Paynes Prairie Preserve State Park

APPROVED
Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
December 18, 2013

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

MARJORY STONEMAN DOUGLAS BUILDING
3900 COMMONWEALTH BOULEVARD
TALLAHASSEE, FLORIDA 32399-3000

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

December 18, 2013

Ms. Sine Murray
Planning Manager
Office of Park Planning, Division of Recreation and Parks
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 525
Tallahassee, FL 32399-3000

Re: Paynes Prairie Preserve State Park – Lease # 2515

Dear Ms. Murray:

The Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the Paynes Prairie Preserve State Park management plan. The next management plan update is due December 18, 2023.

Approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

Marianne S. Gengenbach
Office of Environmental Services
Division of State Lands

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INTRODUCTION

Paynes Prairie Preserve State Park is located in Alachua County between Gainesville and Micanopy (see Vicinity Map). The main entrance is about 1.25 miles north of the town of Micanopy (see Reference Map). Access to the main entrance of the park is from U.S. Highway 441 Six other access points are located along U.S. Highway 441, Southeast 15th Street and State Road 20.

Paynes Prairie Preserve State Park is a complex and diverse system of uplands and freshwater wetlands. The Paynes Prairie ecosystem supports a variety of plant and animal life and provides critical habitat for many species. Paynes Prairie has profound cultural significance as well. Humans have frequented it since prehistoric times. In the 1600s, the largest cattle ranch in Spanish Florida was based at the prairie. In 1774, William Bartram referred to the prairie as the "Great Alachua Savanna" and provided a glimpse of both the natural and cultural significance of the prairie at that time. Today, the prairie remains an important part of the local culture with many people sharing a great affinity for the vast plain. Archie Carr wrote of Paynes Prairie:

> "There is no telling the things you see on the Prairie. The sun rises at one end and sets at the other. To a taste not too dependent upon towns, there is always something, if only a new set of shades in the grass and sky or a round-tail muskrat bouncing across the blacktop, or a string of teal running low with the clouds in the twilight in front of the winter wind. The Prairie is a solid thing to hold to in a world all broken out with man. There is peace out there, and quiet to hear the rails call, and the cranes bugling in the sky." (Carr 1964:162)

Paynes Prairie was the first state preserve in the Florida state park system. Acquisition began in 1970 under the Land Acquisition Trust Fund (LATF) and Land and Water Conservation Funds. Since the initial acquisition, additional parcels were acquired under LATF, EEL, P200 and Florida Forever programs; through a settlement; and through a lease from the St. Johns River Water Management District (SJRWMD). The park currently contains 21,654 acres.

Paynes Prairie Preserve State Park is designated as a single-use property to provide natural resource-based public outdoor recreation and other related uses. According to the lease agreements, the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) will manage the property only for the conservation and protection of natural and historical resources and for resource-based public outdoor recreation that is compatible with the conservation and protection of the property (see Addendum 1). There are no legislative or executive directives that constrain the use of this property.

PURPOSE AND SIGNIFICANCE OF THE PARK

Paynes Prairie Preserve State Park is managed to conserve and protect the natural and historical resources of the park with particular emphasis on the water resources and imperiled species of the basin marsh ecosystem. The provision of resource-based public outdoor recreation which is compatible with the conservation and protection of the resources is also an important purpose of the park.

Park Significance

- In 1974, Paynes Prairie Preserve State Park was designated as a National Natural Landmark as an exceptional example of karst prairie formation and freshwater marsh diversity. The park retains much of the historic landscape that William Bartram described as "the Great Alachua Savanna" over 230 years ago.

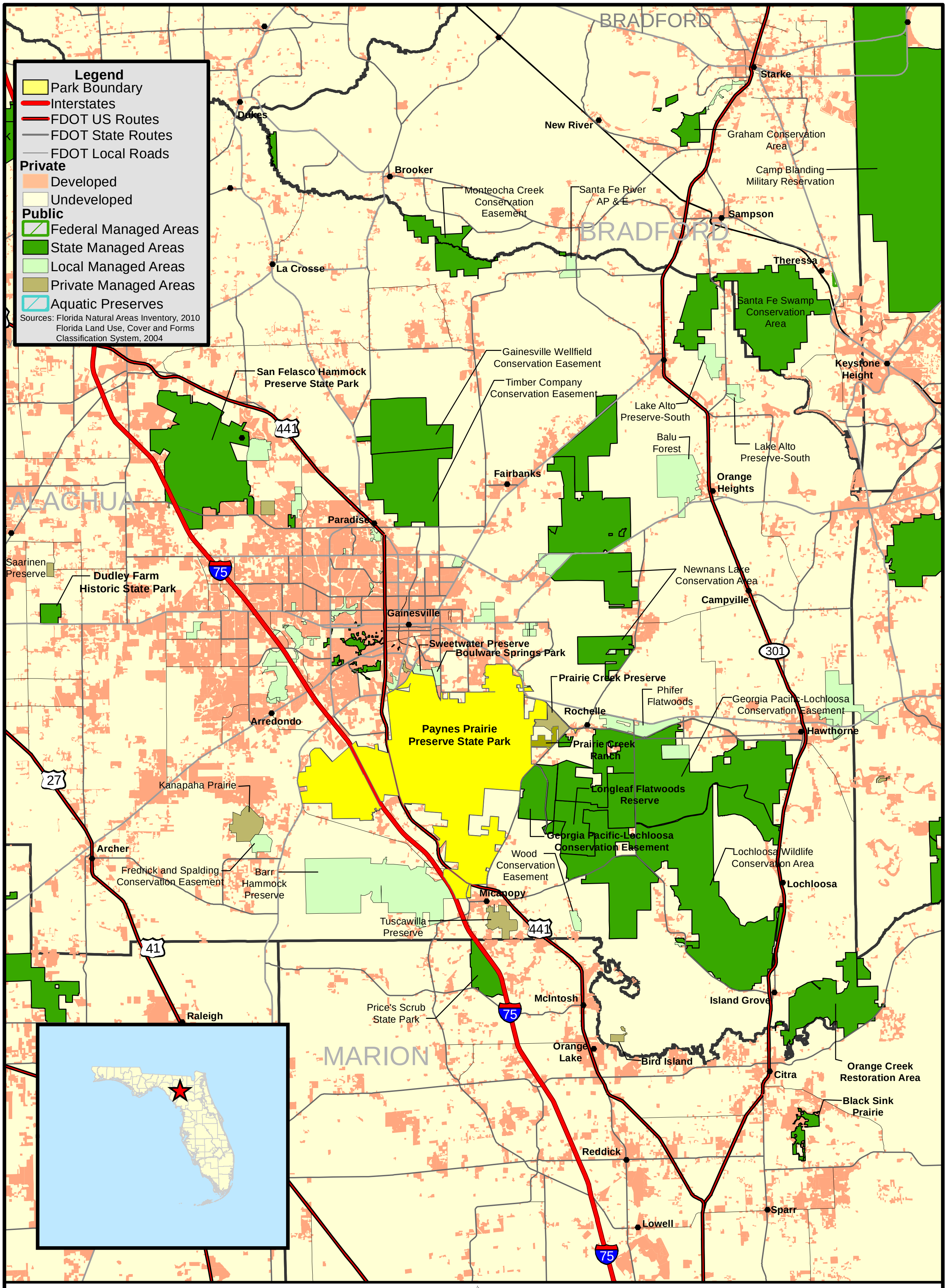
- The park protects Paynes Prairie, a 16,000-acre karst polje (sinkhole valley). All surface waters within the prairie and its surrounding 121,000-acre watershed flow directly into the Floridan aquifer through the Alachua Sink at a rate of up to one million gallons per day.

- The park protects the largest and most biologically diverse freshwater marshes in northern Florida.

- The park is nationally recognized as a major avian habitat area that supports one of the most diverse assemblages of bird species in the state.

- The park contains 139 recorded sites that provide evidence of approximately 12,000 years of uninterrupted human occupation that extends from Paleo-Indian times through the 20th Century.

- The park provides a high-quality recreational link to the Gainesville to Hawthorne Trail. The 16-mile trail connects communities to five distinct managed natural areas, including the park. These areas provide residents and visitors with outstanding camping, boating, wildlife viewing and water quality for fishing.



PAYNES PRAIRIE PRESERVE STATE PARK

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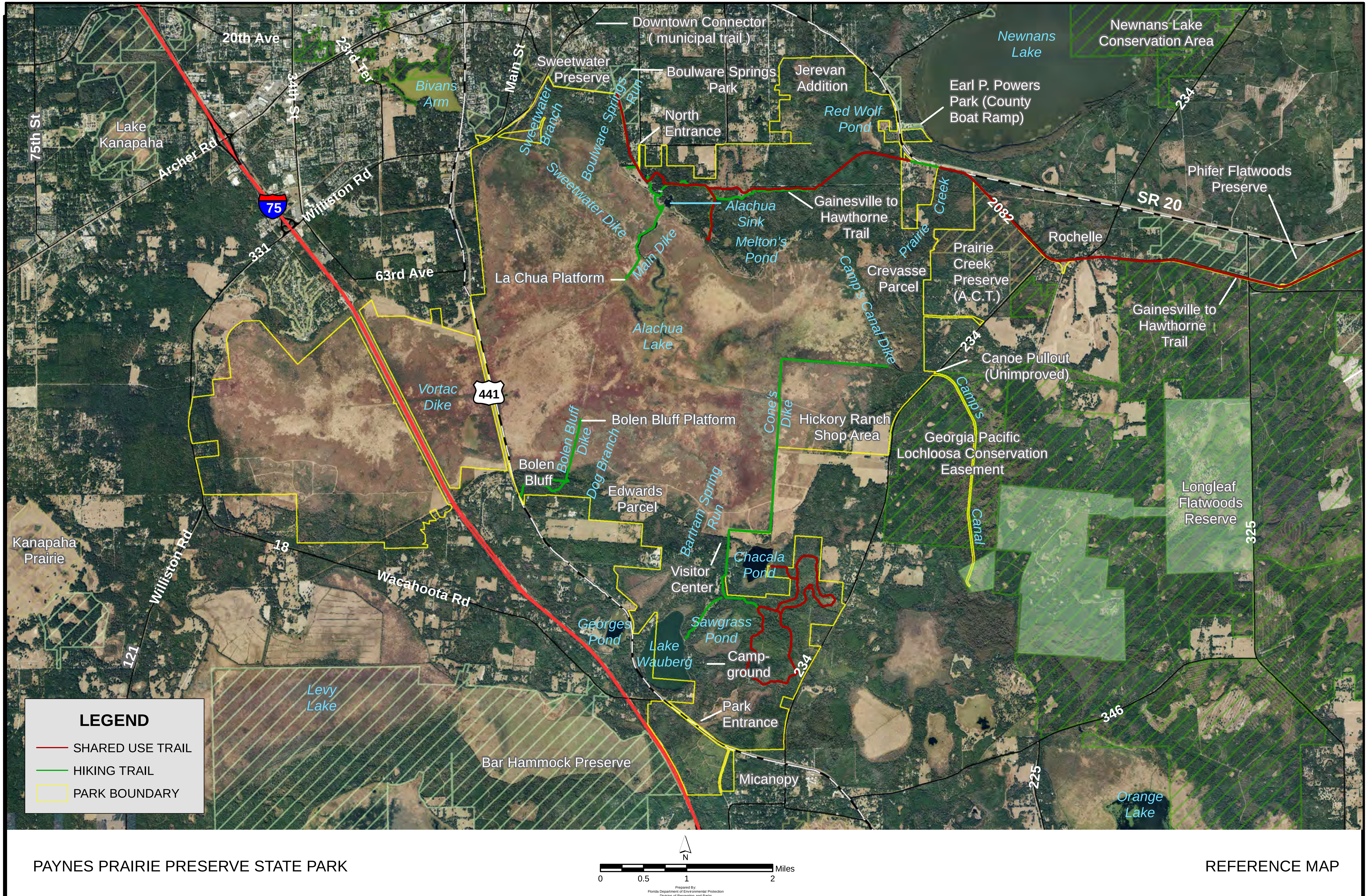
0 1.25 2.5 5 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks

VICINITY MAP



PAYNES PRAIRIE PRESERVE STATE PARK

REFERENCE MAP

Paynes Prairie Preserve State Park is classified as a State Preserve in DRP's unit classification system. In the management of a State Preserve, preservation and enhancement of natural conditions is all important. Resource considerations are given priority over user considerations and development is restricted to the minimum necessary for ensuring its protection and maintenance, limited access, user safety and convenience, and appropriate interpretation. Permitted uses are primarily of a passive nature, related to the aesthetic, educational and recreational enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Program emphasis is placed on interpretation of the natural and cultural attributes of the preserve.

PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of Paynes Prairie Preserve State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the February 7, 2002 approved plan.

The plan consists of three interrelated components: the Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and issues are identified, and measurable management objectives are established for each of the park's management goals and resource types. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, imperiled species management, cultural resource management and restoration of natural conditions.

The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as access, population, adjacent land uses, the natural and cultural resources of the park, current public uses and existing development, measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives locate use areas and propose the types of facilities and programs and the volume of public use to be provided.

The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. An implementation schedule and cost estimates are included for each objective and action. Included in this table are (1) measures that will be used to evaluate DRP's implementation progress, (2) timeframes for completing actions and objectives and (3) estimated costs to complete each action and objective.

All development and resource alteration proposed in this plan is subject to the granting of appropriate permits, easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state or federal agencies.

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this park, it was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation. Uses such as water resource development projects, water supply projects, stormwater management projects not specifically identified in this plan, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan.

The potential for generating revenue to enhance management was also analyzed. Visitor fees and charges are the principal source of revenue generated by the park. It was determined that multiple-use management activities would not be appropriate as a means of generating revenues for land management. Instead, techniques such as entrance fees, concessions and similar measures will be employed on a case-by-case basis as a means of supplementing park management funding.

The use of private land managers to facilitate restoration and management of this park was also analyzed. Decisions regarding this type of management (such as outsourcing, contracting with the private sector, use of volunteers, etc.) will be made on a case-by-case basis as necessity dictates.

MANAGEMENT PROGRAM OVERVIEW

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (DRP) is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

> It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such

> public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

The Board of Trustees of the Internal Improvement Trust Fund (Trustees) has granted management authority of certain sovereign submerged lands to DRP under Management Agreement MA 68-086 (as amended January 19, 1988). The management area includes a 400-foot zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely affect public recreational uses.

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in DRP's Operations Manual (OM) that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, public use regulations, resource management, law enforcement, protection, safety and maintenance.

Park Management Goals

The following park goals express DRP's long-term intent in managing the state park.

1. Provide administrative support for all park functions.
2. Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.
3. Restore and maintain the natural communities/habitats of the park.
4. Maintain, improve or restore imperiled species populations and habitats in the park.
5. Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
6. Protect, preserve and maintain the cultural resources of the park.
7. Provide public access and recreational opportunities in the park.
8. Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.

Management Coordination

The park is managed in accordance with all applicable laws and administrative rules. Agencies having a major or direct role in the management of the park are discussed in this plan.

The Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service (FFS), assists DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC), assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within the park. In addition, the FFWCC aids DRP with wildlife management programs, including imperiled species management and Watchable Wildlife programs. The Saint Johns River Water Management District (SJRWMD) collaborates with DRP staff to monitor and improve water resources within the park. Staff members with the Alachua Conservation Trust (ACT) have assisted the state with acquiring nearly 2,500 additional acres for the park. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. Volunteers from the Florida Cracker Horse Association and the Florida Cracker Cattle Association combine conservation efforts with DRP for the benefit of the park's resident herds. DRP staff coordinates with the Florida Department of Transportation (FDOT) in managing the U.S. Highway 441 ecopassage facility that was constructed to facilitate wildlife crossing the prairie and highway stormwater facilities. The City of Gainesville, Alachua County and surrounding communities are very supportive of the park and have expressed an interest in providing support for resource management, particularly prescribed burning.

Public Participation

The DRP provided an opportunity for public input by conducting a public workshop and an Advisory Group Meeting to present the draft management plan to the public. These meetings were held on July 15 and 16, 2013, respectively. Meeting notices were published in the Florida Administrative Register, July 8, 2013 [VOL 39/131], included on the Department Internet Calendar, posted in clear view at the park, and promoted locally. The purpose of the Advisory Group meeting is to provide the Advisory Group members an opportunity to discuss the draft management plan (see Addendum 2).

Other Designations

Paynes Prairie Preserve State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation. The park is a component of the Florida Greenways and Trails System, administered by the Department's Office of Greenways and Trails.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. Surface waters in this park are also classified as Class III waters by DEP. This park is not within or adjacent to an aquatic preserve as designated under the Florida Aquatic Preserve Act of 1975 (Section 258.35, Florida Statutes).

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

The Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) in accordance with Chapter 258, Florida Statutes, has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. The management measures expressed in this plan is consistent with the DEP's overall mission in ecosystem management. Cited references are contained in Addendum 3.

DRP's philosophy of resource management is natural systems management. Primary emphasis is placed on restoring and maintaining, to the degree possible, the natural processes that shaped the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management for imperiled species is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values.

DRP's management goal for cultural resources is to preserve sites and objects that represent Florida's cultural periods, significant historic events or persons. This goal often entails active measures to stabilize, reconstruct or restore resources, or to rehabilitate them for appropriate public use.

Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management activities and refines management actions, and reviews local comprehensive plans and development permit applications for park/ecosystem impacts.

The entire park is divided into management zones that delineate areas on the ground that are used to reference management activities (see Management Zones Map). The shape and size of each zone may be based on natural community type, burn zone, and the location of existing roads and natural fire breaks. It is important to note that all burn zones are management zones; however, not all management zones include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.

Table 1: Paynes Prairie Preserve State Park Management Zones		
Management Zone	**Acreage**	**Managed with Prescribed Fire**
PP-1	812.68	Y
PP-101	64.42	N
PP-2	692.45	Y
PP-201	366.63	Y
PP-202	82.31	N
PP-3	587.54	Y
PP-301	245.82	Y
PP-4	380.94	Y
PP-5	491.15	Y
PP-6	639.87	Y
PP-601	14.72	N
PP-7	686.65	Y
PP-8	1703.55	Y
PP-801	606.01	Y
PP-802	145.00	Y
PP-803	25.33	N
PP-804	169.25	Y
PP-805	186.93	Y
PP-806	98.06	Y
PP-807	1.50	N
PP-9	2135.68	Y
PP-901	4.91	Y
PP-10	1057.11	Y
PP-1001	122.10	N
PP-11	544.92	Y
PP-1101	68.86	Y
PP-1102	2.84	Y
PP-1103	138.33	Y
PP-1104	113.51	Y
PP-1105	33.82	N
PP-12	1734.35	Y
PP-1201	95.50	Y
PP-1202	180.51	Y
PP-13	1025.54	Y
PP-1301	936.03	Y
PP-1302	467.07	Y
PP-1303	65.54	Y
PP-1304	118.67	Y

Table 1: Paynes Prairie Preserve State Park Management Zones		
Management Zone	Acreage	Managed with Prescribed Fire
PP-1305	429.18	Y
PP-1306	159.41	Y
PP-1307	495.30	Y
PP-1308	165.29	Y
PP-1309	91.20	Y
PP-1310	69.81	Y
PP-1311	52.70	N
PP-1312	46.74	Y
PP-1313	26.47	Y
PP-14	46.17	Y
PP-1401	20.27	Y
PP-1402	68.74	Y
PP-15	48.30	Y
PP-1501	44.81	Y
PP-1502	39.32	Y
PP-1503	67.65	Y
PP-16	19.16	Y
PP-1601	43.52	Y
PP-1602	17.55	Y
PP-1603	85.13	Y
PP-1604	34.41	Y
PP-17	16.81	Y
PP-1701	36.62	Y
PP-1702	64.37	Y
PP-1703	278.98	Y
PP-18	35.17	Y
PP-1801	29.72	Y
PP-19	35.11	Y
PP-20	73.27	Y
PP-2001	3.74	Y
PP-21	34.71	Y
PP-2101	144.80	Y
PP-22	18.48	Y
PP-23	91.77	Y
PP-24	129.30	Y
PP-2401	15.79	Y
PP-25	50.67	Y
PP-2501	76.97	Y
PP-26	237.54	Y

Table 1: Paynes Prairie Preserve State Park Management Zones		
Management Zone	Acreage	Managed with Prescribed Fire
PP-27	57.77	Y
PP-28	22.51	Y
PP-29	197.76	N
PP-30	42.25	Y
PP-31	237.69	Y
PP-32	145.06	Y
PP-33	35.82	Y
PP-34	119.58	Y
PP-35	82.59	Y
PP-36	18.02	Y
PP-37	17.00	Y
PP-38	182.60	Y
PP-39	49.37	Y
PP-40	25.76	Y
PP-41	47.62	N
PP-42	84.62	N

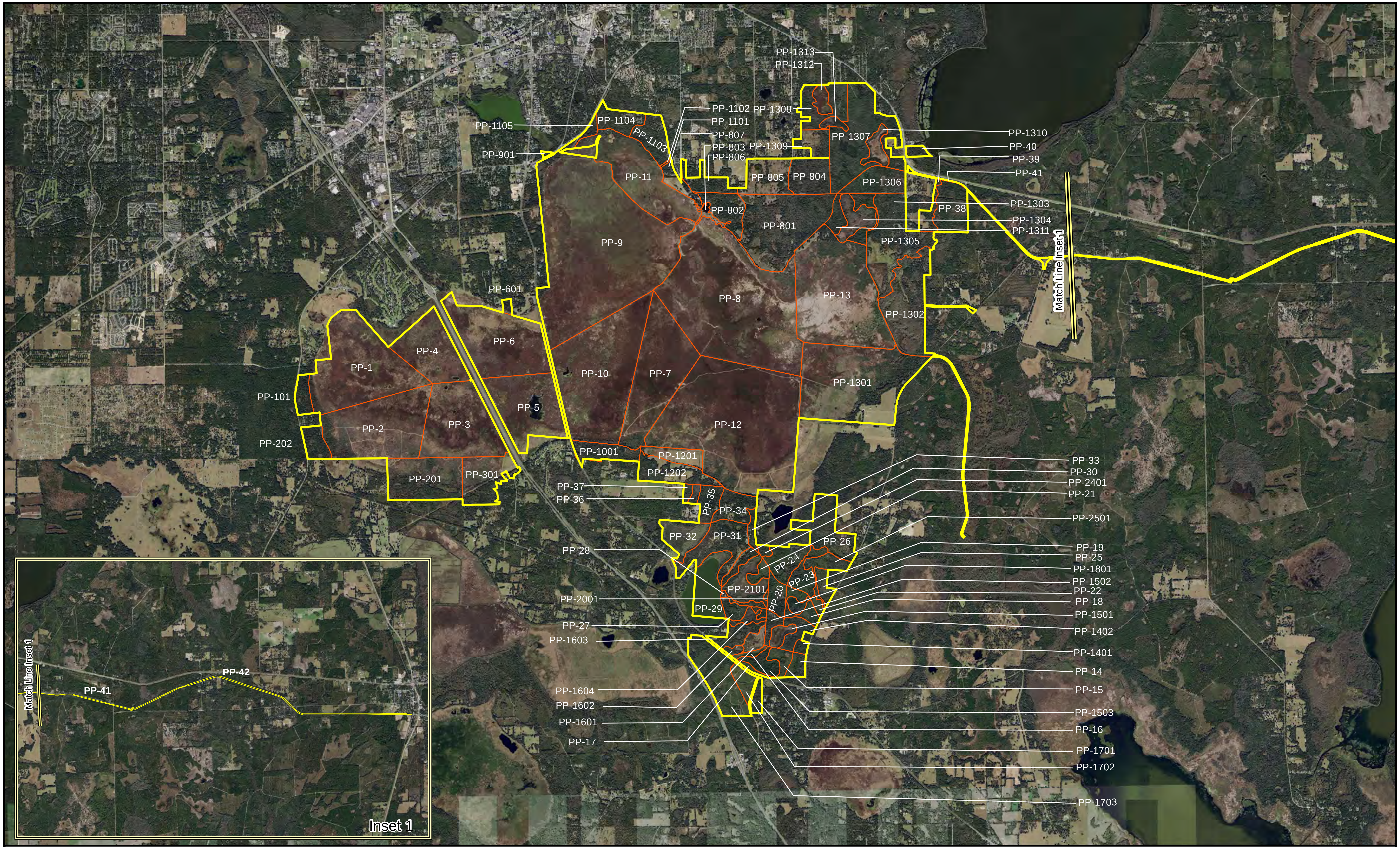
RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

Paynes Prairie Preserve State Park is located in a region of karst topography characterized by horizontal rock formations, irregular drainage patterns, sinkholes and other solution features. The dominant feature of the state park is Paynes Prairie, which is the largest of several flat-bottomed solution basins located in southeastern Alachua County. The Paynes Prairie basin extends about eight miles east to west and from one to four miles north to south. Low hills separate the basin from neighboring prairies and lakes. A primary topographic feature of Paynes Prairie is Alachua Sink, a swallow hole with direct surface water to groundwater connections. The sink is bordered on the north by bluffs rising 30 to 40 feet above the floor of the basin. Numerous sinkholes occur in the uplands bordering the basin. Elevations within the park range from about 45 feet above mean sea level (msl) at Alachua Sink to 151 feet above msl at a point 1.2 miles northeast of Alachua Sink.

Considerable alteration of terrain has occurred in the park. There are four borrow pits on the property. Numerous canals and dikes, along with two multilane highways, cut through the basin. Abandoned tram beds and railroad rights-of-way cross portions of the uplands in several locations. Topographic alterations such as the abandoned rail beds in the uplands have changed natural drainage patterns in the park and modified



PAYNES PRAIRIE PRESERVE STATE PARK

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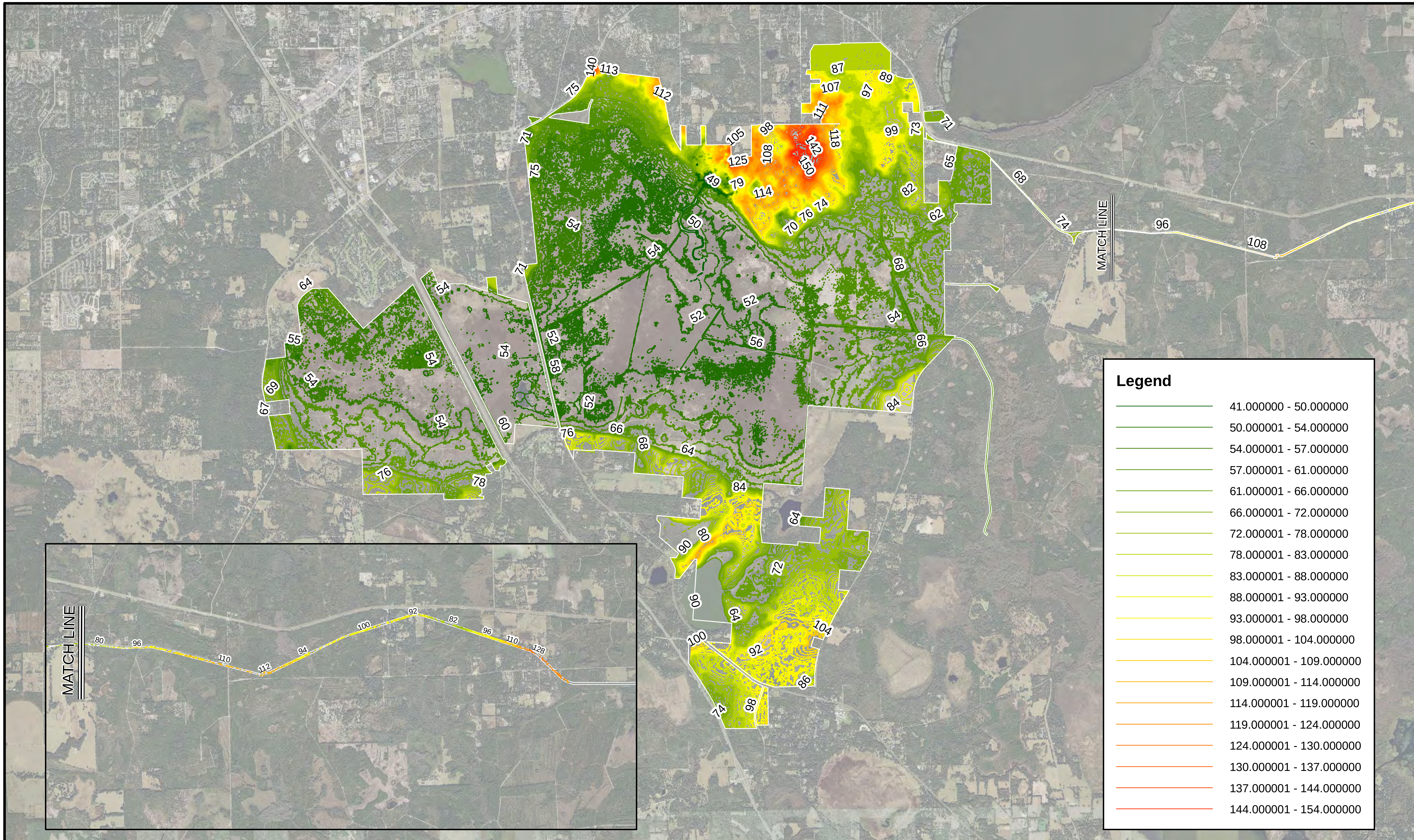
Prepared By:
Florida Department of Environmental Protection
Division of Recreation and Parks
Date of Aerial: 2009

MANAGEMENT ZONES MAP



PAYNES PRAIRIE
PRESERVE STATE PARK

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0 0.5 1 2 Miles

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TOPOGRAPHIC MAP

the natural fire regime. They also continue to provide corridors for dispersal of invasive exotic plants. Additional impacts from topographic alterations (i.e., canals and dikes) in the prairie basin are discussed in the Hydrology section below.

The most extensive abandoned railway, which follows the north rim of the prairie basin, was converted into the Gainesville to Hawthorne Trail in the early 1990s. For several miles within the park, however, the trail detours away from a portion of the old railway bed in order to avoid ecologically sensitive areas. The surface of the 2.9-mile stretch of railroad bed within the park shows minimal elevation change despite its location along the topographically varied north rim of Paynes Prairie. When the railroad bed was originally constructed, excavators removed soil from higher elevations along the route and deposited it in lower areas in order to create a grade that was suitable for locomotives. About 6000 feet of the western end of the abandoned railroad bed was recontoured in 2003 using heavy equipment to restore the natural topography of the rim of the basin and in the Alachua Sink Hammock. The restoration area will be allowed to restore itself naturally with the native species from the adjacent upland hardwood forest. Additional work is still needed on the remainder of the railway from just east of Melton's Pond to where the Gainesville to Hawthorne Trail rejoins the railway corridor. Approximately 8500 feet of the railway corridor remains to be restored.

Geology

The park is located along the east-west axis of the northern and central physiographic zones in the Central Highlands region, specifically within the Alachua Lake-Cross Valley physiographic division with its characteristic large flat-bottomed lakes. A portion of the northern part of the park lies along an erosional escarpment of the Northern Highlands division. The Fairfield Hills lie immediately to the south (Scott 1992).

The geologic formations underlying Paynes Prairie are, in descending order (youngest to oldest), surficial marine deposits, the Hawthorn Group, Ocala Limestone, the Avon Park Formation, and Oldsmar Limestone. Uplands surrounding the basin are mainly remnants of the Wicomico terrace (70 - 100 feet above msl). Surficial deposits in the park consist chiefly of sands and clayey sands and often contain layers of clay, marl, and sandy clay. Deposits range in thickness from one foot to as much as 45 feet in areas of higher elevation. Deposition of the Hawthorn Group occurred about 12-25 million years ago during the Miocene age, when seas were muddy and uneven erosion of the land was followed by submergence. This deposit contains clays and sandy clays that vary in color from yellow to green, gray, or blue, as well as beds of quartz sand and sandy phosphatic limestone. The Hawthorn Group ranges in thickness from several feet in erosional remnants to 160 feet in the Gainesville area. The porous, soluble nature of the limestone in the Hawthorn layer gives rise to the karst topography of the region.

Boulders and irregular masses of chert or flint are common near the top of the Ocala Limestone, which is of Eocene age and was formerly known as the Ocala Group (Scott 1992). The flat bottom of the Paynes Prairie basin is essentially the top of the Ocala Limestone and the Floridan aquifer. Formations in the Ocala Limestone are the oldest geologic units that outcrop in the park. The limestone rock deposits are 80 - 130 feet deep in this area. A thin layer of sands or sandy clays from younger deposits such as the Hawthorn Group or Alachua Formation usually covers the eroded surfaces of the Ocala Limestone deposits.

The Avon Park Formation, also of Eocene age, is composed of dolomite with some limestone and gypsum and seams of peat or lignite. It is approximately 210 feet thick in the Gainesville area. The Oldsmar Formation, which is the deepest deposit of Eocene age, is composed essentially of fragmented limestone that is partially or completely dolomitized, with some chert impregnations of gypsum and thin shale beds.

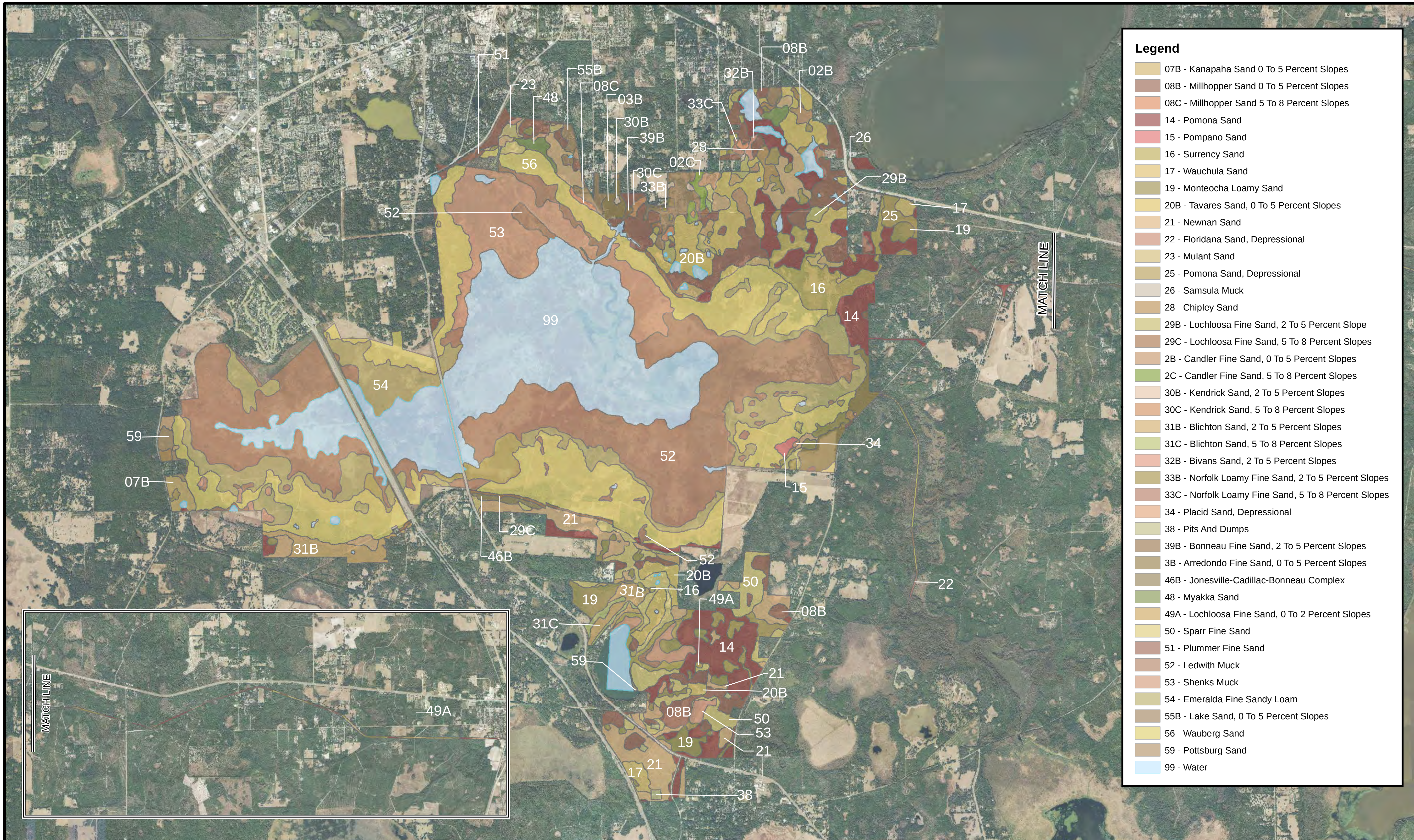
Soils

Paynes Prairie Preserve State Park contains forty-one of the soil types (see Soils Map) recorded in Alachua County by the Natural Resource Conservation Service (Thomas et al. 1985). This great diversity of soils reflects the complex geologic and hydrologic past of the park. Descriptions of soil types found in the park are contained in Addendum 4.

An accurate assessment of current soil conditions in the park is difficult. Past agricultural practices have undoubtedly altered many of the original soil characteristics. Bedding or plowing of the basin marsh for crop production occurred in some of the higher elevations of the prairie basin. Substantial portions of the surrounding uplands were converted to improved pasture. Periodic fertilization of these areas likely caused changes in soil chemistry. Plowing in the uplands certainly caused some soil loss via erosion. Ditching to drain isolated wetlands, a common practice during the period of intensive management for cattle production, was also a contributing factor.

Despite past impacts to soils, there are relatively few soil erosion problems within the park today. However, some concern is still warranted within the Alachua Sink Hammock, also known as Bartram’s Hammock, which encompasses a nearly continuous field of steep-sided sinkholes stretching from the Alachua Sink to the north boundary of the park. Foot traffic in this area is limited in order to protect the sinkholes from unacceptable levels of erosion. Other erosion sites are mainly associated with culverts and water control structures within the prairie basin. In these cases, erosion of dikes may be causing localized sedimentation impacts. Management activities will follow generally accepted best management practices to prevent further soil erosion and conserve soil and water resources on site.

Paynes Prairie Preserve has several sites of potential concern where cattle dipping vats once operated. Soil cores and groundwater well monitoring have verified that the dip



PAYNES PRAIRIE
PRESERVE STATE PARK

N

0 0.5 1 2 Miles

Prepared by:
Florida Department of Environment Protection
Division of Recreation and Park
Date of Aerial:2009

SOILS MAP

vat sites are contaminated with arsenic and chlorinated hydrocarbons, chemicals used during historic cattle operations to combat tick fever in the early 1900s. Additional discussion of this issue appears in the Hydrology section below.

Minerals

No mineral deposits of commercial value are known to exist in the park. The removal of sand for use as fill material in road construction occurred just before and after the State of Florida purchased the property. In the early 1980s, sand was removed from an onsite borrow pit for construction of campground facilities in the park.

Hydrology

The Paynes Prairie Basin, a vast 16,055-acre solution depression that is the dominant landscape feature within Paynes Prairie Preserve State Park, is a closed watershed. In other words, water that enters the basin does not exit it via natural surface channels but rather through sinkholes to the aquifer or by means of evapotranspiration. This results in periodic wide-ranging fluctuations in water levels on the basin. In very wet years, the basin may flood completely, while during severe droughts it may become so dry that only the canals and Alachua Sink continue to retain water. These fluctuations are essential to the health of the prairie ecosystem, but past diversions of surface waters have altered the natural hydrologic regime to the extent that dry periods are now more extensive than they were historically and high water events no longer reach the extremes in elevation or duration they once did. Herbaceous wetland species dominate the Paynes Prairie basin marsh, and the quantity and quality of water that enters the system is critical to their survival. Alteration of natural inflow into the basin, or even of the timing of the inflow, can cause rapid changes in natural community structure and function, generally to the detriment of the basin marsh community.

Paynes Prairie watershed: surface water sources and drainage. Although Paynes Prairie is often referred to as the Paynes Prairie Basin, it is actually a sub-basin within the larger Paynes Prairie watershed, whose surface waters eventually either drain into Alachua Sink or flow southward through Camps Canal to the River Styx and thence to Orange Lake. The Paynes Prairie watershed, including all of its adjacent surface water sources, covers approximately 121,000 acres, or 188 square miles. It is roughly rectangular in shape, 10 miles wide and 20 miles long, with its long axis extending in a northeast to southwest direction with Paynes Prairie situated at its southwest end. The watershed consists of twelve sub-basins or drainage units, 11 of which contribute surface water to Paynes Prairie. The sub-basins range in size from 596 to 78,896 acres, with Newnans Lake being the largest by far. Table 2 lists all the sub-basins and summarizes their watershed characteristics (see Hydrologic Sub-Basins map).

The Newnans Lake and Paynes Prairie sub-basins account for nearly 80 percent of the total area of the entire Paynes Prairie watershed (Robison et al. 1997). Within the watershed, there are three major surface water inflows (Prairie Creek, Sweetwater

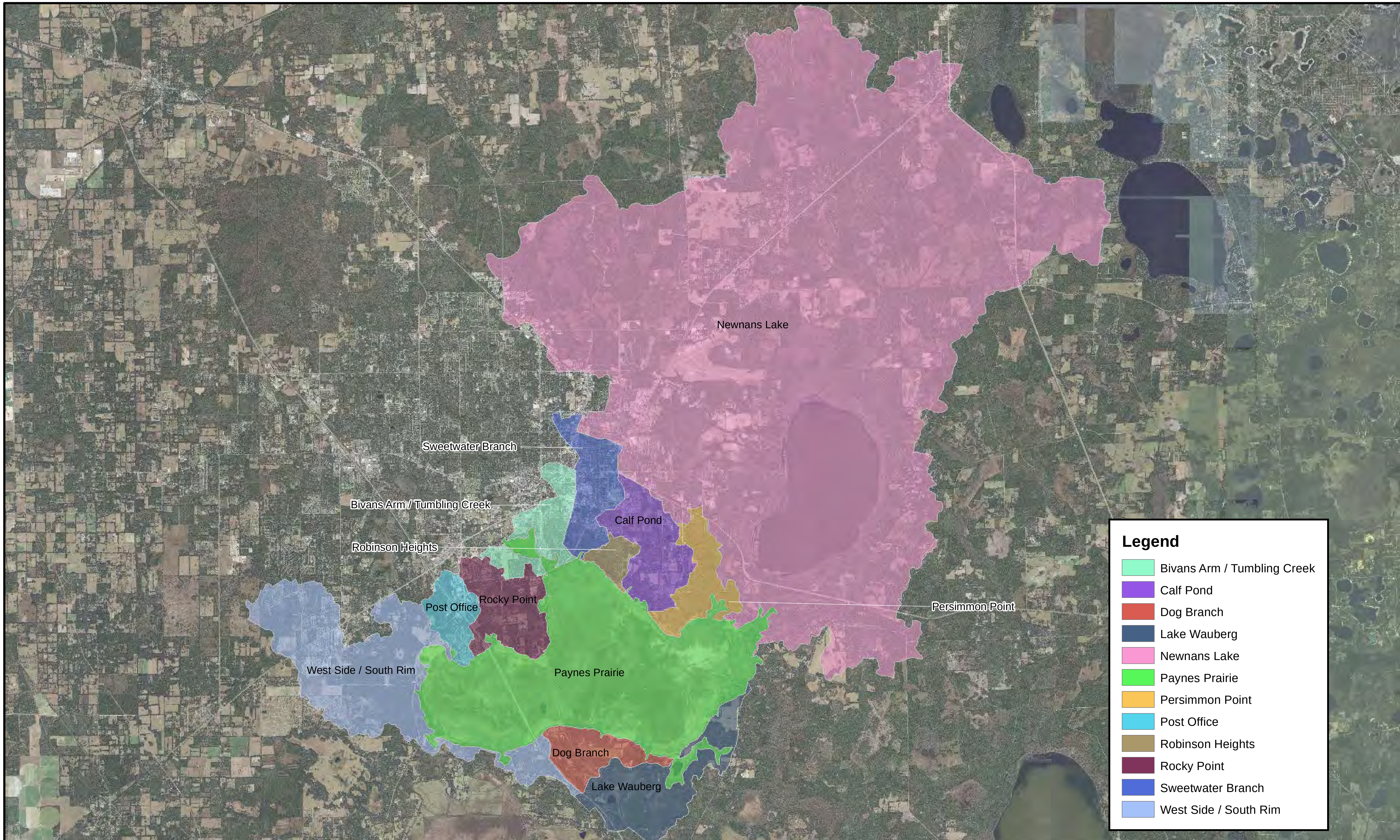
Branch and Bivans Arm) and five minor inflows (Jerevan seepage from the Persimmon Point sub-basin, Post Office Creek, Boulware Spring Run from the Robinson Heights

Table 2: Paynes Prairie Watershed Characteristics			
Surface Water Sub-basins	**Number of Acres**	**Percent of Paynes Prairie Watershed**	**Percent Urban, or Built-up**
Newnans Lake	78,882	65%	11%
Paynes Prairie	16,055	13%	1%
West Side/South Rim	8,024	7%	28%
Lake Wauberg	3,347	3%	5%
Calf Pond	2,679	2%	27%
Rocky Point	2,441	2%	41%
Sweetwater Branch	2,229	2%	72%
Bivans Arm/Tumbling Creek	1,818	2%	83%
Persimmon Point	1,812	2%	7%
Dog Branch	1,564	1%	15%
Post Office	1,271	1%	37%
Robinson Heights	596	<1%	20%
Total Watershed	**120,719**	**100%**	**14%**

sub-basin, Chacala Run from the Lake Wauberg sub-basin, and Dog Branch) that discharge into the prairie basin. Greater detail about these inflows is provided later in this Hydrology section under sub-sections that describe the individual sub-basins in the Paynes Prairie watershed.

Because an artificial drainage-way, Camps Canal, has linked Paynes Prairie with Orange Lake since the 1920s, the Paynes Prairie watershed is now considered a component of the much larger Orange Creek Basin, which covers approximately 600 square miles in three north Florida counties, Alachua, Marion and Putnam. The basin marsh at Paynes Prairie is a major link in a series of wetlands that provide much of the water supply for the Orange Creek Basin. The general direction of water movement is from Hatchet Creek in north-central Alachua County southward through Newnans Lake, Prairie Creek, Camps Canal, River Styx, Orange Lake and Lake Lochloosa, and then eastward along Orange Creek to the Ocklawaha River.

Surface water sources have two separate but related impacts on the Paynes Prairie Basin. First, they establish a sheetflow regime on the higher edges of the basin, and



PAYNES PRAIRIE PRESERVE STATE PARK

N

0 1 2 4 Miles

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of Aerial: 2009

HYDROLOGIC SUB-BASIN MAP

second, they contribute to the total water budget of the basin. Historically, surface waters entered the basin via typical stream channels or seepage from the surficial aquifer. Once the inflows reached the basin, due to the level terrain they rapidly began to form braided channels. In many cases, they ceased to exist altogether as streams and began to sheetflow across the basin toward the area of lowest elevation, Alachua Lake.

One characteristic of sheetflow is that it may lead to the creation of wetlands on slightly elevated portions of the basin. Such wetlands would typically not form if surface waters flowed solely through channels that funneled water directly to the lowest points in the basin. There appears to be considerable diversity in the sheetflow wetlands, perhaps because each stream that contributes inflow to the basin has its own unique hydrology (water quantity and quality). When these streams begin to sheetflow across the basin, wetlands are created that appear to be distinctive and reflective of the water source. The result is substantial variation in vegetation over a relatively small area, producing a very diverse assemblage of wetland plants and animals within the Paynes Prairie Basin as a whole, as described in the Natural Communities section below.

Sheetflow wetlands have physical characteristics that are different from typical basin wetlands. For example, the shallow flowing waters that are characteristic of sheetflow wetlands are more effective at moving wastes, organic matter and nutrients quickly through the system than are the relatively still waters of basin wetlands. In addition, sheetflow wetlands have higher oxygen levels due to the more direct agitation of the water column. However, herbaceous species dominate both types of wetlands, so any extreme natural or anthropogenic event such as a hurricane or the dredging of canals could alter surface water characteristics to the extent that wetland community composition would change drastically.

Anthropogenic influences on the prairie such as dikes and canals have changed the natural hydroperiods of both sheetflow and basin wetlands far beyond their normal wet/dry cycles. Even some of the more subtle topographic alterations, such as levees, have modified the natural movement and direction of surface water sheetflow, especially at lower elevations. Combine those influences with the more substantial impacts of two major highways bisecting the basin and the result is compartmentalization and isolation of large areas of potential sheetflow across the watershed. Additional discussion about dikes and other disturbances of basin hydrology appears below in the Dikes, Canals and Sheetflow Restoration section. Ecosystem function within the Paynes Prairie Basin is highly dependent on the hydrologic quality of the surrounding sub-basins. Even the smallest of the sub-basin watersheds can significantly affect prairie resources. Sweetwater Branch and Bivans Arm, for example, are two of the most significant contributors of poor quality water to the prairie basin (Alachua County Environmental Protection Department, ACEPD 2008). Their watersheds are highly urbanized and have extremely inefficient storage capacity for storm water runoff. Despite their relatively small size, they often discharge extremely high volumes of poor quality surface water. These discharges can profoundly influence the prairie ecosystem by driving biological processes in portions of the basin, resulting in a greater diversity of plant associations than would otherwise be expected from a system seemingly so flat and uniform. In 1997, water managers for the St. Johns River Water Management District (SJRWMD) conducted a water budget analysis of inflows into the Main Canal, a large drainage channel east of U.S. Highway 441 (U.S. 441) that ultimately drains into Alachua Sink (Robison et al. 1997). For this analysis, hydrologists grouped sub-basins according to their proximity and location of discharge onto the Paynes Prairie Basin. One of the most interesting pieces of information derived from this water budget exercise was the apparent hydrologic importance of the western lobe of the basin (west of U.S. 441), including its adjacent sub-basins. According to the water budget analysis, the west portion of the basin appears to provide potentially the second largest amount of surface water sheetflow to the Main Canal. Coincidentally, the western part of the basin contains over half of the acreage within the Paynes Prairie sub-basin, underscoring its importance as a contributor to the direct rainfall portion of the overall water budget. It also demonstrates the need to continue dike restoration activities on the prairie basin in order to restore surface water sheetflow throughout Paynes Prairie.

Newnans Lake sub-basin: Newnans Lake is the largest contributor of surface water discharge to the Paynes Prairie Basin. Historically, all the surface waters from this significant sub-basin drained to the prairie basin via Prairie Creek and its associated forested wetlands (Robison et al. 1997, FDEP 2001). In the late 1920s, however, the most significant landowner in the prairie basin, Camp Ranch Incorporated (Camp Ranch), constructed a canal and levee system (Camps Canal) that diverted the Prairie Creek discharge away from Paynes Prairie and south to the River Styx and Orange Lake. Prior to that massive manipulation of local hydrology, surface water inflow through Prairie Creek accounted for roughly half the total water budget of the prairie basin. Consequently, the most significant outcome of the diversion was the loss of over 50 percent of the historic surface water supply for the Paynes Prairie sub-basin. In 1975, the Florida Park Service sought to rectify that situation somewhat by redirecting to Paynes Prairie just under half its historic inflow from Prairie Creek. In 1994, the SJRWMD permitted this partially restored flow by rule. Currently, the SJRWMD apportions the various contributions to the water budget for the Paynes Prairie Basin as follows: 1/3 Prairie Creek, 1/3 all other adjacent surface water inflows and 1/3 direct rainfall (Price Robison pers. comm.).

Prairie Creek begins at the southern end of Newnans Lake. In the early 1960s in an effort to raise water levels in the lake, Alachua County constructed a water control structure just south of where the lake drains into the creek. When State Road 20 was widened in 1999, this weir system was completely removed. There is evidence that during the existence of the structure there was an increase in flocculent sediments in the southern half of the lake (Cohen et al. 2008, Di et al. 2010). These sediments appear to have contributed to the high nutrient loading in the lake (Gao and Gilbert 2003).

The surface area of Newnans Lake normally fluctuates from a low of 6,200 acres at 65 ft. msl to a high of 7,400 acres at 68 ft. msl (Lasi and Schuman 1996). Hatchet Creek, Little Hatchet Creek and Lake Forest Creek are the three major watersheds contributing surface water to Newnans Lake. Hatchet Creek has numerous tributaries and drains a large area of undeveloped land including the Austin Cary Memorial Forest and a few forested wetlands such as Buck Bay and Saluda Swamp. Little Hatchet Creek drains rural areas to the east and northeast of Gainesville, as well as receiving runoff from northeast Gainesville, Gainesville Regional Airport and the Airport Industrial Park. All three of the creeks are intermittent stream systems that may dry out completely during drought periods (ACEPD 2008). A severe drought in the spring of 2000 reduced overall water levels in Newnans Lake to record low elevations.

Paynes Prairie sub-basin: The Paynes Prairie sub-basin is the second largest within the Paynes Prairie watershed. Its dominant feature is Paynes Prairie, a vast limestone depression situated below 65 feet NGVD and draining to Alachua Sink. About 87 percent of the prairie (14,047 acres) is contained within the boundaries of Paynes Prairie Preserve State Park. All surface water entering the Paynes Prairie Basin from adjacent sub-basins, except for that which evaporates or infiltrates downward, eventually discharges into Alachua Sink and thus directly into the Floridan aquifer.

Alachua Sink currently functions as a stream-to-sink feature that receives discharge from two of the primary surface water conduits within Paynes Prairie, the Main Canal and the Sweetwater Canal. The Main Canal drains most of the Paynes Prairie Basin, while the Sweetwater Canal channelizes the flow of Sweetwater Branch directly to Alachua Sink. The general direction of groundwater movement, once surface waters enter Alachua Sink, is west/northwest towards the Santa Fe River basin. One significant threat to groundwater flow in this region is the Murphree well field, which is the source of Gainesville's regional water supply. Consumptive use of groundwater pumped from this northeast Gainesville well field has caused a "cone of depression" to develop around it to the extent that local groundwater flow is now in that direction (Mercer et al. 2007).

Alachua Lake, situated east of U.S. 441 within a large depression in the Paynes Prairie Basin, is the largest open water marsh lake in the basin. It can fluctuate greatly in size, however. Depending on the year or season and the particular balance of inflows and outflows at the time, Alachua Lake may be completely dry or it may cover the entire 16,000 acres of the basin. Alachua Lake drains to Alachua Sink via the Main Canal. The course of the Main Canal, despite past dredging, is believed to be quite similar to that of its historic channel, which William Bartram observed in the spring of 1774. Since the water level of Alachua Sink is essentially that of the Floridan aquifer, aquifer levels have a substantial influence on surface water levels within the basin. Specifically, if the surface of the aquifer rises high enough, the surface water flow from Alachua Lake will decrease as water backs up within the basin. It is conceivable that the aquifer could rise high enough for a flow reversal to occur, with the sink acting as a spring, but this is unlikely since Alachua Sink is a major recharge point and the local high point of the aquifer's potentiometric surface (Kinnaman and Dixon 2009).

While Alachua Lake typically maintains the largest and most open pool of standing water in the prairie basin, most of the basin is actually sheetflow wetland filled with emergent marsh vegetation. The proportion of sheetflow wetland to marsh lake is in constant flux. At the peak of the late summer growth of marsh vegetation, the water level in the basin marsh around Alachua Lake may actually be a foot higher than the lake level. This is possible because the marsh vegetation becomes so dense that it essentially impedes water flow, preventing surface waters from draining to a uniform level and sequestering local inflows and rainfall within the marsh.

Calf Pond sub-basin: Calf Pond is the main feature of a small closed watershed on the northern rim of the Paynes Prairie Basin. This watershed is not a direct contributor of surface water to the prairie but instead discharges directly into the Floridan aquifer through a swallet in the Flamingo Hammock community just north of the park. During periods of heavy rainfall, surface water from Calf Pond can overflow into an intermittent stream system that carries it southwest to the above-mentioned swallet.

Persimmon Point sub-basin: This sub-basin, which is wedged between the Calf Pond and Newnans Lake sub-basins, has minimal urban development since most of its lies within Paynes Prairie Preserve. Though it is a small watershed, Persimmon Point contains substantial storage capacity, including Trout Pond and Pike Pond near the top of the sub-basin and Melton's Pond and Long Pond near the bottom. The upper portion of this watershed, referred to as the Jerevan Tract, maintains a hydrologic connection with Paynes Prairie by means of sheetflow through a series of forested wetlands in management zones PP-1307, PP-1306 and PP-1311, eventually draining into a lobe of the prairie basin in PP-1304.

Sweetwater Branch sub-basin: Historically, Sweetwater Branch was a small intermittent seepage stream that drained pine flatwoods in what is now east Gainesville. Rosewood Branch is its only major tributary. As Gainesville grew, the Sweetwater basin began to urbanize, and the impervious surfaces of development replaced the natural communities that once flourished there, natural areas that had facilitated the infiltration and storage of surface water runoff. Currently, due to a near complete build-out within the watershed, the area of impermeable surface is so great that storage capacity for storm water runoff is woefully inadequate.

Most of the urban development in the Sweetwater watershed pre-dated the adoption of government regulations dealing with storm water retention. As a result, Sweetwater Branch morphed from an ephemeral stream to a deep canal, and massive storm water pulses began to flush through the now sterile channelized ditch. Within parts of the lower Sweetwater drainage, these pulses ultimately scoured out permanent scars over twenty feet in depth. The storm water surges also greatly increased downstream sediment loads. At the terminus if its discharge into the prairie basin, the Sweetwater Canal has accumulated sediments that now extend more than four feet above what was once a 20-foot deep canal. In addition, over the past 40 years huge amounts of urban trash, debris and spilled waste have washed downstream into this portion of the prairie basin.

Storm water runoff is not the only threat to the Sweetwater sub-basin hydrology. Treated sewage waste effluent from the Gainesville Main Street Wastewater Treatment Plant (Main Street Plant) has discharged directly into the Sweetwater system for at least 100 years. The John R. Kelly Generating Station (Kelly Power Plant) also discharges significant loads of nutrients directly into the stream. The cumulative result has been an acceleration of ecological succession in the Sweetwater outfall area of the prairie basin (management zones PP-9 and PP-11), radically changing it from a once predominantly open herbaceous marsh system to a closed canopy system of willow swamp and dense shrub thicket. The dramatic alterations of the Sweetwater system have also created a perfect environment for the establishment of invasive exotic plants. Additional discussion about exotic plant infestations at Paynes Prairie appears below in the Exotic Species section of this management plan.

Complicating matters further is the specific influence that dikes and canals have had on the allocation and distribution of surface water sheetflow within the prairie basin. By 1937, the Camp Ranch had initiated construction of the Sweetwater Branch dike and canal to reduce sheetflow within the basin east of U.S. 441. Decisions made about the management of the Sweetwater Branch inflow in this part of the basin were similar to those for Camps Canal in the northeastern corner of the basin. Unfortunately, the only effective way of dewatering the part of the basin supplied by Sweetwater Branch was to short-circuit its natural sheet flow pattern and channelize it so that it flowed directly to Alachua Sink. Although this exercise apparently did reduce some of the undesirable biological effects on the basin, it also effectively dewatered PP-11 and prevented surface and subsurface waters from draining into adjacent PP-9 and thence to Alachua Lake. It also exacerbated issues at Alachua Sink by dumping water there directly into the Floridan aquifer, exposing the local groundwater supply to increased loads of pollutants (FDEP 2008c). Additional discussion about the impacts of the Sweetwater diversion and potential restoration activities appears later on in this Hydrology section.

The Sweetwater Branch sub-basin presents Paynes Prairie with one of its most significant ecological challenges (ACEPD 2007). Of all the small watersheds adjacent to the prairie basin, Sweetwater Branch has the second highest level of urban buildup (Robison et al. 1997). The only other watershed rivaling it in concentration of urban development is the adjacent Bivans Arm sub-basin. Both sub-basins pose a great threat to Paynes Prairie because they represent two of the three major sources of surface water for the prairie basin. Unfortunately, they are compromised by poor water quality and altered flow regimes.

Bivans Arm sub-basin: The Bivans Arm sub-basin lies just west of the Sweetwater Branch watershed. Similar to Sweetwater, it has a much higher level of urban buildup than most of the other watersheds associated with the prairie basin. Historically, this watershed discharged to Paynes Prairie via an unaltered intermittent stream (Hoenstine and Lane 1991). Now, however, dikes play a substantial role in controlling surface water inflows from this system, although some sheetflow across the prairie still occurs.

The two primary surface water sources for the Bivans Arm watershed are Tumbling Creek and Little Tumbling Creek. These streams flow through older urban areas that have little or no provision for storm water storage. They eventually converge at Bivans Arm Lake and in forested wetlands located at the south end of the watershed. Tumbling Creek passes primarily through a region of heavy commercial and industrial development in south Gainesville, while Little Tumbling Creek flows through an area that is more residential. The creeks are rated as two of the poorest quality wetland systems in Alachua County (ACEPD 2004). In contrast with Sweetwater Branch, most of the sediments carried by the Bivans storm waters accumulate within Bivans Arm Lake and not the prairie basin.

Bivans Arm drains into Paynes Prairie Preserve through a culvert under State Road 331 (Williston Road). In the park, flow is contained within the Bivans Arm Canal for the first 1,000 feet and then passes through a culvert under the Bivans Arm Dike, contributing to the sheetflow across management zone PP-9, and eventually discharging into Alachua Lake, the Main Canal and Alachua Sink. Storm water surge overflows from Sweetwater Branch also contribute to the flow in the Bivans Arm Canal, damaging much of the area in the process.

Robinson Heights sub-basin: The most significant feature in the Robinson Heights sub-basin is Boulware Spring and its associated spring run. Boulware is the only spring run that flows onto the prairie basin and is one of the few springs in southeastern Alachua County (Rosenau et al. 1977). Boulware Spring once supplied the City of Gainesville with drinking water, and the City still manages the property. Currently the site contains a historic water treatment building, a meeting facility and a city park that acts as the primary trailhead for the Gainesville to Hawthorne Trail.

Flow measurements for Boulware Spring Run have ranged from 0.49 to 1.0 cubic feet per second (cfs), making it a minimal-sized third magnitude spring (Scott et al. 2004).

Apparently, groundwater supplying this spring comes from the surficial aquifer and not the Floridan. Groundwater in this upper region of the aquifer is extremely vulnerable to surface contamination from events such as spills, dumping or even seepage from local storm water ponds (Fernald and Purdum 1998).
Boulware Spring discharges across a series of concrete tanks before flowing into a highly channelized streambed that passes through the Robinson Heights subdivision en route to Paynes Prairie Preserve (Water and Air Research Inc. 2004). The quality of riparian habitat in the upper spring run is poor since it has been severely altered by stream channelization and the unauthorized filling of wetlands. Prior to recent road upgrades within the Robinson Heights neighborhood, storm water runoff washed heavy loads of sediment directly into the streambed. The sediments made the streambed an ideal site for the proliferation of numerous non-native aquatic plants in the floodplain, including wild taro (*Colocasia esculenta*). The sediments, in combination with the dense stands of wild taro, have often clogged the natural channel of the run, especially where it enters the park. The park staff has had some recent success in controlling the taro at this urban interface, allowing the portion of the run at the edge of the prairie rim to re-channelize.

West Side and South Rim sub-basins: The vast majority of the West Side sub-basin lies outside the park and to the west of State Road 121, whereas the South Rim sub-basin is primarily north of Wacahoota Road. Currently there are only a few culverts under these roads, with none connecting to a stream channel or ditch draining into the prairie basin. This may lead to the conclusion that the contribution of surface waters to the prairie basin from these watersheds is negligible. Land use development in the West Side and South Rim sub-basins has increased in the past 15 years, with residential subdivisions scattered primarily in the far western area. Much of the property adjacent to the park along State Road 121 and Wacahoota Road is still relatively undeveloped.

Rocky Point sub-basin: The Rocky Point sub-basin contains an extensive network of shallow depressions, giving it substantial capacity for surface water storage. This sub-basin has no natural streams, but it does convey some limited surface water inflow to the rim of the prairie basin. One substantial drainage area in this sub-basin cuts across County Road 18 (Rocky Point Road) at the road's western end where it turns 90 degrees toward the northwest. There are several culverts under that portion of the road, and during severe thunderstorms, this area can experience brief episodes of localized flooding. A sharp change in elevation in this area, from about 125 feet to 70 feet over a relatively short distance, may influence the movement of surface runoff toward the prairie basin. In the eastern part of the watershed, at least two culverts under U.S. 441 allow surface runoff to drain into PP-9 of the prairie basin.

The northwest part of this sub-basin has a high level of development that could potentially influence the prairie. Otherwise, the watershed contains low-density housing, pastures and forested landscapes.

Post Office sub-basin: The Post Office sub-basin is a small watershed lying entirely outside the park and just west of the Rocky Point sub-basin. Its headwaters consist of a linear strand of forested wetlands immediately west of Gainesville's Main Post Office on SW 34th Street. These wetlands coalesce to form a small intermittent stream, Post Office Creek, that flows westward through culverts under Interstate Highway 75 (I-75), then southward under State Road 121 and ultimately through a local golf course before entering the prairie basin via an artificial channel into a highly disturbed area. This outflow area, mostly outside the park boundary, formerly received sewage effluent from a package treatment plant for the residential subdivision associated with the golf course. The various impacts would not be that important except that Post Office Creek is the only significant water source for the entire west side of the prairie basin.

Commercial and semi-industrial development within the headwaters of this watershed may be causing degradation of surface water quality. Other negative influences include the two major highways that bisect the sub-basin. Given the natural impermeability of the forested wetland soils within this watershed and the accelerated rates of development therein, the adjacent prairie basin is likely to continue to experience water quality problems.

Lake Wauberg sub-basin: The Lake Wauberg sub-basin consists of a series of connected, shallow water depressions, each containing either a lake or a forested wetland (Opper 1982). The water bodies that make up this chain are Georges Pond, Lake Wauberg and Chacala Pond, all of which are clastic upland lakes. The major forested wetlands in the chain are Burnt Pond and Sawgrass Pond. Some evidence suggests that fire exclusion may have played a role in the ecological succession of the latter two ponds from basin marsh to forested wetland. Much of the Lake Wauberg watershed lies within the park. The portion outside the park contains low-impact agricultural lands, rural housing and woodlands.

The ponds in this watershed obtain their water mainly by way of seepage from the surficial aquifer or from direct rainfall. The only stream channels within the watershed are those connecting the major ponds. Burnt Pond and Georges Pond contribute surface water flow only when conditions are the wettest. Under high water conditions, Burnt Pond drains west under U.S. 441 to Georges Pond, which then overflows eastward under the highway again to Lake Wauberg. Lake Wauberg, in turn, overflows into Sawgrass Pond, which may then drain through Sawgrass Run to Chacala Pond and thence by way of Chacala Run to the prairie basin. Chacala Run is yet another intermittent stream along the prairie rim that sometimes provides a significant amount of surface water inflow to the eastern prairie basin. A comparison of historic aerial photographs suggests that the course of this creek system where it meanders onto the basin has changed very little over the years. Much of the watershed east of Chacala Pond influences the Paynes Prairie hydrology only during the wettest of conditions.

Lake Wauberg is the central landscape feature in this watershed. The lake measures approximately 370 acres in surface area and reaches a depth of about 15 feet (Florida Lakewatch 2004). Very little fluctuation in the surface elevation of the lake occurs, even during severe droughts, because of its impervious bottom and the substantial input of seepage from surrounding uplands. The University of Florida has maintained recreational facilities on the western and southern shorelines of the lake since 1939. Some single-family home sites exist in this area as well.

In 2002, Lake Wauberg was designated an impaired Florida water body because of high nutrient levels (Wu et al 2003), however there is a growing body of evidence that suggests Lake Wauberg may have always had a naturally high level of eutrophication (Carr 1934, Whitmore and Brenner 2002).

Dog Branch sub-basin: The Dog Branch sub-basin is similar to the adjacent Lake Wauberg watershed in that they both contain several shallow, interconnected depressional wetlands. Dog Branch, an intermittent stream, is the most significant landscape feature in this sub-basin. Surface water sources for Dog Branch originate just west of U.S. 441 in a series of small wetlands that drain eastward under the highway and combine to form a creek, which then flows north to the prairie basin. Though small, Dog Branch is a significant source of surface water inflow to the prairie. Much of the Dog Branch watershed is still in relatively good condition despite having only a small portion protected within the park boundaries. The same cannot be said for the part of Dog Branch that flows into Paynes Prairie, however. During the Camp Ranch period, the hydrology of the entire prairie basin, including Dog Branch, was manipulated extensively. Dog Branch represents a classic example of the conversion of a historic natural sheetflow system to a highly altered canal and dike system.

Dikes, canals and sheetflow restoration: Disruption of surface water sheetflow within the prairie basin has been extensive. Most of the dikes, canals and other water control features in the basin were constructed from the 1920s through the 1970s. All water control structures built by previous landowners specifically manipulated water levels with the intent of dewatering the basin to create an optimal cattle-grazing landscape. With the exception of a 0.4-mile stretch of Sweetwater Branch Canal rerouted by the Florida Park Service in the 1970s and 9.0 miles of dikes and highways built by the Florida Department of Transportation, the Camp Ranch was responsible for constructing all of the water control features on the prairie basin. Including the two major highways, I-75 and U.S. 441, both of which cut through Paynes Prairie, the prairie basin contains about 38 miles of dikes and 50 miles of canals.

