long town road that also provides property access. Approximately two miles of primitive and lightly developed service roads are maintained on the property to provide access for maintenance to Department staff. These roads are not designated for public use, but provide foot-travel only access for the public to the property. Paradise Marsh Wildlife Area infrastructure is shown on **Map D-4**. There is one dike about 425 feet long with a water control structure on this property that creates an impoundment on the north side of County Trunk Highway CD.

Recreation

The main uses of this property include deer, waterfowl and small game hunting. This property is heavily used during the gun deer seasons and overcrowding may be an issue. There is a population of wild pheasants on this property that provide opportunity for pheasant hunting (this property does not receive supplemental pheasants from the state game farm). Opportunity for mourning dove hunting is enhanced through the establishment of sunflower food plots. Trapping opportunities for furbearing animals, such as mink and muskrat, exist on this property.

This property is considered a satellite wetland to the nearby Horicon Marsh. During migration periods, large numbers of waterfowl and other wetland birds can be observed at Paradise Marsh. Hiking and other wildlife watching are also popular activities on the property. Recently, geocaching has become a more popular activity on the property. Mushroom and berry picking are popular seasonal activities at Paradise Marsh.

Current Management

Current management objectives focus on protecting the watershed of Beaver Creek and managing for pre-settlement vegetation types. This includes maintaining existing prairies and savannas and seeking opportunities to increase these cover types. The property is managed on a landscape scale, creating smooth transitions between cover types.

The property is monitored for invasive species such as buckthorn and garlic mustard. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grasslands. Wetlands are managed through limited disturbance to prevent the spread of reed canary grass. Woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of oak, hickory and desirable native species.

Peter Helland Wildlife Area

Property for the Peter Helland Wildlife Area (WA) began to be acquired in 1972 to serve as a goose management area and a satellite unit for the Horicon Marsh. Today, the Peter Helland WA is a 3,586 acre property that consists of approximately 2,600 acres of wetland, 500 acres of upland grasslands, and about 250 acres of wooded habitat. The boundaries of the Peter Helland WA are shown on **MAP F-5.**

Current State Ownership:	3,586 acres
Current Fee Simple Ownership:	3,480 acres
Current Project Boundary:	4,807 acres
Property Master Plan:	None

Native Americans used the marsh as a hunting ground, probably for prairie chicken, deer, waterfowl, and small mammals. Following settlement by European immigrants and the development of drainage and dredging equipment, the marsh was partially drained to allow muck farming.

The wildlife area consists of wetlands, uplands, and the North Branch of Duck Creek. This portion of Duck Creek is a warmwater creek and not considered trout habitat. The creek was significantly altered by farming practices and currently does not have natural flow. Crystal Lake, the only inland lake in the CCPG properties, currently has an over population of bluegills

The wetlands range from Wet Prairie and sedge meadow to cattail marsh and disturbed areas dominated by reed canary grass. Shrub carr with dogwood and willow are interspersed within the low areas. The uplands are former agricultural areas with scattered oak woodlots. Some of the fields are planted with food crops for wildlife and others with native grassland for nesting cover.

Soils, Geology and Hydrology

Peter Helland Wildlife Area lies in a basin formed by the meltwaters from the last glacial period about 10,000 years ago. The majority of the property is flat; however, a ridge runs along the north side of the property on private land. There are upland pockets in the large expanse of wetland areas. The North Branch of Duck Creek flows in a westerly direction through the property. The soils are primarily comprised of organic and poorly drained Houghton-Adrian muck. The Boyer and Granby series, the second most prominent soils on the property, are loamy sand.

Habitat and Vegetative Cover

The Peter Helland WA is predominantly wetlands with some grasslands and minor amounts of woodlands (**Map C-5**). Table 12 provides a breakdown of current cover types.

Table 12 - Peter Helland Cover Types

Cover Types	% Cover
Agriculture	4
Aspen	<1
Developed	<1
Grassland	14
Oak	5
Shrub	<1
Upland Conifer	1
Upland Hardwood	1
Water	1
Wetland	73

Many of the Peter Helland WA wetlands were extensively disturbed. Large wetland restoration projects occurred in the mid 1990s on this property. Multiple scrapes and one small flowage were created during these restorations. Much of the wetlands can be classified as sedge meadow or closer to Duck Creek, Emergent Marsh. Due to the disturbance on these sites, many of the sedge meadow areas are predominantly reed canary grass with other exotics, though areas of hummock sedge marsh remain with cordgrass, bluejoint grass and various sedges being present. Native, invasive and hybrid cattails are present in Emergent Marsh on the property.

Approximately 25% of this property is considered uplands consisting of reclaimed agricultural fields planted into Surrogate Grasslands of both native and introduced species. Most of these fields are native grass and forb plantings, with the dominant grass species being big bluestem, little bluestem, switchgrass and Indian grass. Introduced grass species are primarily timothy or brome grass. Some fields remain in agricultural production, primarily in row crops or food plots.

The wooded uplands are predominantly oak or aspen woodlots. A tornado in 2008 destroyed most of the woodlots on the west side of this property. A restoration project is underway on a former oak woodlot just south of Healy Road, but heavy deer browse may limit the oak regeneration. Most of the remaining woodlots have infestations of invasive garlic mustard and buckthorn. Black locust is also dominant in some areas and is especially problematic when the woodlands border grasslands. There is a potential oak savanna restoration in the oak woodlot directly east of Crystal Lake.

State Natural Area

Springvale Wet Prairie State Natural Area (271 acres) is an open wetland complex of Wet Prairie grading into sedge meadow and Calcareous Fen situated along both banks of Duck Creek (**Map E-4**). This site is an ecological reference site (WDNR ERA 2005) for Wet Prairie. The prairie contains a significant grass component including cordgrass, big bluestem, and bluejoint grass. A mound located on the south creek bank supports many calcium-loving plants that are fen indicator species. Also present are two undisturbed springs and spring runs. Springvale Wet Meadow was designated a State Natural Area in 2007 (WDNR SNA d.).

Administrative Facilities and Access

Access to this property is gained by two county roads (County Trunk Highways P and SS) and four township roads (Pardeeville Road, Sawyer Road, Raddatz Road, and Healy Road). This property has 11 surfaced and native surfaced parking lots serving it. Approximately two miles of primitive service roads are maintained on the property to provide maintenance for DNR staff. These roads are not designated for public use, but provide foot-travel only access for the public to the property. Peter Helland Wildlife Area infrastructure is shown on **Map D-5**.

Recreation

The property is now used extensively for hunting, especially for deer, turkey, pheasant, and waterfowl, with heaviest use for deer hunting during the nine day gun season. Pheasant hunting is a popular activity. The small 'wild' bird population on this property is supplemented with game farm raised birds to increase hunting opportunities. Mourning dove hunting has become popular on this property, with food plots planted for dove management. Other small game hunting is also common. Trapping is very common, especially for muskrat, mink and beaver. Fishing is popular on Crystal Lake. Access is limited to Crystal Lake so motor boats are prohibited and canoes must be carried in. Due to the vast nature of the wetlands here, bird watching is becoming more popular. An organized triathalon routes much of the biking course on the paved public roads that run through this wildlife area.

Current Management

Current management objectives focus on protecting the watershed of Duck Creek and managing for pre-settlement vegetation types. This includes maintaining existing prairies, savannas, and sedge meadows and seeking opportunities to increase these cover types. The property is managed on a landscape scale, creating smooth transitions between cover types. Management issues have arisen with Duck Creek. Corrections will have to be implemented in a section where the creek has broken out of its bank and now flows in the ditch line under Sawyer Road, compromising the ability for fish to move upstream.

The property is monitored for invasive species such as black locust and garlic mustard. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grasslands. Wetlands are managed through limited disturbance to prevent the spread of aggressive invasive species. Woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of oak, hickory and desirable native species.

