

Regional and Property Analysis Sugar River Planning Group



Properties in this report are located in Dane, Green and Rock counties:

Wildlife Areas

Albany WA
Avon Bottoms WA
Badfish Creek WA
Brooklyn WA
Evansville WA
Hook Lake-Grass Lake WA
Liberty Creek WA
Extensive Wildlife Habitats Scattered
Wildlife Lands
Footville Public Hunting Grounds

Fishery Areas

Anthony Branch SBP
Allen Creek SBP

Parks and Recreation Areas

Montrose State Ice Age Trail Area

State Natural Areas

Avon Bottoms SNA
Hook Lake Bog SNA
Swenson Wet Prairie SNA

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MAP Series J - Hook Lake Bog State Natural Area, Hook Lake/Grass Lake Wildlife Area, and Extensive Wildlife Area

MAP Series K - Montrose State Ice Age Trail Area

MAP Series L - Liberty Creek WA

Each map series consists of the following maps as warranted. Some maps may not be added if the subject is not applicable to the property.

1 = DNR and Other Public Lands

2 = Existing infrastructure

3 = Existing Land Cover

4 = Primary Sites and Trout Streams

5 = Land Records Designation

6 = Landscape View

7 = Archaeological and Cultural Sites

Introduction to the Properties and the Region

Property Overview

The Sugar River Planning Group (SRPG) properties are located in south central Dane, eastern Green and western Rock counties (Map A. Collectively, the wildlife, fishery and natural area properties contain almost 13,500 acres of fee title and public access easement lands). Wildlife Management has acquired 11,871 acres for the wildlife areas, about 88% of the state lands in this planning group. The remaining 12% were acquired by Fishery Management (860 acres), Natural Heritage Conservation (527 acres in natural areas) and Parks and Recreation (239 acres in Ice Age Trail lands).

The DNR currently leases about 10,287 acres for public access through the Voluntary Public Access program. These leases represent 46% of the lands available for public hunting in this planning group. These leases will expire between 2015-2017.

The following properties are included in this planning effort:

Wildlife Areas

- Avon Bottoms Wildlife Area (2,839 acres)
- Albany Wildlife Area (1,430 acres)
- Badfish Creek Wildlife Area (1,147 acres)
- Brooklyn Wildlife Area (2,946 acres)
- Evansville Wildlife Area (807 acres)
- Extensive Wildlife Habitat / Scattered Wildlife Lands (1,286 acres in fourteen scattered parcels)
- Grass Lake/Hook Lake Wildlife Area (853 acres)
- Liberty Creek Wildlife Area (563 acres)
- Footville Public Hunting Grounds (8,833 acres)

Fishery Areas

- Anthony Branch Stream Bank Protection Area (637 acres)
- Allen Creek Stream Bank Protection Area (223 acres)

State Natural Areas

- Avon Bottoms State Natural Area (168 acres, within the Avon Bottoms Wildlife Area)
- Hook Lake Bog State Natural Area (527 acres)
- Swenson Wet Prairie State Natural Area (40 acres, within the Avon Bottoms Wildlife Area)

Parks and Recreation Areas

- Montrose State Ice Age Trail Area (239 acres)

Property planning for state properties has evolved over the decades. The SRPG properties have been managed according to the guidance developed in prior master plans, wildlife action plans, game and species management plans and property/habitat management handbooks. The habitat and recreation elements in these plans were implemented as resources allowed.

Master plans were developed and approved by the Natural Resources Board for the following properties: Albany WA (1982), Avon Bottoms WA (1986), Badfish Creek WA (1984), Brooklyn WA (1984) and Evansville WA (1988). There are no approved master plans for Liberty Creek WA or Hook Lake Natural Area/Wildlife Area. Anthony Branch SBP and Allen Creek SBP have Fish Management approved work plans dating to the early 1990's.

Purpose of Regional and Property Analysis (RPA)

The current master planning process for state properties follows the parameters laid out in the Wisconsin Administrative Code, Chapter NR 44. Master plans describe the scope, purpose, and management of a property or a group of properties. These plans are required to be updated at 15-20 year intervals. The Regional and Property Analysis (RPA) is the first phase and foundation of the master planning process. Functionally, it describes the current uses, resources and management of these properties and places them in a regional recreational, habitat and ecological context. The RPA highlights the most important issues to consider when planning the properties and identifies the most suitable potential future roles or niches for these properties.

This RPA contains the following three elements:

Regional Analysis – This analysis describes the broader biological/ecological, recreational, cultural and economic environment that affects the properties and their uses. It identifies significant ecological and recreational needs within the planning group region. It also defines existing and potential social demands or constraints that affect these properties and should be considered during the planning process.

Property Analysis – This component of the 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 – This section is the most important component of the RPA. The Findings and Conclusions summarize the major recreational, wildlife habitat and ecological challenges and opportunities identified in this document. It helps focus the planning process and becomes the foundation for building the master plan's vision and goals, and action strategies.

The goal of this master planning process is to develop management strategies so the SRPG properties can continue to provide high-quality nature based outdoor recreational experiences in an increasingly fragmented and populated landscape.

The scope of use and management of a state property is governed by its official designation. The properties included in this planning group include:

Introduction to Properties by Designation

The scope of use and management of a state property is governed by its official designation. The properties included in this planning group include seven Wildlife Areas, two Streambank Protection Fee Areas and one Ice Age Trail area. There are three state natural areas designated within the boundaries of two wildlife areas: Hook Lake Bog State Natural Area [527 acres] within the Hook Lake-Grass Lake WA and the Swenson Wet Prairie [40 acres] and Avon Bottoms [168 acres] within the Avon Bottoms WA.

In addition, fourteen Extensive Wildlife Habitat or Scattered Wildlife Habitat programs and one public hunting access easement have been acquired to provide hunting opportunities as well as improved wildlife habitat.

The Footville Public Hunting Grounds (PHG) is not a designated property, but has been an active area of cooperation between the DNR and local landowners. The PHG contain over 8,000 acres and is a unique situation with a long history of private lands being leased to provide public hunting opportunities in Rock County.

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 ch. NR 1.51. Wildlife 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, skiing, snow shoeing, nature study, berry picking, and other low-impact recreational activities. As directed by chs. 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.

Stream Bank Protection and Remnant Fishery Areas

The Stream Bank Protection Remnant Fishery Area programs have criteria or goals for establishing, adjusting, expanding and managing project areas. Examples include the practicability of acquiring easements or fee title, providing public access, protecting and/or restoring in-stream and riparian habitats along streams, rivers and lakes, protecting downstream watersheds, improving water quality, protecting state investments in existing properties, and protecting unique and endangered resources. Section 23.09 (2) (d) 13 and Section 23.094, Wis. Statutes, provides legislative authority and direction for acquisition and management of these areas. These properties also provide opportunities for compatible recreational uses such as hunting, hiking, bird watching, nature enjoyment, and cross-country skiing. Due to the limited size and wetness of many of these properties certain access and recreational activities (e.g., motorized access and horse trails) have been restricted to protect the habitats and recreational experience.

Ice Age Trail

The purpose of all State Ice Age Trail Areas (SIATAs) is to permanently protect lands to provide for segments of the Ice Age Trail; preserve Wisconsin's glacial landscape features and other natural and cultural resources associated with the route of the Ice Age Trail; and, where possible, offer a primitive atmosphere of relative solitude and perceived remoteness where visitors may experience a quiet connection with nature (Wisconsin Administrative Code NR 1.29). Currently, there are about 600 miles of permanently protected IAT in the state.

These properties provide opportunities for low impact public recreation such as hiking, backpacking and snowshoeing while protecting the natural and scenic character within the corridor. State Ice Age Trail Areas are purchased by the DNR under the authority of section 23.09 (2) (d) 10, Wisconsin Statutes. Limited camping in dispersed camping areas by long-distance Ice Age Trail Hikers (in accordance with NR 45.10 (1) (a) 5. Wisconsin Administrative Code) follow the "Leave No Trace" principles. Stays are limited to one night and no fires are allowed other than portable camping stoves.

The Ice Age National Scenic Trail is one of eleven National Scenic Trails. Congress designates national scenic trails, "in order to provide for the ever-increasing outdoor recreation needs of an expanding population and in order to promote the preservation of, public access to, travel within, and enjoyment and appreciation of the open-air, outdoor areas and historic resources of the Nation..."

State Natural Areas

Natural Areas are defined and authorized in Wisconsin Statute 23.27-23.29 and Administrative Code ch. 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 State Natural Areas in perpetuity. While the intent of the Natural Areas program is to preserve the best examples of the state's diverse natural communities, many recreational uses are usually allowed, if they do not threaten the site's natural values.

Voluntary Public Access Leases

The voluntary public access leases were purchased with funds provided through a USDA Voluntary Public Access and Habitat Incentive Program (VPA-HIP) grant. The VPA-HIP program is part of the federal Farm Bill. The leases on these private lands run through 2015-2017. Without additional funding these lands will no longer be available for public use following expiration of the short-term leases.

Consideration in the master planning process will be given to options that could provide longer term availability of these leased lands for public access.

Leased lands are not managed by the DNR, but some assistance regarding habitat management and food plots may be provided if resources are available.

Analysis of the Regional and Local Context

Regional Socioeconomic and Land Use Patterns

Information in this section comes from the following sources:

1) The "Region 9 Profile" (WDNR 2010a) developed by the UW-Madison Applied Population Laboratory. The series of profiles provides a regional context for DNR managers as they engage in planning and decision making for their properties.

2) The "Ecological Landscapes of Wisconsin" (WDNR 2014) describes the land use and socio-economic characteristics of the Southeast Glacial Plains Ecological Landscape (hereafter "Southeast Glacial Plains").

Both 1) and 2) describe regions that extend far beyond the SRPG (Figure 1), yet most of the regional descriptions are consistent with each other. In instances where they diverge, clarification is provided.

3) Population and planning materials available from federal, state and local planning agencies.

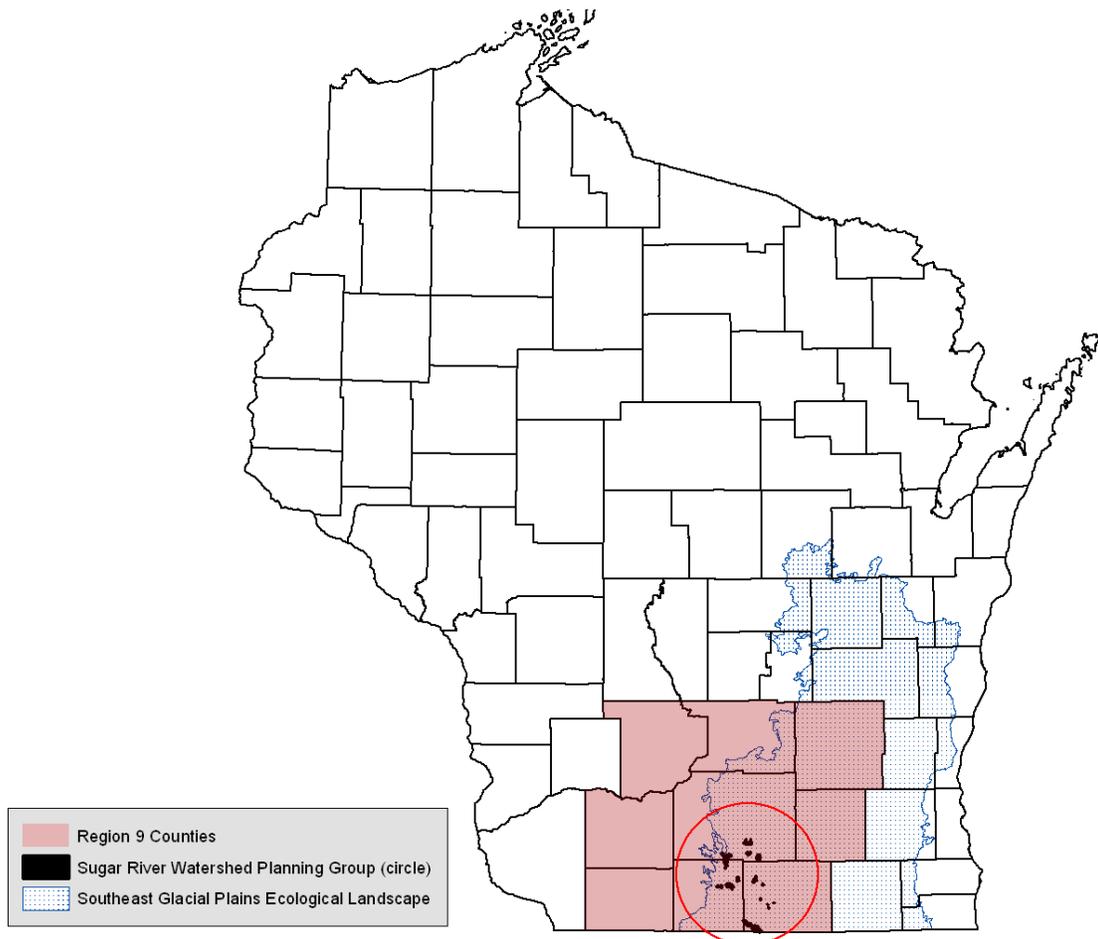


Figure 1. Relationship of Southeast Glacial Plains Ecological Landscape and "Region 9" (WDNR 2010) with Sugar River Planning Group

Population

US Census Bureau data for 2010 indicated the population in Dane, Green and Rock counties was approximately 685,000. The City of Madison (population 233,209) is the largest population center within these counties. Janesville (population 63,575) and Beloit (population 36,966) are the largest cities in Rock County. Other rapidly growing communities close to the SRPG include Fitchburg, Oregon and Stoughton in Dane County. These properties are also used by residents in Illinois from the Rockford/Winnebago County area (population 295,000).

The SRPG lies within a densely populated region of the state with an estimated 143 persons per square mile, or 18% of the state's population (DNR 2010). Sixty percent of the residents in this region live in cities, with 23% living in Madison alone. Dane and Green counties are the fastest growing in the region.

Table 1 provides summary socioeconomic information about the SRPG properties (Sources: (WisDWD 2011 and US Census Quick Facts)

Table 1. Socio-economic snapshot of the SRPG counties compared to the State of Wisconsin

	Dane County	Green County	Rock County	State
2010 Population	488,000	37,000	160,000	5,686,986
Projected Population Growth (2000 to 2035)	>48%	30-48%	18-30%	24%
Median household income (2007-2011)	\$61,913	\$53,933	\$50,532	\$52,374
Population below the poverty level (2007-11)	12%	9.7%	13.3%	12.0%
Total Employment (2011)	294,827	14,029	58,512	2,663,596

Region 9 as shown in Figure 1 (DNR 2010) has four population trends that stand out with respect to outdoor recreation planning:

- Madison and its suburbs represent a relatively large and rapidly growing population,
- Development pressure and growth in towns outside the urban centers is increasing,
- The population over age 65 will constitute about 24% of the overall population by 2035, and
- Hispanic and Asian ethnicities are a growing percentage of the population.

The population in the SRPG region is considerably younger than the state of Wisconsin as a whole, but is still aging at a moderate pace. In 2008, the region's median age was 37 years with the under age 20 and over age 65 populations projected to grow significantly in number between 2008 and 2020 (DNR 2010).

The ethnic heritage of the SRPG region is becoming increasingly diverse. Dane County is home to 20% of Wisconsin's Asians. The Hispanic population is growing rapidly and currently makes up 5% of the region's total population. Still, the population in the region remains about 89% non-Hispanic White. Overall, this region has a slightly higher proportion of college-educated adults than the state as a whole. Dane County has a proportion of college graduates that is more than twice that of other counties in the region.

Employment

The three dominant employment sectors in Green and Rock counties are education and health; trade, transportation and utilities; and manufacturing. In Dane County the three dominant categories are education and health; trade, transportation and utilities; and professional & business services.

Service sector employment is approximately 9.3% of the region's workforce and is increasing relative to other sectors. Tourism and recreation employment has increased in this region by 13% between 2000 and 2008. The fishing, hunting, canoeing, bird watching, hiking, and other nature based recreation opportunities on the SRPG properties contribute in part to this sector. The workforce in extractive industries, which includes agriculture, is about 4.4% in the region compared to 4.2% for the state.

Transportation Network

The transportation infrastructure of the region is highly developed with a higher density of roads, railroads and airports than the state as a whole (DNR 2010). The region has a well-developed network of federal, state and local highways and roads connecting the urban and rural areas.

Land Uses and Ownership

The Dane, Green and Rock counties have a total area of about 1,604,000 acres. The region has a diverse mix of agricultural, forest, wetland and developed lands (Figure 2). This area has much of the state's most productive soils and about 68% of the land is devoted to agricultural operations. These counties have consistently been among the highest producers in the state of both row crops and dairy. Field crops (especially corn, soybeans and hay) are the primary commodities produced in these counties.

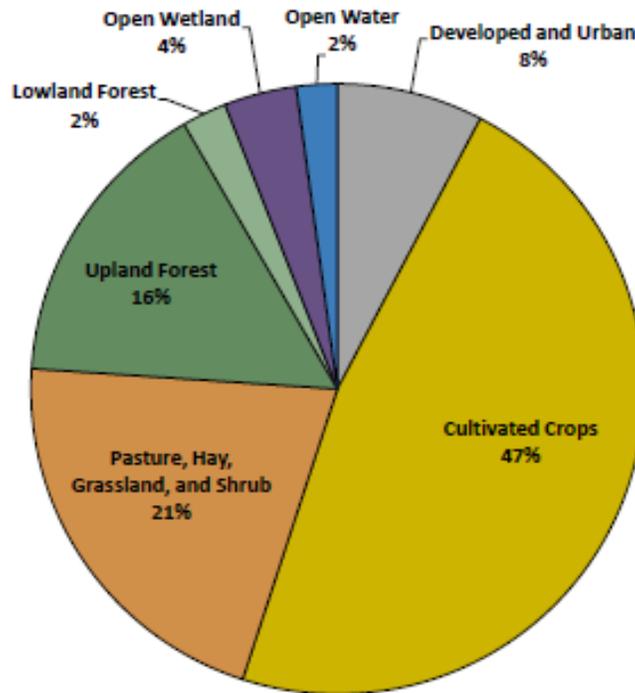


Figure 2 Region 9 Land Cover.

(Source: (WDNR 2010))

A major management objective of the SRPG fish, wildlife and natural area properties is to protect and/or restore critical wildlife habitats and native communities. Wetlands are important to many game and non-game species, but many wetlands have been adversely impacted by ditching and draining to create agricultural lands, shoreland developments, invasive plants and animals (e.g., carp), pollution and sedimentation.

Restoring wetlands are important from both a state and regional conservation perspective (WDNR Wisconsin Waterfowl Strategic Plan 2008–2018 and US-FWS Joint Venture Implementation Plan, 2007). These counties have lost over 50% of their pre-settlement wetlands (Capital Area Regional Planning Commission, 2011 and Rock County Planning Department, 2010). About 4% of the total area of Rock County, about 20,000 acres, is considered wetlands while Dane County has somewhat more than 50,000 acres of wetlands.

Residential development is primarily located in and around the cities and smaller villages. However, proximity to the Madison metropolitan area is contributing to increased development pressure in southern Dane and northern Green and Rock counties, especially on agricultural lands and woodlands.

Population growth adds to housing and infrastructure development, which impacts both the supply of and demand for land and outdoor recreation opportunities. Housing development, especially in unincorporated rural areas, can fragment and simplify natural communities as well as reduce the supply of land available for many forms of outdoor recreation.

Increased population often broadens the demand for outdoor pursuits on these state properties. These pursuits include traditional hunting, fishing and nature enjoyment as well as activities such as walking for exercise, dog walking and geocaching. At the most basic level, more housing in an area means more people participating in some form of outdoor activity. These residents may also have mixed tolerance for traditional recreational and habitat management activities such as hunting, controlled burns, timber harvesting and snowmobiling.

A significant issue affecting wildlife habitat in the planning area is the reduction of acreage enrolled in the federal Conservation Reserve Program (CRP). CRP lands are managed to maintain a permanent vegetative cover. High agricultural commodity prices have led to a rapid reduction in CRP acres in the region (USDA. 2014). CRP enrollment has dropped from a high of almost 83,000 acres in 1994 to less than 43,000 in 2013.

Grassland-dependent wildlife (e.g., pheasant) populations will ebb and flow in response to a variety of environmental variables with the amount and quality of the grasslands an important consideration. The CRP grasslands provided valuable habitat on private lands that complemented the habitat on public lands. These public and private lands provided a landscape-scale context for grassland wildlife management. Acreage enrolled in CRP is expected to continue to decline with an attendant loss of permanent vegetative cover. This will reduce the quality and amount of habitat for a variety of wildlife. It will also reduce the permanent cover that has also protected ground and surface waters important to the wetlands and our cold and warmwater sport fisheries.

Nature Based Recreation and Habitat Lands

The Wisconsin Conservation Department (predecessor of DNR) had established several dozen wildlife areas and protected tens of thousands of acres statewide. Today there are slightly over 170 wildlife properties with 740,000 acres in wildlife areas statewide. A significant majority of these wildlife lands are located in northern Wisconsin where population densities are low. In contrast, the much more densely settled and developed southern part of the state has limited state wildlife and recreation acreage. As a result there is much greater user pressure in the south due to the much larger population and significant competition for land and habitat in these counties.

Approximately 23% of all land in Wisconsin is publicly-owned by federal, state or local units of government (DNR 2010). Public ownership drops to about 11% in the Southeast Glacial Plains Ecological Landscape area and only 5% in the nine county Region 9 is available for public outdoor recreation (see Figure 1, page 9). Public recreation lands drops to 1.5% in Green County, 2.4% in Rock County and 4.8% in Dane County (Table 2).

The DNR and the U.S. Fish and Wildlife Service (US FWS) are the principle state and federal providers of hunting, fishing and trapping land in these counties (Map A). The DNR is the principle recreational land holder with more than 40,000 acres in park, riverway, wildlife, fishery and natural area lands. The U.S. FWS owns 2,138 acres in thirteen Waterfowl Production Areas (WPAs) in Dane and Rock counties. Collectively, these state and federal fish and wildlife properties represent about 2.6% of the total land area of these counties. These properties also provide the public with opportunities for hiking, bird watching, kayaking, berry picking and general nature enjoyment.

Table 2. Public Access Lands in the SRPG Region

	Dane County	Green County	Rock County	Total
	Acres			
Land Area	793,335	373,754	461,101	1,628,190
DNR	24,985 (3.1%)	5,701 (1.5%)	9,516 (2.1%)	40,202 (2.5%)
US FWS	1,814 (0.2%)	0 (0%)	324 (0.07%)	2,138 (0.1%)
County*	11,900 (1.5%)	25 (0.01%)	1,000 (0.2%)	10,550 (0.8%)

* County owned land: Dane County Parks (2012), Rock County (2014), Green County Tourism Office (2014)

About 9,000 acres of private lands in western Rock County provide hunting access through short-term Voluntary Public Access leases. These leases will expire between 2015 and 2017. These lands are at risk of being lost to public access if the owner does not re-enroll or if funds are not available to continue the program.

The US Natural Resources Conservation Service (NRCS) has purchased easements on 9,891 acres through their Wetland Reserve, Farm and Ranch Lands Protection and the Emergency Watershed Protection Easement programs in these three counties. These easements are intended to restore, protect and maintain the functions

of wetlands, working farmlands and floodplains. A significant majority of these are permanent easements and the NRCS is committed to re-establishing fish and wildlife habitat, water quality, flood water retention and ground water recharge as appropriate. Two considerations with these programs is the lack of public access on these easements and the potential for sub-division of the large blocks into small recreational lots that could complicate future habitat management activities and public access to these lands.

Additional opportunities for outdoor recreation are provided by the county lands in Table 2 as well as lands owned by city, village, university, school forest, land trust, and other conservation oriented entities (see Dane and Rock counties Parks References). These lands provide public opportunities for one or more nature based outdoor recreation activities and some of these lands complement the wildlife habitat and nature preservation goals of the state and federal conservation properties.

However, many of these local properties have significantly different recreation, education or research goals than the state/federal conservation properties. These local open spaces provide opportunities for residents to participate in active sports (e.g., team sports) and family activities (e.g., picnicking and play sets). A limited number offer small to modest scale fishing, hiking and nature enjoyment opportunities. Typically they provide no to very limited opportunities for hunting and trapping. It should be noted local lands purchased for conservation purposes with state Stewardship Funds are open for outdoor pursuits as defined in the law.

Additional public recreational lands are scattered throughout the broader region, with the largest being along the Mississippi River, the Lower Wisconsin Riverway, the Baraboo Hills, Horicon Marsh and the Southern Kettle Moraine State Forest. There are several state (i.e., Sugar River and Badger State trails) and county/municipal trails in the region that are extensively used for hiking, biking, snowmobiling and ATV activities.

Finally, a significant majority of the land in these counties is privately owned. Private undeveloped parcels provide wildlife habitat and can provide recreational opportunities for the land owners and their guests. A small amount of private land (1,440 acres) enrolled in the Managed Forest Law in these counties is available for hunting and other recreational purposes.

State and Regional Wildlife Plans

As noted earlier, the recreation and habitat management activities conducted on these properties are generally consistent with the actions recommended in state and regional plans such as the Wisconsin Statewide Comprehensive Outdoor Recreation Plans, Wildlife Action Plan, regional Joint Venture plan for waterfowl and bird species and property management handbooks ((WDNR. 2006a, WDNR 2006b, WDNR Wisconsin Waterfowl Strategic Plan 2008–2018 and US-FWS Joint Venture Implementation Plan, 2007). The purpose of this master planning process is to assess the existing management activities and recommend changes, where appropriate, to integrate and implement current policy, guidance and practices into property management.

Local Land Use and Open Space Planning

The current recreation and habitat management activities and boundaries of the SRPG properties are consistent with local land use and open space plans (See Dane County, Green County and Rock County Comprehensive Planning citations in the References). State properties often are found along environmental corridors or include blocks of conservation lands that local plans indicate are worthy of protection.

State recreation and habitat management complements the local open space properties and recreation efforts by providing larger blocks of habitat and high quality natural communities of regional importance for hunting, fishing, trapping and a wide variety of nature based activities. The state lands provide longer trails and outdoor experiences in less crowded, rustic settings. These properties also provide valuable ecosystem services such as protecting large wetlands and floodplains for flood control, providing scenic vistas, protecting unique natural and cultural resources, and maintaining the health and diversity of the local ecosystems.

Recreation Values, Trends and Uses

Defining the Region

The findings from the Statewide Comprehensive Outdoor Recreation Plans (SCORP; DNR 2012 and 2006a) are used to describe the overall recreation resources of the region. For purposes of SCORP evaluations, Wisconsin is broken into eight regions of similar size. The Sugar River Planning Group lies within the **Southern Gateways** which includes: Columbia, Dane, Dodge, Green, Iowa, Jefferson, La Fayette, Richland, Rock and Sauk Counties.

The SRPG properties provide opportunities for nature based recreational to citizens in Dane, Green and Rock counties and beyond. The trend in this region is towards increasing population density with growing demand for residential, commercial and urban infrastructure land uses. Recreation activities are increasing the demands on our existing public lands and waters (DNR 2010).

The Open Space and Parks plans for Dane, Green and Rock counties were also reviewed to assess recreation opportunities in the region.

Economic Value of Recreation

The American Sportfishing Association (SFA, 2013) and the Outdoor Industry Association (OIA) estimated the national multiplier effect of recreation expenditures was \$1.5 to \$2 for every dollar spent on these activities.