Please note that the water control features referred to herein as dikes were actually linear spoil piles constructed of materials dredged when canals were dug to drain water from the prairie. In some cases, only one canal was associated with a dike; in other

Table 3: Hydrological Restoration Plan					
Name	**Restoration Activity**	**Priority**	**Year of Restoration**	**Length Restored (miles)**	**Length Unrestored (miles)**
Angle Dike	Yes	-	1990s	0.5	0.472
Bolen Bluff Dike	Yes	-	2002	1.5	0.657
Dog Branch Dike	Yes	-	2002-03	1.6	0.435
East-West Dike	Yes	-	2002-03	3.5	0.194
Camps Canal Dike	No	1			2.136
Prairie Creek East Berm	No	1			0.872
Prairie Creek West Berm	No	1			0.309
Sweetwater Branch Dike	No	2			2.067
Boulware Run Dike	Yes	2	1980s	0.09	0.242
Old Sweetwater Dike	No	2			0.259
Bivans Arm Dike	No	2			0.555
Old Culvert Dike	No	2			0.055
Stub Dike	No	2			0.040
Steve's Dike	No	2			0.383
"C" Dike	No	2			0.312
Cones Dike	No	3			3.875
Otto Waley Dike	Yes	4	1970s	0.07	1.145
Borrow Dike	Yes	5	1970s	0.16	1.213
Vortac Dike	No	6			1.004
I-75 East Dike	No	7			2.557
I-75 West Dike	No	8			2.082
Government Dike	Yes	9	1970s	0.25	0.866
Mystery Dike	No	10			0.518
Burnt Pond Dike	No	11			0.641
Rice Paddy Dikes	Yes	11	1970s	0.1	1.089
Alligator Point Dike	No	12			0.409
Main Finger Dike	Yes	13	2002-03	0.18	0.287
Main Canal Dike	No	-			0.982
U.S. 441 Dikes	No	-			1.928
I-75 Dikes	No	-			2.604
Total Restored				7.95	
Total Unrestored					30.188
Grand Total					**38.138**

cases, there were two canals, one on each side of a dike. There were rare occasions when a low berm, or second low dike, was placed on the side of a canal opposite a larger main dike. This explains why the total lengths of canals and dikes in the prairie basin are not the same. A prioritized hydrological restoration plan for all water control features in the basin is contained in Table 3.

These historic dikes and canals have significantly influenced surface water sheetflow across the prairie basin (Best et al 1995; JEA and WSI 2010). Some of the structures impede sheetflow, while others reduce or eliminate standing water by channelizing or directing its flow elsewhere. Over 80 percent of the historic water control features within the park still exist. A few, such as the Main Canal Dike, provide recreational vistas and are integral to interpretation of the park, so they likely will persist. Perhaps the two biggest obstacles to complete removal of unwanted dikes are a lack of dedicated funding and the very high cost (Goodman et al 2006). Permitting in itself requires a considerable investment in time. Nevertheless, DRP will continue to consider hydrological restoration a high priority and will design and implement beneficial dike removal projects as funding becomes available.

Even though there is a strong level of uncertainty in assigning a higher priority to one restoration project over another, the primary objective will continue to be to increase natural sheetflow throughout the prairie basin. As the total area of natural sheetflow increases, so too will the ecological benefits for this unique landscape. Following is a discussion about the most significant water control features within the prairie basin, including those have experienced at least some restoration, those that have a high priority for removal, and those that are likely to remain due to their importance to park operations.

Camps Canal Dike: The earliest attempts at dike restoration within the prairie basin occurred at the Camps Canal Dike, built by the Camp Ranch in the 1920s. This dike, constructed across the natural outfall of Prairie Creek, effectively blocked the creek from flowing westerly onto the prairie basin and diverted it southward via Camps Canal, thereby eliminating over 50 percent of the natural surface water inflow to the prairie. As mentioned earlier, Prairie Creek was, and still is, the most important source of sheetflow for Payne Prairie. Following purchase of Camp Ranch by the state in 1970, the Florida Department of Natural Resources in 1975 breached the Camps Canal Dike in a logical effort to restore the Prairie Creek sheetflow to the eastern basin. This early project constituted the initial effort in what has become a long-term, complex and pivotal endeavor to restore the natural hydrology of Paynes Prairie.

Shortly after the initial breaching of the Camps Canal Dike, the Florida Park Service installed a three-culvert structure in the dike, complete with flashboard risers. However, the canal was deep and the culvert elevation relatively high so that when water levels in Prairie Creek dropped below a certain point, inflow through the culverts into the prairie ceased and Camps Canal captured the entire flow of the creek, carrying it south to the River Styx and Orange Lake. In 1994, the Governing Board of the SJRWMD passed Rule 40C-2.302 F.A.C. regarding the reservation of water for Paynes Prairie by rule (SJRWMD 2009). SJRWMD hydrologists have determined that, with the rule in place, the current water control structure at Prairie Creek distributes a long-term average of about 45 percent of the creek's flow to Paynes Prairie, with the remainder discharging to Orange Lake. Even with the diversion of 55 percent of the Prairie Creek flow, the portion that still manages to reach the prairie currently amounts to over half of the surface water inflow for the entire basin, and about a third of the total water budget for the basin (Robinson et al. 1997).

Installing culverts in the Camps Canal Dike greatly improved the sheetflow regime within management zone PP-13 of the park. The removal of the Angle Dike was another early restoration project that helped reestablish important sheetflow patterns in PP-13. In this case, the water source was seepage from the Persimmon Point/Jerevan sub-basin into the northern third of the zone. Altogether, these early restoration efforts reestablished at least 500 acres of sheetflow across the basin marsh in PP-13. They also raised water levels in Alachua Lake and thereby increased the wetland acreage supported by the Alachua Lake pool (Robison et al. 1997). Clearly, to enable completion of the restoration process on the east side of the prairie, reallocation of 100 percent of the Prairie Creek discharge back to the prairie basin would be necessary.

Two other levee systems, Cones Dike and Otto Waley Dike, currently constrain sheetflow from leaving PP-13 and spreading into zones PP-1301 and PP-8 respectively. The elimination of both dike systems would be central to efforts to improve surface water sheetflow in the eastern basin, raise average water levels in the Alachua Lake pool, and increase the frequency, duration and height of high water events. During low water periods, PP-1301 is also affected by Cones Dike Canal, which dewaters the northern part of the zone.

Dike restoration projects: The Park made several other attempts at sheetflow restoration within the prairie basin in the 1970s. Most of these efforts were relatively minor in regards to total length of dike removed, but they specifically targeted the partial restoration of sheetflow in manipulated areas that received extremely limited surface water flow, including the Borrow Dike, Government Dike, Otto Waley Dike and Dog Branch Dike systems.

Historically, Boulware Spring Run would have been a source of sheetflow for the north-central part of the prairie basin (PP-11), but the Camp Ranch channelized its flow early on, conveying it directly to the Sweetwater Branch Canal. A considerable length of this channel remains today, but park staff back-filled the lower third in the late 1980s and placed two additional ditch blocks upstream of the restored portion. That effort stopped the ditch from draining the surrounding marsh and allowed some sheetflow from the spring run to resume its natural movement across PP-11.

During the Camp Ranch period, Borrow Dike was constructed westward from Cones Dike in order to dewater Alachua Lake, improve grazing and facilitate access to the central part of the prairie. For similar reasons, the ranch built another dike, Otto Waley, which connected Cones Dike with Persimmon Point to the north. In the late 1970s, park staff partially pushed the eastern end of Borrow Dike back into its canal. Two culverts were also removed from Otto Waley Dike leaving gaps in the dike. Over a mile of Borrow Dike remains intact, but there is no vehicular access. Although there are two sets of staff gauges along this dike, fluctuating water levels and the dense vegetation have made monitoring them almost impossible. Borrow Dike appears to follow an old Prairie Creek channel and in effect impedes its flow. The dike cuts off natural sheetflow from management zone PP-8 into PP-12, directing it instead toward Alachua Lake and Alachua Sink.

Probably the most ambitious and effective hydrological restoration projects at Paynes Prairie to date occurred during the years 2002-2003, targeting the Dog Branch Dike, East-West Dike and Bolen Bluff Dike systems. These dike/canal systems either conveyed surface waters directly to the Main Canal and Alachua Lake or otherwise reduced sheetflow within the east part of the prairie basin. The attempts to remove the dikes and fill in the canals of the three systems represented the first large-scale effort by DRP to restore natural sheetflow within the east prairie basin.

Dog Branch Dike had been the object of earlier restoration efforts. In the 1970s, park staff had bulldozed the southernmost end of the dike into the adjacent canal. This had the effect of obstructing the flow of the run, but it did not restore the natural sheetflow regime as had been desired. In 2002, the park resumed efforts to restore the Dog Branch Dike system more effectively. Much of the dike was pushed into the adjacent borrow canal, almost completely backfilling it. The only portion of the dike left intact was in the middle of the basin, adjacent to and north of Borrow Dike, where a stand of trees harbored a heron rookery.

East-West Dike and Bolen Bluff Dike were two of the most significant hydrological legacies of the Camp Ranch. Both of these dike/canal systems effectively dewatered the central part of the prairie basin. The Bolen Bluff system directly conveyed surface waters from zones 10 and 7 to the East-West Dike/Canal, virtually eliminating sheetflow from this part of the basin. The East-West Canal system funneled large quantities water from west of U.S. 441 and from management zone PP-10 to the Main Canal and Alachua Sink. In 2002 and 2003, DRP contracted out the bulldozing of the majority of the East-West and Bolen Bluff Dikes and the backfilling of their adjacent borrow canals.

The Main Dike and the southern section of the Bolen Bluff Dike may never be completely restored since they provide visitors with all season access to observation towers on the basin, except during extreme high water events. La Chua Trail, which follows the Main Dike, is considered one of the finest wildlife viewing trails in the state. Further study may reveal, however, that DRP needs to reduce the length of the Main Dike and/or Bolen Bluff Dike in order to ensure there is an adequate flow of water through the system and to benefit wildlife. Over 7.5 miles of dike restoration and 7.5 miles of canal restoration have taken place within the prairie basin to date, resulting in the restoration of surface water sheetflow to over 5,000 acres of the prairie basin.

I-75 and U.S. 441 Dikes: These dikes and canals are prominent examples of levee systems that do not impede overall flow but nevertheless reduce sheetflow and dewater key portions of the prairie basin. These two landscape features exert a significant influence on the natural hydrology of the central and western parts of the prairie.

In general, water levels in the canals that run along both sides of these two highways continually strive toward equilibrium. Water is virtually always flowing from one canal to another through culverts under the dikes, but flows are of such low velocity that they generally do not cause water level changes that are measurable by staff gauges. The canals associated with the dike systems specifically channelize surface water flow, thereby reducing sheetflow and causing the surrounding landscape to dry out during periods of low water. This encourages invasion of the prairie by woody plant species, artificially amplifying ecological succession within areas that were once predominantly open herbaceous marsh. When canals have berms or dikes associated with them, the woody vegetation problem becomes even more dramatic. DRP, with the assistance of the Florida Department of Transportation (FDOT), has invested considerable resources over the last several years in controlling woody invasive exotic and native species within Paynes Prairie, primarily along U.S. 441, but also along I-75.

Given the importance of the western half of the prairie basin to the total water budget for Paynes Prairie, DRP should seek a long-term solution to the chronic problems associated with the fact that two major highways cut through the park. DRP should work with appropriate government entities to achieve meaningful restoration of the natural sheetflow and wetlands within the prairie basin, with serious consideration given to raising these two roadways above the marsh landscape via bridging.

VORTAC and Government Dikes: VORTAC Dike is located between zones 3 and 4 west of I-75, while Government Dike extends east to west between U.S. 441 and I-75, forming the dividing line between zones 5 and 6. Both dike systems were part of a pre-1970 federal government effort to install a radio navigation tower within the prairie basin. DRP has subsequently worked with the Federal Aviation Administration (FAA) to decommission the site for any future use in order to proceed with restoration of the site. Government Dike, which begins at U.S. 441, was part of the access route to the

VORTAC site prior to the construction of I-75. When I-75 was built, it effectively segregated Government Dike from the VORTAC site, so the federal government constructed an alternative access connector that originated at the north rim of the basin and ran southward parallel to I-75 on top of the berm associated with the I-75 canal. In its entirety, the VORTAC site consists of the main VORTAC Dike plus two additional short dikes and a widened earthen pad. The main east/west stretch of VORTAC Dike is approximately 3100 feet in length. One of the short dikes is a westward extension of the main VORTAC dike, while the other dike projects north of the VORTAC pad for approximately 692 feet.

In 2001, park staff surveyed cross sections of the dikes, pads and canals within the VORTAC site. Survey results indicated that large amounts of spoil material were imported to the site, including gravel and limerock. Therefore, in addition to backfilling the adjacent canal with some spoil taken from the VORTAC Dike, restoration of the entire VORTAC site will require removal of excess spoil to an off-site disposal location. In the 1970s, the park backfilled small sections of Government Canal. The relative success of this early restoration attempt, in terms of acres returned to sheetflow, is unknown.

Sweetwater Branch and Bivans Arm Dikes: One of the most important restoration needs in the east part of the prairie basin centers on the Sweetwater Branch/Bivans Arm dike and canal system. The entire system consists of eight different dike segments measuring nearly four miles in length and including smaller “finger” dikes such as the “C”, Steve’s, Stub, Boulware, and Old Culvert Dikes. Historic aerial photography clearly illustrates the hydrological alterations that took place in this region of the prairie basin during the period from 1937 to 1960 (JEA and WSI 2010). The first dredge work in the canal occurred in 1937 (Robison et al. 1997). Sometime after 1938, the sheetflow pattern of the Sweetwater outfall into the basin shifted in direction. In addition, the canal systems associated with the dikes contributed significantly to the dewatering of management zone PP-11. These extensive hydrological changes translated directly into a severe invasion of zones PP-9, PP-10, and PP-7 east of U.S. 441 by woody plants and other undesirable wetland species.

By the time the state acquired Paynes Prairie in 1970, sediment deposition in Sweetwater Branch had already caused the canal to become severely clogged. A large volume of the canal’s flow was being forced onto the prairie basin through a culvert in Bivans Arm Canal and it was then sheetflowing across PP-11 to the east. At that time, DRP asked the City of Gainesville to re-dredge Sweetwater Canal, which temporarily eliminated the nutrient-rich pollution loads that were sheetflowing across zones PP-9 and PP-11, but in turn increased the volume of storm water and nutrients being discharged to Alachua Sink. Subsequent to the City’s dredge work in the 1970s, Sweetwater Canal again clogged with sediments and is again polluting PP-9 with nutrient-rich sheetflow.

The ultimate goal of DRP is to obtain high quality water from Sweetwater Branch and provide sheetflow pulses to the east part of the prairie basin. From 2002 to 2006, stakeholders organized as the Orange Creek Basin Working Group (OCBWG) guided the development of the Sweetwater Branch Watershed Restoration Plan (JEA 2003). This plan was the first positive step in a long process of developing strategies to restore water quality in Sweetwater Branch and remove significant dikes and canals from the prairie basin. During the years 2006 through 2010, plan design and implementation progressed significantly (WSI 2006a, WSI 2006b, JEA 2009, JEA and WSI 2010). Construction on the project began in September 2012. The primary driving force behind these efforts has been the Total Maximum Daily Load (TMDL) regulatory program administered by the DEP.

Water Monitoring

The premier natural resource within Paynes Prairie Preserve is the prairie basin. The marsh and marsh lake within the basin are essential to maintaining the abundance and diversity of plants and animals for which the park is justifiably famous. One of the most significant properties of this ecosystem is that it responds quickly to local environmental changes. Fluctuations in water quality and/or quantity can cause rapid changes in the structure and function of natural communities in the basin, communities that are characteristically herbaceous. Which species are dominant at any given time depends on the prevailing environmental conditions. Evidence is clear that increased nutrients and sediments from the Sweetwater Branch/Bivans Arm watersheds have accelerated ecological succession in areas receiving their sheetflow, with shrub swamps replacing basin marsh (Best et al. 1995).

The OCBWG was formed in 1994 out of a strong need to address the declining health of water bodies in the region. Paynes Prairie Preserve has benefited strongly from the formation of this large stakeholder group. With efforts to restore the troubled watersheds surrounding the park becoming more intensive, the OCBWG has played an integral role in identifying and implementing necessary actions to improve the health of the park. In the late 1990s, SJRWMD authorities responded to public concerns by instituting a comprehensive monitoring strategy for the region (Lasi and Shuman 1996).

In 1996, with expanded efforts in 2000, the DEP also initiated a formal, statewide monitoring program for surface waters and groundwater (FDEP 2001, FDEP 2005). This Integrated Water Resource Monitoring Program (IWRMP) evolved from a mandate to implement the requirements of the 1999 Florida Watershed Restoration Act and to satisfy Section 303(d) of the Federal Clean Water Act (Maddox et al 1992; Copeland et al. 1999). The IWRMP takes a comprehensive watershed approach to monitoring Florida’s water resources, based on natural hydrologic units. Accordingly, the 52 hydrologic basins in Florida are on a five-year rotating schedule that allows water resource issues to be addressed at different geographic scales (Livingston 2003). In addition, the IWRMP assigns a water body identification number (WBID) to each water body (FDEP 2001). This watershed approach provides a framework for implementing TMDL requirements to restore and protect specific water bodies (Clark and DeBusk 2008). All priorities for TMDL development in Florida follow strict adherence to verified priority water body lists reviewed by the United States Environmental Protection Agency (EPA) (USEPA 1995). Specifically, DEP's primary plan to address water quality issues is to implement Basin Management Action Plans (BMAPs) (FDEP 2008c; Grubbs 2001). Much of the important hydrological information collected, stored, and managed by various agencies can now be accessed through a variety of web-based databases (FDEP 2008a; FDEP 2008b; Silvanima et al. 2008; SJRWMD 2010).

Water quality

Several water bodies whose surface water outflows influence the Paynes Prairie basin have experienced significant declines in water quality. Two indices that state officials use to rank surface water quality are Trophic State Index (TSI) and Water Quality Index (WQI). The TSI evaluates nutrient enrichment levels in lakes, whereas the WQI evaluates stream health (Hand et al. 1996).

In 1996, the SJRWMD and DEP reported that the following water bodies contained significant amounts of pollutants: Sweetwater Branch, Tumbling Creek, Newnans Lake and Lake Wauberg (Lasi and Schuman 1996; Hand et al 1996). Three of these water bodies lie north of the park within the most urbanized areas of Gainesville. In addition, there are two point sources of waste effluent, the Main Street Plant and the Kelly Power Plant, that have a long history of emptying directly into Sweetwater Branch (JEA 2009). Water managers have long recognized that these urbanized watersheds create serious water quality issues for Paynes Prairie (Best et al 1995; FDEP 2001; ACEPD 2008).

According to DEP's basin status report for this region, Sweetwater Branch, Tumbling Creek, Alachua Sink, Newnans Lake and Lake Wauberg all became potentially impaired water bodies in 2001 because of excessive nutrients or high levels of fecal coliform bacteria (FDEP 2001). Based on the Impaired Waters Rule (IWR), in 2002 the EPA verified that those water bodies were impaired, which meant that their surface water quality did not meet applicable state water quality standards (IWR, Chapter 62-303 F.A.C). This designation triggered a long chain of mandatory requirements that Florida would have to accomplish to comply with EPA regulations concerning polluted water bodies. The compliance process started with assigning a TMDL for each polluted system.

In 2003, Sweetwater Branch, Tumbling Creek, Newnans Lake and Lake Wauberg were designated with specific TMDLs that would require reductions in either nutrient or fecal coliform bacteria levels (Burger and Magley 2003; Shelly and Magley 2003a; Gao and Gilbert 2003). Alachua Sink, the ultimate receiving body for the two Gainesville creek systems, was assigned a TMDL that would require a reduction in nutrient levels (Gao et al 2006). This TMDL specifically established regulatory limits on discharged nitrogen from the Main Street Plant and on storm water from the City of Gainesville. Some OCBWG stakeholders have voiced serious concerns about implementing TMDLs based solely on these point sources when non-point sources such as Alachua Lake may actually be of greater importance (Goodman et al 2006).

In 2008, the OCBWG and DEP produced a phased implementation plan called the Orange Creek BMAP (FDEP 2008b). Language in this document outlined those specific reductions necessary to meet TMDL allocations for this watershed. Three important management actions recommended were to identify and remediate sources of fecal coliform bacteria in urban "hot spots," implement the Sweetwater Branch/Paynes Prairie Sheetflow Restoration Project, and develop Pollution Load Reduction Goals (PLRG) for Newnans Lake. The following is a brief discussion about the importance of each action.

The Alachua County Environmental Protection Department (ACEPD) has had a very strong monitoring program in Gainesville's urban creeks since the late 1990s (ACEPD 2007). This county agency is a very important and dedicated partner in the OCBWG group. The ACEPD has amassed an extensive surface water monitoring dataset from across the county that has been an effective tool in detecting existing and emerging watershed problems (ACEPD 2004). In addition, the county's creek "hot spot" monitoring program will allow managers to determine if the required TMDL reductions are being achieved (ACEPD 2008).

Perhaps one of the most ambitious projects proposed for water bodies in the Orange Creek Basin will be restoration of the Sweetwater Branch system to its natural state as a significant provider of sheetflow across the east part of the prairie basin (JEA and WSI 2010). The sheetflow restoration project has three major components. The first step will be to construct a 125-acre treatment wetland within the prairie basin to remove nitrogen from the Sweetwater inflow. The second phase will be to remove the Sweetwater Dike system to allow the resumption of sheetflow across zone PP-9 in the east prairie basin. The final phase will be to institute alum treatment at the Main Street Plant in order to lower phosphorus concentrations in its waste effluent. Once the overall project is completed, the necessary Alachua Sink TMDL reductions will have been achieved.

The treatment wetland will remove most of the excess nitrogen from the Sweetwater Branch flow. Much of the remaining nitrogen will be removed when discharge water from the treatment wetland sheetflows across the prairie. Some other aspects of the project will be creation of a sediment basin, installation of a trash trap, and stabilization of the Sweetwater Branch streambed. In addition, since construction of the treatment wetland requires the use of about 125 acres of adjacent state park, OCBWG stakeholders needed to acquire a similar parcel to offset the use of state lands for the project. As of April 2011, the state/stakeholder land exchange had already taken place and the final engineering phase of the project had proceeded to nearly 60 percent completion.

Newnans Lake is a shallow, hyper-eutrophic water body. The lake has experienced deteriorating water quality since the 1960s (Cohen et al. 2008; Di et al. 2010). Emerging evidence suggests, however, that phosphorus and perhaps nitrogen levels in this nearly 8000-year-old lake have always been uniquely high, making it a naturally eutrophic water body (Gao and Gilbert 2003; Riedinger-Whitmore et al 2005). Lake Wauberg also seems to have naturally eutrophic characteristics (Florida Lakewatch 2004). Paleolimnological analysis has pointed to natural geologic and edaphic influences (i.e. the Hawthorn Formation) as the possible cause of the characteristically high background levels of phosphorus in some area lakes (Whitmore and Brenner 2002; Ramnarine 2003).

Unfortunately, nutrients in Newnans Lake over the past 30 years have increased markedly to nearly 2-3 times the natural background levels. Persistent algal blooms are now commonplace in the lake. In 2010, the SJRWMD developed systematic goals for the reduction of pollutant levels in Newnans Lake (Di et al. 2010). Each water management district in Florida is required under the Water Resource Implementation Rule (Chapter 62-40 F.A.C.) to set Pollution Load Reduction Goals (PLRGs). There are a number of influencing watersheds in eastern Gainesville surrounding Newnans Lake, but apparently, the Hatchet Creek systems contribute the majority of the pollutants (Shelly and Magley 2003b).

There is an extensive well monitoring database for the Paynes Prairie Basin (FDEP 2010). Numerous entities such as DEP, SJRWMD, environmental consulting firms and university researchers are all involved in the sampling of wells within the basin. The wells are used to monitor groundwater quality and background levels at Very Intense Study Areas (VISA), waste management facilities, drinking water contamination sites, cattle dip vats, private residential areas and public areas. There are now over 114 different wells scattered across the entire Paynes Prairie watershed that are undergoing various levels of sampling. Data from dedicated, long-term monitoring wells, used by state agencies for tracking water quality changes within watersheds, are accessible through a Storage and Retrieval database managed by DEP (STORET, FDEP 2010).

One specific subset of well data important to the prairie basin is that associated with previous cattle dipping sites within Paynes Prairie Preserve. During the 1950s and 60s, the Camp Ranch had dipped its cattle in pesticides such as arsenic to control tick infestations. In 2003, DRP identified and tested up to 10 significant areas of concern within the park where previous landowners had conducted intensive cattle operations (EEI 2008a, 2008b, 2008c, 2008d, 2008e, 2009a, 2009b, 2009c, 2009d). Rigorous sampling of groundwater and soils at these ten sites revealed severely contaminated areas in all but one site (EEI 2008f). Recommendations from these reports suggest that the monitoring and assessment at these nine sites should continue in order to delineate the extent of the problem further.

Water quantity

Paynes Prairie has had a long history of water level manipulations. Apparently the first major water control project took place in 1927 when the Camp Ranch decided to divert Prairie Creek southward away from the prairie basin. That action initiated a series of distinct hydrological changes in the eastern part of the basin. Those changes accelerated after the ranch constructed additional dikes and canals to dewater areas in an effort to improve cattle grazing. Also in 1927, the state constructed the first major highway across the basin, U.S. 441. A second highway, I-75, was completed in 1964. Both highways have functioned as artificial water control structures and have altered the natural fluctuations of Paynes Prairie's dynamic marsh community.

As mentioned earlier, two major surface water inflows for Paynes Prairie are at Prairie Creek/Camps Canal and at Sweetwater Branch. The SJRWMD monitors water levels and discharge rates at both of these sites (SJRWMD 2011). For the Prairie Creek/Camps Canal system, stage and discharge are measured at State Road 20 near the head of the creek just south of Newnans Lake (2.93 miles upstream of the Prairie Creek control structure culverts) and at County Road 234 a short distance upstream from where Camps Canal flows under the highway (1.14 miles downstream of the culverts). SJRWMD hydrologists determine the actual discharge through the Prairie Creek water control structure into Paynes Prairie by subtracting the Camps Canal flow from the Prairie Creek headwaters flow. For Sweetwater Branch, stage and discharge are measured where Sweetwater Branch flows under Williston Road.

The SJRWMD conducts similar monitoring for Alachua Sink. The stage of the Main Canal is measured on the upstream and downstream sides of the Main Water Control Structure. Discharge is measured at the culverts of the Main Control Structure. This arrangement enables a more accurate measurement of the actual contribution of surface water from Alachua Lake. With the microwave telemetry currently in use, monitoring at State Road 20, County Road 234 and the Main Canal is now continuous.

Since nearly all the water occupying the lowest elevations of the prairie basin has entered the prairie from east of U.S. 441, the direction of water flow under the two major highways remains highly dependent on whether water levels in the east basin are rising or falling. Currently, there is no water level monitoring at I-75 or points westward. In addition, there are no water level monitoring gauges within any of the five minor contributors of surface water to the prairie basin, namely the Jerevan seepage, Post Office Creek, Boulware Spring Run, Chacala Run and Dog Branch. However, water level gauges are in place along some of the remaining dikes in the park, as well as along some of the restored dikes.

The SJRWMD is required to assess the vulnerability of water bodies, rank them according to their degree of vulnerability, and then protect those waters by assigning them specific minimum flow or level (MFL) values. The purpose of an MFL is to assist managers in establishing limits on permit issuance based on the regional water supply, as well as to determine the point at which groundwater withdrawals would begin to have negative influences on wetland resources. As of May 2011, the SJRWMD had only adopted rules (40C-8.031 F.A.C.) for MFLs for four small lakes within the Orange Creek Basin. Lake Wauberg was one of those lakes, and the only one within the Paynes Prairie watershed that was considered (SJRWMD 2009, 2010; Mace 1997). Other significant water bodies in the Orange Creek Basin, including Orange Lake, Lake Lochloosa and Newnans Lake, are not currently on the SJRWMD's priority list for establishment of MFLs. In fact, Newnans Lake has never received a priority status for MFL assessment. DRP recommends the establishment of an MFL on Newnans Lake because of its importance to water availability in Prairie Creek and thus Paynes Prairie. Priority schedules and MFL lists for each water management district undergo mandatory annual review by the DEP (Llewellyn 2008).

In 1994, Paynes Prairie was the second state-managed property in Florida to require implementation of a water protection strategy, but the first to use a unique type of regulation called a "Reservation" (Florida Statues Chapter 40C-2.302 F.A.C.). This regulation resulted from a multi-year study conducted by the SJRWMD to investigate restoration alternatives for manipulated water bodies within the Orange Creek Basin (Robison et al. 1997). The Prairie Creek reservation, currently the only one in Florida, was an allocation by rule. Its implicit intent was to require the SJRWMD to guarantee Paynes Prairie a certain portion of surface water flow from Prairie Creek (Neubauer et al 2008). The Governing Board of the SJRWMD had determined that such a water reservation was necessary in order to protect the fish and wildlife within Paynes Prairie Preserve. The most important aspect of this rule is that it reserved "from use by permit applicants that portion of the surface water flow in Prairie Creek and Camps Canal that drains by gravity through an existing multiple culvert structure into Paynes Prairie".

This reservation amounts to an average flow of 36 cfs (23 mgd), which is only about 45 percent of the historic flow of surface water through Prairie Creek and Camps Canal. During severe droughts, water levels in Prairie Creek and Camps Canal may drop to the point that culverts in the water control structure at the Camps Canal Dike are completely exposed, and inflow into the prairie basin ceases. Obviously, when there is no water flowing through the culverts, the 45 percent figure becomes somewhat theoretical. Under those circumstances, there may still be water in Camps Canal, but it is not available to Paynes Prairie, and it flows south to the River Styx and Orange Lake. On average, Orange Lake receives about 43 cfs (28 mgd) of the Camps Canal surface water flow. During the SJRWMD study in the 1990s, the maximum annual flow to the prairie basin from Prairie Creek was 57,500 ac-ft/yr (94 cfs or 61 mgd), whereas the minimum annual flow was 900 ac-ft/yr (1.3 cfs or 0.81 mgd) (Robison et al. 1997).

Periodic closure of the Camps Canal water control structure is required under emergency authorization declared by the SJRWMD and FDOT during times of extremely high water on the prairie basin. Closures are necessary to eliminate structural damage to the U.S. 441 roadway. The last closure under emergency order occurred in 2005. When the gates of the Camps Canal structure are closed, all of the Prairie Creek surface water heads toward Orange Lake. During flood events, the park records daily water levels at a gauge located along U.S. 441 north of the visitor overlook. The Camps Canal gates are only reopened when the U.S. 441 gauge falls below 60.20 feet NGVD.

The SJRWMD is responsible for issuing water use permits in the region, and in doing so must ensure that proposed uses are in the public interest, which includes the conservation of fish and wildlife habitat and the protection of recreational values. Recent research has revealed that a significant region of groundwater supply in the eastern part of the SJRWMD, considered a groundwater divide of sorts between the SJRWMD and the Suwannee River Water Management District (SRWMD), has declined to the extent that a westward shift in groundwater potentiometric contours has occurred. The shift appears to be in response to the artificial depletion of groundwater reserves caused by large-scale pumping in Duval and Nassau Counties (Grubbs and Crandall 2007). This regional drawdown may be partially responsible for declining groundwater levels within parts of north-central Florida (Mirti 2001; Grubbs and Crandall 2007). Both water management districts are now collaborating on a joint water supply plan for north Florida, and they are attempting to coordinate more closely when issuing consumptive use permits and monitoring groundwater withdrawals. Currently, it is unknown what effect these potential groundwater shifts will have on the prairie basin or its adjacent surface water sub-basins.

Natural Communities

This section of the management plan describes and assesses each of the natural communities found in the state park. It also describes of the desired future condition of each natural community and identifies the actions that will be required to bring the community to its desired future condition (DFC). Specific management objectives and actions for natural community management, exotic species management, imperiled species management and restoration are discussed in the Resource Management Program section of this component.

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI) (FNAI 2010). The premise of this system is that physical factors such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas that are similar with respect to those factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, however, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

When a natural community within a park reaches the desired future condition, it is considered to be in a "maintenance condition." Required actions for sustaining a community's maintenance condition may include, maintaining optimal fire return intervals for fire dependant communities, ongoing control of non-native plant and animal species, maintaining natural hydrological functions (including historic water flows and water quality), preserving a community's biodiversity and vegetative structure, protecting viable populations of plant and animal species (including those that are imperiled or endemic), and preserving intact ecotones linking natural communities across the landscape.

The park contains 27 distinct natural communities as well as altered landcover types and developed areas (see Natural Communities – Existing Conditions Map). A list of known plants and animals occurring in the park is contained in Addendum 5.

LIMESTONE OUTCROP (NOT ON NATURAL COMMUNITIES MAP)

Desired future condition: Limestone outcrops are associated with karst topography and are often found within other features such as sinkholes or as isolated features within mesic hammocks and upland hardwood forests. Various ferns, mosses and smaller herbs typically grow on the limestone surface or in crevices. Characteristic species include partridgeberry (*Mitchella repens*), brittle maidenhair fern (*Adiantum tenerum*), netted chain fern (*Woodwardia areolata*), jack-in-the-pulpit (*Arisaema triphyllum*), southern shield fern (*Thelypteris kunthii*), and various species of panicgrass (*Panicum* spp.). Other rare fern species may also occur on limestone outcrops.

Description and assessment: The majority of the limestone outcrops in the park are found within the sinkholes and sinkhole lakes of the Alachua Sink Hammock on the north rim of the Prairie Basin. Due to their limited size and vertical nature, the limestone outcrops are not included on the natural community map for the park.

Limestone outcrops located near the Gainesville to Hawthorne Trail are at greater risk from disturbance due to unauthorized foot or bicycle traffic. Rare plants, such as the brittle maidenhair fern, require a humid and protected microclimate. The outcrops are typically found on the vertical sides of sinkholes between the Alachua Sink and the north boundary of the park. Impacts to the sinkholes from erosion and exotic plants, as detailed in the sinkhole description and assessment, also hold true for limestone outcrops. The limestone outcrops in the park are considered to be in good condition.

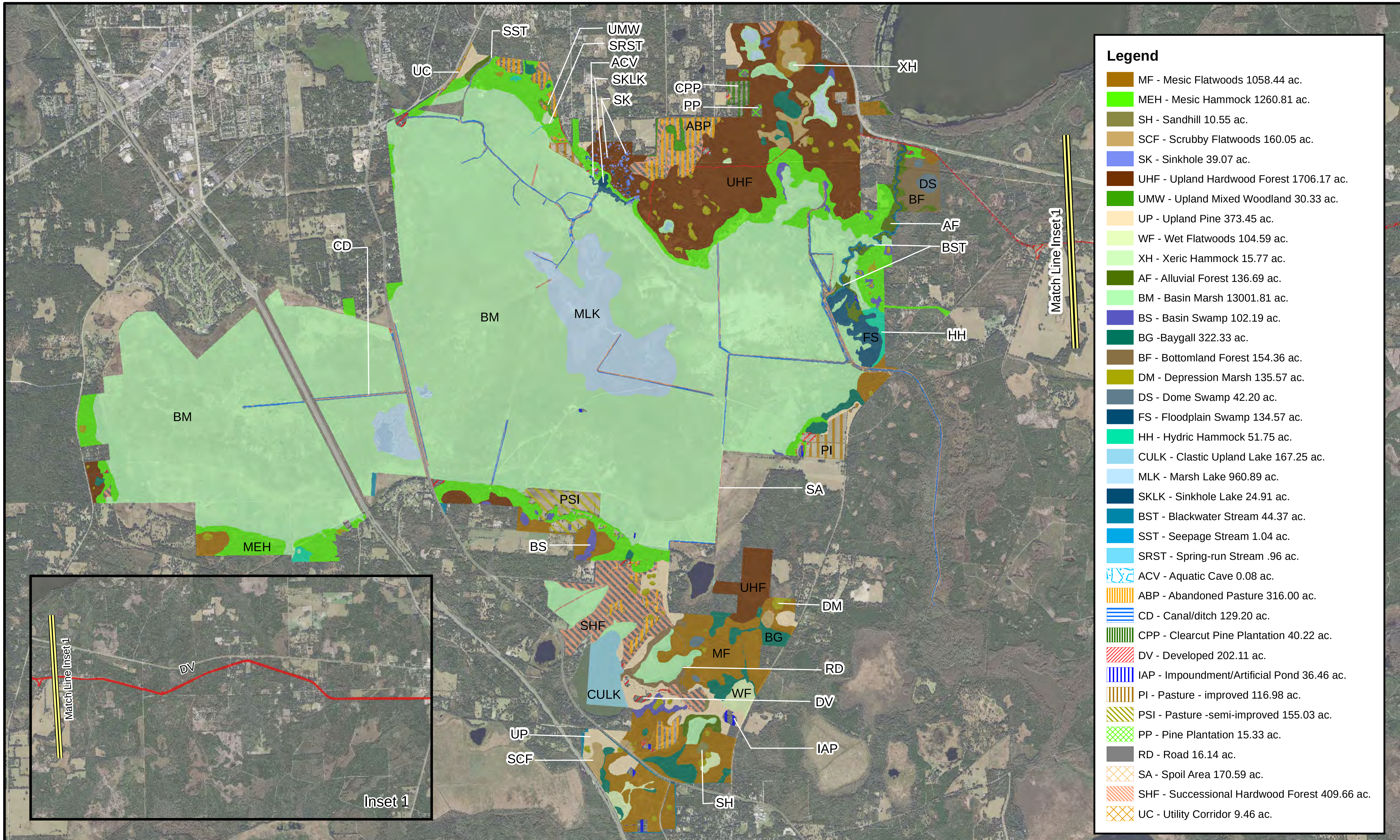
General management measures: Limestone outcrops must be protected from disturbance, particularly from damage due to foot or bicycle traffic. Most of the outcrops are within sinkholes that already have restricted access. Measures must be taken to prevent runoff and erosion from degrading limestone outcrops, particularly near existing trails or roadways. Ground disturbance during removal of exotic plant species in the surrounding sinkhole and upland hardwood forests should be monitored to prevent erosion and impacts to the limestone outcrops and the rare plants that may be present. Mapping of significant limestone outcrops will be necessary to ensure their protection. An inventory of any imperiled plant species should be conducted at the same time.

MESIC FLATWOODS

Desired future condition: Dominant pines will usually be longleaf pine (*Pinus palustris*). Native herbaceous groundcover should be over at least 50 percent of the area and less than 3 feet in height. Saw palmetto (*Serenoa repens*) will comprise no more than 50 percent of total shrub species cover, and are less than 3 feet in height. Shrub species include saw palmetto, gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), runner oak (*Quercus elliottii*), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), and dwarf huckleberry (*Gaylussacia dumosa*). Shrubs are generally knee-high or less, and there are few if any large trunks of saw palmetto along the ground. The Optimal Fire Return Interval for this community is 2-3 years.

Description and assessment: Mesic flatwoods occur on the south side of the park and in the northeast corner in the Jerevan Addition. The flatwoods on the south side are a complex mixture of mesic and wet flatwoods with baygalls and flatwoods ponds interspersed. Typically, mesic flatwoods are dominated by longleaf and slash pines with pond pines being restricted to wet flatwoods. Timbering throughout the mesic flatwoods of the park has reduced the dominance of longleaf pine in the canopy. Logging disturbances and land clearing operations may have also affected pine regeneration patterns. About 50 acres of this community were converted to improved pasture prior to 1956. The typical saw palmetto and gallberry ground cover was uprooted during the process and replaced by exotic grasses. Since 1970, pond pines and slash pines have rapidly recolonized this area. Exclusion of fire has encouraged the spread of hardwoods in some areas. In many areas of mesic flatwoods, the saw palmetto cover is much thicker than probably occurred in pre-Columbian times. This may be attributable to exclusion of fire or perhaps to the traditional restriction of burning to winter months.

Many of the mesic flatwoods east of U.S. 441 are overdue to be burned. Other areas located between U.S. 441 and I-75, north of the town of Micanopy, are suffering from an



PAYNES PRAIRIE PRESERVE STATE PARK

Florida Department of Environmental Protection
Division of Recreation and Parks
Date of Aerial: 2009

NATURAL COMMUNITIES MAP
EXISTING CONDITIONS

extended period of fire exclusion. These areas are extraordinarily difficult to prescribe burn due to smoke management concerns and heavy fuel loads. The park staff has met on site with the FFS to discuss ways to reduce these fuel loads safely with prescribed burning, while minimizing smoke impacts on the adjacent highways. During the summer and fall of 2001, an outbreak of southern pine beetles affected a large proportion of the mesic flatwoods in the southern part of the park. Most of these areas were logged in an effort to control the expansion of the outbreak.

The Jerevan Addition in the northeast corner of the park has several areas of mesic flatwoods intermingled with successional hardwood forest and scrubby flatwoods. In many locations, hardwoods have increased in dominance due to fire exclusion. Firebreaks have been established in the Jerevan flatwoods, but prescribed burns are still pending. Mesic flatwoods is the dominant community type adjacent to the Gainesville to Hawthorne Trail east of the park. The mesic flatwoods within the park range from poor to good condition depending on recent fire history, impacts from past cattle operations, and southern pine beetle outbreaks.

General management measures: Dormant and growing season fires will be needed in the mesic flatwoods of the park to reduce hardwood dominance in many areas, and to limit the expansion of baygalls into portions of the flatwoods in the southern end of the park. The areas impacted by logging during the southern pine beetle outbreak will require extensive restoration efforts including replanting of longleaf pines and possibly groundcover restoration and hardwood control. Prescribed fire will be reintroduced to the Jerevan flatwoods and restoration to a more natural condition will proceed.

MESIC HAMMOCK

Desired future condition: Mesic hammock is a well-developed evergreen hardwood and/or palm forest which can occur, with variation, through much of peninsular Florida. The often dense canopy will typically be dominated by live oak (*Quercus virginiana*) with cabbage palm (*Sabal palmetto*) mixed into the understory. Southern magnolia (*Magnolia grandiflora*), sweetgum (*Liquidambar styraciflua*), sugarberry (*Celtis laevigata*) and pignut hickory (*Carya glabra*) can be common components in the subcanopy as well. Slash pines (*Pinus elliottii*) or loblolly pine (*Pinus taeda*) may be sparsely distributed in the canopy. The shrubby understory may be dense or open, tall or short, and is typically composed of saw palmetto (*Serenoa repens*), beautyberry (*Callicarpa Americana*), yaupon (*Ilex vomitoria*), American holly (*Ilex opaca*), gallberry (*Ilex glabra*), common persimmon (*Diospyros virginiana*) and sparkleberry (*Vaccinium arboretum*). The groundcover may be sparse and patchy but generally contains panicgrasses (*Panicum* spp.), switchgrass (*Panicum virgatum*), sedges, as well as various ferns and forbs. Abundant vines and epiphytes occur on live oaks, cabbage palms, and other subcanopy trees. Mesic hammocks will generally contain sandy soils with organic materials and may have a thick layer of leaf litter at the surface. Mesic hammocks are rarely inundated and not considered to be fire-adapted communities and are typically shielded from fire.

Description and assessment: Much of the transitional area making up the prairie rim is mesic hammock with a canopy consisting almost solely of scattered live oak. Large areas of mesic hammock on the rim of the prairie were affected by the grazing of livestock from the late 1600s to the early 1970s. Many of these areas were maintained in the past as pastures under a monoculture of live oaks. Other hardwoods, particularly yaupon holly, have become established since the removal of cattle and the cessation of mowing. Some of these areas may even be the remains of the Indian fields mentioned by William Bartram in his journey around the rim of Paynes Prairie: "Passing through a great extent of ancient Indian fields, now grown over with forests of stately trees, Orange groves and luxuriant herbage" (Harper 1958:126).

The Crevasse and Edwards parcels are the most recent additions to Paynes Prairie and include significant areas of mesic hammock that, until recently, were grazed by cattle. The Crevasse property also includes large areas of mesic hammock that were fenced and used for raising various species of deer in the past. Gradual recovery of the understory is expected in these areas. As with the upland hardwood forest, the loss of the red bays (*Persea borbonia*) due to laurel wilt disease will have a large impact on the mesic hammocks. The condition of the mesic hammocks range from poor to good, with nearly all of them affected to some extent by past cattle grazing or agriculture.

General management measures: As with the upland hardwood forest, invasive exotic plants and feral hogs are the primary management concern. Interior fences on the Crevasse Addition will be removed to allow natural movement of wildlife through the property. Remaining pasture areas will not be burned in the areas identified as mesic hammock to allow native species to recolonize these areas.

SANDHILL

Desired future condition: Dominant pines will usually be longleaf pine (*Pinus palustris*). Herbaceous cover is 80 percent or greater, typically of wiregrass (*Aristida beyrichiana*), and is less than 3 feet in height. In addition to groundcover and pines characteristics, there will be scattered individual trees, clumps, or ridges of onsite oak species (usually turkey oaks (*Quercus laevis*), sand post oak (*Quercus margaretta*), and blue-jack oak (*Quercus incana*)). In old growth conditions, Sand post oaks are commonly 150-200 years old, and some turkey oaks are over 100 years old. The Optimal Fire Return Interval for this community is 2-3 years.

Description and assessment: Remnant sandhills can still be found north of the park boundary. Most of this community type within the park and in the surrounding areas was cleared of virtually all of the valuable longleaf pines and converted to improved pasture or another form of agriculture. These conversions likely took place early in the

20th century or even in the 1800s. Exclusion of fire in sandhills results in succession to xeric hammock and upland hardwood forest. Only relict examples of typical sandhill species remain today.

In many cases sandhill grades into upland pine and upland mixed woodland, which often act like an ecotone between the flammable sandhill and the fire-intolerant hardwoods of true upland hardwood forest. In natural situations, the line between sandhill and upland pine and upland mixed woodland is influenced by the local fire regime and may be difficult to discern. Within the park, there has been an almost complete loss of native sandhill, upland pine, and upland mixed woodland indicator species, further blurring the distinction between these areas. Based upon early surveyors' notes, it appears that most of the sandhills were located to the north of the park, outside the park boundary with upland pine and upland mixed woodland lying within the boundary.

The limited sandhills on the south side of the park were impacted by an outbreak of southern pine beetles in the summer and fall of 2001. Much of this area was dominated by loblolly pines. These loblolly stands were logged in an effort to limit the expansion of the outbreak. The sandhills within the park are considered to be in generally poor condition.

General management measures: Restoration of the areas impacted by the southern pine beetle outbreak will require additional replanting with longleaf pines as well as groundcover restoration and hardwood control. For restoration efforts to be successful in the improved pasture areas that were once sandhill, replantings with longleaf pines and native groundcover species will have to be accompanied by measures to control or remove the exotic grasses. In the meantime, these areas will continue to be managed with prescribed fire. As with the previous two community types, more research is needed on conversion of pasture grasses to native groundcovers.

SCRUBBY FLATWOODS

Desired future condition: Dominant tree species of the interior will usually be longleaf pine (*Pinus palustris*). Mature sand pines (*Pinus clausa*) will typically not be present. There will be a diverse shrubby understory often with patches of bare white sand. A scrub-type oak "canopy" will vary in height from 3 – 8 feet and there will be a variety of oak age classes/heights across the landscape. Dominant shrubs include sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), saw palmetto (*Serenoa repens*), rusty staggerbush (*Lyonia ferruginea*), and tarflower (*Bejaria racemosa*). Cover by herbaceous species is often well below 40 percent. The Optimal Fire Return Interval for this community is regionally variable. Areas may be burned as frequently as every 3-8 years when burn prescriptions are designed to achieve a mosaic of burned and unburned areas.

Description and assessment: Scrubby flatwoods occur on the south side of the park near Micanopy and on the Jerevan Addition in the northeast corner of the park. This community's pine canopy has largely disappeared. The scrubby flatwoods along I-75 and in portions of the Jerevan Addition are typical of the community. These patches are dominated by characteristic species of scrubby oaks and lyonias. The absence of fire has resulted in the understory shrubs growing to approach tree size in localized patches found east of U.S. 441 and in parts of the Jerevan Addition. Sand live oak and staggerbush dominate these areas. The scrubby flatwoods are in fair condition, primarily due to lack of fire.

Within Alachua County, scrubby flatwoods is a relatively rare community type. Although these isolated patches are too small and discontinuous to support many scrub or scrubby flatwoods endemics, gopher tortoises (*Gopherus polyphemus*) and possibly Florida mice (*Podomys floridanus*) may be found in these areas. Florida mice historically occurred in sandhills outside the park boundary west of Newnans Lake. Park and District staffs have unsuccessfully surveyed the Jerevan scrubby flatwoods for Florida mice.

General management measures: Restoration to a more characteristic scrubby flatwoods community using prescribed fire alone would require sufficient build-up of leaf litter to fuel an intense fire. Girdling of larger oaks and mechanical preparation will be required to speed restoration by lowering the fuel structure and opening the closed canopy before burning.

SINKHOLE

Desired future condition: Sinkholes are characteristically cylindrical or conical depressions with limestone or sand walls. Sinkholes do not contain standing water for long periods as do Sinkhole Lakes. Depending upon the age of the sinkhole, the vegetation of sandy sinkholes may represent a well-developed forest including southern magnolia (*Magnolia grandiflora*), sweetgum (*Liquidambar styraciflua*), wax myrtle (*Myrica cerifera*), grape vines (*Vitis* spp.), Virginia creeper (*Parthenocissus quinquefolia*), water oak (*Quercus nigra*) and pignut hickory (*Carya glabra*). Sinkholes with vertical limestone walls may be covered by a variety of mosses, liverworts, ferns and small herbs. Sinkholes will generally have a very moist microclimate due to seepage and being buffered by the lower elevation and a tree canopy. Desired future conditions include limiting unnatural erosion and protecting the microlimate from disturbance.

Description and assessment: Solution of the limestone underlying Paynes Prairie Preserve State Park has resulted in the formation of numerous sinkholes along the prairie rim. This process continues today and is most active on the north rim of Paynes Prairie. The uplands along the north rim are pockmarked with sinkholes that appear to follow weaknesses or fracture planes in the underlying limestone layers. The greatest concentration of active sinkholes occurs in the hammock north and east of Alachua Sink.

Although the sinks are in generally good condition, a number of problems exist. Trash still clutters some of the sinkholes, while exotic plants are a problem in others. The condition of the sinkholes in the Alachua Sink Hammock varies from highly disturbed to pristine. The most disturbed sinkhole is located along the Gainesville to Hawthorne Trail bypass within the power line right-of-way. It contains a concrete drainage structure designed to mediate the flow of runoff from the trail into the sinkhole. To the north of the trail, the chain of sinkholes continues relatively unbroken to the northern boundary of the park, while to the south the sinkhole complex extends to Alachua Sink itself. Several of the sinkholes have been colonized by exotic plant species such as coral ardisia (*Ardisia crenata*) and small-leaf spiderwort (*Tradescantia fluminensis*). Some of the sinkholes adjacent to the Gainesville to Hawthorne Trail or along the abandoned railroad bed have received untreated runoff from the trail or bed surface during periods of heavy rainfall, resulting in increased siltation and accelerated slope erosion. Several of the sinkholes have been subjected to increased foot traffic since the trail opened. The park maintains a narrow ranger-guided hiking trail within the Alachua Sink Hammock that passes through the sinkhole field. Although the hiking trail has relatively little impact on the sinks due to the limited access, bicyclists have been documented leaving the Gainesville to Hawthorne Trail, illegally entering these fragile areas and using the hiking trail as an off road bike trail. Although all of these sinkholes are considered restricted areas due to their sensitivity, they are attractive sites for exploration and as a result can be expected to receive impacts from unauthorized visitor access. The sinkholes within the park range from fair to excellent condition.

General management measures: Protection of the sinkholes from unauthorized foot and bicycle traffic and from stormwater runoff and erosion are the primary management measures. Mapping and monitoring of the sinkholes has been an ongoing process for many years. Light detection and ranging (LIDAR) data obtained from Alachua County has allowed highly accurate GIS mapping of the sinkholes within the upland hardwood forests utilizing 1-foot topographic contour intervals.

UPLAND HARDWOOD FOREST

Desired future condition: Upland hardwoods forests are mature, closed canopy hardwood forests typically occurring on slopes and rolling hills with generally mesic conditions. Overstory tree species may consist of southern magnolia (*Magnolia grandiflora*), pignut hickory (*Carya glabra*), sweetgum (*Liquidambar styraciflua*), live oak (*Quercus virginiana*), laurel oak (*Quercus laurifolia*), Florida maple (*Acer saccharinuum* subsp. f*loridanum*), spruce pine (*Pinus glabra*) and swamp chestnut oak (*Quercus michauxii*). Understory species will include trees and shrubs such as American holly (*Ilex opaca*), flowering dogwood (*Cornus florida*), eastern hophornbeam (*Ostrya virginiana*), American hornbeam (*Carpinus caroliniana*), eastern redbud (*Cercis* *canadensis*), red bay (*Persea borbonia*), horse sugar (*Symplocos tinctoria*), and beautyberry (*Callicarpa americana*). Ground cover will comprise of shade tolerant herbaceous species, sedges and vines.

Description and assessment: Upland hardwood forest is an important upland community in the park, particularly on the North Rim. Some examples of this forest type are undoubtedly the result of succession from upland pine, upland mixed woodland or xeric hammock. During its history, the upland hardwood forest has endured varying levels of disturbance from human occupation of the region. Consequently, the forest ranges in age from early successional stages to relatively mature examples.

North of Alachua Sink where limestone is very close to the surface, pines are largely absent. The underlying karst geology heavily influences this hammock; many sinkholes and limestone outcrops are present. Certain plant species, including the endangered silver buckthorn (*Sideroxylon alachuense*) and Godfrey's swamp privet (*Forestiera godfreyi*) occur in this hammock and in few other places due to the strong limestone presence in the soils. The Alachua Sink Hammock also contains numerous southern soapberry trees (*Sapindus saponaria*) including a former National Champion. This example of upland hardwood forest is one of the most diverse within the park and does not appear as disturbed as many of the other examples. The description offered by William Bartram in the spring of 1774 is remarkably similar (Harper 1958). The description even describes "Orange trees of remarkable magnitude and very fruitful" (Harper 1958:130). Trifoliate orange (*Poncirus trifoliata*), a common rootstock for citrus trees, still occurs scattered throughout this hammock and in many other locations around the prairie rim. First introduced by the Spanish, citrus has long been associated with agricultural pursuits at Paynes Prairie.

The unique setting of this hammock and its unusual underlying geology make it an exceptional community for the area, despite the human alterations of the past. Unfortunately, the abandoned railroad bed corridor causes fragmentation of the hammock, diminishing its ecological value. For example, the corridor serves as an invasion route for exotic plants such as chinaberry (*Melia azedarach*), coral ardisia and camphortree (*Cinnamomum camphora*). In addition, the linear nature of the disturbance allows grassland animal species such as the cowbird (*Molothrus ater*), a nest parasite of forest birds, to intrude deeper into hammock areas and to impact significantly greater numbers of nesting songbirds.

Large areas of upland hardwood forest near the rim of the prairie were probably affected by the continuous influence of exotic grazing animals from the late 1600s to the early 1970s. Much of the upland hardwood forest community was cleared for agricultural purposes in the past, including large areas that were converted to improved pasture. Most of these areas have resisted natural succession due to a thick ground cover composed mainly of exotic grasses and may be classified as abandoned pasture. Other areas undergoing succession may be classified as successional hardwood forest. Cattle grazing and selective cutting have also occurred in most areas, affecting the structure and diversity of the community. Southern magnolias were regularly harvested for the manufacture of crates in Micanopy. More recently, the arrival of laurel wilt disease has caused the loss of the majority of the adult red bay trees within the park. First affecting the southern end of the park, the disease reached the north rim and the Alachua Sink Hammock in 2010. Typically this disease kills all or nearly all adult red bay trees over 4" dbh and results in a shift in species composition in hardwood forests (Shields et al. 2011). Depending on their land-use history, the upland hardwood forests at Paynes Prairie range from poor to excellent condition.

General management measures: Upland hardwood forests typically require little active management. The main concern in this community type at Paynes Prairie is the control of invasive exotic plant species. Coral ardisia is a persistent problem that has been the target of concentrated control efforts in the North Rim area. Other species, such as the small-leaf spiderwort, are more difficult to control and remain a significant threat. Feral hogs (*Sus scrofa*) may also be a threat to upland hardwood forests.

UPLAND MIXED WOODLAND

Desired future condition: Dominant tree species will include longleaf pine (*Pinus palustris*), southern red oak (*Quercus falcata*), sand post oak (*Quercus margaretta*), and mockernut hickory (*Carya alba*). Hardwood tree species are frequently dominant or co-dominant with pines (*Pinus* spp.). Flowering dogwoods (*Cornus florida*) and pignut hickory (*Carya glabra*) may be present. Subcanopy species include sparkleberry (*Vaccinium arboretum*), and rusty blackhaw (*Viburnum rufidulum*). Percent herbaceous cover will be comparable to sandhill and is 3-4 feet in height during spring and summer. In some areas, grasses and forbs may reach heights of 6-8 feet or more during the fall (due to blooming of taller grass species such as yellow indiangrass (*Sorghastrum nutans*), silver plumegrass (*Saccharum alopecuroides*), and big bluestem (*Andropogon gerardii*)). In old growth conditions, oaks and hickories are commonly 150-200 years old. The Optimal Fire Return Interval for this community is 2-5 years, depending on adjacent natural communities.

Description and assessment: Upland mixed woodland often acts as a transition zone between upland pine or sandhill and adjacent upland hardwood forests or mesic hammocks. Like upland pine, upland mixed woodland is a fire-adapted community dominated by longleaf pine with scattered southern red oak, and mockernut hickory. However, upland mixed woodland typically lacks wiregrass as a dominant groundcover, and the oaks and hickories may be co-dominant with the longleaf pines. Unfortunately, the richer soils of these longleaf forests made them more desirable for agricultural pursuits. Being a transitional community, upland mixed woodland is also very susceptible to succession to upland hardwood forest when there is a lack of fire. As a result, very few intact examples of upland mixed woodland exist in north central Florida.

Surveyors' records obtained from the General Land Office (GLO) Early Records (http://data.labins.org/2003/SurveyData/LandRecords/GLO/index.cfm) from surveys conducted in the first half of the 19th century give details concerning the vegetation encountered along section lines and the tree species used for witness trees at section corners. Surveyors distinguished between various types of hardwoods and pine lands. Pine lands were usually characterized as either flat with or without palmetto which were flatwoods or rolling or wavy with blackjack (turkey oaks) being sandhills. The surveyors' notes also refer to "oaks and hickories" as being distinct from "hammocks." Given the location and soil types of the areas described as "oaks and hickories," it is likely that these areas were what we now refer to as upland mixed woodland. The term "hammocks" seems to apply to both upland hardwood forest, and to mesic hammock closer to the rim of Paynes Prairie.

With very few exceptions, nearly all of the indicator species for upland mixed woodland and upland pine have been extirpated from these sites within the park due to a long history of agriculture and cattle production. Most of the areas that were once upland mixed woodland were eventually converted to improved pastures after a long history of agriculture and free ranging cattle. It is known from the early surveyors' records, and from comments by William Bartram, that true sandhills were located some distance north of the current park boundary, and that a thick band of hardwoods rimmed the prairie basin. Between these extremes was a broad transition zone of upland pine and upland mixed woodland. Two isolated patches of upland mixed woodland (or possibly upland pine) occur within the pastures of the north rim. These contain mature southern red oaks, mockernut hickories and longleaf pines along with scattered herbaceous and other woody remnants. Unfortunately, these areas suffer from long-term fire exclusion and the natural groundcover species have been lost from shading by invasive laurel oaks or replaced by muscadine (*Vitis rotundifolia*) grapevines.

At the south end of the park, very few survey data are available describing the vegetation types, so the existence of upland mixed woodland and upland pine are more difficult to discern. Like the north rim of the park, most of the upland longleaf sites were cleared for agriculture or cattle prior to the advent of aerial photography in the 1930s. The upland mixed woodland in the park is considered to be in poor condition.

General management measures: The areas designated as upland mixed woodland will be restored to the extent possible. In most cases, the removal of bahiagrass (*Paspalum notatum*) pastures and complete restoration of native groundcover would be required to effect restoration. Initial steps will include small-scale removal of the exotic pasture grasses and replanting of longleaf pines, southern red oaks and mockernut hickories. Since wiregrass is typically not a dominant species in upland mixed woodland, groundcover restoration will have to focus on other, unfortunately less available species. Given these constraints and the financial costs associated with complete restoration, restoration of former improved pastures to upland mixed woodland will not be a high priority. However, these areas will continue to be treated with prescribed fire at intervals appropriate for upland mixed woodland. Additional research is needed on effective methods for removal of pasture grasses, control of native and exotic weeds, and establishment of native groundcovers in upland mixed woodland restoration areas.

UPLAND PINE

Desired future condition: Dominant tree species will usually be longleaf pine (*Pinus palustris*). An intermittent subcanopy of smaller hardwood trees will be scattered throughout (usually southern red oak (*Quercus falcata*), sand post oak (*Quercus margaretta*), mockernut hickory (*Carya alba*), flowering dogwood (*Cornus florida*), bluejack oak (*Quercus incana*), and sassafras (*Sassafras albidum*). In old growth conditions, oak trees and hickories are commonly 150-200 years old. Herbaceous cover will be less than 3 feet in height and is comparable to sandhill, but may have a higher density of understory shrubs and saplings. Groundcover may be dominated by wiregrass (*Aristida stricta* var. *beyrichiana*), with little bluestem (*Schizachyrium scoparium*), broomsedge bluestem (*Andropogon virginicus*), and indiangrass (*Sorghastrum* spp.). Other typical forbs include narrowleaf silkgrass (*Pityopsis graminifolia*), bracken fern (*Pteridium aquilinum*), goldenrod (*Solidago* spp.), squarehead (*Tetragonotheca helianthoides*), soft greeneyes (*Berlandiera pumila*), and yellow jessamine (*Gelsemium sempervirens*). The Optimal Fire Return Interval for this community is 2-3 years.

Description and assessment: Soil types indicate this community probably once covered a much more extensive area on the north side of the park. Conversion to improved pasture removed most indicators of upland pine. Early land surveys of Florida documented vegetation types along section line surveys. These early surveyors' notes clearly note the presence of upland pine species north of the prairie rim and document the transitions between open sandhills; upland pine/upland mixed woodland and upland hardwood forests/mesic hammocks along section and Spanish grant lines. Surveys conducted by Washington and Burr in 1845-46 cover most of the park, with some surveys dating back to the 1830s or before.

As with other communities within the park, much of the upland pine was cleared at some point in time and eventually converted to improved pasture. Virtually all the longleaf pines were timbered. Only relict individuals of typical upland pine species remain today (particularly southern red oak). Abandoned agricultural fields rapidly succeed to thickets of laurel oaks, water oaks and sweetgums, and eventually to a successional hardwood forest or xeric hammock. Areas that were converted to improved pasture are more resistant to successional changes. Natural recolonization and invasion by offsite hardwoods are very slow due to the thick sod dominated by exotic grasses such as bahiagrass and pangola (*Digitaria eriantha*).

Several degraded upland pine areas on the south side of the park were impacted by an outbreak of southern pine beetles in the summer and fall of 2001. Many of these areas were dominated by loblolly pines and were logged in an effort to limit the expansion of the outbreak. Upland pine within the park is considered to be in poor condition.

General management measures: As is the case with upland mixed woodland, restoration of the diverse groundcover that is typical of upland pine is a difficult and expensive task. Restoration of longleaf pines and hardwoods typical of upland pine can be accomplished along with limited removal of exotic pasture grasses. Treating the upland pine areas with prescribed fire with a fire return interval typical of upland pine will help restoration efforts by reducing competition from offsite hardwoods and promoting any remnant species that may remain on site. More research is needed on effective methods for removal of pasture grasses, control of native and exotic weeds, and establishment of native groundcovers in upland pine restoration areas.

WET FLATWOODS

Desired future condition: Depending on the region of the state, dominant pines will usually be longleaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), pond pine (*Pinus serotina*), and/or loblolly pine (*Pinus taeda*). Pond cypress (*Taxodium ascendens*) may reach the canopy in some locations. The canopy will be open, with pines being widely scattered and of at least three age classes. The subcanopy may include scattered sweetbay (*Magnolia virginiana*), swamp bay (*Persea palustris*) and loblolly bay (*Gordonia lasianthus*). Native herbaceous cover is at least 80 percent. Pitcherplants (*Sarracenia* spp.) and other plants such as terrestrial orchids may be present and abundant in some areas. Common shrubs will include fetterbush (*Lyonia lucida*), large gallberry (*Ilex coriacea*), titi (*Cyrilla racemiflora*), and wax myrtle (*Myrica cerifera*). The Optimal Fire Return Interval for this community is 2-4 years.

Description and assessment: Wet flatwoods occur within a mosaic of mesic flatwoods and baygalls on the south side of the park near Micanopy. Usually dominated by pond pine, wet flatwoods tend to be less well drained and more prone to shallow flooding than the adjacent slash and longleaf pine dominated mesic flatwoods. William Bartram passed through wet flatwoods between Tuscawilla Lake and Paynes Prairie in 1774, describing it as "a level, grassy plain, interspersed with low, spreading, three-leaved Pine-trees, large patches of low shrubs…" (Harper 1958:119). He describes the area as "savanna or bay-gale" (Harper 1958:119). Portions of this area maintain a similar aspect today.

Wet flatwoods are defined and maintained by both the hydrologic and fire regimes. Both of these have been altered within the park through ditching, road building and timber operations. The wet flatwoods are in poor to fair shape due to intermittent burning and past land use practices. The wet flatwoods between U.S. 441 and I-75 were heavily impacted by the southern pine beetle outbreak in 2001. Most of this area was logged in an effort to control the expansion of the outbreak. Natural regeneration of pond pines is occurring on site, and this area is in fair condition. Heavy fuel loads in this area and the proximity of two major highways has made burning very difficult and dangerous. Additional firebreaks have been created to allow smaller sections to be burned thereby increasing safety and lowering smoke production. As noted in the mesic flatwoods description, park staff will continue to work with the FFS to use safe methods of applying fire to these areas.

It is likely that the swamp bay trees in the wet flatwoods will be affected by the laurel wilt disease, and there will be a loss of adult swamp bays. In general, the wet flatwoods are in fair condition due to lack of frequent fire and impacts from southern pine beetles.

General management measures: Management of the wet flatwoods will concentrate on maintaining a natural fire regime in addition to restoring the natural hydrology wherever possible. The areas impacted by southern pine beetles may require additional restoration efforts including replanting of longleaf and pond pines where necessary and possibly groundcover restoration and hardwood control.

XERIC HAMMOCK

Desired future condition: Typically considered a late successional stage of scrub or sandhill that generally occurs in small isolated patches on excessively well drained soils. Vegetation will consist of a low closed canopy dominated by sand live oak (*Quercus geminata*) which provides shady conditions. Typical plant species may also include Chapman's oak (*Quercus chapmanii*), and laurel oak (*Quercus laurifolia*). Slash pine or longleaf pine (*Pinus elliottii, Pinus palustris*, respectively) may also be a minor component. Understory of species will include saw palmetto (*Serenoa repens*), fetterbush (*Lyonia lucida*), rusty staggerbush (*Lyonia ferruginea*), myrtle oak (*Quercus myrtifolia*), yaupon holly (*Ilex vomitoria*), Hercules' club (*Zanthoxylum clava-herculis*), and Florida rosemary (*Ceratiola ericoides*). A sparse groundcover layer of wiregrass (*Aristida stricta*) and other herbaceous species may exist but will typically be absent. A continuous leaf litter layer may be present. Overgrown scrub in need of fire and/or mechanical treatment should not be confused with true xeric hammock.

Description and assessment: Xeric hammocks occur primarily in the uplands to the north of the basin. Here, the canopy is fairly open and dominated by sand live oaks, while the understory is moderately thick, with rusty lyonia and scrub oaks predominant. Many of these areas were probably once scrubby flatwoods or sandhills that have suffered from long-term fire exclusion. Some of the xeric hammock of the park has suffered disturbance in the past, specifically, clearing of the understory by livestock or machinery. The xeric hammocks are in fair to good condition.

General management measures: True xeric hammocks require relatively little active management. Most of the xeric hammocks at Paynes Prairie are of anthropogenic origin, usually due to fire exclusion. In some cases, restoration to a fire-adapted natural community type may be warranted.

ALLUVIAL FOREST

Desired future condition: Alluvial forest is a seasonally flooded, closed canopy, hardwood forest that occurs on ridges or slight elevations within the floodplain of rivers. Typical overstory trees may include overcup oak, water hickory (*Carya aquatica*), American elm (*Ulmus americana*), laurel oak (*Quercus laurifolia*), and red maple (*Acer rubrum*). Understory species may include swamp dogwood (*Cornus foemina*), and willow species (*Salix* sp.). Presence of groundcover will be variable. Species such as netted chain fern (*Woodwardia areolata*) and other shade tolerant herbaceous species may be present.

Description and assessment: Alluvial forest is found in limited areas within the park, occurring along the upland course of Sweetwater Branch and along Prairie Creek. The Sweetwater Branch area is one of the most adversely impacted by human activity in the park. Exotic plants such as the air-potato (*Dioscorea bulbifera*) and Chinese tallowtree (*Sapium sebiferum*) are now widespread in this community. The Sweetwater Branch area is considered to be in poor condition. The alluvial forest along Prairie Creek has been altered hydrologically by the construction of tram roads and a powerline. Past logging activities have also caused changes. Revegetation of the some of this area with laurel oak, loblolly pine and sweetgum has created an uncharacteristic flora. This area is considered to be in fair to good condition with the higher quality examples found on the Crevasse Addition.

General management measures: Maintenance of the natural flooding cycles of Prairie Creek will help restore the alluvial forest areas that have been disturbed in that area. The Sweetwater Branch area will require significantly more effort. Portions of the alluvial forest may be included in the Sweetwater Branch / Paynes Prairie Sheetflow Restoration Project.

