

Highlands Hammock State Park

Advisory Group Draft Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
January 2018



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INTRODUCTION

Highlands Hammock State Park is located in Hardee and Highlands Counties (see Vicinity Map). Access to the park is from U.S. Highway 27 and County Road 634 four miles west of Sebring (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

Highlands Hammock State Park was initially acquired on July 31, 1935 as a donation to the State of Florida. Currently, the park comprises 9,251.24 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and on January 23, 1968, the Trustees leased (Lease Number 2324) the property to DRP under a 99-year lease. In 1988, the Trustees assigned a new lease number, Lease Number 3622, to the park without making any changes to the terms and conditions of Lease Number 2324. The current lease will expire on January 22, 2067.

Highlands Hammock State Park is designated single-use to provide public outdoor recreation and conservation. There are no legislative or executive directives that constrain the use of this property (see Addendum 1).

Purpose and Significance of the Park

The purpose of Highlands Hammock State Park is to protect, develop, operate, and maintain the property for public outdoor recreational, park, conservation, historic preservation and related purposes. The park will be managed for the conservation and protection of natural, historic, and cultural resources and to provide resource-based public outdoor recreation which is compatible with the conservation and protection of the property.

Park Significance

- Highlands Hammock State Park, one of the nine public recreation areas established through the New Deal in Florida, serves as an example of what inspired the Florida State Park System in its physical expression of early twentieth century recreation planning.
- Most of the rustic built environment, as seen in the park today, was constructed in the 1930s by a local company of the Civilian Conservation Corps (CCC). This highly successful New Deal Program is reflected on in the park's CCC museum.
- The park contains 18 distinct natural communities including, sandhill, scrub, flatwoods, wet prairie/cutthroat seep, baygall, basin swamp, and a large tract of hydric hammock, the natural feature responsible for the creation of this park.

- The park is one of the highest ranked in the state park system for the number and diversity of Florida endemic species including Highlands goldenaster, scrub liatris, Highlands tiger beetle, Florida pine snake, Florida scrub lizard, Florida scrub-jay, and Florida panther. The park also hosts an incredibly vibrant array of fireflies due to the parks uniquely accommodating features for many species.
- The park is an important component of a conservation lands system that provides important resource protection for the ancient islands that make up the Lake Wales Ridge scrub.

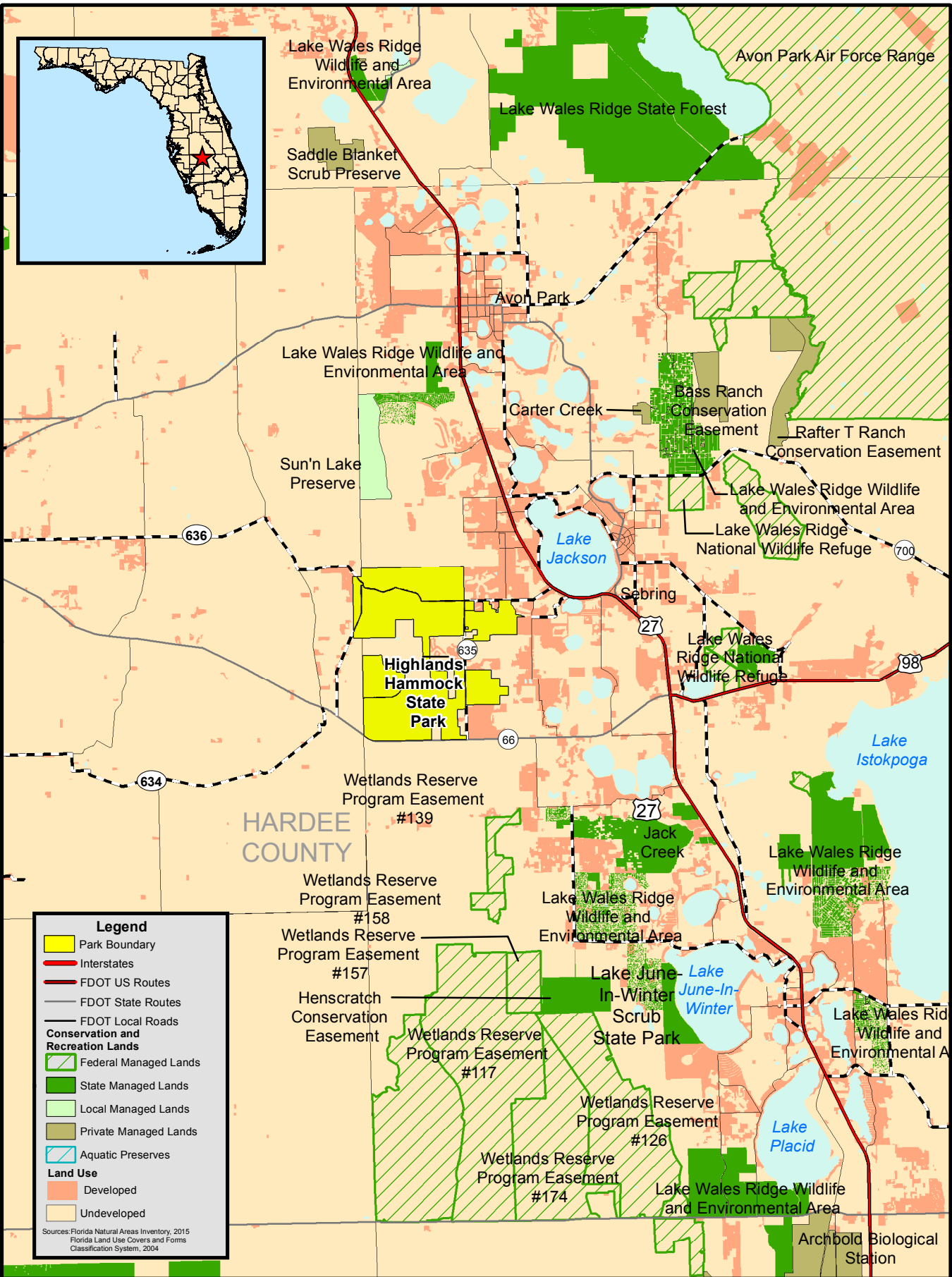
Highlands Hammock State Park is classified as a State Park in the DRP's unit classification system. In the management of a State Park, a balance is sought between the goals of maintaining and enhancing natural conditions and providing various recreational opportunities. Natural resource management activities are aimed at management of natural systems. Development in the park is directed toward providing public access to and within the park, and to providing recreational facilities, in a reasonable balance, that are both convenient and safe. Program emphasis is on interpretation on the park's natural, aesthetic, and educational attributes.

Purpose and Scope of the Plan

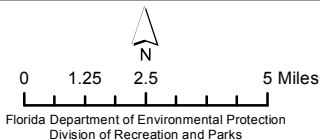
This plan serves as the basic statement of policy and direction for the management of Highlands Hammock State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions, and criteria or standards that guide each aspect of park administration, and sets forth the specific 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 2007 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.

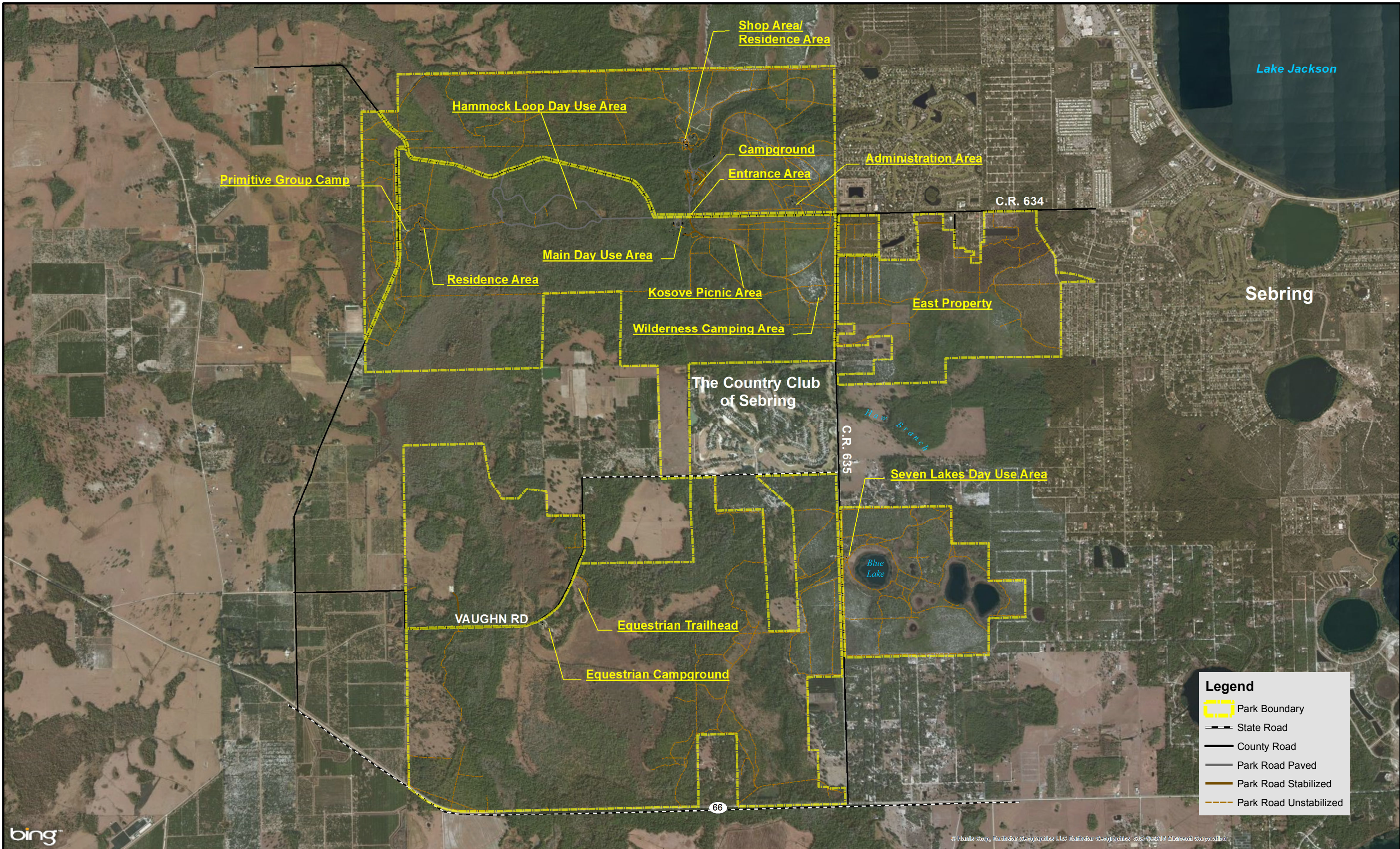
The Land Use Component is the recreational resource allocation plan for the park. Based on considerations such as access, population, adjacent land uses, the natural



HIGHLANDS HAMMOCK STATE PARK



VICINITY MAP



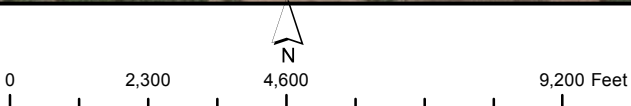
Legend

- Park Boundary
- State Road
- County Road
- Park Road Paved
- Park Road Stabilized
- Park Road Unstabilized

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HIGHLANDS HAMMOCK STATE PARK



Florida Department of Environmental Protection
 Division of Recreation and Parks
 Date of aerial, 2014

REFERENCE MAP

and cultural resources of the park, and current public uses and existing development, measurable objectives are set to achieve the desired allocation of the physical space of the park. These objectives identify use areas and propose the types of facilities and programs as well as 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 the 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 accordance with 253.034(5) F.S., 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's natural and cultural resources, management needs, aesthetic values, visitation, and visitor experiences. For this park, it was determined that timber management as part of the park's natural community management and restoration activities could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. This compatible secondary management purpose is addressed in the Resource Management Component of the plan.

DRP has determined that uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities, and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park.

In accordance with 253.034(5) F.S., 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 timber management as part of the park's natural community management and restoration activities would be appropriate at this park as an additional source of revenue for land management since it is compatible with the park's primary purpose of resource-based outdoor recreation and conservation.

DRP may provide the services and facilities outlined in this plan either with its own funds and staff or through an outsourcing contract. Private contractors may provide

assistance with natural resource management and restoration activities or a concessionaire may provide services to park visitors to enhance the visitor experience. For example, a concessionaire could be authorized to sell merchandise and food and to rent recreational equipment for use in the park. A concessionaire may also be authorized to provide specialized services, such as interpretive tours, or overnight accommodations when the required capital investment exceeds that which DRP can elect to incur. Decisions regarding outsourcing, contracting with the private sector, the use of concessionaires, etc. are made on a case-by-case basis in accordance with the policies set forth in DRP's Operations Manual (OM).

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.

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in the 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:

- Provide administrative support for all park functions.

- Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.
- Restore and maintain the natural communities/habitats of the park.
- Maintain, improve, or restore imperiled species populations and habitats in the park.
- Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.
- Protect, preserve, and maintain the cultural resources of the park.
- Provide public access and recreational opportunities in the park.
- 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 (FWC) assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish, and other aquatic life existing within the park. In addition, the FWC aids DRP with wildlife management programs, including imperiled species management. The Florida Department of State (FDOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites.

Public Participation

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 [\[INSERT Dates\]](#), respectively. Meeting notices were published in the Florida Administrative Register, [\[INSERT publication date, VOL/ISSUE\]](#), 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

Highlands Hammock 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 the Department. 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. Management measures expressed in this plan are consistent with the DRP's overall mission in natural systems management. Cited references are contained in Addendum 3.

The 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 the park values.

The 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 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. Highlands Hammock State Park Management Zones			
Management Zone	Acreage	Managed with Prescribed Fire	Contains Known Cultural Resources
HH-E001	47.27	Y	N
HH-E002	58.09	Y	N
HH-E003	81.07	Y	N
HH-E004	25.62	Y	N
HH-E005	53.13	Y	N
HH-E006	6.73	Y	N
HH-E007	51.43	Y	N
HH-E008	114.17	Y	N
HH-E009	47.57	Y	N
HH-E010	70.12	Y	N
HH-E011	106.60	Y	N
HH-E012	39.53	Y	N
HH-E013	173.31	Y	N
HH-E014	6.79	N	N
HH-H001	108.65	Y	N
HH-H002	80.03	Y	N
HH-H003	75.30	Y	N
HH-H004	52.93	Y	Y
HH-H005	132.59	Y	Y
HH-H006	123.79	Y	Y
HH-H007	91.15	Y	Y
HH-H008	141.57	Y	N
HH-H009	325.31	Y	Y
HH-H010	160.84	Y	Y
HH-H011	322.73	Y	Y
HH-H012	189.53	Y	N
HH-H013	152.30	Y	Y
HH-H014	71.59	N	Y
HH-H015	394.88	Y	Y
HH-H016	16.59	Y	Y
HH-H017	133.33	Y	Y
HH-H018	75.02	Y	N
HH-H019	73.44	Y	N
HH-H020	56.84	N	Y
HH-H021	80.37	Y	N
HH-H022	223.14	Y	Y
HH-H023	45.88	Y	N
HH-H024	95.35	Y	Y
HH-H025	185.84	Y	N
HH-H026	22.88	Y	N
HH-H027	377.03	Y	N

HH-H028	112.41	Y	N
HH-H029	102.83	Y	N
HH-S001	581.21	Y	N
HH-S002	424.61	Y	N
HH-S003	242.52	Y	N
HH-S004	189.91	Y	N
HH-S005	476.42	Y	N
HH-S006	676.60	Y	N
HH-S007	290.32	Y	N
HH-S008	343.95	Y	N
HH-S009	184.30	Y	Y
HH-S010	161.81	Y	N
HH-S011	104.88	Y	N
HH-SL001	92.98	Y	N
HH-SL002	33.61	N	N
HH-SL003	82.44	Y	N
HH-SL004	65.22	Y	N
HH-SL005	44.80	Y	N
HH-SL006	11.52	Y	N
HH-SL007	89.47	Y	N
HH-SL008	106.76	Y	N
HH-SL009	49.65	Y	N
HH-SL010	25.271	Y	N
HH-SL011	20.13	Y	N
HH-SL012	34.68	Y	N

Resource Description and Assessment

Natural Resources

Topography

The northeastern corner of the original boundary of Highlands Hammock State Park lies atop the western edge of the Lake Wales Ridge. The highest elevation in the park is located here at 151 feet above mean sea level (msl). The more recently acquired East Parcel edges into the Lake Wales Ridge at a little more than 140 feet msl. From these high points, the land slopes downhill to a topographical low of less than 80 feet msl (see Topographic Map). The low flat basin of the upper Little Charlie (or Charley) Bowlegs Creek extends through the park, south to north, as a broad conduit, below the 85 and 80-foot levels, and marks the western-most edge of the Lake Wales Ridge watershed where it flows through the park.