Wisconsin is #2 in the nation in terms of both resident hunters (763,000) and non-resident hunters (131,000) (Southwick Associates, 2012). These hunters participated in an estimated 12.2 million hunting days in 2011. The total economic contribution in Wisconsin is estimated at \$3.95 billion dollars generating \$228 million in state and local tax revenues.

The American Sportfishing Association indicates Wisconsin is the #9 state in the nation in terms of angler expenditures. Their report further states that total expenditures were about 1.46 billion dollars with about 1.25 million participants. Wisconsin ranked #3 in the nation with 337,000 non-resident anglers and it was estimated they spent an estimated \$445 million. The report estimated angling alone contributed about \$132 million toward state and local tax revenues.

The Ice Age Trail Alliance (IATA), the Department of Tourism and other partners undertook a survey of Ice Age Trail users and businesses along the entire length of the trail (IATA, 2012). Along with IATA member input, researchers from the University of Wisconsin–Whitewater interviewed users on the trail and polled businesses near the trail. The research estimated the trail draws over 1.25 million visitors every year, and users contribute approximately \$113 million annually to statewide and local economies.

The 2011 US FWS *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* indicated in state expenditures for wildlife-related recreation by residents and tourists was the fifth highest in the nation at \$5.5 billion.

License Purchases

License and stamp/permit purchases are an indication of participation in regulated outdoor activities. DNR records indicate nearly 133,000 resident licenses and over 4,800 non-resident licenses are sold each year in these three counties (Table 3).

Table 3. Annual Average License Purchases (2009-2012 average)

License	Resident	License	Resident
Fishing (annual)	68,784	Turkey	9,925
Gun Deer	33,366	Small Game	9,065
Archery	10,982	Patron and Sports	10,267

SCORP

The primary source of information on outdoor recreation in Wisconsin is the *Statewide Comprehensive Outdoor Recreation Plan (SCORP)* (WDNR 2006a and 2012). DNR revises SCORP periodically to determine status, trends and needs for outdoor recreation in Wisconsin. Information for the document is obtained through public surveys, listening sessions and interviews. Table 4 shows the higher demand uses in the Southern Gateways region for residents and tourists.

SCORP reports suggest the following future participation trends:

Increasing Demand – Bird watching, Wildlife viewing, Developed/RV Camping, Off-road ATV, boating and kayaking.

Stable Demand – Primitive/Tent Camping, Day hiking, Fishing, Cross Country Skiing, Snow shoeing, Swimming in lakes & streams, visiting nature centers.

Decreasing Demand – Hunting, Mountain biking, horseback riding and Snowmobiling.

Relative participation rates (i.e., % of population participating) is fairly consistent across the state for most outdoor recreational uses.

The *SCORP 2006* (WDNR 2006a) report indicated there was unmet trail demand in the Southern Gateway region for ATV usage, biking trails, hiking trails and horse trails.

Table 4 High Demand Recreational Activities in the Southern Gateway Region	
Wisconsin Residents	Non-residents
Walking for pleasure	Sightseeing
Picnicking	Bird watching
Nature-based education	Hiking
Walk pets at a dog park	Picnicking
Kayaking	Camping
Source: SCORP (WDNR 2006a)	

A major recommendation in the SCORP report is the preservation and protection of the larger areas that provide space for popular regional outdoor recreational activities. Specific recommendations for the preservation of valuable habitat are found in the *Wisconsin Land Legacy Report* (DNR 2006a). The *Land Legacy Report* identifies the most important sites warranting protection of their natural resource and outdoor recreation values. The report identifies the Sugar River as a site of statewide importance and a high priority for near term protection.

Hunting Preferences and Travel

Distance to a recreation site affects user participation and satisfaction. Results from surveys in the 1991-96 SCORP and the 1985 US Fish and Wildlife Service National Survey of Hunting, Fishing, and Wildlife-Associated Recreation found that 65-70% of outdoor recreation occurs within 50 miles of home.

A more current survey by Responsive Management and the National Shooting Sports Foundation (NSSF) (Responsive Management, 2009) reported the following insights on hunting access and satisfaction in Wisconsin.

- The majority of Wisconsin licensed hunters primarily hunt deer (77%) followed in popularity by waterfowl (8%), upland game birds (6%), and wild turkey (6%). The three SRPG counties had hunting license sales similar to the preferences noted above.
- About 46% of hunters use public lands at least half the time they hunt.
- Upland game bird and waterfowl hunters have a greater propensity to hunt on public land.
- Hunters indicate they mostly hunt their primary species on the same land each year (68%).

The report noted a common complaint was outdoor experiences were compromised by the number of other users.

The three most important factors affecting where hunters' choose to hunt their primary species include:

- Land not crowded with other users (80%),
- familiarity with the land (60%), and
- Easy access by foot (54%).

The report also indicates 25 miles is the median distance Wisconsin hunters travel to hunt their primary game species.

Constraints to hunting access deemed major problems in the report included:

- Loss of previously open private land due to posting by the new or existing landowner,
- Loss of hunting land due to housing and other land use changes making land not huntable,
- Cost of gasoline.

Hunting and Trapping

The oak-hickory dominated forests, mixed grasslands and wetlands provide excellent wildlife habitat for many species including deer, turkey, pheasant, small game and waterfowl. The public lands are heavily used for hunting, and crowding can be an issue on opening day for deer, waterfowl, and pheasant.

Pheasant hunting is very popular on the grasslands and working farmlands of the region. The DNR supplements the wild pheasant population by stocking game farm-raised pheasants. In 2012, about 6,600 birds were stocked on eight SRPG properties, and over 9,900 birds were stocked on these same properties in 2013. On average, over 4,900 Pheasant Stamps were purchased in the three-county region.

Waterfowl hunting is also popular with an average of 13,205 goose permits and 4,426 waterfowl stamps purchased every year in the three-county region (2009-2012).

Trapping of fur-bearing animals also occurs on these wildlife lands. Over the last four years about 1,400 trapping licenses were purchased annually in these three counties.

Shooting Ranges

The Yellowstone Wildlife Area shooting range, located in northeastern Lafayette County, is owned by the DNR and is managed in cooperation with the Fayette Sportsman's Club. The shooting range is open daily each week throughout the year, except for Tuesdays when the range is closed for use by state and local law enforcement agencies. There are no fees required for use of the range. This range is within 30 miles of the Albany WA, Liberty Creek WA and portions of the Brooklyn WA.

Several private clubs provide commercial opportunities for shooting and lie within 30 miles of Badfish Creek WA, Brooklyn WA, Hook Lake/Gras Lake WA and Anthony Branch SBP in Dane County. Other commercial opportunities beyond 30 miles include Milford Hills and McMiller Shooting Center (see WDNR shooting range locator link).

The National Sporting Shooting Foundation web directory indicated there are 31 club or commercial entities in Wisconsin that are within 30 miles of the SRPG properties. According to information on the respective web pages eight of the clubs or commercial entities offer public shooting opportunities. However, public access to these facilities is limited in terms of time, require members accompany a guest and/or charge a fee for shooting.

Dog Training

A Class 2 dog training areas is located at the Badfish Creek Wildlife Area. Additional Class 2 dog training opportunities are available at Cadiz State Park (Green County). Class 1 field trial and training grounds near the SRPG include the Richard Bong state recreation area (Kenosha County), the Kettle Moraine State Forest—Ottawa Unit (Waukesha County), the Pine Island Wildlife Area (Columbia County) and the Lower Wisconsin River Wildlife Area—Mazomanie Unit (Iowa County).

Fishing and Water-based Activities

Water resources on these properties include two lakes, numerous springs, ponds and wildlife scrapes, almost 14 miles of trout streams, 13 miles of the Sugar River, 9.3 miles of the Little Sugar River, 2.6 miles of Badfish Creek, and about 9 miles of other streams. There are about 11 miles of Class 2 and three miles of Class 3 trout waters in the SRPG. There are no large impoundments within this planning group.

Over 9,700 Inland Trout Stamps were purchased annually in these three counties (average of the 2009-2012 license sales). The in-stream and riparian habitat work done along trout streams have been primarily funded with Trout Stamp revenues.

The rivers and streams on these properties used for fishing include the Sugar River, Little Sugar River, Story Creek, Badfish Creek, Anthony Branch, Allen Creek and Liberty Creek. Canoeing and kayaking are popular on the Sugar and Little Sugar rivers and Badfish Creek. The Sugar River and Little Sugar River support abundant, self-sustaining populations of warmwater game and native fish species. Story Creek and Anthony Branch and Allen Creek support some trout reproduction, but stocking is needed to sustain the game fishery. These fisheries are utilized by both local and regional anglers.

The small bog and marshy lakes at the Hook Lake Bog-Grass Lake Wildlife Area are enjoyed by hunters, bird watchers and for general nature enjoyment by canoeists and kayakers. Due to winterkill these lakes do not sustain warmwater game fisheries.

Birding

Birding is an increasingly popular activity in the Southern Gateways region. The Wisconsin Department of Tourism lists nearly 300 bird watching sites in the state on their web page with a number of them in the planning area (WDT web link).

The Great Wisconsin Birding and Nature Trail (DNR 2008) is a project of the Wisconsin Bird Conservation Initiative (a collaborative effort of birding interests with the DNR). These counties are included in the Southern Savanna Region and the auto trail includes Brooklyn WA and Avon Bottoms WA. Avon Bottoms has also been identified as an Important Bird Area (DNR 2007), a designation reserved for areas that are extremely important to bird life.

Wildlife Viewing

The *National Survey of Fishing, Hunting, and Wildlife-Associated Recreation* (US FWS 2011) provides the following estimates of wildlife watching in Wisconsin:

- About 48% of the Wisconsin resident population (16 years or older) participates in wildlife watching.
- If non-resident tourists older than 16 years are included the percentage of the population watching wildlife increased to 67%.

The number of locals and tourists visiting the SRPG properties for wildlife watching has not been rigorously assessed, but the values noted above and observations provided by staff suggest these properties are used for viewing wildlife.

Trails

The Montrose State Ice Age Trail Area is a segment of the Ice Age National Scenic Trail. The Ice Age Trail is one of 41 designated Wisconsin State Trails and the only one designated as a "State Scenic Trail".

Other trails in the region include the Sugar River State Trail (24 miles in length) and the Badger State Trail (40 miles in length). Recent estimates suggest annual usage is about 165,000 and 92,000, respectively. Another option is the Cheese Country (Tri-County) Trail (47 miles in length), which provides multi-use recreation opportunities in summer and winter (e.g., walking, biking, ATV, snowmobiling, skiing and equestrian activities).

Hiking, cross country skiing, and snow shoeing are allowed on the SRPG properties along the service roads, stocking lanes, fire breaks and informal hunter and angler trails.

No mountain bike or equestrian trails are located on the SRPG properties.

County parks in Dane and Rock counties provide an additional 54 miles of hiking trails, 19 miles of bridle trails, and 28 miles of ski trails (Dane County Parks, 2013 and Rock County Parks, 2014).

Snowmobiling

Snowmobiling is a popular winter pursuit in the region. Over 600 miles of state and local trails are located in the planning area. These trails cross both private and public land. Snowmobile trails provide access to most portions of Dane, Green and Rock counties. They are predominantly located in rural areas, but many have links to cities and villages to make amenities available to riders.

Camping

Tent and RV style camping opportunities in the Southern Gateway region exist at numerous public (state and county parks) and private facilities. Dispersed tent camping is allowed on the Montrose State Ice Age Trail Area northwest of the Brooklyn Wildlife Area, otherwise no camping is allowed on the other state-owned fish, wildlife and natural areas.

Geocaching

Geocaching is an outdoor sport or game where participants search for hidden objects by using Global Positioning System (GPS) coordinates posted on the internet (Geocaching, 2014). According to geocaching web maps there are approximately 40 caches on SRPG properties. Popular geocaching properties include Albany WA, Liberty Creek WA and Brooklyn WA. There are additional 15-20 caches along the Sugar River Trail as it passes through the Albany WA.

Walking and Dog Walking

An increasingly common activity on the properties is pleasure or exercise walking and dog walking, especially where residential developments are close to a property. This activity is most evident at Badfish Creek WA.

Biological Resources and Ecological Characteristics

Background information for this section of the Regional & Property Analysis is largely reproduced from the "Ecological Landscapes of Wisconsin" (WDNR 2014). Developed by the WDNR Ecosystem Management Planning Team, this resource identifies the best areas of the state to manage for natural communities, including their key habitats, aquatic features, native plants, and native animals from an ecological perspective. Additional information more finely tuned to regional characterization of the SRPG is reproduced from the Rapid Ecological Assessment for the Sugar River Planning Group (WDNR 2013).

It's important to note that land cover and vegetation descriptions in this document may differ depending on the terminology and classification systems used by ecologists, foresters and wildlife managers. This is evident in the natural community narratives, tables and land cover types in the property descriptions. The ecological descriptions contain critical details based on analyses of plant and animal communities as viewed from a "ground up" perspective. In contrast, the "land cover types" in Map Series D and certain tables and narrative in the property write-ups (i.e., Forest Resources) provide a forest management or 'tree-top' perspective. While the "top down" perspective is useful for certain planning purposes it misses certain qualities of ground level ecological communities; for instance, a small rare bog community will appear only as a "wetland".

Ecological Landscapes

The SRPG falls almost completely within the Southeast Glacial Plains Ecological Landscape, although the northwestern parcels of Brooklyn Wildlife Area and the Montrose State Ice Age Trail Area fall partly within the Western Coulee and Ridges Ecological Landscape. See Fig. 3 for the study area in relation to Ecological Landscapes.

The **Southeast Glacial Plains Ecological Landscape** borders Illinois and covers a large area of southeastern Wisconsin. This ecological landscape is home to some of the world's best examples of continental glacial activity. Most of this Ecological Landscape is composed of glacial materials deposited during the Wisconsin Ice Age. Apart from the interlobate moraine (a long ridge-like formation that developed between the Green Bay and Lake Michigan lobes during the Wisconsin Glaciation), most of the region offers moderate topographical relief, with glacial deposits forming the greatest irregularities (Martin 1974). Soils in this landscape vary from poorly drained clayey to well drained loamy soils with a silt loam surface over calcareous loam till.

Historically, vegetation in the Southeast Glacial Plains Ecological Landscape consisted of a mix of prairie, oak forests, savanna, and maple-basswood forests. Wet-mesic Prairie, Southern Sedge Meadow, Emergent Marsh, Calcareous Fen, and tamarack swamp were found in poorly drained, wetter portions of the landscape, while end moraines and drumlins supported savannas and forests.

The Southeast Glacial Plains Ecological Landscape has undergone dramatic changes in land use and land cover, incurred by settlers that plowed the prairies, drained the wetlands, and cut the forests for lumber and to make way for farmland. The landscape went from a primarily open structure of prairies, wetlands, and savanna to primarily agricultural cropland. Remaining forests occupy only about 10% of the land area, with important cover types including oak, maple-basswood, and lowland hardwoods. Over half of the wetlands in this landscape were drained for farming purposes; some escaped this fate because they were simply too difficult to drain.



Figure 3. Ecological Landscapes of Wisconsin and the study area.

The **Western Coulee and Ridges Ecological Landscape** is the largest of the 16 Ecological Landscapes. It is located in southwestern and west central Wisconsin within the Driftless Area, a region that escaped glaciation during the last glacial period. The Driftless Area is noted for its steeply dissected terrain, extensive network of streams, and lack of glacial deposits (although glacial outwash materials do occur in river valleys). Soils on hilltops and side slopes are formed in loess over limestone or sandstone. They range from well drained to moderately well drained and typically have silt loam to sandy loam surface textures, moderate permeability, and moderate available water capacity. Upland ridges are also generally productive. Side slopes, particularly on south- and west-facing slopes, tend to be dry and erodible, and their shallow depths to bedrock can limit management options. (Other features of this Ecological Landscape [e.g., large river systems] are not addressed here due to their lack of pertinence to the SRPG.)

Historical vegetation consisted of southern hardwood forest, oak savanna, and prairie, along with wetlands (forested and open) along rivers and streams. With Euro-American settlement, most of the level land on ridge tops and in valley bottoms was cleared for agriculture. The untillable steep slopes between valley bottom and ridge top either remained in forest or grew up into oak-dominated forests when early wildfire-suppression policies were instituted.

There have been dramatic changes in the land use and land cover of Western Coulee and Ridges Ecological Landscape since the mid-1800s. Settlers plowed ridge top prairies and cleared valleys for farmland, cut trees on the steep slopes for building homes and barns, and allowed cattle to graze whatever wasn't planted to crops. The landscape now comprises a patchwork of agricultural fields on the ridges and valleys, and second-growth forests on the steeper slopes and in the river floodplains.

Natural Communities of the Region

Opportunities for sustaining natural communities in Ecological Landscapes were developed in 2005 by the Ecosystem Management Planning Team (EMPT; not published until 2007 [EMPT 2007]), and later focused on wildlife Species of Greatest Conservation Need and their habitat in the Wisconsin Wildlife Action Plan (WDNR 2006b). These opportunities are further recognized in the Sugar River Planning Group Rapid Ecological Assessment.

The goal of sustaining natural communities is to manage for natural community types that 1) historically occurred in a given landscape and 2) have a high potential to maintain their characteristic composition, structure, and ecological function over a long period of time (e.g., 100 years). This list can help guide land and water management activities so that they are compatible with the local ecology of the Ecological Landscape while maintaining important components of ecological diversity and function. Based on EMPT's criteria, these are the most appropriate community types that could be considered for management activities within the Southeast Glacial Plains Ecological Landscapes.

There are "major" and "important" management opportunities for 34 natural communities in the Southeast Glacial Plains Ecological Landscape, 23 of which occur within the SRPG (Table 5). In the Western Coulee and Ridges Ecological Landscape, there are "major" and "important" management opportunities for 44 natural communities, three of which occur on the Montrose SIATA (the only study area property within that ecological landscape, Table 5).

A "major" opportunity indicates that the natural communities can be sustained in the Ecological Landscape, either because many significant occurrences of the natural community have been recorded in the landscape or major restoration activities are likely to be successful in maintaining the community's composition, structure, and ecological function over a longer period of time.

An "important" opportunity indicates that although the natural community does not occur extensively or commonly in the Ecological Landscape, one to several occurrences are present and are important in sustaining the community in the state. In some cases, important opportunities may exist because the natural community may be restricted to just one or a few Ecological Landscapes within the state and there may be a lack of opportunities elsewhere.

Table 5. Major and Important Natural Communities Management Opportunities in the Southeast Glacial Plains and Western Coulee and Ridges Ecological Landscapes that Occur in the Sugar River Planning Group

Natural Community	Southeast Glacial Plains	Western Coulee & Ridges
Bog Relict	X	
Calcareous Fen	X	
Coldwater streams	X	
Coolwater streams	X	
Dry Prairie	X	X
Dry-mesic Prairie	X	
Emergent Marsh	X	
Floodplain Forest	X	
Oak Barrens	X	
Oak Opening	X	
Oak Woodland	X	
Sand Prairie	X	
Shrub Carr	X	
Southern Dry Forest	X	
Southern Dry-mesic Forest	X	X
Southern Sedge Meadow	X	
Southern Tamarack Swamp (rich)	X	
Submergent Marsh	X	
Surrogate Grasslands	X	X
Warmwater Rivers	X	
Warmwater Streams	X	
Wet-mesic Prairie	X	
Wet Prairie	X	

Numerous rare species are known from **the Southeast Glacial Plains and Western Coulee and Ridges Ecological Landscapes**. “Rare” species include all of those species that appear on the WDNR’s NHI Working List (WDNR 2011) classified as “Endangered,” “Threatened,” or “Special Concern.” Tables 6 and 7 list the number of species known to occur in each of these landscapes based on information in the NHI database as of 2013.

Table 6. Listing Status for rare species in Southeast Glacial Plains Ecological Landscape (Sept. 2013). Source is the NHI database. Listing Status is based on the NHI Working List published June 2011.

Listing Status	Taxa					Total Fauna	Total Plants	Total Listed
	Mammals	Birds	Herptiles	Fishes	Invertebrates			
Federally Endangered	0	0	0	0	3	3	0	3
Federally Threatened	0	0	0	0	0	0	2	2
Federal Candidate	0	0	1	0	1	2	0	2
State Endangered	0	9	7	5	11	32	11	43
State Threatened	4	9	3	6	6	28	27	55
State Special Concern	2	20	2	8	59	91	64	155

Table 7. Listing Status for rare species in Western Coulee & Ridges Ecological Landscape as of Sept. 2013. Source is NHI database. Listing Status based on the NHI Working List published June 2011.

Listing Status	Taxa					Total Fauna	Total Plants	Total Listed
	Mammals	Birds	Herptiles	Fishes	Invertebrates			
Federally Endangered	0	0	0	0	5	5	0	5
Federally Threatened	0	0	0	0	0	0	2	2
Federal Candidate	0	0	1	0	0	1	0	1
State Endangered	0	6	5	7	17	35	19	54
State Threatened	4	10	2	9	11	36	28	64
State Special Concern	6	15	11	10	93	135	74	209

The Wisconsin Wildlife Action Plan denoted Species of Greatest Conservation Need (SGCN; WDNR 2006a). Species of Greatest Conservation Need are animals that have low and/or declining populations that are in need of conservation action. They include various birds, fish, mammals, reptiles, amphibians, and invertebrates (e.g., dragonflies, butterflies, and freshwater mussels) that are:

- Already listed as threatened or endangered;
- At risk because of threats to their life history needs or their habitats;
- Stable in number in Wisconsin, but declining in adjacent states or nationally.
- Of unknown status in Wisconsin and suspected to be vulnerable.

There are 21 vertebrate SGCN significantly associated with the **Southeast Glacial Plains Ecological Landscape** and 16 associated with the **Western Coulee and Ridges Ecological Landscape** (see Appendix E in the Rapid Ecological Assessment for the Sugar River Planning Group). This means that these species are (and/or historically were) significantly associated with this Ecological Landscape, and that restoration of natural communities with which these species are associated would significantly improve their conditions.

Physical Environment

This section is reproduced in part from "Ecological Landscapes of Wisconsin" (DNR 2014). Land Type Associations (LTAs) of Wisconsin represent a further definition of the NHFEU (Cleland et al. 1997). The NHFEU is a classification system that divides landscapes into ecologically significant regions at multiple scales. The study area encompasses five LTAs: Sugar River Valley, East Johnstown-Milton Moraines, Rock River Prairies, Hills and Valleys-Wisconsin River Drainage, and Orfordville Eroded Moraines (Fig. 4).

The majority of the SRPG, including Brooklyn WA, Montrose State Ice Age Trail Area, Albany WA, Liberty Creek WA, Evansville WA, and Footville Public Hunting Grounds (PHG), and Avon Bottoms WA, lie within an area glaciated prior to the Wisconsin Glaciation. This longer span of time post-glaciation has allowed erosional forces to create a more rolling to hilly bedrock-influenced topography (Fig. 4). Braided proglacial streams carried outwash materials and built landforms including outwash plains, terraces, and fans. The Sugar River is considered by geologists to be a glacial spillway, supported by the presence of outwash material at high elevation along the sides of the river valley (see Sugar River Valley LTA in Fig. 4). Evansville WA and parts of Footville PHG lie within the Rock River Prairies LTA, which is a nearly level outwash plain on pitted outwash plains and collapsed heads-of-outwash. Glacial lakes formed in many parts of the area, including Hook Lake, which is thought to be a kettle hole depression created by glacial deposits 20-80 feet deep.

The SRPG is primarily underlain by Cambrian sandstones, along with occasional strata of dolomite, limestone and shale. Paleozoic rocks (Cambrian and Ordovician) are approximately 1,000 feet thick beneath Dane County (Clayton and Attig 1997), and range from about 1,000 to more than 1,500 feet thick in Rock County (Zaporozec 1982).

Soils

A number of SRPG sites (Albany WA, Albany EWHA, Avon Bottoms WA, Brooklyn WA, and Liberty Creek WA) lie in the lowlands and alluvial areas of the Sugar River and its tributaries. These properties are characterized by floodplains, terraces, and lake plains with predominantly loams and silts over gravelly sandy outwash and silty alluvium. Upland soils are silt loams, and may be shallow over sandstone or limestone bedrock on steeper slopes.

In the northern part of the property group (Hook Lake/Grass Lake WA, Anthony Branch FA, Badfish Creek WA), soils are predominantly wet or poorly drained, with Hook and Grass Lakes underlain by muck and marsh soils; upland soils here are comprised of more well-drained silt loams. Organic muck soils are typical at Evansville WA, where groundwater is at or near the surface throughout the year. At Footville PHG, soils are mostly loams and silt loams, although muck comprises a large part of the central unit. Many of the wetter soils on private lands have been affected by ditching and tiling to promote agricultural production. Some of these soils could be readily returned to wetlands status with appropriate management.

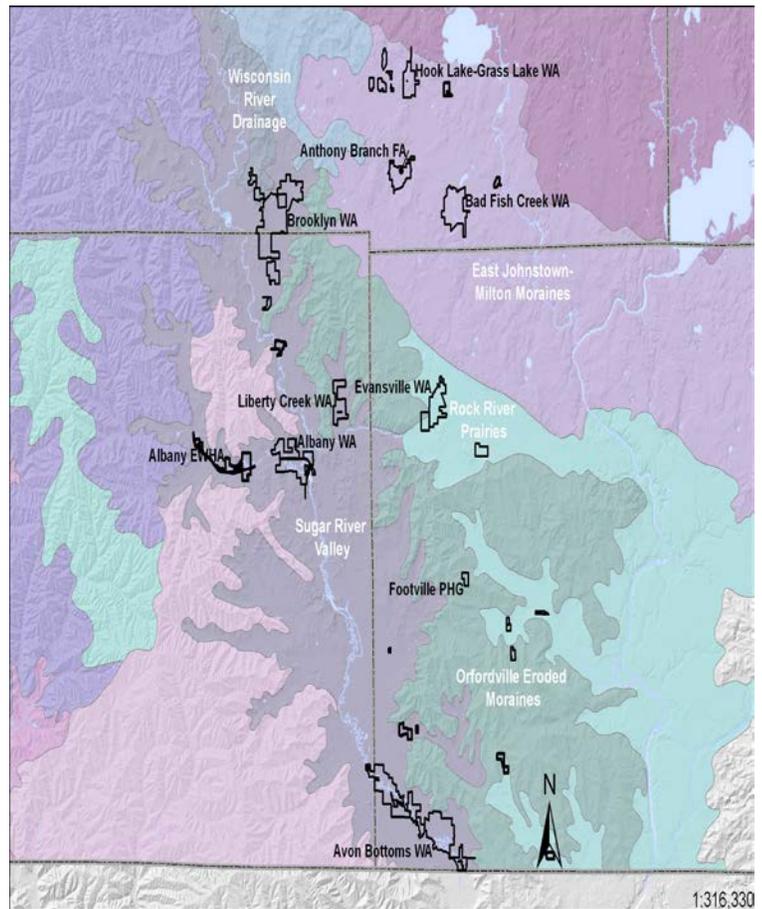


Figure 4. Land Forms and Landtype Associations of the Sugar River Planning Group. Landtype Associations (LTAs) are in white typeface

Main references: Ecological Landscapes of Wisconsin (WDNR 2014) and Web Soil Survey, Natural Resource Conservation Service, USDA.