BASIN MARSH

Desired future condition: Emergent herbaceous and low shrub species are dominant over most of the area, and there will be an open vista. Trees are few and if present occur primarily in the deeper portions of the community. There is little accumulation of dead grassy fuels due to frequent burning; one can often see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in basin marsh will include maidencane (*Panicum hemitomon*), pickerel weed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastalplain willow (*Salix caroliniana*). During droughts, exposed marsh and marsh lake may be colonized by large native weedy species such as southern amaranth (*Amaranthus australis*) and dogfennel (*Eupatorium capillifolium*). The lake bottom variant of basin marsh also typically includes flatsedges (*Cyperus strigosus*), willow-herb (*Decodon verticillatus*), smallfruit beggarticks (*Bidens mitis*), and swamp smartweed (*Polygonum hydropiperoides*) in the emergent zone. The higher grassy areas include southern cutgrass (*Leersia hexandra*) and soft rush (*Juncus effusus*). Floating mats of detached peat from the lake bottom are dominated by floating marshpennywort (*Hydrocotyle ranunculoides*) and frog's-bit (*Limnobium spongia*). The Optimal Fire Return Interval for this community is 2-20 years depending on fire frequency of adjacent communities and the degree of flooding.

Description and assessment: The area covered by this community generally varies on a seasonal cycle, at least to some degree. It also will expand and contract over long periods of drought and flood conditions. However, this system tends to lie below 60 to 64 feet msl within the Paynes Prairie basin. The species composition is relatively diverse, but species domination shifts with fluctuations in water level as well as with other environmental changes. Paynes Prairie is an example of the lake bottom variant of the basin marsh. The basin marsh alternates between lake and marsh depending on the amount of regional rainfall and the rate at which the basin drains through the Alachua Sink. In 1998 and again in 2004, Paynes Prairie filled and flooded nearly the entire basin.

The presence of privately owned lands within the basin restricts the effectiveness of resource management techniques such as water fluctuation and ecological burning. A legacy of the Camp Ranch period is the abundance of exotic grasses in the drier portions of this community. Dr. Larry White, who completed a study on the basin ecosystem in the mid 1970s, found that exotic grasses such as bahiagrass and vaseygrass (*Paspalum urvillei*) generally dominated the higher elevations (White n.d.). Native grasses, primarily maidencane and southern cutgrass, most often dominated the lower elevations. Dense stands of annual exotic legumes also inhabit upper portions of the basin marsh.

While it seemed likely that the high water events in 1998 and 2004 would have allowed the native grasses to become established on the more elevated portion of the basin, such was not the case. Areas that have been dominated by exotic grasses in the past appear to have remained in that state. Shrubs and trees, particularly wax myrtle and persimmon, were set back by the flooding events, but they are still increasingly invading the upper basin marsh. This situation is of great concern, especially on the western side of the basin where persimmon and other woody species are forming near-impenetrable thickets. The woody species not only shade out the herbaceous plants, but their root systems remove significant amounts of water from the soil, causing it to become much drier. As a result, the system is being converted from one that is dominated by grasses to one that is dominated by trees.

Two highways and the remaining portions of the dike and canal system interrupt the natural sheet flow regime of the basin. Transmission line rights-of-way cut across portions of the basin marsh. During periods of high water, effluent-laden water from

Sweetwater Branch flows over part of this community. The nutrient-enriched water has brought on unnatural changes in the vegetation. Silt also has been deposited on the basin, particularly during flood events when the stream brings in a large volume of eroded soil. These deposits also lead to changes in the vegetation as both substrate and water depths are modified.

Dikes provide the means for woody species, some of which are exotic, to invade the interior of the system. There is also concern that regional groundwater removals may contribute to lowering the local water table, especially under drought conditions. The artificially lowered water table would likely exacerbate the effect of the drought on the vegetation. Currently, most of the basin marsh in the prairie basin is judged to be still in good to fair condition; however, the portion that has been affected by the effluent and the silt is considered to be in poor condition.

Two smaller basin marshes also occur at the northeast end of the park. These are known as Trout Pond and Red Wolf Pond, and both contain open water marsh lakes. Both are in relatively good condition, however, Trout Pond has been impacted somewhat by a pair of short causeways built within the marsh on the eastern side. These were built presumably for access to open water. Trout Pond is also threatened with an invasion of Chinese tallowtree and potentially wild taro (*Colocasia esculenta*). A small stream flows into Trout Pond from private property to the north of the park boundary. This stream and its floodplain are lined with several invasive exotic species. Trout Pond has also been connected to Pike Pond via a ditch that likely transmits water during high water events. These areas are considered to be in fair condition.

General management measures: Restoration of the natural hydrology is a primary goal for Paynes Prairie, as detailed in the Hydrology sections of this management plan. Removal of additional dikes and filling of more canals will help restore sheetflow patterns on the basin itself, but most impacts occur outside the park boundary. The Sweetwater Branch / Paynes Prairie Sheetflow Restoration Project described elsewhere in this plan would greatly improve conditions in the basin marsh previously damaged in the Sweetwater system.

While hydrology may have the greatest impact on the basin marsh of the prairie basin, fire is also a natural process that has shaped the vegetative structure of the basin marsh. A combination of hydro-period manipulation and frequent prescribed fire will help maintain the herbaceous wetlands and discourage the expansion of woody species in the basin marsh. Where fire and flooding are not sufficient to remove woody species, mechanical or chemical treatments will be necessary. Improvement of the basin marsh natural community is discussed further in the Resource Management Program section of this plan.

BASIN SWAMP

Desired future condition: Basin swamps are forested basin wetlands that are highly variable in size, shape and species composition and will have an extended hydroperiod typically 200-300 days. While mixed species canopies are common, the dominant trees will be pond cypress (*Taxodium ascendens*) and swamp tupelo (*Nyssa sylvatica biflora*). Other canopy species can include slash pine (*Pinus elliottii*), red maple (*Acer rubrum*), dahoon holly (*Ilex cassine*), sweetbay (*Magnolia viginiana*), loblolly bay (*Gordonia lasianthus*), and sweetgum (*Liquidambar styraciflua*). Depending upon fire history and hydroperiod, the understory shrub component can be throughout or concentrated around the perimeter. Shrub species can include a variety of species including Virginia willow (*Itea virginica*), swamp dogwood (*Cornus foemina*), wax myrtle (*Myrica cerifera*), and titi (*Cyrilla racemiflora*). The herbaceous component is also variable and may include a wide variety of species such as maidencane (*Panicum hemitomon*), ferns, arrowheads (*Sagittaria* spp.), lizard's tail (*Saururus cernuus*), false nettle (*Boehmeria cylindrica*), and sphagnum moss (*Sphagnum* spp.). Soils will be typically acidic, nutrient poor peats often overlying a clay lens or other impervious layer.

Description and assessment: Basin swamps occur in several locations within the park and along the Gainesville to Hawthorne Trail. Some of these areas may actually be examples of fire-adapted communities that have suffered from long-term fire exclusion. The largest basin swamp occurs in a depression just north of Lake Wauberg. The major overstory species are now blackgum and red maple. In 1937 this area appeared to be an herbaceous wetland and clear of trees and woody shrubs. An abandoned logging tramway bisects this community and affects the natural hydrological regime. A basin swamp along the eastern rim of the prairie was probably once a depression marsh, but succession in the absence of frequent fire has allowed a basin swamp to develop. In the northeast corner of the prairie basin, north of Camp's Canal, a basin marsh system extended north from the main basin. The northern limits of this basin may have naturally been a basin swamp. Hydrological disturbances and the absence of frequent fire have allowed swamp tupelo, red maple, and other basin swamp species to dominate much of this area. Most of the basin swamps are in fair to good condition.

General management measures: Restoration and maintenance of basin swamps depend primarily on restoring and maintaining the natural hydrology and hydroperiod of the wetlands. Where serious perturbations have occurred to the natural hydrology, such as is the case with the diversion of flow from Prairie Creek into Camp's Canal, it will be difficult to maintain or restore some wetlands to their original condition. Some of the areas described as basin swamps may have historically been basin marshes; it may not be feasible to reverse that successional process. Prescribed fires will be used to maintain the ecotones around the basin swamps where they grade into fire-adapted communities.

BAYGALL

Desired future condition: Baygalls consist of wet densely forested, peat-filled depressions typically near the base of a slope. Seepage from adjacent uplands will maintain saturated conditions. Medium to tall trees will mainly consist of sweetbay (*Magnolia virginiana*), loblolly bay (*Gordonia lasianthus*), and/or swamp bay (*Persea palustris*), occasionally sparse pines (*Pinus* spp.) may also exist. A thick understory consisting of gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), dahoon (*Ilex cassine*), titi (*Cyrilla racemiflora*), and red maple (*Acer rubrum*) is typical with climbing vines such as greenbriar (*Smilax* spp.) and muscadine grape (*Vitis* spp.) is usually abundant. The Optimal Fire Return Interval for this community is 25-100 years. Frequent fires from adjacent communities should be allowed to enter baygall ecotone.

Description and assessment: Pockets of baygall community are scattered throughout the park. Many of these areas are associated with mesic and wet flatwoods located to the east and south of Lake Wauberg. Baygalls also occur along the rim of the prairie where seepage from upslope saturates the soils. Although most baygalls are dominated by bays and gums, one in particular located north of the Hickory Ranch shop complex is dominated by large cypress trees. An adjacent baygall is physically similar but is dominated by typical hardwoods. Some difference in fire regime or land use may have affected the dominant tree species in these areas.

The baygalls to the southeast have likely expanded into the flatwoods due to fire suppression before acquisition. Several have been burned through during the course of prescribed burns. Some of these baygalls dominated by hardwoods may have been wet flatwoods at one time. Some baygalls may have been impacted by ditching activities and a transmission line right-of-way cuts through several baygalls. Laurel wilt disease is expected to kill most of the larger swamp bays in the park's baygalls. In general, the baygalls are in fair to good condition.

General management measures: Restoration of natural drainage patterns affected by ditching may be necessary in some baygalls. Prescribed fires will be allowed to burn into the edges of the baygalls to maintain a natural ecotone. Under some conditions, fires may penetrate into or through baygalls.

BOTTOMLAND FOREST

Desired future condition: Bottomland forest is a low lying, mesic to hydric community prone to periodic flooding. Vegetation will consist of a mature closed canopy of deciduous and evergreen trees. Overstory species may consist of species such as sweetgum (*Liquidambar styraciflua)*, sweetbay *(Magnolia viginiana)*, loblolly bay (*Gordonia lasianthus*), water oak (*Quercus nigra*), live oak (*Quercus virginiana*), swamp chestnut oak (*Quercus michauxii*), loblolly pine (*pinus taeda*), and spruce pine (*Pinus glabra*). Red maple (*Acer rubrum*) and bald cypress (*Taxodium distichum*) may also be present. Under story may be open or dense. Understory species will typically include wax myrtle (*Myrica* *cerifera*), dwarf palmetto (*Sabal minor*), and swamp dogwood (*Cornus foemina*). Presence of groundcover is variable and may consist of witchgrass (*Dicanthelium* sp.) and various sedges (*Carex* spp.).

Description and assessment: Bottomland forest occurs along the edges of Lake Wauberg and Sawgrass Pond, and above the floodplain of Prairie Creek. The bottomland forest around Lake Wauberg and Sawgrass Pond is characterized by a dense, shrubby understory. The forest in the northeast corner, however, has an open understory with an abundant ground cover of ferns, herbs and grasses. The bottomland forests are generally in good condition.

General management measures: As with most natural communities that are influenced by water, maintenance of a natural hydroperiod is the primary management action needed for bottomland forest. Protection from the impacts of feral hogs, particularly along Prairie Creek, is also a concern.

DEPRESSION MARSH

Desired future condition: Emergent herbaceous and low shrub species will be dominant over most of the area with open vistas. Trees are few and if present, will occur primarily in the deeper portions of the community. There is little accumulation of dead grassy fuels due to frequent burning; one can often see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in depression marsh include maidencane (*Panicum hemitomon*), panic grasses (*Panicum* spp.), cutgrass (*Leersia* sp.), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort (*Hypericum fasciculatum*), and coastalplain willow (*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and assessment: Depression marshes are scattered throughout the park. In many cases, the distinction between depression and basin marshes is simply one of scale, with basin marshes being the larger of the two. Most of the depression marshes within the park are rapidly being invaded by woody vegetation due to the absence of fire and periodic drought conditions. Depending on water levels, depression marshes may be classified as flatwoods ponds if dominated by open water. Water levels can vary greatly in depression marshes, and many that periodically dry up completely are important breeding sites for amphibian species that cannot tolerate the presence of fish. The various depression marshes in the park vary from poor to good depending on the extent of hardwood succession and hydrological alterations.

General management measures: Prescribed burning of all the depression marshes is needed if succession to forested wetlands is to be prevented. Some may require mechanical or chemical control of hardwoods to allow fires to penetrate. Where the hydrology has been affected by ditching or berms, consideration will be given to restoring the natural hydrology.

DOME SWAMP

Desired future condition: Dome swamps are isolated, forested, depression wetlands occurring within a fire maintained matrix such as mesic flatwoods. The characteristic dome appearance is created by smaller trees that grow on the outer edge (shallower water and less peat) and the larger trees that grow in the interior. Pond cypress (*Taxodium ascendens*) will typically dominate, but swamp tupelo (*Nyssa sylvatica biflora*) may also form a pure stand or occur as a co-dominant. Other subcanopy species can include red maple (*Acer rubrum*), dahoon holly (*Ilex cassine*), swamp bay (*Persea palustris*), sweetbay (*Magnolia viginiana*), and loblolly bay (*Gordonia lasianthus*). Shrubs can be absent to moderate (a function of fire frequency) and can include Virginia willow (*Itea virginica*), fetterbush (*Lyonia lucida*), buttonbush (*Cephalanthus occidentalis*), wax myrtle (*Myrica cerifera*), and titi (*Cyrilla racemiflora*). An herbaceous component can range from absent to dense and include ferns, maidencane (*Panicum hemitomon*), sawgrass (*Cladium jamaicense*), sedges, lizards tail (*Saururus cernuus*), and sphagnum moss (*Sphagnum* spp.). Vines and epiphytes will be commonly found. Maintaining the appropriate hydrology and fire frequency is critical for preserving the structure and species composition of the community. Dome swamps should be allowed to burn on the same frequency as the adjacent fire type community, allowing fires to naturally burn across ecotones. Fires should be appropriately planned to avoid high severity fuel consumption within the dome swamp. The Optimal Fire Return Interval for this community is 2-10 years.

Description and assessment: Scattered domes have developed in karst regions along the prairie rim. Most of these domes lack their cypress component because of selective cutting and fire exclusion in the past. Bays are dominating some of the domes. The recent arrival of the laurel wilt fungus in Alachua County is decimating the swamp and red bays within the park. The result will be a loss of all but the smallest swamp bays within the dome communities. The domes are in fair to good condition.

General management measures: Maintenance or restoration of the natural hydrology is the most important management measure for these isolated wetlands. Allowing prescribed fires to penetrate the domes from the surrounding natural communities will also be an important management action to maintain these areas within the park.

FLOODPLAIN SWAMP

Desired future condition: Floodplain swamps are a frequently or permanently flooded community in low-lying areas along streams and rivers. Soils will consist of a mixture of sand, organics and alluvial materials. Closed canopy will typically be dominated by bald cypress (*Taxodium distichum*) but commonly includes tupelo species (*Nyssa* spp.) as well as water hickory (*Carya aquatica*), red maple (*Acer rubrum*) and overcup oak

(*Quercus lyrata*). Trees bases are typically buttressed. Understory and groundcover will be typically sparse.

Description and assessment: Floodplain swamp is primarily located in the Prairie Creek drainage system. The hydroperiod affecting this community was modified somewhat by diversion of the creek in the 1920s. A high dike paralleling Camp's Canal cuts through a portion of the floodplain swamp. Additional floodplain swamp associated with Prairie Creek was acquired with the Crevasse Addition. Some of these examples may have been basin marsh prior to the diversion of Prairie Creek. Increases in cypress trees along Prairie Creek since the 1930s have caused these once open herbaceous wetlands to transition into floodplain swamp. The floodplain swamps are mostly in good condition along the upper portions of Prairie Creek and in fair condition in the lower stretch of the creek.

General management measures: Where serious perturbations have occurred to the natural hydrology, such as is the case with the diversion of flow from Prairie Creek into Camp’s Canal, it will be difficult to maintain or restore some wetlands to their original condition. To the extent possible, the natural hydrology should be restored and maintained.

HYDRIC HAMMOCK

Desired future condition: Hydric hammock is a closed canopy, evergreen hardwood and/or palm forest with a variable understory dominated by palms, with sparse to moderate ground cover of grasses and ferns. Typical canopy species will include laurel oak (*Quercus laurifolia*), cabbage palm (*Sabal palmetto*), live oak (*Quercus virginiana*), sweetbay (*Magnolia viginiana*), swamp tupelo (*Nyssa sylvatica biflora*), American elm (*Ulmus americana*), red maple (*Acer rubrum*) and other hydrophytic tree species. Soils are poorly drained, with a normal hydroperiod seldom over 60 days per year. Hydric hammock should occasionally burn by allowing fires to naturally burn across ecotones from fires originating in adjacent upland natural communities.

Description and assessment: This community is found in the bottoms of the broad ravine-like depressions and the small circular depressions that are widely scattered along the prairie rim. In many cases, this community is difficult to distinguish from baygall at the wetter end of the spectrum, and upland hardwood forest or mesic hammock at the dryer end. Many of these hydric hammock areas are currently mapped within upland hardwood forest or mesic hammock until better resolution can be obtained using GPS technology to map these areas accurately. The hydric hammock areas are mostly in good condition.

General management measures: Maintenance of natural hydroperiods is important for hydric hammocks. Allowing prescribed fires to burn into the edges from adjacent fire-adapted communities will help maintain natural ecotones.

CLASTIC UPLAND LAKE

Desired future condition: These lakes are shallow to deep, irregularly shaped depressions or basins in upland areas with clay substrates, usually lacking significant outflows. Typical vegetation can vary significantly. Emergent shoreline vegetation may include common buttonbush (*Cephalanthus occidentalis*), Virginia willow (*Itea virginica*), wax myrtle (*Myrica cerifera*), St. John's wort (*Hypericum* spp.) and elderberry (*Sambucus nigra* ssp. *canadensis*). The shoreline may be dominated by herbaceous species instead, including various sedges (*Cyperus* spp.), grasses (Poaceae) and rushes (*Juncus* spp.). Others may be surrounded by hydrophytic trees. Shallow areas may have concentric bands vegetation including pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* spp.), yellow waterlily (*Nymphaea mexicana*), pondlilies (*Nuphar* spp.), and white waterlily (*Nymphaea odorata*), along with submerged aquatics. These lakes typically have fish and various reptile and amphibian species that are adapted to semi-permanent waterbodies.

Description and assessment: Clastic upland lakes lying partially or wholly within the park include Lake Wauberg, Melton's Pond and Chacala Pond. The western and southern portions of Lake Wauberg lie outside the park and are owned by the University of Florida and several private citizens. Melton's Pond, which lies perched on the north prairie rim near Persimmon Point, is entirely within the park. Chacala Pond, situated close to the southeastern corner of the prairie basin, is virtually all in private ownership. It receives inflow from the Sawgrass Pond-Lake Wauberg system by means of a small stream called Sawgrass Run. The clastic upland lakes are in fair to good condition.

Hydrilla (*Hydrilla verticillata*) occurs in Lake Wauberg, although not in extensive beds. Treatment was initiated with approved aquatic herbicides in the fall of 1983. The treatment was initially successful, but reinfestation has reoccurred.

General management measures: Protection of these lakes from contaminated stormwater runoff is an important management measure. These lakes are prone to becoming eutrophic if contaminated by fertilizers or other nutrient-rich runoff. The lakes must also be protected from hydrological manipulations, such as ditches or canals that might lower local water tables.

MARSH LAKE

Desired future condition: Marsh lakes are often associated with depression marshes, which are characterized as shallow, generally round or elliptical depressions, vegetated with concentric bands of aquatic vegetation. Depending upon the depth and slope of the depression, an open water zone, with or without floating plants, may occur at the center. The open water zone is considered a marsh lake if it is small in comparison to the surrounding marsh. Otherwise, the system is considered a flatwoods lake or a prairie lake, depending upon the surrounding community. The hydrosoil will typically be acidic sand with some peat and occasionally a clay lens. Although water levels may fluctuate significantly, water is typically present year-round.

Description and assessment: The largest marsh lake in the park is Alachua Lake. Historically, Alachua Lake has fluctuated in size, depending mainly upon variation in rainfall, flow of streams into the basin, and the capacity of Alachua Sink to drain the basin. The maximum recorded size of the lake was attained in the 1871-1891 period when Alachua Sink was plugged and waters backed up to fill the entire basin. Lake level was reportedly about 64 feet msl. During the 1998, Alachua Lake reached nearly those levels, peaking at 61.4 feet msl in March. At that level, water began to enter the travel lanes of U.S. 441 within the basin.

A number of factors restrict the natural fluctuation of water levels in Alachua Lake. The diversion of Prairie Creek into Camp's Canal essentially removed the basin's primary water source, although the park now taps some of that flow. In dry years, the inflow is often insignificant due to the positioning of the water intake gates along Camp's Canal. A water control structure near Alachua Sink allows for some manipulation of water levels, but private ownership of portions of the basin and the two highways that cut across the basin preclude flooding to optimum levels. Finally, abnormal silting of Alachua Sink may have reduced the sink's capacity to drain the basin. Alachua Lake is considered to be in good condition.

Marsh lakes also occur in the northeast portion of the park in association with Red Wolf Pond and Trout Pond, both smaller basin marsh systems. These are considered to be in good condition.

General management measures: Maintenance or restoration of a natural hydrological regime is critical for management of these aquatic systems. The fluctuation of water levels is perhaps the most important management measure for the marsh lakes and surrounding basin marshes. The extreme highs and lows are more important than the averages when managing water levels. In general, the natural variation in regional precipitation will determine water levels. Restoration of the Sweetwater Branch sheetflow will likely affect water levels in the marsh lake on the prairie basin.

SINKHOLE LAKE

Desired future condition: Sinkhole lakes are relatively permanent and typically deep lakes characterized by clear water with a high mineral content formed in depressions within a limestone base. Vegetative cover may range from being completely absent, consist of a fringe of emergent species or be completely covered with floating plants. Typical plant species may include smartweed (*Polygonum hydropiperoides*), duckweed (*Lemna* spp.), bladderwort (*Utricularia* spp.), and rushes (*Juncus* spp.). Desired conditions include minimizing disturbances that cause unnatural erosion and minimizing pollution to the connected aquifer system.

Description and assessment: Alachua Sink is the park's only sinkhole lake of significant size. Unlike most sinkhole lakes, Alachua Sink receives abundant surface inflow. Outflow is through subterranean channels to the aquifer below. Bathymetric measurements of the active portion of the sink indicate that the depth is greater than -75 feet NGVD, which is over 120 feet below normal surface water levels (Ritter 1991). Water quality in Alachua Sink is degraded by nutrient enriched and silt-laden water from Sweetwater Branch. Excessive siltation of the sink could result in partial blockage of its outlet channels, thereby diminishing its capacity to drain the basin. Pollutants could eventually find their way to the Floridan aquifer that serves as the source of drinking water for the Gainesville area. Water-hyacinths (*Eichhornia crassipes*) occur in Alachua Sink, but at present, their density is low and they seem to be under natural control. Severe infestations such as those that occurred during cattle ranching days are no longer common. The Alachua Sink is considered to be in fair condition due to water quality concerns.

Numerous other sinkhole lakes occur within the Alachua Sink Hammock. Depending on the depth of the sinkhole and the current level of the aquifer, certain sinkholes within the sinkhole field northeast of the Alachua Sink hold water for varying periods of time. Most of these sinkhole lakes are considered to be in good condition.

General management measures: Sinkholes and sinkhole lakes must both be protected from unnatural levels of erosion. By their very nature, sinkholes are eroding features, and high levels of erosion can affect the water quality of sinkhole lakes. Foot and bicycle traffic can cause damage and increased erosion on the sides of sinkholes and sinkhole lakes, so it is important to restrict access to these sensitive features.

BLACKWATER STREAM

Desired future condition: Blackwater streams are characterized as perennial or intermittent watercourses originating in lowlands where extensive wetlands with organic soils collect rainfall and runoff, discharging it slowly to the stream. The stained waters are laden with tannins, particulates, and dissolved organic matter derived from drainage through adjacent swamps resulting in sandy bottoms overlain by organic matter. Emergent and floating vegetation (including golden club (*Orontium aquaticum*), smartweeds (*Polygonum* spp.), grasses and sedges) may occur but is often limited by steep banks and dramatic seasonal fluctuations in water levels. Desired conditions include minimizing disturbance and alterations and preserving adjacent natural communities.

Description and assessment: Prairie Creek is a blackwater stream that runs through the northeastern edge of the park. Prairie Creek once flowed unimpeded from Newnans Lake across the Paynes Prairie basin and into Alachua Lake. The construction of Camp's Canal and Dike diverted the flow away from Paynes Prairie towards Orange Lake via the River Styx. Portions of the upper section of the creek near its source at Newnans

Lake are privately owned. The natural hydroperiods of the creek were historically disrupted by the presence of a weir located just below Newnans Lake. The weir was removed in 1999. The park manages land leased from the St. Johns River Water Management District that includes both banks of Prairie Creek on the south side of State Road 20. The Crevasse Addition includes an additional 1.7 miles of Prairie Creek. Prairie Creek suffers from the same water quality issues that plague its source, Newnans Lake. The construction of Camp's Canal removed the flow from two to three miles of Prairie Creek within the prairie basin. The condition of Prairie Creek is considered poor to fair.

Dog Branch originates from several basin swamps and flows onto the prairie basin just east of Bolen Bluff. One of the headwaters and a section of the stream that flows through uplands were recently added to the park with the Edwards Addition. Another blackwater stream, Lochloosa Creek, flows underneath the Gainesville to Hawthorne Trail. These blackwater streams are considered to be in good condition.

General management measures: Protection of the watersheds of the blackwater streams is a critical need for maintaining or enhancing the water quality and quantity in these systems. An increase in flow from Prairie Creek onto the prairie basin would improve conditions on the basin, but would require modification of the water control system currently in place at Camp's Canal.

SEEPAGE STREAM

Desired future condition: Seepage streams are narrow, relatively short, perennial or intermittent streams formed by percolating water from adjacent uplands. Water color will be clear to slightly colored, with a fairly slow flow rate and fairly constant temperature. Bottom substrate is typically sandy, but may include gravel or limestone.

Description and assessment: Sweetwater Branch is a seepage stream. The stream has changed tremendously since William Bartram described it in 1774. Once following a very narrow, meandering course through the uplands before sheet flowing across the prairie, Sweetwater Branch now flows through an artificially straightened and widened channel.

The urban nature of its watershed has caused drastic changes in the hydroperiod of the stream. Normal flow volume is many times that described by Bartram, since the system now receives water continuously from urban sources, including the discharge from the Main Street Wastewater Treatment Plant. During periods of heavy rainfall, the stream's flow increases dramatically due to urban runoff. Sweetwater Branch has been receiving nutrient enriched and silt laden water for many years, changing the original biota of the stream community. Storm surges carry especially high concentrations of pollutants through the system. Sweetwater Branch is considered to be in poor condition. The

Sweetwater Branch / Paynes Prairie Sheetflow Restoration Project will address many of these issues. Additional information may be found in the Hydrology section above.

Bartram Spring is one of the larger seepage streams along the rim of the prairie. Located west of Chacala Pond, it may have been the site of William Bartram's camp when he visited the area in 1774. This seepage area was heavily invaded by coral ardisia until recently when the area was treated under a grant from the Bureau of Invasive Plant Management. The seepage system is in good condition.

Other small seepage streams associated with seepage areas occur in scattered locations around the rim of Paynes Prairie. Many of these are too small to map. Ditching activities in the uplands may have impacted some of these seepage systems.

General management measures: Protection of the watersheds of seepage streams is important in maintaining and enhancing water quality and quantity. Dramatic changes will be occurring where Sweetwater Branch enters the Prairie Basin with the construction of a treatment wetland designed to attenuate stormwater pulses and improve water quality. As part of this project, the Sweetwater Canal and Dike on the prairie basin will be removed and sheetflow restored where the water exits the treatment wetland.

SPRING-RUN STREAM

Desired future condition: Spring-run streams are perennial watercourses that derive most, if not all, of their water from limestone artesian openings from the underground aquifer. The waters will be typically cool, clear, and circumneutral to slightly alkaline. These factors allow for optimal sunlight penetration and minimal environmental fluctuations that promote plant and algae growth. However, the characteristics of the water can change significantly downstream as surface water runoff becomes a greater factor. Areas of high flow will typically have sandy bottoms while organic materials concentrate around fallen trees and limbs and slow moving pools. Typical vegetation will include tapegrass (*Vallisneria americana*), arrowheads (*Sagittaria* spp.), southern naiad (*Najas guadalupensis*), and pondweeds (*Potamogeton* spp.).

Description and assessment: Boulware Springs Run is a small artesian-fed stream that enters the park just west of the entrance to the District Office and the La Chua trailhead. After a brief passage through the uplands, it winds through the basin and empties into Sweetwater Canal. Boulware Springs, the source of the run, is contained within a city park. Boulware Springs was the original drinking water supply for the City of Gainesville. The uppermost stretch of the run passes through a subdivision located just east of the park boundary. Much of Boulware Springs Run is choked with wild taro, an exotic plant. Although some level of control has been obtained in the past using physical removal and herbicides, the spring run within the park is constantly reinfected from a large population of wild taro located on the spring run within the adjacent subdivision. The spring run is considered to be in fair condition.

General management measures: Control of exotic plant species will continue to be a priority for Boulware Spring Run. Since the headspring is located within a city park and receives some level of protection, the main impacts to water quality lie within the residential area that the stream passes through. Impacts to the stream in this area will be identified and addressed to the extent possible.

AQUATIC CAVE

Desired future condition: Caves are characterized as cavities below the ground surface in karst areas, a cave system may contain portions classified as terrestrial caves and portions classified as aquatic caves. The latter vary from shallow pools highly susceptible to disturbance, to more stable, totally submerged systems. Desired future conditions include protecting against alterations that may increase pollution in aquatic systems.

Description and assessment: The only known aquatic cave in the park is located near Alachua Sink. The extent of the aquatic cave system that underlies the Alachua Sink is unknown. The cave receives nutrient enriched and silt laden water from Sweetwater Canal. Condition of the cave system is suspected to be fair to good.

General management measures: Unlike many aquatic cave systems that serve as sources of water, the Alachua Sink cave system acts as a drain for aquatic systems. Maintenance of the water quality and quantity entering the cave system is the primary action needed to protect the cave system. The improvement of the water quality of Sweetwater Branch should help in this respect.

ABANDONED PASTURE

A long history of cattle production resulted in the creation of many semi-improved and improved pastures at Paynes Prairie. With the exception of the pastures at Hickory Ranch that are maintained for the Florida Cracker Cattle herd, most of these pastures were abandoned after state acquisition. The dense bahiagrass has prevented significant hardwood succession in many areas. Historically these pastures were created in a variety of natural community types, including sandhill, upland pine; upland mixed woodland, upland hardwood forest, mesic hammock and mesic flatwoods. In some cases, they may have been used for agricultural crops prior to being converted to pastures. Bartram notes that the Native Americans had extensive fields around the rim of the prairie at the time of his visit in 1774 (Harper 1958).

Limited restoration of the upland pastures has occurred on the North Rim along the Gainesville to Hawthorne Trail with the planting of longleaf pines and wiregrass. Given the difficulty of restoring sandhill, upland pine and upland mixed woodland from bahiagrass pastures, restoration will not be a high priority. The abandoned pastures will be managed with prescribed fire to discourage offsite hardwoods such as laurel oaks and sweetgums from becoming established in former fire-type communities. The Optimal Fire Return Interval for this community is typically 2-5 years. Where pastures were created in former upland hardwood forests or mesic hammocks, these areas will be allowed to revert naturally to their former community types.

CANAL/DITCH

Numerous canals and ditches were constructed in the prairie basin to enhance drainage to increase cattle production as detailed in the Hydrology section. Filling of these canals using adjacent spoil material began shortly after state acquisition and continues to be a high priority for restoration of the Paynes Prairie basin marsh.

Ditching also occurred in upland areas adjacent to the former railroad right-of-way, much of which is now part of the Gainesville to Hawthorne Trail. Some ditching of isolated wetlands has also occurred in the uplands around the prairie basin, although many of them are not mapped.

CLEARCUT PINE PLANTATION

Areas that were formerly in planted pine plantations that were clearcut during the 2001 southern pine beetle outbreak have been mapped as clearcut pine plantation. Some of these areas were either originally upland pine or upland hardwood forest. However, these plantations were planted on old pastures and lack significant natural community remnants. Restoration of these areas will require additional research to determine the former natural community types to set restoration goals. The Optimal Fire Return Interval for this community is 3-20 years depending on the stage of restoration.

DEVELOPED

There are many developed areas located within the park ranging from staff residences to campgrounds, picnic areas and boat ramps. A complete list of all the developed areas may be found in the Land Use Component. Development is concentrated on the south side of the park near Micanopy, away from the prairie basin and rim. Limited developed areas are also located on the north rim near the Alachua Sink. Routine herbicide of the railroad right-of-way to control woody vegetation was an integral part of the CSX Transportation's maintenance regime. Consequently, exotic weeds and grasses dominate much of what is now the Gainesville to Hawthorne Trail. The trail and the surrounding right-of-way are classified as developed areas.

Priority invasive plant species (FLEPPC Category I and II species) will be removed from all developed areas. Other management measures include proper stormwater management and development guidelines that are compatible with prescribed fire management in adjacent natural areas.

IMPOUNDMENT/ARTIFICIAL POND

Several borrow areas that were used for road construction or other activities are located in the park. The ones located in flatwoods areas typically hold water at times due to the shallow water tables in flatwoods. One of these borrow pits is located within a cultural site known as Paynes Town. Part of the cultural site was damaged during excavation prior to state ownership, but much of the cultural site remains intact. Where feasible, borrow pits should be restored to their natural contours. Cost-effectiveness, return on investment and consideration of other higher priority restoration projects within the park will determine the extent of restoration measures in these borrow areas.

PASTURE—IMPROVED

Although many disturbed areas in the park were once improved pastures, the only pastures currently managed as improved pastures are located at Hickory Ranch. These pastures are used for the maintenance of the park's herd of Florida Cracker Cattle and the horses used as working stock.

PASTURE—SEMI-IMPROVED

Semi-improved pastures retain some of the native groundcover species due to an incomplete conversion to improved pasture. Some of the pasture areas on the Crevasse Addition and Edwards Addition were recently or are currently being used as pastures. These areas retain significant coverage of native grasses and forbs. Future management will include prescribed fires where appropriate. The Optimal Fire Return Interval for this community is 2-10 years. Some areas may be allowed to revert naturally to mesic hammocks.

ROAD

All of the paved roads within the park have been designated as roads. In most cases, unimproved service roads and firebreaks are not labeled as roads for the purposes of natural community mapping.

SPOIL AREA

Spoil areas include deposits of dredge or other spoil material. The dikes associated with the excavated canals on the prairie basin are included in this designation.

SUCCESSIONAL HARDWOOD FOREST

In most cases, the areas designated as successional hardwood forests are old fields, pastures or other cleared areas that have become dominated by laurel oaks, sweetgums, water oaks and loblolly pines. The original natural community type may be one of several upland types ranging from sandhill to upland hardwood forest. Restoration of these areas will require a concerted effort to remove offsite hardwood species and replant both canopy and groundcover species. Given the more pressing restoration needs at Paynes Prairie, these restoration projects will not be given a high priority. In those areas determined to be fire-type, the Optimal Fire Return Interval is 2-5 years but can vary depending on the stage of restoration.

UTILITY CORRIDOR

Several power line rights–of-ways pass through the park. Where the groundcover vegetation has been significantly altered from the original natural community, these areas are designated as utility corridors. Where the native species have been retained, as in the power line that crosses through the basin marsh, the natural community type has been used rather than the altered landcover type.

Imperiled Species

Imperiled species are those that are (1) tracked by FNAI as critically imperiled (G1, S1) or imperiled (G2, S2); or (2) listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC) or the FDACS as endangered, threatened or of special concern.
Table 4 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

Numerous imperiled species occur within the park boundaries. The large expanse of the park and the wide range of natural communities support a diverse assemblage of species. The park not only contains widely distributed imperiled plant species such as hooded pitcher plants (*Sarracenia minor*) and brittle maidenhair fern, but also local endemics. The Alachua Sink Hammock contains both the silver buckthorn and Godfrey's swampprivet. Although the swampprivet is found in other areas in the state, the silver buckthorn is only known from a handful of sites (Anderson 1997). The population of silver buckthorn on the north rim of Paynes Prairie is by far the largest of any currently known site. The park staff has mapped most of the known individuals using a mapping grade GPS and has developed a GIS coverage to track these individuals. Some individuals, particularly those near the District 2 headquarters, were cultivated from seed collected in the Alachua Sink Hammock. Research on the distribution and taxonomic relationship of this species with other buckthorns is ongoing. Godfrey's swampprivet is much less common in the park than the silver buckthorn, but several individuals have been located and mapped. The Alachua Sink Hammock is only open to ranger-guided activities to not only protect the numerous sinkholes and limestone outcrops from foot or bicycle traffic, but also to protect the imperiled plant species, including the brittle maidenhair fern. The only known location in the park for Mexican tear-thumb (*Polygonum meisnerianum*) has also been mapped using a GPS. Populations of the hooded pitcherplant have also been mapped in the past for tracking the status of the population.

The American alligator (*Alligator mississippiensis*) is the park's most visible imperiled species, and it does not appear to be in any danger of declining within the park.

However, during extended droughts the alligator population can become very concentrated within the remaining water bodies. Crowding may cause increased stress on the animals and the low water concentrates fish and other food items causing the alligators to feed aggressively. In the past, portions of the La Chua Trail have been temporarily closed for visitor safety reasons during these extreme events. Closure of the trail also reduces stress on alligators that normally seek to avoid human interaction. High water events have also resulted in trail closures. Alligators need to bask to regulate body temperatures, and the last basking areas to submerge during flood events are usually on the La Chua Trail itself, creating conflict with park visitors on the trail.

Gopher tortoises (*Gopherus polyphemus*) in the uplands of the north rim and south end of the park are also of concern. Staff counted gopher tortoise burrows on the north rim prior to the opening of the Gainesville to Hawthorne Trail in 1990. A second burrow count and GPS mapping survey was conducted in 2004-05 on the north rim. The south end of the park was censused in 1991 and mapped using GPS in 2007.

In 1990, many of the tortoises were located near the Gainesville to Hawthorne Trail and along the abandoned railroad berm. In many cases, the burrows are in abandoned pastures on upland pine, sandhill or upland hardwood forest soils. Poaching of gopher tortoises along the trail outside the park boundary has been documented several times in the past. Domestic dogs ranging free along the trail are also likely to predate gopher tortoises. Recreational use of the Gainesville to Hawthorne Trail may also have an impact on the gopher tortoises adjacent to the trail. Between 1990 and 2005, there was a decrease in the number of burrows outside the park along the Gainesville to Hawthorne Trail, perhaps due to poaching. There was also an apparent movement of burrows away from the Gainesville to Hawthorne Trail within the park. It is likely that the increased recreational use of the trail caused the tortoises to move away from the trail. Additional recontouring and restoration of the abandoned railroad berm has the potential to impact tortoises that have burrowed into the berm. In most cases, the berm passes through upland hardwood forest or mesic hammock and the gopher tortoises have opportunistically colonized the open corridor through the Alachua Sink Hammock. Restoration of upland pine and sandhills within the north rim pastures will likely benefit gopher tortoises in those areas.

Tortoise populations have also apparently declined in the south end of the park between 1991 and 2007. Habitat quality has likely declined due to lack of adequate fire and southern pine beetle outbreaks. Many of the areas that support tortoises were improved pasture prior to state acquisition, and have gradually become less suitable for tortoises (Snyder 2007).

Sporadic sightings and roadkills of Florida pine snakes (*Pituophis melanoleucus mugitus*) have occurred in the north rim area of the park. Despite the relatively poor condition of the fire-adapted upland natural communities on the north rim, pocket gophers (*Geomys* *pinetis*) are abundant in the former pastures. Pocket gophers are a primary food source for pine snakes, and their burrow systems provide subterranean shelter for pine snakes. The greatest threat to pine snakes is mortality on roadways within and adjacent to the park. Although no sightings of eastern indigo snakes (*Drymarchon couperi*) have occurred within the park for decades, road mortality is a well-documented threat to that species as well.

The park also provides critical habitat for many imperiled bird species. Paynes Prairie is well known as a wintering ground for greater sandhill cranes (*Grus canadensis tabida*), but it also provides important breeding and wintering habitat for resident Florida sandhill cranes (*Grus canadensis pratensis*). In the past decade, sightings of migratory and resident whooping cranes (*Grus americana*) have become routine within the park, particularly during the winter when the migratory sandhill cranes are present. In the spring of 2010, a pair of non-migratory whooping cranes nested within the prairie basin and hatched two chicks. Unfortunately, the chicks did not survive the perils of the prairie basin. Park staff routinely cooperates with the USFWS and the International Crane Foundation concerning the migratory whooping cranes and with the FFWCC concerning the resident whooping cranes. Aerial surveys and radio telemetry are used by these agencies to track the whooping cranes within the park and in surrounding areas.

Water levels greatly influence habitat use by sandhill and whooping cranes. While drying areas of the marsh and wet prairie provide feeding habitat, areas of standing water are important for overnight roosting sites and for nest sites. Fluctuations in water levels on the basin also greatly affect other wading bird species. During periods of rapidly lowering water levels, the prairie basin attracts foraging wading birds from the surrounding region. During the fall of 1999, over 650 wood storks (*Mycteria americana*) were documented foraging in Alachua Lake along with large numbers of other birds many of which were also imperiled species. Several species of imperiled wading birds routinely nest within the park. Management of the prairie basin emphasizes restoration of natural hydrological fluctuations. Populations of wood storks and other wading birds are often very dynamic in space and time and depend upon hydrological changes rather than hydrological constants.

Large feeding or breeding aggregations of wading birds often attract the attention of park visitors. To minimize the impacts of human disturbance, certain recreational trails or specific areas within the park may be temporarily closed to the public to protect imperiled species. This can be particularly important during the establishment of nesting rookeries that are prone to abandonment if disturbed during the early phases of nesting.

Several pairs of bald eagles (*Haliaeetus leucocephalus*) nest near or within the park with many other transient birds passing through. While the staff usually monitors bald eagle nests within the park, this species has been delisted and is no longer considered an imperiled species in Florida. Several imperiled bird species, including the snail kite (*Rostrhamus sociabilis plumbeus*), magnificent frigatebird (*Fregata magnificens*), crested caracara (*Caracara cheriway*) and the tern species (*Sterna* spp.) were recorded as single individuals or accidentals and do not represent resident or even seasonal populations.

Organized bird counts that occur within the park boundaries include the Audubon Christmas Bird Count and the North American Migration Count. Numerous birdwatchers frequent the park and assist staff in monitoring avian species, particularly imperiled or accidental species. The Christmas Bird Count provides an annual count of birds by species within the park that can be compared between years to track population trends.

Several imperiled species of mammals occur within the park, although significantly more occurred historically. Sherman's fox squirrels (*Sciurus niger shermani*) have been sighted sporadically on the south side of the park in the mesic flatwoods and near Hickory Ranch. Species that occurred in the park in historical times include the Florida panther (*Felis concolor coryi*), red wolf (*Canis rufus*), and black bear (*Ursus americanus floridanus*). Of those three, only the black bear has been recently confirmed within the park. Sporadic sightings of black bear have been recorded on the south side of the park near Bolen Bluff and the Visitor Center. Although panther or cougar sightings have been reported in the Prairie Creek area, none has been confirmed. Sightings of imperiled mammals within the park are documented by staff.

The round-tailed muskrat (*Neofiber alleni*) is a "species of greatest conservation need" (FFWCC 2011) that occurs in the basin marshes of Paynes Prairie. The FFWCC is currently studying this species at Paynes Prairie and other public lands. Staff will continue to cooperate with the FFWCC to monitor round-tailed muskrats.

Table 4: Imperiled Species Inventory

Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FFWCC	**USFWS**	**FDACS**	**FNAI**		
PLANTS						
Brittle maidenhair *Adiantum tenerum*			LE	G5,S3	9,10	Tier 1
Southern lady fern *Athyrium filix-femina* subsp. *asplenioides*			LT		9,10	Tier 1

Table 4: Imperiled Species Inventory						
Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FFWCC	**USFWS**	**FDACS**	**FNAI**		
Godfrey's swampprivet *Forestiera godfreyi*			LE	G2,S2	2,10	Tier 2
Angle pod *Gonolobus suberosus* (=*Matelea gonocarpos*)			LT		2,10	Tier 1
Florida spiny pod *Matelea floridana*			LE	G2,S2	1,10	Tier 1
Blueflower butterwort *Pinguicula caerulea*			LT		1,4, 10	Tier 1
Yellow butterwort *Pinguicula lutea*			LT		1,4, 10	Tier 1
Mexican tearthumb *Polygonum meisnerianum*			LE	G5?T5? S1	4	Tier 2
Hooded pitcherplant *Sarracenia minor*			LT		1,4,6 , 10	Tier 2
Silver buckthorn *Sideroxylon alachuense*			LE	G1,S1	2,3, 10	Tier 3
Little ladiestresses *Spiranthes tuberosa*			LT		1,6	Tier 1
INVERTEBRATES						
Dion skipper *Euphyes dion*				G4, S2S3	10, 13	Tier 2
Hayhurst's scallopwing *Staphylus hayhurstii*				G5,S2	10, 13	Tier 2
REPTILES						
American Alligator *Alligator mississippiensis*	FT(S/A)	FT(S/A)		G5,S4	4,10, 13	Tier 1
Eastern Indigo snake *Drymarchon couperi*	FT	LT		G3,S3	1,6,7	Tier 1
Gopher tortoise *Gopherus polyphemus*	ST			G3,S3	1,6,7 ,10,1 2 13	Tier 3

Table 4: Imperiled Species Inventory						
Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FFWCC	**USFWS**	**FDACS**	**FNAI**		
Florida pine snake *Pituophis melanoleucus mugitus*	SSC				1,6,7	Tier 1
BIRDS						
Limpkin *Aramus guarauna*	SSC			G5,S3	4	Tier 2
Short-tailed hawk *Buteo brachyurus*				G4G5, S1		Tier 2
Crested caracara *Caracara cheriway*	FT	LT		G5,S2	1	Tier 2
Little blue heron *Egretta caerulea*	SSC			G5,S4	4	Tier 2
Reddish egret *Egretta rufescens*	SSC			G4,S2	4	Tier 2
Snowy egret *Egretta thula*	SSC			G5,S3	4	Tier 2
Tricolored heron *Egretta tricolor*	SSC			G5,S4	4	Tier 2
Swallow-tailed kite *Elanoides forficatus*				G5,S2	1	Tier 2
White-tailed kite *Elanus leucurus*				G5,S1	1	Tier 2
White ibis *Eudocimus albus*	SSC			G5,S4	4	Tier 2
Merlin *Falco columbarius*				G5,S2		Tier 2
Peregrine falcon *Falco peregrinus*				G4,S2		Tier 2
Southeastern American kestrel *Falco sparverius paulus*	ST			G5T4, S3	1,5	Tier 2
Magnificent frigatebird *Fregata magnificens*				G5,S1		Tier 2

Table 4: Imperiled Species Inventory						
Common and *Scientific* Name	**Imperiled Species Status**				**Management Actions**	**Monitoring Level**
	FFWCC	**USFWS**	**FDACS**	**FNAI**		
Whooping crane *Grus americana*	FXN	LE,XN		G1, SNR	1,3,4 ,6,10 ,13	Tier 3
Florida sandhill crane *Grus canadensis pratensis*	ST			G5T2T 3,S2S3	1,4,6 ,10,1 3	Tier 2
Black rail *Laterallus jamaicensis*				G4,S2	1,4	Tier 2
Wood stork *Mycteria americana*	FE	LE		G4,S2	4	Tier 2
Brown pelican *Pelecanus occidentalis*	SSC			G4,S3	4	Tier 2
Roseate spoonbill *Platalea ajaja*	SSC			G5,S2	4	Tier 2
American avocet *Recurvirostra americana*				G5,S2	4	Tier 2
Snail kite *Rostrhamus sociabilis plumbeus*	FE	LE		G4G5T 2,S2	4	Tier 2
Least tern *Sterna antillarum*	ST			G4,S3	4	Tier 2
Caspian tern *Sterna caspia*				G5,S2	4	Tier 2
Sooty tern *Sterna fuscata*				G5,S1	4	Tier 2
MAMMALS						
Sherman's fox squirrel *Sciurus niger shermani*	SSC			G5T3,S 3	1,6	Tier 1
Florida black bear *Ursus americanus floridanus*	ST			G5T2,S 2	1	Tier 1

Management Actions:

1 Prescribed Fire
2 Exotic Plant Removal
3 Population Translocation/Augmentation/Restocking
4 Hydrological Maintenance/Restoration

5 Nest Boxes/Artificial Cavities
6 Hardwood Removal
7 Mechanical Treatment
8 Predator Control
9 Erosion Control
10 Protection from visitor impacts (establish buffers)/law enforcement
11 Decoys (shorebirds)
12 Vegetation planting
13 Outreach and Education
14 Other

Monitoring Level:

Tier 1. Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e. not conducting species-specific searches). Documentation may be in the form of *Wildlife Observation Forms*, or other district specific methods used to communicate observations.

Tier 2. Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.

Tier 3. Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.

Tier 4. Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.

Tier 5. Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

Detailed management goals, objectives and actions for imperiled species in this park are discussed in the Resource Management Program section of this component and the Implementation Component of this plan.

Exotic Species

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to out-compete, displace or destroy native species and their habitats, often because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

For the purposes of discussing exotics, it may be convenient to divide Paynes Prairie Preserve habitats into two categories, prairie basin and uplands. Within the basin, Chinese tallowtree (*Sapium sebiferum*) is the exotic plant of greatest concern and the one covering the greatest area. Sweetwater Branch and Boulware Spring Run are the two most critical sources of tallow invasion. With the upcoming development of the Sweetwater treatment wetland in PP-9, however, there may be a significant decline in the influx of tallowtree seeds into that part of the basin. The portion of the west side of the basin that is owned by the Gainesville Country Club is an additional point source for tallowtree invasion. Wild taro (*Colocasia esculenta*), another exotic species of increasing concern, is most common in the part of the basin influenced by Boulware Spring Run.

Chinese tallowtree infestations at the park, which are often dense, occur throughout the upper edges of the prairie basin marsh that was formerly classified as wet prairie under the previous FNAI system. Tallowtree also occurs in the wetter, emergent marsh areas classified as basin marsh, but infestations there are much less dense and more scattered. FNAI has redefined the basin marsh community in Florida, and now considers most of Paynes Prairie to be a representative of the "disappearing lake" variant of basin marsh (FNAI 2010). With the advent of FNAI's new definitions for wet prairie and basin marsh, the areas at Paynes Prairie formerly classified as wet prairie are now recognized to be part of the basin marsh community. For purposes of tallowtree management, however, it may still be convenient to distinguish between the less wet areas, formerly called wet prairie, where tallowtree is abundant, and the wetter areas of basin marsh, where tallowtree is less common.

Upland habitats at Paynes Prairie Preserve cover about 6,000 acres. Coral ardisia is widespread in Alachua Sink Hammock just north of the prairie basin, as well as in hammocks south of the basin. Chinese tallowtree occurs not infrequently in the park's numerous sinkholes. Several other exotic species that are not yet widespread but increasing in number are cause for concern. These include skunkvine (*Paederia foetida*) and catclawvine (*Macfadyena unguis-cati*) in the hammocks, small-leaf spiderwort in the sinkholes, Japanese climbing fern (*Lygodium japonicum*) along the hammock-basin marsh interface, and Caesarweed (*Urena lobata*) in the sinkholes within Alachua Sink Hammock and near Hickory Ranch, where there are livestock impacts. There are also some scattered areas of cogongrass (*Imperata cylindrica*) in the park. Flatwoods and improved pasture areas are currently less impacted by exotics than the hammocks.

The park staff conducts surveys for invasive exotic plants in conjunction with other land management activities. Estimates of the density of exotic plant infestations are made during the preparation of proposals for contracted treatment. The park uses a combination of in-house and contracted labor to treat exotics. Contracts include those funded by the FFWCC Invasive Plant Management Section. The general strategy is to use contracted labor to treat the larger, denser infestations, and to use in-house labor to treat the more scattered, less dense outlying populations and to conduct routine maintenance. Ideally, follow-up maintenance treatment occurs the second year after a contracted treatment. The exotics treatment plan for the basin has generally been to begin treatments in the basin interior and then proceed back toward the major point sources of infestation, for example Sweetwater Branch and Boulware Spring Run. Augmentation of park staff with AmeriCorps members and volunteers has contributed greatly to the park's ability to maintain an effective exotics treatment program.

Exotic plant treatment within the prairie basin can be quite difficult. Some management zones are very large, covering 1000-2000 acres. Finding the target exotic species can be quite difficult in the thick vegetation. Depending on the amount of standing water in the basin, access may be severely limited and there may be restrictions on the types of herbicides permitted. Because of the rank growth of woody vegetation, the park may need to use bulldozers, tree cutters and mowers to create access for contractors and staff.

Often after treatments, the park will widen the mowed access lines to include the entire treatment area with the purpose of returning shrubby areas to herbaceous wetlands. This restoration activity produces a healthier community that is better able to resist invasive species, and the reduced stature of the vegetation makes it easier to find and retreat invasive exotics in the future. In addition, since the restored community is easier to burn, fire becomes another viable tool to use in exotics management. Frequent prescribed fire in the basin will increase the effectiveness of tallowtree treatments. Fire reduces the stature of the trees, making them less attractive as perching sites for avian seed dispersers. It also opens up the landscape so that it is easier to find the species that need treatment. Another advantage is that fire has the potential to set back reproduction of the tallowtrees.

Integrating exotic species treatment with the habitat restoration and prescribed fire programs generates a synergistic effect, producing a healthier ecosystem that is more resistant to invasion by exotics. The result may be a reduction in the number, density and variety of invasive species that need treatment. Unfortunately, the converse may also be true. The necessity to treat invasive exotics becomes greater and more challenging when the fire and restoration goals are not being achieved.

In developing a long-term treatment plan for Chinese tallowtree at the park, staff should consider that Paynes Prairie Preserve contains about 13,000 acres of basin marsh susceptible to tallow invasion, as well as smaller acreages of other vulnerable natural communities including sinkholes, depression marshes and floodplain swamps. Ideally, every acre of tallowtree in the basin should receive treatment at least once every three years to prevent the trees from reaching reproductive age. That would mean surveying and treating over 4,000 acres of potential tallowtree habitat every year in the prairie basin alone. However, a more realistic approach might be to focus treatment efforts on the drier areas of marsh formerly classified as wet prairie, since high water events in the basin will reduce the number of acres of basin marsh that the tallow is colonizing. With that in mind, a goal of treating 1,200 acres in the basin per year would probably be more reasonable. That figure still far exceeds the largest number of acres that have been treated in one year in the entire park, namely 474. The park will need additional resources if it is to achieve an exotics treatment regime in the basin of more than 1,200 acres per year. That total does not include the additional upland acres that need treatment.

In the uplands surrounding the prairie basin, coral ardisia, cogongrass, Japanese climbing fern, air-potato, skunkvine, catclawvine and small-leaf spiderwort are the exotic species of primary concern. Ardisia can be found anywhere there is upland hardwood forest and mesic hammock in the park. Ideally, staff should retreat ardisia every three years to prevent reproduction. Japanese climbing fern and skunkvine can reproduce every year, so they should receive treatment annually. The habitats impacted by these species encompass at least 3000 acres. Treatments should be on a three-year rotation, with annual treatments for those areas infested with Japanese climbing fern, skunkvine and other species that complete their reproductive cycle within one year. In order to achieve control of those species, the park should treat a minimum of 1000 acres of infested uplands every year.

In spite of the exotics treatment that has occurred annually at the park, it has not been sufficient to reduce populations of exotics or keep exotic plant treatments in maintenance phase. If the park's goal is to eliminate reproducing adults within exotic plant populations, then reproductive age should be one of the measures for scheduling retreatment. Since young tallowtrees can produce seeds within four years of seed germination, retreatment of tallow-infested areas should occur every three years in the basin. For both tallowtree and ardisia to receive retreatment within the windows of opportunity dictated by their reproductive cycles, the park would have to retreat 2,200 acres each year. Adding skunkvine and Japanese climbing fern to the treatment schedule would obviously increase the annual retreatment needs.

The ideal treatment goals discussed above are substantially higher than the average number of acres treated annually in the park today. For example, from fiscal year 2002-2003 through fiscal year 2009- 2010, the period covered by the previous Paynes Prairie management plan, the park treated a total of 2093.5 acres of invasive exotic plants. The resources needed to achieve a higher level of treatment are currently not available to the park. However, the above treatment goals are a worthy target if the park is to succeed in disrupting the reproductive cycles of many of these species. An increase in prescribed fire frequency in the basin may provide some assistance by reducing the number of acres that need exotics treatment annually. If the park can meet the treatment goals discussed above, it should be able to achieve reductions in exotic plant populations and move toward management of these species in a maintenance phase rather than in a population growth phase.

Table 5 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC 2009). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 5: Inventory of FLEPPC Category I and II Exotic Plant Species

Common and *Scientific* Name	**FLEPPC Category**	**Distribution**	**Management Zone(s)**
PLANTS			
Mimosa *Albizia julibrissin*	I	1	PP-1602
		2	PP-1309
Coral ardisia (scratchthroat) *Ardisia crenata*	I	2	PP-802, PP-805, PP-801, PP-8, PP-35, PP-1603, PP-1602, PP-1402, PP-1306, PP-1305, PP-1303, PP-1105, PP-1102, PP-1101, PP-101, PP-1309, PP-9
		3	PP-1311, PP-901, PP-806, PP-804, PP-801, PP-601, PP-37, PP-32, PP-1104, PP-1103, PP-36
Calico flower *Aristolochia littoralis*	II	1	PP-802
Paper mulberry *Broussonetia papyrifera*	II	2	PP-807
Camphortree *Cinnamomum camphora*	I	2	PP-802, PP-42, PP-601, PP-801
Wild taro *Colocasia esculenta*	I	3	PP-1102
Air-potato *Dioscorea bulbifera*	I	1	PP-802
		2	PP-1309, PP-41
		3	PP-1105, PP-1307, PP-1308

Table 5: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and *Scientific* Name	**FLEPPC Category**	**Distribution**	**Management Zone(s)**
Water-hyacinth *Eichhornia crassipes*	I	2	PP-1302, PP-29
Hydrilla *Hydrilla verticillata*	I	2	PP-29, PP-1102
Cogongrass *Imperata cylindrica*	I	2	PP-1101, PP-42, PP-807
		3	PP-41, PP-1105, PP-202
		4	PP-1601
Lantana *Lantana camara*	I	1	PP-1101
Glossy privet *Ligustrum lucidum*	I	2	PP-802
Chinese privet *Ligustrum sinense*	I	2	PP-601
Japanese honeysuckle *Lonicera japonica*	I	2	PP-8, PP-801, PP-9
Japanese climbing fern *Lygodium japonicum*	I	2	PP-1308, PP-9, PP-802, PP-8, PP-601, PP-42, PP-1309, PP-11, PP-41
		3	PP-801
Catclawvine *Macfadyena unguis-cati*	I	1	PP-11
		2	PP-9
		3	PP-601, PP-804, PP-806, PP-901
Chinaberry *Melia azedarach*	II	2	PP-7, PP-9, PP-801, PP-13, PP-8, PP-201, PP-6, PP-5, PP-42, PP-301, PP-3
		3	PP-1001
Natal grass *Melinis repens*	I	2	PP-1101
Heavenly bamboo *Nandina domestica*	I	2	PP-802

Table 5: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and *Scientific* Name	**FLEPPC Category**	**Distribution**	**Management Zone(s)**
Tuberous sword fern *Nephrolepis cordifolia*	I	3	PP-38
Skunkvine *Paederia foetida*	I	1	PP-807
Torpedograss *Panicum repens*	I	2	PP-1302
		3	PP-1312, PP-1602, PP-1501, PP-1310
Water-lettuce *Pistia stratiotes*	I	2	PP-803, PP-29
Chinese ladder brake *Pteris vittata*	II	2	PP-1602
Kudzu *Pueraria montana*	I	3	PP-1105
Mexican petunia (Britton's wild petunia) *Ruellia simplex*	I	3	PP-11
Chinese tallowtree *Sapium sebiferum*	I	1	PP-2
		2	PP-901, PP-201, PP-26, PP-8, PP-601, PP-802, PP-7, PP-1309, PP-807, PP-1307, PP-301, PP-31, PP-42, PP-5, PP-6, PP-3, PP-1301, PP-12, PP-1001, PP-1311
		3	PP-11, PP-13, PP-1302, PP-1308, PP-1, PP-4, PP-10, PP-9
		5	PP-801
Rattlebox *Sesbania punicea*	II	2	PP-802
Tropical soda apple *Solanum viarum*	I	1	PP-802
		2	PP-1301
Small-leaf spiderwort *Tradescantia fluminensis*	I	3	PP-802

Table 5: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and *Scientific* Name	**FLEPPC Category**	**Distribution**	**Management Zone(s)**
Caesarweed *Urena lobata*	I	2	PP-802
		3	PP-1301, PP-801
Chinese wisteria *Wisteria sinensis*	II	2	PP-802
Elephant ear *Xanthosoma sagittifolium*	II	1	PP-802

<u>Distribution Categories:</u>

0 No current infestation: All known sites have been treated and no plants are currently evident.
1 Single plant or clump: One individual plant or one small clump of a single species.
2 Scattered plants or clumps: Multiple individual plants or small clumps of a single species scattered within the gross area infested.
3 Scattered dense patches: Dense patches of a single species scattered within the gross area infested.
4 Dominant cover: Multiple plants or clumps of a single species that occupy a majority of the gross area infested.
5 Dense monoculture: Generally, a dense stand of a single dominant species that not only occupies more than a majority of the gross area infested, but also covers/excludes other plants.
6 Linearly scattered: Plants or clumps of a single species generally scattered along a linear feature, such as a road, trail, property line, ditch, ridge, slough, etc. within the gross area infested.

Exotic animal species include non-native wildlife species, free ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, DRP actively removes exotic animals from state parks, with priority being given to those species causing the ecological damage.

Although the exotic animal list for the park is much less extensive than the exotic plant list, Paynes Prairie Preserve does have several terrestrial or aquatic invasive exotic animals that are of concern. The terrestrial species include the brown anole (*Anolis sagrei*), greenhouse frog (*Eleutherodactylus planirostris*), Mediterranean gecko (*Hemidactylus turcicus*), nine-banded armadillo (*Dasypus novemcinctus*), capybara (*Hydrochoerus hydrochaeris*), feral hog (*Sus scrofa*), coyote (*Canis latrans*), and the occasional feral cat or dog. Exotic fish species include an armored catfish known as the brown hoplo (*Hoplosternum littorale*) and tilapia (*Tilapia aureus*).

Unfortunately, feral hogs are now numerous in Paynes Prairie Preserve and are found in many areas, but especially in the prairie basin. The park has an active program of feral hog removal. Park staff and contractors both participate in hog removal as conditions warrant. Very few capybaras have been observed within the park, and none in recent years. However, there is a reproducing population in northern Alachua County along the upper Santa Fe River, so the park needs to be prepared to control this species if individuals are observed again. Feral dogs and cats can sometimes be problematic in the park since there is a continuous influx of these animals from surrounding urban areas. Feral and stray dogs and cats in the park are trapped and transferred to the Alachua County Animal Services. The park staff sometimes removes armadillos, which may cause extensive ground disturbance and are a threat to ground nesting birds and small reptiles and amphibians.

The Mediterranean gecko has an established breeding population at the District 2 administrative office near the Alachua Sink. This species rarely leaves the vicinity of human habitation (Wilson and Porras 1983), and it is not actively removed since it appears to pose little threat to surrounding natural areas. The brown anole has been seen infrequently at the District 2 office, but a breeding population was established in the past at the Ranger Station in Micanopy. Both exotic lizards probably arrived at the site by hitching rides on automobiles since substantial populations occur throughout urban areas of Alachua County. Brown anoles, which compete with native green anoles, are removed when encountered to prevent their establishment.

Coyotes are common in north-central Florida and are well established in the park. Currently, there are no control measures in place for them. With the extirpation of the native red wolf in the southeast, the coyote may be filling a portion of that species' niche.

One of the two exotic fish species, the brown hoplo, was impacted by an extended period of freezing weather during the winter of 2009-2010. At least 100 dead brown hoplo were recovered from the Main Canal after the prolonged hard freeze. Additional specimens were found after freezes in the winter of 2010-2011, so it is expected that the species can survive and repopulate after severe cold events.

In some cases, native wildlife may also pose management problems or nuisances within state parks. A nuisance animal is an individual native animal whose presence or activities create special management problems. Examples of animal species from which nuisance cases may arise include raccoons, venomous snakes and alligators that are in public areas. Nuisance animals are dealt with on a case-by-case basis.

Relatively few native species can be classified as nuisance species at Paynes Prairie. The American alligator, however, is of particular concern within the park. Conflicts between alligators and recreational users of the park have increased over the years as park visitation has increased and the alligator populations have rebounded. Paynes Prairie is graced with a large, and apparently healthy, population of alligators. Unlike many other prairie or lake systems in the area, alligators are not methodically harvested from Paynes Prairie. To some degree, they are also provided more protection from removal under the FFWCC nuisance alligator program. As a result, the alligator population in the park may resemble a more natural population in terms of age structure and sex ratios than harvested populations.

Alligators are a management issue primarily in three locations: U.S. 441, Lake Wauberg and La Chua Trail. At two sites on the park boundary, along the U.S. 441 right of way and at Lake Wauberg, larger alligators have been illegally poached or have been removed by the FFWCC under the nuisance alligator program. U.S. 441 is a popular location to stop and observe wildlife, either along the road shoulder or at the observation platform. Lake Wauberg is partly managed by the University of Florida as a recreational area. Some of the removed animals were likely fed by recreational users and eventually were perceived as a threat. Park staff routinely provides interpretive programs on alligators and posts warning and interpretive signs to educate the public about the ramifications of feeding alligators. Due to public safety concerns, the removal of nuisance alligators by the FFWCC will likely continue. Public education and increased public tolerance of large alligators may help reduce the number of complaints to the FFWCC.

La Chua trail is wholly contained within the park boundary and is a very popular area for wildlife observation. Alligators are quite numerous along the trail during certain seasons and during low water events. At certain water levels and during certain seasons, large basking alligators frequently block the trail and cause users to detour around them or wait for them to relocate. Park staff with the assistance of Americorps members have systematically cleared vegetation and created basking areas for the alligators on the far side of the Main Canal that runs beside the La Chua trail. Given the option, alligators prefer to bask on bare ground away from humans. Occasionally a female will nest alongside La Chua trail and defend her nest site aggressively. In the past, these females have been relocated by the FFWCC and their eggs collected for artificial incubation in the interests of public safety. More recently, however, park staff have placed plastic construction fence between the nest and the park visitors with good results. In cases such as this, and in all cases where an individual alligator is perceived as a threat, park staff will follow DRP guidelines.

Several plant species may also be classified as nuisance species in certain situations. In fire-adapted upland communities, species such as laurel and water oaks, sweetgum, and black cherry invade during periods of fire exclusion. Once established, these offsite hardwoods can further alter the natural fire regime by changing the fuel characteristics of the area through shading of herbaceous species and creating less combustible leaf litter. Restoration of natural communities such as upland pine forest, sandhills and

mesic flatwoods often necessitates mechanical or chemical treatment of invasive hardwoods to restore a more natural fire regime.
Similar problems are seen in herbaceous wetland communities such as basin and depression marshes. These open wetlands are naturally maintained through a combination of fire and flooding to prevent hardwood invasion and succession to a forested wetland. Coastal plain willow, buttonbush, red maple and sweetgum have heavily invaded many of the depression marshes within the park. These same species, along with persimmon, wax myrtle and saltbush, are also constantly encroaching upon the basin marshes of the prairie basin. In the absence of routine high water events, prescribed fire is used to control the invasion of these species in herbaceous wetlands. Consideration will be given to mechanical or chemical removal of these hardwoods.

Detailed management goals, objectives and actions for management of invasive exotic plants and exotic and nuisance animals are discussed in the Resource Management Program section of this component.

Special Natural Features

Paynes Prairie has long been recognized for its ecological and geological values. Its virtues have been extolled in print as the "level, green plain" of William Bartram (Harper 1958:119) and Archie Carr's "about the best thing to see on U.S. Route 441 from the Smoky Mountains to the Keys" (Carr 1964:160). Paynes Prairie is a natural resource of international significance. The dramatic purchase of Paynes Prairie in 1970 from Camp Ranch, Inc., after only a six-month acquisition process provided the State of Florida with its first state preserve. The recognition of the unique value of Paynes Prairie fueled the state purchase. Declared a National Natural Landmark in 1974, the 16,000-acre prairie basin includes north Florida's largest and most diverse freshwater basin marsh. The Paynes Prairie ecosystem supports a wide variety of plant and animal life and provides critical habitat for many species.