Pine Island Wildlife Area

Current State Ownership:	5,848 acres
Current Fee Simple Ownership	5,490 acres
Current Project Boundary:	7,566 acres
Approved Property Master Plan:	None

The Pine Island Wildlife Area (WA) is a block of public land stretching along the Wisconsin River, just upstream from the City of Portage. This property is nearly seven miles long and at its widest is about 1.5 miles across. The majority of the acreage is located in the corridor between the Wisconsin River to the north, and Interstate Highways 90/94, which parallel the river to the south. Approximately 3/4 of the property acreage is located in the northwestern part of Columbia County, and the balance of the property extends into northeastern Sauk County. Pine Island WA lies in the floodplain of the Wisconsin River and the Baraboo River, and it includes several islands in the Wisconsin River. This wildlife area was named for the large island in the Wisconsin River which is referred to as “Pine Island”. Prior to settling of the area and agricultural development, the island had a significant stand of white pine. The white pines were removed in the early 1900s by settlers for construction of barns.

Archaeological resource areas located on this property are shown in **MAP ARCH-2** in Appendix A.

The floodplain area between the two rivers was originally farmed by early settlers and as late as the 1950s. A hand dug-ditch in a wetland portion of this area still remains. Between 1890 and 1900, a levee was constructed by the Corps of Engineers on the south and north sides of the Wisconsin River for flood control purposes to protect the City of Portage and the farmlands along the river. The levee on the south side of the Wisconsin River runs the entire length of the wildlife area just north of Levee Road. The DNR has the responsibility for maintaining this levee.

Ross Bennett, a private businessman from Portage, was influential in promoting the idea of a wildlife area along the Wisconsin River west of Portage. The area was considered suitable for a wildlife area because of its use by Canada geese. During the late 1940s and early 1950s, several hundred Canada geese consistently used the area. In 1952, the Pine Island WA was established. The boundaries of the Pine Island WA are shown on **MAP F-6.**

The Wisconsin River is the dominant water resource on the property. It passes along the entire length of the northern part of the wildlife area. The river is commonly used by canoeists and power boats; however numerous sandbars can hinder navigation when water levels are low. The Baraboo River, a major tributary to the Wisconsin River, drains the watershed south and west of the wildlife area. Spring runoff and heavy rainfall events in the Baraboo River watershed can create extensive flooding and inundate large portions of the floodplain on this property.

Soils, Geology and Hydrology

Soils in the Pine Island WA are characteristic of glacial lake basins. Alluvial, loamy and muck soils are the most prominent. The alluvial segment is generally poorly drained with high available water capacity. Loamy soils have sandy to silty characteristics with seasonal variation in droughtiness. Soil depth of the loamy classes varies from 10 to 40 inches. Muck soils are of the Adrian series and have 10 to 40 inches of peat and muck over sand.

The Cambrian sandstone bedrock underlying the wildlife area is covered with surface deposits of glacial lake materials from the Green Bay lobe of the Wisconsin Glacier. Modification of the glacial deposits has resulted from fluvial action of the Wisconsin River and surface weathering agents. Due to the loamy sand soil, water permeability is high. Water level fluctuations of the Wisconsin River definitely affect the water table of the sandy soils.

Habitat and Vegetative Cover

Pine Island WA is the largest property in the CCPG and contains a diverse mix of cover types (**Map C-6**) along the Wisconsin River. **Table 13** provides a breakdown of current cover types on the property. This wildlife area contains one of the largest tracts of contiguous grassland in the area. Approximately 1,000 acres, almost a quarter of the property, are managed and maintained as grassland habitat. These grasslands consist mainly of Surrogate Grasslands, re-established after the lands came out of agricultural production, and are seeded to both native and introduced species of grasses and forbs. Complementing the grasslands are large stands of oak woodlands. Many acres of oak savanna have been restored in these areas and restoration efforts are ongoing.

Large acreages of Pine Island WA are dominated by Oak Woodlands and Oak Openings. Black oak is prominent on the drier, higher sites, while white and swamp white oakare prevalent in the lower areas. This property has one of the largest intact swamp white oak savannas in the state. Swamp white oak savannas have not been thoroughly investigated as a distinct community type, but they appear to be a rare type of oak savanna community, exotic species are not a large issue in the wooded areas, though small infestation of garlic mustard and Japanese hedge parsley exist.

Table 13 Pine Island Cover Types

Cover Types	% Cover
Agriculture	4
Aspen	5
Bottomland Hardwood	16
Developed	2
Wetland	15
Grassland	18
Oak	26
Sand Bar	1
Shrub	3
Upland Hardwood	9
Water	1

The large Surrogate Grasslands are mostly planted to native grasses and forbs, though some cool season grass plantings are present. The dominant grasses present are big bluestem, little bluestem, Indian grass and switchgrass with needlegrass present in some areas. Many native forb species are present, such as flowering spurge, spiderwort, wild white indigo, common milkweed and violets. Invasive species, especially crown vetch and spotted knapweed, are threatening many areas of grassland. Work is being conducted to remove these species from the property.

Many sloughs and seasonal ponds exist on the floodplain, and four of the main sloughs generally hold water throughout the year. In addition to the natural water features on this wildlife area, one wetland restoration exists, which provides three shallow wetland scrapes. Several borrow ponds dug during the development of the interstate highway. These ponds provide some fishing opportunity and were used in the past as rearing ponds for walleye and largemouth bass.

Along the Wisconsin River, primarily north of Levee Road and on the islands, bottomland hardwoods are the dominant habitat type. Emergent wetlands, sedge meadows, small upland woodlots, and scattered aspen stands round out the dominant habitat types that can be found on the wildlife area. The Pine Island WA was identified as an important place for work on medium-sized rivers and streams of upper Midwest significance and Floodplain Forest communities of state significance In the *Wisconsin Wildlife Action Plan* (WDNR 2006b).

Most wetlands on Pine Island can be defined as Floodplain Forest, emergent wetlands or sedge meadow. There is also Wet-mesic Prairie and possibly Wet Prairie plants interspersed (mainly in swales) in the greater Surrogate Grasslands. The dominant species in the Floodplain Forests are silver maple, swamp white oak, river birch and green ash. Some of the Emergent Marshes on this property are very unusual. In dry years, there may be no standing water, yet the water table is high enough that emergent vegetation still exists. Unlike other properties, cattails are not the dominant feature of most of Pine Island's emergent wetlands. Wild rice, rushes and sedges are the predominant vegetation. Some high quality sedge meadows still exist, but many are dominated by the invasive reed canary grass due to past disturbance. A large population of Japanese knotweed presents a threat to the floodplain wetlands.

State Natural Area

The Pine Island Savanna (798 acre) State Natural Area was designated in 2007 (WDNR SNA e.). The savanna is situated along the Wisconsin River on the north side of Levee Road and on Pine Island itself (**Map E-5**). This natural area features one of the largest floodplain savanna remnants in the state along with several patches of Sand Prairie. This natural area is considered an ecological reference site (WDNR ERA 2005) that provides an important opportunity for Pine Barrens and Sand Prairie restoration,

Primary Sites

Pine Island Grassland – 1,039 acres (CCPG04)

This site is a large area of open grasslands and wetlands, Shrub-carr, Emergent Marsh, and scattered trees. The slight variations of topography and soils have resulted in a diverse landscape that supports numerous large populations of sedge wren, grasshopper sparrow, field sparrow, and bobolink. This site provides habitat for dickcissels (SC), bell's

vireos (THR), Henslow's sparrows (THR), Regal Fritillaries (END), and Blanding's Turtles (THR).

Acoustical surveys indicate good quality habitat for bats is present on this site and throughout the Pine Island WA. Existing cover types (prairie, savanna, and wetland) provide habitat for the six species of bats observed the spring and fall movement and summer residency periods.