Hydrology and Water Quality

The SRPG properties lie within the Sugar-Pecatonica and Yahara River basins. These basins consist largely of agricultural landscapes with the Yahara River basin also influenced by urban point and non-point sources. The Sugar and Pecatonica Rivers join in Illinois and flow into the Rock River, which eventually flows into the Mississippi River in northwestern Illinois. Water bodies are associated with each of the larger and many of the smaller SRPG properties (Table 8), belying the importance of aquatic and wetland habitats in the early designation of these sites as fishery and wildlife areas.

Table 8. Water bodies of the Sugar River Planning Group

Property Name	Waterbody Name	WBIC	ORW/ERW	Trout Stream
Anthony Branch WA	Anthony Branch (aka Rutland Branch)	8010000	ERW	Class II
Badfish Creek WA	Badfish Creek	0799500	no	no
Brooklyn WA	Story Creek (aka Tipperary Creek)	0885400	ERW	Class II
Albany WA/EWHA	Little Sugar River	0880100	no	no
Albany WA/EWHA	Sugar River	0875300	ERW	no
Liberty Creek WA	Liberty Creek	0883800	ERW	Class III
Evansville WA (W unit)	Allen Creek	0883700	ERW	Class II
Footville PHG	Bass Creek	0795800	ERW	no
Footville PHG	Marsh Creek	0797700	no	no
Avon Bottoms	Sugar River	0875300	no	no
Avon Bottoms	Taylor Creek	0876300	no	no

Several warm water streams figure prominently in the SRPG, including Little Sugar River, Sugar River, Bass Creek, and Taylor Creek. Four streams in the basin are spring-fed trout streams: Anthony Branch, Story Creek, Allen Creek (Class II) and Liberty Creek (Class III); these four streams are also identified as Exception Resource Waters (ERWs).

Outstanding and Exceptional Resource Waters (ORW and ERW) are officially designated (Wisconsin Administrative Code NR 102.11) waters that provide outstanding recreational opportunities, support valuable fish and wildlife habitat, have good water quality, are not significantly impacted by human activities, and, thereby recognized as being the highest quality waters in the state. While ORWs typically do not have any point sources discharging pollutants directly to the water, ERWs have existing point sources at the time of designation.

The Sugar River is a warm water stream and an ERW, holding great significance as a warm water fishery (harboring at least 50 fish species) and as a Conservation Opportunity Area for protection of diverse native aquatic communities (WDNR 2006a).

The Hook Lake basin occupies about 430 acres, and is thought to be a kettle hole depression in glacial deposits 20-80 feet thick. Water sources are rainfall and surface run-off, resulting in a soft water lake and bog, rarities in southern Wisconsin. Grass Lake is 93 acres, and is alkaline and nutrient-rich, supporting marsh species more typical of southern Wisconsin; a large ditch and associated berm constructed by the Madison Metropolitan Sewerage District cut across the northwest corner of the marsh and run along its west boundary.

Every watershed in the Southeast Glacial Plains Ecological Landscape had a “High” susceptible rating for groundwater pollution (WDNR 2014). This is related in part to the interaction of the soils and geology of these watersheds with the agricultural, suburban and urban land uses that predominate in this landscape.

DNR partnered with U.S. EPA to develop an assessment tool for all the watersheds in the state (WDNR link). This tool ranks each watershed based on many aspects of watershed condition, including water quality, hydrology, habitat, and biological condition. The assessment provides a prediction of both overall watershed health and vulnerability. Most of the streams, rivers and wetlands are in the lower half of the quality rankings on a statewide basis due to sedimentation, excessive nutrients, watershed disturbance and invasive species, especially for the warmwater resources.

Vegetation and Natural Communities

The SRPG represents a mosaic of grasslands, oak savanna/forest, open wetlands, and Floodplain Forest. Virtually all of the SRPG properties have a river or stream flowing through them. As a result, wetlands and aquatic habitats figure prominently in the cover types of this property group. Marshes, wet prairies, fens and sedge meadows occur in areas with poorly drained soils, typically associated with streams and rivers. Floodplain Forests are found along the Sugar River and Little Sugar River. Shrub-carr and Southern Sedge Meadow wetlands are most common while Floodplain Forest and Wet Prairie are less common to rare, respectively.

Grasslands in the form of remnant prairie along with oak savannas are typically found on ridge tops and drier slopes, with oak forests on moister slopes. Sandy upland terraces can also harbor remnant prairie and oak savanna. Other cover types include surrogate grassland, pine plantation, crops, and fallow fields.

Fragmentation of habitats has adverse impacts on these communities (WDNR 2010b). For example, the National Land Cover Data (EPA, 2006) indicates large blocks of continuous mature forest cover are not common in the planning area. Forest interior birds are most productive when they have access to compact forest blocks greater than 250 acres. Fewer than 20 parcels containing less than 7,000 acres of upland forest met this size threshold in the planning region. Importantly, many of these larger blocks were compromised by significant amounts of edge, in-holdings, roads, utility corridors and other intrusions.

Figure 5 (attached at the back of this document) shows the ten largest forest blocks for each of the upland and bottomland forests in the planning region. The SRPG properties contain one of the ten upland forest blocks (i.e., Brooklyn Wildlife Area) and two of the ten bottomland forests (i.e., Avon Bottoms Wildlife Area and Albany Wildlife Area).

Detailed descriptions of the major SRPG community types are found in the Rapid Ecological Assessment (REA) for the Sugar River Planning Group (SRPG), page 16-25 and in the detailed property narratives in this document.

Opportunities for Biodiversity Conservation

The SRPG is noted for its diverse natural communities and species diversity in the Rapid Ecological Assessment for the Sugar River Planning Group. Sixty-five rare animal species are documented for SRPG properties, including five State Endangered, 14 State Threatened, and 46 Special Concern species. Nineteen rare plant species are documented, including three State Endangered, six State Threatened, and 10 Special Concern species.

Appendix A provides a matrix of rare species known from the SRPG and their associated natural communities. Rare or declining animals (not including invertebrates) of the SRPG that are classified as Species of Greatest Conservation Need in Wisconsin's Wildlife Action Plan are listed relative to their association with natural communities in Appendix A. In addition, there are a number of broad themes that capture the exceptional resources of this property group:

The Sugar River and Avon Bottoms WA. The Sugar River at **Avon Bottoms WA** provides a major opportunity to manage for a large and complex mosaic of riparian wetland habitat types including Floodplain Forest, Wet-mesic Prairie, Southern Sedge Meadow, and Emergent Marsh. The river and its backwater sloughs, oxbows and ponds also represent important natural communities with unique assemblages of aquatic plants. Together, these communities create vital habitat for rare and declining plants, birds, fish, herptiles, bats, and aquatic invertebrates.

For a detailed discussion on this theme, see pages 30-35 in the SRPG REA.

Wetland Conservation. With the exception of the Montrose State Ice Age Trail Area, all of the SRPG properties have a river or stream flowing through them. As a result, wetlands and aquatic habitats figure prominently in the habitat types of this property group. It is notable that eight of the ten Primary Sites designated for this property group are wetlands, bespeaking the significant role they play in the larger landscape.

All wetlands are important targets for conservation and restoration, as they serve to slow the release of storm water (thus minimizing flooding), filter nutrients and pollutants that are carried in runoff, and provide moisture banks during low water periods or droughts. Wetlands also provide vital habitat for numerous animals and plants, including basking, foraging, and overwintering habitat for numerous rare or uncommon amphibians and reptiles. The vast wealth of wetlands in the SRPG is shown in Table 9.

For a detailed discussion on this theme, see pages 35-38 in the SRPG REA.

Table 9. Wetlands of the Sugar River Planning Group

Property Name	Remnant Wetlands										Wet Meadow	Wetland Planting **	Approx. Wetland Area (Acres)
	Bog Relict	Calcareous Fen	Emergent Marsh	Floating-leaved Marsh	Floodplain Forest	Shrub-carr	Southern Sedge Meadow	Tamarack (rich) Swamp	Wet-mesic Prairie	Wet Prairie			
Albany WA		x	x		x	x	x				x		741
Albany EWHA			x		x	x	x				x		322
Anthony Branch FA		x				x	x				x		383
Avon Bottoms WA					x				x	x	x	x	1,956
Badfish Creek WA			x			x	x			x	x		831
Brooklyn WA			x			x	x		x	x	x		1,298
Evansville WA		x					x			x	x		590
Footville PHG											x	x	30
Hook Lake-Grass Lake WA	x		x	x				x					450
Liberty Creek WA*						x	x		x	x	x		520
Montrose SIATA													0

Note: Primary source: Wisconsin Wetlands Inventory

*Wetlands Inventory data not available. Acreage based on NHI inventory data.

** Anthropogenic Wetlands are wetlands re-created on former croplands.

Oak Savanna and Prairie Conservation. Opportunities exist on SRPG properties to restore three types of oak savanna (Oak Openings, Oak Woodlands, and Oak Barrens), all of which are globally rare communities. Such actions would improve habitat for many plants and animals that are specialists of grassland, savanna, woodland, and barrens. Less than 0.1% of original prairie remains in Wisconsin.

For a detailed discussion on this theme, see pages 38-39 in the SRPG REA.)

Oak savanna sites with good restoration potential:

- Brooklyn Oak Savanna and Dry Prairie Primary Site
- Albany Sand Prairie and Oak Savanna Primary Site
- Swenson Wet Prairie SNA

Important sites for **lowland prairie conservation** include:

- Badfish Creek Wet Prairie Primary Site
- Brooklyn Wet Prairie Primary Site
- Evansville Wet Prairie Primary Site
- Swenson Wet Prairie State Natural Area
- Liberty Creek Wildlife Area (including the Liberty Creek Wet Prairie Primary Site)

Important SPRG sites for **upland prairie conservation** are:

- Montrose State Ice Age Trail Area harbors two Dry Prairie remnants.
- Brooklyn Oak Savanna and Dry Prairie Primary Site also harbors two Dry Prairie remnants.
- Albany Sand Prairie and Oak Savanna Primary Site have good-quality Sand Prairie and Dry-mesic Prairie. The site is also an important nesting area for turtles and is potentially suitable habitat for a variety of rare herptiles such as plains gartersnakes, North American racer, and ornate box turtles (in drier locations).
- At Avon Bottoms WA, the planted sand prairies along Smith and Carroll Roads potentially provide suitable habitat for sand-loving reptiles such as plains gartersnakes, North American racer, and ornate box turtles.
- Dry Prairie, Sand Prairie and surrogate grasslands on sandy, dry sites at Brooklyn, Albany and Avon Bottoms WAs provide important habitat for small mammals, including some that are rare.

Bird Conservation. The SRPG provides important opportunities for conservation of grassland and forest interior birds. Grassland birds have declined more steeply than any other group of birds in North America and the Midwest. Many of the rare forest interior birds found on SRPG properties have had significant population declines in Wisconsin and throughout their range. Protected large blocks of forest interior habitat are rare in south central Wisconsin, yet forests at Albany, Brooklyn and Avon Bottoms Wildlife Areas attract an impressive assemblage of rare forest interior birds.

For a detailed discussion on this theme, see pages 41-43 in the SRPG REA.

Properties with the best potential for managing for **forest interior birds** and **grassland birds** due to their large size and landscape context:

- Avon Bottoms WA protects an extensive floodplain forest and backwater system of statewide significance, providing habitat for numerous rare forest birds, bats, fishes and aquatic insects. This property provides the best opportunity for forest birds in the entire planning group and has also been recognized as an Important Bird Area.

The extensive grasslands on the wildlife area and the adjacent federal conservation easements provides excellent habitat for grassland birds too.

- Albany and Brooklyn WAs have older-aged Oak Savanna and Oak Woodland that support rare forest-interior birds. However, several stands at Albany WA will be harvested to regenerate oak that will leave them unsuitable for forest interior birds for many decades. The remaining intact stands provide many of the key structural aspects of quality interior forest habitat for rare birds in the state. However, the forested context of these areas is somewhat poor due to the fragmentation, amount of edge and disturbance in these remaining forest blocks. This can often result in low population numbers and nesting success.

Given the landscape context (see Figure 5), it is debatable whether some of the forest blocks on these properties can provide or maintain viable long-term populations of forest interior birds. The master plan team will consider if more forested acreage is warranted at these sites, and if connecting and enhancing the oak woodlands are worth pursuing to promote these rare birds.

- All three of these properties have larger grasslands valuable to grassland birds.

Primary Sites

Ten ecologically important sites, or “Primary Sites,” were identified within the SRPG REA (Table 17 and Map F). Primary Sites are delineated because they generally encompass the best examples of

- 1) Rare and representative natural communities,
- 2) Documented occurrences of rare species populations, and/or
- 3) Opportunities for ecological restoration or connections.

These sites warrant high protection and/or restoration consideration during the development of the master plan. The REA is meant to be considered along with other information when identifying opportunities for various management designations during the planning process. Short descriptions of these sites are included in the property narratives below, while complete descriptions of the Primary Sites can be found in Appendix G of the SRPG REA.

- Albany Sand Prairie and Oak Savanna
- Anthony Branch Sedge Meadow and Fen Mounds
- Avon Bottoms Floodplain Forest
- Badfish Creek Wet Prairie
- Brooklyn Oak Savanna and Dry Prairie
- Brooklyn Wet Prairie
- Evansville Wet Prairie
- Hook Lake Bog State Natural Area
- Liberty Creek Sedge Meadow
- Swenson Wet Prairie and Woods

Management Considerations

Invasive Species. Non-native invasive species thrive in newly disturbed areas, but also may invade and compromise high-quality natural areas. They establish quickly, tolerate a wide range of conditions, are easily dispersed, and are relatively free of the diseases, predators, and competitors that kept their populations in check in their native range. Non-native invasive plants can out-compete and even kill native plants by monopolizing light, water, and nutrients, and by altering soil chemistry and mycorrhizal relationships. Where non-native invasive

plants become dominant, they may even alter ecological processes by limiting use of prescribed fire, by modifying hydrology, and by limiting tree regeneration and ultimately impacting forest composition (WDNR In prep. b).

In addition to the threats to native communities and native species diversity, non-native invasive species negatively impact forestry (by reducing tree regeneration, growth and longevity), recreation, agriculture, and human health (by causing skin rashes and increasing incidence of tick-borne diseases).

The frequent usage of the SRPG for recreation has contributed to the introduction and spread of non-native invasive species throughout the properties. Parking areas, trails, and other high-use areas are typical entry points for non-native invasive species that are introduced by visitors' footwear, clothing, vehicle tires, boats, and recreational equipment. Once established, these invasives may continue to spread along natural corridors (e.g., waterways) and along human-made corridors (e.g., trails and roads). They even have the potential to invade remote natural areas via vectors such as wind, water, and wildlife. Non-native invasive species may also be spread inadvertently through management activities such as timber operations and roadside mowing, especially if Best Management Practices aren't followed.

Thirty-seven non-native invasive species that are widespread at SRPG and pose the greatest immediate threat to native species diversity, rare species habitats, or high-quality natural communities are listed in Table 12 in the Rapid Ecological Assessment. See Table 13 for invasive species that are currently not known at SRPG, but could appear there.

See the SRPG REA (pages 46-52) for a complete discussion of the impacts of non-native invasives, descriptions of specific species, and tips on how to control them.

Description of the SRPG Properties

Program Acreage Overview

Table 10 provides a breakdown of land acquisition by program for the SRPG properties. Almost 22,280 acres (93% of the total) was acquired, eased or leased by the Wildlife Management program. Fishery Management has acquired about 860 acres; Natural Heritage Conservation about 527 acres and Parks and Recreation has the smallest at 239 acres.

Table 10. DNR Public Lands

	Fee Title	Public Access Easements	No Public Access Easements ¹	Leased ²	Total
Acres					
Wildlife Areas, Public Hunting Grounds and Scattered Wildlife/Extensive Wildlife Habitat Areas					
Avon Bottoms WA	2,835	4		714	3,553
Albany WA	1,427	3		282	1,712
Brooklyn WA ³	2,608	338		151	3,097
Badfish Creek WA	1,147			287	1,434
Evansville WA	707	100			807
Footville PHG				8,833	8,833
Hook Lake/Grass Lake WA	745	108	121		974
Liberty Creek WA	563			20	583
EWH/SWL ⁴	1,284	2			1,286
Fishery Areas – Streambank Protection and Remnant Areas					
Allen Creek	223				223
Anthony Branch	637				637
Parks and Recreation – State Ice Age Trail Area					
Montrose	204	35	51		290
Natural Heritage Conservation – State Natural Areas ⁵					
Hook Lake Bog	527				527
Total	12,907	590	172	10,287	23,956

¹ No access easements include scenic easements and Purchase of Development Rights.

² The leased lands are short-term leases set to expire between 2015-2017.

³ The Story Creek SBP Area contains 403 acres consisting of several easement parcels and one fee title parcel. These lands are adjacent to the Brooklyn WA and are open for public recreation. The planning for these parcels is included in the Driftless Areas Master Plan

⁴ EWH/SWL= Extensive Wildlife Habitats/Scattered Wildlife Lands. There are 14 properties purchased through the EWH/SWL programs included in the planning group.

⁵ Avon Bottoms WA contains two state natural areas (Avon Bottoms and Swenson Wet Prairie).

Habitat and Recreation Management Overview

Wildlife Management staff are responsible for managing about 13,300 acres of fee title and easement lands on the SRPG wildlife and fishery properties. Fishery Management biologists focus their efforts on the near stream riparian zones and in-stream management activities along trout streams on the SRPG properties. Wildlife staff also assist the Natural Heritage Conservation staff with management on the state natural areas as time and resources allow. The Ice Age Trail parcels are managed by volunteers with guidance provided by DNR staff.

Examples of management activities by Wildlife, Fishery, Natural Heritage Conservation, and Parks and Recreation staff as well as volunteers are included in the individual property descriptions and in Appendix C.

The following is a summary of the Wildlife Management staff accomplishments on the SRPG properties between 2010-2013:

- restored 180 acres of grassland/year,
- conducted grassland maintenance on 1,180 acres/year,
- enhanced forest habitat on 43 acres/year,
- maintained Oak Savannas/Barrens habitat on 13 acres/year,
- planted trees on 15 acres/year,
- assisted with timber markings/sales on about 100 acres/year,
- developed or restored 140 acres of wetlands/year,
- conducted invasive species control on 23 acres/year,
- maintained 17 miles/year of hunter/hiker trails,
- inspected and maintained 33 miles/year of boundaries and installed boundary postings on 6 miles/year.

In addition wildlife staff have conducted wildlife surveys, maintained roads, dikes, buildings and equipment, responded to public inquiries, participated in Learn to Hunt and other public outreach programs, and conducted required program and interdisciplinary office duties.

DNR staff also have office and field duties associated with properties under their responsibility that are not part of the SRPG. These accomplishments are not recorded above.

The majority of the land on these properties is actively managed. In contrast, a relatively small amount is passively managed (i.e., natural processes are allowed to direct the composition and structure of the plant and animal communities). Passive management primarily occurs on the natural areas and in the warmwater streams.

See Appendix C for a more detailed discussion of active and passive management on state fish, wildlife and natural area properties.

Cover Types and Land Use Overview

The SRPG properties are a diverse mix of cover types. Overall, open wetlands are the dominant cover type and comprise 28% of the total land cover. Close behind are forest lands, particularly floodplain and bottomland forests, at 27% with grasslands and prairies following at 25%. Lowland shrubs make up 13% of the land cover with very limited open water, primarily as rivers and streams, at about 1%.

Agriculture practices are applied to about 6% of the total land cover of the SRPG properties. This constitutes about 14% of the uplands, and if the forested habitats are discounted nearly 20% of the uplands are managed using farming practices.

Nearly 7,900 acres (58% of the total) of the fee title and eased lands are lowlands consisting of open wetlands, shrub wetlands, floodplain or bottomland forests, and open water. The remaining acres are uplands consisting of grasslands and prairies, forests and land managed with agricultural practices.

Land Cover and Vegetation Maps and Descriptions

This document is a compilation of the work efforts by staff from four different programs (Wildlife, Fisheries, Forestry and Natural Heritage Conservation) in three different divisions of the DNR. These programs often have different terminology and nuanced interpretations of the natural resources on a property. This results in slightly different qualitative and quantitative resource descriptions. Consequently, the narrative sections, maps and tables may vary slightly depending on the programmatic perspective being applied.

For example, a “ground up” compared to a “top down” perspective can affect the level of detail provided on the plant and animal communities being described. The land cover type maps and tables in the property descriptions provide a large scale, aerial or “top down” (i.e., forestry management) perspective. This perspective may not capture the diverse ecological qualities of the ground level communities (e.g., a 10-20 acre bog) due to its small size. However, the “ground level” community may be described in the narrative portions of the property write-up, especially if a Natural Heritage Conservation “Primary Site” is found on the property.

Albany Wildlife Area and Extensive Wildlife Habitat Lands

Albany Wildlife Area (WA) is a 1,430-acre property located north and west of the City of Albany in Green County. This property includes the confluence of the Sugar River and the Little Sugar River north of Albany and then stretches west along the Little Sugar River towards Monticello. See Map Series B.

Current State Ownership:	1,430 acres
Current Acreage Goal:	1,580 acres
Current Project Boundary:	1,670 acres
Approved NR 44 Master Plan:	No

The wildlife area was established in 1956 as a Federal Aid Fish and Wildlife Restoration Project with the intent of protecting important wetlands and providing public hunting opportunities. Although of modest size, Albany is the largest state wildlife area located entirely within Green County. An additional 282 acres of short-term Voluntary Public Access leases have been acquired for public hunting and fishing adjacent to the wildlife area. These leases will expire by 2017.

Albany WA has significant opportunities for biodiversity conservation including:

- Wetland Conservation in the Sugar and Little Sugar River floodplains
- Oak Savanna Conservation
- Prairie Conservation
- Herptile Habitat
- Forest Bird Habitat

The cover types on the wildlife area are listed in Table 11.

In addition to Albany WA, the DNR has invested in three Extensive Wildlife Habitat (EWH) parcels and one Scattered Wildlife Habitat (SWL) parcel. The three EWH parcels (580 acres) lie upstream along the Little Sugar River between the Albany WA and the Village of Monticello. These parcels were purchased between 1970 and 1990 to provide wildlife habitat, public recreation and buffer portions of the Sugar River trail. The SWL parcel (20 acres) is immediately northeast of the Albany WA and includes portions of Allen Creek and the Sugar River. EWH and SWL properties are purchased on a statewide basis so there are no property based acreage goals or boundaries. These parcels are shown in Map Series B. Table 12 provides a summary of the cover types on the EWHs and the SWL.

A significant opportunity for biodiversity conservation at the EWHs along the Little Sugar River is:

- Wetland Conservation along the Little Sugar River floodplain

Soils, Geology and Hydrology

The alluvial and riparian areas along the Sugar and Little Sugar Rivers are subject to seasonal flooding and contain poorly to somewhat poorly drained silt loams. Along the riparian corridor areas of well drained soils are restricted to silt and sandy loam soils on shallow terraces. Uplands are gently sloping to very steep, with shallow silt loam soils that are prone to erosion. In general, soil management centers around the wetness and poor drainage in the lowlands and the erosion hazards on the uplands.

The site is underlain by Paleozoic sedimentary rocks primarily consisting of sandstone with minor elements of limestone, shale and conglomerate.

The Sugar River is a warmwater stream that flows north to south through or along the SWL parcel and the Albany WA. The Sugar River in the wildlife area is designated an Exceptional Resource Water.

The Little Sugar River flows into the Albany WA from the west and joins the Sugar River just north of the City of Albany. A large sandy delta has developed at the confluence of the two rivers. Both rivers meander extensively with numerous oxbows and sloughs creating diverse aquatic habitats in the riparian areas. Several feeder streams and springs course into the river between Monticello and Albany. A 20-acre wetland on one of the EWH parcels was restored in the mid-1990's under the U.S. Fish and Wildlife Service's Partners in Wildlife program by plugging a small ditch.

Habitat and Vegetative Cover

Floodplain Forests are found along the Sugar and Little Sugar Rivers in this wildlife area and portions of the EWH and SWL parcels. Much of this community is degraded, with scattered large trees, open canopy, and a low-diversity ground layer dominated by reed canary grass and other weedy species. Open habitats within the floodplain are mostly dominated by reed canary grass, often with scattered willows, though some areas harbor Emergent Marsh. Adjacent uplands are old farmlands (about 310 acres of which have been planted to prairie), areas of upland oak savanna/forest, and an area with remnant Sand Prairie/Dry-mesic Prairie. There are 110 acres of cropland planted to corn, soybeans, sunflowers and hay; these are rotated for the purposes of crop production and wildlife.

A small, fair-quality wetland with a mix of Emergent Marsh, Southern Sedge Meadow and Calcareous Fen lies in the northwestern corner of the wildlife area. Groundwater calciphiles such as Angelica are noted here, along with a rare plant.

A 50+-acre good-quality Southern Dry Forest/Oak Woodland is located north and west of Rubens Cave Road. This forest harbors timber-sized white, black and red oaks, and a diverse ground layer of 44 species typical of Southern Dry Forest and Oak Woodland, including spring ephemerals such as Dutchman's breeches. Non-native invasive shrubs such as common buckthorn along with garlic mustard and Japanese hedge-parsley pose a significant threat to this site. Note: In preparation for an oak regeneration harvest, the understory was forestry mowed and then broadcast sprayed in 2013. As a result, the description of the shrub and ground layer provided here may no longer apply.

The southwestern part of the Albany WA (south of Zurfluh Road) contains a fair-quality 45 acre Southern Dry Forest/Oak Woodland. Timber-sized white oak is common, with a ground layer dominated by garlic mustard and oak forest generalists. In areas with sandy soils, timber-sized black oaks occur with a low-diversity ground layer of Pennsylvania sedge and scattered native forbs. Note: In preparation for an oak regeneration harvest, the understory was forestry mowed and then broadcast sprayed in 2013. As a result, the description of the shrub and ground layer provided here may no longer apply.

The Albany EWH parcels lie along the Little Sugar River, with the Sugar River Recreational Trail bisecting the easternmost parcels. The floodplain harbors scattered patches of closed to open silver maple-dominated Floodplain Forest with reed canary grass and other mostly common or weedy species in the ground layer. Open habitat areas in the floodplain are mostly dominated by reed canary grass and cattails. Adjacent uplands are old farmlands (much of which have been planted to low-diversity prairie or are fallow with cool-season grasses) and small areas of degraded oak opening/upland forest.

The Fischer Tract is a 194 acre parcel and is the eastern most of the EWH parcels. The area north of the Little Sugar River has springs, spring ponds, and approximately 27 acres of degraded sedge meadow. The sedge meadow areas are dominated by tussock sedge, and generally have moderate species diversity. A 50-acre complex of Southern Sedge Meadow, Emergent Marsh, and wooded terraces lies in an abandoned braided channel of the Little Sugar River on the southeastern part of this parcel just south of the recreational trail. A 20-acre reed canary grass dominated Emergent Marsh lies in the southeastern part of the Fischer parcel. Reed canary grass is dense close to the recreational trail, but relatively absent elsewhere. Emergent Marsh areas are dominated by broad-leaved cat-tail, with some areas of dense sweet flag. Dense native shrubs create a transition zone to sandy terraces of young, low-quality forest with aspen poles and occasional small silver maple and red oak. Two rare plants are known from this site in the past: one state-threatened species was observed in 1958 and one special concern species was observed in 1987; both are found in Floodplain Forest and Southern Sedge Meadow habitat.