Cultural Resources

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Florida Department of State (FDOS) maintains the master inventory of such resources through the Florida Master Site File (FMSF). State law requires that all state agencies locate, inventory and evaluate cultural resources that appear to be eligible for listing in the National Register of Historic Places. Addendum 7 contains the FDOS, Division of Historical Resources (DHR) management procedures for archaeological and historical sites and properties on state-owned or controlled properties; the criteria used for evaluating eligibility for listing in the National Register of Historic Places, and the Secretary of Interior's definitions for the various preservation treatments (restoration, rehabilitation, stabilization and preservation). For the purposes of this plan, significant archaeological site, significant structure and significant landscape means those cultural resources listed or eligible for listing in the National Register of Historic Places. The terms archaeological site, historic structure or historic landscape refer to all resources that will become 50 years old during the term of this plan.

Condition Assessment

Evaluating the condition of cultural resources is accomplished using a three-part evaluation scale, expressed as good, fair and poor. These terms describe the present condition, rather than comparing what exists to the ideal condition. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair assessment is usually a cause for concern. Poor describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action is needed to reestablish physical stability.

Level of Significance

Applying the criteria for listing in the National Register of Historic Places involves the use of contexts as well as an evaluation of integrity of the site. A cultural resource's significance derives from its historical, architectural, ethnographic or archaeological context. Evaluation of cultural resources will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district), NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

There are no criteria for use in determining the significance of collections or archival material. Usually, significance of a collection is based on what or whom it may represent. For instance, a collection of furniture from a single family and a particular era in connection with a significant historic site would be considered highly significant. In the same way, a high quality collection of artifacts from a significant archaeological site would be of important significance. A large herbarium collected from a specific park over many decades could be valuable to resource management efforts. Archival records are most significant as a research source. Any records depicting critical events in the park's history, including construction and resource management efforts, would all be significant.

The following is a summary of the FMSF inventory. In addition, this inventory contains the evaluation of significance.

Pre-Historic and Historic Archaeological Sites

Desired future condition: All significant archaeological sites within the park that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: Paynes Prairie Preserve State Park has 105 archaeological sites recorded within the FMSF or in preparation for submission to the FMSF. The park and some of its adjoining properties encompass highly significant prehistoric and historic era archaeological resources that merit nomination to the National Register of Historic Places as an archaeological and historic district. Because the park contains archaeological evidence for every period of the aboriginal cultural sequence from Paleo-Indian times through European contact, it has the potential to yield significant information about changing settlement patterns in north-central Florida (Mullins 1977).

The park also contains significant archaeological sites from the historic era. Rancho de La Chua (AL02327) is believed to be the site of Hacienda de La Chua, the largest cattle ranch in Spanish Florida, covering about 87 square miles (Baker 1993). Established before 1637, La Chua was owned by La Florida's royal treasurer, Francisco Menendez Marquez. It reached its zenith of prosperity between 1672 and 1695, and operated until the early eighteenth century. La Chua, like other Spanish sites in the neighboring areas of north Florida, suffered a series of attacks during the late 1600s. Various Indian tribes, the English and the French attacked Spanish La Florida. French buccaneers traveled up the Suwannee, Santa Fe and Withlacoochee Rivers to raid La Chua Ranch twice between 1682 and 1684 (Milanich 2006). By the end of 1706, La Chua had been abandoned (Milanich 2006).

Another historic era site, Cuscowilla, which was an early Seminole settlement in Florida, is thought to be located near present day Micanopy, but that is yet to be confirmed. William Bartram described the settlement in 1774 (Harper 1958). At that time, the chief of Cuscowilla was Cowkeeper, who was later succeeded by his nephew, King Payne. In the 1790s, the town was relocated to a site east of Lake Wauberg and renamed Paynes Town (AL00366). The Seminoles inhabited Paynes Town until 1813, when a group of soldiers from the Tennessee volunteers occupied and burned it (Blakeney-Bailey 2004). The remains of Fort Tarver (AL00522), a fortified farm or plantation site at the time of the Second Seminole War (ca. 1835), are located on the north rim of Paynes Prairie southeast of Alachua Sink (Mullins 1977). Another Second Seminole War outpost, Fort Crane, is reported in the literature (and by local informants) to be located near Rochelle on the eastern edge of Paynes Prairie, but that site has not yet been rediscovered (United States Dept. of the Army 1971?). More archival and historical research will be conducted before pursuing any subsurface archeological testing within the park.

Evidence of human occupation of Paynes Prairie and its environs throughout the nineteenth century includes Chimney Field (AL00506 - ca. 1850), Stafford Pond House (AL00509), and Herlong House artifacts (AL00518b). From 1871 to 1891, when extreme flooding transformed the prairie into a lake, a ferry transported agricultural products across the basin (AL00514 Ferry Station). The remains of nineteenth and twentieth century railroad lines and a tram line are located in uplands adjacent to the prairie. These have been recorded within the FMSF as linear resource groups (AL00515, AL05203 and AL05404). Remains of homesteads from the early twentieth century have been found throughout the park (AL00509, AL00533 and AL02917). In the 1920s, the prairie basin and much of its rim were purchased by Camp Ranch, Inc. and used for cattle ranching until the state purchased the property in 1970. Cultural artifacts of the cattle ranching era, including the remains of the Camp Ranch, cattle dip vats, corrals, and numerous dikes and canals are evident and have recently been recorded within the FMSF as archaeological sites or linear resource groups (AL05576, AL05577, AL05578, AL05579, AL05580, AL05581, AL05582, AL05583, and AL05584).

Several archaeological surveys and studies have been undertaken at Paynes Prairie over the past half century. The most important recent survey was the Paynes Town Seminole Project (Blakeney-Bailey 2004). Another potentially significant recent survey was conducted in the area of the future Sweetwater treatment wetland (Torres et al 2009). Earlier surveys at Paynes Prairie included those by Carl Clausen (1964); Sue Mullins (1976; 1977); William D. Browning and Melissa G. Wiedenfeld (1988); Philip Gerrell (1990); Henry Baker (1993); Brent Weisman (1993); Joseph Southerland (1994); Barbara Purdy (1996); Anne V. Stokes (1997); Ryan J. Wheeler (1998); and Robert Austin (1999).

Twenty-one archaeological sites, primarily twentieth century and derived from activities associated with the Camp Ranch, have recently been documented for the FMSF. In addition, several linear resource groups (AL05203, AL05204, AL05471 and AL05576) that document the railroads, canals and dikes of the nineteenth and twentieth centuries have been submitted to the FMSF. Two recent additions to the park, the Edwards and Crevasse properties, have not yet been evaluated for archaeological sites. There is anecdotal evidence that Native American or historic archaeological sites likely occur on these properties. A predictive model was completed for the park in 2012 (Collins et al. 2012)

Condition assessment: The majority of the archaeological sites at Paynes Prairie Preserve are in good condition. The exceptions are sites ranked as fair: AL00365, AL00366, AL00428, AL02923 and AL05464, and those ranked as poor: AL00346, AL00350, AL00351, AL00352 and AL00356. All of the sites listed as poor have been heavily looted. Some of the sites listed as fair have experienced minor looting. From time to time, looting attempts still occur at these sites.

Site AL00366 (Paynes Town) is in fair condition. A portion of this important site was damaged during the 1960s and 1970s by quarrying for sand. According to Blakney-Bailey (2004), conditions within the Paynes Town site range from heavily disturbed to well preserved.

Level of Significance: Paynes Prairie Preserve State Park Unit Management Plan addresses the status and expected conditions of resources located in Paynes Prairie Preserve State Park. Florida Master Site File (FMSF) has record of 103 archaeological sites in the park. The significance of each of the cultural resources located within this park is identified in Table 6. The sites must be monitored, any stabilization issues addressed, and additional information or data relative to any of the sites submitted to DHR/FMSF.

Lake Pithlachocco Canoe Site (8AL04792) was listed on NRHP 3/27/2001 following determination of Eligible for NRHP by the recorder and Potentially Eligible for NRHP by SHPO based on Criterion D since the property has yielded, or is likely to yield information important in prehistory or history. Recorders also determined Sweetwater Branch Hill (8AL00081), Old Pecan Grove (8AL00257), Woody Woodpecker (8AL02325) and Paynes Prairie West 1 (8AL05454) Eligible for NRHP and SHPO found them Potentially Eligible for NRHP.

Paynes Town (8AL00366), Persimmon Point (8AL00454), Chimney Field Prehistoric (8AL00505), Chimney Field Historic (8AL00506), Firelane (8AL00507), Ferry Station (8AL00514), Bee Hive Field Village (8AL00521), Fort Tarver (8AL00522), North Beehive Field (8AL00523), Island (8AL00528), Cones Ranch (8AL02902), Watermelon Patch (8AL02906), Warner Woodruff 1 (8AL02907) and Plantation Professional Center (8AL03511) were deemed Eligible for NRHP by recorders but were Not Evaluated by SHPO.

The recorder found Paynes Prairie Disturbed (8AL05201) Ineligible for NRHP and SHPO cited Insufficient Information. Recorders and SHPO determined Sweetwater Branch Flint (8AL00080), NN (8AL00410), Jones Field (8AL00432), Small Chip (8AL03275), Paynes Prairie West 2 (8AL05455), Sweetwater Branch I (8AL05463), Camp Bridge (8AL05469) and Wildlife Research Laboratory (8AL05510) Ineligible for NRHP.

Recorders and SHPO cited Insufficient Information to determine eligibility for None (8AL00163), Rancho de La Chua (8AL02327), Waterline Flakes (8AL05202) and Sweetwater Branch II (8AL05464). Recorders recovered Insufficient Information for evaluation of Rochelle-Micanopy I (8AL00428), RR-1 South (8AL02555) and Jerevan #1 (8AL02923), sites Not Evaluated by SHPO.

Although recorders deemed Alachua Sink (8AL00022), NN (8AL00365), Herlong House (8AL00498), Rim (8AL00499), AZ 1, 4 Field (8AL00500), Rochelle Road Garbage Pump (8AL00501), Stafford Pond House (8AL00509), Brick Dump (8AL00511), Futch Flint Field (8AL00516), Blum Jug (8AL00524) and Deer (8AL00526) Likely NRHP Eligible, the sites were not evaluated by SHPO. The recorder also deemed Troiano (8AL04777) Likely NRHP Eligible but SHPO determined the site Ineligible for NRHP.

Melton Mound 2 (8AL00006), NN (8AL00010), Manka (8AL00023), South Paynes Prairie 8 (8AL00038), South Paynes Prairie 9 (8AL00039), South Paynes Prairie 10 (8AL00040), Paynes Prairie 6 (8AL00061), Paynes Prairie 7 (8AL00062), Jackson (8AL00077), Castle (8AL00086), Paynes Prairie 5 (8AL00136), NN (8AL00192), KJ-8 (8AL02477), KJ-9 (8AL02478), NN sites (8AL00315, 346, 350-352), Newnans (8AL00356), Bolen Bluff (8AL00439), Road Intersection (8AL00495), Boat Ramp (8AL00496), Bath House (8AL00497), Celt (8AL00502), Cactus Field (8AL00503), Herlong House Artifacts (8AL00518b), Barn Artifacts (8AL00519b) and Queen Ester Watson Mound (8AL00520) were Not Evaluated by Recorder and Not Evaluated by SHPO.

NR Listed or Eligible resources warrant higher profile monitoring and measures to stabilize and mitigate deterioration and disturbance, but all recorded sites will be located, visited and monitored regularly with necessary steps taken to conserve their integrity. Evidence of previously unrecorded sites will be documented and newly discovered sites will be recorded to DHR/FMSF standards. Boundaries of sites will be redefined as appropriate. The park has no significant collection of artifacts

General management measures: All archaeological sites in the park are protected. The park has an annual monitoring program already established, which should ensure that all sites are visited regularly. Photo documentation of the more vulnerable sites is recommended. It will be especially important to institute more frequent monitoring of sites that are subject to looting. Staff will document any new looting that occurs at previously looted sites or at currently intact sites. The park will request that law enforcement continue to provide assistance in protecting these sites. At the Paynes Town site, protection and preservation may need to be supplemented by stabilization in areas that were historically mined for sand. Fill dirt to replace the soil removed from this site may be available from the future excavation of the Sweetwater treatment wetland in management zone PP-9 of Paynes Prairie.

Historic Structures

Desired future condition: All significant historic structures and landscapes that represent Florida's cultural periods or significant historic events or persons are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: At the time of this update of the management plan, Paynes Prairie Preserve State Park had 28 known historic structures recorded within the FMSF. All of these structures are 20th century or presumed to be 20th century (AL05575). The structures fall into four general categories, namely Camp Ranch, Hickory Ranch, the Wauberg buildings, and miscellaneous other residences and associated structures. Very little is known about the history of the Wauberg buildings or of Hickory Ranch, except that the Cone family owned the latter.

Eleven historic structures are associated with the Camp Ranch operation. The most significant of these are the Camp Ranch bunkhouses (AL05555, AL05560), house (AL05557), barn (AL05561), office (AL05558), railroad warehouse (AL05556), and slaughterhouse (AL05559). All were constructed in the 1940s, and all are clustered on the north rim of the prairie above Alachua Sink. AL05555 is an unusual building for Florida because the exterior material is sandstone. The Bison Pen Windmill (AL05569) is located a mile or so east of the cluster of ranch structures. It served to pump water for livestock and continued in that capacity until 1990. Another structure, this one significant for its biological impact, is the Camps Canal Pumping Station (AL05568), which is located on the far eastern side of the prairie basin. Constructed in 1937, it once helped the Camp Ranch dewater Paynes Prairie by actively pumping water out of the prairie and into Camps Canal.

The Wauberg house, barn and livery (AL05563, AL05562 and AL05564) were built in 1940 in the Florida Vernacular style. The original use of the barn and livery continued until 1971. Park rangers now use the house as a residence. The Hickory Ranch High Barn (AL05574), Hay Barn (AL05572), Shop (AL05570) and Corn Crib (AL05573) were all built in 1949. These structures continue to be used for livestock and land management functions including hay storage. The Hickory Ranch Horse Stable (AL05571) was built in the 1960s. It continues to serve as a stable and as an office.

The remaining significant historic structures in the park are residences or are associated with residences. The Bolen Bluff Residence (AL05567) was built in 1940 by a local constable. The Camp Ranch moved it to its present location after 1949. It is currently in use as a residence. The Kincaid Warehouse (AL05566) was built in 1940 as a warehouse and it is used as such today. It was associated with the original Kincaid House (AL02917) that was constructed around 1925. Due to their poor condition, park staff documented the house and the Kincaid Barn (AL02918A) in the 1990s and then demolished them. The New Kincaid House (AL05565), built adjacent to the original Kincaid House, still serves as a park residence.

In addition to the individual structures, the park has several linear resource groups recorded: Railroad (AL00515), Atlantic Coastline Railroad Gainesville (AL05203), Tampa Jacksonville Railroad (AL05404), Sweetwater Branch Canal (AL05471) and Camp Ranch Canal/Dike (AL05576). These all date from the late 19th century or early 20th century. A small portion of a rural historic landscape, Serenola Plantation (AL05453), extends into the park.

Condition assessment: Most of the historic structures at Paynes Prairie Preserve are in good or fair condition. Structures in poor condition include the Hickory Ranch Hay Barn Building #47 (AL05572), which needs a new roof and partial flooring, the Hickory Ranch Shop Building #45 (AL05570), which needs a new roof and support beams, the Kincaid Warehouse (AL05566), which has some roof leaks and uneven flooring, and the

Wauberg Livery Building #13 (AL05564). Other structures in poor condition include the Kincaid House (AL02917) and Kincaid Barn (AL02918A), both removed with DHR approval, and the PZ-2 House (AL00533), which was already dilapidated in 1976. At that time, it was recommended that no action be taken other than documentation if the structure were to be demolished, but it has not yet been demolished or officially recorded.

Eight historic structures are in fair condition. The Camp Ranch Bunkhouse 2 - Building #6 (AL05560) is in fair condition. Several years ago, the chimney collapsed and was removed. This building sits on a bluff overlooking Alachua Sink and is currently used as an office. The Camp Ranch Slaughterhouse (AL05559), 3215 SE 35TH ST. (AL03833), the Wauberg Barn - Building #10 (AL05562), the New Kincaid House - Building #3 (AL05565), the Hickory Ranch Horse Stable - Building #46 (AL05571), the Hickory Ranch Corn Crib - Building #49 (AL05573), and the Hickory Ranch High Barn - Building #50 (AL05574) are all in fair condition. To be considered in good condition, the High Barn (AL05574) may need to have some of its roof replaced.

The Camp Ranch Barn - Building #17 (AL05561) is in good condition, and it will function as an interpretative facility at the point where the La Chua Trail enters the prairie basin. All of the other Camp Ranch historic structures located on the north rim of the prairie are in good condition except for the slaughterhouse (AL05559) and bunkhouse (AL05560), both of which are in fair condition.

Level of Significance: Five linear resources, one rural historic landscape, and 28 historic structures located in the park have been recorded in the FMSF. Several have been formally evaluated by the State Historic Preservation Officer (SHPO) for significance and determined ineligible for the National Register. These linear resources and historic structures are listed within Table 4 as "not significant" (NS) and include the Atlantic Coastline Railroad: Gainesville-Hawthorne (8AL05203), Tampa Jacksonville Railroad (8AL05404), Serenola Plantation (8 AL05453), Camp Water Trough (8AL05468), Camp Manholes (8AL05470), Sweetwater Branch Canal (8AL05471) and Camp Feed Trough (8AL05472). The Kincaid House (8AL02917) and Kincaid Barn (8AL02918A) were also formally evaluated by the SHPO for significance and determined ineligible for the National Register; these two buildings have since been demolished.

3215 SE 35th St. (8AL3833) was recorded as part of a historic structure survey for unincorporated Alachua County and considered as ineligible for the National Register by the recorder, but has not been formally evaluated by the SHPO. The Railroad Site (8AL00515) and PZ-2 House (8AL533) were not evaluated for significance by either the recorder or SHPO. Twenty additional historic structures (8AL05555—8AL5575) were recently recorded by park staff and have not been evaluated for significance.

General management measures: Paynes Prairie Preserve currently has an inspection program for structures. Personnel are routinely scheduled to work in areas where the there are historic structures so that the buildings receive a weekly visual inspection. Any problems noticed are identified in a work plan. Residential structures receive an annual walk-through inspection.

Two structures, the Camp Ranch bunkhouses AL05555 and AL05560, need to be evaluated to determine what rehabilitation treatments are necessary. Plans for the Camp Ranch Barn (AL05561) include adaptive reuse as an interpretive area. BNCR and BDC staff will assist the park in that project by providing advice and direction. A Historic Structures Report may be warranted for the Camp Ranch buildings as a group. The park needs to determine if any or all of the buildings require an HSR.

Collections

Desired future condition: All historic, natural history and archaeological objects within the park that represent Florida's cultural periods, significant historic events or persons, or natural history specimens are preserved in good condition in perpetuity, protected from physical threats and interpreted to the public.

Description: The main collection is housed at the Paynes Prairie Visitor Center, which currently provides 1373 sq ft of climate-controlled space. The Visitor Center is now undergoing a redesign of its interior space. This is a long-term project, but when completed it will provide a total of approximately 1870 sq ft of climate-controlled space for the collection and for interpretation of the Paynes Prairie experience. The park's formal collection contains natural resource objects such as specimens of sandhill cranes and other animals native to the prairie, as well as a few archaeological artifacts and a reproduction of Audubon's sandhill crane painting.

There is also an informal collection consisting of documents such as research studies, some books pertaining to the prairie, and original photographs by the late Dominic Martino, a former park volunteer and professional photographer. The documents are stored in the resource room at Hickory Ranch. The Audubon print is located at the Visitor Center. Two additional informal collection items are an antique gas pump that may date to the 1920s and a 1930s era pickup truck. The truck is in very poor condition due to exposure to the elements. Until 2011, the pickup was parked in the woods about 500 ft from the Wauberg Barn. After recording its original location, park staff moved it into the barn to protect it from the elements. The antique gas pump is located next to the Wauberg Livery and is exposed to the weather. The park may decide to relocate it to the barn as well in order to protect it from further deterioration. Both items are photo documented annually.

Park staff obtained many of the objects in the collection. The Audubon print was a donation.

Condition Assessment: The collection is exhibited at the Visitor Center and is stored either at the Visitor Center or at Hickory Ranch. The part of the formal collection that is stored in the Visitor Center is in good condition. Collections at both sites are housed under climate-controlled and pest-controlled conditions and are kept secured. Better storage conditions are needed for the materials kept at Hickory Ranch, however.

Level of Significance: The natural resource items are the most significant part of the park's collection. This includes photographs by Dominick Martino. The collection is used for interpretation and to illustrate the diverse biological resources of the park. Historic documents are available to future park managers and staff as reference material.

General management measures: Paynes Prairie Preserve has a Scope of Collections Statement. The collections are restricted to those that support interpretation of the natural and cultural resources of Paynes Prairie. The specific themes addressed by the collection are cultural resources, geology, hydrology, ecology and recreation. The time periods covered range from Paleoindian to the present.

A collections inventory, an assessment, and a collections management plan need to be developed for the formal and informal collections. The photographs by Dominic Martino may need archival treatment.

Detailed management goals, objectives and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 6 contains the name, reference number, culture or period, and brief description of all the cultural sites within the park that are listed in the Florida Master Site File. The table also summarizes each site's level of significance, existing condition and recommended management treatment. An explanation of the codes is provided following the table.

Table 6: Cultural Sites Listed in the Florida Master Site File

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
NN AL00010	Prehistoric with pottery	Archaeological Site	NE	G	P
Alachua Sink AL00022	Prehistoric with pottery	Archaeological Site	NR	G	P
Manka AL00023	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NE	G	P
South Paynes Prairie 8 AL00038	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NE	G	P
South Paynes Prairie 9 AL00039	Deptford, 700 B.C.-300 B.C.	Archaeological Site	NE	G	P
South Paynes Prairie 10 AL00040	Prehistoric	Archaeological Site	NE	G	P
Paynes Prairie 6 AL00061	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NE	G	P
Paynes Prairie 7 AL00062	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NE	G	P
Jackson AL00077	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NE	G	P
Sweetwater Branch Flint AL00080	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NS	G	P
Sweetwater Branch Hill AL00081	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NR	G	P
Castle AL00086	Deptford	Archaeological Site	NE	G	P
Paynes Prairie 5 Al00136	Hickory Pond, A.D. 800-1250	Archaeological Site	NE	G	P
None AL00163	Deptford	Archaeological Site	NE	G	P
NN AL00192	Deptford	Archaeological Site	NE	G	P
Old Pecan Grove AL00257	Prehistoric with pottery	Archaeological Site	NR	G	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
NN AL00315	Prehistoric with pottery	Archaeological Site	NE	G	P
NN AL00346	Weeden Island 1	Archaeological Site	NE	P	P
NN AL00350	Prehistoric with pottery	Archaeological Site	NE	P	P
NN AL00351	Weeden Island II	Archaeological Site	NE	P	P
NN AL00352	Prehistoric	Archaeological Site	NE	P	P
Newnans AL00356	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NE	P	P
NN AL00365	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NR	F	P
Paynes Town AL00366	Nineteenth Century American, 1821-1899	Archaeological Site	NR	F	P
NN AL000410	Prehistoric	Archaeological Site	NS	F	P
Rochelle-Micanopy I AL00428	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NE	F	P
Jones Field AL00432	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NS	G	P
Bolen Bluff AL00439	Archaic	Archaeological Site	NE	F	P
Persimmon Point AL00454	Prehistoric	Archaeological Site	NR	G	P
Entrance Station AL00494	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NS	G	P
Road Intersection AL00495	Indeterminate	Archaeological Site	NE	G	P
Boat Ramp AL00496	Indeterminate	Archaeological Site	NE	G	P
Bath House AL00497	Indeterminate	Archaeological Site	NE	G	P
Herlong House AL00498	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NR	G	P
Rim AL00499	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NR	G	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
AZ 1, 4 Field AL00500	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NR	G	P
Rochelle Road Garbage Pump AL00501	American, 1821-present	Archaeological Site	NR	G	P
Celt AL00502	Prehistoric	Archaeological Site	NE	G	P
Cactus Field AL00503	Indeterminate	Archaeological Site	NE	G	P
AZ-2 Dump AL00504	American, 1821-present	Archaeological Site	NS	G	P
Chimney Field Prehistoric AL00505	Cades Pond, 300 B.C.-A.D. 800	Archaeological Site	NR	G	P
Chimney Field Historic AL00506	American Acquisition/ Territorial Development 1821-45	Archaeological Site	NR	G	P
Firelane AL00507	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NR	G	P
Night Hawk AL00508	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NS	G	P
Stafford Pond House AL00509	American, 1821-present	Archaeological Site	NR	G	P
Stafford Pond Dump AL00510	American, 1821-present	Archaeological Site	NS	G	P
Brick Dump AL00511	American, 1821-present	Archaeological Site	NR	G	P
Palmetto AL00512	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NS	G	P
Sawgrass Pond AL00513	Nineteenth Century American, 1821-1899	Archaeological Site	NS	G	P
Ferry Station AL00514	American, 1821-present	Archaeological Site	NR	G	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Railroad AL00515	American Nineteenth Century	Linear Resource Group	NE	G	P
Futch Flint Field AL00516	Archaic, 8500 B.C.- 1000 B.C.	Archaeological Site	NR	G	P
Herlong House Artifacts AL00518B	American, 1821- present	Archaeological Site	NE	G	P
Barn Artifacts AL00519B	American, 1821- present	Archaeological Site	NE	G	P
Queen Ester Watson Mound AL00520	Prehistoric	Archaeological Site	NE	G	P
Bee Hive Field Village AL00521	Alachua A.D., 1250- A.D. 1600	Archaeological Site	NR	G	P
Fort Tarver AL00522	American Acquisition/ Territorial Development 1821- 45	Archaeological Site	NR	G	P
North Beehive Field AL00523	Alachua A.D., 1250- A.D. 1600	Archaeological Site	NR	G	P
Blum Jug AL00524	American, 1821- present	Archaeological Site	NR	G	P
Robinson Heights AL00525	Archaic, 8500 B.C.- 1000 B.C.	Archaeological Site	NS	G	P
Deer AL00526	Alachua A.D., 1250- A.D. 1600	Archaeological Site	NR	G	P
Oak Grove Fossil AL00527	Archaic, 8500 B.C.- 1000 B.C.	Archaeological Site	NS	G	P
Island AL00528	Archaic, 8500 B.C.- 1000 B.C.	Archaeological Site	NR	G	P
Sink Area AL00529	Archaic, 8500 B.C.- 1000 B.C.	Archaeological Site	NS	G	P
Buffalo Pens AL00530	Alachua A.D., 1250- A.D. 1600	Archaeological Site	NE	G	P
Fenceline AL00531	Archaic, 8500 B.C.- 1000 B.C.	Archaeological Site	NE	G	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
PZ-2 Dumps AL00532	American, 1821-present	Archaeological Site	NS	G	P
PZ-2 House AL00533	Twentieth Century	Historic Structure	NE	P	P
Woody Woodpecker AL02325	Archaic, Early & Middle	Archaeological Site	NR	F	P
Rancho De La Chua AL02327	Twentieth Century American, 1900-present	Archaeological Site	NE	G	P
KJ-8 AL02477	Not Specified	Archaeological Site	NE	G	P
KJ-9 AL02478	Not Specified	Archaeological Site	NE	G	P
RR-1 South AL02555	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NE	G	P
Prairie Creek AL02561	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NS	G	P
Hawthorne R&T AL02562	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NS	G	P
Cones Ranch AL02902	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NR	G	P
Watermelon Patch AL02906	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NR	G	P
Warner Woodruff 1 AL02907	Prehistoric	Archaeological Site	NR	G	P
Kincaid House AL02917	c-1925	Historic Structure (removed with DHR approval, 1993)	NS	P	N/A
Kincaid Barn AL02918A	c-1925	Historic Structure (removed with DHR approval, 1993)	NS	P	N/A
Kincaid Barn Site AL02918B	Twentieth Century American, 1900-present	Archaeological Site	NE	G	P
Jerevan #1 AL02923	Twentieth Century American, 1900-present	Archaeological Site	NE	F	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Small Chip Site AL03275	Prehistoric	Archaeological Site	NS	G	P
Plantation Professional Center AL03511	Alachua A.D., 1250-A.D. 1600	Archaeological Site	NR	G	P
Old Safe AL03515	Twentieth century American, 1900-present	Archaeological Site	NS	G	P
3215 SE 35TH ST AL03833	Twentieth Century	Historic Structure	NE	F	P
Troiano Site AL04777	Archaic, Hickory Pond	Archaeological Site	NS	G	P
Lake Pithlachocco AL04792	Early Archaic	Archaeological Site	NR	G	P
Paynes Prairie Disturbed AL05201	Nineteenth Century American, 1821-1899	Archaeological Site	NS	G	P
Waterline Flakes AL05202	Prehistoric	Archaeological Site	NE	G	P
Atlantic Coastline Railroad: Gainesville AL05203	Twentieth Century American, 1900-present	Linear Resource Group	NS	G	P
Tampa - Jacksonville Railroad AL05404	Unspecified on form by the recorder	Linear Resource Group	NS	G	P
Water Shut Off AL05435	Unspecified	Archaeological Site	NE	G	P
Serenola Plantation AL05453	American Civil War, 1861-1865	Rural Historic Landscape Resource Group	NS	G	P
Paynes Prairie West 1 AL05454	Twentieth Century American, 1900-present	Archaeological Site	NR	G	P
Paynes Prairie West 2 AL05455	Prehistoric	Archaeological Site	NS	G	P
Sweetwater Branch I AL05463	Prehistoric	Archaeological Site	NS	G	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Sweetwater Branch II AL05464	Archaic, 8500 B.C.-1000 B.C.	Archaeological Site	NE	F	P
Camp Water Trough AL05468	Twentieth Century, 1940s	Historic Structure	NE	G	P
Camp Bridge AL05469	Twentieth Century American, 1900-present	Archaeological Site	NS	G	P
Camp Manholes AL05470	Twentieth Century	Historic Structure	NE	G	P
Sweetwater Branch Canal AL05471	Nineteenth & Twentieth Century	Linear Resource Group	NE	G	R
Camp Feed Trough AL05472	Twentieth Century, 1950s	Historic Structure	NE	P	ST
Wildlife Research Laboratory AL05510	Prehistoric	Archaeological Site	NS	G	P
Camp Ranch Bunkhouse, Building #1 AL05555	Twentieth Century	Historic Structure	NE	G	P
Camp Railroad Warehouse, Building #2 AL05556	Twentieth Century	Historic Structure	NE	G	P
Camp Ranch House, Building #4 AL05557	Twentieth Century	Historic Structure	NE	G	P
Camp Ranch Office, Building #5 AL05558	Twentieth Century	Historic Structure	NE	G	P
Camp Ranch Slaughterhouse AL05559	Twentieth Century	Historic Structure	NE	F	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Camp Ranch Bunkhouse 2, Building #6 AL05560	Twentieth Century	Historic Structure	NE	F	P
Camp Ranch Barn, Building #17 AL05561	Twentieth Century	Historic Structure	NE	G	P
Wauberg Barn, Building #10 AL05562	Twentieth Century	Historic Structure	NE	F	P
Wauberg House, Building #13 AL05563	Twentieth Century	Historic Structure	NE	G	P
Wauberg Livery AL05564	Twentieth Century	Historic Structure	NE	P	P
New Kincaid House, Building #3 AL05565	Twentieth Century	Historic Structure	NE	F	P
Kincaid Warehouse, Building #44 AL05566	Twentieth Century	Historic Structure	NE	P	P
Bolen Bluff Residence, Building #11 AL05567	Twentieth Century	Historic Structure	NE	G	P
Camps Canal Pumping Station, Building #20 AL05568	Twentieth Century	Historic Structure	NE	G	P
Bison Pen Windmill AL05569	Twentieth Century	Historic Structure	NE	F	P
Hickory Ranch Shop, Building #45 AL05570	Twentieth Century	Historic Structure	NE	P	P
Hickory Ranch Horse Stable, Building #46 AL05571	Twentieth Century	Historic Structure	NE	F	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Hickory Ranch Hay Barn, Building #47 AL05572	Twentieth Century	Historic Structure	NE	P	P
Hickory Ranch Corn Crib, Building #49 AL05573	Twentieth Century	Historic Structure	NE	F	P
Hickory Ranch High Barn, Building #50 AL05574	Twentieth Century	Historic Structure	NE	F	P
Jackson Tank AL05575	Probably Twentieth Century	Historic Structure	NE	G	P
Camp Ranch Canals/ Dikes AL05576	Twentieth Century	Linear Resource Group	NE	G	R
Kincaid Dip Vat AL05577	Probably Twentieth Century	Archaeological Site	NE	G	P
Bison Pen Dip Vat AL05578	Probably Twentieth Century	Archaeological Site	NE	G	P
South Jackson Dip Vat AL05579	Probably Twentieth Century	Archaeological Site	NE	G	P
NORTH JACKSON DIP VAT AL05580	Probably Twentieth Century	Archaeological Site	NE	G	P
West Side Dip Vat AL05581	Probably Twentieth Century	Archaeological Site	NE	G	P
Bolen Bluff Dip Vat AL05582	Probably Twentieth Century	Archaeological Site	NE	G	P
High Barn Dip Vat AL05583	Probably Twentieth Century	Archaeological Site	NE	G	P
Jackson Gap Dip Vat AL05584	Probably Twentieth Century	Archaeological Site	NE	G	P
Paynes Prairie Bottle Dumps AL05585	Possibly Late Nineteenth Century & 1st Half of Twentieth Century	Archaeological Site	NE	G	P

Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Pitcher Pump AL05586	Possibly Nineteenth Century or Early Twentieth Century	Archaeological Site	NE	G	P
East Gate Brick Wall AL05587	Possibly Nineteenth Century or Early Twentieth Century	Archaeological Site	NE	G	P
Alachua Sink Earthen Works AL05588	Possibly Nineteenth Century or Early Twentieth Century	Archaeological Site	NE	G	P
Lithic Scatter on the Prairie AL05637	Prehistoric	Archaeological Site	NE	G	P

Significance:

NRL National Register listed
NR National Register eligible
NE not evaluated
NS not significant

Condition

G Good
F Fair
P Poor
NA Not accessible
NE Not evaluated

Recommended Treatment:

RS Restoration
RH Rehabilitation
ST Stabilization
P Preservation
R Removal
N/A Not applicable

RESOURCE MANAGEMENT PROGRAM

Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of DRP's management goals for Paynes Prairie Preserve State Park. Please refer to the Implementation Schedule and Cost Estimates in the Implementation Component of this plan for a consolidated spreadsheet of the recommended actions, measures of progress, target year for completion and estimated costs to fulfill the management goals and objectives of this park.

While, DRP utilizes the ten-year management plan to serve as the basic statement of policy and future direction for each park, a number of annual work plans provide more specific guidance for DRP staff to accomplish many of the resource management goals and objectives of the park. Where such detailed planning is appropriate to the character and scale of the park's natural resources, annual work plans are developed for prescribed fire management, exotic plant management and imperiled species management. Annual or longer- term work plans are developed for natural community restoration and hydrological restoration. The work plans provide DRP with crucial flexibility in its efforts to generate and implement adaptive resource management practices in the state park system.

The work plans are reviewed and updated annually. Through this process, DRP's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Chapters 253.034 and 259.037, Florida Statutes.

The goals, objectives and actions identified in this management plan will serve as the basis for developing annual work plans for the park. The ten-year management plan is based on conditions that exist at the time the plan is developed, and the annual work plans provide the flexibility needed to adapt to future conditions as they change during the ten-year management planning cycle. As the park's annual work plans are implemented through the ten-year cycle, it may become necessary to adjust the management plan's priority schedules and cost estimates to reflect these changing conditions.

Natural Resource Management

Hydrological Management

Goal: Protect water quality and quantity in the park, restore hydrology to the extent feasible and maintain the restored condition.

The natural hydrology of most state parks has been impaired prior to acquisition to one degree or another. Florida's native habitats are precisely adapted to natural drainage patterns and seasonal water level fluctuations, and variations in these factors frequently determine the types of natural communities that occur on a particular site. Even minor changes to natural hydrology can result in the loss of plant and animal species from a landscape. Restoring state park lands to original natural conditions often depends on returning natural hydrological processes and conditions to the park. This is done primarily by filling or plugging ditches, removing obstructions to surface water "sheet flow," installing culverts or low-water crossings on roads, and installing water control structures to manage water levels.

Objective: Conduct/obtain an assessment of the park's hydrological restoration needs.

Ensuring that Paynes Prairie receives a reliable and ecologically viable quantity of surface water is of critical concern to DRP. In the years before construction of Camps Canal, the Newnans Lake watershed contributed virtually all its surface water flow to the prairie basin through an unaltered Prairie Creek. At that time, inflow from Prairie Creek accounted for about half the total water budget of Paynes Prairie. Today, despite a major diversion of the creek's flow southward to Orange Lake, Prairie Creek remains the single largest contributor of surface water to the prairie basin. According to the current reservation by rule administered by the SJRWMD, Paynes Prairie holds under reservation the daily volume of water that passes through culverts in the water control structure at the Camps Canal Dike. That volume amounts to only 45 percent of the total Prairie Creek flow on average, but it accounts for fully one third of the prairie's total surface water inflow today.

In pursuit of the above objective, DRP will continue to coordinate closely with the SJRWMD, DEP, Alachua County and the City of Gainesville in protecting and improving hydrological resources within the Paynes Prairie watershed, particularly at Paynes Prairie Preserve State Park. Coordination may consist of the maintenance of relevant correspondence and regular attendance at meetings concerned with regional or local hydrology. DRP will continue to review county land use changes proposed for properties outside the park, looking for potential impacts to the Paynes Prairie hydrology. Staff will provide comments to public officials if any threats to the water resources of Paynes Prairie become apparent. Finally, DRP will continue its tradition of close cooperation with various independent groups engaged in hydrological research in the Paynes Prairie watershed.

The continued monitoring of water inflow to Paynes Prairie from adjacent sub-basins, including any associated storm water runoff, is of paramount importance to the park. DRP should continue to support all entities that track water sources for the prairie basin, both surface water and groundwater. DRP will work closely with the SJRWMD to ensure that the reservation rule developed for the control structure at Camps Canal functions properly. The aim will be to either increase surface flow to the Paynes Prairie sub-basin or, at the very least, maintain the current flow so that the ecology of the

Paynes Prairie system does not suffer significant harm. DRP will encourage all OCBWG stakeholders, including DEP water managers, to become actively involved in the MFL assessment for Newnans Lake.

Water quality monitoring is another need at Paynes Prairie Preserve, not only within the prairie basin but also within sub-basins that supply surface water to the prairie. Indications of increased nutrient loading within Sweetwater Branch and Alachua Sink have led to the listing of both water bodies as verified impaired for nutrients. Both have been assigned a specific TMDL (see details in the Hydrology section above) which establishes regulatory limits on discharged nitrogen from the Main Street Plant and from City of Gainesville storm water facilities. In 2008, the OCBWG and DEP produced a phased plan called the Orange Creek BMAP designed to reduce pollutants in the entire Paynes Prairie watershed. Complementing the BMAP will be Pollution Load Reduction Goals set by the SJRWMD for Newnans Lake.

DRP will continue to participate in the BMAP process. District and park staffs will work closely with DEP regulatory personnel in seeking the best available options for reducing pollutants in Sweetwater Branch and Alachua Sink in order to attain the assigned TMDL level. DRP will continue to coordinate with the SJRWMD and the OCBWG in reducing nutrient loading in Newnans Lake and in developing PLRG goals for this important watershed. Park and district staffs will continue to support the OCBWG and will seek additional funding to supplement beneficial land management and restoration activities within the Paynes Prairie watershed.

Objective: Restore natural hydrological conditions and functions to approximately 5,000 acres of basin marsh natural community.

For decades within the prairie basin, historic dike and canal systems have significantly disrupted the natural sheetflow of surface waters across the landscape. Some of the systems impede sheetflow, while others reduce or eliminate standing water in the basin marsh and marsh lakes by channelizing or directing flow elsewhere. Removal of some of the dikes and canals, such as the East-West and Bolen Bluff systems, has definitely benefited Paynes Prairie hydrology. One basic need for additional restoration to proceed successfully is an evaluation of the benefits and/or drawbacks of removing other old dikes and canals from the prairie basin in order to restore natural sheetflow regimes. If restoration is projected to be both beneficial and feasible, DRP should commit to seeking funds for phased removal of the most intrusive of the remaining dikes and canals. DRP should also continue efforts to improve water quality in streams and lakes that contribute surface water flow to the prairie basin.

The Sweetwater Branch /Paynes Prairie Sheetflow Restoration Project has two major components that would address issues of water distribution and quality within the east part of the prairie basin. The first is construction of a 125-acre treatment wetland within management zone PP-9 of the basin to remove excess nitrogen, and the second is removal of 3.9 miles of dikes and the backfilling of associated canals in the Sweetwater Branch Dike system. Upon completion of the project, Alachua Sink would finally meet the reduced TMDL standard designated by the EPA. Removal of excess nitrogen from the Sweetwater Branch flow would rely on filtration within the treatment wetland, with the remaining nitrogen being removed as Sweetwater sheetflows across the eastern prairie basin. This restored sheetflow would also begin to reverse ecological impacts associated with previous manipulations of the basin marsh hydrology.

In attempting to achieve the above objective, park and district staffs will continue to implement the Paynes Prairie Hydrological Restoration Plan. The park will evaluate and prioritize additional dike and canal restoration projects, and will seek funding to remove as many of the artificial water control features on the prairie as feasible. One of the most important sheetflow restoration projects, described in detail in the Sweetwater Branch / Paynes Prairie Sheetflow Restoration Plan, will be the removal of all the Sweetwater Branch dikes and the return of the east prairie basin to a natural sheetflow regime. DRP fully supports the OCBWG and other stakeholders in implementation of this restoration plan, which will result in improved water quality and restoration of a natural sheetflow regime to about 5,000 acres of prairie basin.

One hydrological issue still in need of better resolution today is the continued diversion of part of the historic Prairie Creek sheetflow away from the prairie basin. Pertinent to that, DRP will continue to cooperate with sister agencies and other stakeholders in seeking ways to increase Paynes Prairie's proportionate share of the Prairie Creek flow.

Sheetflow restoration in other parts of the prairie basin is certainly a possibility, but additional evaluation may be necessary and adequate funding must be available. DRP will continue to coordinate with the FDOT in seeking a long-term solution to hydrological issues caused by the two major highways, I-75 and U.S. 441 that cross the prairie basin. DRP will also proceed with efforts to find funding for the dismantling of the VORTAC Dike system west of I-75. Park and district staffs will continue to consider the best means of reducing the impacts of Cones Dike and Otto Waley Dike on the hydrology of zones PP-1301 and PP-8. Restoring the sheetflow volume and distribution pattern there may require the partial or complete removal of dikes or the installation of additional culverts. As funding permits, DRP will conduct a similar evaluation of Borrow Dike, and it will determine if it would be beneficial to reduce the lengths of the Main and Bolen Bluff dikes. If evaluations indicate that any of these potential hydrological restoration projects are both beneficial and feasible, then DRP will seek funding to implement them.

Objective: Monitor and evaluate the impacts of historic cattle dipping operations at Paynes Prairie.

In 2003, the DEP identified significant areas of concern within Paynes Prairie Preserve where previous landowners had conducted intensive cattle dipping operations.

Rigorous groundwater and soil sampling at nine sites in the park revealed that soils were severely contaminated. Recommendations from DEP were to continue the monitoring and assessment at these nine sites in order to delineate the extent of the problem.

DRP will continue to cooperate with DEP and other agencies in the long-term monitoring of water quality and soils in areas where cattle dipping operations had occurred, and will mitigate impacts as needed, using the best available means of remediation.

Natural Communities Management

Goal: Restore and maintain the natural communities/habitats of the park.

As discussed above, DRP practices natural systems management. In most cases, this entails returning fire to its natural role in fire-dependent natural communities. Other methods to implement this goal include large-scale restoration projects as well as smaller scale natural communities' improvements. Following are the natural community management objectives and actions recommended for the state park.

Prescribed Fire Management: Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystem. Prescribed burning increases the abundance and health of many wildlife species. A large number of Florida's imperiled species of plants and animals are dependent on periodic fire for their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels.

All prescribed burns in the Florida state park system are conducted with authorization from the Department of Agriculture and Consumer Services, FFS (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

Objective: Within 10 years, have 13,500 acres of the park maintained within the optimum fire return interval.

Table 7 contains a list of all fire-dependent natural communities found within the park, their associated acreage and optimal fire return interval, and the annual average target for acres to be burned.

The park is partitioned into management zones including those designated as burn zones (see Management Zones Table and Map). Prescribed fire is planned for each burn zone on the appropriate interval. The park's burn plan is updated annually because fire management is a dynamic process. To provide adaptive responses to changing conditions, fire management requires careful planning based on annual and very specific burn objectives. Each annual burn plan is developed to support and implement the broader objectives and actions outlined in this ten-year management plan.

Table 7: Prescribed Fire Management		
Natural Community	**Acres**	**Optimal Fire Return Interval (Years)**
Basin Marsh	12,962	2-20
Mesic Flatwoods	1,072	2-3
Upland Pine	378	2-3
Baygall	323	25-100
Scrubby Flatwoods	162	3-8
Depression Marsh	136	2-10
Wet Flatwoods	107	2-4
Dome Swamp	42	2-10
Upland Mixed Woodland	30	2-5
Sandhill	11	2-3
Altered Landcover Types		
Abandoned Pasture	289	2-5
Clearcut Pine Plantation	40	3-20
Pasture - Semi-improved	120	2-10
Successional Hardwood Forest	223	2-5
Annual Target Acreage*	1,100 – 7,300	
*Annual Target Acreage Range is based on the fire return interval assigned to each burn zone. Each burn zone may include multiple natural communities.		

Fire has historically been a significant force in shaping the natural Florida landscape. The fire management program at Paynes Prairie Preserve State Park is intended to restore the natural process of fire to the landscape. Upland communities are normally burned in the lightning season during the late spring and summer. However, natural lightning-caused ignitions may occur in any month of the year. In some cases, areas will be burned during the winter season to reduce fuel loads before switching to lightning season burning. Fuel loads, restoration goals and natural community type will be considered when scheduling prescribed fires.

The wetlands of the prairie basin present a burning challenge. During normal conditions, the basin marsh vegetation will not burn during the lightning season. It will burn when under drought stress but managing the fire under such severe conditions is so difficult that it is usually not attempted. As a practical matter when conditions are suitable for the basin to burn during the lightning season, the conditions are so severe that the FFS has justifiably stopped issuing burn permits. For this reason most of the burning in the basin is done in the winter season. More specifically, burns are conducted from the first killing frost, usually some time in December, until the vegetation greens up in the spring, some time in March. Park staff will continue to investigate methods of safely applying fire to the basin in the lightning season. Fire can of course be used for management goals other than the restoration of natural processes. Fuel reduction, site preparation, and other management goals are all legitimate uses of fire. Where woody vegetation that has become established due to reduced water levels, the park uses fire in the basin marsh to control invading hardwoods. This usually requires relatively frequent burns. Shorter return intervals also help to overcome the reduced effectiveness of winter burning over lightning season burns. Areas of the basin marsh that are deeper and less susceptible to hardwood invasion do not require frequent fire, and would normally have a much longer fire return interval.

Burning basin marsh is not at all like upland burning. There are many years when high water or low water events have reduced fuels to the point that an area may not carry fire. While every effort is made to burn portions of the basin every year, the number of days with suitable weather conditions that coincide with days when sufficient staff is available is very limited. The burn window is constrained by the usual environmental and landscape variables. Two major highways bisect the basin. Both carry a heavy volume of high-speed traffic in four or six lanes. The entire north side of the basin is occupied by the City of Gainesville, the University of Florida and a large medical and health care complex. Smoke management is a top priority in park burning. However, smoke management constraints reduce the burn opportunities within the basin.

Variables such as fire intensity, available fuels, water levels and the ability to conduct a burn in a given year result in a complex mosaic of vegetation on the ecotone between the uplands and the prairie basin. This mosaic is in large part an artifact of the unique constraints of burning the prairie basin.

Increased emphasis on fire management of the mesic, wet and scrubby flatwoods communities is intended to increase the number of acres burned in these communities. A substantial number of new and reworked firebreaks have been installed in the past several years to make it easier to apply prescribed fires in these volatile fuel types. The highways adjacent to the flatwoods areas make prescribed fires very difficult. To mitigate some of the smoke management hazards, the park has reduced the size of some management zones to limit the number of acres burned on a given day, so that less smoke is produced during prescribed fires.

Most of the other upland fire-adapted natural communities, including sandhill, upland pine, and upland mixed woodland, were heavily impacted by agricultural pursuits over the past several hundred years. Most of these areas were converted to improved or semi-improved pastures at some point, and some have gradually succeeded to successional hardwood forests. While all of these areas benefit from prescribed fires, emphasis will be placed on burning those areas with the highest potential for successful restoration. This will primarily be those areas that retain remnant groundcover species.

Several wetland natural community types are influenced by fire in the landscape. These include baygalls, dome swamps and depression marshes. It is important to allow prescribed fires to burn into the edges of these community types to maintain natural ecotones between wetlands and uplands. Care must be taken to avoid burning into wetlands during drought conditions to avoid ground fires burning dry organic deposits long after surface fires are extinguished. Under certain weather and fuel conditions, these wetland types may burn completely through.

The annual targeted burn acreage is between 1,100 and 7,300 acres per year based on the range of fire return intervals for the natural communities and altered landcover types within the park. These figures are heavily weighted by the wide range of the fire return interval for the basin marsh (2 to 20 years), since the basin marsh includes over 80 percent of the fire-type acreage in the park.

Many wildlife species depend upon or benefit from natural and prescribed fires. Upland species like gopher tortoises, Sherman's fox squirrels, Florida pine snakes, and other wildlife species require fire-maintained habitats. Fire is also an important tool in the management of wetlands, including the basin and depression marshes. Many amphibian species require ephemeral wetlands, such as depression marshes, for breeding sites. Depression marshes are maintained as open herbaceous wetlands by fire. Without periodic fire, they can suffer from hardwood invasion and become inappropriate for certain amphibian species. Likewise, the open herbaceous basin marsh is maintained by periodic fires that act in concert with periodic floods to curtail hardwood invasion. Wildlife species like the sandhill crane, whooping crane, American alligator, Florida water rat, and numerous other mammals, reptiles, amphibians, and birds benefit from periodic fires in the Prairie's basin marsh.

In order to track fire management activities, DRP maintains a statewide burn database. The database allows staff to track various aspects of each park's fire management program including individual burn zone histories and fire return intervals, staff training/ experience, backlog, if burn objectives have been met, etc. The database is also used for annual burn planning which allows DRP to document fire management goals and objectives on an annual basis. Each quarter the database is updated and reports are produced that track progress towards meeting annual burn objectives.

Natural Communities Restoration: In some cases, the reintroduction and maintenance of natural processes is not enough to reach the natural community desired future conditions in the park, and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that include mechanical treatment of vegetation or soils and reintroduction or augmentation of native plants and animals. For the purposes of this management plan, restoration is defined as the process of assisting the recovery and natural functioning of degraded natural communities to desired future condition, including the re-establishment of biodiversity, ecological processes, vegetation structure and physical characters.

Examples that would qualify as natural community restoration, requiring annual restoration plans, include large mitigation projects, large-scale hardwood removal and timbering activities, roller-chopping and other large-scale vegetative modifications. The key concept is that restoration projects will go beyond management activities routinely done as standard operating procedures such as routine mowing, the reintroduction of fire as a natural process, spot treatments of exotic plants, small-scale vegetation management and so forth.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions in the natural communities (see Natural Communities – Desired Future Conditions Map).

Objective: Conduct habitat/natural community restoration activities on 25 acres of upland pine and upland mixed woodland communities.

Small remnant patches of upland mixed woodland or upland pine exist on the north rim of the prairie. These patches have been invaded by offsite hardwoods and are surrounded by abandoned pastures. Restoration of the original natural communities from pasture is difficult and little is known about the best techniques to achieve this. Soil chemistry may have been altered due to past fertilization. This initial restoration will be experimental and small in scale. Because of these factors, it is of a lower priority than other restoration and improvement projects.

Of the 25 acres, approximately 20 have remnant southern red oak and mockernut hickory. Remnant longleaf pines are also present but in very low numbers. It is not known what native groundcover species might still be found in that community. About 5 acres are dominated by pasture grasses.

Restoration needs and activities differ for these two areas. The abandoned pasture will serve as a research site to determine the most effective method for removing exotic pasture grasses. It may take several years of successive herbicide treatments to remove the bahia and other exotic grasses. Once this is accomplished, native groundcover restoration can begin on this piece. If the site were determined to be upland mixed woodland, wiregrass would be a minor part of the groundcover restoration. This would complicate groundcover restoration because wiregrass is one of the most readily available species at this time. In addition to groundcover, this site would eventually need planting of longleaf pine , southern red oak, mockernut hickory and possibly some other shrub species.

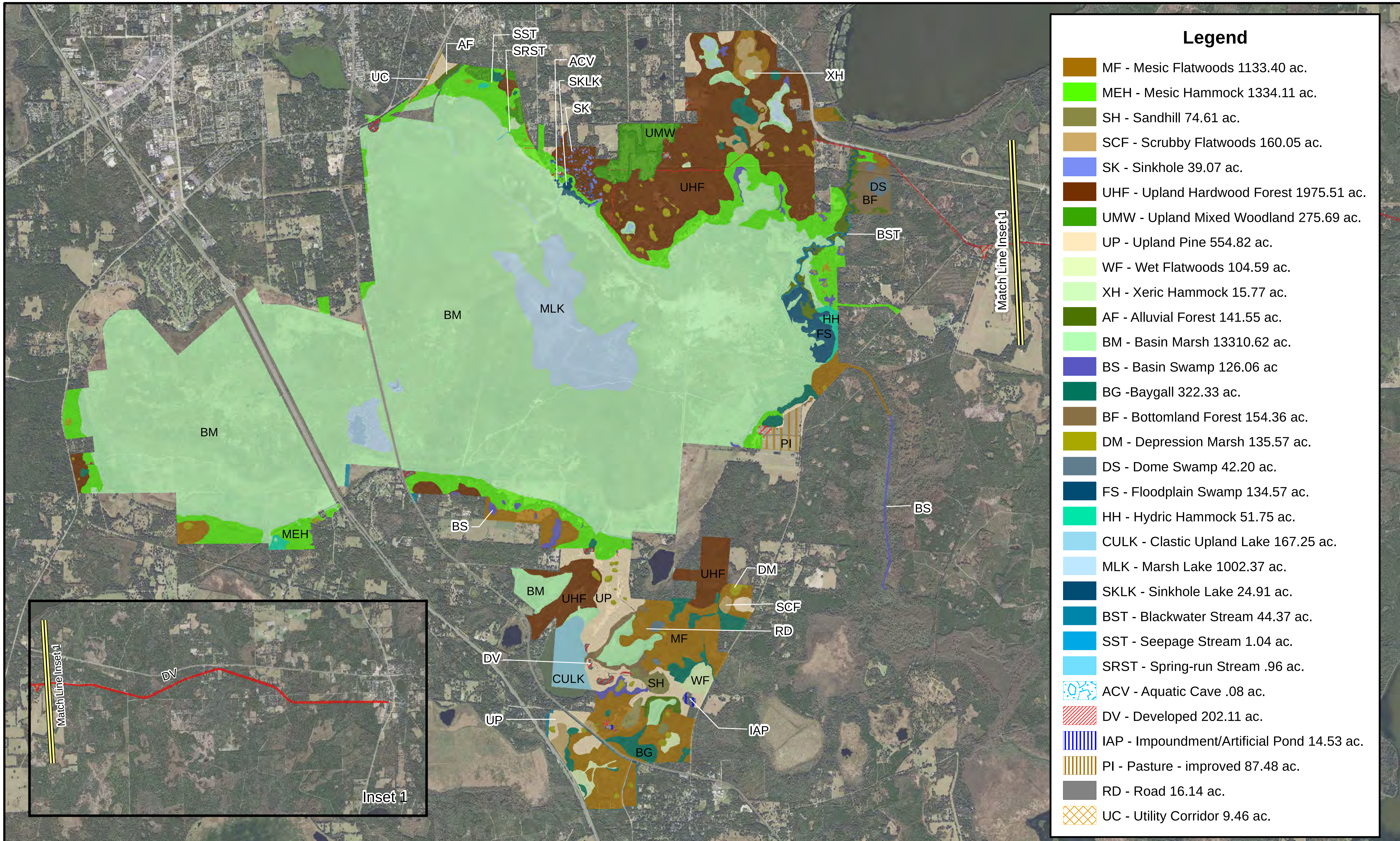
The 20-acre area with remnant southern red oak and mockernut hickory will need to be surveyed for species native to that community. Invading hardwoods, such as laurel oak, will need to be treated mechanically and/or chemically. Fire will be an important part of the process to determine which, if any, groundcover species are still present. It is highly likely that native groundcover species will need to be planted here along with longleaf pines, and probably additional southern red oak and mockernut hickory.

Maintenance activities will include follow-up spraying of bahia and other exotic grasses, retreatment of invading offsite hardwoods and their sprouts and prescribed fire.

Natural Communities Improvement: Improvements are similar to restoration but on a smaller, less intense scale. This typically includes small-scale vegetative management activities or minor habitat manipulation. Following are the natural community/habitat improvement actions recommended at the park.

Objective: Conduct natural community/habitat improvement activities on 30 acres of scrubby flatwoods.

Much of the scrubby flatwoods community is overgrown and suffers from lack of fire. Mechanical treatment, including mowing, of this natural community will allow safer use of prescribed fire. Limited planting of longleaf pines may also be included in this improvement project. Maintenance activities would include prescribed fire and supplemental planting of longleaf if needed.



PAYNES PRAIRIE PRESERVE STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Date of Aerial: 2009

NATURAL COMMUNITIES MAP
DESIRED FUTURE CONDITIONS

Objective: Conduct natural community/habitat improvement activities on 100 acres of mesic and wet flatwoods.

Timbering activities prior to park acquisition and more recently southern pine beetle outbreaks have caused the loss of the longleaf pine component in many of the mesic and wet flatwoods communities. An increased dominance of native and offsite hardwood species is partly the result of disturbance. This in turn has affected fire behavior. Mechanical and chemical control of hardwoods may be required in some areas. Longleaf pine and wiregrass will be replanted in these communities as necessary. Maintenance activities include the continued use of prescribed fire.

Objective: Conduct natural community/habitat improvement activities on 400 acres of basin marsh.

Persimmon and other hardwoods are invading the edges of the basin marsh particularly along the western edge of the prairie basin in management zones PP-1 and PP-2. This almost impenetrable thicket is a concern because of its impact on lowering water levels through evapotranspiration and its ability to outcompete desired herbaceous vegetation. To help restore the desired herbaceous fringe, hardwoods will be treated mechanically and/or chemically. Maintenance activities may include repeated mechanical or chemical treatments as well as prescribed fire.

Coastal plain willow along dikes and berms is encroaching upon and replacing the herbaceous vegetation in some areas of the basin marsh. This woody shrub is changing the natural community structure and species composition of the basin marsh. Mechanical and/or chemical treatment of the willow will be needed to restore the herbaceous nature of the marsh. The improvement project initiated in 2012 in management zones PP-5 and PP-6 will be continued with additional herbicide applications and mowing of hardwoods and willows. Maintenance activities in other areas of basin marsh within the park may include repeated mechanical or chemical treatments as well as prescribed fire.

Imperiled Species Management

Goal: Maintain, improve or restore imperiled species populations and habitats in the park.

DRP strives to maintain healthy populations of imperiled plant and animal species primarily by implementing effective management of natural systems. Single species management is appropriate in state parks when the maintenance, recovery or restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values. In the preparation of this management plan, DRP staff consulted with staff of the FFWCC's Imperiled Species Management or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FFWCC, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet DRP's mission. Long-term monitoring is also essential to ensure the effectiveness of resource management programs. Monitoring efforts must be prioritized so that the data collected provides information that can be used to improve or confirm the effectiveness of management actions on conservation priorities. Monitoring intensity must at least be at a level that provides the minimum data needed to make informed decisions to meet conservation goals. Not all imperiled species require intensive monitoring efforts on a regular interval. Priority must be given to those species that can provide valuable data to guide adaptive management practices. Those species selected for specific management action and those that will provide management guidance through regular monitoring are addressed in the objectives below.

Objective: Update baseline imperiled species occurrence inventory lists for plants and animals.

Paynes Prairie Preserve State Park, by virtue of its location near the University of Florida, has received a great deal of scientific attention since it was acquired by the State. As a result, the park has lengthy species occurrence lists, and many imperiled species have been documented and studied within the park. Additional surveys for imperiled plant and animal species are needed in the Crevasse and Edwards parcels that were recently added to the park.

Objective: Monitor and document 4 selected imperiled animal species in the park.

Gopher Tortoise: The majority of the gopher tortoise burrows were located and mapped in 1990-91 in appropriate habitats within the park. These areas were re-censused between 2004 and 2007 using a GPS and a decline in the number of burrows was noted. Another GPS-based census of the gopher tortoise burrows will be conducted prior to 2017 to track population trends and burrow distribution. Previous burrow counts relied on a complete census count using transects guided by GPS. As upland natural community restoration and improvement projects proceed, it will be increasingly important to track gopher tortoise numbers. Future counts will be conducted using park staff and volunteers as necessary.

Sherman's Fox Squirrel: Additional documentation of Sherman's fox squirrels within the park is needed. All sightings by park staff will be recorded with a description of the individual squirrel. Fox squirrels are highly variable in coloration, which will aid in the identification of individuals. Existing wildlife observation forms may be used to document fox squirrel sightings for future input into DRP GIS system.

Whooping Crane: Both resident and migratory whooping cranes occur frequently at Paynes Prairie. Staff will continue to document sightings of whooping cranes, and will continue to coordinate with FFWCC, USFWS, and International Crane Foundation monitoring programs.

Other Imperiled Bird Species: Paynes Prairie serves as the focal point for the annual Audubon Christmas Bird Count in Gainesville. The Gainesville CBC has been held for over 50 years and provides data on long-term population trends. Many of the imperiled bird species are documented and censused on an annual basis during the CBC. Park and District staff serve as team leaders for those sections of the count that lie within the park boundary.

> ***Objective: Monitor and document 4 selected imperiled plant species in the park.***

Silver Buckthorn: The population of silver buckthorn located on the north rim of Paynes Prairie will continue to be monitored. A nearly complete census of known individuals was conducted using GPS technology. The population will continue to be tracked and data will be maintained in DRP GIS system.

Godfrey's Swamp Privet: All known individuals of Godfrey's swamp privet have also been mapped and will continue to be tracked using GPS and GIS technology.

Hooded Pitcher Plant: As restoration of the mesic and wet flatwoods proceeds at the south end of the park, it will be important to track the population of hooded pitcher plants. Most of the known populations have been mapped using GPS. As the habitats are opened up with prescribed fires, it is hoped that additional populations will become apparent. Surveys will be conducted as necessary using GPS and GIS technology.

Mexican Tear-thumb: The Mexican tear-thumb within the park will continue to be monitored periodically. Previously recorded GPS locations will be revisited and additional sites will be investigated.

<u>**Exotic Species Management**</u>

Goal: Remove exotic and invasive plants and animals from the park and conduct needed maintenance control.

DRP actively removes invasive exotic species from state parks, with priority being given to those causing the most ecological damage. Removal techniques may include mechanical treatment, herbicides or bio-control agents.

Objective: Annually treat 400 acres of exotic plant species in the park.

The park will continue to implement its annual treatment plan for the basin and upland areas. That plan will clearly address treatment needs, both in the prairie basin and in the uplands, and set annual treatment goals for each area. In addition, the park will refine the treatment plan to address the need to retreat areas with sufficient frequency to keep the most aggressive exotics from reproducing.

It is estimated that the park will need to treat about 2,200 acres of exotic plants per year in order to prevent the primary invasive species from reproducing. The park currently does not have the resources to achieve that level of treatment. However, certain actions can help make that goal more attainable. For treatment and retreatment cycles in the prairie basin, the park should focus on treating the drier areas of the basin marsh more frequently than the wetter portions. The park should also use prescribed fire more frequently to enhance traditional exotic plant treatments, particularly in the basin. This might mean burning a zone prior to or the year following an exotics treatment. The park should apply for grant funding, such as FFWCC weed management grants, on an annual basis.

There is a real need for research to find effective bio-control methods for many of the invasive exotic plants in Florida. One exotic found at Paynes Prairie Preserve, the small-leaf spiderwort, is spreading throughout the sinkholes on the north rim of the prairie basin. Research is needed to find bio-control and chemical treatment methods that can effectively control the spiderwort but not harm the ferns and other native species coexisting in the sinkholes. Two other species that are relatively new occurrences at the park and need research on effective control methods are skunkvine and catclawvine. Other species at the park that would benefit from research on bio-control methods are Chinese tallowtree, Japanese climbing fern, wild taro, cogongrass and coral ardisia.

Objective: Develop and implement measures to prevent the accidental introduction or further spread of invasive exotic plants in the park.

To prevent new invasive exotic plant populations from expanding, the park should survey for and map new invasive exotics in every zone within the park at least twice within the next 10 years. It is important to know what exotic species are present within the park, where they are located and how severe their infestations are. It is also very important to know what zones or communities are currently free of exotics so that the park can keep those areas exotics free. This is particularly true for high quality or ecologically important habitats. By regularly surveying these exotics free zones, staff can discover new infestations at an early stage and eliminate them before they increase significantly in size. Areas that serve as sources of particularly aggressive species, or of species that can dramatically change ecosystem function, may need to be scouted more frequently. Finding new populations of invasive exotic plants before they become established will help prevent larger infestations from happening. The focus should be on EPPC Category I and II species, while at the same time keeping a watch out for new species that exhibit aggressive tendencies.

Exotic plants often invade an area accidentally through preventable methods of entry. To limit accidental introduction and movement of exotic species, park staff will need to develop and practice preventative measures, including a protocol for equipment inspection and decontamination. Activities such as mowing, logging, fire line preparation and road building can introduce or redistribute exotics through contaminated equipment. Fill dirt, lime rock, potted horticultural plants and mulch are all potentially contaminated by exotics even if they are not readily visible at the time of entry into the park. Some new infestations of exotics may be preventable by ensuring that contractors clean their equipment before entering the park. The further spread of exotics already established in the park may be avoided by making sure that staff and contractors do not move equipment from a contaminated area to an exotic free area within the park without cleaning their equipment first.

Objective: Implement control measures on three nuisance and exotic animal species in the park.

Feral hogs in recent years have become a significant problem at Paynes Prairie Preserve State Park. Feral hog control activities will focus on areas where hogs are causing the most damage, including any threatened cultural resources. Authorized staff and contractors will participate in the feral hog removal program as resources permit. The park will also occasionally ask for assistance from Alachua County Animal Services in removing feral or stray cats and dogs from the park.

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of DRP's statutory responsibilities and an analysis of the park's resource needs and values. The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of those communities specifically managed as early successional.

During the development of this plan, an analysis was made regarding the feasibility of timber management activities in the park. It was determined that the primary management objectives of the unit could be met without conducting timber management activities for this management plan cycle. Timber management will be re-evaluated during the next revision of the management plan.

Additional Considerations

Livestock management. In the 1600s, the largest cattle ranch in Spanish Florida was based at the prairie. In an effort to represent this important part of Florida history, DRP reintroduced two heritage breeds of livestock to Paynes Prairie for interpretive purposes. Both breeds are listed as Critical on the American Livestock Breeds Conservancy Conservation Priority List. DRP assists the FDACS in preserving these historic breeds by maintaining stable and genetically pure herds. Florida cracker cows are currently housed at the Hickory Ranch pastures. A herd of Florida cracker horses is allowed to roam in the basin east of U.S. 441. The park also maintains a reintroduced herd of plains bison on the basin east of U.S. 441.

Working with the Florida Cracker Cattle Breeders Association and Dr. Tim Olson of the University of Florida, DRP maintains two herds of Florida cracker or scrub cows, one at Paynes Prairie and the other at Lake Kissimmee State Park. DRP maintains both herds as interpretive tools since both parks have a long history of cattle ranching. Cracker cows are considered a component of the cultural heritage of Paynes Prairie. Paynes Prairie maintains a herd of about 70 cracker cows.

The Florida cracker horses were originally released onto the prairie basin by the Friends of Paynes Prairie Citizens' Support Organization in 1985 and later donated to the park. Like the cracker cows, these horses represent a recognized breed that closely resembles the stock that originally ran loose on the prairie after the Spanish introduced cattle and horses into Florida. The cracker horses receive minimal management. The park has gradually replaced the park's working horses with cracker horses to allow both an operational and interpretive use of this rare breed. The wild herd currently numbers about 30 horses.

Historical records indicate that the American bison occurred in small numbers in north-central Florida for about 200 years prior to their eradication in the late 1700s. Deforestation of the landscape by European settlers, coupled with a concurrent dramatic decrease in the numbers of Native Americans, had allowed the American bison to expand its range well into the southeast and even into north Florida (Rostlund 1960). For interpretive purposes, DRP released a small group of American plains bison from the Wichita Mountains National Wildlife Refuge onto Paynes Prairie in 1975. After expanding to about 35 animals in the mid-1980s, the herd was reduced down to seven animals due to an outbreak of brucellosis. In the late 1990s, the herd was reduced down to seven female bison after removal of the males due to inbreeding concerns. In 2001, a new bull and cow were added to the herd. By 2010 the herd had expanded to somewhere between 50 to 70 animals.

Management of the livestock at Paynes Prairie Preserve State Park is not only guided by what is best for the natural resources of the park, but also by what is best for the well-being of the livestock herds, and for the safety of the park's visitors and neighbors. A Livestock Management Plan (http://www.dep.state.fl.us/secretary/events/Paynes_Prairie_Livestock_Management_Plan_2011.pdf) was finalized in March 2011 to provide direction for the future management of livestock at Paynes Prairie Preserve State Park (FDEP 2011). The state park's primary goal in its resource management program is to maintain the health and integrity of the Paynes Prairie ecosystem, which includes all native wildlife and plant species, however, the well-being of the introduced livestock species must also be considered. Accordingly, this plan establishes guidelines for maintaining an appropriate number of animals in each of the livestock herds while ensuring protection of the park's natural resources. This plan also addresses concerns about livestock health, genetic diversity and public safety.