Pine Island Floodplain Forest – 159 acres (CCPG05)

This site is bordered to the north by the Wisconsin River and to the south by Levee Road. Floodplain Forest, dominated by silver maple, river birch, and green ash, comprises most of the site. Within this site are also oxbow lakes, Southern Sedge Meadows, and Dry-mesic Prairies. Although no state-listed species were noted from this site, breeding birds include song sparrow, eastern wood-pewee, red-eyed vireo, American redstart, ovenbird, wood thrush, and house wren (Mossman et al. 2009).

Administrative Facilities and Access

Approximately two miles of gravel town roads provide public access to the interior of the property. The DNR maintains 24 un-surfaced and gravel parking lots at the wildlife area. An additional two miles of DNR owned lightly developed service roads provide access to the property for property maintenance. Although these roads are closed to motorized public access, they are open for public use and property access by foot-travel only.

One boat launch, located on the north side of Levee Road, is maintained at the Pine Island WA to provide access to the Wisconsin River. This is the only public boat launch on the river between the Cities of Wisconsin Dells and Portage. It is undersized and often there is insufficient room for parking of vehicles and trailers. It is a very difficult boat landing to maintain because the gravel at the launch site is continually washed away by the river during high water events.

There are six buildings owed and maintained by the DNR at the Pine Island WA. The Pine Island headquarters building provides office and shop space for Wildlife Management field staff. Adjacent to the headquarters building is a large, newly constructed storage shed used for equipment and chemical storage. Three other smaller sheds on the property provide additional cold storage space. A cabin on one of the islands is used by the warden staff during training and while patrolling the Wisconsin River. Pine Island Wildlife Area infrastructure is shown on **Map D-6**.

Recreation

Public hunting is by far the most common form of recreation at Pine Island WA. This property is the most heavily used CCPG property for deer, pheasant, and mourning dove hunting. Pheasant hunting is very popular on the property, despite the limited natural reproduction. The pheasant hunting opportunities are supported almost exclusively by the stocking of captive raised pheasants from the Poynette State Game Farm. Mourning dove hunting at Pine Island WA has become very popular since the season was introduced in 2001. Annually, approximately 16 acres of sunflowers are planted on the property to attract mourning doves and provide a unique hunting experience. Deer hunting is very popular at Pine Island.

Crowding can be an issue, particularly during the nine day traditional gun hunting season. Hunting opportunities for waterfowl, turkey, and many other small game species exist at the property, as well as for hunting and trapping of furbearing animals.

A water control structure along Blount Road is to used to control the water levels in the restored wetland.

Recreational bird watching is becoming increasingly popular at this wildlife area. In recognition of the high value of the area for both bird watching and bird conservation, Pine Island WA is included in the Leopold-Pine Island Important Bird Area (IBA), which began development in 2004. The Leopold-Pine Island IBA covers over 11,000 acres of marsh, grassland, barrens, floodplain, and upland hardwood forest straddling the Wisconsin River in Sauk and Columbia counties west of Portage. In addition to the state wildlife area, the IBA includes four additional large tracts of land managed by federal agencies, private landowners and non-profit organizations. This IBA harbors most of the breeding-bird species representative of the natural floodplain and adjacent upland of this central Wisconsin landscape—including many declining species such as red-headed woodpecker, bobolink, and meadowlark, which are benefiting from management for savanna and prairie habitats. The "missing" species characteristic of more extensive wetlands, grasslands, barrens and forests stand a good chance of appearing in future years as management proceeds.

A Class 1 dog training grounds and a Class I dog trial grounds have been designated at this wildlife area. Both the trial and training grounds are open year round. The use of horses is permitted in the dog trial grounds during approved dog trial events. Overnight camping in self-contained units is allowed on the dog trial grounds for participants in the trials. The Pine Island Field Trial Association, a private entity, has taken on the responsibility of maintaining the trial grounds and has constructed and maintains a bird pen on the grounds. The presence of the field trial grounds (see **Map E-5**) has brought some user conflicts to the property. The use of horses during dog trials has led to unauthorized recreational horseback riding at the property, which is an ongoing problem. Increasingly, non-dog trainers are bringing their dogs to the training grounds to run or walk the dogs without having to follow the nesting season leash laws on other DNR managed lands. There have been complaints from property users of participants in dog trials forcing others from the dog trial grounds.

Additionally, the property is used seasonally for canoeing, hiking, cross country skiing, and snowshoeing. As with many properties, the interest in geocaching at the site has increased in recent years, and many permits have been issued. Although currently not allowed on this wildlife area, requests have been made by the public to establish mountain biking trails, dog-sledding trails and equestrian trails here. Camping is not currently allowed on the property, but unauthorized camping frequently occurs on the state-owned lands, particularly on the islands, sandbars, and shorelines of the Wisconsin River.

Current Management

Current management objectives for this wildlife area focus on protecting the Baraboo and Wisconsin River corridors and managing for pre-settlement vegetation types. This includes maintaining existing prairies, savannas and wetlands and seeking opportunities to increase these cover types. The property is managed on a landscape scale to create smooth transitions between cover types. Phasing out red pine plantings to allow for the conversion to oak savanna in some locations is another important management objective.

Great opportunities exist to maintain and restore oak savanna communities on this property. General land management includes using a mix of mechanical, chemical and prescribed burning methods. The property is monitored for invasive species such as spotted knapweed and garlic mustard. Biological control for spotted knapweed is currently occurring. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grassland. Wetlands are managed through limited disturbance to prevent the spread of reed canary grass. Woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of Floodplain Forests.

Swan Lake Wildlife Area

Current State Ownership:	2,334 acres
Current Fee Simple ownership:	2,333 acres
Current Project Boundary:	4,416 acres
Approved Property Master Plan:	None

Swan Lake Wildlife Area (WA), located in Pacific Township, was designated a wildlife area in 1963. Dominated by wetlands, the initial goal was to manage the property for duck and sandhill crane production, and to provide opportunity for public hunting, trapping and educational opportunities.

The property lies adjacent to and immediately to the east of the City of Portage. Residential development surrounds the property on three sides, particularly the City of Portage to the west, rural subdivisions on the south and east sides, and the many homes and cottages located on the shores of Swan Lake to the northeast. The boundaries of the Swan Lake WA are shown on **MAP F-7.**

Archaeological resource areas found on this wildlife property are shown in **MAP ARCH-3** in Appendix A.

The Fox River bisects the Swan Lake WA flowing northeast from its mouth at Swan Lake. Nearly 80% of the wildlife area is classified as wetland habitat. Although there are small areas of swamp conifers and emergent/open water wetlands, the vast majority, approximately 75% of the total area of the property, is dominated by a vast cattail marsh.

A dike creates a wetland impoundment in the marsh in the southwest portion of the property. For a period of time this dike was maintained for Department vehicle access to the marsh and to manipulate water levels in the impoundment. Extensive muskrat damage and difficulty in making the necessary extensive repairs to this dike have all but rendered it non-functional, and it is no longer maintained.

Soils, Geology and Hydrology

Soils within the Swan Lake WA belong to the Houghton-Adrian-Palms association, which are poorly drained organic soils. The Granby-Alluvial land, wet Morocco association also occurs as poorly drained sandy soils with sandy subsoil. The soils are predominantly of the Boyer sandy loam, Houghton, and Adrian-Gilford-Morocco soils, which consist of muck, fine sandy loam and loamy sand. The muck type soils make up 80% of the soil types. The sandy upland soils are susceptible to drought.

Habitat and Vegetative Cover

The Swan Lake WA is predominately wetlands with relatively smaller amounts of upland forests and grasslands (**Map C-7**). **Table 14** has a breakdown of current cover types on the wildlife area.