Table 11: Albany WA Cover Types

Cover Type	% Cover
Lowland Shrub	32
Bottomland Hardwood	27
Upland Hardwood	10
Grassland	9
Oak	5
Water	5
Prairie	4
Oak Savanna	3
Agriculture	2
Emergent Vegetation	2
Non-Forested Wetland	1

Table 12: EWH/SWL Cover Types

Cover Type	% Cover
Bottomland Hardwood	38
Grassland	15
Prairie	12
Non-Forested Wetland	10
Agriculture	10
Lowland Shrub	9
Oak	5
Upland Hardwood	<1
Water	<1
Upland Conifer	<1

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Primary Sites

Albany Sand Prairie and Oak Savanna - A mosaic of state-imperiled and globally rare ecosystems are featured at this Primary Site, including Dry-mesic Prairie, Sand Prairie, Oak Barrens, Oak Opening, and Oak Woodland. Two rare plants are found in the prairie and Oak Woodland, along with numerous rare and declining grassland/shrubland birds. The sandy soils, proximity to water, abundant food resources, and variable cover types also make this site important for herptiles (e.g., turtles).

For more details on this primary site, see Appendix G of the SRPG REA.

Forest Resources

The oak timber type makes up about 30% of the forest resource on the Albany WA. A shelterwood harvest to regenerate oak is occurring on approximately 140 acres to maintain the oak resource on this property. Forest cover types of Albany WA (not including EWH/SWL) are summarized in Table 13.

Table 103. Forest Cover Types of Albany WA

Forest Type	Forest Type Description	Stands	Acres	Percent of Forested Acres	Percent of Recon Acres
BH	Bottomland Hardwoods	8	368	59%	25%
CH	Central Hardwoods	8	82	13%	6%
O	Oak	6	172	28%	12%
	Totals:	22	622	100%	43%

Wildlife Resources and Habitat Management

The most common game species on the Albany WA and the EWH/SWL parcels include deer, turkey, pheasant and other small game common to southern Wisconsin. Albany is popular with pheasant and turkey hunters, and is stocked in the fall with pheasants to supplement modest wild reproduction. Mallards and wood ducks are fairly common in the river backwaters and oxbow lakes. A brood of ruffed grouse were noted during breeding bird surveys in 2013. Management practices include prescribed burning, farming, haying, logging, and brushing by mechanical means and herbicide. The Fischer Tract is stocked with rooster pheasants for fall hunting. Leaving sunflowers and small grains for fall dove hunting has become an increasingly popular practice in recent years.

About 43% of the Albany WA is wooded, nearly 13% is maintained in native grass and about 10% is used for crop production and wildlife food plots. Much of the land along the river is marsh with reed canary grass, cattails and sedges. Management practices on the EWH and SWL parcels are similar to those on the Albany WA, but management is less intensive because of the high proportion of wetlands and limited equipment access.

Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by Wisconsin Natural Heritage Inventory known at Albany Wildlife Area include small mammals, birds, herptiles, fishes, and invertebrates (Table 14). No wildlife Species of Greatest Conservation Need or other rare or declining species tracked by the inventory are known at Albany EWH.

Table 14. Rare or Declining Species of Albany Wildlife Area

Species Guild	State Status			Total
	Special Concern	Threatened	Endangered	
Small Mammals	1			1
Forest Birds	5	3	1	9
Grassland Birds	7	1		8
Frogs	2			2
Snake			1	1
Turtle		1		1
Fishes	1			1
Invertebrate	1			1

A less rigorous master plan was developed and approved by the Natural Resources Board for this wildlife area in 1982. The plan indicated the property was to be managed for hunting cover, ducks and pheasant production. About 10 % of the acreage was to be kept under agricultural management. Wetlands were to be restored to encourage duck production and promote furbearer populations. Timber was to be managed to maximize wildlife and aesthetic values. These goals have been pursued through the actions implemented over the last thirty years.

Administrative Facilities and Access

There is adequate access to these lands from the surrounding roads and the eight parking lots at the Albany WA and three parking lots at the EWHs along the Little Sugar River. Many of these lots have mowed lanes to provide access for farming and management, and walk-in access for recreational users. Additional lanes are periodically maintained for access by cooperating farmers, for firebreaks or for other management purposes, and are also available for public foot travel.

A rustic boat landing is available for small boats and trailers adjacent to the County Highway EE parking lot, just west of the Sugar River bridge in the Albany WA. A small boat landing at the EWH off Silver Road bridge provides access to the Little Sugar River. There is also a boat landing in the City of Albany, upstream from the mill dam, from which shallow draft boats can navigate north through Albany Lake (Lake Winnetka) into the wildlife area. Due to years of siltation above the dam, water levels in the lake can be as little as a few inches during much of the year. Canoes and kayaks can also be carried down to the Little Sugar River from the Tin Can Road bridge.

On the EWH parcels a dike and water control structure (south of the Sugar River Trail) is maintained to provide a 20-acre wildlife flowage. An access lane leads off the Schneeberger Road parking lot (north of the Sugar River Trail) provides access for cooperating farmers, pheasant stocking and other management activities.

The small SWL parcel northeast of the Albany WA has no infrastructure.

Recreation

The Albany WA offers many recreational opportunities, including hunting for deer, turkeys, pheasants and waterfowl as well as birding, wildlife viewing, cross-country skiing, snowshoeing and hiking (no designated trails), trapping, and gathering of wild edibles. A hotspot has been established on the Wisconsin e-Bird website where birders may report their Albany Wildlife Area observations. Canoeing, kayaking and fishing from small boats are popular on the Sugar and Little Sugar Rivers, but use of the Little Sugar River may be limited by seasonal low water.

Although the 24-mile Sugar River State Trail is not part of this planning effort, the trail corridor is a central feature of the Albany WA and attracts many visitors annually. Hiking and biking are allowed at all times, and cross-country skiing, hunting and snowmobiles are allowed in season.

The EWH and SWL parcels offer similar recreational opportunities although use is limited due to the size of the parcels. Hunting is a popular fall activity, but only one of the EWHs is stocked with rooster pheasants. Dove hunting over small sunflower fields has been popular in recent years.

The previous master plan recommended pheasants be stocked to enhance hunting opportunities. This objective has been achieved. A canoe launch was added as recommended, but not at the location proposed in the 1982 plan. Adding a primitive camping area and maintaining a very short 0.5 bridle trail have not been pursued.

Cultural Resources

Pre-historic cultural resources have been identified on or adjacent to Albany WA and the EWH parcels.

Anthony Branch Streambank Protection Area

The Anthony Branch Streambank Protection Area (SBP) area contains 637 acres and is located 3 miles southwest of Stoughton and 1.5 miles southeast of Oregon in Dane County. The stream was extensively ditched and channelized in the 1940's and 1950's. Fishery surveys dating from the late 1960's identified springs and trout resources worthy of protection. Land acquisition began in 1979 with the intent of protecting the stream corridor and water quality while also providing public access. The stream section in the fishery area is also called the Rutland Branch. **See Map Series C.**

Current State Ownership:	637 acres
Current Project Boundary:	1,020 acres
Approved NR 44 Master Plan:	No

This property is apt of the statewide SBP and does not have a project specific acquisition goal.

Significant opportunities for biodiversity conservation at Anthony Branch include:

- Wetland Conservation

Soils, Geology and Hydrology

The soils of the Anthony Branch Fisher Area are mostly wet to varying degrees, with silt loam, sandy loam, silty clay loam and muck on 0-6% slopes. All but a small area in the west-central part are hydric soils. The site is primarily underlain by Cambrian sandstones, along with occasional strata of dolomite and shale.

The Anthony Branch of Badfish Creek flows is classified as a Class II trout stream and an Exceptional Resource Water. Anthony Branch (aka Rutland Branch) is a two-mile-long spring-fed tributary to Badfish Creek. The majority of the trout stream lies within the boundary of this fishery property. It drains approximately six square miles of wet meadow, pasture and cropland.

Habitat and Vegetative Cover

The majority of Anthony Branch consists of open/brushy wetlands, prairies and scattered woodlands (Table 15). Approximately 125 acres of low-quality sedge meadow (dominated by reed canary grass) occupies the east/northeast part of the site. These wetlands have been adversely affected by past drainage practices. However, areas of good quality Southern Sedge Meadow and Shrub-carr still persist. Seventy acres of good-quality Southern Sedge Meadow spans the central and southwestern parts of the property, and is designated a Primary Site (see below). The sedge meadow complex includes a small area of Wet Prairie, springs /spring runs, and four Calcareous Fen mounds. Small patches of Wet-mesic Prairie are found along the east edge, with conservative species such as prairie dock and Riddell's goldenrod.

The uplands consist of low-diversity prairie plantings and small amounts of cropland are in farm agreements in anticipation of future grassland planting. Several patches of overgrown Oak Opening/Oak Woodland are found on the property. A 13-acre low-quality Oak Woodland with restoration potential is located in the northwestern part of the site. This small woodland has open-grown burr, white and occasionally black oak that attain up to 30" dbh. Shrubs are abundant in the understory, especially common buckthorn and Eurasian bush honeysuckle. The ground layer is species poor, mostly dominated by garlic mustard and oak woods generalists. The site has limited restoration potential due to small size and significant management effort needed to restore and maintain it.

Cover Type	% Cover
Non-Forested Wetland	31
Prairie	26
Lowland Shrub	17
Grassland	9
Bottomland Hardwood	6
Oak	4
Aspen	3
Oak Savanna	2
Upland Hardwood	1
Upland Conifer	<1
Water	<1

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Primary Sites

Anthony Branch Sedge Meadow and Fen Mounds – The inclusions of Fen Mounds and Wet Prairie enhance the floral diversity of this 70-acre sedge meadow complex and provide habitat for rare or declining marsh birds.

For more details on this primary site, see Appendix G of the SRPG Rapid Ecological Assessment.

Forest Resources

The forestry resource on this property is comprised of approximately 25% oak, 26% central hardwoods, and 30% bottomland hardwoods. Active management will be needed in the future to maintain the oak resource. Forest cover types are summarized in Table 16.

Table 16. Forest Cover Types of Anthony Branch Streambank Protection Area

Forest Type	Description	Stands	Acres	% of Forested Acres	% of Recon Acres
A	Aspen	1	19	17%	2%
BH	Bottomland Hardwoods	2	33	30%	4%
CH	Central Hardwoods	2	28	26%	3%
O	Oak	2	27	25%	3%
SW	White Spruce	1	2	2%	0%
	Totals	8	109	100%	12%

Wildlife Resources and Habitat Management

Turkey, American woodcock and mourning dove are the most common upland game bird species at Anthony Branch Fisheries and Wildlife Area. Habitat management has focused largely on restoring and maintaining the open herbaceous grasslands and wetlands. Prairie plantings are managed periodically through controlled burning and late summer mowing. Twenty acres on the west side of the property are sharecropped in preparation for a future grassland restoration. The high-quality herbaceous wetlands along the creek are periodically maintained through controlled burning and targeted brush removal. The wetland areas in the north and southeast of the property have been periodically hayed in the late summer to control brush, but the southern portion of the property has now largely succeeded to Shrub-carr or low-quality forested wetland. Maintenance of desirable vegetation along the riparian corridor is done in cooperation with DNR Wildlife Management and State Natural Areas staff through the use of prescribed burning, herbicide use, and restoration plantings.

The primary management activities are stocking trout and upland habitat management to support a sustainable fishery. This stream had been consistently stocked with brown trout, but starting in 2013 stocking has been directed toward promoting a brook trout due to the abundance and consistently favorable (cold) temperatures of the groundwater inputs. The fish community is very simple and consists of brook and brown trout, mottled sculpin, creek chubs and white suckers. There may be seasonal movement of warm water species from Badfish Creek into the stream's lower reach.

No stream habitat restoration has been undertaken to date, but re-establishing a natural meandering pattern, addition of in-stream habitat features, and maintenance of cold base flow are desired goals.

Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by the Natural Heritage Inventory known at Anthony Branch Fishery Area include one Threatened grassland bird and one Special Concern marsh bird.

For a list of rare or declining species of the entire property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix C in the same document.

Administrative Facilities and Access

Four gravel parking lots provide public access to the property. Two lots on County Road A provide access from the north and lots on Oak Ridge Road and Old Stone Road provide access from the east and south respectively. A water control structure impounds the pond furthest to the north where it discharges to Anthony Branch. A concrete bridge over a lateral tiled ditch is located about 1/8th mile west of the water control structure. Maintenance vehicles (including tractor) may cross Anthony Branch at a gravel ford in the northwest part of the site, due west of the wooded island.

Recreation

Anthony Branch Fishery Area provides quality hunting and fishing opportunities throughout the seasons. Anthony Branch is classified as a Class 2 brown trout fishery in its entirety. The stream receives light fishing pressure due to limited developed access and modest numbers of fish in comparison to higher profile Dane county streams.

Since the conversion from traditional row-crop agriculture in the 1980's, the parcel has become a popular upland game-bird area (turkey) and bow-hunting property. The property was previously stocked with pheasants, but stocking has been suspended in order to focus attention on other large properties within the county. Sunflower fields have also been planted within the small sharecropping field on the west side of the property to provide for dove hunting opportunities. Many of the wetlands have a strong shrub component and harbor both nesting and migratory woodcock.

Proximity to Madison makes it a convenient destination. Due to the proximity to Madison, this property does receive some non-consumptive recreational use including hiking, wildlife photography and wildlife watching.

Local Planning Designation

The value of Anthony Branch as a trout fishery is acknowledged by local ordinance. Almost the entire fishery area lies within a "thermally sensitive area" in Dane County. A thermally sensitive area is land that drains to surface waters capable of supporting a community of cold water fish and other aquatic life or serves as a spawning area for cold water fish species. Ordinances require that thermal control practices be included in a stormwater management plan if a development occurs within a thermally sensitive area to ensure no increase in temperature of stormwater post-construction in order to protect the cold water communities.

Cultural Resources

Pre-historic cultural resources have been identified on this property.

Avon Bottoms Wildlife Area

Avon Bottoms Wildlife Area is a 2,839 acre property located in Rock and Green counties. The property follows the Sugar River bottoms through the Rock County Town of Avon, from a point just west of County Highway T on the Rock/Green county line to the Illinois border. Avon Bottoms Wildlife Area was begun in 1960 as a Federal Aid in Fish and Wildlife Restoration project to provide public hunting and produce ducks and pheasants. **See Map Series D.**

Current State Ownership:	2,839 acres
Current Acreage Goal:	3,007 acres
Current Project Boundary:	3,775 acres
Approved NR 44 Master Plan:	No

Avon Bottoms Wildlife Area is gaining new respect for its wild nature in close proximity to Wisconsin and Illinois population centers. Surrounding the many sloughs and oxbows of the lower Sugar River, the property includes two State Natural Areas set aside for their rare intact plant communities. This property is one of several state, federal and local conservation properties running from Brodhead to the mouth of the Sugar River in a Winnebago County.

This property is also listed as a high quality Wetland Gem by the Wisconsin Wetlands Association .

Significant opportunities for biodiversity conservation at Avon Bottoms WA include:

- The river and its backwater sloughs, oxbows and ponds represent important natural communities with unique assemblages of aquatic plants. This large and complex mosaic of riparian wetland habitat types includes Floodplain Forest, Wet-mesic Prairie, Southern Sedge Meadow, and Emergent Marsh.
- Important habitat for rare and declining plants, birds, herptiles, bats, fishes, and aquatic invertebrates.
- The Sugar River Conservation Opportunity Area (COA) encompasses Avon Bottoms WA and surrounding lands, as described in Wisconsin's Wildlife Action Plan (WDNR 2006).

Soils, Geology and Hydrology

Soils in the lowest parts of outwash plains and terraces are nearly level and are poorly drained while soils on outwash plains and terraces are nearly level and gently sloping and are somewhat excessively drained. In general, these soils are wet all or most of the year, are poor building sites, have low natural fertility, and low available moisture capacity, and are susceptible to severe erosion when tilled.

The majority of the property is underlain by sandstone with minor elements of limestone, shale and conglomerate. Approximately one-fifth of the property (northwest end) is underlain by dolomite with lesser amounts of sandstone and shale.

The Sugar River is a warm water stream and an Exceptional Resource Water, holding great significance as a warmwater fishery (harboring at least 50 fish species) and as a Conservation Opportunity Area for protection of diverse native aquatic communities (WDNR 2006). The Sugar River flattens and develops a meandering course in Rock County that is constantly changing. Consequently, the site harbors a number of oxbows and small oxbow lakes -- temporary pond areas made by the cut-off of old stream meanders -- along with running sloughs and potholes, which harbor unusual reptiles and amphibians, fishes, and invertebrates.

Avon Bottoms WA owes much of its wild character to the lower Sugar River's tendency to flood frequently. In the past twenty years alone, it has gone into flood stage 24 times. With the lower Sugar River floodplain averaging nearly two miles wide through the Town of Avon, this high flood frequency keeps most human development well back from the river. As a result, the Bottoms remain relatively undeveloped for southern Wisconsin.

Spring flooding on the lower Sugar River is common. However, flood events have been recorded in every month except October, November and December, including at least 15 summer floods, which can destroy agricultural crops in the floodplain. Even lowland hardwoods adapted to regular inundation have succumbed to prolonged summer flooding during the growing season, as occurred in 2007 and 2008.

This high flood frequency, the relatively poor sandy loam soils (which may also be droughty at times), the tight radii of the river meanders (which do not favor large modern farm equipment) and the decline of fire and grazing have all combined to allow lowland hardwoods to re-establish along the lower Sugar River. The result has been a more or less continuous forested corridor from Shirland, Illinois north through the Town of Avon in Rock County, Wisconsin to the village of Albany in Green County and beyond.

Habitat and Vegetative Cover

Avon Bottoms features a lowland hardwood forest in the floodplain of the meandering Sugar River one of the most important and biologically diverse river systems in Wisconsin. Large silver maples, swamp white oaks and green ash dominate the diverse canopy of this wet-mesic forest. Numerous sloughs and old oxbows wind among bottomland hardwoods, grassland and agricultural cropland (Table 17).

Avon Bottoms WA (much of which is designated as Avon Bottoms Floodplain Forest Primary Site) features a lowland hardwood forest in the floodplain of the meandering Sugar River. Only a few small tracts at the southwest and southeast ends have open canopy areas dominated by reed canary grass and brush. The Floodplain Forest features large (20-28" DBH) silver maple, swamp white oak, and green ash that dominate the canopy. The composition of the understory differs from other Wisconsin floodplain forests due to the presence of rare species at the northern extent of their range. Numerous sloughs, oxbows and riverine lake/ponds occur within the Floodplain Forest matrix, providing unique habitat niches for plants and animals. These ponds and sloughs have strongly zonal vegetation dependent on water depth and season, and are mostly dominated by annuals. Buttonbush is occasional at the pond edges. Beyond the Floodplain Forest, over 700 acres of grassland occupies upland habitat, much of which is planted to sand prairie. Wet-mesic Prairie and Southern Sedge Meadow with Oak Opening are found in Swenson Wet Prairie SNA, and is described below.

Swenson Wet Prairie SNA and Primary Site lies in the low, flat floodplain of the Sugar River near its confluence with Taylor Creek. The Oak Opening is currently undergoing restoration, and now has 25% canopy cover from bur oak, swamp white oak, black oak, white oak, and green ash, as well as a diverse ground layer including species indicative of savanna such as Turk's-cap lily and red trillium.

At least 450 acres of former croplands in the wildlife area have been planted to diverse prairie north/northeast of the river and 350 acres southwest of the river.

Many rare plants are found in the wildlife area, including 10 Special Concern species, six state Threatened species, and three state endangered species.

For detailed descriptions of the natural community types see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25. For more details on this primary site, see Appendix G of the REA.

State Natural Areas and Primary Sites

Avon Bottoms Floodplain Forest. Avon Bottoms Floodplain Forest Primary Site features an extensive area of lowland hardwood forest in the floodplain of the meandering Sugar River, coinciding with the Sugar River Conservation Opportunity Area (WDNR 2006a). This site provides vital habitat for bats, aquatic invertebrates, fishes, and birds (both breeding and migratory), along with a number of rare plants that are at the northern edge of their range. **Avon Bottoms State Natural Area** (168 acres) and the **Swenson Wet Prairie and Woods** (40 acres) are located within the Avon Bottoms Floodplain Forest Primary Site.

Swenson Wet Prairie and Woods is an excellent example of a Wet-mesic Prairie and Southern Sedge Meadow with low river bottom savanna (Oak Opening) and scrub interspersed with shallow, abandoned river channels. Rare birds of grassland and savanna are known here, along with several rare plant species. Swenson Wet Prairie SNA is part of the Swenson Wet Prairie and Woods Primary Site.

For more details on this primary site, see Appendix G of the SRPG REA.

Forest Resources

Approximately 90% of the forestry resource on the Avon Bottoms WA is bottomland hardwoods. There is great concern over the impact of EAB and the loss of ash and the high canopy forest that currently exists throughout this property. Forest cover types are summarized in Table 18.

Cover Type	% Cover
Bottomland Hardwood	47
Non-Forested Wetland	13
Prairie	12
Grassland	11
Lowland Shrub	7
Agriculture	5
Upland Conifer	2
Oak	2
Upland Hardwood	1

Table 18. Forest Cover Types of Avon Bottoms Wildlife Area

Forest Type	Forest Type Description	Stands	Acres	% of Forested Acres	% of Recon Acres
BH	Bottomland Hardwoods	9	1,301	89%	43%
CH	Central Hardwoods	2	17	1%	1%
MC	Miscellaneous Coniferous	1	57	4%	2%
O	Oak	2	69	5%	2%
PR	Red Pine	1	11	1%	0%
PW	White Pine	2	9	1%	0%
	Totals:	17	1,464	101%	48%

EAB mortality has been identified in the southeast corner of this property. In response, underplanting ash with swamp white oak, river birch and other appropriate species is being pursued as staff time and resources allow. The intent is to maintain the large block of continuous forest canopy along the Sugar River and reduce the potential for invasion by reed canary grass as ash mortality occurs.

Wildlife Resources and Habitat Management

The wildlife area is managed to provide opportunities for public hunting, fishing, trapping and other outdoor recreation while protecting the qualities of the unique native communities and associated species found on the property. The floodplain forest management objective is to protect the ecological gradients from lowland to uplands along with protection of the floodplain corridor along the river. Forest management along the corridor has been primarily passive due to the difficult access and wet soils.

Extensive efforts to maintain and restore grassland communities on the uplands through prairie restoration have occurred. Management prescriptions include mowing, prescribed burning and herbicide treatments. Strict protocols are followed when conducting prescribed burns and other management to protect rare species. When grasslands become overgrown with woody species farming agreements are utilized to set back woody succession and aid restoration by replanting with desirable species. Where feasible, populations of undesirable or invasive species are controlled or eliminated by cutting, pulling, burning, herbicide treatment and/or bio-control.

The USDA Natural Resources Conservation Service has also restored thousands of acres of wetlands, grasslands and floodplain forest on private land easements adjacent to the wildlife area. Over 700 acres of this land has been leased for public hunting and other recreation under the Voluntary Public Access (VPA) program. Dove fields are planted annually, and hunting for waterfowl, deer, doves and stocked pheasant is popular with both Wisconsin and Illinois residents.

Nest boxes have been placed throughout the bottoms for wood ducks and the rare Prothonotary warbler, the only obligate cavity-nesting warbler in the eastern U.S. By discouraging nest parasitism by brown-headed cowbirds, these boxes have fledged some of the largest warbler broods on record. Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by Wisconsin Natural Heritage Inventory known at Avon Bottoms Wildlife Area include the following animals (Table 19).

Table 19. Rare or Declining Animal Species of Avon Bottoms Wildlife Area

Species Guild	State Status			Total
	Special Concern	Threatened	Endangered	
Small Mammals	2			2
Grassland Birds	10	2	1	13
Forest Birds	10	4	1	15
Savanna Birds	2			
Frogs	2			2
Turtles		1	1	2
Fishes	3	1	1	5
Dragonflies	1			1
Mayflies	6			6

For a list of rare or declining species on the property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix C in the same document.

All of the major habitat management recommendations included in the 1986 master plan have been achieved:

- Project boundaries were modified as approved.
- Substantial areas of prairie and grassland have been maintained or added to this property to provide habitat beneficial to grassland game and non-game birds and grassland nesting ducks.
- Farm agreements using crop and grass rotations to renovate grasslands and provide food plots have been pursued.
- Two state natural areas have been established.
- Forest management was pursued as warranted given the wet soils, low quality of many trees and desire to save large specimen trees.

Hedgerows that were proposed as travel lands and cover were not implemented because subsequent study indicated they increased predation of game and non-game birds in the adjacent grasslands.

Administrative Facilities and Access

There are eight permanent parking lots maintained on wildlife area, plus five grass lots that are mowed only for the fall hunting seasons. An additional four lots are mowed on the adjacent VPA lease lands. From a few of these parking areas, management lanes lead deeper into the property, although there are no established loop trails, as the lanes dead-end into the Sugar River bottoms.

Small boats may be launched from trailers at a DNR ramp on Beloit-Newark Road, just east of the Sugar River bridge, and also from Sugar River Park on Nelson Road, part of the Rock County Park System. Each of these ramps has an adjacent parking area. The Sugar River Park also has a fire ring; but no restroom facilities are available.

On the west side of the property, canoes and kayaks can be carried down to the Sugar River from the County Highway T bridge. Two miles above Avon Bottoms in Green County, there is a small boat launch and restroom facilities at Clarence Bridge County Park on Mt. Hope Road, just south of the intersection with State Highway 11/81. Below the wildlife area, there are canoe launches with restroom facilities at Colored Sands Forest Preserve north of Shirland, Illinois. The northern launch is off Haas Road and the southern launch is off Yale Bridge Road.

Recreation

Avon Bottoms WA offers many recreational opportunities and is noted for excellent pheasant hunting. Deer, turkey and waterfowl hunting are also popular. The river and sloughs provide good warmwater sport fishing and trapping.

Avon Bottoms is a designated Important Bird Area and is recognized as an excellent site for bird watching and wildlife viewing.

Other activities include hiking, cross country skiing and snow shoeing, but no designated trail are provided on the property. Gathering wild edibles is also pursued on the property.

A portion of a regional snowmobile trail passes through the property along Smith Road and County T.

Canoeing is popular and offers a challenging experience due to the meandering nature of the stream and numerous backwater channels, especially during flood stage. Care should be taken before departing to not underestimate travel times, and to make preparations for emergency assistance, as the many confusing channels and large amount of woody obstructions in the river can greatly impede travel. Nearly every year, a night-time search and rescue operation must be made to rescue lost hunters or canoeists.

All of the major recreation management recommendations included in the 1986 master plan have been achieved:

- Pheasant stocking has met or exceeded recommendations.
- Added additional access points to improve parking and access to the river.

Cultural Resources

Pre-historic and historic cultural resources have been identified on or adjacent to the Avon Bottoms WA.

Badfish Creek Wildlife Area

Badfish Creek Wildlife Area is a 1,147 acre property located three miles southwest of Stoughton in southern Dane County. Originally purchased in 1972 from Stoughton Farms for the Dane County Scattered Wetlands program, the Badfish Creek WA was designated in 1973 to provide pheasant production and public hunting, trapping, and compatible outdoor recreational and educational activities. Badfish Creek runs through the center of the property and the property is dissected by numerous agricultural drainage ditches. **See Map Series E.**

Current State Ownership:	1,147 acres
Current Acreage Goal:	1,262 acres
Current Project Boundary:	1,273 acres
Approved NR 44 Master Plan:	No

Significant opportunities for biodiversity conservation at Badfish Creek WA include:

- Wetland conservation
- Prairie Conservation (Wet Prairie, specifically)
- Grassland bird conservation

Soils, Geology and Hydrology

The soils formed in outwash plains and are poorly drained to well drained; moderately deep to deep silt loams and mucks underlain by silt, sand and gravel. Muck type soils are found on about 65% of the soils. Wetness places development limitations on much of this fishery area. They are also prone to drought and erosion.