Highway corridor management: Paynes Prairie Preserve State Park is surrounded and split by over 50 miles of roads and highways ranging from two lane state roads to a six lane high speed interstate. The effects of these roads extend far beyond the right-of-ways. Roads not only have direct mortality effects on wildlife, but they can alter hydrology, hamper prescribed burning efforts, act as corridors for invasive plants and animals, and serve as isolation mechanisms for some wildlife species. Fortunately, these effects are recognized and steps have been taken to mitigate them wherever possible.

Perhaps the most apparent impact of a road on the Paynes Prairie ecosystem is the large number of road-killed wildlife seen on U.S. 441 within the prairie basin. Since at least the 1930s, U.S. 441 in the prairie basin has been noted for the large abundance of reptiles and amphibians along the roadside (Beck 1938). In later years, that stretch of highway would become a Mecca for snake hunters partly due to the writings of Carl Kauffeld (1957). Richard Franz's road kill surveys between 1973 and 1977 documented large numbers of road kills and determined that few, if any, snakes were able to successfully cross the highway without being hit. In fact, the only snakes that were observed to survive entering the roadway were those that turned back (Franz, unpublished data). Park staff began systematically recording road kills on all roads within or bordering the park in 1989. Agency and public awareness of the high number of road kills prompted an analysis of the situation by the FDOT (Southall 1991) and later led to the formation of an interagency working group to address road impacts on the park. Subsequently a group of local citizens, along with students and faculty of the University of Florida, formed the Paynes Prairie Wildlife Coalition who successfully lobbied the FDOT and DEP to mitigate the road kill impacts of U.S. 441.

Construction of an Ecopassage System, which combines a barrier wall with multiple passageways under the roadway, began in late 1999 and was completed in the fall of 2000. Funded by the FDOT, the barrier wall stretches the length of U.S. 441 within the prairie basin. The four pre-existing box culverts were supplemented with four 36-inch round culverts to provide multiple routes for wildlife to pass under the roadway. The U.S. Geological Survey was contracted to document road kills and culvert use by wildlife for a period of one year before construction and one year post-construction. The Paynes Prairie project has been showcased by the U.S. Department of Transportation, Federal Highway Administration in a publication (Finch 2000) and at a website (http://www.fhwa.dot.gov/environment/wildlifecrossings/amphibin.htm) that detail transportation's impacts on wildlife and highlights exemplary mitigation projects.

In the course of discussions with the FDOT over the past decade or more, several issues have been raised over other road impacts on the park. The Paynes Prairie Working Group addressed not only road kill issues, but also prescribed burning and hydrological issues. The FDOT has also been receptive to working with the DEP to mitigate hydrological problems caused by the extensive canals and spoil piles created during the construction of I-75 and U.S. 441. The roadside canals channelize the flow of water within the Prairie basin marsh, disrupting natural sheet flow, decreasing residence time, and effectively de-watering surrounding areas. The spoil piles within the FDOT right-of-ways were created by the on-site disposal of inappropriate fill material during the dredging of the rights-of-ways for road fill. These ridges of high ground provide ideal habitat for invasive hardwoods such as coastal plain willow and invasive exotics such as Chinese tallowtree. Once established on-site, these species can rapidly invade basin marsh systems.

Related to the hydrological issues is scenic vista management along I-75 and U.S. 441 in the prairie basin. The establishment of trees and shrubs within the basin marsh on the spoil piles drastically changes the character and aspect of the wetland system within the right-of-way. The green tunnel effect prevents motorists passing through the basin from viewing the wide expanse of Paynes Prairie. The loss of this scenic vista is not only an issue for DRP, but also for the FDOT, which is concerned with vista management along highways statewide. Control of invasive trees and shrubs within the U.S. 441 corridor has been very successful due to partnerships between DRP, FDOT and Florida Power Corporation (now Progress Energy). Much of the I-75 corridor, however, remains virtually unmanaged. Some control of invasive hardwoods has occurred within the FDOT right-of-way as part of a project to replace boundary fences. However, a broad deep canal and large, nearly continuous, spoil banks covered with many species of trees and shrubs dominate most of the FDOT right-of-way. Restoration of a natural hydrological regime within the I-75 right-of-way and flattening of the spoil banks will restore both the degraded basin marsh and the scenic vista that has been lost.

Arthropod Control Plan

Certain biting arthropods such as mosquitoes and ticks may be considered problem species when they occur in high densities, particularly if there are human health concerns. Mosquito control on state parks must comply with mosquito control provisions in Chapter 388, Florida Statutes. Control of arthropods, primarily mosquitoes, within state parks by a local arthropod control agency requires an arthropod control plan that is developed and agreed upon by the local arthropod control agency and DRP.

Cultural Resource Management

Cultural Resource Management

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. DRP is implementing the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Paynes Prairie Preserve State Park.

Goal: Protect, preserve and maintain the cultural resources of the park.

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. All activities related to land clearing, ground disturbing activities, major repairs or additions to historic structures listed or eligible for listing in the National Register of Historic Places and collections care must be submitted top the DHR for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to DHR for consultation and DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that DRP consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of DHR.

Objective: Assess and evaluate 139 of 139 recorded cultural resources in the park.

The park currently assesses its cultural resources on a regular basis. Most of the sites are in good condition. The exceptions are sites AL00365, AL00366, AL00428, AL02923 and AL05464, which are considered to be in fair condition, and sites AL00346, AL00350, AL00351, AL00352 and AL00356, which are ranked as poor. All of the poor sites and some of the fair sites have experienced episodes of looting. The sites where looting has occurred need to be assessed more frequently. As many as 20 vulnerable sites within the park are visited on a monthly basis. The use of game cameras in the future could help the park monitor those sites through remote photography.

The park will continue its regular program of assessing sites. If stabilization or preservation needs become apparent during the course of site assessments, the park will identify and prioritize the needs.

Paynes Prairie has many historic structures currently in adaptive reuse by the park. It has not yet been determined how many structures will need a Historic Structures Report (HSR). During the next ten years, the park should remedy that situation by deciding which of the structures will need an HSR. For this process, the park could consider the Camp Ranch structures as one group. The park should complete 10 Historic Structures Reports in the next 10 years. If an HSR identifies any necessary rehabilitation or maintenance projects, the park staff will prioritize them.

Objective: Compile reliable documentation for all recorded historic and archaeological resources.

The park needs to ensure that all currently known sites are recorded properly in the Florida Master Site File and that site records are updated regularly, especially when new discoveries are made. As of December 2010, park staff had updated site records for all known sites in Paynes Prairie Preserve, however new unrecorded sites are probably present on the Crevasse property, which the state acquired and added to the park in late 2010.

A predictive model for locating archaeological sites within the park was completed in 2012. Paynes Prairie Preserve has a rich history of human habitation including pre-European settlements, Spanish Colonial ranches and early nineteenth century homesteads. The predictive model indicates areas of high, medium and low probability for the occurrence of archaeological sites. The model will also provide guidance for future development and will aid in selecting the best locations for future Phase 1 archaeological surveys. The Crevasse, Edwards and Flanders additions to the park have not yet received any archaeological surveys. The predictive model will aid the park in identifying areas that are highest priority for a Phase 1 survey.

There is a need for additional research and documentation about the location of the Second Seminole War outpost, Fort Crane, which appears to be located on or near the Crevasse addition at the southeast edge of the park near Rochelle.

Over the years, the park has collected a considerable amount of information pertaining to natural resource management. The various items include Dr. Larry White's Ecosystem Analysis of Paynes Prairie (White, no date), the botanical and zoological drawings of William Bartram, and photographs, all of which need to be compiled and organized as part of the administrative and natural history heritage of the park.

The community of Rochelle borders the southeast boundary of the park. Descendants of the families who pioneered the area still live there. Interviews with members of this community could provide the park with oral history accounts that might help document some of the history of Paynes Prairie. Others with whom it might be worthwhile to conduct oral interviews are Jack Gillen, a former manager of Paynes Prairie Preserve, and Butch Hunt, a former ranger there. Butch, the grandson of the Camp Ranch foreman, actually grew up on Paynes Prairie, and during his childhood years became very familiar with the ranch's cattle operations.

The park has a Scope of Collections Statement that is based on four themes: cultural resources, geology and hydrology, ecology, and recreation. These themes should guide the development of any additional collections and the acceptance of future donations. The park should review its Scope of Collections on an annual basis.

Objective: Bring 11 of 139 recorded cultural resources into good condition.

The park currently has a cyclical maintenance program for its cultural resources, particularly its historic structures. Residence buildings receive an annual walk-through inspection. Park rangers visually evaluate buildings weekly, and any problems identified are described in a work plan.

The park currently has a monitoring program for all of its cultural resources. Staff should formalize that program by writing and adopting a clear protocol.

Because the park has so many historic structures, it is necessary to prioritize their repair in order to bring them into good condition. The ability of the park to improve these structures to a good condition will also depend on the availability of funding. Priority should be given to the following cultural resources in the park for repairs: Camp Ranch Bunkhouse 2 - Building #6 (AL05560), Camp Ranch Bunkhouse - Building #1 (AL05555), Camp Ranch Barn - Building #17 (AL05561), Wauberg Livery - Building #13 (AL05564), Wauberg Barn - Building #10 (AL05562), Hickory Ranch Hay Barn - Building #47 (AL05572), Hickory Ranch Horse Stable - Building #46 (AL05571), Hickory Ranch High Barn - Building #50 (AL05574), Hickory Ranch Corn Crib - Building #49 (AL05573), Bison Pen Windmill (AL05569), and Paynes Town (AL00366).

The highest priority for repair is the Camp Ranch Bunkhouse 2 (AL05560), which is currently used as an office. The building needs to be evaluated for restoration or demolition because the structure is rapidly deteriorating. The chimney, which collapsed and was removed, does not need to be rebuilt for the building to achieve a good condition. Camp Ranch Bunkhouse (AL05555), also part of the historic Camp Ranch complex, needs repairs. The park needs to determine the original flooring material of the building. Currently, the floor is uneven concrete. It had once been covered with wood flooring, but after termites were discovered, it was removed. The Camp Ranch Barn (AL05561) is planned for adaptive reuse as an interpretive area on the La Chua Trail. Because it will be in public use, it needs attention to maintain it in good condition. The Wauberg Livery (AL05564) may need a new roof within 10 years. The Wauberg Barn (AL05562) is being treated for termites. The Hickory Ranch Hay Barn (AL05572) needs a new roof and some flooring. The Hickory Ranch High Barn (AL05574) may need some of its roof replaced. The Hickory Ranch Corn Crib (AL05573) may need a new roof within 10 years. The Bison Pen Windmill (AL05569) and Paynes Town (AL00366) are included on the list because they need stabilization. The Paynes Town site could be stabilized using some type of geofabric material covered with backfill.

Resource Management Schedule

There is a priority schedule for conducting all management activities in the park. The basis for these priorities is the purposes for which lands were acquired in addition to the enhancement of resource values. The Implementation Component of this management plan contains the priority schedule.

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. The managing agency considered the findings and recommendations of the land management review team in preparing this management plan.

Paynes Prairie Preserve State Park was subject to a land management review on October 24, 2011. The review team made the following determinations:

1. The land is being managed for the purpose for which it was acquired.
2. The actual management practices, including public access, complied with the management plan for this site.

LAND USE COMPONENT

INTRODUCTION

Land use planning and park development decisions for the state park system are based on the dual responsibilities of the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP). These responsibilities are to preserve representative examples of original natural Florida and its cultural resources, and to provide outdoor recreation opportunities for Florida's citizens and visitors.

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan to guide the location and extent of future park development. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management, and through public workshops, and user groups. With this approach, DRP objective is to provide quality development for resource-based recreation with a high level of sensitivity to the natural and cultural resources at each park throughout the state.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are described and located in general terms.

EXTERNAL CONDITIONS

An assessment of the conditions that exist beyond the boundaries of the unit can identify any special development problems or opportunities that exist because of the unit's unique setting or environment. This also provides an opportunity to deal systematically with various planning issues such as location, regional demographics, adjacent land uses and park interaction with other facilities.

Paynes Prairie Preserve State Park is located within an unincorporated area of Alachua County in the north central part of the state. The park is adjacent to the southern boundary of the City of Gainesville, the county’s largest urban area. Two additional incorporated areas with much smaller populations lie in close proximity to the park. The Town of Micanopy lies due south of the park and the City of Hawthorne is located at the east end of the Gainesville to Hawthorne Trail (GHT).

Over 630,000 people reside within 30 miles of the park, with the most of the population living within Alachua County and adjacent Marion County (Census, 2000 and Census, 2010). The estimated populations of Alachua County and Marion County have grown 21 percent since 2000, and are projected to grow an additional 19 percent by 2020 (Census, 2010 and BEBR, University of Florida, 2011). As of 2010, 22 percent of the residents in these counties were in the 0-17 age group, 31 percent in the 18-34 group, 28 percent in the 35-54 group, 15 percent in the 55-64 group, and 23 percent were 65 or older. The 18-34 age group is higher than the state average due to the University of Florida's large student population. The 65 and older age group is also higher than the state average due to the large number of retirees that have moved to Marion County in recent years. Despite a relatively modest population size compared to other regions in the state, a strong projected growth rate will only serve to produce additional demand for recreation services.

There are many opportunities for resource-based recreation within the vicinity of the park. A number of public lands that provide recreation are owned and managed by Gainesville. Several of these lands include Boulware Springs Park, located at the western terminus of the 16-mile GHT. Gum Root Park and Morningside Nature Center feature trails through a variety of natural communities, including one of the last remaining examples of longleaf pine woodlands, and provide access to wildlife viewing and historical resources.

The City of Gainesville is currently developing the Sweetwater Branch / Paynes Prairie Sheetflow Restoration Project adjacent to park. The facility will include a 125-acre constructed wetland designed to improve water quality in the Alachua Sink and restore over 1,300 acres of additional wetlands in Paynes Prairie Preserve State Park. The newly restored wetlands will provide a public use area for birding and nature study within the city park and high-quality wetland habitat for wildlife within the state park. The construction of this project started in the fall of 2012. Completion is expected by the summer of 2014.

Alachua County's recreation areas include Phifer Flatwoods, Sweetwater Preserve and Barr Hammock Preserve. Phifer Flatwoods and Sweetwater Preserve provide the public with hiking and biking opportunities. Trail users can access the GHT from Phifer Flatwoods, which features 3 miles of natural scenery. The County opened the newly acquired Bar Hammock Preserve in February 2013 and offers hiking/biking trails, scenic overlooks, and regularly scheduled educational programs. Two County boat ramps provide powerboat and canoe/kayak users with access to Newnans Lake. The State-Desginated Potano Paddling Trail, including Prairie Creek, encircles Newnans Lake. Paddlers can travel into the park from the lake by navigating south along Prairie Creek to Camp's Canal. A canoe take out is located on County Road 234.

The Grove Park Wildlife Management Area is owned by the SJRWMD and Plum

Creek Timber Company and managed by the Florida Fish and Wildlife Conservation Commission. More than 16,000 acres provide visitors with opportunities for hunting, fishing, hiking, biking, horseback riding and primitive camping. Listed on the Great Florida Birding Trail, the area also provides rewarding wildlife viewing opportunities. The management area has several direct shared-use trail links to the GHT, providing regional trail users greater access to conservation areas.

On the north and east sides of Newnans Lake, the SJRWMD manages the 6,500 acre Newnans Lake Conservation Area. Recreational activities supported on this property include hiking, bicycling, fishing, horseback riding, wildlife viewing, canoeing, and picnicking.

The Prairie Creek Preserve is a former ranch and deer farm now owned and managed by Alachua Conservation Trust (ACT). ACT maintains 1,100 acres of natural areas along the park's eastern boundary and promotes nature-based recreation and eco-tourism. Special events and environmental education classes are provided in addition to trails and access to the GHT. The Prairie Creek Lodge is a dramatic 5,000 square foot former hunting lodge and provides overnight accommodations at the preserve. These lands are located along the park's eastern boundary just south of Rochelle off County Road 234.

State parks within the vicinity include San Felasco Hammock Preserve State Park, Devil's Millhopper Geological State Park, Dudley Farm Historic State Park and Marjorie Kinnan Rawlings Historic State Park. San Felasco Hammock Preserve State Park has one of the largest tracts of mature upland hardwood forest in Florida and several champion trees. Hikers, off-road bicyclists and horseback riders are provided with a diversity of scenery within the park's natural communities. Dudley Farm Historic State Park and Marjorie Kinnan Rawlings Historic State Park are listed on the National Register of Historic Places and provide living histories of farm life in Florida. Interpretative programs chronicle the lives of a late 19th-Century family of settlers and a mid 20th-Century Pulitzer Prize winning author. The farms also feature heritage varieties of livestock and plants, in addition to native wildlife, which are still seen in historic fields and along hiking trails within the parks.

Existing Use of Adjacent Lands

The park is bisected by U.S. Highway 441 (U.S. 441) and Interstate Highway 75 (I-75). Property along this transportation corridor is a mix of low-density residential, agricultural and limited commercial uses. County Road 234 runs along the southeastern boundary of the park and connects U.S. 441 and I-75. The most intense land use pressure is from Gainesville, with residential subdivisions and single-family homes spread along the northern rim of the basin. Much of the land to the east, south and west of the park is in agricultural uses, primarily pine plantations and cattle range. Most of the 31,807-acre Lochloosa Wildlife Florida Forever Project has been acquired to the east of the park, which provides some buffering from encroaching development.

Planned Use of Adjacent Lands

Alachua County has grown by 13 percent in the last decade, largely by the continued expansion of the Gainesville metropolitan area. Given the rate of population growth in this region, a transition to residential and commercial uses on all sides of the park continues to be a likely scenario. The most intense development will continue to occur along the northern boundary of the park. Growth in residential and commercial development around Micanopy to the south is also anticipated (Town of Micanopy, 2012). Those areas supporting pine plantations and rangeland to the east, south and west are less likely to experience rapid growth due to the wet nature of the landscape. However, as development pressure pushes south from Gainesville, these areas could begin shifting to higher intensity uses.

Future land use for Alachua County indicates that most unincorporated lands adjacent to the Park will continue to support rural and agriculture areas. The County maintains a 660-foot preservation buffer overlay for lands adjacent to preservation lands. The overlay provides the County and DRP with additional oversight concerning the protection of the park's resources. Alachua County designations north of the park include an urban services line that supports future municipal utilities for higher densities. Gainesville has designated lands adjacent to the park's northern boundary as mixed use. Land use designations within the city include medium densities of single-family and multi-family residential, public facilities, and conservation and recreation. The town of Micanopy occupies lands on the southeast corner of the park and will continue to support mostly low-density residential and limited commercial. No significant transportation improvements adjacent to the park are anticipated in the near future. The DRP will continue to work with local governments to protect the park's resources from potential impacts associated with expanding transportation systems (Alachua County, 2011, City of Gainesville 2012, Town of Micanopy 2012

PROPERTY ANALYSIS

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

Recreation Resource Elements

This section assesses the unit's recreation resource elements those physical qualities that, either singly or in certain combinations, supports the various resource-based recreation activities. Breaking down the property into such elements provides a means for measuring the property's capability to support individual recreation activities. This process also analyzes the existing spatial factors that either favor or limit the provision of each activity.

Land Area

The majority of lands within the park consist of wetlands, a major portion of which is contained in the large, irregularly shaped bowl of the prairie basin. The extensive presence of wetlands has concentrated the development of recreational facilities and uses primarily along the northern and southern uplands that rim the prairie basin.

Nearly 3.5 miles of the 16-mile long the GHT benefits from passing through the park's mix of open fields and hardwood hammocks. The remainder of the trail crosses several creeks, wetlands and upland communities of varying quality east of the park boundary. Recreation development beyond the park's boundary is limited to upland areas along the former railroad corridor.

Water Area

Water based recreation opportunities occur at several water bodies in the park. The largest of these, Alachua Lake, is located in the heart of the prairie basin. With highly fluctuating water levels and marsh-like characteristics, Alachua Lake is most suitable for its vistas and wildlife viewing opportunities. North of the lake, visitors can view the interior of Alachua Sink from a boardwalk located on the sink's steep bluffs. During periods of low rainfall, Alachua Sink retains water and serves to concentrate wildlife, particularly the park's abundant alligator population, making this a prime wildlife viewing location. The area north and east of Alachua Sink contains numerous lesser sinkholes that provide opportunities for interpretation of karst features.

Chacala Pond and Lake Wauberg are located at the southern end of the park. Access to Chacala Pond is limited to a small area along its eastern edge, whereas, the majority of Lake Wauberg, a 300-acre water body, lies within the park's boundary. The latter provides a variety of water based recreation opportunities, including boating, fishing, and picnicking. The limited visibility, in addition to the abundant alligator population, makes these waters unsuitable for swimming. Residential and recreational development along the western and southern shores has increased traffic on Lake Wauberg, affecting the visitor experience.

Prairie Creek flows from Newnans Lake into Camp's Canal. The creek retains much of its historic channel alignment and associated forested wetlands; providing opportunities for fishing, canoeing and kayaking.

Natural Scenery

The park contains an abundance of natural scenery, including the large expanse of freshwater marshes and marsh lakes that comprise the heart of the prairie basin. Basin vistas are enhanced by a series of observation platforms and overlooks at various locations in the park, and are most stunning during seasonal wildflower blooms. The park's lakes, creeks and sinkholes add to the scenic quality of the landscape.

Scenery along the GHT is variable, with the section that winds through the park containing the highest quality visual resources. A diversity of visual experiences is provided from the trail as it winds along the north rim of the prairie. The trail passes through pockets of forests and open fields, and provides glimpses into the basin from overlooks. Trail crossings at Prairie Creek and Lochloosa Creek are quite scenic. Outside the park boundary, the GHT passes adjacent to pine plantations and isolated rural areas.

Significant Habitat

The large expanse of the park and the wide range of natural communities support a diverse assemblage of species. Imperiled species including hooded pitcher plants, brittle maidenhair fern, silver buckthorn, Godfrey's swampprivet and Mexican tear-thumb occur within the park.

The park provides critical wildlife habitat for many species and excellent opportunities for wildlife viewing. Large numbers of wading birds use the basin for foraging, roosting and breeding. Wood storks are common and the fall migration of greater sandhill cranes draws birding enthusiasts from all over the world. Bald eagles and ospreys nest within or near the park. Black bears and otters are occasionally sighted while deer and turkeys are abundant in park uplands. The park maintains a healthy alligator population that, during dry periods, makes an impressive sight near the Alachua Sink viewing area.

Natural Features

The Paynes Prairie Basin, a vast 16,055-acre solution depression is the park's dominant landscape feature. Ancient bluffs surrounding the basin provide visitors with exceptional views of the marsh and prairie landscape. The bluffs range in elevation from 30 to 40 feet above the basin floor and may be accessed at northern and southern locations within the park.

Archaeological and Historical Features

As detailed in the resource component, the park contains numerous archaeological sites ranging from Paleo-Indian times through European contact. This long history of human occupation provides a rich opportunity for cultural history interpretation.

Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

Past Uses

The park is part of what was once the largest Spanish cattle ranch in Florida during the 17th Century. After Spanish rule, Seminole Indians farmed large fields on the basin rim and continued to herd livestock in the area until the early 1800's. Ranching and agriculture continued as the primary land uses from the time of statehood until the state purchased the property in 1970.

Future Land Use and Zoning

The DRP works with local governments to establish designations that provide both consistency between comprehensive plans and zoning codes that permit typical state park uses and facilities necessary for the provision of resource-based recreation opportunities.

The County has designated park lands with "Conservation" zoning and "Preservation" future land use. Typical state park development is permitted in these categories with review by the County.

Current Recreational Use and Visitor Programs

Paynes Prairie Preserve State Park recorded 278,453 visitors in FY 2012/2013. By DRP estimates, the FY 2012/2013 visitors contributed over $12.9 million in direct economic impact and the equivalent of 207 jobs to the local economy (FDEP, 2013).

Over 27 distinct biological communities provide a collection of habitats for wildlife and livestock, including alligators, bison, horses and over 270 species of birds. Exhibits and an audio-visual program at the visitor center explain the area's natural and cultural history. A 50-foot-high observation tower near the visitor center provides a panoramic view of the park.

Ten trails provide opportunities for hiking, horseback riding, paddling, bicycling and seasonal ranger-led activities and guided hikes. Park visitors may find recreational opportunities within the following use areas:

Lake Wauberg Day Use Area: Lake Wauberg, the park's primary use area, may be accessed at the southern end of the park from U.S. 441 via Savannah Boulevard (the main drive). The main picnic area is south of the parking lot and includes two large pavilions, restrooms, BBQ shelter and playground equipment. A boardwalk connects the main parking lot to a former picnic area, restroom and hiking trail to the north. While previously supporting swimming, the roughly 200 feet of shoreline adjacent to this area is now restricted to “fishing only” due to poor water visibility and the presence of alligators. An adjacent ramp provides boat access to the lake. An overflow parking area is located along the entrance road to handle traffic during peak visitation. Freshwater fishing is permitted on Lake Wauberg. Bass, bream and speckled perch are commonly caught. Areas for fishing along the bank are limited. Water access is available from the park's boat ramp.

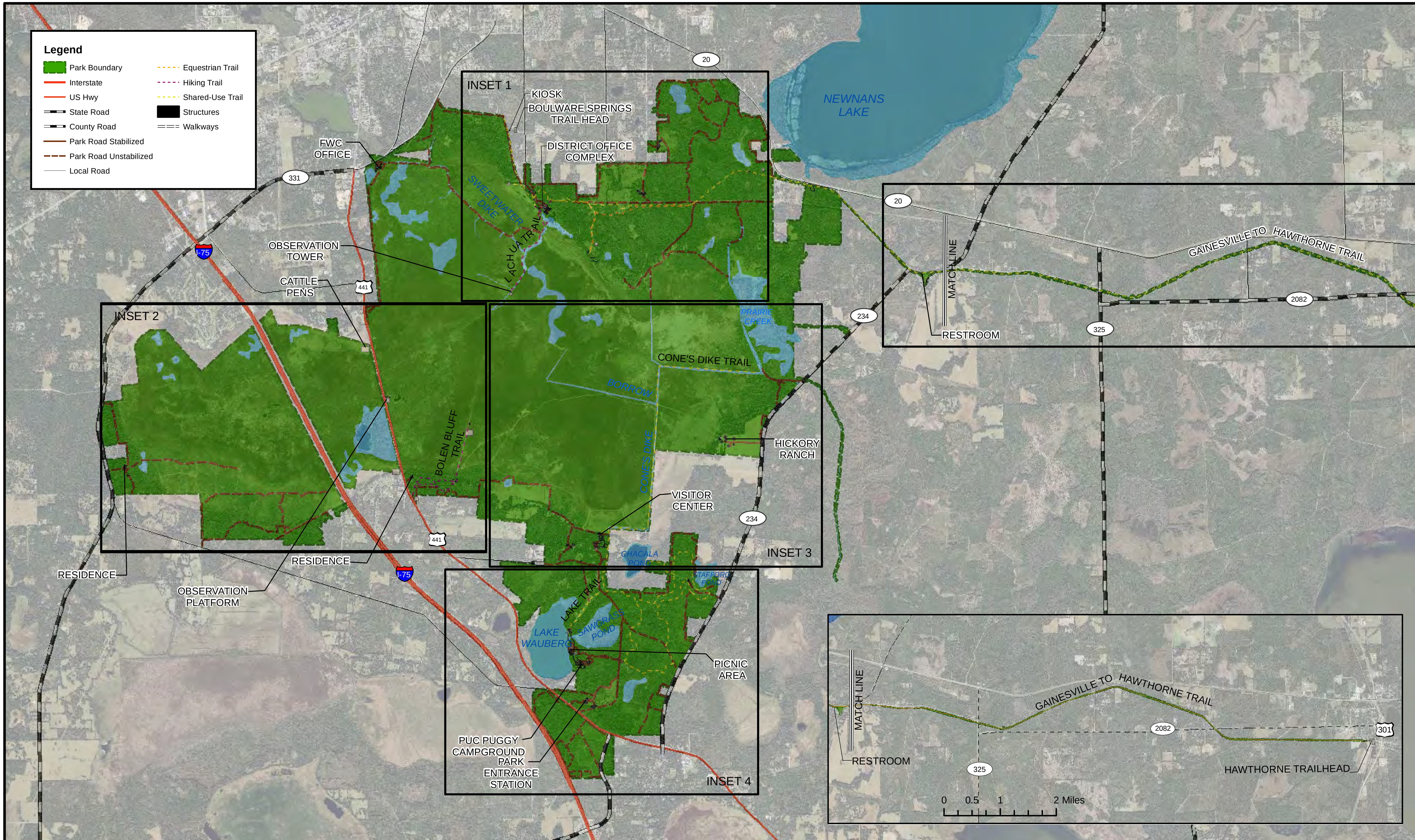
Puc Puggy Family Camping Area: The Puc Puggy Campground is located just east of the Lake Wauberg Day Use Area. It includes utility service for 35 RV sites and 15 tent sites. Parking is not provided at tent sites, although paved paths provide universal accessibility to four locations from the parking lot.

Visitor Center: The park’s Visitor Center is located at the end of Savannah Boulevard. This architecturally unique structure won the 1984 Governor’s Design Award and is the focal point of park’s interpretation. The center’s exhibits are currently being updated with Phase I (planning) and Phase II (design) recently completed. The project includes structural modifications to the existing building, improved exhibits and way-finding system that connects the park’s other interpretive programs to the Center. The park is currently seeking funding for Phase III to construct the project. A 50-foot tall observation tower is located nearby that provides spectacular views northward over the prairie basin. The Wacahoota Trail is a 0.25-mile loop that connects with the observation tower. A small picnic area and restrooms are located next to the Visitor Center.

La Chua Trailhead: The La Chua Trailhead is located on the north rim of the park and includes a small parking area accessed from Camp Ranch Road off Southeast 15th Street. The 1.5-mile hiking trail meanders under an old railroad bridge and through former ranch lands to provide views of Alachua Sink before terminating at the 20-foot tall Alachua Lake Observation Platform. A 1,000-foot boardwalk was recently constructed to provide trail users with universal access and a covered overlook at the Alachua Sink for wildlife viewing. A composting restroom provides convenience for visitors at the intersection of the La Chua Trail and the GHT. Adaptive re-use of the adjacent, historic Camp Ranch Barn is underway. Known as the Ranching Period Interpretive Area, this facility will provide visitors a sheltered area with interpretive panels that tell the story of the prairie’s agricultural and ranching history.

Trails and observation points: Ten different routes provide approximately 30 miles of trails for a variety of user groups. The park has recently incorporated cell phone tour stops around the park to enhance the visitor's trail experience. The following provides a brief description of those trails not previously discussed.

The 1.5-mile Bolen Bluff Trail is located off U.S. 441 and provides hiking and

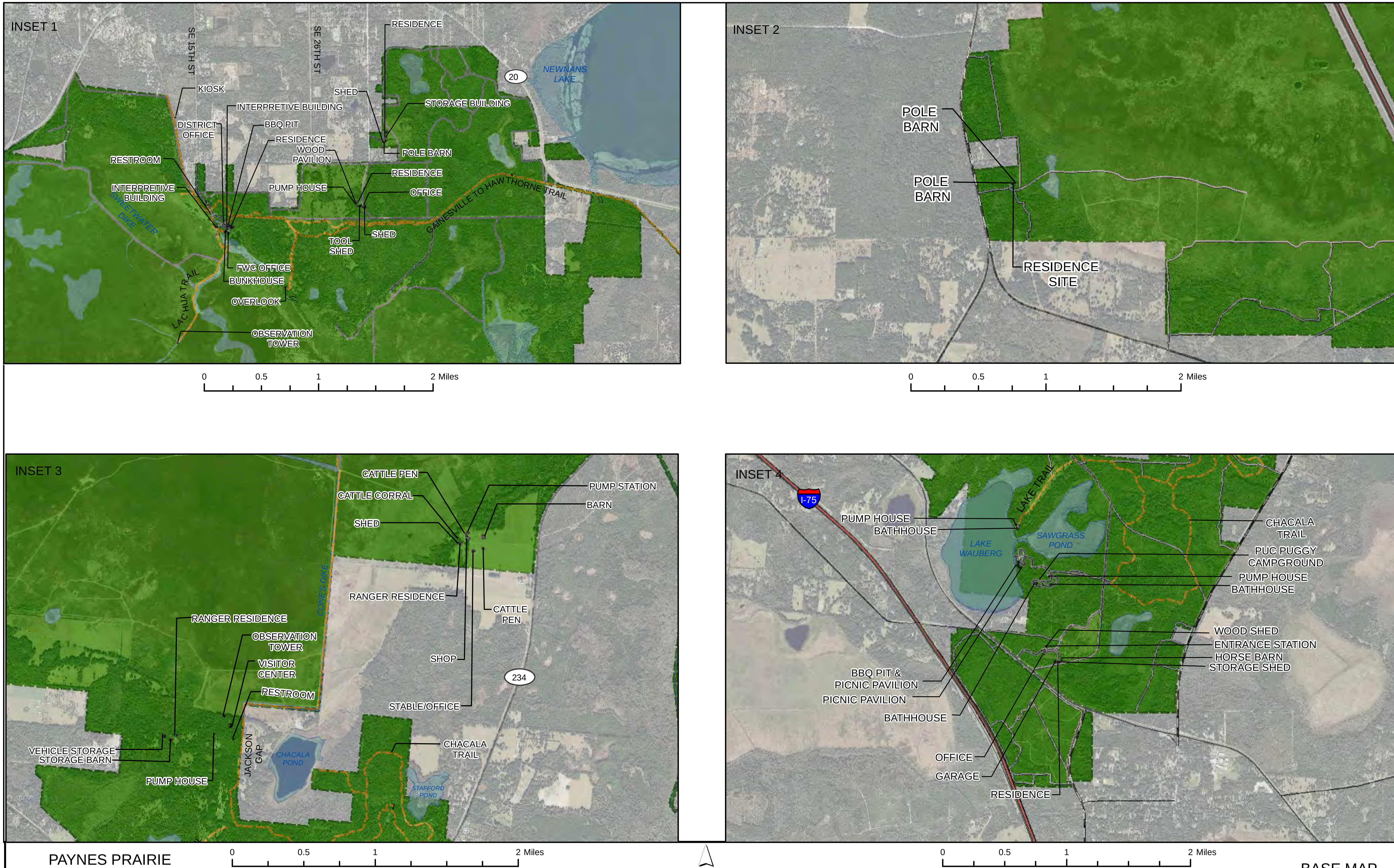


PAYNES PRAIRIE
PRESERVE STATE PARK

0 0.5 1 2 Miles

Prepared by:
Florida Department of Environment Protection
Division of Recreation and Park
Date of Aerial:2009

BASE MAP
PAGE 1 OF 2



PAYNES PRAIRIE
PRESERVE STATE PARK

Prepared by:
Florida Department of Environment Protection
Division of Recreation and Park
Date of Aerial:2009

BASE MAP
PAGE 2 OF 2

bicycling access to shady hammocks and marsh habitats. Views in this area are enhanced by a 66-foot boardwalk and an observation platform at the trail's terminus. A boardwalk and overlook are also available to motorists travelling on U.S. 441 from a pulloff along the north bound lanes.

An extensive trail network is located in the southern part of the park that links the main use areas and significant natural features. The 6.5-mile Chacala Trail consists of a series of loops available for hiking, bicycling, horseback riding and primitive camping. The trailhead, located at the Savannah Boulevard and the Lake Wauberg turnoff, provides access to a system of trails that meander through shady hammocks, pine flatwoods and old fields before terminating at Chacala Pond. One primitive camping area with 3 campsites, a composting restroom, non-potable water source, and horse hitching area are available for trail users.

Cone's Dike Trail is a roughly 4.0-mile linear trail extending east from the Visitor Center into the park's marshes with use limited to biking and hiking. Jackson's Gap Trail is a roughly 1.3-mile connector between the Cone's Dike Trail and Chacala Trail. This trail allows hiking, bicycling and horseback riding.

The Lake Trail is a short 0.85-mile spur available to hikers and bicyclists. This trail connects the small picnic area on Lake Wauberg to Savannah Boulevard.

The Rim Ramble Loop Trail is located in the Alachua Sink Hammock Area between the north rim and the GHT. This 3.3 mile loop traverses an area of steep karst topography and is only accessible by ranger guided tours due to the sensitive nature of this site.

Prairie Creek: A fishing platform is located on the south side of the Prairie Creek Bridge on SR 20. This facility is a cooperative project between DRP, St. Johns River Water Management District and Florida Fish and Wildlife Conservation Commission. The platform is accessible from the adjacent GHT and by parking along the shoulder of SR 20 on the east side of the Prairie Creek Bridge. Prairie Creek is part of the State-Designated Potano Paddling Trail which encircles Newnans Lake. Palm Point Park, Powers Park, Kate's Fish Camp, and Owen's-Illinois Park are launch sites for the trail. Prairie Creek which flows southward for approximately 2 miles to the intersection of Camp's Canal. Prairie Creek is also accessible from Camp's Canal at the CR 234 crossing. Paddlers can launch or pull out canoes and kayaks from a clearing in the right-of-way on the west side of the road.

Gainesville to Hawthorne Trail: Opened to the public since 1992, the GHT is a 16-mile shared use trail consisting of a 10- foot wide paved path, paralleled by a natural surface equestrian trail. The trail extends west from the Boulware Springs

Park through the Paynes Prairie Preserve State Park (a 3.5 mile segment) and the Lochloosa Wildlife Management Area to the City of Hawthorne. Parking is provided at four trailhead locations, Boulware Springs Park in Gainesville, Lochloosa Trailhead, Rochelle Trailhead and the Hawthorne Trailhead. Restroom facilities are also provided at various intervals along the trail.

The northern trailhead at Boulware Springs Park is the site of Gainesville's first public water source and is listed in the National Register of Historic Places and designated as a landmark by the American Waterworks Association. This facility supports bicycle, pedestrian and equestrian use by providing trail users with parking, restroom facilities and an orientation kiosk.

The trail enters the park near Sweetwater overlook less than one mile south of Boulware Springs Park. From this point, the GHT heads east near the northern rim of the basin, with significant natural features highlighted at the Alachua Lake and Red Wolf Pond overlooks.

The La Chua Trailhead, located north of the District 2 office complex, also provides access to the GHT. Access at this location is limited to pedestrians and bicyclists. A universally accessible restroom and water are provided at this location. Several interpretive signs are scattered along the section of trail within the park. The trail leaves the main body of the park near the Prairie Creek Bridge on State Road 20.

Another universally accessible restroom is provided at Rochelle near the intersection of County Road 234 and County Road 2082. The trail then continues east, through Grove Park, to the Lochloosa Trailhead, roughly one mile west of the trail's terminus. This location provides paved parking to accommodate equestrian users and contains an interpretive kiosk. DRP supports the development of equestrian trails on adjacent conservation lands and will consider providing connections to future trails via the Lochloosa Trailhead.

The trail ends at the town of Hawthorne, where a trailhead with paved parking, water, and an interpretive kiosk supports pedestrian and bicycle use.

Other Uses

The preserve supports a variety of research efforts through the DRP research and collecting permitting process. The University of Florida and Florida Fish and Wildlife Conservation Commission are actively involved in studying the natural resources of the park. A Memorandum of Understanding (MOU) between Gainesville and DRP includes a 225-acre easement that was granted to the city to develop water improvement facilities within the park. The MOU is a cooperative effort that implements the Paynes Prairie Sheetflow Restoration Project that restores degraded wetlands in the park and improves water quality in the Alachua Sink.

The headquarters for District 2 of the Florida Park Service is located in the park and is accessed from the park's northern entrance road off Southeast 15th Street. Several historic structures that date from the early 20th century ranching period are used for administrative offices for District Staff, AmeriCorps, and FWC law enforcement.

Protected Zones

A protected zone is an area of high sensitivity or outstanding character from which most types of development are excluded as a protective measure. Generally, facilities requiring extensive land alteration or resulting in intensive resource use, such as parking lots, camping areas, shops or maintenance areas, are not permitted in protected zones. Facilities with minimal resource impacts, such as trails, interpretive signs and boardwalks are generally allowed. All decisions involving the use of protected zones are made on a case-by-case basis after careful site planning and analysis.

At Paynes Prairie Preserve State Park, the entire prairie basin and the sinkholes located along the northern prairie rim have been designated as protected zones as delineated on the Conceptual Land Use Plan.

Existing Facilities

Recreation Facilities

Visitor Center Area
- Visitor Center
- Observation tower
- The Wacahoota Trail (0.25 mi. loop)
- Paved pedestrian path
- Picnic tables
- Restrooms
- Paved parking (52 spaces)

Lake Wauberg Day Use Area
- Paved parking (180 spaces-16 oversized)
- Large picnic pavilions (2)
- Scattered picnic tables and grills
- BBQ shelter
- Playground equipment
- Boardwalk
- Restrooms (2)
- Boat ramp

Puc Puggy Family Camping Area
- Standard Campground (35 RV sites/15 tent sites)

Campground bathhouses (2)

Hacienda de La Chua
Ranching Period Interpretive Area
Unpaved parking (handicap access only)
Rim Ramble Trailhead (Ranger-guided only)

Prairie Creek
Fishing platform

Trails and Observation Points
La Chua Trail (1.5 mi.)
Stabilized parking (35 spaces)
Composting restroom
Camp Ranch Barn (Ranching Period Interpretive Area)
Honor box
Interpretive signs
Potable water
Alachua Sink overlooks (2)
Alachua Lake Observation Platform
Boardwalk (1000 ft.)

Bolen Bluff Trail (1.5 mi.)
Stabilized parking
Bolen Bluff Observation Platform
Honor box

Chacala Trail (6.5 mi.)
Stabilized parking (10 spaces)
Primitive camping area (3 campsites)
Composting restroom
Non-potable water source
Hitching posts

Jackson's Gap Trail (1.3 mi.)
Utilizes visitor center parking

Cone's Dike Trail (4.0 mi.)
Utilizes visitor center parking

The Lake Trail (0.85 mile)
Stabilized parking (2 spaces)

U.S. 441 Observation Platform
Paved parking (5 spaces)

Gainesville to Hawthorne Trail
Shared use trail (16 mi. paved path and natural surface equestrian trail)

Lochloosa Trailhead
Paved parking (15 truck/trailer spaces)
Interpretive kiosk

Hawthorne Trailhead
Paved parking (27 standard spaces)
Potable water
Interpretive kiosk

District/Park Support Facilities

South Park Entrance
Administration Office
Paved parking (3 spaces)
Ranger Station

West Prairie
Residence, staff mobile home site (1)
Utility shed
Pole barn
Pump house (1)

Hickory Ranch
Office building
Shop
Lumber shed
Hay shed
Sign/paint shed
Equipment storage building
Residence, mobile home

North Prairie
Three bay shop (used by District construction staff)
Pole barn
Pump shed
Pump house
Residence

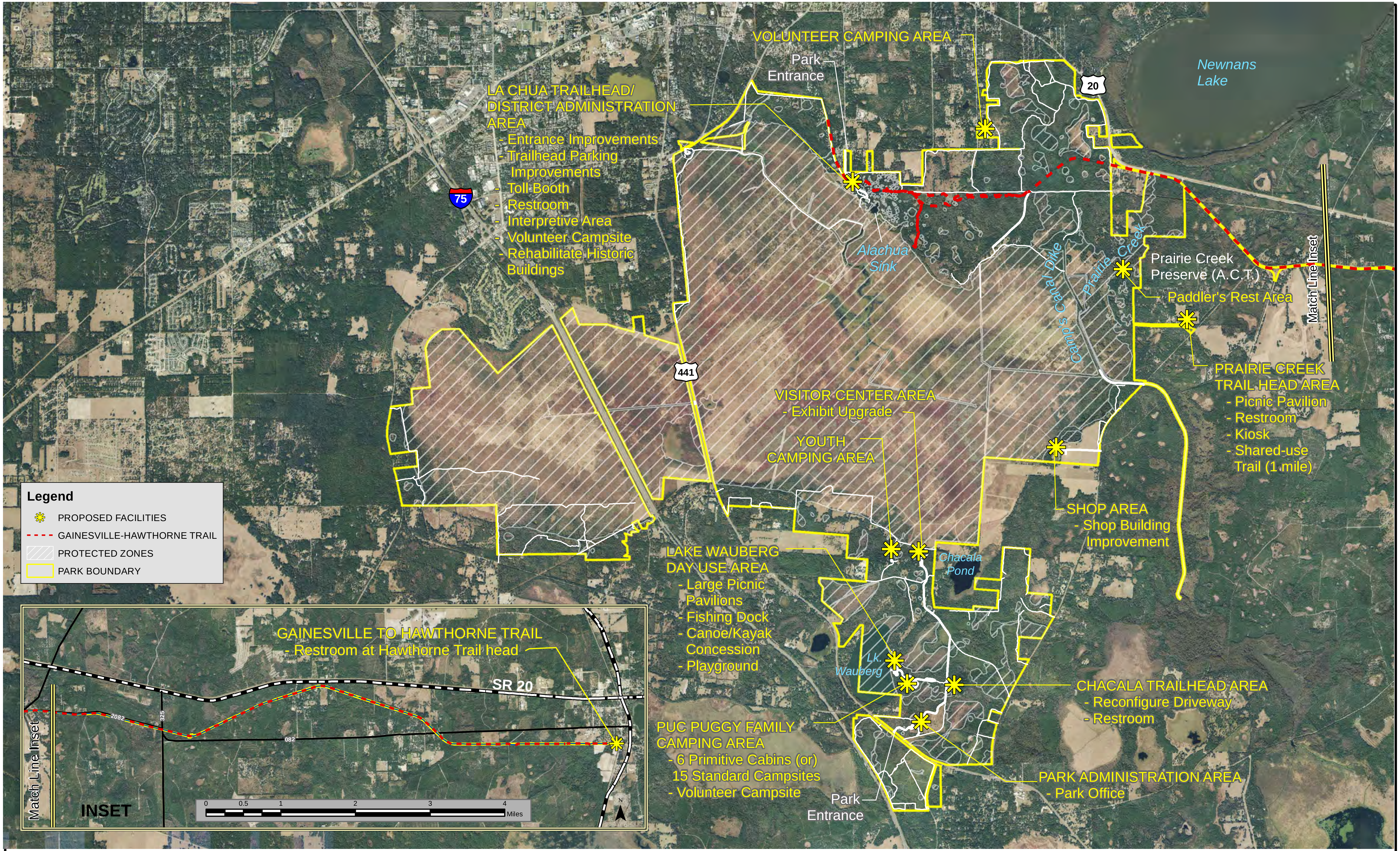
North Park Entrance
Administration building (historic)
Training center (modular)
Residence (1) (historic)
Law enforcement building (historic)
AmeriCorps office building (historic)
Stabilized parking (15 spaces)

CONCEPTUAL LAND USE PLAN

The following narrative represents the current conceptual land use proposal for this park. As new information is provided regarding the environment of the park, cultural resources, recreational use, and as new land is acquired, the conceptual land use plan may be amended to address the new conditions (see Conceptual Land Use Plan). A detailed development plan for the park and a site plan for specific facilities will be developed based on this conceptual land use plan, as funding becomes available.

The conceptual land use plan described here is the long-term, optimal development plan for the park, based on current conditions and knowledge of the park's resources, landscape and social setting. The development plan will be reassessed during the next update of the park management plan, and modified to address new conditions, as needed.

During the development of the management plan, DRP assessed potential impacts of proposed uses or development on the park resources and applied that analysis to decisions on the future physical plan of the park as well as the scale and character of proposed development. Potential impacts are more thoroughly identified and assessed as part of the site planning process once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) are more thoroughly investigated. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Stormwater management systems are designed to minimize impervious surfaces to the greatest extent feasible, and all facilities are designed and constructed using best management practices to avoid impacts and to mitigate those that cannot be avoided. Federal, state and local permit and regulatory requirements are met by the final design of the projects. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, the park staff monitors conditions to ensure that impacts remain within acceptable levels.



PAYNES PRAIRIE PRESERVE STATE PARK

0 1 2 4 Miles

Prepared By:
Florida Department of Environmental Protection
Division of Recreation and Parks
Date of Aerial: 2011

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CONCEPTUAL LAND USE PLAN

Potential Uses

Public Access and Recreational Opportunities

Goal: Provide public access and recreational opportunities in the park.

The existing recreational activities and programs of this state park are appropriate to the natural and cultural resources contained in the park and should be continued. New and improved activities and programs are also recommended and discussed below.

Objective: Maintain the park's current recreational carrying capacity of 2,626 users per day.

Located within 50 miles of 40 nature parks, the park provides visitors with opportunities for outstanding wildlife viewing, including large numbers of alligators and more than 270 bird species. The park provides camping and day-use recreation, including water recreation and more than 30 miles of trails through 27 distinct natural communities. The park also contains most of the GHT, providing users with access to approximately 16 paved miles from Gainesville's Boulware Springs Park through beautiful woodlands, past lakes, creeks and prairie vistas, to the town of Hawthorne.

Objective: Expand the park's recreational carrying capacity by 458 users per day.

In 2011, the park was expanded in the vicinity of Prairie Creek when the Board of Trustees purchased the 508 acre Crevasse Tract from Alachua Conservation Trust and subsequently added the property to DRP's lease. These lands will enable users to enjoy a new shared-use trail that will provide additional access to Prairie Creek and connect the park to the GHT with connections to existing trails on the adjacent Alachua Conservation Trust property. This area will provide visitors with additional opportunities for hiking, biking, wildlife viewing, and picnicking.

Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) indicates that resident and tourist participation rates for camping in this region are higher than the state average with demand for camp sites increasing through 2020. To address this need, camping opportunities will be expanded with the addition of a primitive cabin area adjacent to the Puc Puggy Family Camping Area and a youth camp area in the vicinity of the visitor center. SCORP also indicates an above average participation in shoreline fishing for residents in this region. It is recommended that additional fishing opportunities be provided by constructing fishing facilities on Lake Wauberg.

Objective: Continue to provide the current repertoire of 10 interpretive, educational and recreational programs on a regular basis.

Interpretive, educational and recreational programs are offered to park visitors and school groups. The visitor center provides interpretive and educational programs that utilize the center's displays and theater. The Camp Ranch Barn is being converted into the Ranching Period Interpretive Area on the La Chua Trail. Interpretive and recreational programs also include weekly ranger-guided walks, overnight hikes and events. Monthly overnight backpacking hikes to Persimmon Point during the cooler months provide campers with an interpretation of the prairie's natural and cultural history. The hike gives beginners an opportunity to enjoy a short-distance overnight trip while learning backpacking essentials. Staff provides guided walks geared toward both novice and experienced users. Park related subjects explore zoology, water resources and prehistoric and historic anthropology. A ranger-guided hike known as the "Rim Ramble" provides visitors with an opportunity to access resource-sensitive areas while protecting rare resources. During cooler months, weekly campfire programs are offered at the amphitheater to campers and day-use visitors. Program topics include but are not limited to regional prehistoric and historic settlement, archaeology, cowboy culture, nocturnal wildlife behavior and identification, sandhill cranes, the American alligator and other reptiles, and resource management.

Educational programs are provided to school and community groups throughout the year. Components of the resource-based program are designed to complement classroom curricula and are presented at the visitor center and in classrooms. In 2010, the park began hosting an annual prescribed fire festival in partnership with regional land management agencies and prescribed fire professionals. The program raises community awareness and support for prescribed fires and offers educational and interactive activities, including hands-on opportunities to try tools and equipment used by burn professionals. Winter stargazing events are held at Hickory Ranch in partnership with the Alachua Astronomy Club. The program also serves as a fundraising event for the Friends of Paynes Prairie.

Objective: Develop 6 new interpretive, educational and recreational programs.

Visitors have expressed interest for new interpretive, educational and recreational programs as identified in the park's statement for interpretation. It is recommended the park develop interpretive programs that explore the Paynes Prairie Sheetflow Restoration Project and the park's agricultural and ranching history, including the collection of heritage breed livestock scrub cattle and Spanish horses. Also recommended are the development of an environmental film series for the Visitor Center, nature photography walks and nature writing workshops. Planned upgrades to the Visitor Center include new and improved exhibits to better interpret the park's history and ecology.

Proposed Facilities

Capital Facilities and Infrastructure

Goal: Develop and maintain the capital facilities and infrastructure necessary

to implement the recommendations of the management plan.

The park has been a popular recreation site since 1970. Updates to this plan propose upgrades to existing facilities that address the changing needs of current park users, in addition to new recreational facilities that provide for group camping, fishing and trail access to new park land.

The existing facilities of this state park are appropriate to the natural and cultural resources contained in the park and should be maintained. New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities that visitors enjoy while in the park, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of improved or renovated and new facilities needed to implement the conceptual land use plan for Paynes Prairie Preserve State Park:

Objective: Maintain all public and support facilities in the park.

All capital facilities, trails and roads within the park will be kept in proper condition through the daily or regular work of park staff and/or contracted help.

Objective: Improve/repair nine existing facilities, 16 miles of trail and 3.0 miles of road.

Major repair projects for park facilities may be accomplished within the ten-year term of this management plan, if funding is made available. These include the modification of existing park facilities to bring them into compliance with the Americans with Disabilities Act (a top priority for all facilities maintained by DRP). The following discussion of other recommended improvements and repairs are organized by use area within the park.

Parkwide: It is recommended that the 1.5 mile road segment from the ranger station to the campground area be widened and resurfaced to better accommodate the larger RVs and trailers that are commonly used by today's campers. The remainder of the entrance drive (1.5 miles from the Lake Wauberg turnoff to the visitor center) should be repaved to repair the cracks and potholes resulting from weathering over the last twenty years.

Visitor Center Area: Construction of the new interpretive exhibits at the Visitor Center is recommended to complete Phase III, the final phase, of the project.

Puc Puggy Family Camping Area: Electrical upgrades are recommended to accommodate larger RVs. Up to 35 existing sites will be upgraded to 50-amp service, if feasible. Camping opportunities will be expanded by providing six primitive cabins (or) 15 standard camp sites in the area between the existing campsites and the Lake Wauberg Day Use Area. One additional volunteer RV site will be provided in this area for maintenance purposes.

Lake Wauberg Day Use Area: This area is comprised of the former swimming area on the north side of Sawgrass Pond and the existing picnic area south of the boat ramp. Picnicking opportunities will be expanded on the north side with the addition of two large picnic pavilions and a playground. Fishing opportunities will be enhanced with the addition of a small fishing deck and access boardwalk that will tie into the existing boardwalk. A canoe and kayak concession will also be established in this area to provide paddling opportunities on Lake Wauberg. No enhancements are proposed for the south side picnic area.

Chacala Trailhead Area: This area will be improved with the addition of a composting restroom. Reconfiguration of the driveway on Savannah Boulevard is needed to improve access by large trucks and horse trailers which currently have difficulty making the sharp turn from the main park drive.

La Chua Trailhead Area: Recommended improvements to the existing trailhead include a reconfigured paved parking area, a new restroom and a tollbooth. Parking will be provided for up to 40 vehicles and a small restroom will connect to municipal sewer lines. A standard park entrance sign and landscaping will be installed at the entrance to the trailhead (and district office) to make it more attractive and visible to visitors approaching from SE 15th Street and SE 41 Avenue. The park will also work with Alachua County to determine the feasibility of improving the ingress and egress to and from the park at the intersection of the above mentioned county roads. A Ranching Period Interpretive Area utilizing the historic Camp Ranch Barn is recommended. Upgrades to the existing structure include cosmetic refurbishment and interpretative kiosks.

Gainesville to Hawthorne Trail: Re-pavement is recommended for the entire 16 miles of the GHT. Root upheavals have caused a significant amount of cracking. Corrective actions to control erosion and sedimentation at problem spots along the trail will be implemented. A small restroom is proposed for the trailhead located in the town of Hawthorne due to the increasing use of this facility.

Park Administration Area: The current park office is a modular unit located across from the entrance station on Savannah Boulevard. This site is problematic due to parking lot flooding. Standing water often persists for many days after a heavy rain. It is recommended that the park office be relocated to a more appropriate location within the park.

District Administration Area: Rehabilitation of the historic masonry bunkhouse is proposed. A second historic structure, a framed bunkhouse currently used by AmeriCorps staff, is also recommended for rehabilitation, if feasible. If the framed bunkhouse cannot be rehabilitated, the structure will be evaluated for removal and staff will be relocated to other offices. One volunteer RV site will be provided in this area to support the operation of the toll booth proposed for the La Chua trailhead.

Objective: Construct three new facilities and 1 mile of trail.

Youth Camp Area: Youth camping opportunities will be provided by developing a group camp just west of the Visitor Center. A small restroom with outdoor showers, several fire rings, and picnic tables will be provided.

Prairie Creek Trailhead Area: A one mile shared-use trail that connects the park's Crevasse addition to ACT's Prairie Creek Preserve and the GHT is recommended east of Prairie Creek. The trailhead and parking will be located at the ACT Prairie Creek Lodge east of the park and accessed from County Road 234 at the south end of the trail system. The trailhead area will feature a small picnic pavilion, composting restroom, and an interpretive kiosk. A portion of the trail will be located adjacent to the banks of Prairie Creek and provide paddlers access to a proposed trailside rest area. The exact alignment of the trail will be determined during trail development and in collaboration with ACT.

Volunteer Camping Area: The park relies heavily on volunteers to assist with a wide variety of tasks related to visitor services and resource management. A volunteer camping area is proposed for the life estate property on the northeast side that is convenient to both the park and the City of Gainesville. The property has one existing residence with electricity and septic service. Approximately 8 to 10 campsites will be provided on this site.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in Implementation Component of this plan. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist DRP in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes. New facilities and improvements to existing facilities recommended by the plan include:

Parkwide
Entrance road, widening and resurfacing (3.0 miles)

Visitor Center Area
Exhibit upgrades, Phase III

Puc Puggy Family Camping Area
Campground electrical upgrades (up to 35 sites)
Primitive cabins (6) or Standard Campsites (15)

Volunteer campsite (1)

Lake Wauberg Day Use Area
Large picnic pavilions (2)
Boardwalk with fishing deck
Canoe/kayak concession
Playground

Youth Camp Area
Small restrooms
Outdoor showers
Fire rings
Scattered picnic tables

Chacala Trailhead Area
Parking area, driveway reconfiguration
Composting restroom

La Chua Trailhead Area
Entrance improvements
Trailhead parking, redesigned and paved (up to 40 vehicles)
Small restroom with sewer hookup
Tollbooth
Camp Ranch Barn renovation for interpretive area

Gainesville to Hawthorne Trail
Trail, resurfacing (16 miles)
Small restroom (Hawthorne trailhead)

Prairie Creek Trailhead Area
Shared-use trail (1 mile)
Composting restroom
Small picnic pavilion
Interpretive kiosk
Canoe/kayak landing (paddler's rest area)

Volunteer Camping Area
Campsites (8 – 10)

Park Administration Area
Park office

District Administration Area (Hacienda de La Chua)
Rehabilitate historic buildings (2)
Volunteer campsite (1)

Existing Use and Recreational Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and park the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 8).

Table 8--Existing Use and Recreational Carrying Capacity

	Existing Capacity		Proposed Additional Capacity		Estimated Recreational Capacity	
Activity/Facility	One Time	Daily	One Time	Daily	One Time	Daily
Visitor Center	80	320	0	0	80	320
Camping						
Cabins	0	0	36	36	36	36
Standard	280	280	0	0	280	280
Tent	60	60	0	0	60	60
Primitive	24	24	0	0	24	24
Youth	0	0	60	60	60	60
Picnicking	136	272	136	272	272	544
Trails, Preserve						
Hiking	95	380	0	0	95	380
Shared-use	55	220	10	40	65	260
Trails, GHT						
Shared-use	160	640	0	0	160	640
Equestrian	128	256	0	0	128	256
Fishing, Shoreline	15	30	5	10	20	40
Boating						
	40	80	20	40	60	120

Table 8--Existing Use and Recreational Carrying Capacity						
	Existing Capacity		Proposed Additional Capacity		Estimated Recreational Capacity	
Activity/Facility	One Time	Daily	One Time	Daily	One Time	Daily
Visitor Center	80	320	0	0	80	320
Canoeing/Kayaking						
Boating	32	64	0	0	32	64
TOTAL	1,105	2,626	267	458	1,372	3,084

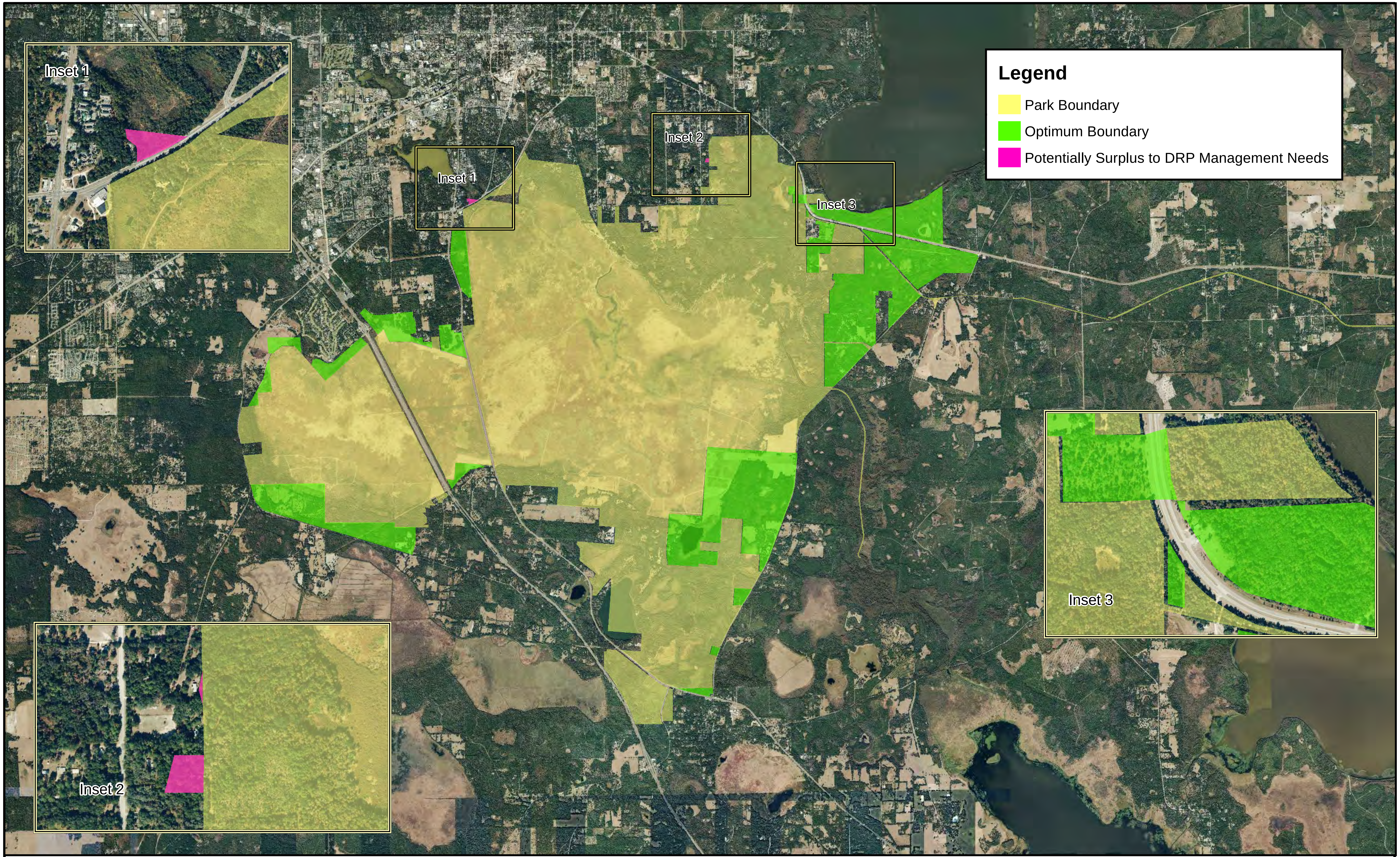
The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity.

Optimum Boundary

The optimum boundary map reflects lands that have been identified as desirable for direct management by DRP as part of the state park. These parcels may include public as well as privately owned lands that improve the continuity of existing park lands, provide the most efficient boundary configuration, improve management access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. The map also identifies lands that are potentially surplus to the management needs of DRP.

As additional needs are identified through park use, development, research, and as changes to adjacent land uses on private properties occurs, modification of the park's optimum boundary may be necessary. Reasons for optimum boundary modification could include the enhancement of natural and cultural resources, the improvement of recreational values and management efficiency and the removal of parcels that are no longer desirable for state park management.

Identification of parcels on the optimum boundary map is intended solely for planning purposes. It is not to be used in connection with any regulatory purposes. A property's identification on the optimum boundary map should not be used by any party or governmental entity to reduce or restrict the lawful rights of private landowners. Identification on the map does not empower or suggest that any government entity should impose additional or more restrictive environmental land use or zoning regulations. Identification should not be used as the basis for permit



PAYNES PRAIRIE PRESERVE STATE PARK

N
0 0.5 1 2 Miles

Prepared By:
Florida Department of Environmental Protection
Division of Recreation and Parks
Date of Aerial: 2011

OPTIMUM BOUNDARY MAP

denial or the imposition of permit conditions.

The optimum boundary map reflects lands identified for direct management by DRP as part of the park. These parcels may include public as well as privately owned lands that improve the continuity of existing park lands, provide additional natural and cultural resource protection and/or allow for future expansion of recreational activities.

Changes to the 2002 approved optimum boundary reflect lands that have been developed or fragmented by development. Most of the lands identified on the updated optimum boundary map are adjacent to the boundary of the park and provide valuable watershed protection for the prairie basin. A large parcel of land, lying north of State Road 20, would protect a vital wildlife corridor from the park's northern boundary to Newnans Lake. Parcels on the northern boundary of the park and west of I-75 would provide a critical buffer to control invasive exotic plants and improve the park's natural communities (see Optimum Boundary Map).

At this time, three small parcels are considered surplus to the needs of the park. One of these, on the northwestern boundary, is bisected by Main Street and disconnected from the main body of the park. The other two parcels are located on the park's north side south of State Road 20. Removal of these parcels would enhance park operations by creating a more efficient boundary configuration.

IMPLEMENTATION COMPONENT

The resource management and land use components of this management plan provide a thorough inventory of the park's natural, cultural and recreational resources. They outline the park's management needs and problems, and recommend both short and long-term objectives and actions to meet those needs. The implementation component addresses the administrative goal for the park and reports on the Florida Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) progress toward achieving resource management, operational and capital improvement goals and objectives since approval of the previous management plan for this park. This component also compiles the management goals, objectives and actions expressed in the separate parts of this management plan for easy review. Estimated costs for the ten-year period of this plan are provided for each action and objective, and the costs are summarized under standard categories of land management activities.

MANAGEMENT PROGRESS

Since the approval of the last management plan for Paynes Prairie Preserve State Park in 2002, significant work has been accomplished and progress made towards meeting DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and DRP.

Acquisition

- Acquired 703 acres of which 184 acres was received from the City of Gainesville and St. Johns River Water Management District in exchange for the 225-acre enhancement wetland easement given to the City of Gainesville.
- Acquired an additional 92 acres to the park through a management lease from Alachua County.
- Added 508 acres to the park through the acquisition of the Crevasse Tract from Alachua Conservation Trust.

Park Administration and Operations

- A Statement of Interpretation has been created for the park.
- The park's volunteer program was expanded to include full-time staffing for the Visitor Center and campground in addition to weekend staffing for the LaChua Trail during peak season.

Resource Management

<u>Natural Resources</u>

- Identification of the park's boundary was improved with approximately 10 miles of fencing and 5 miles of survey.
- Staff backfilled 4.75 miles of dikes into 7.5 miles of canals restoring sheet flow to 6,000 acres of the prairie basin marsh.

- Staff removed two miles of rail bed, restoring hydrology and the natural fire behavior in the park's upland-basin marsh ecotone.
- Between 2004 and 2007, staff completed two censuses of the gopher tortoises on the north and south sides of the park.
- Staff completed a census of the silver buckthorn (*Sideloxoron alachuense).*
- Restoration of 1,600 acres within the park include planting 39,000 longleaf tublings and 21,000 wiregrass plugs, mowing/chopping 600 acres of basin marsh "wet prairie", mowing 19 acres of scrubby flatwoods including 10,000 feet of fire lines needed to burn this community.
- Between 2007 and 2010, staff documented silver buckthorn and treated competing plant species.
- Prescribed fire treatments have been implemented on lands between U.S. Highway 441 and Interstate 75 near Micanopy.
- Staff installed five miles of mineral soil boundary line firelines and mowed 70 acres of flatwoods to reduce fuel loads and widen existing firelines.
- Treated 1,600 acres of invasive exotics.
- Eleven acres of cogongrass is currently within maintenance levels.
- Over 236 acres of offsite hardwoods have been removed from areas that had been clear-cut to control a southern pine beetle outbreak.
- Staff expanded invasive exotic plant treatments to target Chinese tallowtree and coral ardisia.
- The park's Livestock Management Plan was implemented in 2011.
- Staff initiated a multi-agency task force to evaluate the park's alligator/visitor risk management.
- A feral hog removal program has been implemented at the park.

Cultural Resources

- A Scope of Collections has been developed for the park's artifacts.
- Staff developed and implements regular historic building and cultural site assessments.