Table 14 Swan Lake Cover Types

Land Cover	% Cover
Aspen	6
Developed	1
Grassland	4
Oak	8
Sand Bar	1
Swamp Conifer	1
Swamp Hardwood	1
Upland Conifer	1
Wetland	77

The uplands on the DNR-owned land are primarily oak woodlands or aspen stands. Nestled among the aspen and oak woodlands are grassland fields, both native and introduced grass species, with remnant species, such as blue eyed grass and lupine, found growing in two of these grassland fields. Black locust is an invasive species of major concern here, as it occurs extensively in both wooded and grassland areas. Crown vetch was planted in the former gravel pit area off of County Trunk Highway P as an erosion control measure many years ago, and has now spread into the adjacent grasslands. Detailed descriptions of the grassland vegetation found on this property are included in the primary site descriptions below. Large areas of both Emergent Marsh with scattered potholes and sedge meadow occur on this property. The Emergent Marsh is dominated by cattails, though rushes and sedges occur throughout the marsh as well. Purple loosestrife is beginning to take hold in some areas of this marsh. A detailed description of the extensive sedge marshes located on the property is included in the primary site descriptions below.

Primary Sites

Swan Lake WA has four primary sites containing over 1,000 acres of diverse and rare plant communities (**Map E-9**).

Swan Lake Sedge Meadow and Barrens – 702 acres (CCPG09)

This site provides landscape level opportunities to promote globally imperiled natural communities and a breeding population of a State Threatened species. The majority of this site is a high quality Southern Sedge Meadow with Calcareous Fen components. This area is significant because of the size of the Southern Sedge Meadow and limited amount of invasive species.

Oak Barrens remnants are found on the peninsula and edges of the upland island at the north end of the site. Black oak dominates with white oak and red maple present in smaller numbers. The understory is dominated by Pennsylvania sedge and bracken fern. Characteristic forbs include bird's-foot violet, columbine, frostweed, prairie alumroot, bastard-toadflax, prairie phlox, wood-betony and common spiderwort. Hazelnut and early low blueberry are abundant in the shrub layer, and many areas are being invaded by common buckthorn. Several openings are present on the island and represent former agricultural fields and homesteads. Depending on the level of shading, these openings vary in quality from smooth brome and Kentucky bluegrass dominated fields to communities more closely resembling Sand Prairie. The areas of Sand Prairie contain such species as switchgrass, little blue-stem, June grass, numerous sedge species, frostweed, arrow-leaved violet, lyre-leaved rock-cress, Carolina puccoon, hoary puccoon, bastard-toadflax, dwarf dandelion, common spiderwort, and blue-eyed grass.

Oak Barrens are also present along with Oak Opening and small areas of Dry Prairie at the south end of the property. The terrain has numerous esker-like ridges with wet swales. The Oak Opening and Dry Prairie areas have bur oak 5-18 inch diameter along with big blue-stem, cylindrical blazing-star, whorled milkweed, leadplant, side-oats grama, silky aster, prairie drop-seed, June grass, Kalm's brome, and needle grass. Japanese hedge-parsley has invaded the shaded areas.

A large old field with Sand Prairie elements persists in the center of this site. This field has species that were likely planted during prairie restoration, as well as species more typical of Sand Prairies.

This site provides habitat for Blanding's turtle (THR). Breeding bird surveys were not done here and should be considered a high priority for future research.

Swan Lake Tamaracks – 205 acres (CCPG08)

This site contains a high quality Southern Tamarack Swamp (rich) and Southern Sedge Meadow on the north side of the Fox River within the wildlife area. Tamaracks in southern Wisconsin have been on the decline due to many factors including hydrologic manipulation, invasive species, drought, and difficulty with reproduction. This site harbors a healthy stand of mature tamarack over a dense shrub layer of poison sumac, bog birch, and willows, with a thick herbaceous layer of typical Southern Sedge Meadow species. Southern Sedge Meadow, with a lack of reed canary grass or purple loosestrife in the surveyed areas, dominates the majority of the site. Adjacent areas include Shrub-carr, an upland oak forest with a Spring Pond, and Emergent Marsh. Tamarack saplings are common on the gradient between the Southern Tamarack Swamp (rich) and the Southern Sedge Meadow.

Due to the difficulty accessing this site and its previous unknown quality, biotic inventory has been limited. Breeding bird, herptile, and more comprehensive rare plant and natural community surveys are recommended for this site. High quality habitat appears to be present on adjoining private lands and efforts should be made to survey these areas.

Swan Lake Wetlands – 94 acres (CCPG07)

This site consists of a Southern Sedge Meadow with occasional pockets of cattail marsh, common reed grass, and reed canary grass. With the exception of a few clumps of dogwood and willow, the site is open and free of woody growth. Much of the meadow is permanently flooded although wet-mesic areas are also present. Shallow ponds are scattered throughout the site and permanent ditches flank the road. To the north, the property borders the Fox River, a medium-sized, shallow, mud-bottomed, slow-flowing stream. This river is undoubtedly important in providing hibernating sites for turtles. Further upstream, the river connects to the Wisconsin River via the Portage Canal, providing a good dispersal corridor for aquatic species.

Swan Lake Wet-mesic Prairie – 46 acres (CCPG06)

This site consists of Wet-mesic Prairie, a globally imperiled natural community, within a large matrix of fire-dependent oak forests and high quality Southern Sedge Meadow. The Wet-mesic Prairie is dominated by tall grasses including big blue-stem and blue-joint grass with Indian grass and prairie cordgrass. Forbs consist of late goldenrod, grass-leaved goldenrod, swamp milkweed, prairie blazing-star, and white wild indigo.

Administrative Facilities and Access

Access to the property is limited, due in large part to the expansive wetland areas that define Swan Lake WA. Three gravel parking areas are maintained, one on County Trunk Highway P at the southern boundary of the property, one off State Highway 33 on the northern boundary of the property, and one in the northeast corner of the property at the end of Ontario Street. An abandoned gravel pit at the County Trunk Highway P parking area is a popular place for target shooting. This activity however continually results in frequent littering problems and is often of concern to other users of the property and neighbors, given the high level of residential development adjacent to the wildlife area.

Approximately two miles of gravel and un-surfaced primitive and lightly developed service roads provide vehicular access for Department staff for property maintenance needs. A service road from County Trunk Highway P heads north for 1/2 mile to the old dike. A short distance away, at the edge of the wetland, a second service road continues northeast into the property and provides access to the upland “island” in the marsh. These service roads are available for property users to access the property by foot travel only. A short boardwalk across the wetland connects these two service roads, and provides the public easy access to the interior uplands. Swan Lake Wildlife Area infrastructure is shown on **Map D-7**.

Recreation

Hunting, trapping, fishing and canoeing are all permitted recreational activities on the property, however, the Swan Lake Wildlife Area is most frequently used by deer and waterfowl hunters. Opportunities for turkey, small game hunting and trapping also exist at the property. Canoeing and fishing are popular activities for the stretch of the Fox River that runs through this property. The natural setting of the property also provides ample hiking and wildlife viewing opportunities, especially for property neighbors in the adjacent residential developments. Target shooting is also a popular activity on the property, particularly in the parking areas off County Trunk Highway P. Erosion caused by Off-road Vehicles (ORV) is evident in the gravel pit off County Trunk Highway P and littering is a major issue at that same parking lot and the parking lot at the end of Ontario Street.

Current Management

Current management objectives focus on protecting the watershed of the Fox River and managing for pre-settlement vegetation types. This includes maintaining existing prairies, savannas, and sedge meadows and seeking opportunities to increase these cover types. The property is managed on a landscape scale to create smooth transitions between cover types.

The property is monitored for invasive species such as black locust and crown vetch. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grasslands. Wetlands are managed through limited disturbance to prevent the spread of reed canary grass. Oak woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of oak, hickory and desirable native species. Aspen stands are managed to keep the stands in a young age class for wildlife habitat purposes.

Rocky Run Fishery Area

Rocky Run Creek, a tributary to the Wisconsin River, is a long, low-gradient steam which originates at Mud Lake Wildlife Area. Rocky Run Fishery Area (FA) is located along the creek in a broad valley which is generally bordered by steep slopes. This stream valley is generally isolated from the surrounding land uses, and creates a semi-wild setting. The stream valley contains a diversity of land types, and plant and animal communities.