Most of the swamp and marsh vegetation of the park occupies these low flatlands. The hydric hammock, for which the park is named, is also situated between the 80 and 85-foot contours. The scrub and scrubby flatwoods vegetation mostly occurs above 115 feet. The ridge and its slope give rise to both Tiger Creek and Haw

Branch, which originate in the eastern parts and flow downhill toward the soggy flats in the western third of the park.

There have been human alterations to the topography. In addition to the canals and ditches dug into the land (discussed in the Hydrology section), there are several borrow pits and artificial ponds in the park. One borrow pit may date back to the CCC era. Clay was taken from this excavation to use on service roads, in locales where the sand is very soft. A borrow pit in the south portion of the park, and just north of State Road 66, in zone S009 was created when fill was taken from this pit and used for constructing the highway. There are also some smaller, excavated sites in the former pasture on the south property. These were created to provide water for cattle.

Geology

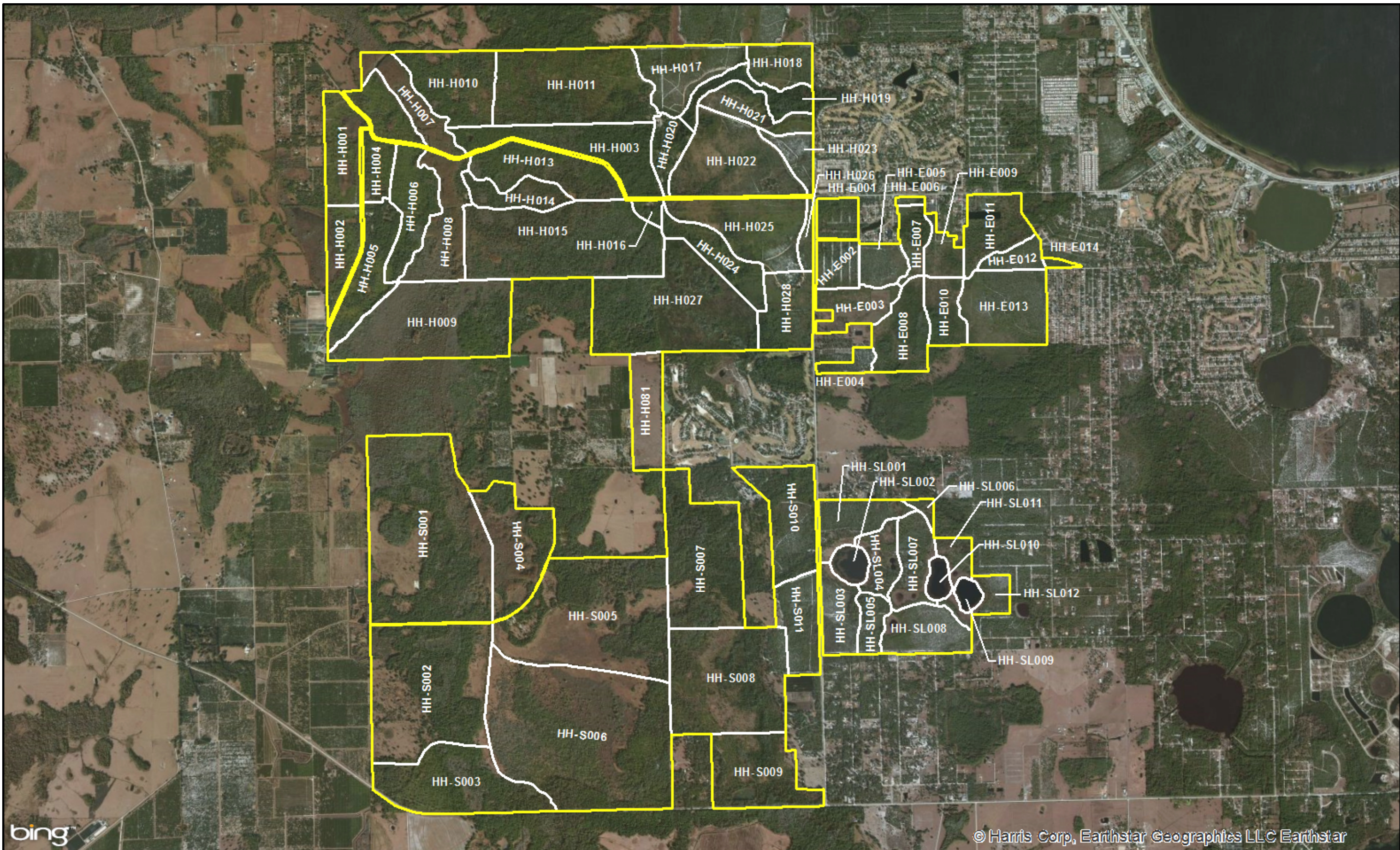
Highlands Hammock State Park lies within the Central Highlands Ridge and Western Flatlands regions. The Highlands Ridge is an ancient shoreline formed during the Yarmouth and Sangamon interglacial stages of the Pleistocene. It is the oldest of the ridge systems in Florida and includes the Lake Wales Ridge, Winter Haven Ridge, Lake Henry Ridge, and Bombing Range Ridge. Highlands Ridge is largely composed of marine sands, sandy limestone and deltaic deposits of the Hawthorn and Citronella formations. Both geological types formed when the world's water level was higher and the older continental landmass to the north was eroding to the south. The surface of the ridge is a relic dune, almost totally covered with sand. It was shaped by wind and wave action during periods of higher sea level.

Portions along the east side of the park lie on the western slope of the Lake Wales Ridge (LWR), and the park land surface reflects a shaping pattern typical of the weaker Gulf wave energy. As sea level fell, a series of terraces were left behind, marking previous shorelines. Many of these terraces can still be seen in the park today.

During the last ice age, the ridge was connected to what is now the southwestern United States by an extension of land now under the Gulf of Mexico, referred to as the Florida Shelf. Many southwestern species migrated to Florida through this connection. In later geologic periods, the Central Highlands formation was surrounded by water and this isolation provided an opportunity for plants and animals to evolve into distinct forms. Some of these forms remain today as endemic organisms found in natural communities that are relics of ancient shorelines.

Soils

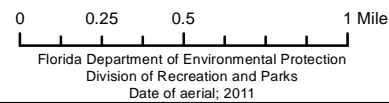
The soils reflect the topography of the Lake Wales Ridge and adjoining Western Flatlands. The Ridge contains generally deep, excessively- to well-drained sandy soils while the Flatlands have poorly drained soils. Rainwater rapidly percolates downward from the sandy uplands, to seep out and moisten the slopes and lower elevations of the land. The soils in the lower elevations of the park are conditioned



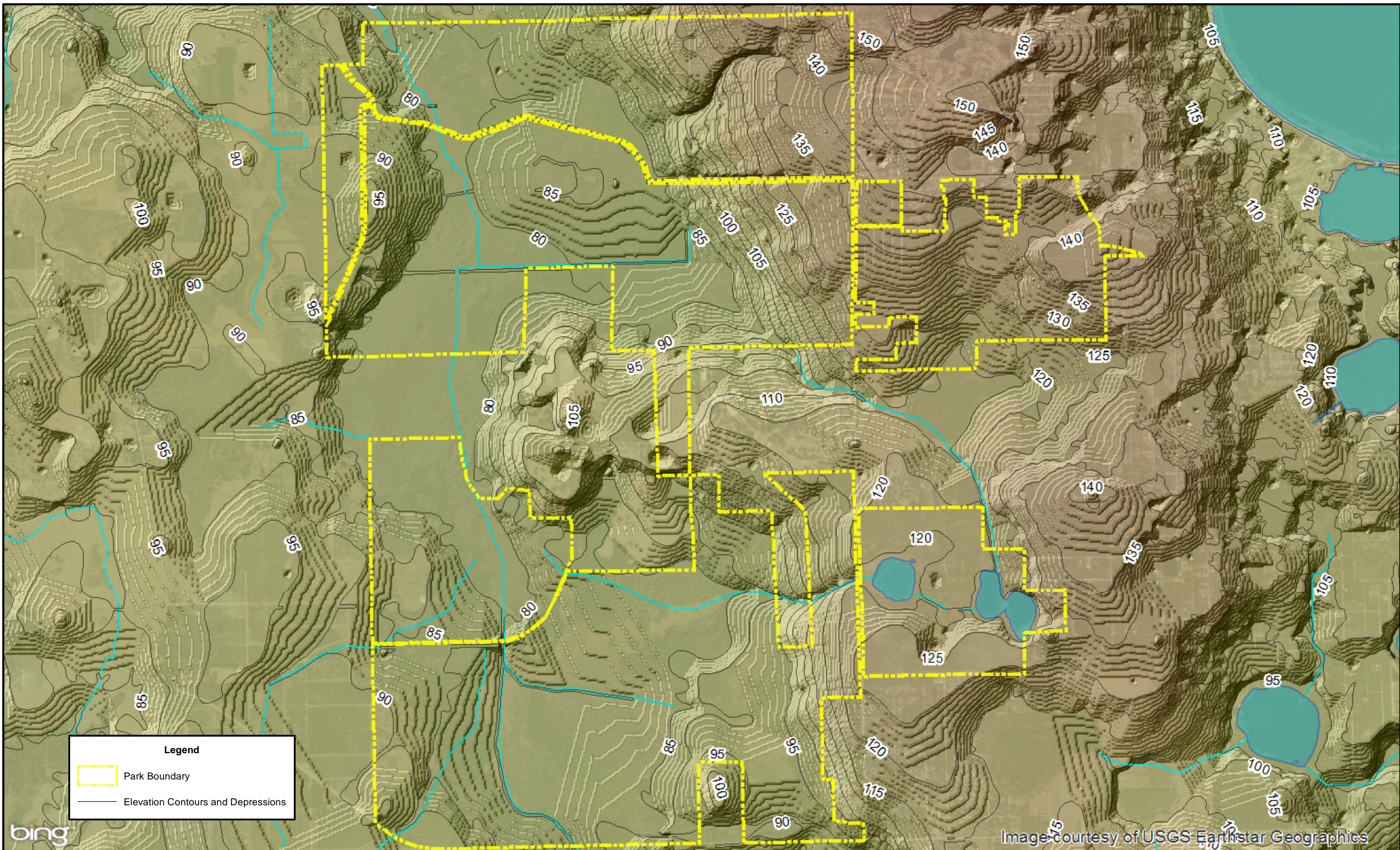
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HIGHLANDS HAMMOCK STATE PARK



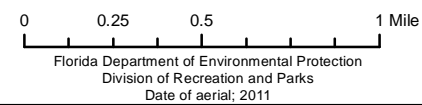
MANAGEMENT ZONES MAP



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Image courtesy of USGS Earthstar Geographics

HIGHLANDS HAMMOCK STATE PARK



TOPOGRAPHIC MAP

by seepage, heavy buildup of organic materials, and longer periods of inundation. There are 28 different soil types at this park recognized by the former USDA Natural Resources Conservation Service (see Soil Map). Many are closely identified with specific natural communities. Addendum 4 contains detailed soil descriptions for HHSP, but an abbreviated descriptive summary correlating natural communities with soil types is provided below.

Upland soils associated with scrub vegetation, and other xeric communities, are Archbold fine sand (0 to 5 percent slopes), and Pomello or Satellite sands. Scrub with sand pine and evergreen oaks is located on Pomello and Satellite sands. Rosemary scrub, which forms almost pure sands, is restricted to Archbold sands. Tavares sand, 0 to 5 percent slopes, is associated with sandhill and xeric hammocks. Five soil types are associated with mesic flatwoods; they are Basinger fine sand, Immokalee sand, Malabar fine sand, Myakka fine sand, Placid, and Smyrna sand.

Hydric soils have several categories, and in the park include: sandy—Felda, and Bradenton; sandy and sandy loam soils, depressional—Basinger, St. Johns, Placid, Malabar, and Chobee; and mucky soils—Sanibel, Kaliga muck and Kaliga frequently flooded), Samsula, Hontoon and Tequesta. The sandy hydric soils are characteristic of hydric hammocks. Depression marshes include Immokalee, Basinger, Basinger depressional, Placid, and Sanibel, while Sanibel, Samsula, Kaliga and Hontoon mucks typify the basin marshes and baygall communities.

An important hydric soil grouping in the park is the Basinger, St. Johns and Placid soil complex. This group has nearly level, poorly and very poorly drained sandy soils. The presence of this complex is a very strong indicator for cutthroat grass (*Coleataenia abscissa*) dominated communities (Bacchus 1991), which may sometimes be referred to as cutthroat seeps. Saturation may vary with local relative composition in the complex, as some seeps have all three soils while others do not.

On a few access areas of the main portion of the park, surface soils are being covered with a reddish sandy clay. While this improves seasonal access for periods of time, and possibly even helps to prevent sand erosion, this practice does alter the soil type, impacts the local hydrology, alters the nutrient contents of the soil and may impact local pollinators. Further research would establish if this is the best possible alternative for preserving access.

Wild or feral hogs (*Sus scrofa*) root and wallow in areas throughout the park, disturbing top soils, changing surface hydrology and causing erosion problems. Damage from wild hogs is discussed further in other sections of the plan.

Minerals

The Florida Geological Survey report, *Geology and Ground-Water Resources of Highlands County, Florida*, states that there is pebble phosphorite in the Hawthorn

formation at Highlands Hammock, but it is too deep to be economically mined (Bishop 1956).

Hydrology

The surface hydrology of the main portion of the park revolves around three drainageways: Little Charlie Bowlegs Creek, Haw Branch, and Tiger Branch. The three drainageways are variously interrupted by miles of man-made alterations, such as canals and ditches, in most portions of the park. The Branches feed into Little Charlie Bowlegs Creek, which flows into Little Charlie Creek, and ultimately into the "Zolfo Springs to Arcadia" sub-basin of the Peace River watershed.