The property is underlain by Paleozoic sedimentary rocks consisting of mostly sandstone in the northeastern two-thirds, and mostly dolomite in the southwestern third.

Originating near Madison, Badfish Creek is 20 miles long, and receives effluent from the Madison Metropolitan Sewerage District. It is rated an Impaired Stream, mainly due to contaminated fish tissues and sediments. The creek has been channelized in the wildlife area. Numerous drainage ditches drain into the creek throughout the property. Twelve ponds were artificially created for duck habitat. Madison Metro currently holds a perpetual easement on a corridor of lands alongside Badfish Creek to maintain the hydraulic characteristics of the creek. The easement rights include brush and tree trimming or removal as well as weed control.

Habitat and Vegetative Cover

The property contains mostly wetland cover types, such as Emergent Marsh, Southern Sedge-meadow, Shrub-carr, and Wet Prairie (Table 20). Many of the former agricultural fields have been planted to prairie while others are dominated by non-native cool-season grasses. The drainage ditches are generally lined with box elder, some cottonwood, and reed canary grass. There are a few small conifer plantations and patches of box elder scattered on the property. The southern entrance and the eastern entrance have small areas of low quality oak savanna. These are several waterfowl scrapes on the west side of the property,

A high-quality area with Wet Prairie and Southern Sedge Meadow and springs lies west of Badfish Creek along an unnamed feeder stream (see Primary Site below). Shrub thickets are common in the Primary Site where soils are drier at the edges, ditches, and channelized portions of the stream, but are limited in the core areas. Reed canary grass is present, but uncommon and localized.

A 20-acre degraded Oak Opening occurs north of the south entrance to the wildlife area. Dominant canopy trees include large diameter, open-grown burr oaks and white oaks with moderate size black oaks and black cherry.

Cover Type	% Cover
Non-Forested Wetland	33
Emergent Vegetation	21
Lowland Shrub	17
Grassland	15
Prairie	4
Oak Savanna	3
Upland Hardwood	3
Bottomland Hardwood	2
Aspen	1
Oak	<1
Upland Conifer	<1
Water	<1

The shrub layer is dense with native brambles and non-native invasives. The site has limited restoration potential due to small size and significant management effort needed to restore and maintain it.

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Primary Sites

Badfish Creek Wet Prairie. Based on analysis of Wet Prairie records in the NHI database, this site ranks among the top 15 statewide in terms of its size and intact hydrology. The floral diversity and significance of the site is further enhanced by a Southern Sedge Meadow and small complex of springs and associated spring runs.

For more details on this primary site, see Appendix G of the SRPG REA.

Forest Resources

Approximately 75% of the forestry resource on the Badfish Creek WA consists of aspen stands and maintenance of this species will call for active management (clearcutting) in the future (Table 21).

Table 21. Forest Cover Types of Badfish Creek Wildlife Area

Forest Type	Forest Type Description	Stands	Acres	% Forested Acres	% of Recon Acres
A	Aspen	1	46	75%	4%
BH	Bottomland Hardwoods	1	3	5%	0%
CH	Central Hardwoods	1	12	20%	1%
	Totals:	3	61	100%	5%

Wildlife Resources and Habitat Management

Management efforts at Badfish Creek WA have focused on maintaining and restoring the open herbaceous wetlands and grasslands community types. In addition, DNR and its partners have created waterfowl habitat through wetland scrapes and creation of impoundments with water control structures.

Management of the open aspect of the herbaceous wetlands and grasslands is accomplished through a combination of prescribed burning, mowing and sharecropping. Open lands management has been very difficult due to the extensive ditching that has lowered the shallow water table thus drying many of the soils at the site. This has led to encroachment by native and non-native trees and shrubs into the former wetlands. Woody encroachment is tackled through burning as well as chemical and mechanical control. As some of the wooded patches age they will be removed through planned timber harvests. Some units that have become overwhelmed by woody cover have been converted back to agricultural units through sharecropping.

The wildlife Species of Greatest Conservation Need and other rare or declining species tracked by the Wisconsin Natural Heritage Inventory at Badfish Creek Wildlife Area include six Special Concern grassland birds and one Special Concern amphibians.

For a list of rare or declining species of the entire property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix B in this document.

Volunteers have contributed to habitat management at this wildlife area. The Stoughton Conservation Club assisted with the addition of waterfowl scrapes on the property and the Dane County Conservation League has helped with funding and volunteer habitat work.

The following habitat management recommendations included in the 1984 master plan have been achieved:

- Project boundaries were modified as approved.
- Wetlands have been re-established and several of the drainage ditches have been plugged.
- Grasslands have been managed for pheasant and other non-game grassland birds.
- Agricultural practices have been used to aid in the restoration and maintenance of the grasslands.

Administrative Facilities and Access

Five gravel parking lots for public access are maintained by DNR. A sixth parking lot and canoe landing at the north end of the property is maintained by the Madison Metropolitan Sewerage District. Three gravel lots are located on Old Stone Road in addition to the canoe landing that provides access to Badfish Creek. Additional gravel parking lots are found on Danks Road and Old Stage Road that access the eastern and southern portions of the property respectively. Internal stocking lanes and burn breaks are mowed and maintained seasonally to allow for land management activities and are used for hunter and hiker access to the property.

A wooden bridge over the Badfish Creek allows hunter/hiker access to either side of the creek along seasonally mowed access lanes. Three small impoundments are maintained by water control structures on the property. A dam south of the wildlife area also affects water levels in Badfish Creek on the property.

Recreation

This wildlife area provides quality hunting opportunities for pheasants, deer and mourning doves. Pheasant hunting is supported by the DNR stocking program and remains the most popular activity on the property. Scattered open water across the property occasionally provides waterfowl opportunities. Turkeys are found in the area, but the lack of wooded acres and extensive wetlands limits their abundance on the property. Dove hunting is provided through managed dove fields in and around the agricultural fields on the property.

Non-consumptive recreation consists mainly of hiking and winter sports along service roads and burn lanes throughout the property. The Friends of Badfish Creek Watershed are interested in improving access to the creek and controlling invasive species along the stream.

The following recreation management recommendations included in the 1984 master plan have been achieved:

- A Class II dog training area was established on the southern portion of the property.
- The parking lots, internal trails and a boat launch have been installed and/or maintained as recommended.

Cultural Resources

No pre-historic or historic cultural resources have been identified on or adjacent to Badfish Creek WA.

Brooklyn Wildlife Area

Brooklyn Wildlife Area (WA) is located between the Villages of Oregon, Brooklyn and Belleville, straddling the Dane/Green County line, about 15 miles south of Madison. Acquisition for the Brooklyn Wildlife Area began in 1945 to provide public hunting, fishing, and other compatible recreational and educational uses. **See Map Series F.**

Current State Ownership:	2,946 acres
Current Acreage Goal:	3,070 acres
Current Project Boundary:	3,315 acres
Approved NR 44 Master Plan:	No

The wildlife area consists of 2,946 acres of fee title lands, 338 acres of easements and 151 acres are leased through the Voluntary Public Access program. A 138-acre parcel consisting of Extensive Wildlife Habitat and a Scattered Wildlife Lands (EWH/SWL) is located about two miles downstream along the Sugar River floodplain in the Town of Brooklyn.

An additional 435 acres is held under fee title or easement in the Story Creek Stream Bank Protection project boundary. The fishery portion of this project area is included in the Driftless Area Master Plan.

In total 4,008 acres are available for public hunting, fishing and other nature based recreation.

Significant opportunities for biodiversity conservation at Brooklyn WA include:

- Wetland Conservation
- Oak Savanna conservation
- Prairie conservation
- Grassland bird habitat

Soils, Geology and Hydrology

This property contains nearly 40 soil phases varying from mucks to loams. Only one of the soil phases present is considered a Class I soil capable of continuous row crop cultivation. The other 39 soil phases have varying degrees of limitation for agricultural purposes. Erosion and wetness are the major limiting factors for cropping.

Two major soil associations found on the Dane County parcels are moderately well to somewhat excessively drained, shallow to moderately deep silt loams and sandy loams in the uplands and well to poorly drained, deep to moderately deep silt loams and mucks underlain by silt, sand and gravel formed in outwash materials. The Green County parcels have shallow and moderately deep, gently sloping to moderately steep upland soils with a loamy clayey subsoil over loam till and underlain by dolomite and deep, nearly level to sloping soils with a loamy subsoil underlain by outwash sand or sand and gravel.

Sandstone ridges along the west edge of the property overlook an outwash valley drained by Story Creek. The property is underlain by Paleozoic sedimentary rocks with sandstone dominating the western half of the wildlife area and sandstone with some dolomite and shale dominating the eastern half.

The wildlife area straddles more than five miles of Story Creek, a Class II trout stream and Exceptional Resource Water. Multiple springs on the northwest part of the property combine to form Neath Spring Creek, which flows south to contribute cold water to Story Creek.

Habitat and Vegetative Cover

The property consists of open wetlands, narrow bands of riparian hardwoods, oak-dominated ridges, restored prairie and cropland. The dominant cover types are wetlands (Southern Sedge Meadow, Shrub-carr, Emergent Marsh, and Wet to Wet-mesic Prairie) and upland oak savanna/forest (Table 22).

Substantial portions of the wetlands have been ditched, and are predominately reed canary grass with scattered dogwood and floodplain tree species. Historical records indicate the Brooklyn Marsh was dominated by extensive sedge meadow with smaller areas of shallow marsh in topographical depressions and wet prairie on higher areas. Two small patches of Dry Prairie lie in the southwest and west-central parts of the site. Large areas of former agricultural land have been planted to prairie, while some are dominated by non-native cool-season grasses.

There are two Primary Sites on the Brooklyn Wildlife Area. The **Brooklyn Oak Savanna and Dry Primary Site** contains a Dry Prairie to the south and a block of Oak Woodland to the north. **Brooklyn Wet Prairie Primary Site** comprises a small, but good-quality Wet Prairie, being encroached upon by brush. See "Primary Sites" for more information.

A 140-acre block of Southern Dry/Dry-mesic Forest is also found at Brooklyn Wildlife Area in the south-central part of the core land holding. The dry areas of the forest have a somewhat open canopy of pole- and timber-sized white and black oaks, while the deeper soil areas are dominated by red oak and slippery elm. The ground layer is sparse with oak forest generalists. Non-native invasives such as garlic mustard pose a threat to this forest community.

Natural Heritage Conservation staff assessed the EWH/SWL south of Brooklyn WA using aerial photos and in-house resources. This site consists primarily of cropland (45%), cool-season grasslands (9%), shrublands (10%) and bottomland hardwoods (36%).

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Primary Sites

Brooklyn Oak Savanna and Dry Prairie. The site consists of two separate communities: a 10-acre prairie and a 50-acre block of Oak Woodland. Soil diversity in the prairie translates into diverse prairie types, from sandy to dry to dry-mesic. The Oak Woodland represents the largest and best-quality patch of oak savanna in the planning group, and supports rare birds.

Brooklyn Wet Prairie. This primary site occupies 19.5 acres near the southern end of Brooklyn Wildlife Area off Hughes Road. This primary site contains the best remaining Wet Prairie at the Brooklyn Wildlife Area along with a diverse ground flora of grasses, sedges, and forbs. Rare birds, turtles, and insects are known to use this important habitat.

For more details on these primary sites, see Appendix G of the REA.

Forest Resources

The oak timber type makes up approximately 330 acres (62%) of the forestry resource on the wildlife area. An oak regeneration project (a shelterwood harvest on approximately 120 acres) is in progress to maintain the oak resource. This oak harvest is currently out for bid and will potentially be cut in the next 2 years. A summary of forest cover types is provided in Table 23.

Table 23. Forest Cover Types of Brooklyn Wildlife Area

Forest Type	Forest Type Description	Stands	Acres	% Forested Acres	% of Recon Acres
A	Aspen	1	13	2%	1%
CH	Central Hardwoods	5	137	26%	5%
MD	Miscellaneous Deciduous	1	17	3%	1%
O	Oak	17	330	62%	13%
PR	Red Pine	3	15	3%	1%
PW	White Pine	1	3	1%	0%
SH	Swamp Hardwoods	1	16	3%	1%
SW	White Spruce	1	2	0%	0%
	Totals:	30	533	100%	22%

Cover Type	% Cover
Non-Forested Wetland	29
Grassland	20
Lowland Shrub	14
Oak	11
Prairie	7
Agriculture	7
Upland Hardwood	4
Emergent Vegetation	4
Bottomland Hardwood	1
Upland Conifer	1
Swamp Hardwood	1
Aspen	<1
Developed	<1
Water	<1

Wildlife and Fishery Habitat Management

Notable game species include stocked and wild pheasant, deer, turkey, rabbit, squirrel, some waterfowl, mourning doves, and occasional quail. On the parcels managed with agricultural practices, corn, small grains and sunflowers are planted or left standing by cooperating farmers for hunting cover and overwinter wildlife food. Cool-season grasslands and prairie restorations are managed to promote grassland nesting birds. Mowing, haying, selective herbicide application and prescribed burning are being used to discourage invasive canary grass and encourage native vegetation including sedges, emergent wetland plants, and wet prairie grasses and forbs.

Since 2004, the DNR has sought to convert annual public hunting ground leases of private lands to easements in cooperation with the USDA NRCS Farm and Ranch Protection Program. These easements allow public hunting and fishing in perpetuity, while allowing the landowner to continue agricultural use of their land.

The inception of the Story Creek Stream Bank Protection project provided state funds to match the NRCS Farm and Ranch Protection program. These funds have been used to protect 403 acres adjacent to the creek with easements that also allow public access for hunting and fishing.

In late 2011, the Brooklyn Marsh NAWCA (North American Wetlands Conservation Act) project removed accumulated sediment from a spring pond to restore spawning habitat for native brook trout and re-established the spring creek as a source of cold water for Story Creek. This project plugged or filled thousands of feet of drainage ditches dug through the center of the Brooklyn Marsh in the 1940s. It also disabled extensive subsurface tile drains to restore the original hydrology of the marsh. This restoration should help ensure Story Creek continues to provide quality trout habitat and fishing recreation for many years to come.

Story Creek has also received a great deal of habitat improvement work over the last 15 years by Fish Management staff. About 0.75 miles of the stream near the Dane-Green county line and a section just south of Bellbrook Road had been channelized prior to DNR purchase. These sections have been re-meandered and lunger structures installed to provide bank cover for trout as described below. These improvements have resulted in better recruitment of young trout, better survival of adult trout and improved trout fishing experiences.

- In 1999, stream flow just downstream from Bellbrook Road was diverted from a drainage ditch back to the original channel. Plugs were placed in adjacent drainage ditches to promote the flow of ground and surface water in the stream.
- In December 2001 350 feet of overhead cover structures (mini-lunker structures) were installed, 1,000 feet of riprap placed along the streambank and 3,200 feet of streambank was brushed.
- In 2006, about 4,000 feet of stream bank were brushed within the wildlife area in Oregon Township. Fourteen lunger structures were repaired by adding new face rock and re-armoring the banks above and below the structures. An additional 500 feet of rip-rap was added to provide stability to the eroding banks. Two ford crossings were also reinforced with rock.
- In 2010, three miles of stream frontage was brushed in Dane Country. The work was combined with Wildlife Management projects to provide brush control on the wildlife area.

A variety of Wildlife Species of Greatest Conservation Need and other rare or declining species have been tracked by the Natural Heritage Inventory at this wildlife area (Table 24).

Table 3 in the SRPG REA provides a list of rare or declining species for the entire property group. For a list of rare species by property, see Appendix C in the same document.

Table 24. Rare or Declining Species of Brooklyn Wildlife Area

Species Guild	State Status			Total
	Special Concern	Threatened	Endangered	
Small Mammals	1			1
Forest Birds	7	4		11
Grassland Birds	12	1		13
Frogs	2			2
Turtles		1		1
Invertebrates	1			1

The EWH/SWL south of Brooklyn WA along the river also has breeding habitat for a rare grassland bird.

The following habitat management recommendations included in the 1984 master plan have been achieved:

- Project boundaries and acreage goals were modified as approved.
- Wetlands have been re-established and several of the drainage ditches have been plugged.
- Grasslands have been managed for pheasant and other non-game grassland birds.
- Trout stream management has been conducted as approved.
- Agricultural practices have been used to aid in the restoration and maintenance of the grasslands.
- Prescribed burns and mechanical brush control have been emphasized for habitat management.

Administrative Facilities and Access

There are 10 parking lots at the wildlife area and most have gravel surfaces. One additional parking spot is available on the Voluntary Public Access lease in the Town of Brooklyn, Green County. Management lanes lead into the interior of the property from many of these lots. They are open for foot travel only and provide access to Story Creek for fishing and the Ice Age Trail for hiking.

A snowmobile trail segment crosses the property for a short distance below State Highway 92. Small boats may be launched nearby at Lake Bellevue in Belleville, as well as downriver where the Sugar River crosses County Highway X in Green County.

Recreation

The Brooklyn WA is the largest of the SRPG properties and provides the broadest range of hunting opportunities. These opportunities include stocked and wild pheasant, deer, turkey, rabbit, squirrel, some waterfowl, quail, gray partridge and mourning doves. Trapping also occurs on the property. Brooklyn WA hosts a well-traveled section of the IAT. Other opportunities include birding, wildlife viewing, gathering wild edibles and winter sports like cross country skiing and snow shoeing. Biking is a popular activity on the roads through and around this wildlife area. Story Creek offers quality trout fishing in sometime challenging terrain. Currently Story Creek in Green County is stocked with brown trout while the headwaters in Dane County are primarily stocked with brook trout though occasionally some brown trout are stocked as well.

The following recreation management recommendations included in the 1984 master plan have been achieved:

- The parking lots and internal trails have been installed and/or maintained as recommended
- Pheasant and trout as recreational resources have received management emphasis as approved.

Local Planning Designation

Almost the entire property lies within a larger “thermally sensitive area” in Dane County. A thermally sensitive area is land that drains to surface waters capable of supporting a community of cold water fish and other aquatic life or serves as a spawning area for cold water fish species. Ordinances require that thermal control practices be included in a stormwater management plan if a development is within a thermally sensitive area to ensure no increase in temperature of stormwater post-construction in order to protect cold water communities.

Cultural Resources

Pre-historic and historic cultural resources have been identified on or adjacent to the Brooklyn WA.

Evansville Wildlife Area and Allen Creek Streambank Protection Area

Evansville Wildlife Area (WA) is a 807-acre property located south and east of Evansville in Rock County. Established in 1960, the primary objective for the Evansville WA is to provide public hunting for pheasants and other small game, and to provide opportunities for public fishing and other compatible recreational uses. This property contains 707 acres of fee title and 100 acres of easements.

Current Fee Title and Easement:	807 acres
Current WA Acreage Goal:	741 acres
Current WA Project Boundary:	905 acres
Approved NR44 Master Plan:	No

The state also purchased 223 acres in 1995 within the Allen Creek Streambank Protection Area boundary to protect lands around several miles of Class 2 and 3 trout waters in Allen Creek.

The wildlife area and streambank protection area provide 1,030 acres for diverse game hunting, trout fishing, bird watching and other compatible nature based recreation pursuits. **See Map Series G.**

Significant opportunities for biodiversity conservation at the Evansville WA include:

- Wetland Conservation
- Prairie Conservation (Wet Prairie, specifically)

Soils, Geology and Hydrology

Virtually all soils are hydric, and groundwater is at or near the surface during most of the year. The soils are primarily mucks and silt loams.

The property is mostly underlain by Paleozoic sedimentary rocks consisting of sandstone and minor strata of limestone, shale and conglomerate. Dolomite underlies the uplands in the southwest part of the main wildlife area.

Allen Creek has its headwaters in Dane County and flows through portions of all three counties before joining the Sugar River just above the Albany WA. Agricultural lands dominate the land cover in the upper and lower reaches of the stream while the middle section flows through the Village of Evansville, the Evansville Wildlife Area and the Allen Creek Streambank Protection Area. The stream has about 2.2 miles of Class 2 trout waters on the wildlife area and 0.7 miles of Class 3 trout waters in the streambank protection area. The stream is an Exceptional Resource Water and has a gradient of 7.3 feet per mile. Springs and several drainage ditches on the wildlife area contribute to the flow.

Habitat and Vegetative Cover

Evansville WA is comprised almost entirely of a vast open wetland associated with Allen Creek. The Allen Creek SBP has wetlands along the creek and grasslands and croplands in the uplands. See Table 25 for a summary of cover types.

Wetlands along the stream are dominated by reed canary grass, with scattered patches of wet prairies, lake sedge and tussock sedge, as well as springs and spring runs. The northeast end of the wildlife area contains the best quality wetland communities and a portion is designated as a Primary Site (see "Primary Sites" section below).

Wetlands in the southern two-thirds of the property are low-quality, reed canary grass-dominated "wet meadow" with a history of plowing, grazing and drainage. The property also has 160 acres of planted native grass and 230 acres of cropland planted to corn, soybeans, sunflower and hay.

Cover Type	% Cover
Non-Forested Wetland	54
Agriculture	22
Grassland	10
Prairie	8
Lowland Shrub	6

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Primary Sites

Evansville Wet Prairie. This site harbors a good-quality wetland refugium within a larger complex of degraded wetland at the north end of the wildlife area. Dominant communities here are Southern Sedge Meadow, Wet Prairie, Calcareous Fen and Springs/Spring Runs. Wet Prairie and Calcareous Fen are two of the state's rarest community types.

For more details on this primary site, see Appendix G of the REA.

Wildlife Resources and Habitat Management

Maintenance on the wildlife area has been adopted by the Rock River Valley Chapter of Pheasants Forever. Pheasants are stocked on this property. Prescribed burning, mowing, haying and farming are the most common management practices.

In 2010, significant brushing projects were completed during the winter along 1.5 miles on Allen Creek in Rock County. The work was combined with Wildlife Management projects to provide brush control on the wildlife area.

Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by the Wisconsin Natural Heritage Inventory at the wildlife area include six Special Concern grassland and shrubland birds.

For a list of rare or declining species of the entire property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix C in the same document.

The following habitat management recommendations included in the 1988 master plan have been achieved:

- Grasslands have been managed for pheasant and other grassland birds. Pheasant stocking equals or exceeds the rate described in the plan.
- Agricultural practices have been used to provide foodplots and aid in the restoration and maintenance of the grasslands.
- Prescribed burns and mechanical brush control have been emphasized for habitat management.
- Project boundary adjustments were achieved.
- Trout stream enhancements have been added to the stream as well

Administrative Facilities and Access

There are seven permanent parking lots on Evansville WA, including three on the east side of State Highway 59/213, two on the west side of the highway within the Allen Creek stream bank protection area, and one off Marsh Road on the east side of the wildlife area and one off County Highway M on the southeast side of the property. Some of these lots have mowed lanes leading from them that aid in access and management of the property.

An abandoned railroad grade leads nearly 1 mile from Marsh Road northwest to Allen Creek on the east side of Evansville WA. Although not formally designated as a trail, this grade is popular with hunters, hikers, and birder, and provides all-season access with good elevated views of the surrounding marsh.

Recreation

Evansville Wildlife Area offers many recreational opportunities, including hunting, birding, fishing, trapping, hiking and cross-country skiing. There are no designated trails on the property. Hunting for pheasants is very popular, and Evansville WA and the nearby Voluntary Public Access leases. This property is frequently stocked in the fall with rooster pheasants. Dove hunting has also grown in popularity in recent years. Allen Creek gets some attention from anglers fishing for trout and other species.

The following recreation management recommendations included in the 1988 master plan have been achieved:

- Additional parking lots have been added beyond those approved in the plan.

Cultural Resources

Historic cultural resources have been identified on or adjacent to the Evansville WA, but none have been identified on the Allen Creek SBP.

Extensive Wildlife Habitat Parcels - Rock County

The DNR owns and manages four Extensive Wildlife Habitat (EWH) parcels in the towns of Avon, Newark and Spring Valley. These four parcels total 397 acres and were acquired between 1961-1990 to provide local hunting opportunities and permanent cover for wildlife in these primarily agricultural areas. **See Map Series H.**

EWH ownership	397 acres
Project Boundary	No
Existing Master Plan	No

The parcel in Avon Township harbors a 110-acre wetland that was ranked as highly significant in the 2001 Rock County Natural Areas Survey (Baller 2001).

Soils, Geology and Hydrology

The soils on the EWH properties primarily consist of loams and silt loams in the uplands with hydric sols in the wetlands with a lens of muck in the wettest areas.

These EWHs are underlain by Paleozoic sedimentary rocks with sandstone and dolomite representing the dominant types, with minor inclusions of limestone, shale, and conglomerates.

The EWH properties in the Town of Avon lie along Willow Creek, while those in the Town of Newark lie along Raccoon Creek.

Habitat and Vegetative Cover

Natural Heritage Conservation staff conducted a cursory survey of aerial photos and in-house resources to describe the habitats at these sites. Some of these parcels were formerly cropped or grazed and have since been replanted to native warm-season grasses or non-native cool-season grasses. The parcel in Avon Township has 110 acres of good-quality Shrub-carr interspersed with open wetland areas along Willow Creek. The Shrub-carr is dominated by red-osier dogwood, pussy willow and black willow, while the open areas are dominated by Canada bluejoint grass, reed canary grass, and fowl manna grass. The northern parcel within Newark Township also harbors 117 acres of mostly open wetland, though its quality and composition are unknown. The southern parcel in Newark Township has 75 acres of wetland communities, including an indeterminate mix of Emergent Marsh, Southern Sedge Meadow, Shrub-carr, and Wet Prairie (Baller 2001); further characterization of this wetland will require surveys, but the NHI database tentatively ranks this wetland as fair quality. See Table 26 for summary of cover types.

Cover Type	% Cover
Lowland Shrub	50
Non-Forested Wetland	22
Grassland	15
Agriculture	7
Upland Hardwood	5
Oak	1

Wildlife Resources and Habitat Management

Management efforts on these EWH parcels are primarily focused on maintaining and restoring the open herbaceous wetland and grasslands for wildlife. Prescribed burning, mowing, chemical treatments and sharecropping are used to control encroachment by native and non-native trees and shrubs. These properties receive these standard management practices as time and resources allow.

Although these properties were not included in the SRPG REA, a review of the Natural Heritage Inventory database revealed the presence of two Wildlife Species of Greatest Conservation Need or other rare or declining species tracked by Wisconsin Natural Heritage Inventory at Rock County EWH, include one Special Concern fish and one threatened turtle.

Please inquire with Natural Heritage Inventory staff for further details.

Administrative Facilities and Access

These EWHs have minimal improvements. Access is off of town roads with the exception of one parking lot at the Town of Avon property.

Recreation

Recreation options at these parcels are limited by their small size. These parcels offer modest deer, turkey and small game hunting. Other nature based recreation such as birding and wildlife viewing may also be pursued. Fishing is not available at these properties. Some trapping also may occur.

Two of the parcels are landlocked with no public access. One parcel is being considered for sale.