Current State Ownership:	743 acres
Current Fee Simple Ownership	737 acres
Current Project Boundary:	1,368 acres
Approved Property Master Plan:	1984

In the late 1940s parts of the upper portions of Rocky Run Creek, above the current fishery area, were channelized to drain the wetlands for agricultural use. In 1954, attempts were made to form a drainage district. The proposed drainage project was opposed by the Wisconsin Conservation Commission and the district was not approved. In 1959, spurred to protect these wetlands, the DNR Wildlife Management staff proposed a project to acquire and protect wetlands east of State Highway 22, near the present-day boundary. This project was not approved. In 1961, the Wisconsin Conservation Commission approved the Columbia County Remnant Habitat Program. The acquisition of the first 185 acres occurred in 1969 under the Remnant Habitat Program for the future Rocky Run FA. The boundaries of the Rocky Run FA are shown on **MAP F-8.**

Archaeological resource areas found on this wildlife property are shown in **MAP ARCH-4** in Appendix A.

Rocky Run Creek flows north, then west before joining the Wisconsin River in west-central Columbia County. Rocky Run FA is located between U.S. Highway 51 and State Highway 22, and approximately eight miles of the creek flow through the project area. The upper six miles of the segment of Rocky Run Creek which flows through the fishery area is designated as Class 2 trout water and the lower two miles Class 3 trout water. This eight-mile segment of stream is characterized by long, slow moving sections, interspersed with riffles and deep pools. The stream bottom is predominantly sand with scattered gravel – rubble areas. Gravel suitable for spawning is limited, though some natural reproduction of both brook and brown trout occurs. Over 90 springs enter this stretch of Rocky Run Creek and greatly increase base flow and contribute to stable water temperatures capable of supporting trout.

While the dominant species in Rocky Run Creek is brown trout, stream surveys have reported many other native fish species such as brook trout, white sucker, blacknose dace, brook stickleback, central mudminnow, black bullhead, creek chub, bluntnose minnow, fantail darter and Johnny darter. Lower portions of the creek also support stocked populations of rainbow trout.

To the east, upstream of the fishery area, stream channelization and wetland drainage have led to high summer water temperatures and low winter water temperatures. Prior to the land alterations, this upstream area quite likely supported brook trout, but it is currently not thought to provide suitable trout water. West of US Highway 51 the water temperatures exceed the range for trout survival so warmwater fisheries dominate though occasional large brown trout are caught.

Soils, Geology and Hydrology

Located on the terminal moraine of the Wisconsin glacier, the soils of the Rocky Run FA are composed of glacial till material and residue from water tolerant plants. Slopes are steep within the valley. Soil types are of five major associations. The soils immediately adjacent to Rocky Run Creek are classified in the Houghton-Adrian association. These are nearly level, organic and poorly drained. The upland soils consist mainly of two types: the Kidder-Wyocena and the Plainfield associations. They are well drained, sandy loam soil, underlain by sand or glacial till. The surrounding Grellton-Friesland and Boyer-Dresden soils are well drained, sandy loam.

Habitat and Vegetative Cover

The Rocky Run FA primarily contains upland oak forests with grasslands with abundant wetlands along the stream (**Map C-8**). **Table 15** has a breakdown of current cover types on the property.

Extensive lowland brush wetlands dominated by alder and willow species are located adjacent to Rocky Run Creek on the west end of the property. A small wetland restoration of approximately 25 acres exists is also found at the west end of the property along with an earthen dike that impounds a warmwater feeder ditch to Rocky Run Creek. Emergent vegetation and open water areas characterize this restored wetland.

Several small ground-water fed impoundments exist at the fishery area.

The uplands at Rocky Run FA are comprised primarily of grasslands and Oak Opening/Woodland. Most of the former agricultural lands have been seeded to native grasses and forbs, or to introduced species (e.g., smooth brome). Prairie remnants occur throughout the Oak Savanna matrix, including a Dry Prairie in a box canyon, and Sand Prairie that straddles the west end of the property and adjoins private lands. Herbaceous invasives, primarily spotted knapweed and sweet clover, threaten the diversity of these grasslands, along with woody invasive species such as black locust, buckthorn, sumac and prickly ash. Frequent prescribed burns are significantly enhancing the quality of the oak savannas and reducing impacts of invasive species such as Japanese hedge parsley. A small portion of the uplands is in red pine plantations.

Table 15 Rocky Run Cover Types

Cover Type	% Cover
Developed	1
Grassland	26
Oak	34
Upland Conifer	4
Wetland	35

State Natural Areas

The Rocky Run Oak Savanna State Natural Area was established in 1988 (WDNR SNA f.). Only a portion of the natural area lies within Rocky Run Fishery Area. The 441 acre Rocky Run Oak Savanna occupies widely differing topography on a south-facing slope above Rocky Run Creek (Map E-6). The eastern portion is gently rolling, while the west is very steep and dissected containing two sheer-walled box canyons cut through Cambrian sandstone. As the topography varies so does the bur, white and black oak savanna canopy structure. The canopy is open on the upper slopes and nearly closed on the relatively flat lower slope, with open-grown oaks and scattered groves of oak, hickory, black cherry and red cedar interspersed with prairie. This site is considered an ecological reference site (WDNR ERA 2005) that provides an important opportunity for Oak Barrens and Dry Prairie management and restoration.

Primary Sites

Rocky Run West Oak Savanna and Wetlands – 290 acres (CCPG12)

The western portion of this site, west of Dunning Road, contains a wetland mosaic of Southern Sedge Meadow and Shrub-carr with Calcareous Fen elements. An impoundment, with varying densities of cattail, provides habitat for rare reptiles and amphibians, but has also contributed to the reed canary grass infestation of the wetland to the east. The uplands contain dry forests of oak, red pine plantations, and open fields. The open fields are sandy, with some providing habitat for ornate box turtles. The eastern portion of this site consists of disturbed Sand Prairie, old field, pine plantations, and oak forest. The Sand Prairie areas provide habitat for ornate box turtles and other fields likely supported historical populations.

Administrative Facilities and Access

Approximately 4.4 miles of primitive service roads are maintained on the property that provide maintenance access for DNR staff and are open for foot travel use by hunters, hikers, birders, and skiers. Five gravel and unsurfaced parking lots are located at access points on the periphery of Rocky Run Fishery Area, including at State Highway 22, Dunning Road (two sites), Phillips Road, and Morse Road. Rocky Run Fishery Area infrastructure can be found on **Map D-8.**

There is one dike about 1,000 feet long on the western potion of this property that forms an impoundment. Water levels are controlled by one water control structure on this dike.

Recreation

Hunting for deer, turkey, small game, and trout fishing are the primary recreational uses of the property. Hiking, cross country skiing, and snowshoeing are also enjoyed. Birding is popular on the fishery area and in the adjacent portion of the Rocky Run Oak Savanna State Natural Area. This property has been part of the Audubon Christmas Bird Count for many years.

There is also evidence of mountain bike and horseback riding usage at the property. These are not authorized uses of this property and management concerns are raised when these uses occur in the state natural area. A snowmobile trail, which is a part of a larger Columbia County network of trails, traverses the property from east to west between State Highway 22 and Dunning Road.

Current Management

Current land management objectives focus on protecting the watershed of Rocky Run Creek and managing for pre-settlement vegetation types. This includes maintaining existing prairies and savannas and seeking opportunities to increase these cover types. The property is managed on a landscape scale to create smooth transitions between cover types. The primary fishery management objective of Rocky Run Creek is to maintain the trout population, which includes stocking of brown and brook trout, and fish habitat development.

The property is monitored for invasive species such as spotted knapweed, Japanese hedge parsley, garlic mustard, and black locust. Biological control of spotted knapweed is occurring on this property. Prairie and savanna areas are managed and maintained through prescribed burning, mowing, and herbicide application to limit brush encroachment and encourage vigorous growth of native plants associated with these communities. The wetlands are managed with limited disturbance to prevent the spread of reed canary grass. Management that involves oak trees follows guidelines that prevent the spread of oak wilt.