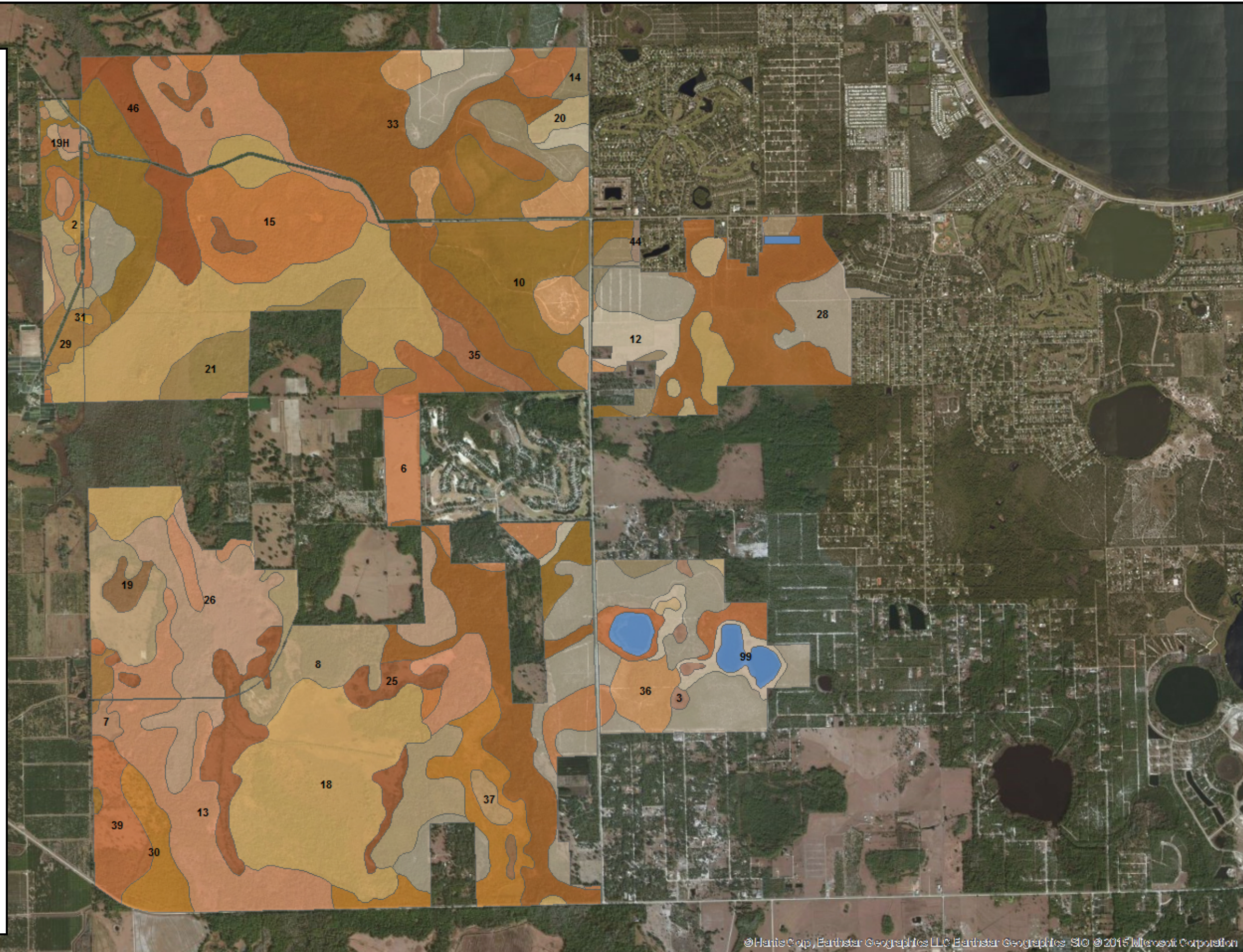
The greatest volume of water moves through Little Charlie Bowlegs Creek and its associated drainage basin, which traverses the park from the south to its lowest elevation at the north end of the park. The creek first assumes a recognizable form in cypress-dominated floodplain swamp in the original part of the park. The eastern edge of the floodplain swamp marks the western boundary of the hydric hammock (the central feature of the park), which extends out onto low-lying land next to the swamp. On the western side of the swamp, the land rises more steeply, covered with pines and palmettos. The drainage basin originates several miles south of the park where, before drainage canals were dug, water moved overland as sheet flow through several broad marshes. A good portion of this basin to the south has been brought within the park boundaries since 1990.

The two other drainageways are small creeks that emerge on the Highlands Ridge and run downhill to Little Charlie Bowlegs Creek. Haw Branch is a seasonal creek; it flows only when surface water is plentiful. It originates on the Seven Lakes property of the park, flows north across private land for more than a mile, and reenters the park a mile south of the entrance. Tiger Branch arises just inside the park boundary and flows downhill into wetlands near the junction of the county road and the park drive.

Man-made alterations to the hydrology are mostly legacy issues as properties were acquired, but some were implemented by the park. For example, the founders of the park had a moat built around the hydric hammock. As the park was taking shape, local citizens, and even prominent botanists of the time, knew little of the local natural communities' resilience or of the area's need for fire, and they were concerned that the hammock was under threat from drought and fire. They determined that a moat was needed north and south of the hammock to guard against these imagined threats. The resulting system of water control is attributed to Alexander Blair and a Mr. Hawkins. Blair was an engineer employed by Margaret Shippen Roebling, who put up most of the money to purchase the park. This system was integrated with plans for roads and fences. A canal and dike were extended from the terminal point of Tiger Branch, west to Little Charlie Bowlegs Creek. The dike became the county road. Dams were placed in the canal at intervals to step-down the surface of water as it moved toward the creek. In addition, in Little

Legend

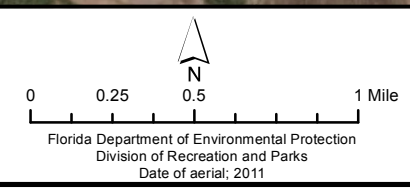
- 02 - St. Lucie sand, 0 to 8 percent slopes
- 03 - Basinger fine sand, depressional
- 06 - Tavares sand, 0 to 5 percent slopes
- 07 - Placid fine sand, depressional
- 08 - Immokalee sand
- 10 - Myakka fine sand
- 12 - Basinger fine sand
- 13 - Felda fine sand
- 14 - Satellite sand
- 15 - Bradenton fine sand
- 18 - Kaliga muck
- 19 - Hicoria mucky sand, depressional
- 19H - Ona fine sand
- 20 - Samsula muck
- 21 - Hontoon muck
- 25 - Chobee fine sandy loam, depressional
- 26 - Tequesta muck
- 28 - Archbold sand, 0 to 5 percent slopes
- 29 - Pomona sand
- 30 - Oldsmar fine sand
- 31 - Felda fine sand, depressional
- 33 - Basinger, St. Johns, and Placid soils
- 35 - Sanibel muck
- 36 - Pomello sand, 0 to 5 percent slopes
- 37 - Malabar sand, depressional
- 39 - Smyrna sand
- 44 - Satellite-Basinger-Urban land complex
- 46 - Kaliga muck, frequently flooded
- 99 - Water



birds

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HIGHLANDS HAMMOCK STATE PARK



SOILS MAP

Charlie Bowlegs Creek, a dam was built to prevent the creek and swamp from draining during dry periods; removable boards were placed in the dam during the dry season to hold water. South of the hammock, another canal and dike were constructed running from east to west. In 1981, however, the boards in the dam were removed for good, after research established that cypress and other hydric hammock species require periodic dry spells. Cypress seeds, for instance, can only germinate and get a footing as seedlings when the swamp is dry.

The land acquired south of the original park features hundreds of acres of marsh and swamp, wet prairie and wet flatwoods, and several miles of drainage ditches that were dug to drain them when the property was used to pasture cattle. South and east of the original park, on the Seven Lakes property, several of the lakes were connected by ditches, which probably impacts seepage flows in this parcel.

In 2006, PBS&J, Inc., was contracted by SWFWMD to perform a Hydrological Restoration assessment for the park, as part of a larger Lake Wales Ridge hydrology assessment project (PBS&J 2006). That report did produce several suggestions for immediate restoration actions, some of them based on observable erosion and ditching issues and some based on conceptual modeling of the overall hydrology at the park. Most of the erosion issues have been addressed, and evaluated in subsequent Land Management Reviews (LMR), but the conceptualized proposals for ditch blocking or for backfilling and revegetation have not yet been implemented. Also, in the 2013 LMR, the team indicated a need to address adjacent property concerns, particularly the need to study and ameliorate the impacts from the discharges from the Crewsville Water Association citrus groves that enter the park along Vaughn Road and management zones S001 and S002. This aspect was not discussed in the PBS&J report. Other aspects not discussed in the report include the ditching in the East parcel and in the southwest section of the South parcel, and whether there are any remnant impacts from the dam in its current state.

Based on these gaps, a more detailed full-park hydrology assessment is still needed. Park management can partner with SWFWMD, Highlands County, and possibly Lake Watch, to initiate this assessment. Since such an assessment fits under SWFWMD's Recommended Actions #4 ("Identify and evaluate other drainage modifications in the Upper Peace River watershed that may have affected flows in the Peace River"), this project may be eligible for SWFWMD Cooperative Funding Initiative support. Waters from the park ultimately enter the Peace River roughly 20 miles away, near Gardner and just north of the Desoto County line, into an area designated the Zolfo-Springs-to-Arcadia sub-basin. Background materials that will assist a full-park study include the work by Bob Tighe, "Hydrologic Monitoring at Highlands Hammock State Park 1985 to 1989" (Tighe 1997).

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 (DFC) of each natural community and identifies the actions that will be required to bring the community to its desired future condition. Specific

management objectives and actions for natural community management, exotic species management, and imperiled species management [and population 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). 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 dependent 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 (especially including those that are imperiled or endemic), and preserving intact ecotones that link natural communities across the landscape.

The park contains 23 distinct communities and landcover types (see Natural Communities Map), 18 of which are natural. Of the natural communities, four are imperiled: sandhill, Florida scrub, scrubby flatwoods, and sandhill upland lake. At HHSP these communities are globally significant due to the number and diversity of endemic species. In fact, new species are still being discovered here (Delaney 2010; Deyrup 2012). Descriptions of the communities are organized to match the order in which they are described in the FNAI 2010 guide. A list of currently known plants and animals occurring in the park is presented in Addendum 5.

Mesic Flatwoods

Desired future condition: Mesic flatwoods are pine flatwoods characterized by an open canopy of tall pines, typically longleaf pine (*Pinus palustris*) and/or south Florida slash pine (*Pinus elliotii*), and a dense, low ground layer of low shrubs, grasses, and forbs. Saw palmetto (*Serenoa repens*) will generally be present but not overly dominant. Other shrub species may include gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), runner oak (*Quercus pumila*), dwarf live oak (*Quercus minima*), shiny blueberry and Darrow's blueberry (*Vaccinium myrsinites* and *V. darrowii*), and dwarf huckleberry (*Gaylussacia dumosa*). The herbaceous layer is primarily grasses, including wiregrass (*Aristida stricta*), witchgrasses (*Dicanthelium* spp.), and broomsedge grasses (*Andropogon* spp.). This community has minimal

topographic relief and the soils contain a hardpan layer within a few feet of the surface that impedes percolation. Due to these factors, water can saturate the sandy surface soils for extended periods during the wet season, but lengthy droughts also commonly occur during the dry season. The Optimal Fire Return Interval for this community is 1-3 years in areas dominated by cutthroat and other grass species and 2-4 years in areas dominated by saw palmetto. Invasive exotic plant cover will be 5% or less.

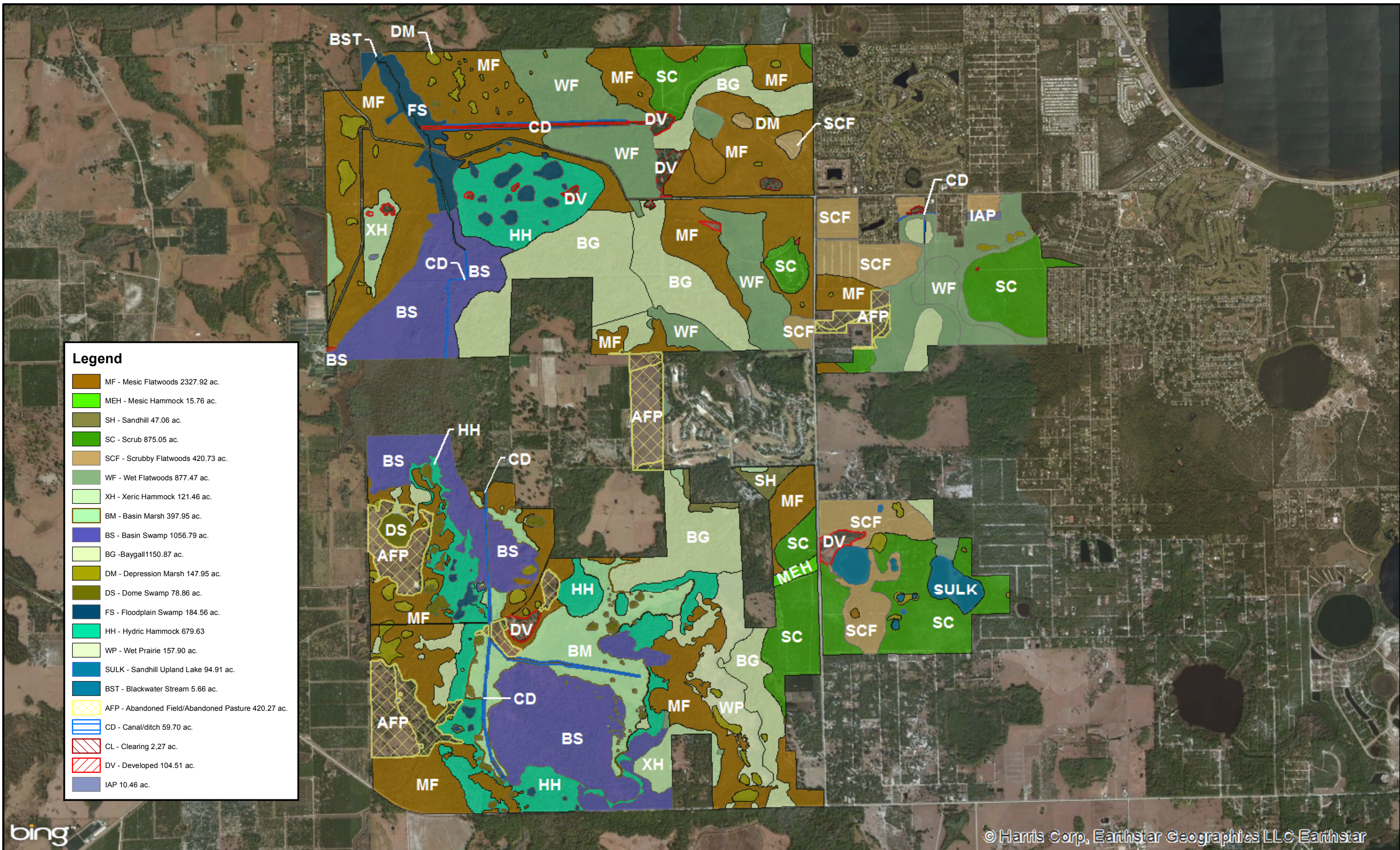
Description and assessment: There are nearly 2,350 acres of mesic flatwoods. Where there has been prescribed fire, these communities are generally in good to excellent condition. As noted earlier, seepage resulting from the hardpan layer will support pockets and strands of cutthroat grass. Other Florida endemics found in these mesic flatwoods include Florida Indian plantain (*Arnoglossum floridanum*), Florida false sunflower (*Phoebanthus grandiflorus*), lesser Florida spurge (*Euphorbia polyphylla*), and Florida scrub roseling (*Callisia ornata*). On the other hand, numerous invasive exotic plants are real threats here, including rosary pea (*Abrus precatorius*), particularly where oaks are beginning to establish hammocks in the flatwoods, Brazilian pepper (*Schinus terebinthifolia*), cogongrass (*Imperata cylindrica*), lantana (*Lantana camara*), rose natalgrass (*Melinis repens*), caesarweed (*Urena lobata*), chinaberry tree (*Melia azedarach*), and Old World climbing fern (OWCF) (*Lygodium microphyllum*), among others. Hog damage is a problem in this community as well.

In the south corner of H005 and the southwest corner of H009, a neighboring business has placed structures and vehicles within the park boundaries, in the mesic flatwoods community. It appears roughly 4.5 acres of park land has been encroached upon in this corner.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue efforts to reduce encroaching hardwoods, as well as baygall species along the wetter edges. Continue control of exotic invasive plant species and feral hogs. Communicate with the adjacent landowner to address and resolve the business encroachment issue.