Recreation and Visitor Services

- Staff obtained grant money to complete Phase I and II of the interpretive display renovation project in the park's Visitor Center.
- Additional days of operation at the Alachua Sink/LaChua trail provide visitors with more opportunities for wildlife viewing.
- An AM radio station that covers U.S. Highway 441 and Interstate 75 was installed at the park and informs motorists about park activities and resources.
- Staff developed and implemented a cell phone interpretive tour throughout the park.

Park Facilities

- An amphitheater has been constructed near the campground for interpretive programs.
- A universally accessible boardwalk was constructed adjacent to the Alachua Sink on the Alachua trail.
- Universally accessible sidewalks and walkways have been constructed to expand visitor use throughout the park.
- A park administrative office established near the south entrance.
- A fishing dock has been constructed off the Gainesville to Hawthorne Trail (GHT) to improve fishing opportunities on Prairie Creek.
- Six rest stops and two water fountains have been provided for GHT users.
- Campsites and tent pads were enhanced by improving campground drainage.
- Honor boxes have been installed at the Alachua Sink/LaChua Trail and Bolen Bluff Trail.

MANAGEMENT PLAN IMPLEMENTATION

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 9) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

Many of the actions identified in the plan can be implemented using existing staff and funding. However, a number of continuing activities and new activities with measurable quantity targets and projected completion dates are identified that cannot be completed during the life of this plan unless additional resources for these purposes are provided. The plan's recommended actions, time frames and cost estimates will guide DRP's planning and budgeting activities over the period of this plan. It must be noted that these recommendations are based on the information that exists at the time the plan was prepared. A high degree of adaptability and flexibility must be built into this process to ensure that DRP can adjust to changes in the availability of funds, improved understanding of the park's natural and cultural resources, and changes in statewide land management issues, priorities and policies.

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing DRP's annual legislative budget requests. When preparing these annual requests, DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 7 may need to be adjusted during the ten-year management planning cycle.

Table 9
Paynes Prairie Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 1 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Goal I: Provide administrative support for all park functions.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Continue day-to-day administrative support at current levels.**	Administrative support ongoing	C	**$2,029,000**
Objective B	**Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.**	Administrative support expanded	C	**$300,000**
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Continue an assessment of the park's hydrological needs.**	Assessment conducted	LT	**$75,000**
Objective B	**Restore natural hydrological conditions and function to approximately 5,000 acres of basin marsh natural community.**	# Acres restored or with restoration underway	LT	**$236,000**
Action 1	Oversee contracting and removal of approximately 4 miles of dikes and backfill approximately 4 miles of associated canal (Restoration project funded as part of City of Gainesville Sweetwater Project).	# Miles of dikes removed and canals filled	LT	$10,000
Action 2	Continue to support the implementation of the Sweetwater/Paynes Prairie Sheetflow Restoration Project.	Plan implemented	LT	$10,500
Action 3	Continue to seek funding to implement the Paynes Prairie Hydrological Restoration Plan.	Plan implemented	LT	$10,000
Action 4	Remove dikes and backfill canals in accordance with the Paynes Prairie Hydrological Restoration Plan	# Miles of dikes removed and canals filled	UFN	$205,000
Objective C	**Monitor and evaluate the impacts of historic cattle dipping operations at Paynes Prairie.**	Evaluation completed	LT	**$3,000**
Goal III: Restore and maintain the natural communities/habitats of the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Within 10 years have 13,500 acres of the park maintained within optimal fire return interval.**	# Acres within fire return interval target	LT	**$1,116,000**
Action 1	Update annual burn plan.	Plan updated	C	$16,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning between 1,100 - 7,300 acres annually, as identified by the annual burn plan.	Average # acres burned annually	C	$1,100,000
Objective B	**Conduct habitat/natural community restoration activities on 25 acres of upland pine and upland mixed woodland communities.**	# Acres restored or with restoration underway	UFN	**$17,000**
Action 1	Develop/update site specific restoration plan	Plan developed/updated	ST	$2,200
Action 2	Implement restoration plan	# Acres with restoration underway	UFN	$15,000

* 2013 Dollars
ST = actions within 2 years
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C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 9
Paynes Prairie Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 2 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Objective C	**Conduct habitat/natural community improvement activities on 30 acres of scrubby flatwoods community.**	# Acres improved or with improvements underway	LT	**$6,000**
Objective D	**Conduct habitat/natural community improvement activities on 100 acres of Mesic and Wet Flatwoods communities.**	# Acres improved or with improvements underway	UFN	**$38,000**
Objective E	**Conduct habitat/natural community improvement activities on 400 acres of basin marsh communities.**	# Acres improved or with improvements underway	LT	**$58,000**
Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.**	List updated	C	**$2,000**
Objective B	**Monitor and document 4 selected imperiled animal species in the park.**	# Species monitored	C	**$16,000**
Action 1	Develop additional monitoring protocols for Sherman's fox squirrels.	# Protocols developed	ST	$100
Action 2	Implement monitoring protocols for the Sherman's fox squirrels.	# Species monitored	C	$800
Action 3	Continue to monitor and document gopher tortoises and whooping cranes.	# Species monitored	C	$3,000
Action 4	Continue to work with volunteers during the annual Audubon Christmas Bird Count by documenting imperiled bird species at the park.	# Species documented	C	$12,300
Objective C	**Monitor and document 4 selected imperiled plant species in the park.**	# Species monitored	C	**$4,000**
Action 1	Continue to implement monitoring protocols for 4 selected imperiled plant species including silver buckthorn, Godrey's swamp privet, hooded pitcher plant, Mexican tear-thumb.	# Species monitored	C	$3,500
Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Annually treat 400 acres of exotic plant species in the park.**	# Acres treated	C	**$1,393,000**
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	$16,000
Action 2	Implement annual work plan by treating 400 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	$1,377,000
Objective B	**Develop and implement measures to prevent the accidental introduction or further spread of invasive exotic plants in the park.**	# Plan developed/implemented	C	**$9,000**
Objective C	**Implement control measures on 3 exotic and nuisance animal species in the park.**	# Species for which control measures implemented	C	**$105,000**
Action 1	Continue control activities on feral hogs.	# Removed	C	$100,000
Action 2	Relocate feral cats and stray dogs to County Animal Control Facilities.	# Relocated	C	$5,000

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Table 9
Paynes Prairie Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 3 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.

Goal VI: Protect, preserve and maintain the cultural resources of the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	**Assess and evaluate 139 of 139 recorded cultural resources in the park.**	Documentation complete	UFN	**$158,000**
Action 1	Complete 103 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization projects.	Assessments complete	LT	$8,000
Action 2	Complete 10 Historic Structures Reports (HSR's) for historic buildings and cultural landscape. Prioritize stabilization, restoration and rehabilitation projects.	Reports and priority lists completed	UFN	$150,000
Objective B	**Compile reliable documentation for all recorded historic and archaeological sites.**	Documentation complete	ST	**$469,000**
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	$5,000
Action 2	Conduct Phase 1 archaeological survey for 11 priority areas planned for development which occur in high and medium sensitivity areas.	# Areas surveyed	UFN	$464,000
Action 3	Review the park's Scope of Collections Statement on an annual basis.	Document reviewed	ST	$250
Objective C	**Bring 11 of 139 recorded cultural resources into good condition.**	# Sites in good condition	C	**$1,026,000**
Action 1	Design and implement a regular monitoring programs for 11 cultural sites.	# Sites monitored	C	$1,000
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	# Sites maintained	C	$1,025,000
Goal VII: Provide public access and recreational opportunities in the park.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain the park's current recreational carrying capacity of 2,626 users per day.**	# Recreation/visitor	C	**$2,029,000**
Objective B	**Expand the park's recreational carrying capacity by 388 users per day.**	# Recreation/visitor	UFN	**$300,000**
Objective C	**Continue to provide the current repertoire of 10 interpretive, educational and recreational programs on a regular basis.**	# Interpretive/education programs	C	**$70,000**
Objective D	**Develop 6 new interpretive, educational and recreational programs.**	# Interpretive/education programs	UFN	**$35,000**
Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.		**Measure**	**Planning Period**	**Estimated Manpower and Expense Cost* (10-years)**
Objective A	**Maintain all public and support facilities in the park.**	Facilities maintained	C	**$2,272,000**
Objective B	**Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990.**	Plan implemented	LT	**$600,000**
Objective C	**Improve and/or repair 9 existing facilities, 16 miles of trail and 3 miles of road as identified in the Land Use Component.**	# Facilities/Miles of Trail/Miles of Road	UFN	**$5,746,000**

* 2013 Dollars
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UFN = currently unfunded need

Table 9
Paynes Prairie Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 4 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Objective D	**Construct 3 new facilities and 1 mile of trail as identified in the Land Use Component.**	# Facilities/Miles of Trail/Miles of Road	UFN	**$565,000**
Objective E	**Expand maintenance activities as existing facilities are improved and new facilities are developed.**	Facilities maintained	UFN	**$140,000**
Summary of Estimated Costs				
	Management Categories			
	Resource Management			$4,731,000
	Administration and Support			$2,329,000
	Capital Improvements			$6,911,000
	Recreation Visitor Services			$4,846,000
	Law Enforcement Activities[1]			
		1Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.		

* 2013 Dollars
ST = actions within 2 years
LT = actions within 10 years
C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Addendum 1—Acquisition History

Purpose of Acquisition
The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida ("Trustees") has acquired Paynes Prairie Preserve State Park to protect the water resources and endangered and threatened species of the wet prairie/marsh ecosystem.

Sequence of Acquisition
On September 29, 1970, the Trustees purchased a 9,219.9-acre property which constituted the initial area of Paynes Prairie Preserve State Park. The Trustees purchased the property from Camp Ranch, Inc. for $2,100,000. This purchase was funded with the Land Acquisition Trust Fund ("LATF") and Land and Water Conservation Fund ("LWCF").

Since the 1970's initial purchase, Trustees has acquired several individual parcels under LATF, LWCF, Environmentally Endangered Lands ("EEL"), Preservation 2000/Additions and Inholdings ("P2000/A&I ") and Florida Forever/ A&I programs and added them to Paynes Prairie Preserve State Park. The State of Florida Department of Environmental Protection, Division of Recreation and Parks ("DRP"), which manages Paynes Prairie Preserve State Park under a long-term lease, has also leased properties from the St. Johns River Water Management District ("SJRWMD") and Alachua County to manage these properties as part of Paynes Prairie Preserve State Park. Currently the park has approximately 21,654 acres.

Management Leases
On January 27, 1971, the Trustees leased Paynes Prairie Preserve State Park to DRP under a 99-year lease, Lease No. 2515. This lease will expire on January 26, 2070. On April 9, 1990, DRP leased approximately 158-acre property from the SJWMD under a 20-year lease and started managing it as part of Paynes Prairie Preserve State Park. The Division has amended this lease to add lands and extended the initial lease by additional 20 years. The current term of the lease will expire on April 8, 2030.

On May 8, 2007, DRP leased a 25-acre property from Alachua County, Florida, to manage it part of Paynes Prairie Preserve State Park. The Trustee amended the lease to add new lands to the park. The term of this lease is coterminous with the term of Lease No. 2515.

According to the three leases (Trustees' lease, SJWMD lease and Alachua County lease), DRP manages Paynes Prairie Preserve State Park to conserve and protect the natural and historical resources of the park and to use the property for resource-based public outdoor recreation which is compatible with the conservation and protection of the resources.

Title Interest

Trustees, SJWMD and Alachua County hold fee simple title to different portions of Paynes Prairie Preserve State Park.

Special Conditions on Use
Paynes Prairie Preserve State Park is designated as a single-use property to provide resource-based public outdoor recreation and other park related uses. Uses such as water resource development projects, water supply projects, storm-water management projects, and linear facilities and sustainable agriculture and forestry are not consistent with the management purposes of the park.

Outstanding Reservation
Following is a listing of outstanding reservations and rights that apply to Paynes Prairie Preserve State Park:

Type of Instrument: Easement, Easement No. 32254
Grantor: Trustees
Grantee: City of Alachua, Florida
Beginning Date: November 23, 2010
Ending Date: Perpetuity
Outstanding Rights: This easement allows the city to construct, operate and maintain overhead and underground electric utility facilities upon or under a certain portion of Paynes Prairie Preserve State Park.

Type of Instrument: Warranty Deed
Grantor: Alachua Conservation Trust Incorporated
Grantee: Trustees
Beginning Date: June 29, 2010
Ending Date: Perpetuity
Outstanding Reservations: This deed reserves a non-exclusive easement for ingress, egress and utility over and across a portion of the subject land to the grantor. The deed is also subject to a non-exclusive electric utility easement in favor of Clay Electric cooperative, Inc. dated June 29,2010, and recorded in ORB 3966, Page 1816, public records of Alachua County, Florida.

Type of Instrument: Fee Simple Deed
Grantors: St. Johns River Water Management District and the City of Gainesville
Grantee: Trustees
Beginning Date: August 11, 2009
Ending Date: Perpetuity
Outstanding Rights: This deed is subject to an easement for ingress and egress.

Type of Instrument: Easement, Easement No. 32091
Grantor: Trustees

Grantee: City of Gainesville, Florida
Beginning Date: August 24, 2009
Ending Date: Perpetuity
Outstanding Rights: This non-exclusive easement allows the City of Gainesville to construct, operate and maintain facilities on a certain portion of Paynes Prairie Preserve State Park to improve water qualities and hydrology of Paynes Prairie as well as to provide public access to the Sweetwater Branch enhancement wetland areas on a portion of Paynes Prairie Preseve State Park as long as the easement area is used for this purpose.

Type of Instrument: Easement, Easement No. 31419
Grantor: Trustees
Grantees: Katheen Spinks and Alison S. MacClarrie
Beginning Date: December 8, 2005
Ending Date: For as long as the route is used for private ingress and egress purposes
Outstanding Rights: This easement grants the right to use and maintain a certain portion of Paynes Prairie Preserve State Park for private ingress and egress only.

Type of Instrument: Easement, Easement No.
Grantor: Trustees
Grantee: The City of Gainesville, Florida
Beginning Date: April 19, 2005
Ending Date: Perpetuity
Outstanding Rights: This easement grants the right to install underground sewer line in certain area of the Paynes Prairie Preserve State Park.

Type of Instrument: Access Easement
Grantor: Trustees
Grantee: Trustee of Vernon Eddy Revocable Trust
Beginning Date: March 2, 2005
Ending Date: Perpetuity
Outstanding Rights: This easement grants the right of egress and ingress across and upon a certain portion of the property.

Type of Instrument: Easement, Easement No. 31093
Grantor: Trustees
Grantee: Gainesville Regional Utilities
Beginning Date: February 28, 2003
Ending Date: Perpetuity
Outstanding Rights: The easement will enable the grantee to construct, operate, and maintain

Type of Instrument: Easement, Easement No. 30841

Grantor: Trustees
Grantee: Warren Holland Tanton
Beginning Date: May 21, 2002
Ending Date: Perpetuity
Outstanding Rights: This non-excusive easement will enable the grantee to use a certain portion of Paynes Prairie Preserve State Park for private ingress, egress and utility.

Type of Instrument: Easement
Grantor: Trustees
Grantee: Bell South Communications, Inc.
Beginning Date: June 10, 1999
Ending Date: Perpetuity
Outstanding Rights: This non-exclusive easement grants to grantee the right to construct, operate and maintain a 2420-foot telephone cable over, under, upon and across a portion of Paynes Prairie Preserve State Park.

Type of Instrument: Easement
Instrument Holder: Trustees
Beginning Date: October 29, 1999
Ending Date: For a period coterminous with Lease No. 2515
Outstanding Rights: The easement allows the Clay Electric Cooperative, Inc. to operate electric distribution facilities across and under a portion of park property.

Type of Instrument: Warranty Deed
Grantor: Dorsey L. Spaulding
Grantee: Trustee
Beginning Date: February 9, 1999
Ending Date: Perpetual
Outstanding Right: This deed is subject to a perpetual non-exclusive easement for ingress, egress and for public utilities across a portion of the land subject to this deed.

Type of Instrument: Warranty Deed
Grantor: Philip A. Thomas
Grantee: Trustees
Beginning Date: January 19, 1999
Ending Date: Perpetuity
Outstanding Rights: The deed is subject to a perpetual non-exclusive easement for ingress and egress across a certain portion of the property.

Type of Instrument: Warranty Deed
Grantors: James C. Emerson et al
Grantee: Trustees
Beginning Date: November 24, 1998

Ending Date: Perpetuity
Outstanding Rights: The deed is subject to a perpetual easement for ingress and egress and public utilities recorded in O.R. book 2077, page 1373.

Type of Instrument: Quitclaim Deed
Grantors: Lee and Dori Lloyd
Grantee: Trustees
Beginning Date: October 13, 1998
Ending Date: Perpetuity
Outstanding Rights: The deed is subject to an easement for ingress, egress, and public utility purposes recorded in O.R. book 2077, page 1373.

Type of Easement: Quitclaim Deed
Grantor: Lee John Lloyd, Dori Emerson Lloyd
Beginning Date: October 13, 1998
Ending Date: Forever
Outstanding Rights: The deed is subject to an easement for ingress, egress, and public utility purposes recorded in O.R. book 2077, page 1373.

Type of Instrument: Non-Exclusive Perpetual Access Easement Agreement
Grantor: Trustees
Grantee: Emmer Development Corporation
Beginning Date: December 5, 1997
Ending Date: Perpetuity
Outstanding Rights: The easement grants the right to grant to use the easement area for pedestrian and vehicular ingress and egress to and from Grantee's property**.**

Type of Instrument: Warranty Deed
Grantor: Emmer Development Corporation
Grantee: Trustees
Beginning Date: November 24, 1997
Ending Date: Perpetuity
Outstanding Rights: The deed is subject to an easement granted to CoxCom, Inc. for cable television, recorded in O.R. Book 2141, Page 0878, of the Public Records of Alachua County, Florida.

Type of Instrument: Easement, Easement No. 29586
Grantor: Trustees
Grantee: Jeffrey Lyn Simmons
Beginning Date: August 28, 1995
Ending Date: August 27, 2045

Outstanding Rights: This easement non-exclusive easement allows the grantee to construct and maintain a driveway crossing, upon and across a certain portion of Paynes Prairie Preserve State Park.

Type of Instrument: Private Driveway Permit
Grantor:DRP
Grantee: Third Bethel Baptist Church
Beginning Date: May 26, 1994
Ending Date: Coterminous with the Term of Lease No. 2515
Outstanding Rights: The rails-to-trails permit allows Third Bethel Baptist Church to cross trail for use of private driveway crossing.

Type of Instrument: Warranty Deed
Grantor: Dollie Mae Newton
Grantee: Trustees
Beginning Date: April 15, 1993
Ending Date: Perpetual
Outstanding Rights: The deed is subject to a perpetual easement for ingress, egress, and public utilities recorded in O.R. book 1903, page 152.

Type of Instrument: Warranty Deed
Grantor: Susan C Rogers and et al.
Grantee: Trustees
Beginning Date: September 22, 1992
Ending Date: Perpetuity
Outstanding Rights: The deed is subject to a drainage easement to State of Florida recorded in O.R. book 329, page 192, Alachua County, Florida.

Type of Instrument: Warranty Deed
Grantor: Jack L. Warner, Marilyn P. Warner and Betty P. Woodruff
Grantee: Trustees
Beginning Date: June 16, 1992
Ending Date: Perpetuity
Outstanding Rights: The deed is subject to an easement to Florida Power Corporation recorded in Deed book 335, page 128, Alachua County, Florida.

Type of Instrument: Easement, Easement No. 28713
Grantor: Trustees
Grantee: Alachua County, Florida
Beginning Date: May 11, 1992
Ending Date:50 years from the beginning date.
Outstanding Rights: The easement grants the grantee the right to use a certain portion of Paynes Prairie Preserve State Park as a public right of way.

Addendum 2—Advisory Group Members and Report

<u>Local Government Representatives</u>
The Honorable Mike Byerly, Chair
Alachua County Board of County Commissioners
12 SE 1st Street
Gainesville, Florida 32601

The Honorable Ed Braddy, Mayor
City of Gainesville
200 E. University Avenue
Gainesville, Fl 32601

The Honorable Matthew Surrency, Mayor
City of Hawthorne
6700 SE 221st Street
Hawthorne, Florida 32640

The Honorable Richard Shutterly, Mayor
Town of Micanopy
706 NE Cholokka Blvd.
Micanopy, Florida 32667

<u>Agency Representatives</u>
Mr. Ken Hornby
Alachua Soil and Water Conservation District
3924 NW 29th Lane
Gainesville, Florida 32606

David Jowers, Park Manager
Paynes Prairie State Preserve
100 Savannah Blvd.
Micanopy, Florida 326667-9702

Doug Longshore
Florida Forest Service
7620 133rd Road
Live Oak, Florida 32060

Terry Doonan
Florida Fish and Wildlife Conservation Commission
North Central Region
3377 E. U.S. Highway 90
Lake City, Florida 32055-8795

J.B. Miller
Senior Land Resource Planner
Bureau of Real Estate Services
St. Johns River Water Management District
4049 Reid Street
Palatka, FL 32178

Mike Wisenbaker, Archaeology Supervisor
Bureau of Archaeological Research
Florida Division of Historical Resources
1001 DeSoto Park Drive
Tallahassee, Florida 32301

<u>Tourist Development Council Representative</u>
Roland Loog, Director
Alachua County Visitor and Convention Bureau
30 East University Boulevard
Gainesville, Florida 32601

<u>Environmental and Conservation Representatives</u>
Bob Simons
Alachua Audubon Society
1122 NW llth Avenue
Gainesville, FL 32601

Erin Condon, Executive Director
Florida Defenders of the Environment
4424 NW 13th Street Suite C8
Gainesville, Florida 32609

Tom Kay
Executive Director
Alachua Conservation Trust
7204 SE County Road 234
Gainesville, FL 32641

Recreational User Representative
Judy Trotta
Florida Trail Association
Florida Crackers Chapter
8123 SW 47th Road
Gainesville, FL 32608

Helen Koehler
The Goethe Trail, Inc.
1950 SE 111 Court
Morriston, FL 32668

Fairlie Bagley
Gainesville Cycling Club
5123 SW 94 Street
Gainesville, FL 32608

Citizen Support Organization Representative
James Perran Ross, Vice President
Friends of Paynes Prairie
1919 SW 63rd Avenue
Gainesville, FL 32608

Adjacent Landowner
Dominic Greco
2831 SW 70th Lane
Gainesville, FL 32608

The Paynes Prairie Preserve State Park Advisory Group meeting was held in the Training Center at the District 2 Office on July 16, 2013. Linda Demotropoulos represented Mayor Braddy; Mitchell Sapp represented Judy Trotta; Nancy Fischer represented Roland Loog. Mayor Surrency, Mike Wisenbaker, Erin Condon, and Dominic Greco were not able to attend. All other Advisory Group members were in attendance. Attending staff were Dan Pearson, Matt Bledsoe, Andrea Christman, Brian Fugate, Lew Scruggs, and David Copps.

Mr. Scruggs began the meeting by explaining the purpose of the Advisory Group and reviewing the meeting agenda. Mr. Scruggs then asked each member of the Advisory Group to express his or her comments on the draft plan.

Summary of Advisory Group Comments

Mitchell Sapp has no problems with the management of state parks. FTA is interested in all of the parks but he would like to see them better funded. He stated that prescribed burning should be a community effort and that hunting is an effective method for removing feral hogs.

Terry Doonan thinks the park is well managed and is impressed with the sheet flow restoration. He would like to see more specific hydrologic restoration actions stated in the plan. Staff explained that the Division prefers to address hydrologic restoration in a general manner in the unit management plan to provide more flexibility. Mr. Doonan suggested the development of a multi-agency workgroup to specifically address hydrologic issues in the park. He stated that FWC's Aquatic Resource Enhancement Section (ARES) may be a potential funding source for hydrology-related projects. Mr. Doonan asked how the park is reaching out to gain public support for burning the basin. Staff explained that the park hosts a day-long fire festival to promote burning and that the park is grooming a relationship with local media but the difficulty of smoke management and highway safety is a challenge. Staff also mentioned the transient nature of Gainesville's population as another challenge to developing sustained community support for prescribed fire. Mr. Doonan offered FWC support for fire education efforts. Mr. Doonan asked for clarification on the "clivus multrum" label on the base map on page 151. Staff explained that it refers to a type of restroom and agreed that the label should be changed to "restroom". Mr. Doonan asked why the parcel in inset 3 on the Optimum Boundary map (page 171) was designated as surplus as it is adjacent to lands that are in the optimum boundary. Staff explained that the parcel to the west of the parcel in question may be purchased by Alachua County and that the County asked the park to manage it. If this occurs, the parcel designated as surplus should be taken off the surplus list and the parcel to the west should be added to the optimum boundary. Mr. Doonan asked how the park defines "imperiled species" and why fox squirrel and black bear were the only mammals listed as imperiled in Table 4. Staff explained that the Division uses FWC, FDACS, and FNAI definitions and categories but that other species of concern can be added if necessary. A discussion about the round-tailed muskrat followed. Staff suggested that round-tailed muskrat can be discussed in the plan as a Tier 1 but that anything more would require FWC assistance. Mr. Doonan said that there are probably more butterflies that could be listed as imperiled. Staff replied that one of the District biologist is a lepidopterist and is working on expanding the list of butterflies. Mr. Doonan recommended that plan objectives for resource management should include more time-based actions.

Nancy Fischer explained that Visit Gainesville is funded through a tourist tax. She said that Visit Gainesville is proud of Paynes Prairie and loves to promote it. She used the University of Florida PREVIEW event as an example of how they get the word out to students and their parents about the park. Ms. Fischer stated that Visit Gainesville will gladly do what they can to promote Paynes Prairie and urged to park to call on them.

Mike Byerly stated that the Board of County Commissioners is supportive of the park and urged staff to request the County's help for projects such as the proposed improvements to the north entrance. He mentioned that the County is providing a paved bike lane along SE 15th Street and may be able to assist the park with improvements to the intersection at Camp Ranch Road. Commissioner Byerly suggested that resurfacing currently proposed for a 3.5 mile segment of the Gainesville to Hawthorne rail trail should be expanded to include the entire length of trail.

J.B. Miller stated that the Hydrology section is well written. He urged the park not to give up on efforts to burn in difficult places such as the area between the highways where smoke management is a critical concern. He mentioned that Saint Johns River Water Management District will help in burning efforts and urged the park to call on them for assistance. Mr. Miller would like to see some additional conservation lands mentioned on page 145 in the "Existing Use of Adjacent Land" section. Mr. Miller supports the protection of the round-tailed muskrat and would like to see monitoring of that species in the park. Mr. Miller likes the maintenance and improvement to existing facilities that are mentioned in the plan.

Ken Hornby stated that amount of money listed in the plan for feral hog control is too low. He recommended allocating more funding for this activity. Mr. Hornby stated that Paynes Prairie needs more inflow of water. He recommended that Saint John's Water Management District establish a minimum flow level for Newnan's Lake and re-evaluate the one-third allocation for Paynes Prairie.

Linda Demetropoulos stated that many partnerships and much education will be needed to accomplish the hydrologic restoration and burn goals stated in the plan. She said that the City of Gainesville is willing to participate on working groups to help the park accomplish both of those goals. Ms. Demetropoulos explained that the City has some acquisition funds available for conservation lands and they are looking for parcels in the urban reserve area. She said the City may be interested in the surplus parcel next to Bivens Arm as shown in inset 1 on the Optimum Boundary map. Ms. Demetropoulos stated that the City is interested in having Palm Point Park on Newnan's Lake included as a stop on the Prairie Creek paddling trail.

Doug Longshore asked if the clear cut areas delineated on the Natural Communities map will be reforested. Staff replied that these areas resulted from a southern pine beetle outbreak in 2000 and that most have been replanted.

Helen Koehler appreciates the proposed reconfiguration of the parking area at the Chacala Trailhead. She said that the 6 miles of equestrian trails in the park is not enough for most equestrians who prefer a minimum of 20 to 30 miles of trail. Ms. Koehler would like to see equestrian camping added as an activity in the Statewide Comprehensive Outdoor Recreation Plan (SCORP). She recommended that an equestrian destination be provided to Lochloosa by creating a trail link from the Gainesville to Hawthorn Trail. Ms. Koehler recommended that the park obtain RTP funding to make improvements to the rail trail.

James Perran Ross explained that the Citizen Support Organization is a valuable catalyst that enables the park to implement a variety of projects. Mr. Ross stated that the park is doing a pretty good job of balancing public access with resource protection. He stressed the need to continually educate the public, particularly opponents, about the management needs of the park so they will understand why tools such as fire and herbicides have to be used. Mr. Ross emphasized the need to address hydrology at the watershed level which will require coordinating and cooperating with multiple agencies. Mr. Ross is in agreement with adding the round-tailed muskrat to the imperiled species list and he suggested that volunteers be used as citizen scientist to conduct monitoring. Mr. Ross explained that Paynes Prairie provides unique, landscape scale phenomena which is a significant value that is just as important as listing imperiled species. He used the winter congregation of sandhill cranes as an example. Staff agreed that keeping common species common is a worthwhile goal but the listing of imperiled species is required. Mr. Ross agreed with the proposed upgrades to the visitor center.

Richard Shutterly said that the Town of Micanopy can be a partner in prescribed burning by making some fire vehicles (tanker truck and brush truck) available to the park. He said that the Town's comprehensive plan designates land adjacent to the park as low intensity use. Mayor Shutterly explained that the Micanopy would like for the park to designate the land between the bypass (Management Zone 1701) as surplus so they can acquire it to create a well-field.

Fairlie Bagley approved of the restroom proposed for the Hawthorne trailhead on the rail trail. She expressed concern about erosion and sediment buildup in certain locations along the rail trail. She would like to see some corrective actions implemented to correct this problem.

Tom Kay expressed approval of the plan and offered the services of Alachua Conservation Trust to help with future land acquisition projects. He said that ACT's land manager is available to help with vegetation management where necessary.

Bob Simon said that Alachua Audubon loves Paynes Prairie. He suggested that the park recruit Audubon volunteers to pull coral ardisia. Mr. Simon explained that Paynes Prairie is a prairie because of flooding and that natural systems management should restore the historic hydrology. He recommended that the water control structure just south of Alachua Sink be used to manipulate hydro-periods to bring back high water in the summer and winter. He acknowledged that FDOT doesn't like this idea because of potential flooding on Highway 441 but he urged the park to negotiate with them to work out an agreement. Concerning the use of fire to control woody vegetation, Mr. Simon suggested that the problem areas be burned more frequently, as often as every 1 to 2 years if necessary. Mr. Simon encouraged the park to use all of the vegetation management tools available including mowing and herbicides.

Mr. Byerly recommended that the plan should include a discussion about the possibility of using Gainesville Regional Utility (GRU) injected wastewater to supply water the western rim of the prairie. Staff noted that adding water on the western rim could increase flooding on Highway 441. Mr. Byerly reiterated that he thinks the plan should address this water source by explaining how and when the treated wastewater might be used. **Mr. Ross** recommended that the discussion of hydro-period explain the need for both high and low water periods. In response general discussion on feral hog control, **Mr. Simon** mentioned advancements that have been made in hog trapping by capturing whole groups of animals and advancing across the landscape. He said that this landscape strategy is effective but it requires coordination with all surrounding landowners and agencies. **Mr. Ross** noted that there will always be a source of hogs infiltrating from surrounding areas. **Mr. Miller** said that reducing the numbers to a maintenance stage is a good accomplishment.

Summary of Written Comments

Mike Wisenbaker provided a written summary of recommendations from the Department of Historical Resources. The suggestions are summarized here and his email correspondence is attached.

There is a discrepancy with the numbers of recorded cultural sites. The park lists 136 sites on page two of the plan but DHR claims 139. Mr. Wisenbaker asked for suggestions from the park on how best to rectify this problem. On page six, it is recommended that the park add interpretation to the list of cultural resource management goals. Mr. Wisenbaker disagrees with the claim on page 100 that Cuscowilla was the first Seminole settlement in Florida and provided a quote from William Bartram as evidence of an earlier settlement. Mr. Wisenbaker provided a list of additional archaeological and historical surveys that the park may want to reference. He agrees with the actions listed on page 110 to deal with the looting problem. Mr.

Wisenbaker approves of efforts to locate Fort Crane as described on page 101 but recommended that more archival and historical research be conducted before pursuing subsurface testing which will require a permit from DHR.

Public Comments

Jim Connor recommended that the park should meet with stakeholders more frequently than once every ten years in order to foster good communication and good partnerships.

Staff Recommendations

The staff recommends approval of the proposed management plans for Paynes Prairie Preserve State Park as presented, with the following changes.

- Language was provided that acknowledges the widespread support that the park has from the City of Gainesville, Alachua County, and a host of agency partners on resource management issues affecting the park, particularly the use of prescribed fire.
- The need to control woody vegetation in the prairie basin with hydro-period manipulation and frequent prescribed fire was mentioned. The importance of both high and low water periods in hydro-period management was mentioned.
- The discussion of hydrological restoration was expanded to include activities at the watershed scale and improved coordination between stakeholders to address hydrological issues in the park.
- The need to establish a minimum flow level for Newnan's Lake and water allocation needs for Paynes Prairie were addressed.
- The Land Use Component was modified to include resurfacing of the entire 16 miles of the Gainesville to Hawthorne Trail (GHT). The need for corrective actions to control erosion and sedimentation on the GHT was mentioned.
- The support of Division of Recreation and Parks for the establishment of equestrian trails from the GHT to Lochloosa was mentioned.
- Language was provided stating that the park will explore the possibility of coordinating entrance improvements at SE 15th Street with Alachua County road improvements planned for that area.

Additional revisions were made throughout the document to address editorial corrections, consistency of spellings and notations, and other minor corrections.

Notes on Composition of the Advisory Group

Florida Statutes Chapter 259.032 Paragraph 10(b) establishes a requirement that all state land management plans for properties greater than 160 acres will be reviewed by an advisory group:

"Individual management plans required by s. 253.034(5), for parcels over 160 acres, shall be developed with input from an advisory group. Members of this advisory group shall include, at a minimum, representatives of the lead land managing agency, co-managing entities, local private property owners, the appropriate soil and water conservation district, a local conservation organization, and a local elected official."

Advisory groups that are composed in compliance with these requirements complete the review of State park management plans. Additional members may be appointed to the groups, such as a representative of the park's Citizen Support Organization (if one exists), representatives of the recreational activities that exist in or are planned for the park, or representatives of any agency with an ownership interest in the property. Special issues or conditions that require a broader representation for adequate review of the management plan may require the appointment of additional members. DRP's intent in making these appointments is to create a group that represents a balanced cross-section of the park's stakeholders. Decisions on appointments are made on a case-by-case basis by DRP staff.

Addendum 3--References Cited

Alachua County Environmental Protection Department (ACEPD) 2004. Gainesville Creeks: Storm event monitoring data 2003. Report for St. Johns River Water Management District Palatka, Florida. Contract Number SF672AA January 2004. 53pp.

Alachua County. 2011. Alachua County Comprehensive Plan 2008. Alachua County, Florida.

ACEPD 2007. Gainesville Creeks: A status report on baseflow water quality, stormwater and ecosystem health for the Orange Creek Basin 1998-2003. Report for St. Johns River Water Management District Palatka, Florida. June 2007. 43pp + Appendices.

ACEPD 2008. Fecal coliform bacteria, fluorescent whitening agents, bacteriological indicators, and microbial source tracking studies in Gainesville's urban creeks: Microbial "Hot Spots" June 2004 through August 2007. Report for St. Johns River Water Management District Palatka, Florida. May 2008. 111pp.

Anderson, L. C. 1997. *Sideroxylon alachuense*, a New Name for *Bumelia anomala* (Sapotaceae). Sida 17(3):565-567.

Austin, R. J. 1999. Technical Memorandum: Cultural Resources Assessment Survey of Improvements to State Road 20, Alachua County, Florida. Prepared for Florida Department of Transportation, State Project Number 26080-1522. Southeastern Archaeological Research, Inc. Gainesville, Florida.

Baker, H. 1993. Spanish Ranching and the Alachua Sink Site: A Preliminary Report. The Florida Anthropologist 46(2):82-100.

Beck, W. M. 1938. Notes on the Reptiles of Payne's Prairie, Alachua County, Florida. The Florida Naturalist, July, 1938.

Best, G.R., R.D. Peters Jr., R.E. Borer, and F.F. Gaines 1995. Preliminary assessment of options for management of Sweetwater Branch surface flow into Paynes Prairie, Alachua County, Florida. Center for Wetlands and Water Resources. Gainesville, Fla.: University of Florida. 88pp + Appendices

Blakney-Bailey, J.A. 2004. Paynes Town Seminole Project, Florida Department of State, Division of Historic Resources, Grants in-Aid Survey and Planning Grant, final Report. Oct 29, 2004.

Browning, W. D. and M. G. Wiedenfeld. 1988. Archaeological and Historical Resources Assessment Survey; Proposed Improvements to SR 20. Florida Department of Transportation, Tallahassee.

Bureau of Economic and Business Research (BEBR), Warrington College of Business Administration, University of Florida. 2011. Florida Statistical Abstract.

Burger, C., and W. Magley 2003. Total maximum daily load for fecal coliform bacteria for Sweetwater Branch, Alachua County, Florida WBID 2711. Tallahassee, Florida: Watershed Assessment Section, Florida Department of Environmental Protection. September 19, 2003. 20pp.

Carr, A.F. 1934. The plankton and carbondioxide-oxygen cycle in Lake Wauberg, Florida. Master of Science Thesis, University of Florida, Gainesville. 18pp.

Carr, A. 1964. Ulendo Travels of a Naturalist In and Out of Africa. Alfred A. Knopf, New York. 258pp.

City of Gainesville. 2010. City of Gainesville Comprehensive Plan 2008. Gainesville, Florida.

Clark, M. W. and W. F. DeBusk 2008. Florida's total maximum daily load program after seven years of implementation. University of Florida IFAS Extention, SL270. 3pp.

Clausen, C. J. 1964. The A-356 Site and the Florida Archaic: Unpublished Master's Thesis, University of Florida.

Cohen, M. J., S. Lamsal, L. V. Korhnak, and L. Long 2008. Spatial nutrient loading and sources of phosphorus in the Newnans Lake Watershed. St. Johns River Water Management District SJ2010-SP29. 105pp.

Collins, L. D., S. Fernandez, J. P. Du Vernay, K. A. Driscoll, and T. Doering. 2012. RP729 Archaeological Resource Sensitivity Modeling in Florida State Parks District 2: the Northeast Florida Region. University of South Florida Alliance for Integrated Spatial Technologies, Tampa, Florida. 565pp. +appendices.

Copeland, R., S. Upchurch, K. Summers, T. Janicki, P. Hansard, M. Paulic, G. Maddox, J. Silvanima, P. Craig 1999. Overview of the Florida Department of Environmental Protection's integrated water resource monitoring efforts and the design plan of the status network. Florida Department of Environmental Protection. 43pp.

Di, J. J., D. Smith, C. Lippincott, and E. Marzolf 2010. Pollutant load reduction goals for Newnans Lake. Technical publication SJ2010-1. St. Johns River Water Management District, Palatka Florida 67pp.

Ecology and Environmental Inc. 2008a. Site investigation report for the Paynes Prairie Preserve State Park High Barn cattle dip vat (AOC #1), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 219pp.

EEI 2008b. Site investigation report for the Paynes Prairie Preserve State Park Jackson's Gap cattle dip vat (AOC #2), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 197pp.

EEI 2008c. Site investigation report for the Paynes Prairie Preserve State Park West Side Area cattle dip vat (AOC #3), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 140pp.

EEI 2008d. Site investigation report for the Paynes Prairie Preserve State Park Bolen Bluff cattle dip vat (AOC #4), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 140pp.

EEI 2008e. Site investigation report for the Paynes Prairie Preserve State Park Former Dump (AOC #5), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 130pp.

EEI 2008f. Site investigation report for the Paynes Prairie Preserve State Park Former Unground Storage Tank Area (AOC #6), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 143pp.

EEI 2009a. Site investigation report for the Paynes Prairie Preserve State Park Former Horse barn cattle dip vat (AOC #7), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 147pp.

EEI 2009b. Site investigation report for the Paynes Prairie Preserve State Park Near District Shop cattle dip vat (AOC #8), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 238pp.

EEI 2009c. Site investigation report for the Paynes Prairie Preserve State Park Bison Pen cattle dip vat (AOC #9), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 264pp.

EEI 2009d. Site investigation report for the Paynes Prairie Preserve State Park Jacksons cattle dip vat #1 (AOC #10), Alachua Florida. Report to Florida Department of Environmental Protection Division of Waste Management, Tallahassee, Florida. 238pp.

Fernald E. A., and E. D. Purdum 1998. Water resources atlas of Florida. Florida State University, Institute of Science and Public Affairs.

Finch, G. 2000. Critter Crossings Linking Habitats and Reducing Roadkill. Publication No. FHWA-EP-00-004. U.S. Department of Transportation, Federal Highway Administration, Office of Natural Environment. 32pp.

Florida Department Environmental Protection (FDEP) 2001. Group 1 basin status report: Ocklawaha. FDEP, Division of Water Resource Management, November 2001. 315pp.

Florida Department of Environmental Protection. 2010. Florida State Park System Economic Impact Assessment for Fiscal Year 2010/2011. Tallahassee, Florida.

FDEP 2005. Elements of Florida's water monitoring and assessment program. Florida Department Environmental Protection, Tallahassee, Florida Technical Report 113pp.

FDEP 2008a. Florida Department Environmental Protection STORET database. Web-based water quality data database. http://storet.dep.state.fl.us/WrmSpa/

FDEP 2008b. Florida Department Environmental Protection Bureau of Laboratories. Ecosummary reports. http://www.floridadep.org/labs/cgi-bin/reports/search.asp

FDEP 2008c. 2007 Orange Creek Basin management action plan for Newnans Lake, Orange Lake, Lake Wauberg, Hogtown Creek, Sweetwater Branch, Tumbling Creek, and Alachua Sink. May 2008 Technical Report Orange Creek Basin Working Group and Florida Department Environmental Protection. 118pp.

FDEP 2010. Map Direct. Florida Department of Environmental Protection GIS web browser. http://www.dep.state.fl.us/gis/

FDEP 2011. Livestock Management Plan, Paynes Prairie Preserve State Park. FDEP, Division of Recreation and Parks, March 2011. 25pp. http://www.dep.state.fl.us/secretary/events/Paynes_Prairie_Livestock_Management_Plan_2011.pdf

Florida Fish and Wildlife Conservation Commission. 2011. Florida's

Wildlife Legacy Initiative: Florida's State Wildlife Action Plan. Tallahassee, Florida, USA.

FLEPPC 2009. Florida Exotic Pest Plant Council's 2009 List of Invasive Plant Species. Internet: http://www.fleppc.org/list/list.htm or *Wildland Weeds* Vol. 12(4):13-16. Fall 2009.

Florida Lakewatch 2004. Florida Lakewatch annual data summaries 2003. Department of Fisheries and Aquatic Sciences, University of Florida/Institute of Food and Agricultural Sciences, Gainesville Florida. http://lakewatch.ifas.ufl.edu/

Florida Natural Areas Inventory (FNAI). 2010. Guide to the natural communities of Florida: 2010 edition. Florida Natural Areas Inventory, Tallahassee, FL.

Gao, X., and D. Gilbert 2003. Final nutrient total maximum daily load for Newnans Lake, Alachua County, Florida. Tallahassee, Florida: Watershed Assessment Section, Florida Department of Environmental Protection. September 22, 2003. 78pp.

Gao, X., D. Gilbert, and W. Magley 2006. Final TMDL report: Nutrient TMDL for Alachua Sink WBID 2720A. Tallahassee, Florida: Watershed Assessment Section, Florida Department of Environmental Protection. April 4, 2006. 104pp.

Gerrell, P. R.1990. The Gainesville-Hawthorne Rails to Trails Survey. Bureau of Archaeological Research, Division of Historic Resources, Department of State, Tallahassee.

Goodman, B., R. Hutton, R. Roberts, A. Grippo 2006. Be careful what you ask for: A Florida example of TMDL development and implementation. Proceedings of the Water Environment Federation, Session 21, 2296-2315pp.

Grubbs, G. 2001. Development and adoption of nutrient criteria into water quality standards. Memorandum to water directors, Regions I – X, directors, state water programs, directors, Great Water Body Programs, directors, Authorized Tribal Water Quality Standards Programs, State and interstate water pollution control administrator. Development and adoption of nutrient criteria into water quality standards. United States Environmental Protection Agency, Office of Science and Technology, Washington, DC. 14 November 2001.

Grubbs, J. W. and C. A. Crandall. 2007. Exchanges of water between the Upper Floridan Aquifer and the Lower Suwannee and Lower Santa Fe Rivers, Florida. U.S. Geological Survey. Professional Paper 1656-C. 83pp.

Hand, J., J. Col and L. Lord 1996. 1996 Water quality assessment for the State of Florida. Technical appendix Northeast Florida. Bureau of Surface Water Management, Florida Department of Environmental Protection, 95pp.

Harper, F. (ed.) 1958. The Travels of William Bartram: Naturalist's Edition. Yale University Press, New Haven. 727pp.

Hoenstine, R. W. and E. Lane 1991. Environmental geology and hydrogeology of the Gainesville area, Florida. Special Publication No. 33, Florida Geological Survey, Tallahassee, Florida, 70pp.

Jones Edmunds & Associates (JEA) 2003. Sweetwater Branch watershed management plan. Final Report. Prepared for the City of Gainesville Public Works Department. December 2003.

JEA 2009. Hydrologic and hydraulic modeling report for the Sweetwater Branch/Paynes Prairie sheetflow restoration project. Report for Gainesville Regional Utilities. June 2009. 57pp.

JEA and WSI 2010. Sweetwater Branch/Paynes Prairie sheetflow restoration: Preliminary engineering report (PER). Report for Gainesville Regional Utilities and City of Gainesville Public Works Department. January 2010. 1048pp. + Appendices.

Kauffeld, C. 1957. Snakes and Snake Hunting. Hanover House, Garden City, N.Y. 266pp.

Kinnaman, S. L., J. F. Dixon 2009. Potentiometric surface of the upper Floridan aquifer in the St. Johns River Water Management District and vicinity, Florida, May 2009. Map prepared by United States Geological Survey for St. Johns River Water Management District.

Lasi, M. and J. Schuman. 1996. Orange Creek Basin Surface Water Management Plan. St. Johns River Water Management District, Palatka. 57pp.

Livingston, E. H. 2003. Florida’s rotating basin approach: Towards better integration, coordination, and cooperation. Bureau of Watershed Management, Florida Department of Environmental Protection. 18pp.

Llewellyn J.G. 2008. St. Johns River Water Management District: 2008 minimum flows and levels priority list and schedule. Letter from Florida department of Environmental Protection to Kirby Green, Executive Director, St. Johns River Water Management District. On file at District 2 Bureau of Parks. 6pp.

Mace, J. 1997. Minimum surfacewater levels determined for Lake Wauberg, Alachua County (Project # 01-43-5140-DIST-10900). Memorandum F.O.R. 94-1514, St. Johns River Water Management District, Palatka, Florida. 15pp.

Maddox G. L, J. M. Lloyd, T. M. Scott, S. B. Upchurch, and R. Copeland [Eds.] 1992. Florida's groundwater quality monitoring program: background geochemistry. Special publication No. 34 Florida Geological Survey. 118pp.

Mercer, J. W., J. Erickson, M. Slenska, and M. Brourman 2007. Potential cross contamination due to drilling in source areas. Report for the Koppers Industries Property, Cabot Carbon/Koppers Superfund Site, Gainesville, Florida. Prepared by Geotrans Inc. Sterling Virginia and Beazer East Inc. Pittsburgh, Pennsylvania. 22pp.

Milanich, J.T. 2006. Laboring in the Fields of the Lord, Spanish Missions and Southeastern Indians. Univ. Florida Press. 210 pp.

Mirti, T. 2001. Springflow assessment of White Sulphur Springs. Proceedings of the 2001 Georgia Water Resources Conference held March 2001. K. J. Hatcher (ed.) Institute of Ecology University of Georgia, Athens Georgia 4pp.

Mullins, S. 1976. Archeological Salvage Excavations in the Paynes Prairie State Preserve, Alachua County, Florida. Unpublished Master's Thesis, University of Florida.

Mullins, S. 1977. Archeological Survey in the Paynes Prairie State Preserve Alachua County, Florida. Unpublished Master's Thesis, University of Florida.

Neubauer, C. P., G. B. Hall, E. F. Lowe, C. P. Robison, R. B. Hupalo, L. W. Keenan 2008. Minimum Flows and levels method of the St. Johns River Water Management District, Florida, USA. Environmental Management, Volume 42, Number 6, 1101-1114pp.

Opper, S. C. 1982. The hydrogeology of Lake Wauberg and vicinity, Alachua County, Florida. Master's thesis, University of Florida.

Purdy, B. 1996. Archaeological Survey of Proposed Alternate By-Pass, Gainesville-Hawthorne State Trail. Archaeological Research Team, Gainesville.

Ramnarine, R. 2003. Predicting Phosphatic soil distribution in Alachua County, Florida. Master of Science Thesis, University of Florida, Gainesville. 86pp.

Riedinger-Whitmore, M. A., T. J. Whitmore, J. M. Smoak, M. Brenner, A. Moore, J. Curtis, and C. L. Schelske 2005. Cyanobacterial proliferation is a recent response to eutrophication in many Florida lakes: A paleolimnological assessment. Lake and Reservoir Management 21(4): pp 423-435.

Ritter, M. N. 1991. The Hydrogeology and Origin of Alachua Sink, Alachua County, Florida. Unpublished Master's Thesis, University of Florida.110pp.

Robison, C. P., G. B. Hall, C. Ware, and R. Hupalo 1997. Water management alternatives: Effects on lake levels and wetlands in the Orange Creek Basin. Special Publication SJ97-SP8. St. Johns River Water Management District, Palatka, Florida. 177pp + Appendices.

Rosenau, J. C., G. L. Faulkner, C. W. Hendry, and R. W. Hull, 1977. Springs of Florida. Geological Bulletin No. 31 (rev.), Florida Bureau of Geology, Tallahassee, Florida, 461pp.

Rostlund, E. 1960. The geographic range of the historic bison in the southeast. Annals Assoc. Amer. Geographers 50:395-407.

Scott, T. M. 1992. A geological overview of Florida. Florida Geological Survey, Tallahassee. Open File Report No. 50. 78 pp.

Scott, T. M., G. H. Means, R. P. Meegan, R. C. Means, S. B. Upchurch, R. E. Copeland, J. Jones, T. Roberts, and A. Willet 2004. Springs of Florida. Florida Geological Survey Bulletin No. 66. 377pp.

Shelly, Z., and W. Magley 2003a. Total maximum daily load for total and fecal coliform bacteria for Tumbling Creek, Alachua County, Florida. Tallahassee, Florida: Watershed Assessment Section, Florida Department of Environmental Protection. September 19, 2003. 17pp.

Shelly, Z., and W. Magley 2003b. Total maximum daily load for total coliform bacteria for Hatchet Creek, Alachua County, Florida WBID 2688. Tallahassee, Florida: Watershed Assessment Section, Florida Department of Environmental Protection. September 19, 2003. 18pp.

Shields, J., S. Jose, J. Freeman, M. Bunyan, G. Celis, D. Hagan, M. Morgan, E.C. Pieterson, and J. Zak 2011. Short-term impacts of laurel wilt on redbay (*Persea borbonia* [L.] Spreng.) in a mixed evergreen-deciduous forest in northern Florida. Journal of Forestry 109(2):82-88.

Silvanima, J., P. Hansard, D. Ouellette 2008. Florida Ground water quality: Monitoring network summary 1994-1997. Florida Department of Environmental Protection Online paper. http://tlhdwf2.dep.state.fl.us/ambient/triennial/default.htm

Snyder, H. E. 2007. Gopher tortoise (*Gopherus polyphemus*) population estimates on the south side of Paynes Prairie Preserve State Park, Florida. Florida Department of Environmental Protection, Division of Recreation and Parks. 11pp.

Southall, P. D. 1991. The Relationship Between Wildlife and Highways in the Paynes Prairie Basin. Lake City, Florida: Florida Department of Transportation, District 2. 31pp.

Southerland, J. K. 1994. Addendum to the Gainesville-Hawthorne Rails to Trails Survey. Florida Department of Transportation, Lake City.

St. John River Water Management District (SJRWMD) 2009. Chapter 40C-2, F.A.C.: Permitting of consumptive uses of water. St. Johns River Water Management District Palatka, Florida. 21pp.

SJRWMD 2010. Chapter 40C-8, F.A.C.: Minimum flows and levels. St. Johns River Water Management District Palatka, Florida. 12pp.

SJRWMD 2011. Hydrologic data. Online GIS data retrieval system. http://www.sjrwmd.com/toolsGISdata/index.html

Stokes, A. V. 1997. CRAs of the Plantation Professional Center, Alachua County, Florida. Southeastern Archaeological Research, Gainesville.

Thomas, B. P., E. Cummings, and W. H. Wittstruck. 1985. Soil Survey of Alachua County, Florida. U. S. Department of Agriculture, Soil Conservation Service.

Torres, J.M., M.F. Dickinson, and L.B. Wayne. 2009. Cultural Resources Survey and Assessment, Paynes Prairie Sheetflow Restoration Project, Alachua County, Florida. SouthArc, Inc.

Town of Micanopy. 2000. Town of Micanopy Comprehensive Plan 2008. Micanopy, Florida.

United States Department of the Army, 1971? Forts in Alachua County During the Second Seminole War. Office of the Chief of Military History.

United States Department of Commerce, Bureau of the Census. 2000. U.S. Census 2000

United States Department of Commerce, Bureau of the Census. 2010. U.S. Census 2010

United States Environmental Protection Agency. 1995. Watershed protection: A statewide approach. EPA 841-R-95-004. Office of Water, Washington, DC.

Water & Air Research Inc. 2004. Stream Bioreconnaisance data report Alachua County, Florida 2000-2003. Report for Alachua County environmental Protection Department, Gainesville, Florida. November 2004. 51pp.

Weisman, B. R. 1993. An Archaeological Assessment of the Cone Ranch and Warner Woodruff CARL Additions to the Paynes Prairie State Preserve. Florida Department of State, Division of Historical Resources, Bureau of Archaeological Research, Tallahassee.

Wetland Solutions Inc. (WSI) 2006a Effect of Main Street reclamation facility pretreatment alternatives on sizing of Sweetwater Branch off-line wetland. Report for City of Gainesville and FDEP, December 2006. 38pp.

WSI. 2006b Feasibility Analysis of Sweetwater Branch sheetflow restoration project at Paynes Prairie Preserve State Park, Alachua County, Florida. Report for City of Gainesville and FDEP, June 2006. 70pp.

Wheeler, R. J. 1998. Excavation of "Old Safe" Site. Florida Department of State, Division of Historical Resources, Bureau of Archaeological Research, CARL, Tallahassee.

White, L. D. no date. Ecosystem Analysis of Paynes Prairie. School of Forest Resources and Conservation Research Report No. 24. University of Florida, Florida Agricultural Experimental Station Project FY-1596.

Whitmore, T. J., and M. Brenner 2002. Paleolimnological characterization of pre-disturbance water quality conditions in EPA-defined Florida lake regions. Report for Florida department of Environmental Protection 77pp.

Wilson, L. D. and L. Porras. 1983. The Ecological Impact of Man on the South Florida Herpetofauna. Special Publication No. 9, University of Kansas Museum of Natural History. Lawrence, Kansas. 89pp.

Wu, T. S., A. Baniukiewicz, and D.K. Gilbert. 2003. Nutrient total maximum daily load for Lake Wauberg Outlet, Alachua County, Florida. Tallahassee, Florida: Watershed Assessment Section, Florida Department of Environmental Protection. September 19, 2003. 26pp.

Addendum 4—Soil Descriptions

(2B) Candler fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, excessively drained soil is in the deep, sandy uplands. Slopes are nearly smooth to convex. The areas are mostly irregular in shape and range from about 15 to 300 acres.

Typically, the surface layer is very dark grayish brown fine sand about 6 inches thick. The underlying layers are fine sand to a depth of 82 inches or more. The upper 10 inches is pale brown, the next 12 inches is light yellowish brown, the next 29 inches is yellow, the next 13 inches is very pale brown, and the lower 12 inches is very pale brown and has thin bands of brownish yellow loamy sand lamellae.

Included with this soil in mapping are small areas of Apopka, Arredondo, Chipley and Tavares soils. Also included are small areas of excessively drained soils that have a sandy texture to 80 inches or more. These excessively drained soils do not have thin bands of lamellae. A few areas of Candler soils that have slopes of 5 to 8 percent are included. Total included areas are about 15 percent or less.

This Candler soil has low available water capacity. Permeability is rapid. Natural fertility of the soil is low. Organic matter content of the surface layer is low to very low. Surface runoff is very slow. The water table is at a depth of more than 72 inches.

(2C) Candler fine sand, 5 to 8 percent slopes - This sloping, excessively drained soil is in small areas on sharp breaking slopes and in relatively large areas on long, narrow slopes. The deep, sandy soil is on uplands. The areas vary from about 10 to 125 acres.

Typically, the surface layer is grayish brown fine sand about 5 inches thick. The underlying layers are fine sand to a depth of 85 inches or more. The upper 57 inches is yellow, and the lower 23 inches is pale brown. The lower part has thin lamellae of yellowish brown loamy sand and some thin streaks of clean sand grains that are light gray in color.

Included with this soil in mapping are small areas of Apopka and Tavares soils. Also included are small areas of an excessively drained soil that has sandy texture to a depth of more than 80 inches and does not have thin lamellae streaks or bands. A few small spots of Candler soils which have slopes of 0 to 5 or 8 to 12 percent are included. Total included areas are about 12 percent or less.

In this Candler soil, the available water capacity is low. Permeability is rapid. Natural fertility is low, and organic matter content is usually very low. Surface runoff is slow. The water table is more than 72 inches below the surface.

(3B) Arredondo fine sand, 0 to 5 percent slopes - This nearly level to gently sloping, well-drained soil is in both small and large areas of uplands. Slopes are smooth to convex. The areas are irregular in shape and range from about 10 to 160 acres in size.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand to a depth of 49 inches. The upper 23 inches is yellowish brown, and the lower 18 inches is brownish yellow. The subsoil extends to a depth of 86 inches or more. The upper 5 inches is yellowish brown loamy sand; the next 10 inches is yellowish brown sandy clay loam, and the lower 22 inches is dark yellowish brown sandy clay and sandy clay loam.

Included with this soil in mapping are small depressional areas of soils that have a very dark gray or black surface layer 8 to 24 inches thick. This layer overlies gray sandy material. Also included are small areas of Fort Meade, Gainesville, Kendrick and Millhopper soils. A few areas of this soil include Arredondo soils that have 5 to 8 percent slopes. Some areas of this soil in the western part of the county have small spots of strongly acid to medium acid soil material 40 to 70 inches deep to calcareous limestone. Limestone boulders, fragments of limestone, and sinkholes are in some areas of this soil, mainly in the limestone plain sections of the western part of the county. Most of these boulders are siliceous. Total included areas are about 15 percent.

In this Arredondo soil, the available water capacity is low in the sandy surface and subsurface layers and low to medium in the loamy subsoil. Permeability is rapid in the surface and subsurface layers and moderately slow to moderate in the loamy subsoil. Natural fertility is low in the sandy surface and subsurface layers and medium in the finer textured subsoil. Organic matter content is low. The water table in this soil is at a depth of more than 72 inches. Surface runoff is slow.

(7B) Kanapaha sand, 0 to 5 percent slopes - This nearly level to gently sloping, poorly drained soil is in small to relatively large areas on uplands. Slopes are nearly smooth to slightly convex. The areas are irregular in shape and range from about 10 to 200 acres.

Typically, the surface layer is dark gray sand about 8 inches thick. The subsurface layer is sand about 36 inches thick. The upper 5 inches is light brownish gray, and the lower 31 inches is light gray. The subsoil is sandy clay loam to a depth of 80 inches or more. The upper 6 inches is light brownish gray, and the lower 30 inches is gray.

Included with this soil in mapping are small areas of Blichton, Bivans, Lochloosa, and Wacahoota soils. Also included are small areas of soils that are similar to the Kanapaha soils except that the weighted average is more than 35 percent clay in the upper 20 inches of the subsoil. Small areas of Kanapaha soils that have 5 to 8 percent slopes are included. Also included are about 20 acres along the Santa Fe River that are occasionally flooded. Total included areas are about 20 percent or less.

This Kanapaha soil has a water table that is less than I0 inches below the surface for 1 to 3 months during most years. Surface runoff is slow. The available water capacity is very low-to-low in the sandy surface and subsurface layers, and it is low to medium in the subsoil. Permeability is moderately rapid in the surface and subsurface layers and is slow to moderately slow in the subsoil. Natural fertility is low to medium. Organic matter content of the surface layer ranges from moderately low to moderate.

(8B) Millhopper sand, 0 to 5 percent slopes - This nearly level to gently sloping, moderately well drained soil is in small and large irregularly shaped areas on uplands and on slightly rolling knolls in the broad flatwoods. Slopes are mostly nearly smooth or convex. The areas are variable in size. They range from about 10 to 250 acres.

Typically, the surface layer is dark grayish brown sand about 9 inches thick. The subsurface layer is sand or fine sand about 49 inches thick. The upper 17 inches is yellowish brown, the next 22 inches is light yellowish brown and the lower 10 inches is very pale brown. The subsoil extends to a depth of 89 inches. The upper 6 inches is yellowish brown loamy sand that has grayish and brownish mottles; the next 22 inches is light gray, mottled sandy clay loam; and the lower 3 inches is light gray, mottled sandy loam.

Included with this soil in mapping are small areas of Arredondo, Bonneau, Fort Meade, Gainesville, Kanapaha, Lochloosa and Sparr soils. Siliceous limestone boulders and small sinks are within some delineation. Small areas of Millhopper soils that have 5 to 8 percent slopes are also included. About 25 acres mapped as this Millhopper soil along the Santa Fe River is occasionally flooded. Total included areas are about 20 percent or less.

This Millhopper soil has a water table that is at a depth of 40 to 60 inches for 1 to 4 months and at a depth of 60 to 72 inches for 2 to 4 months during most years. The available water capacity is low in the surface and subsurface layers and is low to medium in the subsoil. Permeability is rapid in the surface and subsurface layers, moderately rapid in the upper 6 inches of the subsoil, and slow to moderately slow below this depth. Natural fertility is low. Organic matter content is low to moderately low.

(8C) Millhopper sand, 5 to 8 percent slopes - This sloping, moderately well drained soil is in small areas on narrow breaks and on long slopes of rolling uplands. These areas are mostly irregular or elongated and range from about 10 to 40 acres.

Typically, the surface layer is dark grayish brown sand about 7 inches thick. The subsurface layer is sand about 47 inches thick. The upper 37 inches is yellowish brown, and the lower 10 inches is pale brown. Mottles of brown and yellow range from none to common. The subsoil extends to a depth of 80 inches or more. The upper 6 inches is yellowish brown sandy loam that has light gray and strong brown mottles, and the lower 22 inches is light gray sandy clay loam that has gray, strong brown, and very pale brown mottles.

Included with this soil in mapping are small areas of a soil which is similar to this Millhopper soil but which has loamy sand surface and subsurface layers. Small areas of Apopka, Arredondo, Gainesville, Kanapaha and Lochloosa soils are included. Small areas of Millhopper soils that have 0 to 5 percent slopes are also included. Total included areas are about 20 percent or less.

This Millhopper soil has a water table that is at a depth of 40 to 60 inches for 1 to 2 months and at a depth of 60 to 72 inches for 2 to 3 months during most years. The available water capacity is low in the surface and subsurface layers, and it is low to medium in the subsoil. Permeability is rapid in the surface and subsurface layers. It is moderate in the upper part of the subsoil and slow to moderately slow in the lower part. The natural soil fertility and the organic matter content are low.

(14) Pomona sand - This nearly level, poorly drained soil is in small and large areas in the flatwoods. Slopes are nearly smooth and range from zero to 2 percent. The areas are irregular in shape and range from about 10 to 350 acres.

Typically, the surface layer is very dark gray sand about 5 inches thick. The subsurface layer is sand to a depth of 16 inches. The upper 4 inches is gray, and the lower 7 inches is light gray. The upper 4 inches of the subsoil is very dark gray sand in which many sand grains are coated with organic material, and the next 4 inches is dark reddish brown sand. The next 8 inches is pale brown sand that has mottles, and the lower 11 inches is very pale brown sand. Below this, loamy subsoil extends to a depth of 69 inches. The upper 4 inches is light gray fine sandy loam, and the lower 22 inches is gray, mottled sandy clay loam. Between depths of 69 and 84 inches, the underlying material is light gray, mottled fine sandy loam.

Included with this soil in mapping are small areas of soils which are similar to Pomona soils but which have a brown, organically stained layer. Many of the sand grains are uncoated. Also included are small areas of soils which are similar to this Pomona soil but which have weakly cemented layers at a depth of 30 to 50 inches. Small areas of Myakka, Newnan, Pelham, Sparr and Wauchula soils are in some areas. About 60 acres mapped as Pomona soil along the Santa Fe River is occasionally flooded. Total included areas are about 20 percent.

In this Pomona soil, the water table is within 10 inches of the surface for 1 to 3 months during most years. During dry seasons, the water table recedes to a depth of more than 40 inches. Surface runoff is slow. The available water capacity is low to medium in the surface and subsurface layers, and it ranges from low to high in the subsoil. Permeability is rapid to very rapid in the surface and subsurface layers, moderate to rapid in the upper part of the subsoil, and moderately slow to moderate in the lower part.

(15) Pompano sand - This nearly level poorly drained soil is on poorly defined flats in the broad flatwoods and in shallow depressions in the sandy, rolling uplands. Slopes are nearly smooth on the broad flats and are slightly concave in the shallow depressions. They range form 0 to 2 percent. The shape of the areas is variable. They are usually relatively small in size and range from about 10 to 45 acres.

Typically, the surface layer is very dark gray sand about 5 inches thick. The underlying layers are sand to a depth of depth of 82 inches or more. The upper 20 inches is light brownish gray and has pale brown mottles, the next 45 inches is gray and has mottles, and the lower 12 inches is gray and has no mottles.

Included with this soil in mapping are a few small areas of soils that have a black or very dark gray, sandy surface layer 6 to 10 inches thick. In a few areas are small inclusions of Chipley, Placid, Plummer and Myakka soils. A few small areas of Pompano soils have 2 to 5 percent slopes. About 250 acres mapped as Pompano soil adjacent to the Santa Fe River along the northern boundary of the county is occasionally flooded for periods of about 1 to 3 weeks. Total included areas are about 15 percent or less.

This Pompano soil has a water table that is less than 10 inches from the surface for 2 to 6 months during most years. Surface runoff is slow. The available water capacity is very low. Permeability is very rapid. The natural fertility is low. Organic matter content of the surface layer is moderately low to moderate.

(16) Surrency sand - This nearly level, very poorly drained soil is in ponds and depressional areas in the broad flatwoods and in areas of wet prairie on uplands. Slopes are less than 1 percent. The areas are relatively small and range from about 10 to 40 acres.

Typically, the surface layer is black sand about 15 inches thick. The subsurface layer is light gray sand to a depth of 28 inches. Between 28 and 80 inches, the subsoil is sandy clay loam. The upper 27 inches is gray, and the lower 25 inches is light gray.

Included with this soil in mapping are small areas of Monteocha, Pomona, Samsula and Wauberg soils. Also included are small areas of soils that have a 10- to 24- inch, black or very dark gray sand or loamy sand surface layer over gray sandy clay loam subsoil. In some delineation are small areas of soils which are similar to this Surrency soil but which have 3 to 10 inches of well-decomposed organic material covering the surface. In some small areas, the subsoil decreases in clay content by 20 percent or more at a depth of about 55 to 60 inches. Total included areas are about 20 percent or less.

This Surrency soil has a water table that is within 10 inches of the surface for about 6 months or more during most years. Water is on the surface for 4 months or more. The available water capacity ranges from low to high in the surface and subsurface layers and from low to medium in the subsoil. Permeability is moderately rapid-to-rapid in the sandy surface and subsurface layers and slow to moderately slow in the loamy subsoil. Natural fertility is medium in the surface layer and is low in the subsurface layer and the subsoil. Organic matter content is high to very high in the surface layer.

(17) Wauchula sand - This nearly level, poorly drained soil is in broad areas of the flatwoods. Slopes are nearly smooth and range from 0 to 2 percent. This soil is in small and large, irregularly shaped or meandering areas that range from about 20 to 800 acres.

Typically, the surface layer is sand about 8 inches thick. The upper 5 inches is black, and the lower 3 inches is dark gray. The subsurface layer is light brownish gray sand about 6 inches thick. The upper part of the subsoil is 4 inches of dark reddish brown loamy sand, in which many sand grains have an organic coating, and 5 inches of dark brown sand. Below this is a leached layer of pale brown, mottled fine sand about 5 inches thick. The lower part of the subsoil is a loamy layer that extends to a depth of 62 inches. The upper 9 inches is gray, mottled fine sandy loam; the next 19 inches is light brownish gray, mottled loamy sand; and the lower 6 inches is light gray, mottled fine sandy loam. Between depths of 62 and 80 inches, the underlying material is light gray, mottled sandy clay loam.

Included with this soil in mapping are small areas of Mulat, Newnan, Pelham, Pomona, Riviera and Sparr soils. Also included are small areas of poorly drained soils that have a brownish stain in the subsurface layer. The sand grains are uncoated or only thinly coated. Total included areas are 15 percent or less.