Rowan Creek Fishery Area

Current State Ownership:	655 acres
Current Fee Simple Ownership	644 acres
Current Project Boundary:	1,061 acres
Approved Property Master Plan:	1984

The first parcel of land (4.75 acres) for the Rowan Creek Fishery Area (FA) was acquired from Columbia County in 1940. Most of the property was purchased in the mid-1980s and current ownership is at 655 acres. The boundaries of the Rowan Creek FA are shown on **MAP F-9.**

Rowan Creek FA is located directly south of the Village of Poynette and extends both to the west and east from the Village. Rowan Creek drains a 60-square-mile area and passes through a valley bordered by steep hillsides as it flows westward to Lake Wisconsin and the Wisconsin River. The upper four miles of the creek (upstream from Poynette) are designated Class 1 trout waters and the lower eight miles (Poynette downstream to County Trunk Highway J) is designated Class 2 trout waters. While the dominant species is brown trout, stream surveys have reported many other native fish such as brook trout, northern pike, walleye, largemouth and rock bass, as well as numerous forage species including mottled sculpin (a coldwater indicator species), brook stickleback, central mudminnow, blacknose dace, creek chub, common shiner, white sucker, American brook lamprey (a native, non-parasitic lamprey), black bullhead and fathead minnow.

Archaeological resource areas found on this wildlife property are shown in **MAP ARCH-5** in Appendix A.

Soils, Geology and Hydrology

Rowan Creek lies within a U-shaped valley as it flows westerly to the Wisconsin River. The valley floor varies in width from 1/4 mile to one mile with adjacent hilltops rising over 200 feet above the streambed. Gradient on the portion of the stream above Poynette falls 30 feet/mile, whereas in the lower region the gradient is 7 feet/mile. Rowan Creek flows through expansive wetlands in the upper reaches and is bordered by bluffs in the lower area.

Soil types within the project area are of four major associations. The Granby and Houghton-Adrian associations compose the primary soils of the valley floor. They are deep and poorly drained, varying in composition from organic to sandy loam, alluvial soils. The upland soils consist mainly of the Kidder-Wyocena and Plainfield associations. They are well drained, sandy loam soil. The Rowan Creek watershed consists of silty soils with high available water capacity. Soils of this area are generally of the Plano and St. Charles associations.

Habitat and Vegetative Cover

The Rowan Creek FA Is dominated by wetlands and bottomland forests with some upland forests and grassland cover types (**Maps C-9a and b**). **Table 16** has a breakdown of current land cover on the property.

Table 16 Rowan Creek Cover Types

Cover Types	% Cover
Bottomland Hardwood	2
Developed	1
Grassland	8
Oak	16
Shrub	2
Swamp Hardwood	13
Upland Conifer	5
Wetland	53

The majority of the vegetation of this fishery area consists of wetlands with many wetland types present including Sedge Meadow, Shrub-carr marsh, Emergent Marsh, and bottomland hardwoods. Many of these wetlands, especially on the western side of the property, are of fairly high quality, though invasive species such as reed canary grass are present in some areas.

The upland areas consist of oak forests and degraded oak savanna, small grassy areas and red pine plantations. Remnant oak savanna forb species such as leadplant, Black-eyed Susan and puccoon along with Indian grass and little blue stem are present in a degraded oak savanna on the west side of the property that is currently undergoing a restoration project. Buckthorn is a major invasive species problem in the upland wooded areas.

Administrative Facilities and Access

Three maintained gravel parking lots are available off County Trunk Highway J, McMillian Road and Loveland Road. Two parking lots, including a multi-use trail head parking lot, are available at County Trunk Highway CS. A parking area maintained by the Village of Poynette and adjacent to the water treatment plant also serves as access to the trail system. The Rowan Creek Fishery Area contains 3.5 miles of multi-use service roads and trails. Half of the system (1.75 miles) consists of primitive service roads that are not graveled, but are available for public foot travel. The other half is part of the designated hiking trail system and includes floating boardwalks, benches and informational kiosks.. Rowan Creek Fishery Area infrastructure is shown on **Map D-9a and b**.

Recreation

The recreational opportunities at this fishery area include: hunting, trapping, hiking, cross country skiing, angling, fly fishing, berry picking, wildlife viewing, canoeing and bird watching. The 3.5 mile of accessible hiking trails and service road are heavily used, both in the summer and the winter. Recently, geocaching has become a more popular activity on the property. Biking is not allowed, but mountain bikers have been observed on site. Users have expressed interest in expanding snowmobile use too. An existing snowmobile trail travels north/south on the eastern part of this property, and connects a larger network of trails in Columbia County. The hiking trail system on the property connects to a trail system within the Village of Poynette. Part of the fishery area lies within the Village of Poynette which limits public hunting. Adjacent landowners have requested that hunting opportunities be limited to archery-use only and prohibiting the use of guns in the Rowan Creek FA.

Current Management

Current management objectives focus on protecting the watershed of Rowan Creek and managing for pre-settlement vegetation types. This includes maintaining existing savannas and seeking opportunities to increase these cover types. The property is managed on a landscape scale to create smooth transitions between cover types. The primary management of Rowan Creek is for trout, which includes stocking of brown and brook trout and habitat development. Habitat improvement projects have included extensive rip rap, bank stabilization and fencing, and installation of in-stream habitat structures such as boom covers, and brush deflectors.

The property is managed for invasive species such as buckthorn and garlic mustard. Oak savanna areas are managed and maintained through prescribed burning, mowing, and herbicide use to limit brush encroachment and encourage vigorous grasslands. Woodlands are managed in a manner that limits the spread of oak wilt and encourages regeneration of Floodplain Forest.

Findings and Conclusions

This section presents the findings and conclusions from the Columbia County Planning Group's (CCPG) Regional and Property Analysis. The first two sections summarize existing conditions and trends on the properties and in the region. Specific trends addressed include the ecological significance and capability of the property, as well as the property's recreational needs, opportunities, limitations and significance. This section does not include every finding or draw every conclusion; rather it provides a summary of the major findings and conclusions.

The findings and conclusions presented here will help guide the CCPG future management, use, and development by highlighting significant opportunities and limitations on the property, and defining a reasonable range of management alternatives that may be considered in the master planning process. As planning for the property continues, conclusions will ultimately help define the property's future Vision and Goals.

The CCPG Properties

The CCPG properties encompass seven State Wildlife Areas (20,551 acres) and two State Fisheries Areas (1,398 acres). Five State Natural Areas (2,390 acres) have been designated within the boundaries of the Wildlife Areas and one has been designated within or adjacent to the boundaries of a Fisheries Area. In total, the CCPG comprises 21,949 acres of state protected and managed land. The scope of use and management of a state property is governed by its official designation.

These properties are primarily located in Columbia County with three properties crossing county borders into Dane (Lodi Marsh), Sauk, (Pine Island) and Marquette (French Creek) Counties. The CCPG is connected by an extensive road network with the region and major Midwest metro areas (e.g., Twin Cities, Madison, Milwaukee, and Chicago).

The CCPG is close to high population growth areas in southern and southeastern Wisconsin. In Columbia County alone the population is projected to grow by 21% over the next 30 years. This population growth could significantly affect the outdoor recreation use on the CCPG properties. It could also result in land use or resource utilization changes (e.g., greater use of groundwater) that could impact the CCPG properties. The goal of the master planning process is to manage the CCPG so they will continue to provide unique, high-quality natural resources and recreational experiences in an increasingly developed and populated landscape.