Mesic Hammock

Desired future condition: Mesic hammock is a well-developed evergreen hardwood and/or palm forest. The canopy may be dense and typically dominated by live oak (*Quercus virginiana*) with cabbage palm (*Sabal palmetto*) mixed into the understory. Southern magnolia (*Magnolia grandiflora*) and pignut hickory (*Carya glabra*) can be common components in the subcanopy as well. At the park, shrubs will be few and are composed of saw palmetto, beautyberry (*Callicarpa americana*), and sparkleberry (*Vaccinium arboreum*). The groundcover is sparse and patchy but generally contains panicgrasses (*Panicum* spp.), switchgrass (*Panicum virgatum*), sedges, as well as various ferns and forbs. Abundant vines and epiphytes will occur on live oaks and cabbage palms and other subcanopy trees. Mesic hammock occupies soils that are sandy and well-drained, but that maintain high moisture by heavy shading of the ground layer and the accumulation of litter. Mesic hammocks



occupies soils that are sandy and well-drained, but that maintain high moisture by heavy shading of the ground layer and the accumulation of litter. Mesic hammocks are rarely inundated, are not considered to be fire-adapted communities, and will typically be shielded from fire. Invasive exotic plant cover will be 5% or less.

Description and assessment: Mesic hammock occurs in small pockets scattered as “islands” on high ground within other wetter communities at the park, or scattered on lower ground within more xeric communities. There are roughly 15 acres of mesic hammock currently mapped at the park and this does not include the pockets within wet flatwoods, mesic flatwoods, and hydric hammock. Generally, the small islands of this community are in fair to good condition at HHSP. The greatest threats come from hog damage, invasive exotic plants such as cogongrass, changes in hydrology brought about by various past and ditching, and berming activities. Although mesic hammocks are not considered fire-adapted communities, cabbage palms are fire tolerant and live oaks have a limited capacity to re-sprout from rhizomes (FNAI 2010; Vince 1989); however, fire needs to be allowed to burn into the edges, as this prevents development of unwanted baygall.

General management measures: Continue to bring prescribed fire into the edges of the hammock as far as it will go. Continue control of exotic invasive plant species and feral hogs.

Sandhill

Desired future condition: This globally rare community is imperiled in Florida (FNAI G3/S2). The dominant pine of sandhill will usually be longleaf pine and/or south Florida slash pine. Herbaceous cover will be very dense, typically of wiregrass, and low in stature. Most of the plant diversity is contained in the herbaceous layer including other three-awns (*Aristida* spp.), pineywoods dropseed (*Sporobolus junceus*), lopsided Indian grass (*Sorghastrum secundum*), bluestems (*Andropogon* spp.), and little bluestem (*Schizachyrium scoparium*). In addition to groundcover and pines, there will be scattered individual trees, clumps, or ridges of turkey oaks (*Quercus laevis*). In old growth conditions, some turkey oaks will be over 100 years old. The Optimal Fire Return Interval for this community is 1-3 years. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are roughly 47 acres of sandhill currently mapped at the park. The seven acres near South Hammock Road are approaching good condition because of fires since 2010; this pattern will need to continue. Species found in the park’s sandhill include scattered turkey oaks, Florida milkweed (*Asclepias feayi*), scrubland goldenaster (*Chrysopsis subulata*), pygmy fringetree (*Chionanthes pygmaea*), and Florida cinchweed (*Pectis linearifolia*). The larger area of this community, along Vaughn Road, is in fair to good condition and will be improved with prescribed fire and hardwood reduction; this area can be expanded to include the xeric hammock near the road.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Prioritize areas for hardwood reduction where fire has not reduced hardwoods to desired conditions. Continue control of exotic invasive plant

species and feral hogs.

Scrub

Desired future condition: This is also an imperiled community (FNAI G2/S2). The dominant plant species include scattered scrub oak (*Quercus inopina*), sand live oak (*Q. geminata*), myrtle oak (*Q. myrtifolia*), Chapman's oak (*Q. chapmani*), saw palmetto, and rusty staggerbush (*Lyonia ferruginea*). There will be a variety of oak age classes and heights between different scrub patches. There will be scattered openings in the canopy with bare patches of sand that support many imperiled and/or endemic plant species; these species will be regularly flowering and replenishing their seed banks. Sand pine (*Pinus clausa*), where present, will usually not be dominant in abundance, percent cover, or height, although pockets of mature sand pine may occur. The Optimal Fire Return Interval for this community will be regionally variable; typically, 4-15 years when aiming to achieve a mosaic of burned and unburned areas. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are roughly 875 acres of scrub community currently mapped at the park. Most of this community is part of the western-most slope of the LWR, and contains a good representation of the endemic and imperiled species associated with this Ridge system. For the most part, the scrub is in good to excellent condition. In addition to the many plants noted in the Imperiled Species section of this plan, the park's scrub is known to include brownhair snoutbean (*Rhynchosia cinerea*), silk bay (*Persea borbonia* var. *humilis*), sand spikemoss (*Selaginella arenicola*), medusahead airplant (*Tillandia balbisiana*), and bigflower pawpaw (*Asimina obovata*) in its plant diversity. Of the 91 species of endemic arthropods known to associate solely with LWR scrub, the park has at least 30 (Deyrup 2012); this includes the Highlands tiger beetle (*Cicindela highlandensis*). Several endemic and imperiled vertebrates are found in this community at the park, including the Florida scrub-jay (*Aphelocoma coerulescens*), Florida scrub lizard (*Sceloporus woodi*), and Florida sand skink (*Plestiodon reynoldsi*).

A few scrub areas are under threat at the park. Sand pine becomes too tall and too thick in areas where fire efforts have not provided sufficient control or where fire has been suppressed. In 2016-2017, 622 acres of scrub was improved through the efforts of park staff and volunteers cutting sand pines, combined with a 520-acre contracted project to cut all sand pines and oaks that were greater than 15 feet tall for scrub-jay habitat in scrub and scrubby flatwoods. In general follow the "Scrub Management Guidelines for Peninsular Florida: Using the Scrub-jay as an Umbrella Species" (FWC and FNAI, 2010) with a goal of creating optimal Florida scrub-jay habitat, while supporting the life history needs of other rare scrub species.

Populations of the invasive plant, rose natalgrass, are an ever-increasing threat, as is cogongrass. Impacts from past and current human activities are especially noticeable in two areas, zones E014 and H029. Zone E014 is problematic for management of imperiled community and species, as it is a thin section of land between utility corridors and roads, adjacent to suburban neighborhoods. There is evidence that the area is used in ways outside of normal park protocols. Attempting to survive in these conditions are imperiled species Curtis' milkweed (*Asclepias*

curtissii) and scrub bluestem (*Schizachyrium niveum*). The other area, Zone H029, is currently designated as an Altered land type: Abandoned Pasture, but should be scrub in the southern 81 acres, based on the soil type and the few endemics, such as Garberia (*Garberia heterophylla*) and brownhair snoutbean, that have managed to volunteer and survive in spite of disturbances from pasture and mowing. Management details for this zone are further discussed in the "Altered: Abandoned Pasture" section.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue efforts to reduce heights and densities of sand pine. Continue control of exotic invasive plant species and feral hogs.

Scrubby Flatwoods

Desired future condition: This is another imperiled community type (FNAI G2/S2) at the park. The dominant tree species of this pine flatwoods type will usually be longleaf pine and south Florida slash pine. Mature sand pines will typically not be present. There will be a diverse shrubby understory, often with patches of bare white sand. The "canopy" will contain a scattered variety of age classes and heights across the landscape and the dominant species will include sand live oak, myrtle oak, Chapman's oak, saw palmetto, rusty staggerbush, tarflower (*Bejaria racemosa*) and Darrow's blueberry. Cover by herbaceous species is low to moderately dense. The Optimal Fire Return Interval for this community is typically 5-15 years and creates a mosaic of burned and unburned areas. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are almost 420 acres of scrubby flatwoods mapped in this plan, all of which are currently found along the eastern side of the park, east of Charlie Bowlegs Creek. Most of the scrubby flatwoods are in excellent condition. In addition to the species listed above and in the Imperiled Species list, Florida scrub frostweed (*Crocantemum nashii*), Chapman's blazing-star (*Liatris chapmanii*), Feay's palafox (*Palafoxia feayi*) are a few of the endemic plants found in this community at the park. Gopher tortoise (*Gopherus polyphemus*) is commonly found in scrubby and the mesic flatwoods communities. As noted in the discussion on Imperiled Species, management for the majority of scrub and scrubby flatwoods species follows Florida scrub-jay best management practices. Sand pine, while native, can occasionally overwhelm this community without some management assistance, particularly if fire is not sufficient to thin the species. Exotic plant species include natal grass, cogongrass, and lantana.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue efforts to reduce encroaching sand pine and hardwoods. As discussed in the Introduction of this management plan, timber management to enhance restoration may be appropriate for certain tracts. Continue control of exotic invasive plant species and feral hogs.

Wet Flatwoods

Desired future condition: This forested upland community is a pine flatwoods type with a sparse canopy, sparse or absent mid-story, and a dense ground cover of

hydrophytic herbs, grasses and low shrubs. In Highlands and Hardee Counties, dominant pines will usually be south Florida slash pine, with some longleaf pine. There are few shrubs, and these are low; species may include fetterbush, swamp azalea (*Rhododendron viscosum*), dahoon (*Ilex cassine*), and wax myrtle (*Morella cerifera*). Native herbaceous cover is dense and may include hooded pitcherplants (*Sarracenia minor*) or Carolina redroot (*Lachnanthes caroliana*). Cutthroat grass dominates some areas. Also, terrestrial orchids, such as yellow fringed orchid (*Platanthera ciliaris*), may be present and abundant in some areas. The Optimal Fire Return Interval for this community is 2-4 years. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are about 881 acres of wet flatwoods mapped in this plan. Many of these acres replace areas formerly designated as seepage slope, as well as some areas of mesic flatwoods, and baygall. At the time of writing this plan, there are two disparate applications for “seepage slope” – a central Florida application for cutthroat-grass-based communities and the state-based FNAI-defined application. The FNAI description for seepage slope limits its range to the panhandle and includes indicator characteristics not found at the park, such as 50-foot elevation changes. As this plan attempts to stay within FNAI-defined parameters, HHSP is not currently mapped as having any “seepage slope.”

Note that cutthroat grass is a LWR endemic that regionally replaces most of the dominant or sub-dominant native grasses that typify various plant communities in other parts of central Florida. Wet flatwoods, with its designated cutthroat grass flatwoods variant is one of these communities. Wet prairie, particularly in its cutthroat seep variant areas, is another. But cutthroat grass is also present in near-surface seepage areas and drainage channels in sandhill, scrubby flatwoods and mesic flatwoods, and along the edges of depression, basin and other marshes. Eleven different microhabitat zones were identified and studied for cutthroat grass, ranging from dry cutthroat grass and cutthroat grass lawns, to boggy sphagnum meadows and natural drainageways (Bridges 1999). At the park, various cutthroat grass microhabitats can be found in nearly all the park’s community types. The plant’s persistence depends on growing-season fire, both to reduce encroachment of woody species and to stimulate flowering.

Generally, the wet flatwoods at the park are in fair to good condition. Lack of fire until recent years has suppressed the health of this community. Shrubby plants dominate in many areas. However, everywhere that fire has been newly introduced, the impact is positive and clearly underscores the need to continue a short 1-2 year growing-season FRI until good to excellent conditions are achieved. At HHSP, much of the wet flatwoods is the cutthroat grass flatwoods community variant and it is very possible that with a better fire regime, many of these acres will revert to wet prairie.

Other native species found in this community at HHSP include toothache grass (*Ctenium aromaticum*), hooded pitcherplant, long strap fern (*Campyloneurum phyllitidis*) and the sensitive ferns (*Woodwardia* spp.), and peelbark St. John’s wort (*Hypericum fasciculatum*). There are a number of heath species, such as blue

huckleberry (*Gaylussacia frondosa* var. *tomentosa*), maleberry (*Lyonia ligustrina* var. *foliosiflora*), and swamp azalea. Major threats include wild hog rooting damage and the invasive plants encroaching from the old botanical gardens (e.g., bamboos, many of which have not been identified; Turk's turban (*Clerodendrum indicum*); dianella lily (*Dianella ensifolia*), as well as the insidious threat from the climbing ferns (*Lygodium* spp.).

General management measures: Continue selective removal of fire breaks, and continue efforts to bring prescribed fire into the proper return interval. Continue efforts to reduce encroaching baygall. Continue control of exotic invasive plant species and feral hogs.

Xeric Hammock

Desired future condition: This hardwood forested upland is typically considered a late successional stage of scrub or sandhill that generally occurs in small isolated patches on excessively well drained soils. Vegetation consists of a low closed canopy dominated by sand live oak, which provides shady conditions. Typical plant species may also include Chapman's oak, and laurel oak. Sand pine, slash pine, or longleaf pine may also be minor components. Understory species will include saw palmetto, fetterbush, myrtle oak, yaupon holly (*Ilex vomitoria*), Hercules' club (*Zanthoxylum clava-herculis*), and Florida rosemary (*Ceratiola ericoides*). A sparse groundcover layer of wiregrass and other herbaceous species may exist. 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. At the park, most xeric hammock could be sandhill. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are roughly 122 acres of xeric hammock currently mapped in the park. Except for those acres around the old youth camp, where there has been development, most are in good condition. Almost all the xeric hammock could be returned to what was probably sandhill, as indicated by the scattered turkey oak (*Quercus laevis*) and soil types in these areas. The four acres along Vaughn Road could easily be included in the management for the adjacent sandhill and eventually returned to sandhill, or the hammock could be left to provide a buffer between the road and park lands. The xeric hammock on the western side of the park has a naturally occurring population of Florida goldenaster (*Chrysopsis floridana*). It is essential that there be no fall burns here; growing-season burns only are appropriate. If this area is not returned to sandhill, selected removal of a few of the smaller oaks and occasionally using a leaf blower to remove leaf litter, may be sufficient to protect and support the goldenaster population. Invasive exotic plants include cogongrass and rose natalgrass.

General management measures: Continue to bring prescribed fire into the hammock. Continue removal of hardwood canopy. Continue control of exotic invasive plant species and feral hogs.

Basin Marsh

Desired future condition: This larger freshwater non-forested wetland community is

regularly inundated and dominated by emergent herbaceous and low shrub species; there is an open vista. Trees, if present, are few and occur primarily in the deeper portions of the community. There is little accumulation of dead grassy fuels due to frequent burning; the soil surface is visible through the vegetation when the community is not inundated. The vegetation is generally divided into grassy, emergent, floating-leaved, and submersed zones from shallowest to deepest portions; shrub patches are sometimes present within any of these zones. Dominant vegetation in basin marsh includes Jamaica swamp sawgrass (*Cladium jamaicense*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* spp.), buttonbush (*Cephalanthus occidentalis*), peelbark St. John's wort, and coastalplain willow (*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are approximately 352 acres of basin marsh currently mapped in the park. All the species listed above can be found in these communities, but condition assessment is difficult to rate because 1) FNAI soil parameters for this community cannot be applied at this park, 2) impacts of hydrologic manipulation have not been assessed, and 3) access to make detailed surveys is difficult. Soil types impact species-association development, which is the primary indicator for judging condition. At the park, the soils in the areas designated as basin marsh are mapped as Chobee fine sands depressionnal, Placid fine sands depressionnal, and Kaliga muck. Most of the basin marsh community is found in the southern part of the park generally associated with portions of the headwaters region of Little Charlie Bowlegs Creek. There is significant ditching in this area and these marshes also receive nutrient-loaded runoff from nearby agricultural and golfing lands. Natural seasonal and longer-term fluctuations in water level are important for maintaining the diversity of marsh vegetation and wildlife, but it is unknown at this time what the full impact has been from all the ditching and other hydrological alterations at the park. Basin marsh is not naturally exposed to fire with the same frequency as depression marsh; however, burning the marsh helps to maintain its character, and areas with dense sawgrass, maidencane (*Panicum hemitomon*), or cutthroat grass burn even when there is standing water. With lack of fire, basin marsh can succeed into baygall or basin swamp.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue efforts to bring prescribed fire into the community. Continue control of exotic invasive plant species and feral hogs.