Cultural Resources

No pre-historic or historic cultural resources have been identified on or adjacent to these EWH parcels.

Footville Public Hunting Ground (Leased)

The Footville Public Hunting Grounds has a unique and long history of limited DNR ownership complemented by substantial leases of private lands to provide public hunting opportunities in Rock County. The Footville Public Hunting Grounds contains 8,833 acres of leased parcels scattered across six towns (Union, Porter, Magnolia, Center, Spring Valley and Plymouth) in Rock County. **See Map Series I.**

Current State Managed:	481 acres
Leased Lands:	8,833 acres
Current Project Boundary:	None
Approved Property Master Plan:	No

Leasing the parcels of the Footville Public Hunting Ground began in the late 1940's. With the post-World War II return of thousands of soldiers to civilian life, there was great demand for recreational land and leasing agricultural land from private landowners was a quick and relatively inexpensive way to meet that demand. The leased parcels primarily consisted of cropland with some scattered wooded, wetland and grassy tracts. Funded with a 50-cent increase in license fees and federal Pittman-Robertson funds, ultimately some 40 counties enjoyed leased public hunting ground programs. This effort increased public hunting opportunities on thousands of acres across southern Wisconsin and helped improve the quality of the wildlife habitat too.

Rock County, and the Footville Public Hunting Ground in particular, was used as an outdoor laboratory for this effort. At the time, overgrazing was considered a primary threat to farmland wildlife. In addition to leasing private land, the Conservation Department provided fencing materials to exclude livestock from small dedicated parcels to provide wildlife nesting, food and winter cover. They also provided wildlife shrubs and conifers that were planted by sportsmen's clubs, school students, and local Scout troops.

Sixty-five years later, most of the other county leased public hunting grounds are gone, but Rock County and the Footville leases are still going strong, albeit with many challenges over the years. The Footville Public Hunting Grounds exists primarily due to the continued cooperation of many private landowners who have leased their land for many years to generously allow public recreation.

Embedded within the leased parcels of the Footville Public Hunting Grounds are five small fee title parcels (481 acres total) purchased by the DNR through the Extensive Wildlife Habitat and Scattered Wildlife Lands programs. These parcels provide islands of permanent cover for wildlife within this agricultural landscape. The following locational references (i.e., former property owner's name) are currently used:

Name	Township (and other location descriptors)	Acres
Costello	Center (southeast of Evansville WA)	202
Murphy Farm	Plymouth (east side of Footville Road)	63
Hanover	Plymouth (north side of town of Hanover)	45
Johnson Farm	Plymouth (Intersection of Orfordville Hanover Road and Carver Road)	69
Dooley	Spring Valley (west site of Coon Valley Road)	102

Soils, Geology and Hydrology

The soils on the EWH properties primarily consist of loams and silt loams with lens of muck in the wettest areas and along drainage ways. The area has rich soils, but to unlock their productivity the area has been extensively ditched and tiled to promote drainage. This has led to an extensive loss of wetlands and stream channelization with a consequent loss of wildlife habitat. Soil wetness remains an issue and during wet years portions of this area are difficult to till, plant and harvest.

Footville Public Hunting Grounds is underlain by Paleozoic sedimentary rocks with sandstone and dolomite representing the dominant types, and minor inclusions of limestone, shale, and conglomerates.

The major streams in the area, Marsh Creek and Bass Creek, have been extensively ditched and channelized and the streams have high phosphorus and sediment loads. Due to this disturbance these streams provide marginal wildlife habitat and modest forage fish populations. They do provide some habitat for mallards and other waterfowl. No springs are recorded on the properties although there is a flowing artesian well pipe in the northwest corner of the Murphy EWH, north of the railroad tracks.

Habitat and Vegetative Cover

A summary of the cover types on the state-owned lands is provided in Table 27. The Costello Unit consists of former cropland that is now a mesic prairie planting with patches of reed canary grass in low areas. The Hanover EWH is a linear property that lies along the north side of a railroad track and a ditched part of Bass Creek. The whole area is disturbed, with an artificial pond, wet pockets of reed canary grass and willow, thickets of box elder, cottonwood, and non-native invasive shrubs, and sandy areas with scattered black oak, eastern red cedar, white mulberry, and a few prairie herbs. An uncommon plant is found along the railroad right-of-way, despite repeated herbicide applications. The Johnson Farm EWH consists of mostly former agricultural land planted to prairie, with a small amount of cropland. The Murphy Farm EWH consists of low-quality, reed canary grass-dominated “wet meadow” north of the road, and old field/wet-mesic prairie restoration south of the road. The former Dooley Farm consists of old field and prairie plantings.

Cover Type	% Cover
Prairie	50
Grassland	21
Non-Forested Wetland	16
Agriculture	7
Bottomland Hardwood	3
Upland Hardwood	2
Shrub	1
Water	<1

Wildlife Resources and Habitat Management

Common game species on the hunting grounds include pheasants, doves, deer, cottontail rabbits and turkeys. Maintenance activities include burning, brushing, mowing, and active farming to provide food patches for wintering wildlife.

The former Dooley Farm was originally owned by Pheasants Forever. While under Pheasants Forever ownership, this parcel was under several federal contracts for CRP and WHIP to rebuild the waterways and control brush encroachment. The habitat development was to be completed during the summer of 2013, at which point Pheasants Forever transferred the property to the DNR.

Bass Creek is a forage fishery that receives no stocking of gamefish. When last surveyed in 2001, it was dominated by blacknose dace, Johnny darters, and white suckers. Quantitative fishery habitat scoring rated Bass Creek as fair. No inventory information is available for Marsh Creek near the leased properties. These warmwater streams are passively managed.

Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by Wisconsin Natural Heritage Inventory known at Footville Public Hunting Grounds include five Special Concern grassland/shrubland birds.

For a list of rare or declining species of the entire property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix C in the same document.

Administrative Facilities and Access

The leased lands have minimal improvements other than posting to indicate boundaries and designated access points where user vehicles won't interfere with farming and other landowner activities.

A gravel parking lot was recently constructed on the state-owned Johnson farm along Orford-Hanover Road. Mowed grass parking lots are maintained at the southeast corner of the Costello tract, at the south end of the Dooley farm along Spring Valley Road, and on the Murphy farm off South Footville Road (one each north and south of the railroad tracks). The goal is to develop gravel parking lots on these grass parking lots in the future.

Recreation

These leased and fee title parcels offer outstanding pheasant hunting. These parcels also offer modest deer hunting, birding and wildlife viewing. Some trapping also occurs.

Cultural Resources

No cultural resources have been identified on the state owned EWH and SWL parcels.

Hook Lake Bog State Natural Area and Hook Lake/Grass Lake Wildlife Area

Hook Lake Bog State Natural Area (SNA) - Grass Lake Wildlife Area (WA) is a 1,380-acre property located four miles south of Madison and just to the north east of the Village of Oregon in the Town of Dunn, Dane County. Hook Lake Bog State Natural Area was established first and comprises 527 acres of the property. This natural area and wildlife area lies south of Schneider Road, east of Hawkinson Road, north of Rutland-Dunn Townline Road and west of Schuster Road. Sandhill Road runs north to south through the property between Hook Lake and Grass Lake. **See Map Series J.**

Current Fee Title and	
Public Access Easement:	1,380 acres
Current Acreage Goal:	2,430 acres
Current Project Boundary:	2,970 acres
Approved Property Master Plan:	No

Hook Lake-Grass Lake WA was established in 1991 to protect a wetland and upland native vegetation complex unique to Dane County and southern Wisconsin. This complex supports an abundant and diverse wildlife community and provides opportunities for outdoor recreation, education, nature enjoyment, and research. A major goal is to protect and preserve the unique bog communities at the Hook Lake Bog, the deep water marsh at Grass Lake and their respective natural communities. These communities were being degraded by soil erosion and pollution, adjacent human development, and an influx of invasive species, especially in the uplands.

An Extensive Wildlife Habitat (EWH) parcel (104 acres) is located about two miles east of Hook Lake-Grass Lake WA at the intersection of Lake Kegonsa Road and Rutland-Dunn Townline Road. This parcel adjoins several U.S. Fish and Wildlife Service Waterfowl Production Area parcels (304 acres).

The significant biodiversity conservation opportunities at Hook Lake SNA-Grass Lake WA include:

- Wetland Conservation (Hook Lake ranks as one of the highest quality wetlands in Dane County, and Grass Lake is one of the few remaining deep water marshes in Dane County).
- Best opportunity for large block, upland grasslands in south-central Wisconsin on public land, providing important habitat for grassland birds and upland game birds
- Significant colony of a state Endangered bird species at Grass Lake.

Soils, Geology and Hydrology

In the northern part of the property, soils are predominantly wet, with Hook and Grass Lakes underlain by muck and marsh soils; while the upland soils are comprised of more well-drained silt loams.

The state natural area and wildlife area lies over Paleozoic sedimentary rocks. Sandstone is the dominant bedrock under Hook Lake and Grass Lake and scattered parcels to the west. Dolomite is the dominant type in areas immediately to the west and east of Hook Lake. Shale is a minor bedrock element throughout.

Hook Lake is thought to be a kettle hole depression in glacial deposits 20-80 feet thick. Water sources are rainfall and surface run-off, resulting in an acidic and nutrient poor soft-water lake. Grass Lake, by comparison, is one of the few remaining deep water marshes in Dane County and is alkaline and nutrient-rich, and supports Emergent Marsh and some aquatic plants. It also receives water from an unnamed ditch that receives effluent from the Madison Metropolitan Sewerage District. Several wetland areas occur in each of the two disjunct units to the southwest that appear to hold water in wet years.

Old aerial photos suggest 17 small wetland basins, ranging in size from 0.5 to about 20 acres, could be identified on the property, but only four of the 17 wetlands appear to remain intact in recent aerial photos.

No springs have been recorded on the property.

Habitat and Vegetative Cover

This property contains two unique lakes: Hook Lake Bog and Grass Lake and expansive prairie/grasslands and upland oak woods (Table 28).

Hook Lake Bog SNA ranks as one of the highest quality wetlands in Dane County. See the Primary Site description below. The lake is covered by Bog Relict, Tamarack (Rich) Swamp and Emergent Marsh with only 50-70 acres of open water remaining. Dominant species are Sphagnum and narrow-leaved woolly sedge. Buttonbush occurs as scattered shrubs around the outer edges of the bog mat and along fissures in the mat.

A 27-acre Tamarack (rich) Swamp lies at the center of the Bog Relict. The bog relict contains species typically associated with northern Wisconsin growing on a Sphagnum mat. The species include tamarack, bog birch, paper birch, and leatherleaf. Areas with shallow, permanent water, including the "moat" between the bog mat and the uplands, support dense growths of floating-leaved aquatic macrophytes, especially white water-lily, yellow pond-lily, and water-shield. At least 28 acres of Emergent Marsh occur at the south end of this site. Variations in water clarity, water depth, and pH from year to year may allow for expansion of Emergent Marsh into areas that are currently occupied by Floating-leaved Marsh.

Uplands on the east side of Hook Lake harbor two small prairie plantings and a block of degraded oak forest. This forest has been devastated by a recent tornado and an overwhelming infestation of non-native invasives, particularly common buckthorn, Eurasian bush honeysuckle, and garlic mustard.

The remaining areas on the property consist of prairie plantings, small, scattered upland woodlots dominated by oaks, and a small red pine plantation. Two small wetland areas (6 acres and 11 acres) of wet meadow/Emergent Marsh occur in the two southwest parcels. A state special concern wildflower is known within the project boundary, but outside of current state land-holdings. This species favors Dry Prairie and Oak Woodland habitats.

Natural Heritage Conservation staff assessed the EWH to the east of the Hook Lake-Grass Lake WA using aerial photos and in-house resources. The site consists of approximately 55 acres of wetland (mostly Emergent Marsh), 22 acres of grassland, 16 acres of woodlands and 11 acres of shrublands.

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Primary Sites / State Natural Areas

Hook Lake Bog State Natural Area. The wetlands at this site rank among the highest quality in Dane County. Hook Lake Bog is located in a glacial pocket and is nearly closed in with vegetation. The lake is covered by Bog Relict, Tamarack (Rich) Swamp and Emergent Marsh with only 50-70 acres of open water remaining. The Bog Relict harbors plant species that are rare in Dane County including the insectivorous round-leaved sundew, seven-angled pipewort, and bogbean. A diverse assemblage of breeding birds and herptiles call this site home.

For more details on this primary site, see Appendix G of the SRPG REA.

Forest Resources

The oak cover type is the dominant forest resource and a summary of forest cover types is provided in Table 29.

Table 29. Forest Cover Types of Hook Lake-Grass Lake Wildlife Area

Forest Type	Forest Type Description	Stands	Acres	% Forested Acres	% of Recon Acres
CH	Central Hardwoods	4	84	38%	10%
O	Oak	4	113	51%	13%
PR	Red Pine	1	10	5%	1%
PW	White Pine	1	9	4%	1%
SW	White Spruce	1	4	2%	0%
	Totals:	11	220	100%	25%

Cover Type	% Cover
Prairie	35
Emergent Vegetation	30
Oak	11
Upland Hardwood	5
Agriculture	5
Water	4
Shrub	2
Tamarack Swamp	2
Upland Conifer	2
Non-Forested Wetland	2
Grassland	1
Developed	1

Wildlife Resources and Habitat Management

Hook Lake and Grass Lake are natural lakes that do not require water level management. Land protection and management efforts have centered on buffering the unique high quality wetland habitats from runoff and nutrient loading.

The natural area is managed as a reserve for the bog relict, as an oak opening restoration site, as an aquatic reserve and wetland protection site, and as an ecological reference area. The native bog and wetland species are managed passively, which allows nature to determine the ecological characteristics and structure of the wetlands.

The adjacent uplands are actively managed to restore grasslands and the oak opening. The location and relatively large patch sizes of the grasslands provide high-quality nesting cover for waterfowl and a diverse group of obligate grassland birds. Most of the grassland restorations are restored prairie of varying diversity and quality.

The forested and wooded sections of this property contain some mature oaks and hickories and provide abundant mast crops for deer, turkeys, squirrels as well as a variety of non-game birds and mammals. Unfortunately, most of the woodlands within the property are heavily impacted by common buckthorn, Eurasian bush honeysuckle, garlic mustard and other non-native invasive species.

Periodic use of prescribed fires is the primary grassland management activity though late summer hay harvests by sharecroppers have also been used more recently. Invasive brush and trees are treated through chemical and mechanical means where appropriate. Opportunities exist to diversify many of the prairie plantings and strategically remove trees/brush between patches of grassland to enhance their overall value to game and non-game grassland species of concern.

Current and past management of the woodlands has included timber harvest as well as periodic controlled burns. Control of invasives has required mechanical treatment of non-native shrubs followed by chemical treatment to prevent re-growth. There are several small non-native conifer plantings on the property that will be harvested and converted to native forest species.

Madison Metropolitan Sewerage District manages a ditch and dike that run just to the west of Grass Lake. The ditch and dike will be monitored for early detection of leakage or other problems which may impact the lake. Water quality in the marsh will also be tested periodically.

Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by Wisconsin Natural Heritage Inventory known at Hook Lake-Grass Lake Wildlife Area include grassland/shrubland birds and amphibians (Table 30).

The NHI database also shows a rare snake in close proximity to the EWH east of the Hook Lake-Grass Lake WA

For a list of rare or declining species of the entire property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix C in the same document.

Table 30. Rare or declining species of Hook Lake-Grass Lake Wildlife Area

Species Guild	State Status			Total
	Special Concern	Threatened	Endangered	
Grassland Birds	7	1		8
Colonial Nesting Birds			1	1
Forest Birds	2			2
Turtle		1		

Administrative Facilities and Access

Two gravel parking lots on Rutland-Dunn road and one gravel lot on Hawkinson road are maintained for public access to this property. In addition, a fourth gravel parking lot is maintained on Schneider Road to provide public access to Grass Lake. A private road off of Rutland-Dunn Road is maintained for DNR access to storage buildings and for access to the McManus Law Office. Internal stocking lanes and burn breaks are mowed and maintained seasonally to allow for land management activities and are used for hunter or hiker access to the property.

Recreation

The Hook Lake SNA/Grassy Lake WA and the EWH provide quality hunting opportunities for turkey, deer, waterfowl, doves, pheasants and squirrels within a close proximity to an urban center. Pheasant hunting is supported by the WDNR pheasant stocking program at Grass Lake WA. High quality wetlands found within the property usually results in good local production of wood ducks and mallards. Dove hunting is provided through a managed dove field within the sharecropping unit.

The diverse wetlands, large grasslands and scattered forest patches make this property group attractive to birding and wildlife enthusiasts. The semi-permanent trail system via access roads on Hawkinson and McManus roads allow for good access to diverse habitat types throughout the seasons.

Cultural Resources

Pre-historic cultural resources have been identified on or adjacent to the Hook Lake Bog State Natural Area and the Hook Lake/Grass Lake Wildlife Area.

Montrose State Ice Age Trail Area

Between 2003 and 2007, 204 acres of fee title, 35 acres of Ice Age Trail access easement, and 51 acres of scenic easement were acquired for the Montrose State Ice Age Trail Area (Montrose SIATA). The scenic easement protects the viewshed for trail users, but provides no public access. **See Map Series K.**

Current Fee Title and Easement:	239 acres
Approved Property Master Plan:	No

The current path was installed with over 2,700 hours of volunteer labor in October 2011. This will be the permanent trail alignment unless additional acquisition to the north takes place in accordance with the Natural Resources Board-approved *Dane County Trailway Protection Strategy (2005)*. The trail may be moved if permanent rights north of the current Montrose SIATA are acquired along the route approved by the Natural Resources Board in 1992 (Dane County “Corridor of Opportunity” for the Ice Age Trail).

The significant opportunity for biodiversity conservation at the Montrose SIATA includes:

- Prairie Conservation

Soils, Geology and Hydrology

Silt loam soils occupy the bluff tops with sandy loams along the steep side slopes. These soils are moderately deep and well drained to somewhat excessively drained. They are underlain by Paleozoic sedimentary rocks consisting of sandstone with minor strata of limestone, shale and conglomerate. Bedrock is exposed in the southwest corners of each of the two parcels in association with Dry Prairie remnants. No hydrological features are present on this property.

Habitat and Vegetative Cover

The Montrose SIATA consists of two disjunct sites located on a flat topped ridge that was previously cropped. The cropped areas have been planted to prairie. The side slopes at both have narrow bands of degraded oak forest and oak woodland, and both have small prairie remnants on the south-facing slope. Large, open-grown burr oaks are common.

The southern parcel has a fair-quality, one-acre Dry Prairie on the upper quarter of a south-facing slope, and is dominated by linear-leaved aster, little bluestem, spiderwort, and side-oats grama. On the northern parcel, a fair- to poor-quality, half-acre remnant is dominated by little bluestem, big bluestem, and Indian grass (Table 31).

For detailed descriptions of the natural communities described above, See the Sugar River Planning Group Rapid Ecological Assessment (REA), pages 16-25.

Cover Type	% Cover
Upland Hardwood	44
Prairie	25
Oak	14
Grassland	9
Agriculture	7
Upland Conifer	1

Forest Resources

The steep slopes are covered with deciduous hardwoods, dominated by either oaks or central hardwoods. Some oak savanna/woodland restoration work has been conducted on this property. There is a small pine plantation at the base of the slope on the west side of the northern parcel.

Wildlife Resources and Habitat Management

The Ice Age Trail generally follows natural contours, is constructed of local natural materials, and is a signed and maintained pathway for year around use. Ongoing management activities include trail maintenance, creation of a dispersed camping area, invasive species control, and restoration of pre-settlement natural communities.

Management and maintenance of the trail duties are shared between the DNR Parks and Recreation, DNR Wildlife Management and volunteers from the Ice Age Trail Alliance, a nonprofit partner supporting the Ice Age Trail. A significant majority of the vegetation management and trail maintenance is conducted by the volunteers.

Vegetation management is performed in accordance with the Ice Age National Scenic Trail *Trail Stewardship Notebook*.

This property is managed to protect corridors of ecologically sensitive lands as well as promote hiking and nature enjoyment. The trail corridor allows the movement of animals and seeds providing an important conservation benefit, but it also poses a challenge since the trail can facilitate the spread of invasive species.

No wildlife Species of Greatest Conservation Need or other rare or declining species tracked by Wisconsin Natural Heritage Inventory have been recorded at the Montrose SIATA.

Administrative Facilities and Access

Site infrastructure includes the trail, several spur and access trails (also used as fire breaks), one parking area, one kiosk, and one dispersed camping area. This infrastructure was added between 2011 and 2013.

Developed access to the property is available off of Frenchtown Road, at the south end of Piller Road, and off of County Highway D via a State Wildlife Area access easement. The property is also accessible via the Badger State Trail to the northwest of the property.

Recreation

Hiking and backpacking are the primary recreational activities of the Montrose SIATA. The trail and the properties also offer opportunities for sight-seeing, wildlife viewing and bird watching along with seasonal activities such as non-groomed cross country skiing and snowshoeing.

Hunting and trapping are permitted on the property except for 100 yards on either side of the Ice Age Trail on DNR-owned land (see Map K-2).

The dispersed camping area (DCA) is for use by those hiking the Ice Age Trail. Rules for the DCA follow Leave No Trace principles. Stays are limited to one night and no fires are allowed other than portable camping stoves.

Cultural Resources

No cultural resources have been identified on or adjacent to the Montrose SIATA.

Liberty Creek Wildlife Area

Liberty Creek Wildlife Area (WA) is a 582-acre property located in Albany and Brooklyn townships, Green County. This wildlife area was established in 1959 to provide public hunting access. The property is mostly marsh dominated by reed canary grass with a small block of oaks along the southwest boundary and several scattered bottomland hardwood islands in the south central portion of the property. **See Map Series L.**

Current Fee Title:	583 acres
Current Acreage Goal:	1,032 acres
Current Project Boundary:	1,075 acres
Approved NR 44 Master Plan:	No

Significant opportunities for biodiversity conservation at Liberty Creek WA include:

- Wetland Conservation
- Prairie Conservation

Soils, Geology and Hydrology

Liberty Creek WA contains 23 different soil types, most of which are wetland soil types. They primarily have a silt loam texture with lesser amounts of loam, sandy loam, loamy sand, and muck.

The wildlife area is underlain by Paleozoic sedimentary rocks dominated by sandstone with minor strata of limestone, shale and conglomerate to the south and east, and by dolomite with some limestone and shale along the west-central and northwest edge.

About 2.2 miles of Liberty Creek, a Class 3 trout stream and Exceptional Resource Water, flows north to south through the wildlife area. An unnamed feeder stream flows into Liberty Creek from the north and west and the channelized Cold Spring Creek flows in from the east.

Habitat and Vegetative Cover

Liberty Creek WA is dominated by open wetlands with about 45 acres of oak woods and 20 acres of upland grass and brush (Table 32).

Although once recognized as one of the most significant wetlands in Green County, "Liberty Creek Marsh" (which includes some private lands) is undergoing severe degradation due to reed canary grass invasion and loss of native wetland plants related to past ditching, grazing, and agricultural run-off. Nonetheless, significant pockets of good-quality remnant wetlands persist (see Primary Site).

For detailed descriptions of the natural community types described above, see the Sugar River Planning Group (SRPG) Rapid Ecological Assessment (REA), pages 16-25.

Cover Type	% Cover
Non-Forested Wetland	54
Emergent Vegetation	32
Oak	6
Bottomland Hardwood	3
Upland Hardwood	2
Prairie	1
Agriculture	1
Grassland	< 1
Lowland Shrub	< 1

Primary Site

Liberty Creek Sedge Meadow. This Primary Site harbors good-quality Southern Sedge Meadow with small inclusions of Wet-mesic Prairie, providing a refugium for two rare natural community types and important habitat for rare species.

For more details on this primary site, see Appendix G of the SRPG REA.

Forest Resources

This property has limited forest cover. Oak is the dominant cover type and a summary of the forest resources is provided in Table 33.

Table 33. Forest Cover Types of Liberty Creek Wildlife Area

Forest Type	Forest Type Description	Stands	Acres	% of Forested Acres	% of Recon Acres
CH	Central Hardwoods	1	4	10%	1%
O	Oak	6	36	90%	6%
	Totals:	7	40	100%	7%

Wildlife Resources and Habitat Management

The property is stocked with pheasants. Deer also use the property, especially as winter cover. Waterfowl can occasionally be found in the creek bottoms. Habitat management includes prescribed burning, mowing and brushing.

Liberty Creek is a modest Class 3 trout stream that had been routinely stocked with brown trout until 2011. No fishery habitat management activities have been conducted on this property in the last 15 years. Land use disturbance has contributed to increased sedimentation and loss of habitat quality in the trout stream.

Wildlife Species of Greatest Conservation Need and other rare or declining species tracked by Wisconsin Natural Heritage Inventory known at Liberty Creek Wildlife Area include grassland birds and amphibians (Table 34). *For a list of rare or declining species of the entire property group, see Table 3 in the SRPG REA. For a list of rare species by property, see Appendix C in the same document.*

Table 34. Rare or declining species at Liberty Creek Wildlife Area

Species Guild	State Status			Total
	Special Concern	Threatened	Endangered	
Grassland Birds	4			4
Forest Birds	2			2
Marsh Birds	1			1
Frogs	1			1
Fishes*	1			1

*Last observed in 1964.

Administrative Facilities and Access

Public access to Liberty Creek WA is limited. The main access is via a short lane off English Settlement Road on the southeast side of the property. A newly improved seven car gravel parking lot is located at the end of this lane. From this lot a mowed management lane runs north along the east property line for about one-quarter mile to the Cold Spring Creek bottoms. The only other public access is on the northern portion of the property. No parking lot is available due to wet ground, but users may park on the shoulder of the Brooklyn-Albany Road. Access became more difficult when a former town road on the south and west side of the property was abandoned.

Recreation

Liberty Creek WA is most noted for pheasant hunting, but offers deer and waterfowl hunting, trapping and other nature based recreation opportunities. Trout fishing may be available in late spring and early summer if the stream is stocked.

Cultural Resources

Pre-historic cultural resources have been identified on or adjacent to the Liberty Creek WA.

Findings and Conclusions

The Sugar River planning Group (SRPG) properties offer the public access to 22,279 acres on seven wildlife areas, one public hunting ground, and 14 wildlife parcels, 860 acres on two fishery areas, 239 acres on Ice Age Trail lands, and 527 acres at the Hook Lake Bog state natural area.

These properties are located in south central Dane County, eastern Green County and western Rock County. The region is connected by an extensive road network and the properties are within an hour drive of over 1,000,000 to 2,000,000 people in the metropolitan areas of Madison, Milwaukee, Chicago and the Rock River valley cities. Importantly, the populations in Dane, Green and Rock counties are anticipated to increase by 20-50% between 2000 and 2035 with the fastest (nearly 50%) in Dane County.

These properties provide a substantial fraction of the publicly available hunting, fishing and outdoor recreation land in a part of the state that is significantly below the state average for public hunting and fishing lands.

Increased human demands on these properties and challenges posed by invasive species and other gradual changes in natural systems could affect the resources vital to the quality of the habitats on these properties. Population growth is expected to lead to increased use and a greater diversity of users. Fragmentation of the landscapes surrounding the SRPG properties is also anticipated. These changes could affect spring flow to trout streams, surface runoff quality and quantity to rivers and wetlands, and the integrity of the native plant and animal communities. In turn, these changes are expected to impact the character and quality of the user experiences on these properties.