The Wauchula soil has a water table that is at a depth of less than 10 inches for 1 to 4 months and is at a depth of 10 to 40 inches for about 6 months. During driest seasons, the water table recedes to a depth of more than 40 inches. The available water capacity is low to medium in the surface layer, very low to low in the subsurface layer, low to high in the upper part of the subsoil, and medium to high in the lower part. Permeability is moderately rapid-to-rapid in the surface and subsurface layers, moderate to moderately rapid in the upper part of the subsoil, and slow to moderately slow in the lower part. Natural fertility is low in the sandy surface and subsurface layers and low to medium in the subsoil. Organic matter content is low.

(19) Monteocha loamy sand - This nearly level, very poorly drained soil is in wet ponds and shallow depressional areas in the flatwoods. Slopes are less than 2 percent. It is in relatively small areas that range from about 8 to 35 acres.

Typically, the surface layer is black loamy sand about 12 inches thick. The subsurface layer is light brownish gray sand to a depth of 18 inches. The upper part of the subsoil is brown sand to a depth of 48 inches. Below this, a subsoil of fine sandy loam extends to a depth of 85 inches. The upper 11 inches is grayish brown, and the lower 26 inches is light brownish gray. Between 85 and 94 inches, the underlying material is light gray sand.

Included with this soil in mapping are small areas of Placid, Samsula and Surrency soils. Included are soils that have characteristics which are similar to Monteocha soils but which have the dark brown subsoil layer below a depth of 30 inches. In the center of some mapped areas, there is a thin 1- to 5-inch covering of well-decomposed organic material on the surface. Total included areas are 20 percent or less.

This Monteocha soil has a water table that is within 10 inches of the surface for more than 6 months during most years. Most areas are covered with water for more than 4 months. Available water capacity is high to very high in the surface layer and medium in the subsurface layer and subsoil. Permeability is rapid in the surface layer, moderately rapid to rapid in the subsurface layer and upper part of the subsoil, and moderately slow to moderate in the lower part. Natural fertility is medium in the surface layer and low in the subsurface layer and subsoil. Organic matter content is high to very high in the surface layer.

(20) Tavares sand, 0 to 5 percent slopes - This is a nearly level to gently sloping, moderately well drained soil. This soil is deep and sandy. It is on slightly convex slopes in broad areas of the flatwoods and along gentle slopes of the rolling uplands. The areas are mainly irregular in shape and range from about 10 to 125 acres

Typically, the surface layer is dark gray sand about 8 inches thick. The underlying layers are sand to a depth of 80 inches or more. The upper 11 inches is pale brown, the next 17 inches is very pale brown, and the lower 44 inches is very pale brown or white and has mottles.

Included with this soil in mapping are small areas of Tavares soils that have 5 to 8 percent slopes. Also included are small areas of Chipley, Candler, Apopka, Pompano and Zolfo soils. About 120 acres of this soil mapped along the Santa Fe River is occasionally flooded. Total included areas are about 15 percent.

In this Tavares soil, the water table is at a depth of 40 to 72 inches for a cumulative period of 6 months or more during most years. It recedes to more than 72 inches below the surface during droughty periods. Surface runoff is slow. The available water capacity is very low-to-low. Permeability is rapid to very rapid. Natural fertility is low, and organic matter content is low to moderate in the surface layer.

(21) Newnan sand - This nearly level, somewhat poorly drained soil is in small to relatively large areas in the flatwoods. Slopes are nearly level to slightly convex and range from 0 to 2 percent. The areas generally range from about 10 to 250 acres.

Typically, the surface layer is dark gray sand about 5 inches thick. The subsurface layer is light brownish gray sand to a depth of 12 inches. The upper part of the subsoil is 4 inches of dark brown sand, in which the sand grains are well coated with organic material, and 4 inches of dark brown sand, that is mottled. Below this is a leached layer of light gray to white sand to a depth of 56 inches. The lower part of the subsoil is loamy, light gray, and mottled. The upper 3 inches is loamy sand, the next 16 inches is fine sandy loam and the lower 7 inches is sandy clay loam.

Included with this soil in some areas are Mulat, Pomona, Sparr and Wauchula soils. In some areas are soils that have characteristics similar to Newnan soils except that they have a brown, organically stained layer directly below the surface layer or have only 1 to 3 inches of leached, light gray or white material between the surface layer and the stained layer. About 65 acres mapped as Newnan soil is within the flood plain of the Santa Fe River and is occasionally flooded. Total included areas are about 20 percent or less.

This Newnan soil has a water table that is at a depth of 18 to 30 inches for 1 to 2 months during most years and at a depth of 30 to 60 inches for 2 to 5 months. During drier periods, it is at a depth of more than 60 inches. The available water capacity is very low-to-low to a depth of about 12 inches and low to medium from 12 to 82 inches. Permeability is rapid to a depth of about 12 inches, moderately rapid to rapid from 12 to 16 inches, rapid from 16 to 56 inches, moderately rapid from 56 to 59 inches, and slow to moderately slow from 59 to 82 inches. Natural fertility is low in the sandy upper 56 inches and medium in the loamy subsoil below. Organic matter content is moderately low.

(22) Floridana sand, depressional - This nearly level, very poorly drained soil is in seasonally ponded, depressional areas and swamps. Slopes are less than 2 percent. The areas are variable in shape and range from about 15 to 75 acres.

Typically, the surface layer is black sand about 14 inches thick. The subsurface layer is gray sand to a depth of 30 inches. The subsoil extends to a depth of 65 inches. It is gray sandy clay loam. Between depths of 65 and 74 inches, the underlying material is light gray sandy loam.

Included with this soil in mapping are small areas of Riviera and Wauchula soils. Also included are some small areas of soils, which are similar to the Floridana soils except that the loamy subsoil is at a depth of 40 to 80 inches. In the center of some depressions are small areas where the surface is covered with 3 to 8 inches of organic material.

About 80 acres mapped, as Floridana soil along the Santa Fe River is occasionally flooded. Total included areas are less than 20 percent.

This depressional Floridana soil has water standing on, the surface for about 6 months or more during most years. For much of the year, the water table is less than 10 inches below the surface. Available water capacity is medium to a depth of about 14 inches, low from 14 to about 30 inches, and medium below 30 inches. Permeability is rapid to 30 inches and slow between 30 to 74 inches. Natural fertility and organic matter content are high to about 14 inches and low below this depth.

(23) Mulat sand - This nearly level, poorly drained soil is in broad areas of the flatwoods. Slopes are nearly smooth to slightly concave and range from 0 to 2 percent. The soil usually is in irregularly shaped small areas and ranges from about 15 to 60 acres.

Typically, the surface layer is sand about 8 inches thick. The upper 5 inches is very dark gray, and the lower 3 inches is dark gray. The subsurface layer is grayish brown to light gray sand to a depth of 26 inches. The subsoil extends to a depth of 54 inches and is gray. The upper 4 inches is loamy sand, the next 17 inches is fine sandy loam and the lower 7 inches is loamy sand. Between depths of 54 and 80 inches, the underlying material is light gray loamy sand.

Included with this soil in mapping are small areas of Pelham, Plummer, Pomona and Wauchula soils. Also included are a few small areas of soils which are similar to the Mulat soil but which have a loamy sand surface layer. Total included areas are about 20 percent or less.

This Mulat soil has a water table that is at a depth of 10 inches for 2 to 4 months and at a depth of 10 to 30 inches for about 2 to 4 months during most years. During drier seasons, the water table recedes to a depth of more than 30 inches. Surface runoff is slow. The available water capacity is low to medium. Permeability is moderately rapid-to-rapid in the surface and subsurface layers and slow to moderately slow in the subsoil. Permeability is moderately rapid-to-rapid in the underlying material. Natural fertility is low, and organic matter content of the surface layer ranges from moderate to moderately low.

(25) Pomona sand, depressional - This nearly level, very poorly drained soil is in shallow depressional areas and along narrow drainageways in the flatwoods. Slopes are nearly smooth or slightly concave and range from 0 to 2 percent. These areas are relatively small and irregularly shaped or elongated. They range from about 10 to 35 acres.

Typically, the surface layer is very dark gray sand about 4 inches thick. The subsurface layer is light gray sand to a depth of 25 inches. The upper part of the subsoil is dark brown sand to a depth of 32 inches; many of the sand grains are coated with organic material. The next layer is grayish brown sand to a depth of 52 inches. Below this, the lower part of the subsoil is gray sandy loam to a depth of 73 inches. Between depths of 73 and 80 inches, the underlying material is gray sandy loam and loamy sand.

Included with this soil in mapping are small areas of Monteocha, Plummer, Pompano and Surrency soils. Total included areas are about 15 percent.

In this Pomona soil, the water table is less than 10 inches below the surface for about 6 months or more. Water is on the surface for about 4 months or more during most years. The available water capacity is low in the surface and subsurface layers and low to high in the subsoil. Permeability is rapid to very rapid in the surface and subsurface layers, moderate to rapid in the upper part of the subsoil, and moderately slow to moderate in the lower part. Natural fertility is low. Organic matter content in the surface layer is moderately low.

(26) Samsula muck – This nearly level, very poorly drained organic soil is in large and small swamps, marshes and ponded areas in the broad flatwoods. Slopes are usually slightly concave and range from 0 to 1 percent. Areas are either circular, irregular in shape, or elongated. They are both large and small in size and range for about 20 to 300 acres. Typically, the surface layer is muck about 35 inches thick. The upper 8 inches is very dark brown, and the lower 27 inches is very dark gray. Between depths of 35 and 75 inches, the underlying layer is sand. The upper 7 inches is dark gray, the next 11 inches is light brownish gray and the lower 17 inches is light gray.

Included with this soil in mapping are small areas of Monteocha, Okeechobee, Plaid, Surrency and Terra Ceia soils. A few areas have small inclusions of soils that have organic material 40 to 60 inces thick over sandy or loamy material. Total included areas are about 20 percent or less.

The Samsula soil has water at or on the surface for more than 6 months during most years. The water table is within 10 inches of the surface for most of the remainder of the year, except during long, extended dry periods. The available water capacity is very high in the organic layer. It is very low in the underlying sandy layer. Permeability is rapid. Natural fertility is medium. Organic matter content in the surface layer is very high.

(28) Chipley sand - This nearly level, somewhat poorly drained soil is in relatively small areas of the broad flatwoods and in both small and large areas on the transition between the broad flatwoods and rolling uplands. Slopes are nearly level to slightly concave and range from 0 to 2 percent. The areas are irregular in shape and range from about 15 to 150 acres.

Typically, the surface layer is sand about 12 inches thick. The upper 6 inches is very dark gray, and the lower 6 inches is dark grayish brown. The underlying layers are sand to a depth of more than 81 inches. In sequence from the top, the upper 13 inches is grayish brown; the next 24 inches is light gray and has yellowish red mottles; and the lower 32 inches is light gray but has no mottles.

Included with this soil in mapping are small areas of Myakka, Pompano, Tavares and Zolfo soils. Also included are a few small areas of somewhat poorly drained and poorly drained soils that have a very dark gray surface layer 10 to 16 inches thick over a grayish underlying layer. The underlying layer is sandy to a depth of 80 inches or more and has less than 5 percent silt and clay in the control section. About 15 acres mapped, as Chipley soil along the Santa Fe River is occasionally flooded. Total included areas are about 15 percent.

This Chipley soil has a water table that is 20 to 40 inches below the surface for 2 to 4 months during most years. During extremely wet seasons, the water table rises to a depth of 15 to 20 inches for brief periods of less than 2 weeks. It recedes to a depth of more than 40 inches during dry periods. Surface runoff is slow. The available water capacity is low, and the permeability is rapid to a depth of more than 80 inches. Natural fertility is low, and organic matter content is moderate to moderately low in the-surface layer.

(29B) Lochloosa fine sand, 2 to 5 percent slopes - This gently sloping, somewhat poorly drained soil is in small and large areas on the rolling uplands. Slopes are slightly convex. The areas are irregular in shape and range from about 10 to 100 acres.

Typically, the surface layer is dark gray fine sand about 7 inches thick. The subsurface layer is yellowish brown loamy sand or sand to a depth of 31 inches. It has light gray and yellowish brown mottles below a depth of 21 inches. The subsoil extends to 76 inches. The upper 4 inches is dark gray, mottled fine sandy loam; the next 19 inches is gray sandy loam; and the lower 22 inches is gray sandy clay loam. Between depths of 76 and 83 inches, the underlying material mixed light gray and greenish gray sandy clay loam.

Included with this soil are small areas of Blichton, Bonneau, Kendrick, Micanopy and Millhopper soils. Also included in some delineation are small areas of soils that are similar to Lochloosa soils except that the clay content of the subsoil decreases by more than 20 percent of its maximum within a depth of 60 inches. Also included are small areas of soils that are similar to Lochloosa soils but have 5 to 20 percent weathered fragments in the subsoil. The rock fragments are 2 to 76 millimeters in diameter. A few areas have small inclusions of Lochloosa soils that have 5 to 8 percent slopes. Siliceous limestone boulders and sinkholes are in some areas. Total included areas are about 15 percent.

This Lochloosa soil has a water table that is about 30 to 40 inches below the surface for 1 to 4 months during most years. The water table rises to a depth of 20 to 30 inches for 1 to 3 weeks. Surface runoff is slow. The available water capacity is low to medium in the sandy surface and subsurface layers and medium in the subsoil. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow in the lower part. Natural fertility in the sandy surface and subsurface layers and low to medium in the loamy subsoil. Organic matter content is low to moderately low in the surface layer.

(29C) Lochloosa fine sand, 5 to 8 percent slopes - This sloping, somewhat poorly drained soil is in relative small areas on sharp breaking slopes and along long, narrow slopes of the upland. The areas are mostly irregular or elongated in shape and range from about 10 to 50 acres.

Typically, the surface layer is grayish brown fine sand about 5 inches thick. The subsurface layer is light yellowish brown, mottled fine sand to a depth of 25 inches. The subsoil extends to a depth of 67 inches. The upper 5 inches is yellowish brown, mottled sandy loam; the next 5 inches is mottled light yellowish brown and gray sandy clay loam; and the lower 32 inches is gray, mottled sandy clay loam. Between depths of 67 to 80 inches, the underlying material is gray, mottled sandy clay and fine pockets of sandy loam and sandy clay loam.

Included with this soil are small areas of Blichton, Kendrick, Micanopy and Norfolk soils. Also included are small areas of soils that are similar to Lochloosa soils in drainage and texture but have subsoil less than 20 inches below the surface. Small areas of Lochloosa soils that have 2 to 5 percent slopes are included. Small moderately eroded spots are in some areas. Rock outcrops and sinkholes are in some areas. Total included areas are about 20 percent.

This Lochloosa soil has a water table that is about 30 to 40 inches below the surface for 1 to 3 months during most years. The water table may be at a depth of 20 to 30 inches for 1 to 3 weeks. Wetness is caused by hillside seepage. Surface runoff is medium on this soil. The available water capacity is low in the sandy surface layer and medium in the subsoil. Permeability is rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow in the lower part. Natural fertility is low in the sandy surface and subsurface layers and low to medium in the loamy subsoil. Organic matter content is low in the surface layer.

(3OB) Kendrick sand, 2 to 5 percent slopes - This gently sloping, well-drained soil is in both small and large areas on the gently rolling uplands. These areas are mostly irregularly shaped or elongated and range from about 20 to 200 acres.

Typically, the surface layer is dark grayish brown sand about 9 inches thick. The subsurface layer is yellowish brown loamy sand to a depth of 26 inches. The subsoil extends to a depth of 90 inches or more. The upper 5 inches is yellowish brown fine sandy loam; the next 20 inches is dark yellowish brown, mottled sandy clay loam; the next 22 inches is dark yellowish brown sandy clay loam; the next 10 inches is yellowish brown, mottled fine sandy loam; and the lower 7 inches is yellowish brown sandy clay loam.

Included with this soil in mapping are some small areas of soils that have similar characteristics to the Kendrick soils except that they have loamy sand surface and subsurface layers less than 20 inches thick over sandy clay loam subsoil. Small areas of soils that are similar to the Kendrick soils but have fine sand surface and subsurface layers or have subsoil that is sandy clay throughout are included. Also included are small areas of Arredondo, Blichton, Bonneau, Lochloosa and Norfolk soils. A few areas of Kendrick soils have 0 to 2 percent slopes or 5 to 8 percent slopes. Small moderately eroded spots are in a few areas. Sinkholes and limestone boulders are in some areas. Total included areas are about 15 percent.

In this Kendrick soil, the available water capacity is low in the surface and subsurface layers, medium in the upper 5 inches of the subsoil and medium to high below this depth. Permeability is rapid in the surface and subsurface layers. Permeability is moderate to moderately rapid in the upper 5 inches of the subsoil, moderately slow to moderate in the next 42 inches, and slow in the lower 17 inches. Natural fertility is low in the sandy surface layer and medium in the loamy subsoil. Organic matter content is low to moderately low in the surface layer. The water table is more than 72 inches below the surface. Surface runoff is moderately slow.

(3OC) Kendrick sand, 5 to 8 percent slopes - This sloping, well-drained soil is usually in elongated areas on long slopes of uplands. The areas are small to relatively large and range from about 10 to 125 acres.

Typically, the surface layer is grayish brown sand about 6 inches thick. The subsurface layer is yellowish brown sand to a depth of 24 inches. The subsoil extends to a depth of 76 inches or more. The upper 5 inches of the subsoil is yellowish brown, mottled sandy loam; the next 27 inches is strong brown sandy clay loam; and the lower 20 inches is yellowish brown, mottled sandy clay loam.

Included with this soil are small areas of soils that are similar to Kendrick soils but have a brownish yellow or yellowish brown loamy subsoil less than 20 inches below the surface or have fine sand surface and subsurface layers. Also included are a few areas of soils that are sandy clay at a depth of 20 to 40 inches. Small areas of Arredondo, Blichton, Gainesville and Lochloosa soils are in some areas. A few areas of Kendrick soils have 2 to 5 percent slopes or 8 to 12 percent slopes. Small moderately eroded spots are included in some areas. Limestone boulders and sinkholes are in some areas and are shown by appropriate symbols. Total included areas are about 20 percent.

In this Kendrick soil, the available water capacity is low in the sandy surface and subsurface layers and medium to high in the subsoil. Permeability is rapid in the sandy surface and subsurface layers, moderate in the upper part of the subsoil, and slow to moderately slow in the lower part. Natural fertility is low in the sandy layers and medium in the loamy subsoil. Organic matter content is low. The water table is more than 72 inches below the surface. Surface runoff is medium.

(31B) Blichton sand, 2 to 5 percent slopes - This gently sloping, poorly drained soil is on gently rolling uplands. Slopes are slightly convex. The areas are mostly irregular in shape and elongated and range from about 10 to 40 acres.

Typically, the surface layer is dark grayish brown sand about 6 inches thick. It is about 3 percent nodules of ironstone and fragments and nodules of phosphatic limestone. The subsurface layer extends to a depth of 28 inches. The upper 7 inches is grayish brown sand, and it has about 2 percent nodules of ironstone and fragments of phosphatic limestone. The next 15 inches is light brownish gray loamy sand. The subsoil extends to a depth of 80 inches or more. The upper 6 inches is dark gray sandy clay loam and are about 4 percent nodules of ironstone and fragments of phosphatic limestone. The next 28 inches is dark gray sandy clay loam that is about 10 percent plinthite and about 3 percent nodules of ironstone and weathered phosphatic limestone. The lower 18 inches is gray sandy clay loam that has dark reddish brown mottles.

Included with this soil in mapping are small areas of Bivans and Lochloosa soils. Small areas of poorly drained soils that have a 10- to 18-inch, black or very dark gray sandy surface layer over sandy clay subsoil are also included. Small areas of Blichton soils that have slopes of 0 to 2 percent or 5 to 8 percent are included in a few areas. A few areas mapped as Blichton soils contain less than 5 percent plinthite. Total included areas are about 12 percent or less.

In this Blichton soil, the subsurface layer and the upper part of the subsoil are saturated by a perched water table for 1 to 4 months during most years. Surface runoff is medium. The available water capacity is low in the sandy surface and subsurface layers and low to medium in the loamy subsoil. Permeability is rapid in the sandy surface and subsurface layers and slow to moderately slow in the loamy subsoil. Natural fertility is low to medium, and organic matter content is moderately low to moderate.

(31C) Blichton sand, 5 to 8 percent slopes - This sloping, poorly drained soil is on the rolling uplands. The areas are irregular in shape and elongated and range from about 5 to 45 acres.

Typically, the surface layer is dark gray sand about 5 inches thick. It is about 2 percent nodules of ironstone and fragments of phosphatic limestone. The subsurface layer is sand to a depth of 31 inches. The upper 21 inches is gray. The lower 5 inches is light gray. It is about 2 percent nodules of ironstone and fragments of phosphatic limestone. The subsoil extends to a depth of 78 inches. The upper 6 inches is light brownish gray sandy loam. It is about 4 percent nodules of ironstone and fragments of phosphatic limestone. The next 12 inches is light brownish gray sandy clay loam and are about 2 percent nodules of ironstone and fragments of phosphatic limestone. It is about 6 percent plinthite, by volume. The next 17 inches is light gray sandy clay loam and are about 1 percent nodules of ironstone and weathered fragments of phosphatic limestone. About 8 percent is plinthite, by volume. The lower 12 inches is light gray sandy clay loam. Between depths of 78 and 80 inches, the underlying material is gray sandy clay loam.

Included with this soil in mapping are small areas of Bivans, Boardman, Lochloosa and Wacahoota soils. Small areas of Blichton soils that have 2 to 5 percent slopes or have less than 5 percent plinthite are included. Total included areas are about 15 percent or less.

This Blichton soil is saturated by a perched water table within 10 inches of the surface for 1 to 4 months during most years. Wetness is caused by hillside seepage. Surface runoff is rapid. The available water capacity is low in the sandy surface and subsurface layers, and it is low to medium in the loamy subsoil. Permeability is rapid in the sandy surface and subsurface layers. It is slow to moderately slow in the loamy subsoil. Natural fertility is low to medium, and organic matter content is moderately low.

(32B) Bivans sand, 2 to 5 percent slopes - This gently sloping, poorly drained soil is on relatively broad flats and at the base of slopes of the rolling uplands. The areas are irregular in shape and range from about 1 to 55 acres.

Typically, the surface layer is dark gray sand about 6 inches thick. The subsurface layer is gray sand 9 inches thick. It has a few nodules of ironstone and fragments of phosphatic limestone. The subsoil extends to a depth of 61 inches. It has a few fine and medium sized nodules and fragments of ironstone and phosphatic limestone. The upper 12 inches is dark gray, mottled sandy clay; the next 18 inches is gray, mottled sandy clay; and the lower 16 inches is gray, mottled sandy clay loam. Between depths of 61 to 81 inches, the underlying material is gray, mottled sandy clay loam.

Included with this soil in mapping are small areas of Blichton, Boardman, Lochloosa and Micanopy soils. Small areas of soils which are similar to Bivans soils but which have a very dark gray or black surface layer 7 to 14 inches thick over sandy clay subsoil are also included. Small areas of Bivans soils that have 0 to 2 Percent slopes are included in a few areas. Total included areas are less than 20 percent.

This Bivans soil has a perched water table that is in the surface and subsurface layers and the upper part of the subsoil for 1 to 4 months during most years. Surface runoff is moderate. The available water capacity is low to medium. Permeability is moderate to moderately rapid in the surface and subsurface layers. It is very slow to slow in the subsoil. Natural fertility is low to medium. Organic matter content of the surface layer is moderately low to moderate.

(33B) Norfolk loamy fine sand, 2 to 5 percent slopes - This gently sloping, well-drained soil is in relatively small areas on the rolling uplands. Slopes are slightly convex. The areas are irregular in shape and range from about 10 to 50 acres.

Typically, the surface layer is dark grayish brown loamy fine sand about 9 inches thick. The subsoil extends to a depth of 62 inches. The upper 6 inches is yellowish brown fine sandy loam; the next 26 inches is dark yellowish brown sandy clay loam; the next 14 inches is dark yellowish brown sandy clay; and the lower 7 inches is dark yellowish brown clay that has gray mottles. Between depths of 62 and 80 inches, the underlying material is light gray, mottled clay.

Included with this soil in mapping are small areas of Bivans, Kendrick, Lochloosa and Micanopy soils. Included in some areas are small areas of Norfolk soils that have slopes of 0 to 2 percent and 5 to 8 percent. Limestone boulders and sinkholes are in some areas and are shown by appropriate symbols. Total included areas are about 15 percent.

This Norfolk soil has a water table that is at a depth of about 48 to 72 inches for 1 to 3 months during most years. Surface runoff is medium. The available water capacity is low in the surface layer and medium to high in the subsoil. Permeability is rapid in the surface layer, moderately slow to moderate in the upper part of the subsoil, and very slow to slow in the lower part. Natural fertility is low in the sandy surface and subsurface layers and medium in the sandy clay loam and sandy clay subsoil. Organic matter content is low to moderately low.

(33C) Norfolk loamy fine sand, 5 to 8 percent slopes – This sloping, well drained soil is in irregularly shaped areas on small, sharp-breaking slopes and in irregularly shaped and elongated areas on the long hillsides of the rolling uplands. These areas range from about 8 to 35 acres.

Typically, the surface layer is dark grayish brown loamy sand about 6 inches thick. The subsurface later is light yellowish brown loamy sand about 5 inches thick. The subsoil extends to a depth of 75 inches or more. The upper 35 inches is yellowish brown sandy clay loam; the next 16 inches is yellowish brown, mottled sandy clay loam; and the lower 13 inches is mottled, yellowish brown and gray sandy clay.

Included with this soil in mapping are small areas of Kendrick, Lochloosa and Bivans soils. Also included are small areas of soils that have yellowish brown, clayey subsoil at a depth of less than 20 inches and have gray mottles within 30 inches of the surface. In a few small areas, the subsoil extends to a depth of less than 60 inches. Also included are small areas of soils that are similar to Norfolk soils but have more than 5 percent, by volume, nodules and fragments of ironstone. Limestone boulders and sinkholes are included in some areas. Total included areas are about 20 percent.

This Norfolk soil has a water table that is at a depth of 48 to 72 inches for 1 to 2 months during most years. Wetness is caused by hillside seepage. Surface runoff is rapid. The available moisture capacity is low in the sandy surface and subsurface layers and medium to high in the loamy and clayey subsoil. Permeability is rapid in the surface and subsurface layers. It is moderately slow in the upper part of the subsoil and very slow to slow in the lower part. Natural fertility is low in the sandy surface and subsurface layers and medium in the underlying subsoil. Organic matter content is low to moderately low.

(34) Placid sand, depressional - This nearly level, very poorly drained soil is along poorly defined drainageways and in wet depressional areas both in the flatwoods and on sandy ridges. Slopes range from 0 to 2 percent. The areas are circular, elongated or irregularly shaped and are about 10 to 50 acres.

Typically, the surface layer is sand about 15 inches thick. The upper 8 inches is black, and the lower 7 inches is very dark gray. The underlying layers are sand to a depth of more than 82 inches. The upper 6 inches is grayish brown, the next 26 inches is light brownish gray and the lower 35 inches is light gray.

Included in some areas are small areas of Pompano and Samsula soils. Total included areas are less than 15 percent.

This Placid soil has a water table that is within 10 inches of the surface for 6 to 12 months of the year. The surface is usually covered with water for 6 months or more. The available water capacity is high to a depth of about 15 inches and low below this depth. Permeability is rapid throughout. Internal drainage is slow because it is impeded by the water table. Natural fertility and organic matter content are high to a depth of about 15 inches and very low below this depth.

(38) Pits and Dumps - This map unit consists of pits from which limestone has been or is being removed during surface mining operations and dumps where the excavated overburden material has been piled adjacent to the pits. Individual areas of pits and dumps are usually impractical to separate at the scale in which they are mapped.

The pits vary from about 5 to 75 acres in size and about 30 to 70 feet in depth. They are quite variable in age, ranging from pits that are currently being mined to old abandoned ones that are approximately 65 to 75 years old.

The dumps mostly consist of large areas of heterogeneous soil material that has been excavated from the surface of the limestone and piled adjacent to the pits. This mixed soil material commonly is about 1 to 15 percent, by volume, fragments and boulders of limestone, which are intermixed with the soil material. This material is in relatively narrow piles, which are about 6 to 30 feet high and are around the perimeter of the pits.

Included with this map unit are some pits in which the soil has been excavated for use in road construction and for fill material on sites for buildings. These pits, locally known as borrow pits, are about 4 to 20 acres in size and about 5 to 10 feet in depth. Small piles of limestone that has been excavated and stored on the floor of some of the pits for future use are also included.

(39B) Bonneau fine sand, 2 to 5 percent slopes - This gently sloping, moderately well drained soil is in small to relatively large areas on uplands. Slopes are generally slightly convex. The areas are irregular in shape and range from about 10 to 40 acres. Typically, the surface layer is dark gray fine sand about 9 inches thick. The subsurface layer is brownish yellow fine sand to a depth of 29 inches. The subsoil extends to a depth of 84 inches or more. The upper inches is yellowish brown fine sandy loam; the next 2 inches is mottled gray and brownish yellow sandy clay loam; the next 15 inches is gray and yellowish brown sandy clay loam; and the lower 9 inches is gray, mottled sandy clay loam.

Included with this soil are small areas of Arredondo, Kendrick, Lochloosa, Micanopy and Millhopper soils. Some areas include Bonneau soils that have slopes to 2 percent or 5 to 8 percent. Also included in the Orange Heights area are about 50 acres of soils that similar to the Bonneau soil but is more than 5 percent plinthite. Limestone boulders and sinkholes are in so areas and are shown by appropriate symbols. Total included areas are about 20 percent or less. This Bonneau soil has a water table that is at a depth of 40 to 60 inches for 1 to 3 months and at a depth c 60 to 72 inches for 2 to 3 months during most years. The water table may be perched at a depth of about to 40 inches for less than 1 month during some years. Surface runoff is slow. Permeability is moderately rapid-to-rapid in the sandy surface and subsurface layers. Permeability is moderately slow to moderate in the upper part of the subsoil and very slow to slow in the lower part. The available water capacity is low in the sandy surface and subsurface layers and medium in the subsoil. Natural fertility is low in the sandy layers and medium in the loamy subsoil. Organic matter content low to moderately low in the surface layer.

(46B) Jonesville-Cadillac-Bonneau complex, 0 to 5 percent slopes - This complex consists of small areas of nearly level to gently sloping, well drained Jonesville and Cadillac soils and moderately well drained Bonneau soils. These soils are so intermixed that they cannot be separated at the scale of mapping. These soils are intermixed across the landscape. Individual areas of each soil range from about 1/10 of an acre to 5 acres. Mapped areas of this complex are irregular in shape and range from about 25 to 125 acres.

Jonesville sand makes up about 45 to 55 percent of each mapped area. Typically, the soil has a dark gray sand surface layer about 7 inches thick. The subsurface layer is pale brown fine sand to a depth of 29 inches. The subsoil extends to a depth of 33 inches and is brownish yellow sandy clay loam. Below this is white limestone to a depth of 80 inches or more. This limestone is soft enough to be dug with light power equipment, such as a backhoe.

In the Jonesville soil, the available water capacity is low in the sandy surface layer, low to very low in the sandy subsurface layer, and medium in the loamy subsoil. Permeability is rapid in the sandy surface and subsurface layers and moderately slow to moderate in the loamy subsoil. Organic matter content is moderately low. Natural fertility is low to medium. Surface runoff is slow. The water table is at a depth of more than 72 inches.

Cadillac fine sand makes up about 25 to 35 percent of each mapped area. Typically, the surface layer is dark gray fine sand about 7 inches thick. The subsurface layer is fine sand to a depth of 52 inches. The upper 22 inches is light yellowish brown, and the lower 33 inches is very pale brown. The subsoil extends to a depth of 76 inches. The upper 7 inches is yellowish brown fine sandy loam, and the lower 17 inches is strong brown sandy clay loam. Between a depth of 76 and 118 inches, the underlying material is clay. The upper 22 inches is yellowish brown and has mottles, and the lower 20 inches is gray and has some limestone fragments.

In the Cadillac soil, the available water capacity is low in the sandy surface and subsurface layers and medium in the loamy subsoil. Permeability is rapid in the sandy layers and slow to moderate in the loamy subsoil. Organic matter content is low to moderately low. Natural fertility is low in the sandy surface and subsurface layers and medium in the loamy subsoil. The water table in this soil is at a depth of more than 72 inches. Surface runoff is slow.

Bonneau fine sand makes up about 5 to I0 percent of each mapped area. Typically, the surface layer is dark gray fine sand about 9 inches thick. The subsurface layer is brownish yellow fine sand to a depth of 29 inches. The subsoil is sandy clay loam that extends to a depth of 84 inches or more. The upper 9 inches is yellowish brown, and the lower 47 inches is gray and has yellowish and brownish mottles.

In this Bonneau soil, the water table is about 40 to 72 inches below the surface for 1 to 3 months during most years. During dry seasons, it is more than 72 inches below the surface. Permeability is moderately rapid-to-rapid in the sandy surface and subsurface layers. It is moderately slow to moderate in the upper part of the subsoil and very slow to slow in the lower part. The available water capacity and the natural fertility are low in the sandy surface and subsurface layers and medium in the subsoil. Organic matter content is low to moderately low.

Included with these soils in mapping are many areas of soils that have pedon characteristics similar to the Pedro soils. Also included are some soils that have a grayish brown, sandy surface layer; a pale brown, sandy subsurface layer that extends a depth of 20 to 40 inches; and yellowish brown or strong brown sandy clay loam subsoil that reaches a depth of more than 60 inches. Some soils have sandy surface and subsurface layers 40 to 50 inches thick, subsoil 4 to 10 inches thick that is yellowish brown or strong brown sandy loam or sandy clay loam, and soft, white limestone at a depth of about 45 to 60 inches. Included in some areas are soils that have fine sand surface and subsurface layers less than 20 inches thick, a yellowish brown or strong brown sandy clay subsoil, and soft limestone at a depth of about 30 to 50 inches. Some areas have included soils that have pedon characteristics similar to the Arredondo and Candler soils. Limestone boulders and sinkholes are common. About 12 acres mapped, as this complex along the Santa Fe River is occasionally flooded. Total included areas are 5 to 15 percent of each mapped area.

(48) Myakka sand - This nearly level, poorly drained soil is in broad areas of the flatwoods. Slopes are nearly smooth to slightly convex and range from 0 to 2 percent. The areas are irregular or elongated in shape and range from about 10 to 100 acres.

Typically, the surface layer is dark grayish brown sand about 8 inches thick. The underlying layers are sand to a depth of 82 inches or more. In sequence from the top, the upper 16 inches is light gray, the next 6 inches is very dark brown and has sand grains well coated with organic materials; the next 5 inches is dark brown; the next 18 inches is very pale brown and has mottles; and the next 29 inches is light brownish gray.

Included with this soil are small areas of Pomona, Sparr and Pompano soils. Included are small areas of poorly drained soils that have a stained layer that does not meet the requirements of a spodic horizon. Also included are a few areas of soils that are similar to the Myakka soil except that they have a well-coated, organic-stained layer 14 to 19 inches below the surface. Total included areas are about 20 percent.

This Myakka soil has a water table that is at a depth of less than 10 inches for 1 to 4 months and at a depth of 10 to 40 inches for 2 to 4 months during most years. The water table recedes to a depth of more than 40 inches during drier seasons. Surface runoff is slow. The available water capacity is very low from 0 to 24 inches, medium to high from 24 to 30 inches, and very low to low below a depth of 30 inches. Permeability is rapid to a depth of about 24 inches, moderate to moderately rapid from 24 to 30 inches, and rapid below a depth of 30 inches. Natural fertility and organic matter content are low.

(49A) Lochloosa fine sand, 0 to 2 percent slopes - This nearly level, somewhat poorly drained soil is in relatively small to large areas in the broad flatwoods and the gentle, rolling uplands that border the flatwoods. Slopes are nearly smooth to slightly convex. The areas are irregular in shape and range from about 10 to 200 acres.

Typically, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer is fine sand to a depth of 34 inches. The upper 7 inches is brown, and the lower 20 inches is very pale brown and has grayish and yellowish mottles. The subsoil extends to a depth of 80 inches or more. The upper 10 inches is pale brown, mottled very fine sandy loam; the next 13 inches is light brownish gray, mottled very fine sandy loam; and the lower 23 inches is gray, mottled sandy clay loam.

Included with this soil are small areas of Bonneau, Millhopper and Sparr soils. Also included are a few small areas of somewhat poorly drained soils that have a sandy surface and subsurface layer 10 to 18 inches thick over a mottled, yellowish brown and gray sandy clay loam subsoil. In the Orange Heights, area there are about 250 acres of soils that are similar to Lochloosa soils but have about 5 to 10 percent plinthite in the subsoil. A few small areas of Lochloosa soils that have slopes of 2 to 5 percent are included. Total included areas are about 15 percent or less.

This Lochloosa soil has a water table that is 30 to 40 inches below the surface for 2 to 4 months during most years. It rises to 15 to 30 inches for 2 to 4 weeks during most years. Surface runoff is slow. The available water capacity is medium to high in the sandy surface and subsurface layers and medium in the subsoil. Permeability is rapid to very rapid in the surface and subsurface layers, moderate in the upper part of the subsoil, and slow in the lower part. Natural fertility is low in the sandy surface and subsurface layers and medium in the loamy subsoil. Organic matter content is low to moderately low in the surface layer.

(50) Sparr fine sand - This nearly level, somewhat poorly drained soil is in relatively small areas on slight rises of the flatwoods and on nearly smooth to slightly convex slopes of the gently rolling uplands. Slope ranges from 0 to 2 percent. The areas are irregular in shape and range from about 10 to 75 acres.

Typically, the surface layer is fine sand about 8 inches thick. The upper 4 inches is dark gray, and the lower 4 inches is dark grayish brown. The subsurface layer is about 40 inches thick. The upper 17 inches is pale brown sand, the next 7 inches is very pale brown fine sand that has light yellowish brown and light gray mottles, and the lower 16 inches is light gray fine sand that has yellowish brown mottles. The subsoil extends to a depth of 84 inches or more and is light gray. The upper 8 inches is loamy sand, and the lower 28 inches is fine sandy loam.

Included with this soil in mapping are small areas of Lochloosa, Kanapaha, Newnan, Millhopper and Zolfo soils. Also included are a few small areas of soils that are similar to Sparr soils but have a surface layer of loamy sand. A few areas are Sparr soils that have of 2 to 5 percent. Total included areas are 15 percent less.

This Sparr soil has a water table that is at a depth of 20 to 30 inches for about 1 to 2 months and at a depth of 30 to 40 inches for about 2 to 3 months during most years. During dry seasons, it recedes to a depth of more than 40 inches. Surface runoff is slow. The available water capacity is medium in the sandy surface layer, Iow in the sandy subsurface layer, and medium in the loamy subsoil. Permeability is rapid to very rapid in the sandy surface and subsurface layers. It is moderate in the upper part of the subsoil and slow to moderately slow in the lower part of the subsoil. Natural fertility is low to a depth of about 48 inches and medium below this depth. Organic matter content is low to moderately low.

(51) Plummer fine sand - This nearly level, poorly drained soil is in the broad areas of the flatwoods. Slopes are nearly smooth and range from 0 to 2 percent. Areas are relatively small and irregular in shape and are about 10 to 50 acres.

Typically, the surface layer is black fine sand about 6 inches thick. The subsurface layer is fine sand to a depth of 42 inches. The upper 8 inches is light brownish gray, the next 18 inches is gray and the lower 10 inches is light gray. The subsoil extends to a depth of 81 inches or more. The upper 8 inches is light gray, mottled very fine sandy loam, and the lower 31 inches is light gray sandy clay loam.

Included with this soil in mapping are small areas of Mulat, Pomona, Pompano and Sparr soils. Also included are a few areas in which the surface and subsurface layers are sand. About 15 acres mapped, as this soil along the Santa Fe River is occasionally flooded. Total included areas in any one delineation are about 15 percent.

This Plummer soil has a water table that is at a depth of less than 10 inches for 1 to 3 months and is at a depth of 10 to 40 inches for about 3 to 4 months during most years. It recedes to more than 40 inches during drier seasons. The available water capacity is medium to high in the surface and subsurface layers and low to medium in the subsoil. Permeability is moderately rapid-to-rapid in the surface and subsurface layers and moderate in the subsoil. Natural fertility is low. Organic matter content is moderately low.

(52) Ledwith muck - This nearly level, very poorly drained soil is in small to relatively large areas of freshwater marshes and wet prairies. Slopes are nearly smooth to slightly concave and are less than 2 percent. The areas are irregular or elongated in shape and rang from about 15 to 100 acres.

Typically, the surface layer is about 15 inches thick. The upper 9 inches is dark brown muck, and the lower inches are black sandy loam. The subsurface layer is loamy sand about 2 inches thick. The subsoil is sandy clay to a depth of 62 inches. The upper 8 inches of the subsoil is very dark gray, the next 19 inches is dark gray and the lower 18 inches is gray. Between depths of 62 and 84 inches, the underlying material is gray sandy clay.

Included with this soil in mapping are small areas of Shenks and Surrency soils. Total included areas are about 15 percent or less.

This Ledwith soil has a water table that is within 10 inches of the surface for more than 6 months during most years. Most areas have water ponded on the surface for 4 months or more. The available water capacity is very high in the upper, 9-inch-thick organic surface layer, medium to high in the mineral surface subsurface layers, and low to medium in the clayey subsoil. Permeability is rapid in the organic surface layer, moderate to rapid in the mineral surface and subsurface layers, and slows to very slow in the clayey subsoil. Natural fertility is medium. Organic matter content in the upper 9 inches is very high.

(53) Shenks muck - This nearly level, very poorly drained organic soil is in the wetter parts of the large prairies and marshes in the southern and eastern parts of the county. Slopes are nearly smooth to slightly concave and are less than 2 percent. The areas are usually irregular or elongated in shape and range from about 200 acres to more than 500 acres.

Typically, the surface layer is muck about 21 inches thick. The upper 18 inches is dark brown, and the lower 3 inches is black. The underlying material extends to a depth of 82 inches or more. The upper 7 inches is black clay loam, the next 23 inches is gray clay, the next 10 inches is dark gray clay and the lower 21 inches is gray, mottled clay.

Included with this soil in mapping are small areas of Ledwith, Martel, Okeechobee and Terra Ceia soils. Total included areas are less than 20 percent.

This Shenks soil has a water table that is at or above the surface except during extended dry periods. The available water capacity of the organic surface layer is very high, and it is medium to very high in the clayey underlying material. Permeability is rapid or very rapid in the surface layer and very slow or slow in the clayey material below. Natural fertility is high. Organic matter content of the surface layer is very high.

(54) Emeralda fine sandy loam - This nearly level, poorly drained soil is in relatively small areas on rolling uplands of the prairies and in broad wet areas of the flatwoods. Slopes are nearly smooth and range from 0 to 2 percent. The areas are irregular in shape and range from about 15 to 100 acres.

Typically, the surface layer is about 10 inches thick. The upper 5 inches is black fine sandy loam, and the lower 5 inches is very dark gray sand. The subsurface layer is light brownish gray sand about 8 inches thick.

The subsoil is gray and extends to a depth of 56 inches. The upper 19 inches is sandy clay, and the lower 19 inches is sandy clay loam. Between depths of 56 and 80 inches, the underlying material is light gray sandy clay loam; the upper 10 inches of the underlying material has thin, discontinuous streaks of light gray sandy material that make up about 45 percent of its volume.

Included with this soil in mapping are small areas of Ledwith and Wauberg soils. Total included areas are about 15 percent.

This Emeralda soil has a water table that is less than 10 inches below the surface for 4 to 6 months during most years. The available water capacity is high in the surface layer, low in the subsurface layer, and medium to high in the subsoil. Permeability is rapid in the surface and subsurface layers and very slow to slow in the subsoil. Natural fertility is medium, and organic matter content is moderate to high in the surface layer.

(55B) Lake sand, 0 to 5 percent slopes - This is a nearly level to gently sloping, excessively drained soil that has sandy texture to a depth of more than 80 inches. Slopes are nearly smooth to convex. The soil is in irregularly shaped areas on the gently rolling uplands. The individual areas are both small and large in size and range from about 20 to 300 acres.

Typically, the surface layer is dark grayish brown sand about 8 inches thick. The underlying layer is sand to a depth of 82 inches or more. The upper 33 inches is yellowish brown, the next 28 inches is strong brown, and the lower 13 inches is yellowish brown and has thin streaks of light gray, clean sand grains.

Included with this soil in mapping are small areas of Arredondo, Candler, Gainesville and Tavares soils. Also included are a few small areas of Lake Soils that have 5 to 8 percent slopes. About 10 acres mapped, as this soil along the Santa Fe River is occasionally flooded. Total included areas are about 15 percent or less.

Available water capacity in this Lake soil is very low-to-low. Permeability is rapid to very rapid. Organic matter content and natural fertility are low. Surface runoff is very slow. The water table is more than 72 inches below the surface.

(56) Wauberg sand - This nearly level, poorly drained soil is mostly in large areas on prairie in the southern part of the county. Slopes are nearly smooth to slightly concave and range from 0 to 2 percent. The areas are irregular and elongated in shape. They range from about 40 to 500 acres.

Typically, the surface layer is sand about 9 inches thick. The upper 5 inches is black, and the lower 4 inches is very dark gray. The subsurface layer is about 15 inches thick. The upper 10 inches of this layer is grayish brown sand, and the lower 5 inches is light brownish gray sand. The subsoil is sandy clay loam to a depth of 63 inches. The upper 26 inches is dark gray, and the lower 23 inches is gray. Between depths of 63 and 81 inches, the underlying material is gray, mottled clay.

Included with this soil in mapping are small areas of Emeralda, Ledwith, Shenks and Surrency soils. Also included are a few small areas of soils that have characteristics similar to those of the Wauberg soil except that they have a thinner, lighter colored surface layer or that the upper 4 to 8 inches of the subsurface layer is brownish sandy material. Total included areas are less than 20 percent.

This Wauberg soil has a water table that is less than 10 inches below the surface for 3 to 5 months during most years. The available water capacity is low to medium in the surface layer, very low to low in the subsurface layer, and low to medium in the subsoil. Permeability is rapid to very rapid in the sandy surface and subsurface layers and slow to very slow in the subsoil. Natural fertility is low in the sandy surface and subsurface layers and medium in the subsoil. Organic matter content is moderately low to moderate.

(59) Pottsburg sand - This is a nearly level, poorly drained soil in the broad areas of the flatwoods. Slopes are nearly smooth and range from 0 to 2 percent. The areas are usually irregular in shape and range from about 15 to 250 acres.

Typically, the surface layer is black sand about 8 inches thick. The subsurface layer is gray to light gray sand to a depth of 52 inches. The subsoil is dark grayish brown to very dark brown sand to a depth of 86 inches or more.

Included with this soil in mapping are small areas of Chipley, Myakka, Plummer, Pompano and Zolfo soils. Also included are small areas of soils that are similar to this Pottsburg soil except that they have a black or very dark gray surface layer 8 to 15 inches thick or have a water table at a depth of 12 to 30 inches for about 1 to 4 months during most years. Total included areas are about 20 percent or less.

This Pottsburg soil has a water table that is at a depth of less than 12 inches for 1 to 4 months and is at a depth of 12 to 40 inches for 4 months or longer during most years. During drier periods, the water table recedes to more than 40 inches below the surface. Surface runoff is slow. The available water capacity is low to a depth of about 52 inches and is medium to very high below this depth. Permeability is rapid to a depth of about 52 inches. It is moderate below this depth. Natural fertility is low. Organic matter content of the surface layer is moderately low to moderate.

Addendum 5—Plant and Animal List

Paynes Prairie Preserve State Park Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
LICHENS		
Rough eyelash lichen	*Bulbothrix goebelii*	
Carolina shield lichen	*Canoparmelia caroliniana*	
Turban lichen	*Cladonia peziziformis*	
Purple-eyed medallion lichen	*Dirinaria purpurascens*	
Tree blood spot lichen	*Haematomma accolens*	
Complex (UV-perforated ruffle)	*Parmotrema perforatum*	
Palm ruffle lichen	*Parmotrema tinctorum*	
Thin rosette lichen	*Pyxine eschweileri*	
Bushy beard lichen	*Usnea strigosa*	
PTERIDOPHYTES		
Brittle maidenhair	*Adiantum tenerum*	SK
Ebony spleenwort	*Asplenium platyneuron*	
Southern lady fern	*Athyrium filix-femina* subsp. *asplenioides*	MEH
American waterfern	*Azolla filiculoides*	
Southern club-moss	*Lycopodiella appressa*	
Japanese climbing fern	*Lygodium japonicum* *	
Tuberous sword fern	*Nephrolepis cordifolia* *	
Cinnamon fern	*Osmunda cinnamomea*	
Royal fern	*Osmunda regalis* L. var. *spectabilis*	
Golden polypody	*Phlebodium aureum*	
Resurrection fern	*Pleopeltis polypodioides* var. *michauxiana*	
Tailed bracken	*Pteridium aquilinum* var. *pseudocaudatum*	
Spider brake	*Pteris multifida* *	
Chinese ladder brake	*Pteris vittata* *	
Water spangles	*Salvinia minima* *	
Downy maiden fern	*Thelypteris dentata* *	
Hairy maiden fern	*Thelypteris hispidula* var. *versicolor*	
Hottentot fern	*Thelypteris interrupta*	
Widespread maiden fern	*Thelypteris kunthii*	
Marsh fern	*Thelypteris palustris Schott* var. *pubescens*	
Shoestring fern	*Vittaria lineata*	
Netted chain fern	*Woodwardia areolata*	
Virginia chain fern	*Woodwardia virginica*	

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)

GYMNOSPERMS

Red cedar	*Juniperus virginiana*	
Sand pine	*Pinus clausa*	
Slash pine	*Pinus elliottii*	
Spruce pine	*Pinus glabra*	
Longleaf pine	*Pinus palustris*	
Pond pine	*Pinus serotina*	
Loblolly pine	*Pinus taeda*	
Bald-cypress	*Taxodium distichum*	

ANGIOSPERMS

MONOCOTS

Ticklegrass	*Agrostis hyemalis*	
Wild colicroot	*Aletris farinosa*	
Southern colicroot	*Aletris obovata*	
Meadow garlic	*Allium canadense*	
Shortspike bluestem	*Andropogon brachystachyus*	
Bushy bluestem	*Andropogon glomeratus*	
Broomsedge bluestem	*Andropogon virginicus*	
Greendragon	*Arisaema dracontium*	
Jack-in-the-pulpit	*Arisaema triphyllum*	
Arrowfeather threeawn	*Aristida purpurascens*	
Bottlebrush threeawn	*Aristida spiciformis*	
Wiregrass	*Aristida stricta* var. *beyrichiana*	
Switchcane	*Arundinaria gigantea*	
Common carpetgrass	*Axonopus fissifolius*	
Pinguin	*Bromelia pinguin*	
Rescuegrass	*Bromus catharticus* *	
Watergrass	*Bulbostylis barbata* *	
Capillary hairsedge	*Bulbostylis ciliatifolia*	
Sandyfield hairsedge	*Bulbostylis stenophylla*	
Piedmont roseling	*Callisia rosea*	
Bandanna-of-the-Everglades	*Canna flaccida*	
Greenwhite sedge	*Carex albolutescens*	
Longhair sedge	*Carex comosa*	
Sandywoods sedge	*Carex dasycarpa*	
Hammock sedge	*Carex fissa* var. *aristata*	
Frank's sedge	*Carex frankii*	

*** Non-native Species   + Extirpated**

Common Name	***Scientific Name***	**Primary Habitat Codes (for Imperiled Species)**
Clustered sedge	*Carex glaucescens*	
Greater bladder sedge	*Carex intumescens*	
Hop sedge	*Carex lupulina*	
Reflexed sedge	*Carex retroflexa*	
Awlfruit sedge	*Carex stipata*	
Southern sandbur	*Cenchrus echinatus*	
Coastal sandbur	*Cenchrus spinifex*	
Indian woodoats	*Chasmanthium latifolium*	
Slender woodoats	*Chasmanthium laxum*	
Longleaf woodoats	*Chasmanthium laxum* var. *sessiliflorum*	
Jamaica swamp sawgrass	*Cladium jamaicense*	
Wild taro	*Colocasia esculenta* *	
Whitemouth dayflower	*Commelina erecta*	
Spring coralroot	*Corallorhiza wisteriana*	
Bermudagrass	*Cynodon dactylon* *	
Yellow nutgrass	*Cyperus esculentus* *	
Baldwin's flatsedge	*Cyperus croceus*	
Leconte's flatsedge	*Cyperus lecontei*	
Pinebarren flatsedge	*Cyperus ovatus*	
Manyspike flatsedge	*Cyperus polystachyos*	
Strawcolored flatsedge	*Cyperus strigosus*	
Tropical flatsedge	*Cyperus surinamensis*	
Green flatsedge	*Cyperus virens*	
Tapered witchgrass	*Dichanthelium acuminatum*	
Variable witchgrass	*Dichanthelium commutatum*	
Cypress witchgrass	*Dichanthelium dichotomum*	
Cypress witchgrass	*Dichanthelium ensifolium* var. *unciphyllum*	
Openflower witchgrass	*Dichanthelium laxiflorum*	
Roughhair witchgrass	*Dicanthelium strigosum*	
Asian crabgrass	*Digitaria bicornis* *	
Southern crabgrass	*Digitaria ciliaris*	
Air-potato	*Dioscorea bulbifera* *	
Florida yam	*Dioscorea floridana*	
Threeway sedge	*Dulichium arundinaceum*	
Coast cockspur	*Echinochloa walteri*	
Common water-hyacinth	*Eichhornia crassipes* *	
Needle spikerush	*Eleocharis acicularis*	
Baldwin's spikerush	*Eleocharis baldwinii*	
Jointed spikerush	*Eleocharis equisetoides*	
Sand spikerush	*Eleocharis montevidensis*	

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Squarestem spikerush	*Eleocharis quadrangulata*	
Viviparous spikerush	*Eleocharis vivipara*	
Indian goosegrass	*Eleusine indica* *	
Green-fly orchid	*Epidendrum conopseum*	
Mediterranean lovegrass	*Eragrostis barrelieri* *	
Purple lovegrass	*Eragrostis spectabilis*	
Flattened pipewort	*Eriocaulon compressum*	
Pinewoods fingergrass	*Eustachys petraea*	
Carolina fimbry	*Fimbristylis caroliniana*	
Forked fimbry	*Fimbristylis dichotoma*	
Southern umbrellasedge	*Fuirena scirpoidea*	
Longhorn false rein orchid	*Habenaria quinqueseta*	
Waterspider false reinorchid	*Habenaria repens*	
White gingerlily	*Hedychium coronarium* *	
Little barley	*Hordeum pusillum*	
Watertyme; Hydrilla	*Hydrilla verticillata* *	
Common yellow stargrass	*Hypoxis curtissii*	
Fringed yellow stargrass	*Hypoxis juncea*	
Cogongrass	*Imperata cylindrica* *	
Prairie iris	*Iris hexagona*	
Tapertip rush	*Juncus acuminatus*	
Toad rush	*Juncus bufonius*	
Leathery rush	*Juncus coriaceus*	
Forked rush	*Juncus dichotomus*	
Soft rush	*Juncus effusus*	
Bog rush	*Juncus elliottii*	
Shore rush	*Juncus marginatus*	
Bighead rush	*Juncus megacephalus*	
Needlepod rush	*Juncus scirpoides*	
Fragrant spikesedge	*Kyllinga odorata*	
Carolina redroot	*Lachnanthes caroliana*	
Southern bogbutton	*Lachnocaulon beyrichianum*	
Dotted duckweed	*Landoltia punctata* *	
Southern cutgrass	*Leersia hexandra*	
Common duckweed	*Lemna minor*	
Little duckweed	*Lemna obscura*	
Valdivia duckweed	*Lemna valdiviana*	
Frog's-bit	*Limnobium spongia*	
Italian ryegrass	*Lolium perenne* *	
Southern watergrass	*Luziola fluitans*	

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Rose natalgrass	*Melinis repens* *	
Nimblewill muhly	*Muhlenbergia schreberi*	
Marsh dewflower	*Murdannia keisak* *	
Southern waternymph	*Najas guadalupensis*	
Woodsgrass; Basketgrass	*Oplismenus hirtellus*	
Goldenclub	*Orontium aquaticum*	
Beaked panicum	*Panicum anceps*	
Fall panicgrass	*Panicum dichotomiflorum*	
Maidencane	*Panicum hemitomon*	
Torpedograss	*Panicum repens* *	
Egyptian paspalidium	*Paspalidium geminatum*	
Dallisgrass	*Paspalum dilatatum* *	
Knotgrass	*Paspalum distichum*	
Field paspalum	*Paspalum laeve*	
Bahiagrass	*Paspalum notatum* *	
Water paspalum	*Paspalum repens*	
Thin paspalum	*Paspalum setaceum*	
Vaseygrass	*Paspalum urvillei* *	
White arrow arum	*Peltandra sagittifolia*	
Green arrow arum	*Peltandra virginica*	
Carolina canarygrass	*Phalaris caroliniana*	
Blackseed needlegrass	*Piptochaetium avenaceum*	
Water-lettuce	*Pistia stratiotes* *	
Annual bluegrass	*Poa annua* *	
Rabbitsfootgrass	*Polypogon monspeliensis* *	
Pickerelweed	*Pontederia cordata*	
Leafy pondweed	*Potamogeton foliosus*	
Anglestem beaksedge	*Rhynchospora caduca*	
Starrush whitetop	*Rhynchospora colorata*	
Shortbristle horned beaksedge	*Rhynchospora corniculata*	
Fascicled beaksedge	*Rhynchospora fascicularis*	
Southern beaksedge	*Rhynchospora microcarpa*	
Bunched beaksedge	*Rhynchospora microcephala*	
Dwarf palmetto	*Sabal minor*	
Cabbage palm	*Sabal palmetto*	
Sugarcane plumegrass	*Saccharum giganteum*	
American cupscale	*Sacciolepis striata*	
Threadleaf arrowhead	*Sagittaria filiformis*	
Grassy arrowhead	*Sagittaria graminea*	
Bulltongue arrowhead	*Sagittaria lancifolia*	

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Broadleaf arrowhead	*Sagittaria latifolia*	
Canby's bulrush	*Schoenoplectus etuberculatus*	
Softstem bulrush	*Schoenoplectus tabernaemontani*	
Woolgrass	*Scirpus cyperinus*	
Fringed nutrush	*Scleria ciliata*	
Tall nutgrass	*Scleria triglomerata*	
Saw palmetto	*Serenoa repens*	
Giant bristlegrass	*Setaria magna*	
Yellow bristlegrass	*Setaria parviflora*	
Narrowleaf blue-eyed grass	*Sisyrinchium angustifolium*	
Lopsided indiangrass	*Sorghastrum secundum*	
Johnsongrass	*Sorghum halepense* *	
American burreed	*Sparganium americanum*	
Prairie wedgescale	*Sphenopholis obtusata*	
Greenvein ladiestresses	*Spiranthes praecox*	
Little ladiestresses	*Spiranthes tuberosa*	MF
Spring ladiestresses	*Spiranthes vernalis*	
Common duckweed	*Spirodela polyrhiza*	
Smutgrass	*Sporobolus indicus* *	
Yellow hatpins	*Syngonanthus flavidulus*	
Bartram's airplant	*Tillandsia bartramii*	
Ballmoss	*Tillandsia recurvata*	
Spanish moss	*Tillandsia usneoides*	
Small-leaf spiderwort	*Tradescantia fluminensis* *	
Bluejacket	*Tradescantia ohiensis*	
Wandering-jew	*Tradescantia zebrina* *	
Tall redtop	*Tridens flavus*	
Eastern gamagrass	*Tripsacum dactyloides*	
Southern cattail	*Typha domingensis*	
Broadleaf cattail	*Typha latifolia*	
Sixweeks fescue	*Vulpia octoflora*	
Columbian watermeal	*Wolffia columbiana*	
Florida mudmidget	*Wolffiella gladiata*	
Saber mudmidget	*Wolffiella oblonga*	
Shortleaf yelloweyed grass	*Xyris brevifolia*	
Carolina yelloweyed grass	*Xyris caroliniana*	
Bog yelloweyed grass	*Xyris difformis*	
Fringed yelloweyed grass	*Xyris fimbriata*	
Richard's yelloweyed grass	*Xyris jupicai* *	
Tall yelloweyed grass	*Xyris platylepis*	

*** Non-native Species + Extirpated**

Common Name	***Scientific Name***	**Primary Habitat Codes (for Imperiled Species)**
Adam's needle	*Yucca filamentosa*	
Southern wild rice	*Zizaniopsis miliacea*	

DICOTS

Slender threeseed mercury	*Acalypha gracilens*	
Oppositeleaf spotflower	*Acmella oppositifolia* var. *repens*	
Boxelder	*Acer negundo*	
Red maple	*Acer rubrum*	
Indian jointvetch	*Aeschynomene indica* *	
Sticky jointvetch	*Aeschynomene viscidula*	
Beach false foxglove	*Agalinis fasciculata*	
Seminole false foxglove	*Agalinis filifolia*	
Hammock snakeroot	*Ageratina jucunda*	
Silktree; Mimosa	*Albizia julibrissin* *	
Tungoil tree	*Aleurites fordii* *	
Alligatorweed	*Alternanthera philoxeroides* *	
False moneywort	*Alysicarpus ovalifolius* *	
Southern amaranth	*Amaranthus australis*	
Common ragweed	*Ambrosia artemisiifolia*	
Bastard false indigo	*Amorpha fruticosa*	
Peppervine	*Ampelopsis arborea*	
American hogpeanut	*Amphicarpaea bracteata*	
Mayweed	*Anthemis cotula* *	
Groundnut	*Apios americana*	
Devil's walkingstick	*Aralia spinosa*	
Scratchthroat; Coral ardisia	*Ardisia crenata* *	
Spreading sandwort	*Arenaria lanuginosa*	
Bluestem pricklypoppy	*Argemone albiflora*	
Calico flower	*Aristolochia littoralis* *	
Carolina milkweed	*Asclepias cinerea*	
Pinewoods milkweed	*Asclepias humistrata*	
Savannah milkweed	*Asclepias pedicellata*	
Swamp milkweed	*Asclepias perennis*	
Butterflyweed	*Asclepias tuberosa*	
Slimleaf pawpaw	*Asimina angustifolia*	
Woolly pawpaw	*Asimina incana*	
Bigflower pawpaw	*Asimina obovata*	
Smallflower pawpaw	*Asimina parviflora*	
Dwarf pawpaw	*Asimina pygmea*	

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Netted pawpaw	*Asimina reticulata*	
Blue waterhyssop	*Bacopa caroliniana*	
Tropical waterhyssop	*Bacopa innominata*	
Silverling	*Baccharis glomeruliflora*	
Groundsel tree; Sea-myrtle	*Baccharis halimifolia*	
Coastalplain honeycombhead	*Balduina angustifolia*	
Pineland wild indigo	*Baptisia lecontei*	
Wax begonia	*Begonia cucullata* *	
Tarflower	*Bejaria racemosa*	
Alabama supplejack	*Berchemia scandens*	
Beggarticks	*Bidens alba*	
Spanish needles	*Bidens bipinnata*	
Burrmarigold	*Bidens laevis*	
Smallfruit beggarticks	*Bidens mitis*	
Crossvine	*Bignonia capreolata*	
False nettle; Bog hemp	*Boehmeria cylindrica*	
Smallhead doll's daisy	*Boltonia diffusa*	
Paper mulberry	*Broussonetia papyrifera* *	
American bluehearts	*Buchnera americana*	
Carolina fanwort	*Cabomba caroliniana*	
American beautyberry	*Callicarpa americana*	
Larger waterstarwort	*Callitriche heterophylla*	
Matted waterstarwort	*Callitriche peploides*	
Hedge false bindweed	*Calystegia sepium* subsp. *limnophila*	
Trumpet creeper	*Campsis radicans*	
Shepherd's purse	*Capsella bursa-pastoris* *	
Hairy bittercress	*Cardamine hirsuta* *	
Sand bittercress	*Cardamine parviflora*	
Pennsylvania bittercress	*Cardamine pensylvanica*	
Heartseed	*Cardiospermum microcarpum*	
Coastalplain chaffhead	*Carphephorus corymbosus*	
Vanillaleaf	*Carphephorus odoratissimus*	
Hairy chaffhead	*Carphephorus paniculatus*	
American hornbeam	*Carpinus caroliniana*	
Water hickory	*Carya aquatica*	
Pignut hickory	*Carya glabra*	
Mockernut hickory	*Carya tomentosa*	
Fivelobe melonleaf	*Cayaponia quinqueloba*	
Sugarberry; Hackberry	*Celtis laevigata*	
Spadeleaf	*Centella asiatica*	

Common Name	***Scientific Name***	**Primary Habitat Codes (for Imperiled Species)**
Spurred butterfly pea	*Centrosema virginianum*	
Common buttonbush	*Cephalanthus occidentalis*	
Mouse-ear chickweed	*Cerastium glomeratum* *	
Coontail	*Ceratophyllum demersum*	
Eastern redbud	*Cercis canadensis*	
Hairyfruit chervil	*Chaerophyllum tainturieri*	
Partridge pea	*Chamaecrista fasciculata*	
Sensitive pea	*Chamaecrista nictitans*	
Hyssopleaf sandmat	*Chamaesyce hyssopifolia*	
Spotted sandmat	*Chamaesyce maculata*	
Lamb's-quarters	*Chenopodium album* *	
Mexican tea	*Chenopodium ambrosioides* *	
Cottony goldenaster	*Chrysopsis gossypina*	
Maryland goldenaster	*Chrysopsis mariana*	
Scrubland goldenaster	*Chrysopsis subulata*	
Spotted water hemlock	*Cicuta maculata*	
Camphortree	*Cinnamomum camphora* *	
Purple thistle	*Cirsium horridulum*	
Nuttall's thistle	*Cirsium nuttallii*	
Sour orange; Grapefruit	*Citrus x. aurantium* *	
Slender scratchdaisy	*Croptilon divaricatum*	
Compact dodder	*Cuscuta compacta*	
Virginsbower	*Clematis virginiana*	
Turk's-turban	*Clerodendrum indicum* *	
Tread-softly	*Cnidoscolus stimulosus*	
Asthmaweed	*Conyza bonariensis* *	
Canadian horseweed	*Conyza canadensis*	
Leavenworth's tickseed	*Coreopsis leavenworthii*	
Roughleaf dogwood	*Cornus asperifolia*	
Flowering dogwood	*Cornus florida*	
Smallflower fumewort	*Corydalis micrantha*	
Parsley hawthorn	*Crataegus marshallii*	
Michaux's hawthorn	*Crataegus michauxii*	
Dwarf hawthorn	*Crataegus uniflora*	
Smooth rattlebox	*Crotalaria pallida* *	
Pursh's rattlebox	*Crotalaria purshii*	
Rabbitbells	*Crotalaria rotundifolia*	
Showy rattlebox	*Crotalaria spectabilis* *	
Silver croton	*Croton argyranthemus*	
Vente conmigo	*Croton glandulosus*	

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Rushfoil	*Croton michauxii*	
Colombian waxweed	*Cuphea carthagenensis* *	
Marsh parsley	*Cyclospermum leptophyllum*	
Leafless swallowwort	*Cynanchum scoparium*	
Swamp loosestrife	*Decodon verticillatus*	
Western tansymustard	*Descurainia pinnata*	
Hairy small-leaf ticktrefoil	*Desmodium ciliare*	
Dillenius' ticktrefoil	*Desmodium glabellum*	
Zarabacoa comun	*Desmodium incanum*	
Pinebarren ticktrefoil	*Desmodium strictum*	
Slimleaf ticktrefoil	*Desmodium tenuifolium*	
Dixie ticktrefoil	*Desmodium tortuosum* *	
Threeflower ticktrefoil	*Desmodium triflorum* *	
Carolina ponysfoot	*Dichondra carolinensis*	
Poor Joe	*Diodia teres*	
Virginia buttonweed	*Diodia virginiana*	
Common persimmon	*Diospyros virginiana*	
Dwarf sundew	*Drosera brevifolia*	
Indian strawberry	*Duchesnea indica* *	
Swamp twinflower	*Dyschoriste humistrata*	
False daisy	*Eclipta prostrata*	
Carolina elephantsfoot	*Elephantopus carolinianus*	
Tall elephantsfoot	*Elephantopus elatus*	
American burnweed	*Erechtites hieraciifolius*	
Smooth elephantsfoot	*Elephantopus nudatus*	
Oakleaf fleabane	*Erigeron quercifolius*	
Prairie fleabane	*Erigeron strigosus*	
Early whitetop fleabane	*Erigeron vernus*	
Fragrant eryngo	*Eryngium aromaticum*	
Baldwin's eryngo	*Eryngium baldwinii*	
Button rattlesnakemaster	*Eryngium yuccifolium*	
Coralbean; Cherokee bean	*Erythrina herbacea*	
Swamp doghobble	*Eubotrys racemosa*	
American strawberrybush	*Euonymus americanus*	
Dogfennel	*Eupatorium capillifolium*	
Yankeeweed	*Eupatorium compositifolium*	
Mohr's thoroughwort	*Eupatorium mohrii*	
Roundleaf thoroughwort	*Eupatorium rotundifolium*	
Lateflowering thoroughwort	*Eupatorium serotinum*	
Slender flattop goldenrod	*Euthamia caroliniana*	