Basin Swamp

Desired future condition: Basin swamps are forested basin freshwater wetlands that are highly variable in size, shape and species composition; they hold water most days of the year. While mixed species canopies are common, the dominant trees are pond cypress (*Taxodium ascendens*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*) Other canopy species include slash pine, red maple (*Acer rubrum*), dahoon

holly, sweetbay (*Magnolia virginiana*), loblolly bay, and sweetgum (*Liquidambar styraciflua*). Depending on fire history and hydroperiod, the understory shrub component is found throughout or concentrated around the perimeter. Shrub species can include a variety of species including Virginia willow (*Itea virginica*), swamp dogwood (*Cornus foemina*), and wax myrtle. The herbaceous component is variable, at HHSP it certainly includes cutthroat grass, and may include a wide variety of species such as maidencane, ferns, arrowheads, lizard's tail, false nettle (*Boehmeria cylindrica*), and sphagnum moss. Soils are typically acidic, nutrient-poor peat often overlying a clay lens or other impervious layer. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are nearly 1,055 acres of basin swamp in the park. These are mostly in the south-southwest portion of the park property. Generally, the basin swamp is in good condition, with a good representation of the species listed above. The larger of the listed airplants can be seen here. As discussed under basin marsh, it is unknown to what extent the altered hydrology and the years of fire suppression have impacted these areas of the park; it is possible that with better prescribed fire, portions of the basin swamp will revert to basin marsh. This community would benefit from more extensive surveys. OWCF infestations and the impacts of altered hydrology are its biggest threats.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work towards an appropriate prescribed fire interval. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant species. Continue to troubleshoot ways to best address the business encroachment.

Baygall

Desired future condition: Baygall is a wet, dense, hardwood forest found in peat-filled depressions typically near the base of a slope. Seepage from adjacent uplands maintain saturated conditions. Medium to tall trees mainly consist of sweetbay, loblolly bay (*Gordonia lasianthus*), and swamp bay (*Persea palustris*). Occasionally sparse pines may also exist. A thick understory consisting of gallberry, fetterbush, dahoon, and red maple are typical, and climbing vines such as greenbriar (*Smilax* spp.) and grape (*Vitis* spp.) are usually abundant. The dominant baygall species are fire intolerant, indicating an infrequent Optimal Fire Return Interval of 25-100 years. Frequent fires from adjacent communities are allowed to enter baygall ecotone (while preparing for the problems associated with peat fires), to prevent encroachment into other, sometimes imperiled, communities such as cutthroat seep. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are over 1,142 acres of baygall currently mapped at the park. These areas have all the species listed above, as well as the occasional swamp azalea. There are dense stands of loblolly bay, beautiful when in bloom, as well as other bays, and there are areas of thick, impassable understory. Long term fire suppression makes it difficult to determine to what extent, if any, the existing baygall coverage is undesirable successional encroachment. It is possible that a third to a half of the acres currently mapped as baygall will readily

revert to wet flatwoods, wet prairie, basin marsh, or basin swamp with restoration fire applications. Also, baygall is another community directly impacted by hydrology alteration. Invasive exotic plants include downy rosemyrtle (*Rhodomyrtus tomentosa*) and OWCF.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work towards an appropriate prescribed fire interval. Continue control of exotic invasive plant species.

Depression Marsh

Desired future condition: This freshwater non-forested wetland community is irregularly inundated and dominated by low emergent herbaceous and shrub species; there are open vistas. Vegetation patterns are probably in concentric bands, resulting from the changes in depth and timing of inundation. The sparsest herbaceous plants are on the outer edges and the taller and sturdier herbs, such as maidencane, panic grasses, cutgrass (*Leersia* spp.), pickerelweed, arrowheads, and peelbark St. John's wort, are next. Trees, if present, are few and occur primarily in the deeper portions of the community where fire can't reach. As depression marshes exist as small depressions within a matrix of fire-maintained communities, such as mesic flatwoods or sandhill, there is little accumulation of dead grassy fuels, due to frequent burning. The soil surface is visible through the vegetation when the community is not inundated. The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are roughly 147 acres of depression marsh currently mapped in the park. Depression marshes occur as "a small or shallow inclusion in a pyrogenic community" (FNAI 2010). At the park, the sizes vary from a tenth of an acre to 14 acres; most are found within mesic flatwoods, with a few scattered in scrub and sandhill. The one along the south boundary of zone S009 probably originated as a borrow pit for road fill on State Road 66, but has since developed good littoral edges and now functions well as a depression marsh. Generally, where prescribed fire has been implemented, these communities are in good condition. Florida gopher frog (*Lithobates capito*) tadpoles can be found in some of these seasonal wetlands. Wrinkled jointtail grass (*Coelorachis rugosa*), swamp rosemallow (*Hibiscus grandiflorus*), and southeastern primrosewillow (*Ludwigia linifolia*) are a few of the native plants in the depression marshes. Threats continue to be hog damage and exotic invasive plants; the latter include water spangles (*Salvinia minima*) on open waters, and torpedo grass (*Panicum repens*), Brazilian pepper and cogongrass along the edges.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue control of exotic invasive plant species and feral hogs.

Dome Swamp

Desired future condition: Dome swamp is an isolated, forested, depression wetland occurring within a fire maintained matrix such as mesic flatwoods. The

characteristic dome appearance is created by smaller trees growing on the outer edge (shallower water and less peat) and larger trees growing in the interior. Pond cypress typically dominates, but swamp tupelo may also form a pure stand or occur as a co-dominant. Other subcanopy species may include red maple, dahoon holly, swamp bay, sweetbay, and loblolly bay. Shrubs are absent to moderate (a function of fire frequency) and are species typically found in the mesic flatwoods. An herbaceous component may be absent or it may be dense and include ferns, maidencane, sawgrass, sedges, lizards tail (*Saururus cernuus*), and sphagnum moss (*Sphagnum* spp.). Vines and epiphytes will be common. As maintaining the appropriate hydrology and fire frequency is critical for preserving dome swamp structure and species composition, this community at the park is allowed to burn on the same frequency as the adjacent fire type community. Fires are appropriately planned to avoid high-severity fuel consumption within the dome swamp. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are about 79 acres of dome swamp currently mapped at the park, scattered in multiple zones and with the largest swamp at about 24 acres. According to FNAI, true dome communities are found within pyric communities and occasionally carry fire completely across their system. In the 2007 plan, many areas designated dome swamp were well within hydric hammock, areas that are not pyric and that were probably once part of the normal hydrology of the Little Charlie Bowlegs Creek system; such areas are now mapped as floodplain swamp community that include dense stands of cypress. Dome swamp at the park is generally found in mesic flatwoods areas, with an expected FRI of 1-3 years. This FRI had not been occurring in the dome swamp in the park and the community assessment is fair for this reason. Hardwood species are filling in and changing the burn potential and the muck layer in the soil. Native plants found in this community at HHSP include prickly bog sedge (*Carex atlantica* subsp. *capillacea*), waterspider false reinorchid (*Habenaria repens*), shade mudflower (*Micranthemum umbros*), and goldenclub (*Orontium aquaticum*). Among the exotic plant species here, OWCF is the main threat.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work towards an appropriate prescribed fire interval. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant species and feral hogs.

Floodplain Swamp

Desired future condition: This type of freshwater forested wetland is a frequently or permanently flooded community in low lying areas along streams and rivers. Soils consist of a mixture of sand, organics, and alluvial materials. The closed canopy is typically dominated by bald cypress (*Taxodium distichum*) but commonly includes swamp tupelo, red maple and swamp laurel oak. Trees bases are typically buttressed. Understory and groundcover are typically sparse, although the "knees" arising from the root systems of cypress and tupelo are common features. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are roughly 186 acres of floodplain swamp at the park. These are generally in good condition. Bald cypress is common in this community and occasionally forms dense stands within the hydric system at the park. Other species found here include swamp tupelo, Savannah panicum (*Phanopyrum gymnocarpon*), climbing aster (*Symphyotrichum carolinianum*), and false nettle. Exotic invasive plants include OWCF and grasses such as torpedo grass and the challenges of treatment access are problematic.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant species and feral hogs

Hydric Hammock

Desired future condition: This freshwater forested wetland is characterized by a closed canopy of evergreen hardwood and palm trees, with a variable understory dominated by palms, and with sparse to moderate ground cover of grasses and ferns. Soils will be poorly drained but only occasionally flooded. Typical canopy species includes laurel oak, cabbage palm, live oak, red cedar (*Juniperus virginiana*), sweetbay, swamp tupelo, American elm (*Ulmus americana*), red maple and other hydrophytic tree species. Healthy hydric hammocks are occasionally burned, usually by allowing fires originating in adjacent upland natural communities to burn across ecotones and into the hammock. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are about 681 acres of hydric hammock currently mapped at the park, incorporating a fine mosaic of smaller, unmapped communities such as mesic hammock. Hydric hammocks are known for having limestone at or within a meter of the surface, and the variable surface topography and the numerous near-circular karst depressions in the main hammock of the park attest to the influence of limestone in shaping this community.

Overall, the condition of the main hydric hammock is fair. Despite many large old live oak trees, currently there is no noticeable recruitment in the main hammock; the oaks that are recruiting are the more hydrophytic species, such as laurel oak. With the "moat" discussed in the Hydrology section earlier and the other hydrology disruptions at the park, it is possible that conditions for live oak recruitment no longer exist. The normal hydroperiod for hydric hammocks is seldom over 60 days per year (FNAI 2010), but current inundation periods at the park are not closely tracked and could be longer than this. Also, openings in the hammock, whether from natural events or from the roads and trails, are tending to fill in with too many cabbage palm, sweetgum, or marlberry (*Ardisia escallonioides*); this is most likely due to the lack of fire anywhere in this community. A complete hydrology assessment will provide the inundation data needed to begin addressing the oak recruitment changes, and mechanical treatments along the visitor use areas is probably the most feasible way to substitute for the correcting effects of edge fires.

The hydric hammocks at HHSP may differ from other hydric hammock communities

in Florida (FDRP 2007). For instance, the red cedar characteristic of other hydric hammocks is not observed in nor recorded for the park. There are subtropical species growing with the expected central and northern species, especially in the understory where plants are probably more protected from the occasional frosts. Subtropical species include two species of wild coffee (*Psychotria nervosa*, *P. sulzneri*), wild lime (*Zanthoxylum fagara*), firebush (*Hamelia patens*), lancewood (*Ocotea coriacea*) and marlberry. The central and north Florida species include wax myrtle, dwarf palmetto (*Sabal minor*), beautyberry, and Walter's viburnum (*Viburnum obovatum*). Epiphytes are common and include the Bartram's and other airplants (*Tillandsia bartramii* and *Tillandsia* spp.), resurrection fern (*Pleopeltis polypodioides* var. *michauxiana*), green-fly orchid (*Epidendrum conopseum*) and butterfly orchid (*Encyclia tampensis*). Note that the only vouchered specimen for gingerbush (*Pavonia spinifex*) for Highlands County comes from this community at the park; as the origins of this species are still being investigated, this mallow should be watched lest it become another caesarweed story. The native wild Boston fern (*Nephrolepis exaltata*) occurs in this community, but so do patches of the related exotics, Asian and Boston sword ferns (*Nephrolepis brownii*, *N. cordifolia*). The exotic ferns need to be removed, but correct identification must be verified before every fern treatment application, not only to avoid the *Nephrolepis* confusion, but also to avoid killing other ferns similar in appearance found the hammock, such as the listed comb polypody (*Pecluma ptilota* var. *bourgeauana*). Other invasive exotic plants in the hydric hammock include OWCF, rosary pea, coral ardisia (*Ardisia crenata*), and zocatillo (*Oplismenus burmannii*). Hog damage is also found in this community.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work towards an appropriate prescribed fire interval, as feasible. Continue manual control of edge and understory woody encroachment. Continue control of exotic invasive plant species.

Wet Prairie/Cutthroat Seep

Desired future condition: This community is similar in species composition to that of the northern seepage slope, but here it is generally found on lower, gently sloping terraces surrounded by mesic or wet flatwoods where the water table is not perched above the level of the normal water table. Trees will be few or absent. Groundcover will be dense and species-rich. Along the LWR system, the dominant grass will be cutthroat grass. Other species will include wiregrass, sedges (*Carex* and other genera), and blue maidencane (*Amphicarpum muehlenbergianum*). Hooded pitcherplants and other carnivorous plant species, and terrestrial orchids are present and abundant in some areas. FRI is 2-3 years. Invasive exotic plant cover will be 5% or less.

Description and assessment: At the park, wet prairie is mostly of the cutthroat seep variant community type. There are currently nearly 158 acres of wet prairie at HHSP in the south portion of the park, in one of the areas formerly mapped as seepage slope. This acreage could increase as wet flatwoods are burned. In the meadows of cutthroat grass at the park, there are clumps of the plant that are probably well over a hundred years old. This zone will benefit from maintaining FRI,

and it also needs to be more fully surveyed for rare species and exotic species. *Hartwrightia* (*Hartwrightia floridana*) and hooded pitcherplants, at the least, are likely to be found here.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue control of exotic invasive plant species and feral hogs. Implement at least Tier 1 rare plant surveys for this community.

Sandhill Upland Lake

Desired future condition: This lentic, lacustrine community is globally rare and imperiled in Florida (FNAI G3/S2). It forms in rounded, shallow, solution depressions within sandy upland communities, where water collects from lateral ground water seepage. These lakes serve as aquifer recharge areas. Water is nearly always present, except during extreme droughts, but the levels may fluctuate dramatically. Shorelines may sometimes be gradual. Typical vegetation is mostly along the shoreline and includes emergent and submerged aquatic plants, and transitional species along the shoreline. Species include water lilies, sawgrass, pickerelweed, meadow beauty (*Rhexia* spp.), peelbark St. John's wort, yellowed-eyed grass (*Xyris* spp.), hatpins (*Syngonanthus flavidulus*), and spikerushes (*Eleocharis* spp.). Healthy sandhill upland lake have low turbidity and no indication of unnatural disturbances in water table or from erosion. Invasive exotic plant cover will be 5% or less.

Description and assessment: There are roughly 93 acres of sandhill lake mapped, all of which are in the Seven Lakes parcel. The largest of these are in good condition. In addition to the species listed above, floating bladderwort (*Utricularia inflata*) are found in the shallower areas, and sand cordgrass (*Spartina bakeri*), grassy-leaf arrowhead (*Sagittaria graminea*), and Richard's yellow-eyed grass (*Xyris jupical*) along the drier edges. A few of the smaller lakes or ponds do have water spangle infestations or other non-native plants that disturb the natural vegetation patterns, and thus the composition, of the water. Hog damage occurs here, too, and creates turbidity, erosion, and pollution.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant and animal species.

Blackwater Stream

Desired future condition: This riverine community is generally characterized as a perennial or intermittent watercourse or stream originating in lowlands, where extensive wetlands with organic soils collect rainfall and runoff and then discharge it slowly to the stream. The stained waters in the watercourse are laden with tannins, particulates, and dissolved organic matter derived from that drainage, resulting in sandy bottoms overlain by organic matter. Although darkly stained, water is generally clear. Emergent and floating vegetation, including golden club, smartweeds (*Polygonum* spp.), grasses and sedges, occur but may be limited by

bank topography and dramatic seasonal fluctuations in water levels. Desired conditions include minimizing disturbance and alterations and preserving adjacent natural communities.

Description and assessment: Little Charlie Bowlegs Creek, Haw Branch, and Tiger Branch are blackwater streams. They are not fully mapped due to the level at which streambeds, canals and ditches interconnect. Where the streambeds appear independent of the multiple canals and ditches, they are in good condition. Native plants known to be in the Creek, or along its wet edges, include green arrow arum (*Peltandra virginica*) and royal fern (*Osmunda regalis* var. *spectabilis*). Threats include the hairy water-clover (*Marsilea vestita*), taro (*Alocasia odora*), and the invasive exotic species also found in the canals and ditches, including exotic fish such as brown hoplo (*Hoplosternum littorale*) and African jewelfish (*Hemichromis letourneuxi*). Hogs damage stream edges and beds. A full hydrology assessment is needed, as is a reduction in the impacts from fire suppression.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant and animal species.