ECOLOGICAL SIGNIFICANCE AND CAPABILITY

Regional Context

The CCPG properties are representative of the Central Sand Hills Ecological Landscape, which is comprised of a series of glacial moraines covered by glacial outwash, extensive wetlands, and the headwaters of coldwater streams. The region is characterized by fire-adapted ecosystems, scattered forests, savannas, prairies, wetlands, Surrogate Grasslands, and diverse populations of game, non-game and rare species. Wetlands, such as fens, sedge meadows, and tamarack swamps, are well-represented here and harbor many sensitive plant and animal species. The CCPG lies at a transition between an agriculture-dominated landscape with large population centers to the south and east and sparsely populated, forested landscapes to the north and west.

Compared to other Ecological Landscapes, the Central Sand Hills provide unique opportunities to preserve and manage Wet-mesic Prairie, Wet Prairie, Calcareous Fen, and Southern Tamarack Swamp sites; restore degraded sites (emphasizing restoration of hydrology); and manage for area-sensitive species in a matrix of Surrogate Grasslands, Sedge Meadow, Shrub-carr, and Savanna habitats. In addition, the region is a priority area for identifying, restoring, expanding and connecting Oak Barrens and Oak Forests by managing for a large-scale mosaic of patches along a successional gradient that includes Oak Forest, Oak Woodland, Oak Opening, and native or Surrogate Grassland. Preserving mature oak forest patches is desired too.

The continental divide separating the Mississippi and Great Lakes Basins runs through Columbia County. Surface waters in the central and southern portion of the county drain to the Mississippi Basin primarily through the Wisconsin River. Surface waters in the northern portion of the county drain to Lake Michigan through the Fox River. The county

has a diverse variety of surface waters including large rivers, smaller warmwater rivers and streams, coldwater streams, natural lakes and large impoundments on the river systems.

Property Opportunities and Limitations

Collectively, the CCPG properties have many ecologically significant characteristics including high quality cold and warm water fisheries, open wetlands, upland and lowland forests, savannas, prairies, grasslands, and populations of rare species, all situated in the diverse landscape of the region. Major threats to the biodiversity of the CCPG over the next ten to 15 years are interrelated and include ecological simplification, habitat fragmentation, altered ecological processes and hydrologic systems, and a growing array of aquatic and terrestrial invasive species.

The following discussion focuses first on the most significant regional opportunities for protecting high quality and/or rare ecological landscapes. Protecting/restoring the needed habitat at the landscape level provides for the widest variety of species. The discussion then describes opportunities for threatened, rare and endangered species and closes with the threats posed by invasive species. The major ecological attributes of the CCPG ecological landscapes and plant and animal communities to be addressed during the master planning process are summarized below

Open Wetlands

It is rare to have such large, intact wetlands in the southern part of the state that are not dominated by invasive species. The CCPG has a diverse array of high-quality wetlands including: Calcareous Fen, Emergent Marsh, Southern Sedge Meadow, Wet Prairie and Wet-mesic Prairie. These wetland complexes can be quite large, covering over 1,000 acres and providing regionally important shorebird stopover sites and habitat for breeding grassland birds, breeding marsh birds, rare reptiles and amphibians, and invertebrates. The mixed emergent wetlands and large size make the open wetlands, such as those at French Creek and Swan Lake Wildlife Areas, important shorebird stopover sites (Grveles et al, In Review). Further, many of these wetland sites also provide extensive habitat connections with upland communities and opportunities exist to protect and enhance them. Of the twelve significant ecological primary sites on the CCPG, eight of them showcase high-quality wetlands and sedge meadows.

While many of the CCPG wetlands remain high-quality due to a lack of invasive species and minimal impacts from draining, others have been heavily impacted by previous disturbances such as ditching and grazing. Opportunities exist to improve these sites through invasive species management and limiting further disturbances.

Oak Savannas

The many fire-adapted natural communities offer significant management opportunities on the CCPG properties within the region. Restoration and expansion of oak savanna remnants can enhance the habitat for numerous threatened and endangered species and SGCN currently known from the CCPG. Specifically, major opportunities are present at Pine Island, French Creek, Swan Lake and Lodi Marsh Wildlife Areas to restore and/or maintain oak savanna communities. Restoration opportunities also exist on other CCPG properties, but they are limited from an ecological landscape perspective due to the limited size of the areas suitable for restoration and the management effort needed to maintain the savannas.

Wildlife Habitat

The CCPG properties provide a variety of high-quality habitat for both common wildlife species as well as rare and sensitive species. They are known for their excellent birding opportunities and hunting for upland game and waterfowl are very popular recreational activities. Primary game species include white-tailed deer, eastern wild turkey, and ring-necked pheasants. The demand for wildlife-based recreation is likely to increase and opportunities exist on the CCPG properties to improve habitat for these common wildlife species.

In addition to the wetland, savanna and grassland habitats discussed in this section, preserving the mosaic of oak communities (e.g.., ranging from savanna, barrens, openings, open woodlands to closed canopy forests) and flood plain forests will enhance wildlife habitat at several CCPG properties. In particular, the oak communities provide valuable mast, nesting and foraging habitat for game and non-game species.

Grasslands and Sensitive Bird and Wildlife Habitat

Grassland bird species are exhibiting the most significant declines of any suite of bird species in Wisconsin and across the Midwest. The CCPG presents opportunities to support viable populations of several sensitive bird species that require large grassland areas with high quality nesting habitat. Maintaining Surrogate Grasslands, removing brushy edges and fencerows, conducting fire management through ecotones, and connecting larger grassland areas would benefit grassland birds. Several primary sites on the CCPG have quality grasslands and certain sites on the CCPG support several conservative grassland obligate species. These species have the potential to increase in density and potentially improve nest productivity if the grasslands are maintained and connected to open wetlands.

Specific management opportunities exist at the Pine Island Wildlife Area Grassland primary site to maintain and increase the openness of the site while also providing pockets and small stands of shrubby habitats and early successional forest. Acoustical surveys indicate good quality bat habitat is present on this site and throughout the Pine Island Wildlife Area. Maintaining existing cover types (prairie, savanna, and wetland) can help to protect the six species of bats that were located during the spring and fall movement and summer residency periods.

Fish Communities

Rowan Creek and Rocky Run Creek Fishery Areas protect critical coldwater habitat and provide fishing access for native brook trout and naturalized brown trout. These streams sustain viable populations because of significant groundwater inputs that maintain the coldwater temperature regimes needed by trout. Supplemental stocking of trout occurs where the in-stream habitat may limit trout natural reproduction. Significant opportunities for enhancing and rehabilitating disturbed stream habitat to improve trout population fitness exist on these properties.

Long-term concerns include nutrient loading to both cold and warm water fisheries and groundwater pumping that may reduce groundwater inputs to these streams. Protecting wetlands, spawning habitat and minimizing impacts from invasive species, such as carp, zebra mussels and Eurasian milfoil, will be needed to maintain desired game and native species abundance and diversity, especially in the warmwater fisheries.

Reptile and Amphibian Habitat

Reptile and amphibian populations have declined significantly in Wisconsin over the last few decades due in large part to habitat modification and fragmentation. There are significant opportunities on the CCPG to protect sites where these species occur at population sizes large enough to remain viable. In particular, management opportunities exist to provide a more shaded environment and protect the springs located at French Creek Wildlife Area, which provide key habitat for a variety of reptiles and amphibians. There are also management opportunities to increase quality reptile habitat at Rocky Run Fishery Area. In addition, the CCPG provides crucial habitat for three threatened and endangered reptile species and presents an excellent opportunity for the conservation of one of these species, the Blanding's turtle, due to an abundance of habitat and the presence of dispersal corridors between areas suitable for habitation.

Invasive Species

Invasive species are a current and growing threat to native communities. Primary invasive species include: buckthorn, garlic mustard, honeysuckle, spotted knapweed, Japanese hedge parsley, black locust, and reed canary grass. If not controlled, there is the potential for significant harm to the high habitat values and general fitness of the habitats on all of the CCPG properties. Future plans should place a priority on control and preventing the spread of invasive species.