Some of these challenges can be met with improved management techniques and appropriate acquisition of habitat lands by state, federal and local governments. Other valuable partners in meeting the challenges of land conservation and management noted above are dedicated sporting groups, non-profit organizations and private landowners.

Priority Needs and Opportunities

The SRPG properties present opportunities to preserve and restore open and forested wetlands, grasslands, upland forests and savanna habitats. There are also significant opportunities to protect and restore meandering floodplains and associated wetland communities. Restoring this landscape mosaic, especially along the riparian corridors, will benefit numerous benefits to game and non-game fish and wildlife species.

The highest priority recreation, habitat and conservation opportunities include:

Protect the Sugar River corridor – Protect and enhance the recreational, habitat and ecological opportunities provided by the properties along the Sugar River corridor. The primary opportunity area is the state owned Avon Bottoms Wildlife Area, adjacent conservation easements and private lands along the floodplain corridor up to Brodhead. Other important areas along this corridor include the public lands and conservation easements along the Sugar River and Little Sugar River at the Albany Wildlife Area and Brooklyn Wildlife Area.

Promote long-term accessibility at the Footville Public Hunting Grounds – Explore options for providing long-term access to quality hunting opportunities for pheasant, doves, deer and other game species on the leased lands and scattered fee title parcels. Promote additional permanent cover to provide a balance between the working farmlands and the permanent cover provided by the embedded public lands in western Rock County.

Protect the high quality aquatic communities - The coldwater fisheries at Anthony Branch and Story Creek, and the warmwater communities along the Sugar and Little Sugar Rivers.

Protect the open wetlands, grasslands and natural areas - Emphasis on the natural communities at Avon Bottoms WA, Albany WA, Anthony Branch SBP, Brooklyn WA, Badfish Creek WA, Evansville WA and Hook Lake Bog SNA/Grass Lake WA.

Recreational Needs, Opportunities and Capacity

Partnership Opportunities and Challenges

The DNR has made a significant investment in providing public access in this region. About 12,907 acres are in fee title ownership and 590 acres of permanent public access easements have been acquired as of 2013. An additional 10,287 acres of hunting access has been obtained as short-term leases through the Voluntary Public Access program. A concern with the leased parcels is the potential loss of access due to a loss or cut in funding or non-participation by landowners. These fee title, easement and leased lands account for over 75% of the public access lands in the three counties and over 97% of the public access lands in Green and Rock counties.

The following agencies, units of government and private entities collaborate with and complement DNR efforts to provide public access, protect working farms and enhance fish and wildlife habitat.

- US Fish and Wildlife Service waterfowl production areas
- US Natural Resource and Conservation Service (NRCS) floodplain and wetland easements.
- Dane County open space lands.
- Town of Dunn (Dane County) open space and working farms initiatives.
- Natural Heritage Land Trust purchases open space and development rights on working lands.
- Sporting groups (e.g., Pheasants Forever, local sporting clubs, The Prairie Enthusiasts and other volunteers) have assisted with land purchases and land management activities.

While all of these efforts help protect habitat and open spaces, they may not provide public access. For example, several partners have protected thousands of acres through wetland, floodplain and/or purchase of development rights easements near Avon Bottoms WA, Albany WA, Hook Lake/Grass Lake WA and the Footville Public Hunting Grounds. However, none of these easements provide public access. A concern about the NRCS easements is the potential for fragmentation and reduced habitat management options if the restored grasslands are sold off as recreational parcels. This could jeopardize their potential for future public access and could reduce their value as wildlife habitat as well.

A significant challenge is the future of the leased parcels of the Footville Public Hunting Grounds. These leases are purchased through the Voluntary Public Access program with federal funding from the USDA. These hunting grounds provide nearly 43% of the public access hunting lands in the SRPG and over 75% of the public access lands in western Rock County. Unless additional funds are obtained to maintain the leases, or fee title/easement acquisition occurs, these lands will not be available for public access after the leases expire in 2017.

Green and Rock counties have among the lowest percentages of state public ownership in the state. Green County has less than 1.5% state hunting and fishing lands, Rock County has slightly more at 1.8%, and Dane County has the most at 3.1%. All three of these counties fall within the bottom third of counties in terms of the availability of state recreational acreage on a per capita basis.

Hunting

The SRPG properties currently provide quality deer, turkey, pheasant, small game, woodcock, dove and waterfowl hunting experiences to many users. Avon Bottoms, Albany, Brooklyn, Badfish Creek and the leased lands at Evansville and Footville are the largest properties and the most heavily used. The smaller properties including Hook Lake/Grass Lake, Anthony Branch, Liberty Creek and the scattered wildlife parcels provide quality hunting experiences, but there is a greater focus on a smaller number of species such as waterfowl, pheasants or small game.

The larger properties have the greatest potential to meet and possibly expand the number of and quality of hunter experiences. These properties typically have larger blocks of habitats that sustain more diverse wildlife populations. They are also more efficient and less costly to manage. Larger properties often have more access points and are less likely to become overcrowded though this remains an issue on opening day of deer and pheasant hunting seasons due to the popularity on these properties.

Providing satisfying hunter experiences in the future will require abundant, sustainable populations of game species on high to moderate quality habitats with good public access. These experiences and habitats can be provided on state owned properties, easements and leased lands, and by partnering with private land owners and other parties (e.g., federal/ local government, land trusts and sporting groups).

Conflicts between hunters and non-hunters currently are minimal as most non-hunters are aware of the hunting seasons and most hunters abide by hunting restrictions near trails, closed areas and adjacent homes. However, the potential for conflict may change as regional demand for nature based outdoor activities is likely to increase given the anticipated increase in the human population. Increasing the number of users and uses creates the potential for competing demands on the SRPG properties.

Dog Training

Badfish Creek WA has a designated Class 2 dog training area. Additional habitat management is being considered to improve the quality of this training ground. Other properties can be used if applications are approved by the wildlife manager. An additional dog training site is being considered for Green County.

Shooting Ranges

No designated shooting ranges are located on the SRPG properties. Under NR 45 the public may target shoot on state properties in Rock and Green counties, but not in Dane County.

Public target shooting is available at Yellowstone Wildlife Area (Lafayette County) and McMiller Sports Center in Waukesha County. These shooting ranges are within about an hour drive of the major communities within the planning region. DNR guidance that recommends free shooting ranges in a 30 miles radius of existing public shooting ranges or within a radius that serves 100,000 people indicates one, possibly two, is considered for the planning area.

Public access on a limited availability and a fee basis is provided at some local private ranges and hunt clubs.

Public access to shooting ranges is part of the DNR's efforts to promote responsible gun ownership and safe hunting experiences. Target shooting is also becoming more popular as a sport. Shooting ranges, whether on public lands or leased private facilities, provide a valuable service, but noise, safety and environmental concerns can be issues if the activity is not well managed or the facility appropriately sited.

Trapping

Trapping is occurring on a number of these properties and the price for furs has provided an impetus for maintaining these activities. Beaver removal is especially desired along trout streams such as Story Creek in the Brooklyn WA. On-going efforts to improve habitat quality in and along the streams, and restore wetlands should provide an abundant and sustainable supply of furbearers.

Fishing

These properties offer numerous warmwater and trout fishing opportunities. Game fish found in the warmwater streams include northern pike, bass, catfish and walleye while the trout streams contain brown and brook trout with the occasional stocked rainbow trout.

The warmwater sport fisheries in the Sugar River (Avon Bottoms WA) and Little Sugar River (Albany WA) are not regularly stocked and rely on natural reproduction to sustain their populations. Fishing these streams is challenging due to their meandering nature, the number of tree falls and fluctuating water levels. However, a quality fishing experience exists for those willing to develop the skills and provide the time to explore these streams. The Little Sugar River has been regularly stocked with brown trout above the City of Albany to maintain a put and take trout fishery.

Badfish Creek is not stocked and supports a modest warmwater sport fishery and occasionally a brown trout may be taken. The channelized stream reaches and the depth of the ditches within the wildlife area offer more challenging and less aesthetically pleasing fishing experiences.

Access to the warmwater streams is from the bridges and bank fishing though some canoe/kayak angling occurs too. Fishing access is passively managed at the current time.

There are four trout streams (Story Creek Anthony Branch, Allen Creek and Liberty Creek) flowing through the SRPG properties. These streams provide opportunities to catch native brook trout, naturalized brown trout and the occasional rainbow trout. Natural reproduction of trout is occurring in Story Creek and Anthony Branch and less so in Allen Creek. Trout are stocked to maintain a sport fishery on these streams because fishing pressure is heavy and/or the in-stream habitat prevents or limits natural reproduction.

Story Creek and Anthony Branch are Class 2 trout streams with the potential to support sustainable brook trout. However, this will require changes in stocking strategies and in-stream and shoreline vegetation management practices to favor brook trout over brown trout. Previous actions to provide and improve trout fishing include the meandering of straightened stream segments and management of near shore vegetation to provide better habitat and angler access.

Allen Creek has both Class 2 and are Class 3 sections and flows through the Evansville Wildlife Area and the Allen Creek Streambank Protection properties. Liberty Creek flows through the Liberty Creek Wildlife Area and is a Class 3 put-and-take trout fishery. These two streams have limited potential to provide quality habitat and support trout fisheries in the future.

Continued efforts to improve water quality, in-stream habitat and angler access in and along these warmwater and coldwater streams could improve game fish abundance and user experiences.

Boating and Water-based Activities

These properties are valued locally as destination for challenging non-motorized boating. The oxbows, sloughs, meandering river corridors and tree falls along the Sugar and Little Sugar Rivers provide an opportunity for solitude. There are no official water trails at the current time, but volunteers have been cutting and removing deadfalls along certain segments of these rivers to improve navigation. Access to these rivers is provided at town boat landings and road crossings.

Developing informal river trails should be explored as options for promoting an awareness of these floodplain corridors and improve accessibility to these rivers. Development of water trails needs to respect the solitude and sense of wildness currently enjoyed by users and protects the ecological integrity of these systems.

Birding, Photography and Wildlife Viewing

Birding and wildlife viewing are increasingly popular on these properties. The existing roadways, the Ice Age Trail and the informal paths provide excellent opportunities for bird and wildlife viewing.

Avon Bottoms is recognized as an Important Bird Area signifying it is extremely important to bird life.

Avon Bottoms and Brooklyn wildlife areas plus the Sugar River Trail through the Albany WA are included in the Southern Savanna Region of the Great Wisconsin Birding and Nature Trail (WDNR 2008) as offering quality bird observation sites.

Additional roadside pull outs, viewing blinds and educational signage should be explored in the planning process.

Hiking, Cross Country Skiing and Snowshoeing

Hiking, walking for pleasure and sightseeing are popular activities as noted by the SCORP analysis and user numbers for the Montrose SIATA and the Sugar River Trail.

The IAT is the premier hiking venue in the region and is the only designated hiking trail on the SRPG properties. The trail section through the Montrose SIATA features scenic bluff top views while the portion through the Brooklyn WA features rolling topography and diverse natural communities. The existing IAT planning corridor does not pass through any of the other SRPG properties. Opportunities to connect and enhance trail infrastructure beyond these two properties are being explored by the DNR, National Park Service, Ice Age Trail Alliance and other interested parties. Expansion of the trail along new routes or other SRPG properties will consider ecologically sensitive sites, compatibility with other major users, the potential to spread invasive species, soil suitability and long-term maintenance issues.

Cross country skiing and snowshoeing occur on most of these properties and these uses are expected to increase as the population of the region expands (DNR 2006c).

Many of the SRPG properties have limited potential to host longer loop trails (e.g., greater than 3 miles) that are desirable as destination trails because of their small size, the non-contiguous nature of the upland parcels, and the amount of wet soils.

Motorized Sports

There are over 800 miles of snowmobile trails in Dane, Green and Rock counties, and several trails cross through the SRPG properties. The trails and associated infrastructure (e.g., bridges and signage) are part of regional trail systems and are maintained by local snowmobile clubs.

ATV use is prohibited on all properties except for individuals with permits for personal mobility devices. A number of these properties are not suitable for ATV use due to the combination of wet or erodible soils and sensitive ecological communities. ATV and other off-road vehicle uses are generally not compatible with the primary purpose of these wildlife and fishery areas. ATV use is allowed on the Cheese Country trail in Green County.

Horseback Riding and Mountain Biking

Horseback riding and mountain biking are not authorized uses on the SRPG properties. There is little to no evidence that horseback riding or mountain biking is an issue on these properties. Regional recreation studies (WDNR 2006c) show a need for additional trails, but the potential for trails on the SRPG properties is limited because of the predominance of wet soils and limited contiguous uplands. Use of these properties for horse and bike interests is limited by the requirement (NR 1.51) that non-primary uses not significantly detract from the primary purposes of the property which is hunting, fishing, trapping and other nature based outdoor recreation.

Equestrian trails and mountain biking trails are provided at other regional public and private facilities. For example, Yellowstone State Park and Wildlife Area provide 30 miles of horse trails and four miles of off road biking trails. Rock and Dane counties offer several county parks with equestrian trails.

Camping

Dispersed camping is allowed in the designated camping area on the Montrose State Ice Age Trail Area. Otherwise, camping is not allowed on the wildlife, fishery and state natural areas. Camping has not been identified as a need on these properties given the availability of camping on other state, county and private facilities in the region.

Geocaching

According to geocaching web maps there are approximately 40 caches on SRPG properties. Popular geocaching properties include Albany WA, Liberty Creek WA and Brooklyn WA. There are 15-20 caches on the Sugar River Trail as it passes through the Albany WA.

Other Recreation Activities

These properties also provide opportunities for gathering wild edibles (e.g., mushroom and berry picking) when in season. Dog walking has become an increasingly popular use for residents close to wildlife areas. Badfish Creek WA is particularly popular for pet walking.

Accessibility

The properties are currently served by a variety of parking lots, pull offs along the road, boat landings and, in some cases, by access points provided by other agencies or local units of governments. Most of the properties have adequate access given their size though Hook Lake Bog/Grass Lake and several of the extensive wildlife lands have limited to no access. Some modest adjustments to improve accessibility may be needed to accommodate the expected growth in population and users to these properties.

Currently there are no handicapped accessible facilities on any of the SRPG properties. With the aging of the population and the DNR goal to improve accessible recreational opportunities some infrastructure improvements for hunting, fishing and wildlife viewing will be considered in the master planning process.

Ecological and Habitat Significance and Capabilities

Regional Context

The SRPG properties are representative of the Southeast Glacial Plains Ecological Landscape, which is comprised of glacial moraines as high ground surrounded by expanses of rolling ground moraine and relatively flat glacial outwash plains. Historically, the region was characterized by a mosaic of forests, savannas, prairies and wetlands; many of these ecosystems were adapted to fire. Some of these original ecosystems still remain, albeit in an often degraded condition, and are interspersed among sizeable areas of cropped land, pastures, roads, and human developments.

These lands are populated with diverse game and non-game species. The SRPG lies at a transition between an agriculture-dominated landscape with large population centers to the north, south and east and more sparsely populated, agricultural and forested landscapes of the Driftless Area to the west.

Collectively, the SRPG properties have the following ecologically significant characteristics:

- Open wetlands, grasslands and oak-dominated forests, and that provide habitat to game and non-game species
- Cold and warmwater streams that support diverse wetland and aquatic communities, herptiles, aquatic invertebrates, bats, and both game and non-game fish
- Extensive open (non-forested) wetlands that support diverse wildlife, including amphibians
- Remnant Oak Savanna and Prairie communities
- Habitat for grassland and forest birds

The principal watersheds in this property grouping are the Sugar River and Yahara River (Badfish Creek) that flow to the Rock River as part of the Mississippi River Basin. The region has a diverse mix of surface waters including smaller warmwater rivers and streams, coldwater streams, several natural lakes and numerous wetlands.

Opportunities

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 habitat for the widest variety of game and non-game 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 SRPG ecological landscapes and plant and animal communities to be addressed during the master planning process are summarized below.

Priority activities include restoring and expanding grasslands, open wetlands, and lowland forests at a landscape scale with local scale opportunities to protect and restore remnant prairies, oak savannas, and oak forests. Managing for a continuum of oak forest, oak savanna, and native or surrogate grassland is also desired to meet the life history needs for the numerous rare and declining species. Preserving blocks of closed canopy forest within this matrix is also desired.

Maintaining a diverse mix of mature, closed canopy forests and young forests is also a challenge. The two most pressing forestry challenges include:

- Maintaining older oak stands for habitat diversity while regenerating sun loving oak seedlings.
- Addressing the potentially catastrophic loss of the ash canopy due to emerald ash borer infestations in lowland forests.

The SRPG fishery areas provide an important opportunity to protect and enhance several high quality coldwater trout streams. The Sugar River extending from just west of **Brooklyn WA** down to the Illinois border (and encompassing **Avon Bottoms WA**) holds statewide importance as a refuge for diverse native flora and fauna, high quality natural communities, and a robust fishery.

The SRPG contains three state natural areas. Hook Lake Bog State Natural Area in Dane County and two state natural areas (Swenson Wet Prairie and Avon Bottoms) have been designated within the boundaries of the Avon Bottoms WA.

Challenges

Particular challenges include non-native invasive species infestations, disrupted hydrology due to dams, ditching and tiling, severe fragmentation of the natural communities by farmlands, infrastructure and built environments such as cities and scattered housing developments.

Major threats to the ecological integrity of the SRPG are inter-related and include ecological simplification and alteration of natural communities due to loss of species diversity, proliferation of invasive species, environmental degradation due to pollution (e.g., sedimentation and nutrient enrichment), the long-term challenge of climate change, changes in surface and groundwater systems, and habitat fragmentation.

A significant issue in the region is the sharp drop in grassland habitat provided by the federal Conservation Reserve Program (CRP). In Wisconsin, these lands have declined from a high of more than 713,000 acres in 1994 to less than 320,000 acres in 2013. CRP enrollment in the three county SRPG region has declined about 50% from an average of 26,000 acres in the mid-1990s to 13,500 acres in 2013.

Wildlife Habitat

The SRPG properties provide a variety of high-quality habitat for both common wildlife species as well as rare and sensitive species. Primary game species include white-tailed deer, eastern wild turkey, American woodcock, small game and ring-necked pheasants. These properties have significant potential for improved habitat quality and increased capacity to support a wide variety of game and non-game species.

Restoring and protecting the mix of grasslands, wetlands and forest habitats will enhance wildlife habitat at several SRPG properties, including **Avon Bottoms WA, Albany WA, Brooklyn WA, Anthony Branch SBP and Hook Lake-Grass Lake WA**. In particular, protecting the mosaic of oak communities (e.g., ranging from savanna to woodlands to closed canopy forests) and lowland forests that provide valuable mast, nesting and foraging habitat for game species is important.

Aquatic Communities

Maintaining the exceptional and outstanding water quality classification of the streams is a priority and enhancing the quality of the impaired streams is desired as resources and regulations allow. Challenges to protecting surface water quality and quantity, especially the maintenance of the trout streams, include minimizing soil, nutrient and herbicide runoff from point and non-point sources. Protecting groundwater quality and flows to local streams and rivers will also contribute to the long-term biological integrity and productivity of these waterbodies.

The in-stream and shoreline habitats for warmwater streams are passively managed at the current time (due to limited resources and other priority activities). Sugar River, and to a lesser extent, the Little Sugar River offer northern pike, bass, catfish and walleye fishing. The warmwater sport fish populations in the Sugar River are occasionally supplemented with stockings of walleye and northern pike fingerlings.

The two highest quality trout streams are Story Creek and Anthony Branch. Both streams are classified as Class 2 trout waters indicating they support some natural reproduction, but they are stocked with trout to sustain the popular sport fisheries. Both streams are fed by numerous springs and have the potential to support sustainable brook trout fisheries. Protecting the springs is essential to sustain the coldwater communities into the future.

Brook trout management would mean a change in in-stream management strategies to favor small pools and riffles and more overhanging streamside vegetation for brook trout rather than larger pools and overhanging banks favored by brown trout. It would also mean brook trout rather than brown trout would be stocked in these streams. The Class 2 trout streams provide some natural reproduction, but all of the trout streams are stocked to maintain viable sport fisheries. Recent changes to wild source stocked fish have improved the populations and encouraged natural reproduction.

The future of the Liberty and Allen Creek trout fisheries is questionable given land use and climate changes anticipated over the coming decades.

Long-term concerns include nutrient loading to both cold and warm water fisheries, land use changes that degrade surface water runoff and groundwater pumping that may reduce spring inputs to these streams. Protecting wetlands, spawning habitat and minimizing impacts from invasive species, such as Mud snails, carp, zebra mussels and others will be critical for their long-term health.

Warmwater streams habitat and population improvements will benefit most from improved water quality, wetland restoration and reduced flashiness to enhance habitat quality rather than direct human intervention in terms of in-stream or shoreline habitat changes.

Badfish Creek carries the distinction of receiving the highly treated effluent of the Madison Metropolitan Sewerage District (MMSD). The stream morphology and flow has been significantly altered by past stream straightening, side ditches, tiling and dredging related to farming activities and the MMSD discharge. Ditching and channelization are not conducive to providing optimal fish habitat in their current condition and potential remedial actions are not anticipated to provide substantial improvement.

Riparian and Aquatic Habitat for Non-Game Species

The lower Sugar River provides important aquatic habitat for fishes and aquatic invertebrates such as mussels, mayflies, dragonflies and damselflies. These species either use habitat at **Avon Bottoms WA**, or their continued survival and viability is influenced by the high-quality aquatic and wetland habitats at the wildlife area.

Acoustical surveys indicate good quality bat habitat is present at **Avon Bottoms** and **Albany WAs**. Maintaining diverse cover types (forests, marshes, sloughs) in close proximity to water can help to protect the six species of bats that were identified during the Rapid Ecological Assessment summer residency period surveys.

Open Wetlands

Non-forested wetlands comprise the majority of land cover on the SRPG. They may vary in quality but typically occupy very large areas, and are vital for minimizing flooding, filtering nutrients and pollutants, providing moisture banks during low water periods or droughts, and providing natural migration corridors for wildlife. Although Southern Sedge Meadow is the dominant natural community type, Calcareous Fen, Wet Prairie, Wet-mesic Prairie, and Emergent Marsh often intergrade with sedge meadow. Open Bog and Floating-leaved marsh occur uniquely at **Hook Lake Bog SNA**. All of these wetlands provide important stopover sites for migratory birds and breeding habitat for grassland and marsh birds, turtles, amphibians, and invertebrates.

Some of the SRPG wetlands remain high-quality due to a lack of invasive species and minimal impacts from draining (e.g., **Hook Lake SNA-Grass Lake WA**), but many have been heavily impacted by non-native invasives, hydrological modification, and grazing (e.g., Evansville WA). Regardless of their condition, the first priority for open wetlands is retaining them in ownership and protecting them from further disturbance. Priorities for restoration should target the highest quality wetlands that were designated as Primary Sites, or other sites later identified as having high restoration potential. Although eradication of invasive species in open wetlands (particularly reed canary grass) is not feasible, opportunities exist to improve all SRGP wetlands by limiting the dominance and spread of invasive species, targeting early detection-rapid response species such as Japanese hops, remediating past disturbances (when feasible), and limiting further system disturbances.

Oak Communities

Opportunities exist on SRPG properties to restore three types of oak savanna (Oak Opening, Oak Woodland, and Oak Barrens), all of which are globally rare communities. Restoration and expansion of oak savanna remnants can enhance the habitat for numerous threatened and endangered species and Species of Greatest Conservation Need (SGCN). Specifically, major opportunities are present at **Brooklyn**, **Albany** and **Avon Bottoms WAs** to restore and/or maintain oak savanna communities. Priorities for restoration should target the highest quality savannas that were designated as Primary Sites, or other sites later identified as having high restoration potential. Restoration opportunities also exist on other SRPG properties (e.g., Badfish Creek WA, Anthony Branch SBP, and Hook Lake Bog SNA), but they have limited potential due to the small size of the restoration areas and the significant management effort needed to restore/maintain them.

Maintaining oak woodlands is also a concern. Many of the oak communities are mature and regenerating oak raises concerns about the loss of closed canopy forest habitat for forest interior birds. Staff will consider management options during master planning to identify habitat objectives and prescriptions that address forest health and succession issues that impact wildlife habitat goals, endangered resources, recreational uses and forest products.

Bird Habitat

Grassland bird species are exhibiting the most significant declines of any suite of bird species in Wisconsin and across the Midwest. The SRPG presents opportunities to support viable populations of numerous bird species that require large grasslands with high quality nesting habitat. Managing from a landscape perspective can better accommodate the complex habitat needs of a greater number and variety of grassland birds, and may include wetland, upland and shrub components.

The best opportunities for grassland bird management are **Avon Bottoms, Brooklyn, Badfish Creek, and Hook Lake-Grass Lake WAs**. These species have the potential to increase in density and potentially improve nest productivity if the open grasslands are maintained and connected to open wetlands.

The DNR and partners have a significant opportunity to collaboratively manage and protect the lower Sugar River around the **Avon Bottoms WA** to provide a mosaic of large open grasslands and wetlands for game and non-game species.

Large, protected blocks of forest are rare in south-central Wisconsin. **Avon Bottoms WA** provides the best opportunity for forest birds in the entire planning group and has also been recognized as an Important Bird Area and Conservation Opportunity Area (WDNR 2006c). Forest blocks at the Brooklyn Oak Savanna and Dry Prairie Primary Site (within **Brooklyn WA**) also attract an impressive assemblage of forest birds, including some that are rare or declining.

Open wetlands provide important habitat for marsh birds and, when in proximity to open water, waterfowl and waterbirds. In particular, the wetlands of **Hook Lake-Grass Lake WA** support a significant colony of a state-endangered colonial bird.

Opportunities to promote stopover habitat for migrating landbirds, waterfowl, waterbirds and raptors also exist on these properties.

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. All SRGP wetlands provide basking, foraging and overwintering habitat for numerous rare or uncommon amphibians and reptiles. In particular, these properties present significant opportunities for the conservation of the Blanding's turtle, due to an abundance of habitat and the presence of dispersal corridors between areas suitable for habitation. Furthermore, opportunities exist at the **Avon Bottoms WA** (sand prairies) and **Albany WA** (Albany Sand Prairie and Oak Savanna Primary Site) to provide habitat for a variety of reptiles, particularly rare terrestrial turtles and snakes.

Non-native Invasive Species

Non-native invasive species are a current and growing threat to natural plant and animal communities. If not controlled, they have the potential to significantly harm the general value and fitness of the habitats on all of the SRPG properties. Future plans should place a priority on conducting surveys to determine area and extent of invasives, limiting their spread, and early detection and rapid control of new and/or small infestations. The major invasive species currently on the SRPG properties include: common buckthorn, garlic mustard, Eurasian bush honeysuckle, spotted knapweed, Japanese hedge parsley, black locust, and reed canary grass.

Emerald Ash Borer poses an imminent threat to ash trees and forested areas on the SRPG properties. This species has been positively identified at Avon Bottoms WA. Staff across the various programs are developing management strategies to address this threat. One example, is underplanting where ash are found with one or more native species such as swamp white oak, river birch or other suitable species.

Summary

With continued population growth, expanding infrastructure needs and increasing row cropping there has been a relentless fragmentation of our natural landscapes. There are increasingly diverse sets of recreational users on our public lands too. Thoughtful planning and management will be needed to maintain high quality wildlife and fishery habitat while also providing for increased demand for a broader array of recreational experiences from an increasing number of users.