Altered Landcover

Abandoned Pasture

Desired future conditions: Each of the abandoned pasture areas at the park has its own hydric, soil and vegetation components, and thus different desired future natural community applications.

Description and assessment: There are nearly 370 acres of abandoned pasture at the park. "Improvement" activities when these areas were active pastures included adding lime or fertilizers to soils and seeding with non-native grasses, which impact soil pH and seed-bank composition. At the park, these altered areas are dominated by weedy native species, such as blackberries (*Rubus* spp.), and non-native species, such as bahia (*Paspalum notatum* var. *saurae*), torpedo grass, and hairy indigo (*Indigofera hirsuta*), but still have a native vegetation component.

In 2012, some of the areas identified as abandoned pasture were evaluated for use as grazing lands, as a potential temporary prescription towards achieving maintenance and restoration efforts, whether directly or through in-kind restoration tasks. The evaluation included: a site visit with experts from the University of Florida's Institute of Food and Agricultural Sciences (IFAS) and Archbold Research Station, representing a range of pertinent knowledge and experience; site visit with experts from Natural Resources Conservation Service (NRCS), an organization with years of field experience supporting and representing local active ranchers (none of the latter were part of the discussions), and NRCS also brought research training materials, published studies of prescription grazing, and publications on currently accepted national business practices. Also considered were the experiences of other park and District staff that are implementing grazing. The biological determination

from this review was that restoration at HHSP could be achieved readily by increasing prescribed fire area and frequency, and by less mowing (H029). In addition, the consensus from the experts was that the challenges to managing a grazing business in the park were far greater than the estimated returns. The challenges included lack of access to water, access difficulties for moving cattle from one plot to another to maintain standard rotation practices, expense of fencing to maintain proper protections, and the low amount of grazing opportunities (Rowe 2012).

All abandoned pasture acres at the park will develop into more natural communities with appropriate fire regime. Most will become mesic flatwoods (around 270 acres) and the rest will be scrubby flatwoods, scrub or sandhill, and pockets of wet flatwoods. In zone H029, the southern 83 acres are mostly on Tavares sand, 0 to 5% slope, and this area was probably once sandhill. It is choked with bahia, but there are many active gopher tortoise burrows, with an estimated population of 624 tortoises (FNAI 2017), and, especially in the few patches of open sand, there are endemic scrub species trying to survive, such as *Garberia* and brownhair snoutbean. Establishing sandhill here requires a restoration plan to address altered soil pH and to arrange plantings of longleaf pine and other species. However, a good interim 10-year management goal would be to remove the bahia grass and burn sufficiently to encourage the native scrub and sandhill species that are already present. In the northern 20-some acres of this zone, the soil and the topography change. And there are sufficient native species along this slope that this will be mesic or wet flatwoods with proper burning. The pastures in the southern portion of the park are likely to begin developing as mesic and scrubby flatwoods and the park has started restoration burning of the abandoned pastures.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue control of exotic invasive plant species and feral hogs.

Canal/Ditch

Desired future condition: A full hydrology assessment provides the park with an overview of what the natural flow of water should be at the park. It provides the data and strategy necessary to plan where canals and ditches need to be altered, and how.

Description and assessment: There are currently six to seven miles of canals and ditches mapped for the park, but this number under-represents the extent of these alterations. Complete mapping must be part of a full-park hydrology assessment. The importance of seepage flow across the HHSP landscape is underscored by the presence of cutthroat grass, pitcherplants, hartwrightia and various orchids in disparate areas of the park. It is also important to understand how to best maintain one of the park's main visitation features – the hydric hammock. The beautiful hammock that inspired the creation of the park developed before most of the extensive ditching and canal work was in place. Without a full cross-park study, there is no way of knowing which ditches or canals might serve well if left in place,

or which ones need to be restructured nor in what order any changes should be implemented.

While there are native species that make effective use of the water features, the same species will do well in the natural communities that would exist without such alterations. On the other hand, the disturbances from creating the canals and ditches have mostly provided habitat for invasive species. West Indian marshgrass (*Hymenachne amplexicaulis*), arrowleaf elephant ear (*Xanthosoma sagittifolium*), taro, OWCF, are but a few.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant species.

Clearing

Desired future condition: Each of the clearing areas at the park has its own hydric, soil and vegetal components, and thus different desired future community applications.

Description and assessment: There are essentially two areas designated as “altered – clearing” in the park. Both are in the East parcel, one in the scrub and the other in a scrubby flatwoods/wet flatwoods ecotone near an impoundment/artificial pond area. The clearing in scrub may be simply left to basic management practices (fire and exotics removal), as it is likely to recruit good endemics on its own; some scrub species seem to “prefer” the more freshly-churned sand when they can get it.

The other area is a different story, however, as this probably has at least one representative of every invasive exotic on the park’s list. There is even a small forest of Australian umbrella trees (*Schefflera actinophylla*). The soil here is disturbed to the point of resembling Arents on the surface, although it is mapped as Basinger/St.Johns/Placid complex (typical of wet flatwoods in the park). Even though this clearing is small, roughly 2 acres, a restoration plan is recommended. Not only is it unlikely that there is sufficient appropriate native seed to re-vegetate naturally, even with proper burning and exotic treatments cycles, but this area is on an urban interface, further exposing it to disturbance and exotics. The restoration plan should include the adjacent impoundment/artificial pond, and provide site-specific planting instructions.

General management measures: Continue efforts to bring prescribed fire into the proper return interval. Continue control of exotic invasive plant species and feral hogs. Also see restoration plan under Management Objectives.

Developed

Desired future condition: The developed areas within the park are managed to minimize negative impact on adjacent natural areas. Invasive plant species are removed from all developed areas. Landscaping only includes plant species found

naturally occurring at the park and, if obtained from outside the park, are from the local region. Mowing schedules allow native vegetation to seed and propagate, as appropriate to each area and original community type. Stormwater is managed to prevent erosion, destructive alteration of water tables in natural communities, and the spread of any undesirable chemicals or plant materials. Development follows guidelines that are compatible with prescribed fire management in the adjacent natural areas.

Description and assessment: Of the 106 acres currently mapped as developed for the park most are in fair to good condition. Erosion issues, road surfacing, and other access challenges are ongoing. Areas that were once planted with non-native species continue to threaten natural areas; coral ardisia and dianella lily, are prime examples of this problem, as are citrus trees (*Citrus* spp). Within the old park boundaries, there were one or two citrus fields planted; these could be evaluated for cultural significance. However, the citrus have now naturalized at the park and are becoming invasive in the mesic and hydric hammocks; the central hydric hammock is especially at risk. The fruit produced by the naturalized plants is generally so bitter as to be inedible. Where possible, citrus trees should be removed.

General management measures: Continue mowing patterns that encourage native plant growth and seeding. Continue monitoring and repairing any erosion issues. Continue removal of citrus trees and control of exotic invasive plant species.

Impoundment/Artificial Pond

Desired future condition: See the discussion under Canals/Ditches.

Description and assessment: There are at least 11 acres of impoundments and artificial ponds at the park. Most of them are scattered in old disturbed areas. All the impoundments or artificial ponds lack the gradients that would encourage natural succession to healthy wetland systems. All are surrounded by the disturbances that encourage exotic plant species. Also, there are exotic fish, such as walking catfish (*Clarius batrachus*), in the larger impoundments. A full-park hydrology assessment is needed to determine the needs and next steps for restoration or enhancement efforts related to impoundments and artificial ponds. Assistance for managing invasive aquatic species is needed in these areas.

General management measures: Continue to work towards a full hydrology assessment of the park. Continue to work with SWFWMD and other relevant agencies to implement water quality testing. Continue control of exotic invasive plant and animal species.

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 (FWC) or the Florida

Department of Agriculture and Consumer Services (FDACS) as endangered, threatened or of special concern.

HHSP is rich in Florida endemic species. While all endemic species should be treated with respect in their own home, some have been assigned special protections. Table 2 lists all the imperiled species currently known to be at the park, endemic or native. Most imperiled species at the park are associated with the four imperiled communities there: scrub, scrubby flatwoods, sandhill, and sandhill upland lake.

In the last plan, a number of imperiled species were reported as "observed," but have no data currently traceable to substantiate these observations. Where these species are vouchered at all for Highlands or Hardee Counties, they are now included with other "look for" tasks (Tier 1 or 2 monitoring); these are marked with "(nv)" (not vouchered) in Table 2 and in Addendum 5. Imperiled species with no substantive observation data, and not vouchered in Highlands County, were dropped from the list; species dropped from the last plan's list were: longleaf fingergrass (*Digitaria gracillima*), dingy-flowered Epidendrum (*Epidendrum anceps*), night-scented orchid (*Epidendrum nocturnum*), and crested yellow orchid (*Platanthera cristata*).

The last confirmed sightings for the following imperiled plants are over 40 years old. General and directed surveys (Tier 1 or 2 monitoring) are needed to confirm presence for: spurred neottia (*Eitroplectris calcarata*), last voucher 1967; Florida hartwrightia last voucher 1966; hammock false reinorchid (*Habenaria distans*), last voucher 1948 (label has "Sebring" and may not be in the park); swamp plume polypody, last voucher 1939; Lewton's polygala (*Polygala lewtonii*) (USF 2015; FLAS 2015).

Restoration efforts for most scrub and scrubby flatwoods species follow Florida scrub-jay best management practices, since its requirements for success generally serve as "umbrella" guidelines for protecting the preponderance of rare scrub and scrubby flatwoods species (USFWS 1999; FWC and FNAI 2010). The related extensive work at the park in the last couple of years -- prescribed fire, hardwood and sand pine removal, and exotic plants removal -- is improving the scrub and scrubby flatwoods communities' endemic plant populations. Eleven imperiled plant species have received Tier 3 or 4 monitoring almost every two years since 2007. With the recent increase in resource management and restoration efforts, by 2014 the Florida jointweed (*Polygonella basiramia*), papery nailwort (*Paronychia chartacea*), and nodding pinweed (*Lechea cernua*) were too common to count throughout many of the zones surveyed and even had patches of dominance. Also, the population counts were up significantly for scrub liatris (*Liatris ohlingerae*) and scrub bluestem. In general, if the current management practices are maintained, the scrub and scrubby flatwoods species that were on the two-year monitoring schedule are doing well enough to change the scrub-related Tier 4 monitoring to a four-year rotation.

Habitat improvement is needed for many areas of the wet flatwoods and seepage slopes, to protect and expand the cutthroat grass, Florida hartwrightia, and hooded

pitcherplant populations. It's likely that managing for cutthroat will work for the wetter areas just as managing for scrub jays works for the scrub, and will result in the extraordinarily rich species diversity normally found in wet prairie and wet flatwoods. Details for managing the cutthroat grass communities and microhabitats are delineated in a separate management memo for the park (Rowe 2015), but essentially consist of pushing back the baygall, acquiring an understanding of the park's overall hydrology, and providing short fire return intervals. Where park management has begun implementing long-overdue prescribed fires in these communities, the impacts are already positive.

The state-listed cardinal airplant (*Tillandsia fasciculata*) and giant airplant (*Tillandsia utriculata*) are threatened by the Mexican bromeliad weevil (*Metamasius callizona*) and need specific protections against this pest. Deliberate population augmentation of these airplant species will likely be needed within the next ten years pending population surveys.

Commercially exploited plants are found at the park; these include various orchids, ferns and palms. Palmetto fruit is also commercially exploited; in zones with an FRI near three years, this practice could significantly deplete palmetto recruitment and an important source of food for Florida black bear (*Ursus americanus floridanus*).

Directed surveys are needed for the Florida sand skink; the distribution and general health of this species at the park is unknown. This is one scrub species that does not fully benefit from using the Florida scrub-jay management strategy, as providing the development of a litter layer maximizes population density and allows more time for skink populations to recover after a fire (FWC 2015; USFWS 2012).

In 2017 FNAI completed a gopher tortoise survey of the park for FWC. The survey was completed using Line Transect Distance Sampling (FNAI 2017). The park was divided into 7 different subpopulations and 482 burrows were scoped with 260 being occupied by tortoises. The total population estimate for the park is 1,658 tortoises, with over 600 tortoises in HH-H29 in the abandoned pasture. This survey transects should be repeated in 5-10 years (2022-2027) to monitor the tortoise population and see if the population responds to habitat improvements through hardwood/tree reduction, exotic plant treatment, and prescribed burning.

During the 2017 Jay Watch surveys, 5-8 Florida scrub-jay families were observed using the park. With improvements to the scrub and scrubby flatwoods more habitat will be in optimal condition for scrub-jays. In 2016-17, 622 acres of scrub and scrubby flatwoods were improved as scrub-jay habitat by reducing the tree canopy cover to 1-2 trees per acre, on average, with chainsaw hand crews through the efforts of staff and volunteers, and a contracted habitat improvement project. The tree cutting will be followed with restoration burning.

Management for listed bird species other than the Florida scrub-jay, such as the southeastern American kestrel, include maintaining snags in otherwise open areas (FWC 2015). Birds recorded for HHSP that are not on state or federal lists, but

whose numbers are limited enough to warrant FNAI tracking (category S1 or S2), include the short-tailed hawk (*Buteo brachyurus*), merlin (*Falco columbarius*), swallow-tailed kite (*Elanoides forficatus*), worm-eating warbler (*Helmitheros vermivorum*), Louisiana waterthrush (*Parkesia motacilla*), and black rail (*Laterallus jamaicensis*).

Directed surveys are needed to monitor several small mammal species. Bats were surveyed at the park in 2016; however none of the currently imperiled species were identified. The imperiled species recorded from the LWR area are the Florida bonneted bat (*Eumops floridanus*) (G1/S1; Federally Endangered), and two S2 species being tracked by FNAI, Rafinesque's big-eared bat (*Corynorhinus rafinesquii*) and big brown bat (*Eptesicus fuscus*). Also, with increasing human development and increasing coyote populations, the populations of most small mammals, including the Sherman's fox squirrel and Florida mouse, are increasingly threatened. Park management, in partnership with the Lake Wales Ridge Ecosystem Working Group (LWREWG), should learn about and develop best available practices to protect and support these species.

The Highlands tiger beetle is currently listed, and there are several other arthropods at the park that are being recommended for listing, including gopher tortoise aphodius beetle (*Aphodius troglodytes*), scrub palmetto flower scarab beetle (*Trigonopeltastes floridana*), and the bi-colored scrub cone ant (*Dorymyrmex flavopectus*). The type specimen for the Highlands firefly (*Photuris lloydii*) came from the park; its presence, though, has not been recorded for a number of years (Nordlie 2014).

Table 2 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.