RECREATIONAL SIGNIFICANCE AND CAPABILITY

Regional Context

The CCPG properties are centrally located to many of Wisconsin's dense urban population centers and are significant because they are readily accessible to a large number of recreational users. The population in Columbia County is projected to increase by 21% over the next 30 years. Regional demand for wildlife-related activities such as hunting, fishing and bird-watching are likely to increase recreational usage on the CCPG. As the user population shifts toward an older demographic, quiet and accessible sports like wildlife viewing are becoming more popular.

Hunting

The CCPG wildlife areas are heavily used for hunting and trapping. While overcrowding does not tend to be an issue during the spring turkey season on any of the properties, it can be a problem for deer and waterfowl hunters. Pine Island is the most heavily used property for deer, pheasant, and mourning dove hunting, with Mud Lake seeing heavy use for pheasant and deer hunting as well. French Creek has the most waterfowl hunters, followed closely by Mud Lake. Peter Helland also has many hunters for all species hunting seasons. All properties are heavily used for deer hunting, especially during the nine day gun season. Conflicts between hunters and non-hunters are not frequent as most non-hunters are aware when hunting seasons are occurring; however requests have been made by surrounding neighbors at Rowan Creek to limit hunting to archery only. Target shooting is extremely popular, particularly at the Swan Lake and French Creek, but littering is an ongoing issue at these sites.

Fishing

The surface water resources in the CCPG offer both high quality warmwater and coldwater sportfishing opportunities. Pine Island provides access to the Wisconsin River and has an improved boat ramp suitable for launching small paddle to motorized water craft. The Wisconsin River has an excellent fishery for walleye, sauger, smallmouth bass, channel and flathead catfish. The two major Fisheries Areas (Rocky Run and Rowan Creek) discussed in this document and three smaller properties (Lodi Spring Creek, Hinkson Creek and Jennings Creek) to be discussed in the master plan all support coldwater stream trout fisheries. These populations are maintained by natural reproduction, supplemental stocking or are totally supported by stocked fish. Recent changes to wild source stocked fish have improved the populations and encouraged natural reproduction.

Boating and Water-based Activities

The region is a popular destination for water-based activities and many CCPG properties offer good opportunities for fishing and non-motorized boating. Canoeing is popular at Mud Lake, French Creek and Pine Island.

Birding

Birding and wildlife viewing are both popular activities in the region and on the CCPG due to the properties' regionally significant and extensive open wetlands and diversity of grassland and oak woodland habitats. Columbia County is included in the Southern Savanna Region of the Great Wisconsin Birding and Nature Trail (WDNR 2008) as having many exceptional birding sites. In addition, the Northern Empire Prairie wetlands, Pine Island savanna, and French Creek marsh/grasslands have been recognized as Wisconsin Important Bird Areas (IBAs), a designation reserved for select areas that have extreme importance to bird life.

Hiking, Cross country Skiing and Snowshoeing

Cross country skiing, snowshoeing, and hiking occur on most properties and are likely to increase in usage. Regionally, walking for pleasure, hiking and sightseeing are among the highest demanded activities by recreational users. Rowan Creek has designated trails that have heavy use year round, but all properties see some use in these capacities throughout the year. The Ice Age National Scenic Trail (IAT) is the premier hiking venue in the region. A section of the IAT is located in Lodi Marsh with Pine Island and French Creek potential sites for future trail segments. Currently, an active habitat management partnership has been developed between the DNR and volunteers associated with the Ice Age Park and Trail Foundation and Friends of Greater Scenic Lodi. Opportunities exist to connect and enhance trail infrastructure within the CCPG, but any expansion will need to consider ecologically sensitive sites, the potential of spreading invasive species, soil suitability and long-term maintenance issues.

Dog Training and Trials

Pine Island has a Class 1 dog training ground and a Class I dog trial ground that is open year round. Increasingly, property users are bringing dogs to run or walk year round with no plans for dog training or trialing. Complaints of dog trial participants forcing others (dog walkers, dog trainers) to leave the area persist. Requests have been made for dog sled training trails on the CCPG properties.

Motorized Sports

Segments of regional snowmobile trails cross Lodi Marsh, Peter Helland, Rocky Run and Rowan Creek. The trail and associated wooden bridge that cross Lodi Marsh and Rowan Creek are maintained by local snowmobile clubs. Requests have been made for expansion of the snowmobile trail at Rowan Creek. Erosion on snowmobile trails has been an issue in the past.

ATV use is currently prohibited on the properties due to the combination of very wet and sandy soils and sensitive ecological communities. ATV and other off-road vehicle uses are generally not compatible with the purpose of state wildlife and fishery areas.

Horseback Riding and Mountain Biking

Horseback riding and mountain biking are not authorized uses on the CCPG properties. Despite this prohibition there is evidence of horseback riding at Mud Lake, French Creek and Rocky Run, and mountain bike usage at Rocky Run and Rowan Creek. These activities are occurring in state natural areas and there is concern about resource damage. While recreation studies show a need for additional equestrian trails in the region, the potential for horse trails, and bike trails as well, are limited on the CCPG. Physical limitations of the properties; specifically, the predominance of wet soils and limited contiguous upland areas are issues that need to be considered. Opportunities for providing horse and bike use on the properties are further limited by the requirement (NR 1.51) that non-primary uses not significantly detract from the primary purposes of the property.

Camping

Overnight camping in self-contained units is allowed at Pine Island by permit on a limited and temporary basis at the dog trial grounds for participants in the trials. There is also evidence of camping, though prohibited, at Pine Island on the islands in the Wisconsin River. It is believed the island campers consider this practice acceptable because it is allowed downstream on islands in the Lower Wisconsin Scenic Riverway. There appears to be a demand here for this type of camping as there are no public camping opportunities for boaters along this stretch of the Wisconsin River.

Other Recreation Activities

Pine Island, Mud Lake, Paradise Marsh and Rowan Creek are popular with geocachers. Many properties are heavily searched for morels each spring, along with berries throughout the summer.

SUMMARY

Collectively, the CCPG properties contain many ecologically significant communities including diverse cold and warmwater fisheries, open wetlands, upland and lowland forests, savannas, prairies, grasslands, and populations of rare species, all situated in the diverse landscape of the region. The CCPG offers significant regional management opportunities to provide these high quality habitats and diverse natural communities.

From a regional perspective, the CCPG can provide high quality habitat for common wildlife species and critical habitat for many rare and special concern species. These habitats range from large open wetlands and grasslands needed for nesting success and sustaining viable wildlife populations to forest management opportunities including Floodplain Forests, upland oak forests and imperiled oak savanna communities.

These habitats provide regionally significant opportunities for outdoor recreation, particularly deer, turkey, waterfowl and pheasant hunting. Wildlife-viewing will continue to be a popular activity with rich opportunities for watching waterfowl, shorebirds and grassland birds. Many of the CCPG properties are also well suited to provide lightly developed, non-motorized recreation experiences such as hiking, cross country skiing, and canoeing.

The close proximity of the CCPG to growing population centers and current trends in outdoor recreation will result in increased pressure to provide a growing and diverse spectrum of users with quality recreational experiences. Thoughtful planning and management will be needed to maintain high quality wildlife and fisheries habitat while also providing recreational experiences for an increasing number of users and uses.

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b. Lodi Marsh - http://dnr.wi.gov/org/land/er/sna/index.asp?SNA=374
c. Empire Prairies (Mud Lake WA) - http://dnr.wi.gov/org/land/er/sna/index.asp?SNA=146
d. Springvale Wet Fen (Peter Helland WA) - http://dnr.wi.gov/org/land/er/sna/index.asp?SNA=547
e. Pine Island Savanna - http://dnr.wi.gov/org/land/er/sna/index.asp?SNA=549
f. Rocky Run Oak Savanna - http://dnr.wi.gov/org/land/er/sna/index.asp?SNA=220

Wisconsin Department of Natural Resources – Ecological Landscape Conservation Opportunity Areas
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Appendix A - Maps