Common Name	***Scientific Name***	**Primary Habitat Codes (for Imperiled Species)**
Godfrey's swampprivet	*Forestiera godfreyi*	MEH, UHF
Upland swampprivet	*Forestiera ligustrina*	
White ash	*Fraxinus americana*	
Carolina ash; pop ash	*Fraxinus caroliniana*	
Cottonweed	*Froelichia floridana*	
Pennsylvania everlasting	*Gamochaeta pensylvanica*	
Spoonleaf purple everlasting	*Gamochaeta purpurea*	
Downy milkpea	*Galactia regularis*	
Eastern milkpea	*Galactia volubilis*	
Goosegrass; Spring cleavers	*Galium aparine*	
Coastal bedstraw	*Galium hispidulum*	
Bluntleaf bedstraw	*Galium obtusum* subsp. *filifolium*	
Hairy bedstraw	*Galium pilosum*	
Stiff marsh bedstraw	*Galium tinctorium*	
Southern beeblossom	*Gaura angustifolia*	
Dwarf huckleberry	*Gaylussacia dumosa*	
Blule huckleberry	*Gaylussacia frondosa* var. *tomentosa*	
Yellow jessamine	*Gelsemium sempervirens*	
Carolina cranesbill	*Geranium carolinianum*	
South American mock vervain	*Glandularia pulchella* *	
Angularfruit milkvine	*Gonolobus suberosus*	MEH, UHF
Loblolly bay	*Gordonia lasianthus*	
Rough hedgehyssop	*Gratiola hispida*	
Roundfruit hedgehyssop	*Gratiola virginiana*	
English ivy	*Hedera helix* *	
Carolina frostweed	*Helianthemum carolinianum*	
Pinebarren frostweed	*Helianthemum corymbosum*	
Narrowleaf sunflower	*Helianthus angustifolius*	
Stiff sunflower	*Helianthus radula*	
Clasping heliotrope	*Heliotropium amplexicaule* *	
Camphorweed	*Heterotheca subaxillaris*	
Crimsoneyed rosemallow	*Hibiscus moscheutos*	
Queen-devil	*Hieracium gronovii*	
Coastalplain hawkweed	*Hieracium megacephalon*	
Innocence	*Houstonia procumbens*	
Floating marshpennywort	*Hydrocotyle ranunculoides*	
Manyflower marshpennywort	*Hydrocotyle umbellata*	
Whorled marshpennywort	*Hydrocotyle verticillata*	
Waterpod	*Hydrolea quadrivalvis*	
Roundpod St. John's-wort	*Hypericum cistifolium*	

*** Non-native Species** **+ Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
St. Peter's-wort	*Hypericum crux-andreae*	
Pineweeds	*Hypericum gentianoides*	
St. Andrew's-cross	*Hypericum hypericoides*	
Dwarf St. John's-wort	*Hypericum mutilum*	
Atlantic St. John's-wort	*Hypericum tenuifolium*	
Fourpetal St. John's-wort	*Hypericum tetrapetalum*	
Clustered bushmint	*Hyptis alata*	
Tropical bushmint	*Hyptis mutabilis* *	
Carolina holly; Sand holly	*Ilex ambigua*	
Dahoon	*Ilex cassine*	
Large gallberry	*Ilex coriacea*	
Inkberry; Gallberry	*Ilex glabra*	
American holly	*Ilex opaca*	
Yaupon	*Ilex vomitoria*	
Hairy indigo	*Indigofera hirsuta* *	
Anil de pasto	*Indigofera suffruticosa* *	
Scarletcreeper	*Ipomoea hederifolia* *	
Largeroot morning-glory	*Ipomoea macrorhiza* *	
Tievine	*Ipomoea cordatotriloba*	
Man-of-the-earth	*Ipomoea pandurata*	
Juba's bush	*Iresine diffusa*	
Virginia willow	*Itea virginica*	
Pineland waterwillow	*Justicia angusta*	
Virginia saltmarsh mallow	*Kosteletzkya pentacarpos*	
Virginia dwarfdandelion	*Krigia virginica*	
Japanese clover	*Kummerowia striata* *	
Grassleaf lettuce	*Lactuca graminifolia*	
Crapemyrtle	*Lagerstroemia indica* *	
Lantana; Shrubverbena	*Lantana camara* *	
Hairy pinweed	*Lechea mucronata*	
Piedmont pinweed	*Lechea torreyi*	
Virginia pepperweed	*Lepidium virginicum*	
Hairy lespedeza	*Lespedeza hirta*	
Slender gayfeather	*Liatris gracilis*	
Shortleaf gayfeather	*Liatris tenuifolia* var. *quadriflora*	
Gopher apple	*Licania michauxii*	
Glossy privet	*Ligustrum lucidum* *	
Chinese privet	*Ligustrum sinense* *	
Canadian toadflax	*Linaria canadensis*	
Apalachicola toadflax	*Linaria floridana*	

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Yellowseed false pimpernel	*Lindernia dubia* var. *anagallidea*	
Sweetgum	*Liquidambar styraciflua*	
White lobelia	*Lobelia paludosa*	
Japanese honeysuckle	*Lonicera japonica* *	
Coral honeysuckle	*Lonicera sempervirens*	
Piedmont primrosewillow	*Ludwigia arcuata*	
Wingleaf primrosewillow	*Ludwigia decurrens*	
Anglestem primrosewillow	*Ludwigia leptocarpa*	
Seaside primrosewillow	*Ludwigia maritima*	
Smallfruit primrosewillow	*Ludwigia microcarpa*	
Mexican primrosewillow	*Ludwigia octovalvis*	
Marsh seedbox	*Ludwigia palustris*	
Peruvian primrosewillow	*Ludwigia peruviana* *	
Hairy primrosewillow	*Ludwigia pilosa*	
Shrubby primrosewillow	*Ludwigia suffruticosa*	
Skyblue lupine	*Lupinus diffusus*	
Taperleaf waterhorehound	*Lycopus rubellus*	
Rusty staggerbush	*Lyonia ferruginea*	
Coastalplain staggerbush	*Lyonia fruticosa*	
Maleberry	*Lyonia ligustrina* var. *foliosiflora*	
Fetterbush	*Lyonia lucida*	
Winged loosestrife	*Lythrum alatum*	
Catclawvine	*Macfadyena unguis-cati* *	
Southern magnolia	*Magnolia grandiflora*	
Sweetbay	*Magnolia virginiana*	
Florida milkvine	*Matelea floridana*	MEH
Axilflower	*Mecardonia acuminata*	
Black medick	*Medicago lupulina* *	
Snow squarestem	*Melanthera nivea*	
Chinaberrytree	*Melia azedarach* *	
White sweetclover	*Melilotus albus* *	
Creeping cucumber	*Melothria pendula*	
Shade mudflower	*Micranthemum umbrosum*	
Florida Keys hempvine	*Mikania cordifolia*	
Climbing hempvine	*Mikania scandens*	
Sensitive brier	*Mimosa quadrivalvis*	
Four-o'clock	*Mirabilis jalapa* *	
Partridgeberry	*Mitchella repens*	
Lax hornpod	*Mitreola petiolata*	
Carolina bristlemallow	*Modiola caroliniana*	

* Non-native Species + Extirpated

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Indian chickweed	*Mollugo verticillata* *	
Spotted beebalm	*Monarda punctata*	
Indianpipe	*Monotropa uniflora*	
Red mulberry	*Morus rubra*	
Southern bayberry; Wax myrtle	*Myrica cerifera*	
Parrot feather watermilfoil	*Myriophyllum aquaticum* *	
Heavenly bamboo	*Nandina domestica* *	
European watercress	*Nasturtium officinale* *	
American lotus	*Nelumbo lutea*	
Spatterdock	*Nuphar advena*	
Yellow waterlily	*Nymphaea mexicana*	
American white waterlily	*Nymphaea odorata*	
Big floatingheart	*Nymphoides aquatica*	
Swamp tupelo	*Nyssa sylvatica* var. *biflora*	
Blackgum	*Nyssa sylvatica*	
Whitetop aster	*Oclemena reticulata*	
Cutleaf eveningprimrose	*Oenothera laciniata*	
Flattop mille graines	*Oldenlandia corymbosa* *	
Clustered mille graines	*Oldenlandia uniflora*	
Pricklypear	*Opuntia humifusa*	
Wild olive	*Osmanthus americanus*	
Eastern hophornbeam	*Ostrya virginiana*	
Common yellow woodsorrel	*Oxalis corniculata*	
Pink woodsorrel	*Oxalis debilis* *	
Butterweed	*Packera glabella*	
Skunkvine	*Paederia foetida* *	
Coastalplain palafox	*Palafoxia integrifolia*	
Florida pellitory	*Parietaria floridana*	
Clustered pellitory	*Parietaria praetermissa*	
Baldwin's nailwort	*Paronychia baldwinii*	
Virginia creeper	*Parthenocissus quinquefolia*	
Hale's pentodon	*Pentodon pentandrus*	
Annual phlox	*Phlox drummondii* *	
Florida false sunflower	*Phoebanthus grandiflorus*	
Oak mistletoe	*Phoradendron leucarpum*	
Red chokeberry	*Photinia pyrifolia*	
Turkey tangle fogfruit	*Phyla nodiflora*	
Carolina leafflower	*Phyllanthus caroliniensis*	
Mascarene Island leafflower	*Phyllanthus tenellus* *	
Cutleaf groundcherry	*Physalis angulata*	

Common Name	***Scientific Name***	**Primary Habitat Codes (for Imperiled Species)**
Clammy groundcherry	*Physalis heterophylla*	
Blueflower butterwort	*Pinguicula caerulea*	MF, WF
Yellow butterwort	*Pinguicula lutea*	MF, WF
Small butterwort	*Pinguicula pumila*	
Pitted stripeseed	*Piriqueta cistoides* subsp. *caroliniana*	
Narrowleaf silkgrass	*Pityopsis graminifolia*	
Rosy camphorweed	*Pluchea baccharis*	
Stinking camphorweed	*Pluchea foetida*	
Sweetscent	*Pluchea odorata*	
Paintedleaf	*Poinsettia cyathophora*	
Orange milkwort	*Polygala lutea*	
Candyroot	*Polygala nana*	
Yellow milkwort	*Polygala rugelii*	
Showy milkwort	*Polygala violacea*	
Denseflower knotweed	*Polygonum glabrum*	
Hairy smartweed	*Polygonum hirsutum*	
Mild waterpepper	*Polygonum hydropiperoides*	
Mexican tearthumb	*Polygonum meisnerianum* var. *beyrichianum*	BM
Pennsylvania smartweed	*Polygonum pensylvanicum*	
Dotted smartweed	*Polygonum punctatum*	
Climbing false buckwheat	*Polygonum scandens*	
Bog smartweed	*Polygonum setaceum*	
Jumpseed	*Polygonum virginianum*	
Hardy orange	*Poncirus trifoliata* *	
Paraguayan purslane	*Portulaca amilis* *	
Carolina laurelcherry	*Prunus caroliniana*	
Peach	*Prunus persica* *	
Black cherry	*Prunus serotina*	
Flatwoods plum; Hog plum	*Prunus umbellata*	
Sweet everlasting	*Pseudognaphalium obtusifolium*	
Common hoptree; Wafer ash	*Ptelea trifoliata*	
Blackroot	*Pterocaulon pycnostachyum*	
Mock bishopsweed	*Ptilimnium capillaceum*	
Kudzu	*Pueraria montana* *	
Carolina desertchicory	*Pyrrhopappus carolinianus*	
Common pear	*Pyrus communis* *	
Bastard white oak	*Quercus austrina*	
Chapman's oak	*Quercus chapmanii*	
Spanish oak; Southern red oak	*Quercus falcata*	
Sand live oak	*Quercus geminata*	

*** Non-native Species   + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Bluejack oak	*Quercus incana*	
Turkey oak	*Quercus laevis*	
Laurel oak; Diamond oak	*Quercus laurifolia*	
Sand post oak	*Quercus margaretta*	
Basket oak; Swamp chestnut oak	*Quercus michauxii*	
Dwarf live oak	*Quercus minima*	
Water oak	*Quercus nigra*	
Running oak	*Quercus pumila*	
Live oak	*Quercus virginiana*	
Low spearwort	*Ranunculus pusillus*	
Wild radish	*Raphanus raphanistrum* *	
Pale meadowbeauty	*Rhexia mariana*	
Fringed meadowbeauty	*Rhexia petiolata*	
Sweet pinxter azalea	*Rhododendron canescens*	
Winged sumac	*Rhus copallinum*	
Least snoutbean	*Rhynchosia minima*	
Tropical Mexican clover	*Richardia brasiliensis* *	
Rough Mexican clover	*Richardia scabra* *	
Castorbean	*Ricinus communis* *	
Bog yellowcress	*Rorippa palustris*	
Swamp rose	*Rosa palustris*	
Sand blackberry	*Rubus cuneifolius*	
Sawtooth blackberry	*Rubus pensilvanicus*	
Southern dewberry	*Rubus trivialis*	
Carolina wild petunia	*Ruellia caroliniensis*	
Britton's wild petunia	*Ruellia simplex* *	
Curly dock	*Rumex crispus* *	
Heartwing dock	*Rumex hastatulus*	
Swamp dock	*Rumex verticillatus*	
Shortleaf rosegentian	*Sabatia brevifolia*	
Smallflower mock buckthorn	*Sageretia minutiflora*	
Trailing pearlwort	*Sagina decumbens*	
Carolina willow	*Salix caroliniana*	
Lily-of-the-valley vine	*Salpichroa origanifolia* *	
Lyreleaf sage	*Salvia lyrata*	
American elder; Elderberry	*Sambucus nigra*	
Pineland pimpernel	*Samolus valerandi* subsp. *parviflorus*	
Canadian blacksnakeroot	*Sanicula canadensis*	
Soapberry	*Sapindus saponaria*	
Popcorntree; Chinese tallowtree	*Sapium sebiferum* *	

*** Non-native Species   + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Hooded pitcherplant	*Sarracenia minor*	MF, WF
Lizard's tail	*Saururus cernuus*	
Sweetbroom	*Scoparia dulcis*	
Hoary skullcap	*Scutellaria incana*	
Helmet skullcap	*Scutellaria integrifolia*	
Coffeeweed; Sicklepod	*Senna obtusifolia*	
Septicweed	*Senna occidentalis* *	
Whitetop aster	*Sericocarpus tortifolius*	
Danglepod	*Sesbania herbacea*	
Rattlebox	*Sesbania punicea* *	
Bladderpod	*Sesbania vesicaria* *	
Yaupon blacksenna	*Seymeria cassioides*	
Piedmont blacksenna	*Seymeria pectinata*	
Cuban jute	*Sida rhombifolia*	
Common wireweed	*Sida ulmifolia*	
Silver buckthorn	*Sideroxylon alachuense*	MEH
Gum bully	*Sideroxylon lanuginosum*	
Florida bully	*Sideroxylon reclinatum*	
Sleepy catchfly	*Silene antirrhina*	
Hedgemustard	*Sisymbrium officinale* *	
American black nightshade	*Solanum americanum*	
Soda apple; Cockroachberry	*Solanum capsicoides*	
Carolina horsenettle	*Solanum carolinense*	
Black nightshade	*Solanum chenopodioides*	
Tropical soda apple	*Solanum viarum* *	
Pinebarren goldenrod	*Solidago fistulosa*	
Giant goldenrod	*Solidago gigantea*	
Elliott's goldenrod	*Solidago latissimifolia*	
Leavenworth's goldenrod	*Solidago leavenworthii*	
Anisescented goldenrod	*Solidago odora*	
Spiny sowthistle	*Sonchus asper* *	
Common sowthistle	*Sonchus oleraceus* *	
Florida hedgenettle	*Stachys floridana*	
Common chickweed	*Stellaria media* *	
Queensdelight	*Stillingia sylvatica*	
Pineland scalypink	*Stipulicida setacea*	
Pink fuzzybean	*Strophostyles umbellata*	
Rice button aster	*Symphyotrichum dumosum*	
Elliott's aster	*Symphyotrichum elliottii*	
Annual saltmarsh aster	*Symphyotrichum subulatum*	

Common Name	*Scientific Name*	Primary Habitat Codes (for Imperiled Species)
Pink baby's-breath	*Talinum paniculatum* *	
Scurf hoarypea	*Tephrosia chrysophylla*	
Sprawling hoarypea	*Tephrosia hispidula*	
Spiked hoarypea	*Tephrosia spicata*	
Wood sage	*Teucrium canadense*	
Climbing dogbane	*Thyrsanthella difformis*	
Carolina basswood	*Tilia americana* var. *caroliniana*	
Eastern poison ivy	*Toxicodendron radicans*	
Virginia marsh St. John's-wort	*Triadenum virginicum*	
Greater marsh St. John's-wort	*Triadenum walteri*	
Forked bluecurls	*Trichostema dichotomum*	
Carolina clover	*Trifolium carolinianum*	
White clover	*Trifolium repens* *	
Clasping Venus' looking-glass	*Triodanis perfoliata*	
Winged elm	*Ulmus alata*	
American elm	*Ulmus americana*	
Caesarweed	*Urena lobata* *	
Heartleaf nettle	*Urtica chamaedryoides*	
Leafy bladderwort	*Utricularia foliosa*	
Humped bladderwort	*Utricularia gibba*	
Floating bladderwort	*Utricularia inflata*	
Zigzag bladderwort	*Utricularia subulata*	
Sparkleberry	*Vaccinium arboreum*	
Highbush blueberry	*Vaccinium corymbosum*	
Shiny blueberry	*Vaccinium myrsinites*	
Deerberry	*Vaccinium stamineum*	
Florida valerian	*Valeriana scandens*	
Tuberous vervain	*Verbena rigida* *	
Brazilian vervain	*Verbena brasiliensis* *	
Herb-of-the-cross	*Verbena officinalis* *	
White crownbeard	*Verbesina virginica*	
Tall ironweed	*Vernonia angustifolia*	
Giant ironweed	*Vernonia gigantea*	
Neckweed	*Veronica peregrina* *	
Possumhaw	*Viburnum nudum*	
Rusty blackhaw	*Viburnum rufidulum*	
Fourleaf vetch	*Vicia acutifolia*	
Bog white violet	*Viola lanceolata*	
Early blue violet	*Viola palmata*	
Primroseleaf violet	*Viola primulifolia*	

Common Name	***Scientific Name***	**Primary Habitat Codes (for Imperiled Species)**
Prostrate blue violet	*Viola walteri*	
Summer grape	*Vitis aestivalis*	
Florida grape	*Vitis cinerea* var. *floridana*	
Muscadine	*Vitis rotundifolia*	
Frost grape	*Vitis vulpina*	
Southern rockbell	*Wahlenbergia marginata* *	
Chinese wisteria	*Wisteria sinensis* *	
Cockleburr	*Xanthium strumarium* *	
Elephant ear	*Xanthosoma sagittifolium* *	
Tallow wood; hog plum	*Ximenia americana*	
Hercules-club	*Zanthoxylum clava-herculis*	

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
INVERTEBRATES		
Giant Water Bug	*Belostoma testaceum*	MTC
Cockroach	*Blattella asahinai*	MTC
American Bumble Bee	*Bombus pennsylvanicus*	MTC
Eastern Leaf-footed Bug	*Leptoglossus phyllopus*	MTC
Uhler's Water Bug	*Lethocerus uhleri*	MTC
Aphid	*Phylloxera caryaecaudalis*	MTC
Palmetto Weevil	*Rhynchophorus cruentatus*	MTC
Beetles		
Metallic Wood-boring Beetle	*Acmaeodera tubulus*	MTC
Twolined Chestnut Borer	*Agrilus bilineatus*	MTC
Blind Click Beetle	*Alaus myops*	MTC
False Mealworm Beetle	*Alobates pennsylvanica*	MTC
Longhorned Beetle	*Anelaphus parallelus*	MTC
Metallic Wood-boring Beetle	*Chrysobothris chryseola*	MTC
Moustached Tiger Beetle	*Cicindela hirtilabris*	MTC
Two-horned Darkling Beetle	*Neomida bicornis*	MTC
Tortoise Beetle	*Octotoma plicatula*	MTC
Rainbow Scarab Beetle	*Phaneus vindex*	MTC
Redbay Ambrosia Beetle	*Xyleborus glabratus*	MTC
Grasshoppers (GH)		
Longheaded Toothpick GH	*Achurum carnatum*	MTC
Brown Winter GH	*Amblytropidia mysteca*	MTC
Wingless Florida GH	*Aptenopedes apterae*	MTC
Linearwinged GH	*Aptenopedes sphenaroides*	MTC
Southern Yellowwinged GH	*Arphia granulata*	MTC
Southern Greenstriped GH	*Chortophaga australior*	MTC
Elegant GH	*Dichromorpha elegans*	MTC
Shortwinged Green GH	*Dichromorpha viridis*	MTC
Keeler's Spur-throat GH	*Melanophus keeleri*	MTC
Spur-throat GH	*Melanophus rotundipennis*	MTC
Migratory GH	*Melanophus sanguinipes*	MTC
Spotwinged GH	*Orphulella pelidna*	MTC
Atlantic GH	*Paroxya atlantica*	MTC
Olivegreen Swamp GH	*Paroxya clavuliger*	MTC
Longhorn Bandwinged GH	*Psinidia fenestralis*	MTC
Rusty GH	*Schistocerca alutacea*	MTC

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
American GH	*Schistocerca americana*	MTC
Mischievous GH	*Schistocerca damnifica*	MTC
Ridgeback Sand GH	*Spharagemon cristatum*	MTC
Marbled GH	*Spharagemon marmorata*	MTC
Dragonflies		
Common Green Darner	*Anax junius*	MTC
Four-spotted Pennant	*Brachymesia gravida*	MTC
Halloween Pennant	*Celithemis eponina*	MTC
Faded Pennant	*Celithemis ornata*	MTC
Regal Darner	*Coryphaeschna ingens*	MTC
Scarlet Skimmer	*Crocothemis servilia*	MTC
Swamp Darner	*Epiaeschna heros*	MTC
Stripe-winged Baskettail	*Epitheca costalis*	MTC
Prince Baskettail	*Epitheca princeps*	BST
Eastern Pondhawk	*Erythemis simplicicollis*	MTC
Golden-winged Skimmer	*Libellula auripennis*	MTC
Bar-winged Skimmer	*Libellula axilena*	MTC
Slaty Skimmer	*Libellula incesta*	BST
Needham's Skimmer	*Libellula needhami*	MTC
Great Blue Skimmer	*Libellula vibrans*	MTC
Greater Hyacinth Glider	*Miathyria marcella*	MTC
Blue Dasher	*Pachydiplax longipennis*	MTC
Eastern Amberwing	*Perithemis tenera*	MTC
Carolina Saddlebags	*Tramea carolina*	MTC
Phantom Darner	*Triacanthagyna trifida*	MTC
Butterflies		
Gulf Fritillary	*Agraulis vanillae*	MTC
Lacewing Roadside Skipper	*Amblyscirtes aesculapius*	MEH
Least Skipper	*Ancyloxypha numitor*	MTC
Hackberry Emperor	*Asterocampa celtis*	MEH
Tawny Emperor	*Asterocampa clyton*	MEH, BF,UHF
Sachem Skipper	*Atalopedes campestris*	MTC
Great Purple Hairstreak	*Atlides halesus*	MTC
Viceroy	*Basilarchia archippus*	MTC
Southern Skipperling	*Copaeodes minima*	BM
Gemmed Satyr	*Cyllopsis gemma*	MEH
Queen	*Danaus gilippus berenice*	MTC
Monarch	*Danaus plexippus*	MTC

* Non-native Species + Extirpated

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Silver-spotted Skipper	*Epargyreus clarus*	MTC
Horace's Duskywing	*Erynnis horatius*	MTC
Variegated Fritillary	*Euptoieta claudia*	MTC
Dion Skipper	*Euphyes dion*	MEH, BM
Barred Yellow	*Eurema daira*	MTC
Sleepy Orange	*Eurema nicippe*	UP, MF, SH
Zebra Swallowtail	*Eurytides marcellus*	SH, UP
Zebra Heliconian	*Heliconius charithonia*	MTC
Ceranus Blue	*Hemiargus ceranus*	MTC
Giant Swallowtail	*Heraclides cresphontes*	MTC
Carolina Satyr	*Hermeuptychia sosybius*	MTC
Fiery Skipper	*Hylephila phyleus*	MTC
Common Buckeye	*Junonia coenia*	MTC
Clouded Skipper	*Lerema accuis*	MTC
Southern Pearly-eye	*Lethe portlandia*	MEH
Viola's Wood Satyr	*Megisto viola*	MTC
Ocola Skipper	*Panoquina ocola*	MTC
Black Swallowtail	*Papiliio polyxenes*	MTC
White M Hairstreak	*Parhasius m-album*	MTC
Cloudless Sulphur	*Phoebis sennae*	MTC
Phaon Crescent	*Phyciodes phaon*	MTC
Pearl Crescent	*Phyciodes tharos*	MTC
Question Mark	*Polygonia interrogationis*	MEH, BF, UHF
Byssus Skipper	*Problema byssus*	MTC
Palamedes Swallowtail	*Pterourus palamedes*	MTC
Spicebush Swallowtail	*Pterourus troilus*	MTC
Common Checkered-Skipper	*Pyrgus communis*	MTC
Tropical Checkered-Skipper	*Pyrgus oileus*	MTC
Hayhurst's Scallopwing	*Staphylus hayhurstii*	MEH, BM
Gray Hairstreak	*Strymon melinus*	MTC
Long-tailed Skipper	*Urbanus proteus*	MTC
Red Admiral	*Vanessa atalanta*	MTC
Painted Lady	*Vanessa cardui*	MTC

Moths

Extensive lists of moth species observed at Paynes Prairie Preserve State Park based on annual surveys from 2007 to 2012 by researchers from the Florida Museum of Natural History, McGuire Center for Lepidoptera & Biodiversity are available from the Bureau of Parks District 2 Office.

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Snails		
Ocala Liptooth	*Daedalochila auriculata*	MTC
Gulf Hammock Liptooth	*Daedalochila delecta*	MTC

FISH

Mud Sunfish	*Acantharchus pomotis*	MLK, BST
Yellow Bullhead	*Ameiurus natalis*	BST
Brown Bullhead	*Ameiurus nebulosus*	CULK, BST
Bowfin	*Amia calva*	CULK, MLK, CD
Pirate Perch	*Aphredoderus sayanus*	MLK
Flier	*Centrarchus macropterus*	CULK, MLK
American Gizzard Shad	*Dorosoma cepedianum*	BST
Threadfin Shad	*Dorosoma petenense*	BST
Everglades Pygmy Sunfish	*Elassoma evergladei*	BM, MLK
Okefenokee Pygmy Sunfish	*Elassoma okefenokee*	BM, MLK
Banded Pygmy Sunfish	*Elassoma zonatum*	BM, MLK
Bluespotted Sunfish	*Enneacanthus gloriosus*	BM, CULK, MLK
Banded Sunfish	*Enneacanthus obesus*	BM, CULK, MLK
Lake Chubsucker	*Erimyzon sucetta*	CULK
Redfin Pickerel	*Esox americanus*	CULK, MLK
Chain Pickerel	*Esox niger*	MLK, BST
Swamp Darter	*Etheostoma fusiforme*	MLK
Golden Topminnow	*Fundulus chrysotus*	MLK, BST
Lined Topminnow	*Fundulus lineolatus*	CULK, MLK
Seminole Killifish	*Fundulus seminolis*	CULK, MLK
Mosquitofish	*Gambusia affinis*	BM, DM, CULK, MLK, BST, CD
Least Killifish	*Heterandria formosa*	BST
Brown Hoplo; Atipa	*Hoplosternum littorale* *	BM, MLK, CD
Flagfish	*Jordanella floridae*	MLK
Brook Silverside	*Labidesthes sicculus*	CULK, BST
Florida Gar	*Lepisosteus platyrhincus*	CULK, MLK, BST
Pygmy Killifish	*Leptolucania ommata*	MLK
Redbreast Sunfish	*Lepomis auritus*	BST
Warmouth	*Lepomis gulosus*	CULK
Bluegill	*Lepomis macrochirus*	CULK, MLK
Dollar Sunfish	*Lepomis marginatus*	BST
Redear Sunfish	*Lepomis microlophus*	CULK, MLK, BST
Spotted sunfish	*Lepomis punctatus*	CULK, MLK, BST
Bluefin Killifish	*Lucania goodei*	MLK, SRST

* Non-native Species + Extirpated

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Largemouth Black Bass	*Micropterus salmoides*	CULK, MLK, BST
White Bass	*Morone chrysops*	CULK
Golden Shiner	*Notemigonus crysoleucas*	CULK, MLK
Ironcolor Shiner	*Notropis chalybaeus*	BST, SST
Redeye Chub	*Notropis harperi*	SRST
Taillight Shiner	*Notropis maculatus*	MLK, BST
Tadpole Madtom	*Noturus gyrinus*	MLK
Speckled Madtom	*Noturus leptacanthus*	MLK
Blue Tilapia	*Oreochromis aureus* *	MLK, CD
Sailfin Molly	*Poecilia latipinna*	CULK, MLK
Black Crappie	*Pomoxis nigromaculatus*	CULK
Eastern Mudminnow	*Umbra pygmaea*	MLK

AMPHIBIANS

Frogs and Toads

Southern Cricket Frog	*Acris gryllus*	BM, BG, DM
Southern Toad	*Anaxyrus terrestris*	MEH, ABP
Greenhouse Frog	*Eleutherodactylus planirostris* *	MEH, UP, ABP
Eastern Narrowmouth Toad	*Gastrophryne carolinensis*	MF, MEH, WF
Green Treefrog	*Hyla cinerea*	MF, MEH, BM
Pine Woods Treefrog	*Hyla femoralis*	MF, WF
Barking Treefrog	*Hyla gratiosa*	MF, MEH
Squirrel Treefrog	*Hyla squirella*	MF, MEH
Spring Peeper	*Pseudacris crucifer*	BG, DM
Southern Chorus Frog	*Pseudacris nigrita*	MF, WF
Little Grass Frog	*Pseudacris ocularis*	MF, DM
Eastern Spadefoot Toad	*Scaphiopus holbrookii*	MEH, UP
American Bullfrog	*Lithobates catesbeiana*	CULK, MLK
Pig Frog	*Lithobates grylio*	CULK, MLK
Southern Leopard Frog	*Lithobates sphenocephala*	BM, DM, SKLK

Salamanders and Newts

Mole Salamander	*Ambystoma talpoideum*	MF, MEH
Eastern Tiger Salamander	*Ambystoma tigrinum*	MEH, UP
Two-toed Amphiuma	*Amphiuma means*	BM, MLK, CD
Southern Dusky Salamander	*Desmognathus auriculatus*	BG, SST
Dwarf Salamander	*Eurycea quadridigitata*	BG, WF
Peninsula Newt	*Notophthalmus viridescens*	BM, MLK

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Sirens		
Narrow-striped Dwarf Siren	*Pseudobranchus axanthus axanthus*	BM, MLK, CD
Eastern Lesser Siren	*Siren intermedia intermedia*	BM, MLK, CD
Greater Siren	*Siren lacertina*	BM, MLK, CD
REPTILES		
Crocodilians		
American Alligator	*Alligator mississippiensis*	BM, CULK, MLK, SKLK
Turtles		
Florida Softshell	*Apalone ferox*	CULK, MLK, CD
Florida Snapping Turtle	*Chelydra serpentina osceola*	CULK, MLK
Chicken Turtle	*Deirochelys reticularia*	BM, DM
Gopher Tortoise	*Gopherus polyphemus*	MF, SH, UP, ABP, PSI
Striped Mud Turtle	*Kinosternon baurii*	BM, MLK
Eastern Mud Turtle	*Kinosternon subrubrum*	BM, MLK
Florida Cooter	*Pseudemys concinna floridana*	CULK, MLK, BST, CD
Florida Red-bellied Cooter	*Pseudemys nelsoni*	CULK, MLK, BST, CD
Eastern Musk Turtle; Stinkpot	*Sternotherus odoratus*	BM, CULK, MLK
Florida Box Turtle	*Terrapene carolina*	MF, MEH, UHF
Yellow-bellied Slider	*Trachemys scripta scripta*	CULK, MLK
Worm Lizards		
Florida Wormlizard	*Rhineura floridana*	SH, UP, ABP
Lizards		
Green Anole	*Anolis carolinensis*	MF, MEH
Brown Anole	*Anolis sagrei* *	DV
Six-lined Racerunner	*Aspidoscelis sexlineatus*	MF, SH, SCF
Broad-headed Skink	*Plestiodon laticeps*	MEH
Southeastern Five-lined Skink	*Plestiodon inexpectatus*	MF, MEH, UP
Mediterranean Gecko	*Hemidactylus turcicus* *	DV
Eastern Slender Glass Lizard	*Ophisaurus attenuatus longicaudus*	SH, SCF, UP
Eastern Glass Lizard	*Ophisaurus ventralis*	MF, MEH
Eastern Fence Lizard	*Sceloporus undulatus*	SH, UP
Ground Skink	*Scincella lateralis*	MEH, UP
Snakes		
Florida Cottonmouth	*Agkistrodon piscivorus conanti*	BM, BS, BM, CD
Scarletsnake	*Cemophora coccinea*	MF, MEH

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Southern Black Racer	*Coluber constrictor priapus*	MTC
Eastern Coachwhip	*Coluber flagellum flagellum*	SH, SCF, UP
Eastern Diamondback Rattlesnake	*Crotalus adamanteus*	MF, MEH, UP, ABP
Southern Ringnecked Snake	*Diadophis punctatus punctatus*	MF, MEH
Eastern Indigo Snake	*Drymarchon couperi*	MEH, UP
Eastern Mud Snake	*Farancia abacura abacura*	BM, MLK, CD
Eastern Hognose Snake	*Heterodon platyrhinos*	MF, MEH
Eastern Kingsnake	*Lampropeltis getula getula*	MF, MEH, BM
Scarlet Kingsnake	*Lampropeltis elapsoides*	MF, UP
Eastern Coral Snake	*Micrurus fulvius*	MF, MEH
Florida Water Snake	*Nerodia fasciata pictiventris*	BM, CULK, MLK
Florida Green Water Snake	*Nerodia floridana*	BM, MLK
Brown Water Snake	*Nerodia taxispilota*	BST
Rough Green Snake	*Opheodrys aestivus*	MF, MEH
Eastern Ratsnake	*Pantherophis alleghaniensis*	MTC
Eastern Corn Snake	*Pantherophis guttatus*	MF, UP
Florida Pine Snake	*Pituophis melanoleucus mugitus*	SH, UP, ABP
Striped Crayfish Snake	*Regina alleni*	BM, MLK
Pine Woods Snake	*Rhadinaea flavilata*	MF, UP
Black Swamp Snake	*Seminatrix pygaea*	BM, MLK
Dusky Pigmy Rattlesnake	*Sistrurus miliarius barbouri*	MF, WF
Florida Brown Snake	*Storeria victa*	MEH, BM
Florida Redbelly Snake	*Storeria occipitomaculata obscura*	MEH, UP
Florida Crowned Snake	*Tantilla relicta*	SH, SCF, UP
Peninsula Ribbon Snake	*Thamnophis sauritus sackenii*	MF, MEH, UP
Eastern Garter Snake	*Thamnophis sirtalis sirtalis*	MEH

BIRDS

Waterfowl

Black-bellied Whistling-Duck	*Dendrocygna autumnalis*	BM, MLK, SKLK, CD
Fulvous Whistling-Duck	*Dendrocygna bicolor*	BM, MLK
Greater White-fronted Goose	*Anser albifrons*	BM, MLK
Snow Goose (incl.Bl. Goose)	*Chen caerulescens*	BM, MLK
Ross's Goose	*Chen rossii*	BM
Canada Goose	*Branta canadensis*	BM, MLK
Tundra Swan (Whistling)	*Cygnus columbianus*	BM, MLK
Muscovy Duck	*Cairina moschata*	BM
Wood Duck	*Aix sponsa*	BM, DM, MLK, SKLK
Gadwall	*Anas strepera*	BM, CULK, MLK

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
American Wigeon	*Anas americana*	BM, CULK, MLK
American Black Duck	*Anas rubripes*	BM, MLK
Mallard	*Anas platyrhynchos*	BM, CULK, MLK
Mottled Duck (Florida)	*Anas fulvigula*	BM, MLK
Blue-winged Teal	*Anas discors*	BM, CULK, MLK
Northern Shoveler	*Anas clypeata*	BM, CULK, MLK
Northern Pintail	*Anas acuta*	BM, CULK, MLK
Green-winged Teal	*Anas crecca*	BM, CULK, MLK
Canvasback	*Aythya valisineria*	CULK, MLK
Redhead	*Aythya americana*	CULK, MLK
Ring-necked Duck	*Aythya collaris*	BM, CULK, MLK
Lesser Scaup	*Aythya affinis*	CULK, MLK
Greater Scaup	*Aythya marila*	OF
White-winged Scoter	*Melanitta fusca*	OF
Bufflehead	*Bucephala islandica*	CULK, MLK
Common Goldeneye	*Bucephala clangula*	CULK, MLK
Hooded Merganser	*Lophodytes cucullatus*	BM, CULK, MLK
Red-breasted Merganser	*Mergus serrator*	CULK, MLK
Ruddy Duck	*Oxyura jamaicensis*	CULK, MLK
Turkeys		
Wild Turkey	*Meleagris gallopavo*	BM, MF, MEH, ABP
New World Quails		
Northern Bobwhite	*Colinus virginianus*	BM, MF, ABP
Loons		
Red-throated Loon	*Gavia stellata*	OF
Common Loon	*Gavia immer*	OF
Grebes		
Pied-billed Grebe	*Podilymbus podiceps*	BM, CULK, MLK, CD
Horned Grebe	*Podiceps auritus*	CULK, MLK
Pelicans		
American White Pelican	*Pelecanus erythrorhynchos*	MLK, OF
Brown Pelican	*Pelecanus occidentalis*	MLK, CULK, OF
Cormorants		
Double-crested Cormorant	*Phalocrocorax auritus*	BM, CULK, MLK, CD, OF

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Anhingas		
Anhinga	*Anhinga anhinga*	BM, CULK, MLK, CD, OF
Frigatebirds		
Magnificent Frigatebird	*Fregata magnificens*	OF
Herons, Egrets, and Bitterns		
American Bittern	*Botaurus lentiginosus*	BM, MLK
Least Bittern	*Ixobrychus exilis*	BM
Great Blue Heron	*Ardea herodias*	BM, DM, MLK, CD
Great Egret	*Ardea alba*	BM, MLK, CD
Snowy Egret	*Egretta thula*	BM, MLK, CD
Little Blue Heron	*Egretta caerulea*	BM, DM, MLK, CD
Tricolored Heron	*Egretta tricolor*	BM, MLK, CD
Cattle Egret	*Bubulcus ibis*	BM, ABP, PI, PSI
Green Heron	*Butorides virescens*	BM, DM, MLK, CD
Black-crowned Night-Heron	*Nycticorax nycticorax*	BM, MLK, CD
Yellow-crowned Night-Heron	*Nyctanassa violacea*	BM, MLK, CD
Ibis and Spoonbills		
White Ibis	*Eudocimus albus*	BM, MLK, CD
Glossy Ibis	*Plegadis falcinellus*	BM, MLK, CD
White-faced Ibis	*Plegadis chihi*	BM, MLK
Roseate Spoonbill	*Platalea ajaja*	BM, MLK, SKLK
Storks		
Wood Stork	*Mycteria americana*	BM, BM, MLK, CD
New World Vultures		
Black Vulture	*Coragyps atratus*	OF, MTC
Turkey Vulture	*Cathartes aura*	OF, MTC
Hawks, Eagles, and Kites		
Osprey	*Pandion haliaetus*	BM, MLK, SKLK
Swallow-tailed Kite	*Elanoides forficatus*	BM, CD, OF
White-tailed Kite	*Elanus leucurus*	BM, OF
Snail Kite	*Rostrhamus sociabilis*	BM, SKLK, CD, OF
Mississippi Kite	*Ictinia mississippiensis*	MEH, OF
Bald Eagle	*Haliaeetus leucocephalus*	CULK, MLK, SKLK, OF
Northern Harrier	*Circus cyaneus*	BM, OF

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Sharp-shinned Hawk	*Accipiter striatus*	MEH, BM, OF
Cooper's Hawk	*Accipiter cooperi*	MEH, BM, OF
Red-shouldered Hawk	*Buteo lineatus*	BM, BS, MEH, MF
Broad-winged Hawk	*Buteo platypterus*	MEH
Short-tailed Hawk	*Buteo brachyurus*	OF
Red-tailed Hawk	*Buteo jamaicensis*	BM, MEH, ABP, PSI
Rough-legged Hawk	*Buteo lagopus*	OF
Golden Eagle	*Aquila chrysaetos*	OF
Falcons and Caracaras		
Crested Caracara	*Caracara cheriway*	BM, OF
American Kestrel	*Falco sparverius*	BM, SH, PSI, PI
Merlin	*Falco columbarius*	BM, OF
Peregrine Falcon	*Falco peregrinus*	BM, MLK, OF
Rails and Coots		
Yellow Rail	*Coturnicops noveboracensis*	BM
Black Rail	*Laterallus jamaicensis*	BM
King Rail	*Rallus elegans*	BM, CD
Virginia Rail	*Rallus limicola*	BM, CD
Sora	*Porzana carolina*	BM, CD
Purple Gallinule	*Poryphyrula martinica*	BM, MLK, CD
Common Moorhen	*Gallinula chloropus*	BM, MLK, CULK, CD
American Coot	*Fulica americana*	BM, MLK, CULK, CD
Limpkins		
Limpkin	*Aramus guarauna*	BM, BST, SLLK, CD
Cranes		
Sandhill Crane	*Grus canadensis*	BM, MLK, OF
Whooping Crane	*Grus americana*	BM, MLK, OF
Plovers		
Black-bellied-Plover	*Pluvialis squatarola*	BM
Am. Golden-Plover	*Recurvirostra americana*	BM
Semipalmated Plover	*Charadrius semipalmatus*	BM
Killdeer	*Charadrius vociferus*	BM, PSI, CD
Avocets and Stilts		
Black-necked Stilt	*Himantopus mexicanus*	BM, MLK, CD

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
American Avocet	*Recurvirostra americana*	BM, MLK
Sandpipers		
Greater Yellowlegs	*Tringa melanoleuca*	BM, MLK, CD
Lesser Yellowlegs	*Tringa flavipes*	BM, MLK, CD
Solitary Sandpiper	*Tringa solitaria*	BM, CD
Willet	*Catoptrophorus semipalmatus*	BM, MLK
Spotted Sandpiper	*Actitis macularia*	BM, CD
Upland Sandpiper	*Bartramia longicauda*	BM
Marbled Godwit	*Limosa lapponica*	SKLK
Semipalmated Sandpiper	*Calidris pusilla*	BM, MLK, CD
Western Sandpiper	*Calidris mauri*	BM, MLK
Least Sandpiper	*Calidris minutilla*	BM, MLK, CD
White-rumped Sandpiper	*Calidris fuscicollis*	BM, MLK, SKLK
Pectoral Sandpiper	*Calidris melanotos*	BM, MLK, CD
Dunlin	*Calidris alpina*	BM, MLK
Stilt Sandpiper	*Calidris himanitopus*	BM, MLK
Long-billed Dowitcher	*Limnodromus scolopaceus*	BM, MLK
Common Snipe	*Gallinago gallinago*	BM, MLK, CD
American Woodcock	*Scolopax minor*	MEH, BM
Wilson's Phalarope	*Phalaropus tricolor*	SKLK
Gulls and Terns		
Laughing Gull	*Leucophaeus atricilla*	MLK
Bonaparte's Gull	*Larus philadelphia*	CULK, MLK, OF
Ring-billed Gull	*Larus delawarensis*	CULK, OF
Herring Gull	*Larus argentatus*	CULK, OF
Great Black-backed Gull	*Larus marinus*	CULK
Caspian Tern	*Sterna caspia*	CULK, OF
Royal Tern	*Sterna maxima*	CULK
Forster's Tern	*Sterna forsteri*	MLK
Least Tern	*Sterna antillarum*	MLK
Sooty Tern	*Sterna fuscata*	MLK
Black Tern	*Chlidonias niger*	MLK
Black Skimmer	*Rynchops niger*	CULK, MLK
Pigeons and Doves		
Rock Pigeon	*Columba livia* *	OF
Eurasian Collared-Dove	*Streptopelia decaocto* *	DV
White-winged Dove	*Zenaida asiatica*	OF

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Mourning Dove	*Zenaida macroura*	MTC
Common Ground-Dove	*Columbina passerina*	BM, PI, PSI
Cuckoos and Anis		
Black-billed Cuckoo	*Coccyzus erythropthalmus*	MEH
Yellow-billed Cuckoo	*Coccyzus americanus*	BM, MEH, SA
Smooth-billed Ani	*Crotophaga ani*	BM
Grooved-billed Ani	*Crotophaga sulcirostris*	BM
Barn-Owls		
Barn Owl	*Tyto alba*	BM, MEH
Owls		
Eastern Screech-Owl	*Otus asio*	MEH, UHF, ABP
Great Horned Owl	*Bubo virginianus*	MEH, MF, ABP
Barred Owl	*Strix varia*	MEH, BS, BG, AF
Short-eared Owl	*Asio flammeus*	BM
Nightjars		
Lesser Nighthawk	*Chordeiles acutipennis*	OF
Common Nighthawk	*Chordeiles minor*	MF, PI, PSI, OF
Chuck-will's-widow	*Caprimulgus carolinensis*	MF, MEH
Whip-poor-will	*Caprimulgus vociferus*	MEH, ABP
Swifts		
Chimney Swift	*Chaetura pelagica*	OF
Vaux's Swift	*Chaetura vauxi*	OF
Hummingbirds		
Ruby-throated Hummingbird	*Archilochus colubris*	MEH, ABP
Kingfishers		
Belted Kingfisher	*Ceryle alcyon*	BM, CULK, MLK, CD
Woodpeckers		
Red-headed Woodpecker	*Melanerpes erythrocephalus*	MEH, ABP
Red-bellied Woodpecker	*Melanerpes carolinus*	MF, MEH, UHF
Yellow-bellied Sapsucker	*Sphyrapicus varius*	MEH, UHF
Downy Woodpecker	*Picoides pubescens*	MF, MEH, UHF
Hairy Woodpecker	*Picoides villosus*	MF, MEH
Northern Flicker	*Colaptes auratus*	MEH, BM, ABP

*** Non-native Species   + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Pileated Woodpecker	*Dryocopus pileatus*	MF, MEH, UHF
Tyrant Flycatchers		
Eastern Wood Pewee	*Contopus virens*	MF, MEH
Alder Flycatcher	*Empidonax alnorum*	BM, SA
Acadian Flycatcher	*Empidonax virescens*	MEH, AF, BS, CD
Least Flycatcher	*Empidonax minimus*	BM, SA
Eastern Phoebe	*Sayornis phoebe*	MTC
Vermilion Flycatcher	*Pyrocephalus rubinus*	BM, PSI
Ash-throated Flycatcher	*Myiarchus cinerascens*	BM, PSI
Great Crested Flycatcher	*Myiarchus crinitus*	MF, MEH, ABP
Western Kingbird	*Tyrannus verticalis*	BM, ABP
Eastern Kingbird	*Tyrannus tyrannus*	MF, ABP, PI
Gray Kingbird	*Tyrannus dominicensis*	BM, ABP
Scissor-tailed Flycatcher	*Tyrannus forficatus*	BM, PSI, ABP
Shrikes		
Loggerhead Shrike	*Lanius ludovicianus*	BM, ABP, PI
Vireos and Allies		
Bell's Vireo	*Vireo bellii*	MEH, BM
White-eyed Vireo	*Vireo griseus*	MF, MEH, BM, ABP
Yellow-throated Vireo	*Vireo flavifrons*	MF, MEH
Blue-headed Vireo	*Vireo solitarius*	MF, MEH, UHF
Philadelphia Vireo	*Vireo philadelphicus*	MEH
Red-eyed Vireo	*Vireo olivaceus*	MEH, UHF
Crows and Jays		
Blue Jay	*Cyanocitta cristata*	MTC
American Crow	*Corvus brachyrhynchos*	MTC
Fish Crow	*Corvus ossifragus*	MEH, BM
Swallows		
Purple Martin	*Progne subis*	BM, OF
Tree Swallow	*Tachycineta bicolor*	BM, OF
N. Rough-winged Swallow	*Stelgidopteryx serripennis*	BM, SKLK, DV, OF
Bank Swallow	*Riparia riparia*	BM, OF
Cliff Swallow	*Petrochelidon pyrrhonota*	BM, OF
Cave Swallow	*Petrochelidon fulva*	BM, OF
Barn Swallow	*Hirundo rustica*	BM, RD, OF

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Tits and Allies		
Carolina Chickadee	*Poecile carolinensis*	MTC
Tufted Titmouse	*Baeolophus bicolor*	MTC
Nuthatches		
Brown-headed Nuthatch	*Sitta pusilla*	MF
Creepers		
Brown creeper	*Certhia americana*	MEH
Wrens		
Carolina Wren	*Thryothorus ludovicianus*	MTC
House Wren	*Troglodytes aedon*	MEH, BM, ABP
Winter Wren	*Troglodytes troglodytes*	MEH
Sedge Wren	*Cistothorus platensis*	BM
Marsh Wren	*Cistothorus palustris*	BM
Kinglets		
Golden-crowned Kinglet	*Regulus satrapa*	MF, MEH, ABP
Ruby-crowned Kinglet	*Regulus calendula*	MTC
Old World Warblers		
Blue-gray Gnatcatcher	*Polioptila caerulea*	MTC
Thrushes		
Eastern Bluebird	*Sialia sialis*	MF, BM, PI, PSI
Veery	*Catharus fuscescens*	MEH, UHF
Gray-cheeked Thrush	*Catharus minimus*	MEH
Swainson's Thrush	*Catharus ustulatus*	MEH
Hermit Thrush	*Catharus guttatus*	MEH, UHF
Wood Thrush	*Hylocichla mustelina*	MEH, UHF
American Robin	*Turdus migratorius*	MTC
Mockingbirds and Thrashers		
Gray Catbird	*Dumetella carolinensis*	MF, MEH, BM, UC
Northern Mockingbird	*Mimus polyglottos*	MEH, BM, ABP, UC
Brown Thrasher	*Toxostoma rufum*	MEH, BM, ABP
Starlings		
European Starling	*Sturnus vulgaris* *	DV, OF

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Wagtails and Pipits		
American Pipit (Water)	*Anthus rubescens*	BM
Waxwings		
Cedar Waxwing	*Bombycilla cedrorum*	MF, MEH, OF
New World Warblers		
Blue-winged Warbler	*Vermivora pinus*	MEH
Golden-winged Warbler	*Vermivora chrysoptera*	MEH
Tennessee Warbler	*Vermivora peregrina*	MEH
Orange-crowned Warbler	*Vermivora celata*	MEH, BM, ABP
Northern Parula	*Parula americana*	BF, MF, MEH
Yellow Warbler	*Dendroica petechia*	BM
Chestnut-sided Warbler	*Dendroica pensylvanica*	MEH
Magnolia Warbler	*Dendroica magnolia*	MEH
Cape May Warbler	*Dendroica tigrina*	MEH
Black-throated Blue Warbler	*Dendroica caerulescens*	MEH
Yellow-rumped Warbler	*Dendroica coronata*	MF, MEH, BM, ABP
Black-throated Green Warbler	*Dendroica virens*	MEH
Blackburnian Warbler	*Dendroica fusca*	MEH
Yellow-throated Warbler	*Dendroica dominica*	MF, MEH, CD
Pine Warbler	*Dendroica pinus*	MF, MEH, ABP
Prairie Warbler	*Dendroica discolor*	MF, BM, ABP
Palm Warbler	*Dendroica palmarum*	MF, BM, ABP, PI
Bay-breasted Warbler	*Dendroica castanea*	MEH
Blackpoll Warbler	*Dendroica striata*	MF, MEH
Cerulean Warbler	*Dendroica cerulea*	MEH
Black-and-white Warbler	*Mniotilta varia*	MF, MEH, UHF
American Redstart	*Setophaga ruticilla*	MF, MEH, BM, UHF
Prothonotary Warbler	*Protonotaria citrea*	BM, BS, CD
Worm-eating Warbler	*Helmitheros vermivora*	MEH
Swainson's Warbler	*Limnothlypis swainsonii*	MEH
Ovenbird	*Seiurus aurocapillus*	MEH, UHF
Northern Waterthrush	*Seiurus noveboracensis*	BM, DM, CD
Louisiana Waterthrush	*Seiurus motacilla*	BM, DM, CD
Kentucky Warbler	*Oporornis formosus*	MEH
Connecticut Warbler	*Oporornis agilis*	MEH
Nashville Warbler	*Oreothlypis ruficapilla*	MEH
Common Yellowthroat	*Geothlypis trichas*	BM, MF

* Non-native Species + Extirpated

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Hooded Warbler	*Wilsonia citrina*	MEH
Wilson's Warbler	*Wilsonia pusilla*	BM
Canada Warbler	*Wilsonia canadensis*	MEH
Yellow-breasted Chat	*Icteria virens*	BM, SA
Tanagers		
Summer Tanager	*Piranga rubra*	MF, MEH, ABP
Scarlet Tanager	*Piranga olivacea*	MEH
Western Tanager	*Piranga ludoviciana*	MEH
Sparrows and Allies		
Green-tailed Towhee	*Pipilo chlorurus*	BM
Eastern Towhee	*Pipilo erythrophthalmus*	MF, SCF, BM
Bachman's Sparrow	*Peucaea aestivalis*	BM
Chipping Sparrow	*Spizella passerina*	BM, ABP, PI
Clay-colored Sparrow	*Spizella pallida*	BM, ABP
Field Sparrow	*Spizella pusilla*	BM, ABP, PI
Vesper Sparrow	*Pooecetes gramineus*	BM, ABP, PI
Lark Sparrow	*Chondestes grammacus*	BM
Savannah Sparrow	*Passerculus sandwichensis*	BM, ABP, PSI
Grasshopper Sparrow	*Ammodramus savannarum*	BM, ABP
Henslow's Sparrow	*Ammodramus henslowii*	BM, ABP
Le Conte's Sparrow	*Ammodramus leconteii*	BM
Fox Sparrow	*Passerella iliaca*	MEH, BM
Song Sparrow	*Melospiza melodia*	BM, MEH, ABP
Lincoln's Sparrow	*Melospiza lincolnii*	BM
Swamp Sparrow	*Melospiza georgiana*	BM
White-throated Sparrow	*Zonotrichia albicollis*	MF, MEH, BM, ABP
Harris's Sparrow	*Zonotrichia querula*	BM
White-crowned Sparrow	*Zonotrichia leucophrys*	BM, MEH, ABP
Dark-eyed Junco	*Junco hyemalis*	ABP
Cardinals, Grosbeaks and Buntings		
Northern Cardinal	*Cardinalis cardinalis*	MTC
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	MEH
Blue Grosbeak	*Guiraca caerulea*	BM, ABP, UT
Indigo Bunting	*Passerina cyanea*	BM, ABP
Painted Bunting	*Passerina ciris*	BM
Dickcissel	*Spiza americana*	BM

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Blackbirds and Allies		
Bobolink	*Dolichonyx oryzivorus*	BM
Red-winged Blackbird	*Agelaius phoeniceus*	BM, DM
Eastern Meadowlark	*Sturnella magna*	BM, PI, PSI
Yellow-headed Blackbird	*Xanthocephalus xanthocephalus*	BM
Rusty Blackbird	*Euphagus carolinus*	BM, BF, BS
Brewer's Blackbird	*Euphagus cyanocephalus*	BM
Common Grackle	*Quiscalus quiscula*	BM, OF
Boat-tailed Grackle	*Quiscalus major*	BM, MLK, OF
Brown-headed Cowbird	*Molothrus ater*	MTC
Orchard Oriole	*Icterus spurius*	MEH, BM
Baltimore Oriole	*Icterus galbula*	MEH, BM
Finches and Allies		
House Finch	*Carpodacus mexicanus*	MEH, DV
Pine Siskin	*Spinus pinus*	BM, OF
American Goldfinch	*Carduelis tristis*	BM, MF, MEH, OF
Old World Sparrows		
House Sparrow	*Passer domesticus* *	DV

MAMMALS

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Didelphids		
Virginia Opossum	*Didelphis virginiana*	MF, MEH
Insectivores		
Southern Short-tailed Shrew	*Blarina carolinensis*	MEH
Least Shrew	*Cryptotis parva*	UP, ABP, BM
Eastern Mole	*Scalopus aquaticus*	MF, MEH, UP
Bats		
Red Bat	*Lasiurus borealis*	MEH, OF
Northern Yellow Bat	*Lasiurus intermedius*	MEH, OF
Seminole Bat	*Lasiurus seminolus*	MEH, OF
Southeastern Myotis	*Myotis austroriparius*	OF
Eastern Pipistrelle	*Pipistrellus subflavus*	MEH, OF
Rafinesque's Big-eared Bat	*Corynorhinus rafinesquii*	OF
Brazilian Freetailed Bat	*Tadarida brasiliensis*	OF

Edentates

* Non-native Species + Extirpated

Paynes Prairie Preserve State Park Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Nine-banded Armadillo	*Dasypus novemcinctus* *	MTC
Lagomorphs		
Eastern Cottontail	*Sylvilagus floridanus*	MF, MEH, ABP
Marsh Rabbit	*Sylvilagus palustris*	BM
Rodents		
Round-tailed Muskrat	*Neofiber alleni*	BM, MLK
Eastern Woodrat	*Neotoma floridana*	MF, MEH
Marsh Rice Rat	*Oryzomys palustris*	BM
Cotton Mouse	*Peromyscus gossypinus*	MF, MEH
Eastern Harvest Mouse	*Reithrodontomys humilis*	BM, MF
Hispid Cotton Rat	*Sigmodon hispidus*	MF, UP, BM, ABP
Southeastern Pocket Gopher	*Geomys pinetis*	SH, UP, ABP, PSI
Capybara	*Hydrochoerus hydrochaeris* *	BM, MLK
House mouse	*Mus musculus* *	DV
Norway Rat	*Rattus norvegicus* *	DV
Black Rat	*Rattus rattus* *	DV
Southern Flying Squirrel	*Glaucomys volans*	MF, MEH
Eastern Gray Squirrel	*Sciurus carolinensis*	MF, MEH
Sherman's Fox Squirrel	*Sciurus niger shermani*	MF, SH, UP
Carnivores		
Coyote	*Canis latrans* *	MTC
Red Wolf	*Canis rufus* ×	MTC
Florida Panther	*Felis concolor coryi* ×	MTC
River Otter	*Lutra canadensis*	BM, MLK, CD
Bobcat	*Lynx rufus*	MF, MEH, BM
Striped Skunk	*Mephitis mephitis*	MF, MEH
Southeastern Weasel	*Mustela frenata olivacea*	MF, MEH
Raccoon	*Procyon lotor*	MTC
Gray Fox	*Urocyon cinereoargenteus*	MF, MEH, BM
Florida Black Bear	*Ursus americanus floridanus*	MTC
Red Fox	*Vulpes vulpes* *	MF, MEH, BM
Artiodactyls		
Bison	*Bison bison*	BM
Cow	*Bos taurus* *	BM, PI, PSI
White-tailed Deer	*Odocoileus virginianus*	MTC
Wild Pig	*Sus scrofa* *	MTC

*** Non-native Species + Extirpated**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Perissodactyls		
Horse	*Equus caballus* *	BM, PI, PSI, DV

TERRESTRIAL

Beach Dune	BD
Coastal Berm	CB
Coastal Grassland	CG
Coastal Strand	CS
Dry Prairie	DP
Keys Cactus Barren	KCB
Limestone Outcrop	LO
Maritime Hammock	MAH
Mesic Flatwoods	MF
Mesic Hammock	MEH
Pine Rockland	PR
Rockland Hammock	RH
Sandhill	SH
Scrub	SC
Scrubby Flatwoods	SCF
Shell Mound	SHM
Sinkhole	SK
Slope Forest	SPF
Upland Glade	UG
Upland Hardwood Forest	UHF
Upland Mixed Woodland	UMW
Upland Pine	UP
Wet Flatwoods	WF
Xeric Hammock	XH

PALUSTRINE

Alluvial Forest	AF
Basin Marsh	BM
Basin Swamp	BS
Baygall	BG
Bottomland Forest	BF
Coastal Interdunal Swale	CIS
Depression Marsh	DM
Dome Swamp	DS
Floodplain Marsh	FM
Floodplain Swamp	FS
Glades Marsh	GM
Hydric Hammock	HH
Keys Tidal Rock Barren	KTRB
Mangrove Swamp	MS
Marl Prairie	MP

Salt Marsh....................SAM
Seepage Slope....................SSL
Shrub Bog....................SHB
Slough....................SLO
Slough Marsh....................SLM
Strand Swamp....................STS
Wet Prairie....................WP

LACUSTRINE
Clastic Upland Lake....................CULK
Coastal Dune Lake....................CDLK
Coastal Rockland Lake....................CRLK
Flatwoods/Prairie....................FPLK
Marsh Lake....................MLK
River Floodplain Lake....................RFLK
Sandhill Upland Lake....................SULK
Sinkhole Lake....................SKLK
Swamp Lake....................SWLK

RIVERINE
Alluvial Stream....................AST
Blackwater Stream....................BST
Seepage Stream....................SST
Spring-run Stream....................SRST

SUBTERRANEAN
Aquatic Cave....................ACV
Terrestrial Cave....................TCV

ESTUARINE
Algal Bed....................EAB
Composite Substrate....................ECPS
Consolidated Substrate....................ECNS
Coral Reef....................ECR
Mollusk Reef....................EMR
Octocoral Bed....................EOB
Seagrass Bed....................ESGB
Sponge Bed....................ESPB
Unconsolidated Substrate....................EUS
Worm Reef....................EWR
MARINE
Algal Bed....................MAB
Composite Substrate....................MCPS

Consolidated Substrate .... MCNS
Coral Reef .... MCR
Mollusk Reef .... MMR
Octocoral Bed .... MOB
Seagrass Bed .... MSGB
Sponge Bed .... MSPB
Unconsolidated Substrate .... MUS
Worm Reef .... MWR

ALTERED LANDCOVER TYPES

Abandoned field .... ABF
Abandoned pasture .... ABP
Agriculture .... AG
Canal/ditch .... CD
Clearcut pine plantation .... CPP
Clearing CL
Developed .... DV
Impoundment/artificial pond .... IAP
Invasive exotic monoculture .... IEM
Pasture - improved .... PI
Pasture - semi-improved .... PSI
Pine plantation .... PP
Road .... RD
Spoil area .... SA
Successional hardwood forest .... SHF
Utility corridor .... UC

MISCELLANEOUS
Many Types of Communities .... MTC
Overflying .... OF

Addendum 6—Imperiled Species Ranking Definitions

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an <u>element</u> as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An <u>element occurrence</u> (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Game and Freshwater Fish Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

<u>FNAI GLOBAL RANK DEFINITIONS</u>

G1 ....Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or fabricated factor.
G2 ....Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 ....Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
G4 ....apparently secure globally (may be rare in parts of range)
G5 ....demonstrably secure globally
GH ....of historical occurrence throughout its range may be rediscovered (e.g., ivory-billed woodpecker)
GX.................believed to be extinct throughout range
GXC...............extirpated from the wild but still known from captivity or cultivation
G#? ....Tentative rank (e.g.,G2?)
G#G#.............range of rank; insufficient data to assign specific global rank (e.g., G2G3)
G#T# ....rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)

G#Q...............rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
G#T#Q..........same as above, but validity as subspecies or variety is questioned.
GU ....due to lack of information, no rank or range can be assigned (e.g., GUT2).
G?...................Not yet ranked (temporary)
S1 ....Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 ....Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 ....Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
S4 ....apparently secure in Florida (may be rare in parts of range)
S5 ....demonstrably secure in Florida
SH ....of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
SX...................believed to be extinct throughout range
SA ....accidental in Florida, i.e., not part of the established biota
SE ....an exotic species established in Florida may be native elsewhere in North America
SN ....regularly occurring but widely and unreliably distributed; sites for conservation hard to determine
SU ....due to lack of information, no rank or range can be assigned (e.g., SUT2).
S?....................Not yet ranked (temporary)
N ....Not currently listed, nor currently being considered for listing, by state or federal agencies.

LEGAL STATUS

FEDERAL

(Listed by the U. S. Fish and Wildlife Service - USFWS)

LE..................Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
PE..................Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.

LT..................Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.
PT..................Proposed for listing as Threatened Species.
C ....Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
E(S/A)..........Endangered due to similarity of appearance.
T(S/A)..........Threatened due to similarity of appearance.
EXPE, XE ......Experimental essential population. A species listed as experimental and essential.
EXPN, XN.....Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

<u>STATE</u>

ANIMALS ..(Listed by the Florida Fish and Wildlife Conservation Commission - FWC)

FE………….. Federally-designated Endangered.
FT………….. Federally-designated Threatened.
FXN……….. Federally-designated Threatened Nonessential Experimental Population.
FT(S/A).......... Federally-designated Threatened species due to similarity of appearance.
ST..................Listed as Threatened Species by the FWC. Defined as a species, subspecies, or isolated population, which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat, is decreasing in area at a rapid rate and therefore is destined or very likely to become an endangered species within the near future.
SSC ....Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species.

PLANTS ......(Listed by the Florida Department of Agriculture and Consumer Services - FDACS)

LE...................Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973,as amended.

LT...................Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

Addendum 7—Cultural Information

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, '*Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state."*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at:
http://www.flheritage.com/preservation/compliance/guidelines.cfm

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at: http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf .

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Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

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Bureau of Historic Preservation
Compliance and Review Section
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The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:

- **a)** are associated with events that have made a significant contribution to the broad patterns of our history; and/or
- **b)** are associated with the lives of persons significant in our past; and/or
- **c)** embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
- **d)** have yielded, or may be likely to yield, information important in prehistory or history.

2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:

- **a)** a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
- **b)** a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
- **c)** a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
- **d)** a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or

f) a property achieving significance within the past 50 years, if it is of exceptional importance.

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

Stabilization is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

Addendum 8 —Land Management Review

Memorandum

Florida Department of Environmental Protection

December 21, 2011

TO: Marianne Gengenbach, Program Administrator
Division of State Lands

FROM: Parks Small, Chief, Bureau of Natural and Cultural Resources
Division of Recreation and Parks

Albert Gregory, Chief, Office of Park Planning LS for AG
Division of Recreation and Parks

SUBJECT: Response to Draft Land Management Review (LMR)
Paynes Prairie Preserve State Park

The Land Management Review draft report provided to DRP determined that management of Paynes Prairie Preserve State Park by the Division of Recreation and Parks met the two tests prescribed by law. Namely, the review team concluded that the land is being managed for the purposes for which it was acquired and in accordance with the land management plan.

Below are Additional Recommendations and Checklist Findings (items the LMR determined should be further addressed in the management plan update) of the draft LMR report, with our Manager's Response to each. The responses were prepared via a coordinated effort of the park, district office, and our offices.

The team recommends that DRP identify the strategies necessary to increase burning at this park. (VOTE: 6+, 0-)
Managing Agency Response: Agree. The Division recognizes this need and will take steps to facilitate more burning in the park.

The team recommends that DRP assess opportunities for mechanical and/or chemical treatments, where appropriate, to facilitate the reintroduction of prescribed fire. (VOTE: 6+, 0-)
Managing Agency Response: Agree. The Division recognizes the benefits of mechanical and chemical treatments prior to reintroduction of prescribed fire.

The team recommends that DRP develop structure and composition goals and an appropriate level of monitoring in the management plan for natural communities at the park. (VOTE: 6+, 0-)
Managing Agency Response: Agree. The Division recognizes the need for structure and composition goals in the management and restoration of natural communities, and will monitor the results of management actions as funding and staff limitations permit. The upcoming management plan update will include descriptions of the desired future conditions for all natural communities, and will include both existing and desired future condition natural community maps.

PLAN REVIEW

Listed species protection & preservation, specifically wading birds with documentation in the management plan.

Managing Agency Response: Agree. Additional information on wading bird management will be included in the upcoming management plan update.

Natural resources survey/management resources, more specifically sport fish or habitat monitoring, with documentation in the management plan.
Managing Agency Response: Disagree. Fishing opportunities within the park are limited to Lake Wauberg. Since this activity is a minor part of the park's responsibilities, sport fish and sport fish habitat monitoring are not a high priority for the Division.

The need for resource management, prescribed fire, specifically area being burned (no. acres), frequency and quality, sandhill, upland pine forest and mesic flatwoods, with documentation in the management plan.
Managing Agency Response: Agree. The upcoming management plan update will include additional information on annual burning goals, including acres to be burned and fire return intervals for all fire-type natural communities.

Adjacent property concerns, specifically surplus lands identified, with documentation in the management plan.
Managing Agency Response: Agree. The Division will address adjacent property concerns and the determination of surplus lands in the update of the management plan.

FIELD REVIEW

Natural communities, regarding mesic flatwoods, scrubby flatwoods and upland pine forest, with documentation in the management plan.
Managing Agency Response: Agree. These fire-type upland communities are in need of more frequent fire and expanded restoration efforts.

Resource management prescribed fire, regarding area being burned (no. acres), frequency and quality, with documentation in the management plan.
Managing Agency Response: Agree. The Division recognizes the need to increase prescribed fire efforts at the park.

Restoration of ruderal areas, regarding sandhill, upland pine forest and mesic flatwood, with documentation in the management plan.
Managing Agency Response: Agree. These community types have been heavily impacted by historical land use practices and require substantial restoration efforts. The Division will pursue restoration of these altered natural communities as funding and staff limitations permit.

Management Resources Infrastucture, regarding staff and funding, with documentation in the management plan.
Managing Agency Response: Agree. If it is determined that additional staff are needed at the time of the next unit management plan revision, it will be included in the plan. However, no new staff can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units. Division funding is determined annually by the Florida Legislature and funds are allocated to the 160 state parks according to priority needs.

Thank you for your attention.

CC: Clif Maxwell, Chief, Bureau of Parks District 2
Willy Cutts, Assistant Chief, Bureau of Parks District 2
David Jowers, Park Manager, Paynes Prairie Preserve State Park
Craig Parenteau, Environmental Specialist, Bureau of Parks District 2