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
PLANTS						
Pinewoods bluestem <i>Andropogon arctatus</i>			LT	G3, S3	1,2,6	2
Curtiss' milkweed <i>Asclepias curtissii</i>			LE	--	1,2,6	1
Manyflowered grasspink <i>Calopogon multiflorus</i>			LT	G2G3, S2S3	1,2	1
Pygmy fringetree <i>Chionanthus pygmaeus</i>		LE	LE	G2G3 S2S3	1,2,6,10	2 or 3
Florida goldenaster <i>Chrysopsis floridana</i>		LE	LE	G1, G1	1,2,6,7,10	4
Highlands goldenaster <i>Chrysopsis highlandsensis</i>			LE	G2, S2	1,2,6	3 or 4
Cutthroat grass <i>Coleataenia abscissa</i>			LE	G3, S3	1,2,4,6	2
False rosemary <i>Conradina brevifolia</i>		LE	LE	G2Q,S2	1,2	2
Narrow-leaved sundew (<i>Drosera intermedia</i>)			LT	G5,S3	1,2,4	1
Spurred neottia <i>Eltroplectris calcarata</i>			LE	G4?, S1	2,4	2
Garberia <i>Garberia heterophylla</i>			LT	--	1,2	1

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
Hammock false reinorchid <i>Habenaria distans</i>			LE	--	2,4	1
Needleroot airplant orchid <i>Harrisella porrecta</i>			LT	--	2,4	1
Florida hartwrightia <i>Hartwrightia floridana</i>			LT	G2, S2	1,2,4	3 or 4
Nodding pinweed <i>Lechea cernua</i>			LT	G3, S3	1,2	3
Scrub blazing star <i>Liatris ohlingerae</i>		E	LE	G3, S3	1,2	3 or 4
Catesby's lily <i>Lilium catesbaei</i>			LT	--	1,2	1
Giant sword fern <i>Nephrolepis biserrata</i>			LT	--	2,13	1
Britton's beargrass <i>Nolina brittoniana</i>		LE	LE	G3, S3	1,2	3 or 4
Papery nailwort <i>Paronychia chartacea</i>		LT	LE	G3T3, S3	1,2	2 or 3
Swamp plume polypody; comb polypody <i>Pecluma ptilota</i> [var. <i>bourgeauana</i>]			LE	G5, S2	2,4	2
Blue-flowered butterwort <i>Pinguicula caerulea</i>			LT	--	1,2,4	1 ; 3 or 4 if present

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
Yellow-flowered butterwort <i>Pinguicula lutea</i>			LT	--	2,4	1 ; 3 or 4 if present
White fringed orchid <i>Platanthera blephariglottis</i> var. <i>conspicua</i>			LT	--	1,2,4	1 ; 3 or 4 if present
Yellow fringed orchid <i>Platanthera ciliaris</i>			LT	--	1,2,4	1
Rose pogonia <i>Pogonia ophioglossoides</i>			LT	--	1,2,4	1 ; 3 or 4 if present
Lewton's polygala <i>Polygala lewtonii</i>		LE	LE	G3, S3	1,2	1 ; 3 or 4 if present
Florida jointweed <i>Polygonella basiramia</i>		LE	LE	G3, S3	1,2	2 or 3
Small's jointweed <i>Polygonella myriophylla</i>		LE	LE	G3, S3	1,2	2 or 3
Giant orchid <i>Pteroglossaspis ecristata</i>			LT	G3G3, S2	1,2	1
Hooded pitcherplant <i>Sarracenia minor</i>			LT	--	1,2,4,6	3 or 4
Scrub bluestem <i>Schizachyrium niveum</i>			LE	G1G2, S1S2	1,2	3
Long-lip ladies'-tresses <i>Spiranthes longilabris</i>			LT	--	1,2,4	1

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
Northern needleleaf <i>Tillandsia balbisiana</i>			LT	--	2,8	2
Cardinal airplant <i>Tillandsia fasciculata</i>			LE	--	2,8	2 or 3
Giant airplant <i>Tillandsia utriculata</i>			LE	--	2,8	2 or 3
Soft-leaved wild pine <i>Tillandsia variabilis</i>			LT	--	2,8	2 or 3
Threebirds orchid <i>Triphora trianthophora</i>			LT	--	2,4	1
Carter's warea <i>Warea carteri</i>		LE	LE	G3, S3	1,2,6	2
Redmargin zephyrlily <i>Zephyranthes simpsonii</i>			LT	G2G3, S2S3	1,2	2
REPTILES & AMPHIBIANS						
American alligator <i>Alligator mississippiensis</i>	FT (S/A)	T (S/A)		G5 S4	1,2,4,10, 13	1
Florida indigo snake <i>Drymarchon couperi</i>	FT	T		G3,S3	1,2,4,8,10, 13	1
Gopher tortoise <i>Gopherus polyphemus</i>	ST			G3,S3	1,2,6,10, 13	3

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
Southern hognose snake <i>Heterodon simus</i>				G2,S2	1,2,6,8,10,13	1
Florida pine snake <i>Pituophis melanoleucus mugitus</i>	ST			G4T3,S3	1,2,4,10,13	1
Blue-tailed mole skink <i>Plestiodon egregius lividus</i>	FT	LT		G4T2,S2	1,2,4,6,10,13	1
Florida sand skink <i>Plestiodon reynoldsi</i>	FT	LT		G2,S2	1,2,4,6,10,13	3
Florida scrub lizard <i>Sceloporus woodi</i>				G2G3,S2S3	1,2,4,6,10,13	1
BIRDS						
Florida grasshopper sparrow (nv) <i>Ammodramus savannarum floridanus</i>	FE	LE		G5T1,S1		2
Florida scrub-jay <i>Aphelocoma coerulescens</i>	FT	LT		G2,S2	1,2,8,13	4
Ivory-billed woodpecker <i>Campephilus principalis</i> ∞	FE	LE		G1,SH	2,4	1
Crested caracara <i>Caracara cheriway</i>	FT	LT		G5,S2	1,2	1

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
Little blue heron <i>Egretta caerulea</i>	ST			G5,S4	2,4	1
Tricolored heron <i>Egretta tricolor</i>	ST			G5,S4	2,4	1
Swallow-tailed kite <i>Elanoides forficatus</i>				G5,S2	2,13	1
Southeastern American kestrel <i>Falco sparverius paulus</i>	ST			G5T4, S3	1,2,14	1
Florida sandhill crane <i>Grus canadensis pratensis</i>	ST			G5T2 T3, S2S3	1,2,4	1
Wood stork <i>Mycteria americana</i>	FT	LT		G4,S2	1,2,4	1
Red-cockaded woodpecker ∞ <i>Picoides borealis</i>	FE	LE		G3,S2	1,2,4 (possibly 3?)	1
Roseate spoonbill <i>Platalea ajaja</i>	ST			G5,S2	1,2,4	1
Snail kite <i>Rostrhamus sociabilis</i>	FE	LE		G4G5 T2,S2	1,2,4	2
MAMMALS						

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level /Tier
	FWC	USFWS	FDACS	FNAI		
Florida panther <i>Puma concolor coryi</i>	FE	LE		G5T1, S1	1,2,4,10,13	1
Sherman's fox squirrel <i>Sciurus niger shermani</i>	SSC			G5T3, S3	1,2,4,8,10,13	2
INVERTEBRATES						
Highlands tiger beetle <i>Cicindela highlandensis</i>		C		G2G3, S2S3	1,2,4,13	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 and Nuisance Species

Exotic species are plants or animals not native to Florida. Invasive exotic species can 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 or predatory insects. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

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, the DRP actively removes exotic animals from state parks, with priority being given to those species causing the greatest ecological damage.

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 venomous snakes or raccoons and alligators that are in public areas. At the park, black bear can occasionally be a nuisance to campers, mostly by rooting trash containers; at present the park has devised special electric fencing that discourages this behavior. Nuisance animals are dealt with on a case-by-case basis in accordance with the DRP's Nuisance and Exotic Animal Removal Standard.

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

The *Current Conditions* report from the Division's database, Natural Resources Tracking System (NRTS) summarizes terrestrial invasive exotic plants survey data reported by park staff; there is currently no similar protocol in place to maintain surveys of aquatic areas. While the timing, location, and specificity of terrestrial surveys vary, in 2016, generally 95% of the park had survey records less than two years old. Based on the Current Conditions report at the time of this writing, there are known exotics scattered across roughly 42% of the park's acres, with an average cover class of about 20% (NRTS 2016). This means that if all the infestations as reported were squeezed into one area, this would cover an area of around 920 acres. Hundreds of hours of hard work and repeated efforts are required to contain and to push back these threats.

Obstructions to treatment include long wet periods where areas cannot be successfully treated or even accessed; occasional frosts; many days of harsh sun with high humidity and heat; and the need to return for the necessary re-

treatments in a timely manner. Park management does dedicate resources to these challenges. Infestations at the park are primarily treated by park staff and volunteers; occasional workdays bring in assistance from the public and nearby agencies. Florida Conservation Corps (FLCC) members have participated in exotics control at the park. Several hundred acres of OWCF infestations, in impossible-to-access areas, received treatment by contractors through FWC's Invasive Plant Management Services (IPMS) in the last few years. The park currently maintains its chemical supplies through the IPMS Herbicide Bank.

Most of the exotic plant infestations at the park are concentrated along developed areas, particularly in the old botanical gardens area and in mowed areas; in the wetlands where the OWCF is a serious threat; and in the communities where cogongrass is encroaching. The air potato needs to be watched, but at the time of this writing, it is being fairly well managed through biocontrol and the occasional public "air potato raids" at the park. In late 2013, air potato leaf beetles (*Liliocersis chenii*) were introduced to the park by the USDA Agricultural Research Service (USDA permit #1016124). The beetles are now doing well, in terms of their survival and spread as well as in their effectiveness at reducing the air potato presence. Cogongrass is probably the greatest threat at the park, not only from its rapid spread and persistence, but also in terms of current numbers of areas infested and densities of infestations. A few exotic species are under-reported in NRTS; these include several bamboo species, guinea grass, Phoenix palm (*Phoenix reclinata*), and natalgrass; the latter is a particular threat to scrub endemic species. FWC should be consulted for assistance in surveying and treating the invasive exotics in the aquatic acres at the park.

Invasive exotic plant species present a moving target for management. FLEPPC re-evaluates the threats and produces a new list every two years. But by the time an exotic shows up on the FLEPPC list, it may already be a serious control problem for the park. Good management practices for invasive exotics dictate that managers be aware of what is not native to their park. Staying current with the FLEPPC findings is certainly essential, as is effective response to such species when they appear; but managers must also be pro-active, noting which species do not "belong," attending to new exotics alerts and weed risk assessments put out by IFAS or FWC, and learning the Early Detection/Rapid Response priority list put out by their local Cooperative Invasive Species Management Area (CISMA). At the park, this would be the Heartland CISMA. The CISMA Early Detection lists may include FLEPPC-listed species, but only those new to the region or the region's borders; otherwise, the list comprises non-native plants threatening local systems.

Treatment at the earliest hint of invasion is always the most efficient approach and is more likely to result in eradication of the problem. At the time of this writing, dianella lily is a good example of a serious threat at the park. Turk's turban is less serious but is spreading in unexpected places, as are the showy and the smooth rattleboxes (*Crotalaria spectabilis*, *C. pallida* var. *obovata*) are appearing at the park. None of these plants are on the 2015 FLEPPC list, although the dianella lily is on the Heartland CISMA Early Detection list.

Table 3 contains a list of the Florida Exotic Pest Plant Council (FLEPPC) Category I and II invasive, exotic plant species found within the park (FLEPPC 2015). The table 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. These data are derived from the FPS Natural Resource Management System, using the last recorded surveys, many of which are those of MZ assigned as of 2014. The park has nuisance exotic plant species that are not yet on the FLEPPC list; for an inventory of all exotic species found within the park, see Addendum 5.

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Rosary pea <i>Abrus precatorius</i>	I	1	HH-E103, HH-H013, HH-H038
		2	HH-E014, HH-E100, HH-H005, HH-H013
		3	HH-E100
Coral ardisia <i>Ardisia crenata</i>	I	1	HH-H013, HH-H074
		2	HH-H004, HH-H016, HH-H038, HH-H076
		3	HH-E014, HH-H050, HH-H075
		4	HH-H011, HH-H025, HH-H041, HH-H066
Air potato <i>Dioscorea bulbifera</i>	I	2	HH-E100, HH-H017, HH-H024, HH-H025, HH-H038, HH-H072, HH-H073, HH-H074
		3	HH-E014, HH-H050, HH-H075
		4	HH-H011, HH-H025, HH-H041, HH-H066
Water-hyacinth <i>Eichornia crassipes</i>	I	3	HH-H007, HH-H008

Cogon grass <i>Imperata cylindrica</i>	I	1	HH-H003, HH-H008, HH-H011, HH-H012, HH-H013, HH-H022, HH-H027, HH-H044
		2	HH-E005, HH-E098, HH-E101A, HH-E103, HH-E104, HH-H001, HH-H003, HH-H006, HH-H010, HH-H011, HH-H012, HH-H013, HH-H015, HH-H016, HH-H017, HH-H025, HH-H041, HH-H044, HH-H045, HH-H054, HH-H072, HH-H074, HH-H081, HH-S010, HH-SL70C, HH-SL70D
		3	HH-E001, HH-E003, HH-E014, HH-E098, HH-E100, HH-E102A, HH-E103, HH-H002, HH-H003, HH-H004, HH-H006, HH-H010, HH-H011, HH-H012, HH-H017, HH-H024, HH-H025, HH-H027, HH-H028, HH-H029, HH-H049, HH-S71, HH-S75, HH-S76B, HH-S80A, HH-Y096D, HH-Y099
		4	HH-E098, HH-E104, HH-E111, HH-H005, HH-H007, HH-H008, HH-H011, HH-H012, HH-H015, HH-H025, HH-H054, HH-SL63A
		5	HH-E111, HH-S77A
Lantana <i>Lantana camara</i>	I	1	HH-E003, HH-E101A, HH-H011, HH-H026
		2	HH-E014, HH-H025, HH-H026
Peruvian primrosewillow <i>Ludwigia peruviana</i>	I	2	HH-H001
Japanese climbing fern <i>Lygodium japonicum</i>	I	1	HH-H011, HH-H013, HH-H016, HH-H072
		2	HH-H006, HH-H012, HH-H013, HH-H076, HH-H077
		3	HH-H013, HH-H027, HH-H028
		4	HH-S77B

Old World climbing fern <i>Lygodium microphyllum</i>	I	1	HH-E102A, HH-E104, HH-H003, HH-H016, HH-H065, HH-H072
		2	HH-E112, HH-H006, HH-H010, HH-H012, HH-H013, HH-H024, HH-H060, HH-H070, HH-H077, HH-H080, HH-S88, HH-Y090, HH-Y091
		3	HH-E102A, HH-E108, HH-E110, HH-E112, HH-H001, HH-H003, HH-H007, HH-H008, HH-H011, HH-H015, HH-H016, HH-S007, HH-S81A, HH-Y083
		4	HH-E102A, HH-E104, HH-H003, HH-H016, HH-H065, HH-H072
		5	HH-H027
Melaleuca <i>Melaleuca quinquenervia</i>	I	1	HH-E098
2		HH-H035	
Natal grass <i>Melinis repens</i>	I	1	HH-E001, HH-E100
		2	HH-E004, HH-E005, HH-E100, HH-E101A, HH-H011, HH-H012, HH-H016, HH-H017, HH-H025, HH-H041, HH-H049, HH-H062, HH-S010, HH-SL001, HH-SL003, HH-SL69
		3	HH-E014, HH-H017, HH-H018, HH-H019, HH-H021, HH-H022, HH-H026, HH-H029, HH-H064, HH-S011
		4	HH-E100, HH-H026, HH-H028
Tuberous sword fern <i>Nephrolepis cordifolia</i>	I	2	HH-H013
Torpedo grass <i>Panicum repens</i>	I	1	HH-H025
		3	HH-H012
		4	HH-H013, HH-H014
Water-lettuce <i>Pistia stratiotes</i>	I	2	HH-H008
Strawberry guava <i>Psidium cattleianum</i>	I	2	HH-S79A, HH-S87

Downy rose-myrtle <i>Rhodomyrtus tomentosa</i>	I	1	HH-H027
Schefflera <i>Schefflera actinophylla</i>	I	2	HH-E100
Brazilian pepper <i>Schinus terebinthifolia</i>	I	1	HH-E104, HH-H02
		2	HH-SL62B
		3	HH-E100, HH-S010, HH-S77A, HH-Y093B, HH-Y095
		5	HH-S77B
		6	HH-E100, HH-E103
Tropical soda apple <i>Solanum viarum</i>	I	1	HH-H008, HH-H015
		2	HH-H029, HH-H081
Caesar's weed <i>Urena lobata</i>	I	1	HH-H013
		2	HH-H001, HH-H003, HH-H004, HH-H005, HH-H006, HH-H007, HH-H008, HH-H010, HH-H011, HH-H013, HH-H015, HH-H016, HH-H024, HH-H025, HH-H072, HH-H076, HH-S010
		3	HH-H010, HH-H011, HH-H012, HH-H013, HH-H014, HH-H015, HH-H016, HH-H072, HH-H076, HH-H077
		4	HH-H010, HH-H013, HH-S007
Shoebuttan ardisia <i>Ardisia elliptica</i>	II	2	HH-H013
Bamboo palm <i>Chamaedorea seifrizii</i>	II	5	HH-H068
Dwarf papyrus <i>Cyperus prolifer</i>	II	2	HH-H007
Durban crowfootgrass <i>Dactyloctenium aegyptium</i> -	II	2	HH-H024
		3	HH-H024
		4	HH-H020
Chinaberry <i>Melia azedarach</i>	II	1	HH-E014, HH-H015
		2	HH-E103, HH-H025
		3	HH-E104, HH-H011
Balsampear <i>Momordica charantia</i>	II	1	HH-E014, HH-H015
		2	HH-H011
Golden bamboo <i>Phyllostachys aurea</i>	II	1	HH-H038

Purpled sesban <i>Sesbania punicea</i>	II	2	HH-H013
Elephant ear <i>Xanthosoma sagittifolium</i>	II	1	HH-E101A

Distribution Categories:

- 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.