Increased collaboration and efficient management of the SPRG properties as well as those of partner agencies and units of government will be needed to provide quality habitat for game and desirable non-game species as well as satisfying recreational experiences for users.

The SRPG properties contain important opportunities to protect and enhance many ecologically significant communities including diverse cold and warmwater fisheries, open wetlands, upland and lowland forests, savannas, prairies, grasslands and populations of rare species. These habitats provide regionally significant opportunities for outdoor recreation, particularly for 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.

From a regional perspective, the SRPG can continue to provide high quality natural communities and habitats for both game and non-game species. Importantly, the SRPG properties are well-suited to continue providing lightly developed, non-motorized recreation experiences in rustic settings for years to come.

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Appendix A: Species List

The following is a list of species referred to by common name in the report text.

Common Name	Scientific Name
Plants	
angelica	<i>Angelica atropurpurea</i>
big bluestem	<i>Andropogon gerardii</i>
black cherry	<i>Prunus serotina</i>
black oak	<i>Quercus velutina</i>
black willow	<i>Salix nigra</i>
blue-joint grass	<i>Calamagrostis canadensis</i>
bog bean	<i>Menyanthes trifoliata</i>
bog birch	<i>Betula pumila</i>
box-elder	<i>Acer negundo</i>
broad-leaved cat-tail	<i>Typha latifolia</i>
burr oak	<i>Quercus macrocarpa</i>
buttonbush	<i>Cephalanthus occidentalis</i>
cat-tails	<i>Typha spp.</i>
common buckthorn	<i>Rhamnus cathartica</i>
cottonwood	<i>Populus deltoides</i>
dogwoods	<i>Cornus spp.</i>
Dutchman's breeches	<i>Dicentra cucullaria</i>
Eastern red cedar	<i>Juniperus virginiana</i>
Eurasian bush honeysuckle	<i>Lonicera spp.</i>
fowl manna grass	<i>Glyceria striata</i>
garlic mustard	<i>Alliaria petiolata</i>
green ash	<i>Fraxinus pennsylvanica</i>
Indian grass	<i>Sorghastrum nutans</i>
Japanese hedge-parsley	<i>Torilis japonica</i>
lake sedge	<i>Carex lacustris</i>
leather-leaf	<i>Chamaedaphne calyculata</i>
linear-leaved aster	<i>Aster linariifolius</i>
little bluestem	<i>Schizachyrium scoparium</i>
maples	<i>Acer spp.</i>
paper birch	<i>Betula papyrifera</i>
Pennsylvania sedge	<i>Carex pensylvanica</i>
prairie dock	<i>Silphium terebinthinaceum</i>
pussy willow	<i>Salix discolor</i>
red oak	<i>Quercus rubra</i>
red-osier dogwood	<i>Cornus stolonifera</i>
red pine	<i>Pinus resinosa</i>
red trillium	<i>Trillium recurvatum</i>
reed canary grass	<i>Phalaris arundinacea</i>
Riddell's goldenrod	<i>Solidago riddellii</i>
seven-angled pipewort	<i>Eriocaulon aquaticum</i>
side-oats grama	<i>Bouteloua curtipendula</i>
silver maple	<i>Acer saccharinum</i>
slippery elm	<i>Ulmus rubra</i>
spiderwort	<i>Tradescantia ohiensis</i>

Common Name	Scientific Name
stiff goldenrod	<i>Solidago rigida</i>
swamp white oak	<i>Quercus bicolor</i>
sweet-flag	<i>Acorus calamus</i>
tamarack	<i>Larix laricina</i>
turk's-cap lily	<i>Lilium michiganense</i>
tussock sedge	<i>Carex stricta</i>
water-shield	<i>Brasenia schreberi</i>
white mulberry	<i>Morus alba</i>
white oak	<i>Quercus alba</i>
white snakeroot	<i>Eupatorium rugosum</i>
white water-lily	<i>Nymphaea odorata</i>
willow spp.	<i>Salix spp.</i>
wiregrass sedge	<i>Carex lasiocarpa</i>
yellow pond-lily	<i>Nuphar advena</i>
Animals	
American woodcock	<i>Scolopax minor</i>
Bell's vireo	<i>Vireo bellii</i>
brook trout	<i>Salvelinus fontinalis</i>
brown trout	<i>Salmo trutta</i>
common raccoon	<i>Procyon lotor</i>
creek chub	<i>Semotilus atromaculatus</i>
eastern cottontail	<i>Sylvilagus floridanus</i>
eastern wild turkey	<i>Meleagris gallopavo</i>
eastern gray squirrel	<i>Sciurus carolinensis</i>
gray partridge	<i>Perdix perdix</i>
mottled sculpin	<i>Cottus bairdii</i>
mourning dove	<i>Zenaida macroura</i>
mucket	<i>Actinonaias ligamentina</i>
northern bobwhite	<i>Colinus virginianus</i>
prothonotary warbler	<i>Protonotaria citrea</i>
ring-necked pheasant	<i>Sylvilagus floridanus</i>
ruffed grouse	<i>Bonasa umbellus</i>
white sucker	<i>Catostomus commersonii</i>
white-tailed deer	<i>Odocoileus virginianus</i>
wood duck	<i>Aix sponsa</i>

Appendix B: Rare Species of the Sugar River Planning Group & Associated Natural Communities

Numbers 1, 2 and 3 denote degree of association within the Southeast Glacial Plains Ecological Landscape per Wisconsin's Wildlife Action Plan (WDNR 2006): 3 = significant association, 2 = important association, 1 = low association. An "X" denotes habitat associations for species that were not identified as Species of Greatest Conservation Need in the 2006 Wildlife Action Plan; specific degrees of association not available.

		Associated Natural Communities Occurring at Sugar River Planning Group																													
Common Name	Scientific Name	Last Obs.	State Status	Fed. Status	Bog Relict	Central Lake Michigan Coastal	Calcareous Fen	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Floodplain Forest	Inland lakes	Moist Cliff	Oak Barrens	Oak Opening	Oak Woodland	Pine Relict	Shrub Carr	Sand Prairie	Southern Dry Forest	Southern Dry-mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Surrogate Grasslands	Warmwater rivers	Warmwater streams	Wet-mesic Prairie	Wet Prairie	
Mammals																															
Big Brown Bat	<i>Eptesicus fuscus</i>	2013	THR		Wide variety of habitats, especially edge habitat near water and farmland.																										
Prairie Deer Mouse	<i>Peromyscus maniculatus</i>	2013	SC/N					X	X						X				X							X					
Eastern Pipistrelle	<i>Perimyotis subflavus</i>	2013	THR				X								X	X					X	X					X	X			
Eastern Red Bat	<i>Lasiurus borealis</i>	2013	SC/N		2		2	3			2	2				2	2		2		2	2	2	1	2			2	2		
Hoary Bat	<i>Lasiurus cinereus</i>	2013	SC/N		2		2	3			2	2				1	1		2		1	1	2	1	2			2	2		
Little Brown Bat	<i>Myotis lucifugus</i>	2013	THR		Commonly roost in human-made structures, but also found in the summer under tree bark, in rock crevices, and in tree hollows, all close to water (they forage over open water or near shorelines and along edge habitat).																										
Northern Long-eared Bat	<i>Myotis septentrionalis</i>	2013	THR		2		2	3			2	2				1	2		2		2	2	2		2			2	2		
Prairie Vole	<i>Microtus ochrogaster</i>	2013	SC/N						3	3						2										2					
Western Harvest Mouse	<i>Reithrodontomys megalotis</i>	2013	SC/N						X	X										X						X					

		Associated Natural Communities Occurring at Sugar River Planning Group																														
Common Name	Scientific Name	Last Obs.	State Status	Fed. Status	Bog Relict	Central Lake Michigan Coastal	Calcareous Fen	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Floodplain Forest	Inland lakes	Moist Cliff	Oak Barrens	Oak Opening	Oak Woodland	Pine Relict	Shrub Carr	Sand Prairie	Southern Dry Forest	Southern Dry-mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Surrogate Grasslands	Warmwater rivers	Warmwater streams	Wet-mesic Prairie	Wet Prairie		
Birds																																
Acadian Flycatcher	Empidonax virens	2013	THR								2										1	3										
American Bittern	Botaurus lentiginosus	2009	SC/M							3									1				2			1					1	
American Woodcock	Scolopax minor	2013	SC/M		2		2				1				2	1			3		1			2		1					1	
Bald Eagle	Haliaeetus leucocephalus	2013	SC/P										3		2										2		3					
Bell's Vireo	Vireo bellii	2013	THR					2	2						1				2	2						2				2	2	
Black-billed Cuckoo	Coccyzus erythrophthalmus	2013	SC/M								2				2	1			3				2								1	
Black Tern	Chlidonias niger	2013	SC/M							3													1		2							
Black-crowned Night-heron	Nycticorax nycticorax	2013	SC/M							X													X								X	
Blue-winged Teal	Anas discors	2013	SC/M					1	2	3	2									1			2		2	2	1		2	2		
Blue-winged Warbler	Vermivora pinus	2013	SC/M		2						2				1	2	2		2		2	2		2								
Bobolink	Dolichonyx oryzivorus	2013	SC/M				1		3						1								2			3			3	3		
Brown Thrasher	Toxostoma rufum	2013	SC/M					2	2						3	3				3						2					1	
Cerulean Warbler	Dendroica cerulea	2013	THR								3						2				1	3										
Common Nighthawk	Chordeiles minor	2013	SC/M					X							X	X				X												
Dickcissel	Spiza americana	2013	SC/M					1	3						1	1										3			1			
Eastern Meadowlark	Sturnella magna	2013	SC/M				1	2	3							2				2			2			3			2	1		

Common Name	Scientific Name	Last Obs.	State Status	Fed. Status	Associated Natural Communities Occurring at Sugar River Planning Group																										
					Bog Relict	Central Lake Michigan Coastal	Calcareous Fen	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Floodplain Forest	Inland lakes	Moist Cliff	Oak Barrens	Oak Opening	Oak Woodland	Pine Relict	Shrub Carr	Sand Prairie	Southern Dry Forest	Southern Dry-mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Surrogate Grasslands	Warmwater rivers	Warmwater streams	Wet-mesic Prairie	Wet Prairie	
Field Sparrow	Spizella pusilla	2013	SC/M					3	2					2	3				3								2			2	
Grasshopper Sparrow	Ammodramus savannarum	2013	SC/M					3	3					2	1				3								3				
Henslow's Sparrow	Ammodramus henslowii	2013	THR						3						2						1					3			2	2	
Hooded Warbler	Wilsonia citrina	2013	THR																			3									
Kentucky Warbler	Oporornis formosus	2013	THR								3											2									
Lark Sparrow	Chondestes grammacus	2013	SC/M					2						3					3												
Least Flycatcher	Empidonax minimus	2013	SC/M									2				1		1			1	1									
Loggerhead Shrike	Lanius ludovicianus	1987	END					2	2					2	1				2							3			1		
Northern Bobwhite	Colinus virginianus	2012	SC/M					2	2						2	1			1						3			2			
Northern Harrier	Circus cyaneus	2013	SC/M				1	2	2	1				2				1	1		2				3			3	2		
Prothonotary Warbler	Protonotaria citrea	2013	SC/M									3																			
Red-headed Woodpecker	Melanerpes erythrocephalus	2013	SC/M											2	3	3					2	2									
Red-shouldered Hawk	Buteo lineatus	2013	THR																			2			1						
Veery	Catharus fuscescens	2013	SC/M													1		3				2			1						

Common Name	Scientific Name	Last Obs.	State Status	Fed. Status	Associated Natural Communities Occurring at Sugar River Planning Group																										
					Bog Relict	Central Lake Michigan Coastal	Calcareous Fen	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Floodplain Forest	Inland lakes	Moist Cliff	Oak Barrens	Oak Opening	Oak Woodland	Pine Relict	Shrub Carr	Sand Prairie	Southern Dry Forest	Southern Dry-mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Surrogate Grasslands	Warmwater rivers	Warmwater streams	Wet-mesic Prairie	Wet Prairie	
Vesper Sparrow	Poocetes gramineus	2013	SC/M					3	2					3	2				3								1				
Whip-poor-will	Caprimulgus vociferus	2013	SC/M		2						1					3			3	3											
Willow Flycatcher	Empidonax trailii	2013	SC/M		2		2		1	2		1			1			3	1		2	1		2				2	2		
Wood Thrush	Hylocichla mustelina	2013	SC/M								2					2			2	3		1									
Yellow-billed Cuckoo	Coccyzus americanus	2013	SC/M								3					1		2		1	2		1								
Yellow-breasted Chat	Icteria virens	2013	SC/M		Dense upland and lowland shrub																										
Yellow-crowned Night-Heron	Nyctanassa violacea	1989	THR								2	3						2						2		2					
Yellow-throated Warbler	Dendroica dominica	2013	END								3									2											
Amphibians																															
American Bullfrog	Lithobates catesbeianus	2013	SC/H				X					X											X		X	X					
Northern Leopard Frog	Lithobates pipiens	2013	SC/H		X					X		X																			
Pickereel Frog	Lithobates palustris	2013	SC/H			2	3			3	2						2				3		3		3	3	3	3	3		

		Associated Natural Communities Occurring at Sugar River Planning Group																												
Common Name	Scientific Name	Last Obs.	State Status	Fed. Status	Bog Relict	Central Lake Michigan Coastal	Calcareous Fen	Coolwater streams	Dry Prairie	Dry-mesic Prairie	Emergent Marsh	Floodplain Forest	Inland lakes	Moist Cliff	Oak Barrens	Oak Opening	Oak Woodland	Pine Relict	Shrub Carr	Sand Prairie	Southern Dry Forest	Southern Dry-mesic Forest	Southern Sedge Meadow	Southern Tamarack Swamp (rich)	Submergent Marsh	Surrogate Grasslands	Warmwater rivers	Warmwater streams	Wet-mesic Prairie	Wet Prairie
Reptiles																														
Blanding's Turtle	<i>Emydoidea blandingii</i>	2013	THR					2	3	2	3	2			3	3	2		2	3		2	2	2	3		2	2	2	3
Eastern Massasauga Rattlesnake	<i>Sistrurus catenatus catenatus</i>	1982	END	C			3		3	3	3	3			3				3	3			3						3	3
Ornate Box Turtle	<i>Terrapene ornata</i>	2013	END						3	2					3	3			3	3	3									
Fishes																														
American Eel	<i>Anguilla rostrata</i>	1974	SC/N					X																			X	X		
Black Buffalo	<i>Ictiobus niger</i>	2004	THR																								2			
Least Darter	<i>Etheostoma microperca</i>	1965	SC/N																								2	2		
Silver Chub	<i>Macrhybopsis storeriana</i>	2007	SC/N																								X	X		
Starhead Topminnow	<i>Fundulus dispar</i>	2010	END																								3	3		
Weed Shiner	<i>Notropis texanus</i>	1974	SC/N																								X	X		
Mussels																														
Black Sandshell	<i>Ligumia recta</i>	2003	SC/P																								X	X		
Dragonflies																														
Dark Rubyspot	<i>Hetaerina titia</i>	2008	SC/N																									X		
Riverine Clubtail	<i>Stylurus amnicola</i>	1992	SC/N																								X	X		
Russet-tipped Clubtail	<i>Stylurus plagiatus</i>	1992	SC/N																								X			

Appendix C: Habitat and Recreation Management

This appendix provides background information on typical habitat and recreation management practices conducted on fish, wildlife and natural areas. The properties are being assessed using staff records of management activities, operating and capital budgets, grants and the Wisconsin DNR Land Management Needs Report (WDNR 2010d) regarding habitat and infrastructure quality. The Needs Report provides a statewide context for assessing annual staffing and financial resources needed for the following:

- 1) Conservation related land management on department lands,
- 2) Maintaining the associated land management infrastructure, and
- 3) Managing the minimally developed recreational facilities that often accompany these conservation lands.

The Needs Report will be used to estimate the resources needed to meet the desired habitat and recreation objectives for these properties during the subsequent planning phases.

Active and Passive Habitat Management

DNR properties are managed using both active and passive forms of management. Understanding the difference between these management styles is important to understanding the habitat and recreation objectives for these properties.

Active Management includes the direct, and often routine, manipulation of the plant and animal communities and the provision of infrastructure to promote a recreational activity. Active management is the most common type of management on the fish and wildlife properties.

Active management includes stocking pheasants and fish (e.g., trout, walleye and northern), conducting prescribed burns, restoring grasslands, conducting timber harvests, tree planting, adjusting water levels on flowages for nesting and migrating waterfowl and shore birds, managing invasive species, and enhancing in-stream and riparian habitats, especially along trout streams. Recreation examples include providing and maintaining parking lots, mowing trails for users and marking property boundaries.

Active management activities span a significant range of time scales. Fish may be stocked every year, prescribed burns may occur every three to five years while timber harvests may occur on 15-50 year cycles or even longer.

During emergency situations such as severe risk of adverse impacts to human health and safety or potentially catastrophic impacts to native communities (e.g., severe insect, disease or fire events) additional management actions may be pursued as warranted.

Passive Management indicates no or very limited action is taken to direct the structure and composition of a habitat or the provision of infrastructure to conduct an activity. For more information about passive management refer to the *State Lands – Passive Management Report 2010* ([WDNR]. 2010c), especially in regards to forest management.

Passive management is often applied to parcels with the following characteristics:

- Reference Areas – Natural forces are allowed to direct the structure, composition and function of the plant and animal communities on reference areas. State natural areas often have reference areas which provide researchers an opportunity to study changes in natural systems.
- Size - Management activities may be too expensive or difficult to conduct due to small acreages.
- Location – Isolated or difficult to reach habitats or parcels,
- Habitat quality - Units with very good to excellent habitat quality may be stable thus requiring little to no intervention, or it may be an infestation (i.e., an expansive reed canary grass infestation in a disturbed wetland) of such size and complexity that the tools and/or resources required for restoration are not currently available.

However, even in passive management areas some limited actions may be taken. For example, action to control invasive species in a high quality natural area may be taken to control the population before it becomes established.

Plant communities on sizeable portions of the fish and wildlife properties are allowed to evolve based on natural succession. For example, savannas and grasslands may be burned, but the species composition may be allowed to evolve based on the competitiveness of the grasses and forbs occurring at the site. Typically the objective of passive management is to promote stable and productive natural communities while minimizing the need for potentially expensive human intervention

Recreation Management

The vast majority of these properties are intended to provide users with rustic outdoor experiences. Recreation management consists of providing quality habitats and natural communities with abundant opportunities to interact with or observe wildlife and non-game species. As a rule users prefer to enjoy a sense of open space and limited interaction with other people or human developments.

Meeting these recreational expectations can be best achieved by providing scattered, well maintained parking lots to disperse users, marking boundaries to clearly identify public lands, providing signage with useful information, and providing water crossings where appropriate.

Wetlands

Wetlands are the most dominant cover type on most of these properties. They provide habitat for many game and non-game animal life cycle needs such as reproduction, food, shelter, resting areas and stopover habitat for migratory birds. Traditionally, wetland management has focused on waterfowl and furbearers, but these wetlands have also benefited shorebirds, wading birds, reptiles and amphibians.

The primary wetland management goal is to improve cover and food for most wetland wildlife. This can be achieved by protecting intact wetland communities or, as appropriate, manipulating water levels and using prescribed fire and/or herbicides to control invasive species and improve the ratio of emergent vegetation to open water in shallow to deep water emergent wetlands. Water level depths are typically stabilized during late spring and maintained at certain levels in the winter to provide overwinter habitat for muskrats, mink, otter and amphibians.

Moist soil management is usually done to provide attractive feeding areas for migratory birds – from waterfowl to shorebirds and wading birds. This is usually done on shallow emergent wetlands and wet meadow wetlands. Water control structures are used to drain wetlands during the growing season to allow early successional wetland plants to establish and develop seed. On areas dominated with reed canary grass, areas can be mowed late in the growing season – often by local farmers through sharecrop contracts - and then flooded during late summer and fall. This promotes large increases in invertebrates that are needed for the diets of waterfowl and shorebirds.

All of the larger properties contain wetlands and some are rare wetland types that provide both breeding and migratory habitat for birds. Restoration of previously drained wetlands has occurred on some properties. Wetlands are usually restored by removing or disabling subsurface drain tiles and plugging drainage ditches and sometimes enhanced by scraping deeper areas to increase water depths and increase habitat diversity.

Certain habitats are relatively stable over time and often can be passively managed though active management may be needed periodically to rejuvenate them. For example, shrub-car wetlands dominated by wetland tolerant shrub species like willow, dogwood and tag alder are found on most of the properties. They are important habitat for variety of wildlife for cover and food. Species range from deer to woodcock, willow flycatchers and black-billed cuckoos. Tag alder areas can be rejuvenated to younger thicker cover by mowing. Drier sites can be burned, cut and/or chemically treated to setback woody vegetation and invasive species that may come to dominate sites over time.

Grasslands

These areas provide valuable food and cover for a variety of wildlife species. Traditionally these areas were managed to provide nesting cover for pheasants and ducks (e.g., mallards and blue wing teal) with benefits to grassland songbirds as well. Pheasant populations have declined throughout this area due to landscape scale changes in land-use that severely limit nesting cover. Pheasant stocking is needed to sustain hunting opportunities on these properties.

Grassland songbirds and some reptiles benefit from large blocks of open grassland cover ranging from hundreds to thousands of acres. Grassland nesting ducks benefit from nesting cover near wetland brood habitat. Limiting edge and perch trees minimizes habitat for predators thus improving nesting success.

Grasslands are developed by conversion of former agricultural fields to cool season grasses, native prairies or warm season grasslands and by rotating covertypes on fields using farming agreements to have croplands for several years followed by planting of cool season grass/hay fields with restricted cutting dates. Warm season grasslands need to be burned or mowed on a regular basis to keep them in grass cover and set back invasive species and woody vegetation. Woody hedges and rock fence-lines are typically removed to minimize edge habitat and travel lanes used by predators.

Agricultural Lands and Practices

Agricultural practices can be used to create food plots for doves and pheasants and winter food for a variety of wildlife. Cropping land can also aid habitat restoration by setting back invasives and non-desirable woody vegetation. Fields can be allowed to go fallow or planted to convert to upland shrub cover and/or forest cover. Some fields are maintained as cropland through farming agreements until funds are available to convert them to permanent forest or grass cover types. In emergency circumstances, such as the drought of 2012, hay cutting may be allowed as well. At any one time, about 20% of the upland areas that are not forested are managed using agricultural practices (e.g., food plots and habitat restoration) on these properties.

Forest Management

The principle management goal for forests on fish and wildlife properties is to provide sustainable habitats for fish and wildlife species. This goal benefits both present and future generations by providing healthy, productive habitats for a variety of wildlife and attractive recreational settings for users. These management practices may also yield forest products (e.g., firewood, pulp and saw timber) for the local and state economies. The long-term benefits are wide ranging and include public hunting, outdoor recreation, habitat for aquatic (i.e., floodplain forests) and terrestrial wildlife, preservation of biological diversity, protection of soil and water resources, production of recurring forest products, and aesthetics.

Forest management seeks to maintain species diversity, while improving the vigor of desirable species such as those that produce mast crops (oaks, hickories, beech), berries (hackberry and black cherry) or provide other benefits to these properties. Forest food crops are important to sustain populations of both game and non-game species such as white-tailed deer, turkey, squirrels, and other furbearers. It also seeks to reduce forest health concerns by managing high risk species (e.g., ash mortality from emerald ash borer infestations) or other high risk trees such as those with obvious infections or decline so as to maintain a productive, yet dynamic, ecosystem. Enhancing tree vigor can reduce losses from both native and non-native forest pests such as gypsy moth.

Early successional forests dominated by shade intolerant species (birch and aspen) provide valuable habitat for deer, grouse and woodcock. As these stands reach their rotation age, the forests are either regenerated through harvests or managed to convert into moderately shade tolerant forests (oak, ash, elm or hackberry) or even into shade tolerant northern hardwoods (maple and basswood). These latter forests can provide long-lived forests with closed canopies desired by forest interior bird species.

Sustainable forest management requires the protection of archeological or historical sites, sensitive species and communities, water resources, such as wetlands, streams, or ephemeral pools, wildlife trees both standing and downed, and legacy trees.

Typical management practices include thinning, selection cuts and regeneration harvests. Suppressing invasive plant species is becoming a more important forest management activity on the fish and wildlife properties. Planting tree seedlings to re-forest harvested areas, creating new forests on open or brush lands or restoring forests after catastrophic mortality from fire, flooding or blow-downs are common practices. Plantings can also aid the conversion of conifer plantations to native hardwood forests. These plantings can be used to create early successional forest types that can later be expanded into adjacent forest stands to create larger blocks that are rare in southern Wisconsin and provide habitat for a wide range of threatened and endangered species, including forest interior birds.

Wisconsin's public forests are managed under the principles of sustainable forest management and are dual certified under the Forest Stewardship Council (FSC) and the Sustainable Forestry Initiative (SFI) programs. Certification means that the forests are managed according to strict environmental, social, and economic standards.

Forest products harvested from or in process of being harvested on these properties include the following:

- Albany WA - Timber sale in process on 138 acres with an appraised value of \$61,332.99 containing an estimated 368,000 board feet of sawlogs and 408 cords of cordwood.
- Avon Bottoms WA - Harvested: 127,000 board feet (sawlog) and 1,495 cords (cordwood) from 97 acres worth \$23,436.85.

Coldwater Streams

The coldwater streams are dominated by groundwater inputs and can sustain fish communities adapted to cold, oxygen rich, flowing water conditions. Story, Anthony Branch and Allen creeks have some natural trout reproduction, but they are stocked with brook and brown trout to sustain the sport fishery. These streams may also support other native species such as white sucker, mottled sculpin and various minnow species as well as invertebrates, mayflies, stoneflies and caddis flies.

Coldwater streams often rely on external sources of energy for the aquatic food web. Small streams are often shaded by trees and grasses so the invertebrates are adapted to eating leaves and detritus from terrestrial sources.

Habitat management can increase the carrying capacity, growth and natural recruitment of trout. Management of the streamside vegetation can increase the productivity by allowing sunlight to penetrate directly into the stream to increase the production of algae and phytoplankton. In turn, this can increase invertebrate and fish populations. Opening streams to sunlight must be done carefully to protect stream temperatures so streams remain sufficiently cold to sustain trout populations.

Sustaining coldwater fisheries will become more of a challenge under changing climatic conditions and landscape changes that reduce the quality and/or quantity of groundwater inputs and surface runoff.

Most trout streams are actively managed and the following activities are commonly conducted:

- Desirable woody and herbaceous species are planted in the riparian zone while less desirable species such as tag alder, aspen, box elder, black willow and invasive species are controlled as appropriate to minimize bank erosion, excessive shading, and degraded habitat quality. It also enhances angler access to the streams.
- Install and maintain in-stream habitat enhancements such as bank stabilization, revetments, current deflectors, and in-stream cover, and lunker and boom cover installations.
- Remove beaver dams to maintain the free flowing environment.
- Stock trout in stream segments that do not support conditions for natural reproduction.
- Provide a range of angler fishing experiences from relatively easy to challenging.

Warmwater Streams, Rivers and Lakes

The larger rivers and streams on or adjacent to these properties provide abundant, sustainable warmwater game fisheries and habitat for diverse semi-aquatic and aquatic plant and animal communities. Currently, very limited to no stocking is occurs in these resources due to limited funding. Passive habitat management is typically followed for the warmwater fisheries.