The park also has invasive exotic animal species. The greatest visible threat is from the wild hog populations. Wild hogs are omnivorous, eating mostly plant material, but also insects, fish, small birds, mammals, reptiles and amphibians. Wild hogs are generally solitary, except during mating times and when sows are caring for a litter. Pig traffic is a vector for exotic invasive species and numerous diseases. Damage from hog rooting and from wallowing negatively impacts native plant species diversity and local hydrology. At HHSP, it directly threatens cutthroat seep areas and populations of hooded pitcherplant, but there is damage visible in nearly every community and management zone at the park. According to FWC, hog densities are about one per 32 acres, so the park could easily have 300 pigs (FWC 2012). In population projection studies, feral hog numbers may triple in five years (Main 2013). The current rate of removal at the park is not sufficient to manage the problem; research for removal techniques beyond current practices are needed.

Other invasive exotic wildlife includes domestic cats (*Felis catus*), red fox (*Vulpes vulpes*), nine-banded armadillo (*Dasypus novemcinctus*), greenhouse frog (*Eleutherodactylus planirostris*), Cuban treefrog (*Osteopilus septentrionalis*), brown anole (*Norops sagrei*), and fish such as walking catfish, brown hoplo, and jewel cichlid. Cats threaten bird, reptile, and amphibian diversity and abundance. Non-native reptiles, amphibians, and fish outcompete, and even eat, related native forms. The full ecologic impacts from these animals is likely much greater than our current knowledge reveals.

Exotic pests and pathogens are also a concern at HHSP. The Mexican bromeliad weevil (*Metamasius callizona*) is attacking airplant species (*Tillandsia* spp.) in the park. As noted in the Imperiled Species discussion, park management is expected to be watchful of damages and be prepared for conservation efforts to protect seeding and recruitment. Also, the silk bays at the park may be threatened by laurel wilt disease, a fatal disease of tree species in the laurel family; this is caused by a fungus (*Raffaella laurifcola*) introduced into the tree by a non-native redbay ambrosia beetle (*Xyleborus glabratus*). The disease was detected in Highlands

County in 2009, and has been observed causing mortality in the park's swamp bays.

Special Natural Features

Hydric Hammock

The park's existence, as well as its name, is rooted in this core feature. "A verdant, luxuriant sanctuary, carefully hidden away / Where one can linger with nature and let their thoughts hold sway / This bountiful spot of woodland..." (Houck 1930) is a poetic but apt description of nearly 280 acres in the heart of the park. Readily accessed by a loop road through the center, and by many trails and boardwalks, visitors can experience a shady, diverse, and engaging corner of natural Florida. There is also cultural history to experience here: In addition to some of the CCC installations still on view, there are examples from the different "eras" of ideas for managing natural systems, such as installing moats meant to keep out Florida's natural fires and to "improve" natural hydrology, and filling aging laurel oaks with concrete in an attempt to preserve them past their normal 60- to 75-year average lifespan.

Lake Wales Ridge Scrub

Florida is generally considered the flattest state in the union, but it has a very special topographic history. The Lake Wales Ridge is a chain of relatively high points that were narrow islands running for about 100 miles down the center of Florida. These ancient seashores and dunes existed above sea level for many of the millennia that the majority of Florida was under water. On these ancient dune islands, natural community associations, and many individual species, adapted and developed that now exist nowhere else. Animals specialized in techniques to beat the heat and the quickly draining fresh water and plants found ways to flourish in soils with no nutrients. Many new species are still being discovered and described here. The particular community association known as Lake Wales Ridge Scrub has been largely destroyed through housing development and agriculture, making the remaining areas that are still under conservation protection even more precious. (Jerome 1996; Sharpe 2005)

Cutthroat flatwoods and prairies

Cutthroat grass is a LWR endemic that regionally replaces most of the dominant or sub-dominant native grasses found in various plant communities in other parts of central Florida. Each individual plant takes a long time to establish and expand, taking as much as 70 years to grow to a clump diameter of 8 to 10 inches; clump size is clearly visible after a burn. Some pockets of the cutthroat grass flatwoods and cutthroat seep wet prairies at HHSP have clumps that may be over 200 years old. As with the LWR scrub, the distribution of healthy cutthroat communities has been greatly reduced by land development and by fire suppression. As fire is being re-introduced at HHSP, large expanses of cutthroat communities are being recovered, which in turn encourages the growth of a diversity of special plants, such as the yellow fringed orchid and the hooded pitcherplant, both of which reach their southernmost range at HHSP.

Fireflies

Florida has more firefly species than any other US state (Nordlie 2014), however, firefly numbers everywhere have been decreasing the last 45 years, and it is possible that many species have gone extinct in Florida. Firefly loss is due to a combination of three factors: places that used to be swampy aren't anymore and the larvae don't have the moist soil they need to grow nor the snails and slugs they need to eat; light pollution at night disrupts mating patterns and success; and pesticide use produces non-target kills of larvae and adults. These challenges are lacking at HHSP. The park not only has a firefly species that, to date, is found only at the park (*Photuris lloydi*, Lloyd 2008), but from March to April the overall firefly populations can offer quite a show. The park firefly education programs not only demonstrate how the average person can encourage firefly populations, but they actively engage children at ages when they are most likely to have "naturalist" interests.

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.

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

Prehistoric 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: Between 1989 and 2005, six archaeological surveys of varying intensity, coverage, and scope have occurred fully or partially within the park. The latest survey was performed in 2013 by the Alliance for Integrated Spatial Technologies (AIST), University of South Florida and the results were written up in a report, *Archaeological Resource Sensitivity Modeling in Florida State Parks Districts 4 and 5* (AIST 2013). This survey included first a sensitivity model, indicating where archaeological and historic sites were likely to occur, followed by a field survey where known points were assessed and where the model had indicated likely areas. In addition to developing accurate data on the existing sites, three new sites were identified and recorded (8HG635, 8HG1268, 8HG1269).

There are 4 archaeological sites recorded in the FMSF and located within the park's boundaries. The first site (8HG635) is recorded as a burial mound, and was discovered when maintenance workers were using fill to construct Cottage Road. Human bones were discovered in the fill and returned to the mound, which was then left undisturbed. The second site (8HG708) is recorded as multicomponent artifact scatter and is only partially located within the park boundary and contains lithic waste flakes, tools and pottery sherds. The third site (8HG1268) is recorded as a dam/water control structure, and was likely built by Mr. Roebling in the early 1930's. The last site (8HG1269) is recorded as building remains that are associated with brick remnants of a chimney from either the Eiland or Skipper house. None of these sites have been formally evaluated by the State Historic Preservation Officer (SHPO) for National Register eligibility.

The acreage associated with recorded site locations in this park is very small, and so the validation of the model against the FMSF data is not very relevant in HHSP. The largest lower portion of the park is associated with floodplain environments

that would not be conducive to settlement. Special resource and seasonal sites are possible, and no systematic survey has been conducted in this portion of the park.

The park itself, opened as a state park in 1936, is a cultural resource. HHSP is significant in the twentieth century history of Florida as one of nine elements of the New Deal-inspired Florida state park system and as one of the physical expressions of early twentieth century recreation planning. In a change from parks being used as monuments or memorials to conflicts, the New Deal era parks physically stated the idea that Floridians, increasingly members of an urban population, needed and indeed possessed a right to communion with Nature. That idea, one of the intellectual underpinnings of the conservation movement of the Progressive Era (1890 – 1920), realized its most widespread expression during the peacetime administrations of Franklin Delano Roosevelt (1933 – 1941).

Condition assessment: Burial mound (8HG635) is in good condition, and has no issues or threats that require management action. Artifact site (8HG708) is in good condition, and has no issues or threats that require management action. This site is only partially located within park boundaries. Dam/water control structure (8HG1268) is in good condition, but requires repair or replacement of the gates that control the water flow. Building remains (8HG1269) is in good condition. These building remnants require a barrier due to the close proximity of the Youth Camp and the possibility of damage.

General management measures: Continue to preserve the sites in good condition. Implement appropriate repair to dam gates, if this need is supported by hydrology assessment.

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: The park is included as part of a cultural resources survey of the nine New Deal Era state parks (HPA, 1998) and has a preservation plan for 12 of its CCC structures (Stevenson Architects, 2008). In 2014, a Short Format Historic American Landscape Survey (HALS) was also completed for the park (Driapsa, 2014).

There are 24 historic structures and one resource group that are recorded in the FMSF. All structures were built during the New Deal Era, between 1930 and 1942. Although none of the recorded structures have been formally evaluated for National Register significance by the SHPO, the CCC structures have been surveyed and as a group are considered potentially eligible for the National Register. Of the 24 recorded structures, Fire Tower (8HG0662) was removed and Silver Fox Ranch (8HG0869) is not located on Highlands Hammock State Park property. The recorded resource group, Sandy Gully Line (8HG1251), is only partially located on park property and insufficient information was provided to the SHPO in order to evaluate its significance.

The structures at the park used either rustic wood frame, masonry vernacular, or wood frame vernacular architecture. Vernacular architecture or construction, either masonry or wood frame is a common construction technique of lay or self-taught builders. These designs were local in nature, the ideas transmitted by word of mouth or by demonstration and relied heavily on native building materials. Wood frame vernacular buildings were used as personnel residences and support buildings. These buildings were generally not seen by the visiting public, and consequently were not constructed in the rustic styling that was commonly associated with park buildings. Rustic buildings in the park were generally more elaborate, reserved for use by the public and were constructed in prominent locations. Rustic wood frame construction took on many forms, depending on the architect and availability of construction materials and personnel. Architectural features included gable roofs, log or square hewn timbers, porches, chimneys, exposed rafter ends, and articulated stone foundations.

Condition assessment: Of the 22 recorded historic structures at the park, two are in fair condition, the rest are in good condition. Of the two in fair condition, one is a storage shed in the ranger residence area and one is in the current shop compound area. The two structures need to be assessed for the work required to bring them into good condition. Provided below are descriptions of the park's historic structures.

Herbarium (8HG0642), 1935 to present, also known as Building 8 or the Record House/Office. This is a one-story, masonry vernacular building with its most notable architectural feature being its gable roof. It is of concrete block construction with stucco exterior wall fabric, stoop, casement windows, brick chimney, exposed rafter ends, coach lamp, and poured concrete foundation. It originally had a barrel tile roof surfacing. It is currently used as an office by park staff, and is in good condition.

Greenhouse (8HG0643), 1942 to present, also known as Building 15, is a one-story masonry vernacular building with a gable roof with 3-V crimp surfacing, gable dormer with exposed truss work defining the front entrance, and a brick parapet gable extension. The brick portion originally served as the boiler room for the greenhouse. The greenhouse has since been converted for use as a repair shop. It is in fair condition due to non-operational ridge vents, doors that are non-functional, and some windows that have been replaced with Plexiglas.

Truck Shed (8HG0644), 1937 to present, also known as Building 18, is a one-story, rustic wood frame maintenance building with a gable roof, wood shingle exterior wall fabric, enclosed units at both ends with three central bays, and post-and-girt construction with knee braces. The building retains much of its original integrity. It is currently used for storage and is in good condition.

Paint and Tool House (8HG0645), 1937 to present, also known as Building 19 or the Oil House, is a one-story, rustic wood frame storage building with a gable roof with

3-V crimp surfacing, and wood drop siding. The building retains much of its original integrity, and is currently used for storage and is in good condition.

Lumber Shed (8HG0646), 1936 to present, also known as Building 17, is a one-story, rustic wood storage building with a gable roof, post-and-grit structural system, wood-shingle exterior wall fabric, extended purlins, and knee braces. The building originally served as a potting shed and has since been converted for use as a lumber shed, and is in good condition.

Latrine (8HG0647), 1937 to present, also known as Bathhouse 11, is a one-story, rustic wood frame and limestone latrine building that has a cross gable roof with cypress shake surfacing, limestone articulated foundation on which rests post-and-grit framing, wood shingle exterior wall fabric, extended purlins in gable ends, and casement windows. It is currently used as a bath house in the campground, and is in good condition.

Picnic Shelter (8HG0648), 1940 to present, also known as Building 34, is a one-story wood recreational building with a gable roof with cypress shake surfacing, tripartite square hewn corner posts with knee bracing, cypress plank siding, and carved extended purlins in gable ends. It is currently used as a pavilion in the campground. The building retains much of its original integrity, and is in good condition.

Concessions (8HG0649), 1939 to present, also known as Building 3, is a one-story, rustic wood frame service-related building that has a cross gable roof with cypress shake surfacing, cypress plank exterior wall fabric, entrance patio with square hewn timbers and knee braces, two limestone chimneys, interior hand forged wrought-iron chandeliers, cut limestone flooring, and articulated limestone foundation. The building is currently closed. It retains much of its original integrity and is in excellent condition.

Interpretive Center (8HG0650), 1939 to present, also known as Building 6 or the CCC Museum, is a one-story, rustic wood frame educational building that has a gable roof with cypress shake surfacing, cypress plank exterior wall fabric, extended purlins in gable ends, two limestone chimneys, hand forged wrought-iron truss braces on the interior, cut limestone flooring, fixed windows, and articulated limestone foundation. The building is currently used as the CCC Museum, and is in excellent condition.

Picnic Shelter (8HG0651), 1940 to present, also known as the Alligator Pavilion, is a one-story, rustic wood recreational building that has a gable roof with cypress shake surfacing, tripartite square hewn corner timbers with knee bracing, exposed rafter ends, extended purlins, limestone chimney, and brick barbecue pit. The building is currently used as a pavilion in the Day Use Area. It retains much of its original integrity, and is in good condition.

Picnic Shelter (8HG0652), 1940 to present, also known as the Owl Pavilion, is a one-story, rustic wood frame recreational building that has a gable roof with

cypress shake surfacing, tripartite square hewn timber corners with knee bracing, and exposed rafter ends. The building is currently used as a pavilion in the Day Use Area. It retains much of its original integrity, and is in good condition.

Picnic Shelter (8HG0653), 1940 to present, also known as the Bear Pavilion, is a one-story, rustic wood recreational building that has a gable roof with cypress shake surfacing, tripartite square hewn corner timbers with knee bracing, cypress planks, and extended purlins in the gable ends. The building is currently used as a pavilion in the Day Use Area, and is in good condition.

Pump House (8HG0654), 1938 to present, also known as Building 14, is a one-story, wood frame vernacular building that has a gable roof with wood drop siding. The building is currently an operational pump house. It retains much of its original integrity, and is in good condition.

Ranger's Residence (8HG0655), 1931 to present, also known as Building 1, is a one-story, wood frame vernacular residential building that has a hip roof with flared eaves, eyebrow dormers, entrance porch, stoop with knee braces, extension, brick chimney, drop siding exterior wall fabric, and 6/6 double-hung sash windows. The building is currently used as a residence. Though it retains much of its original integrity and is in good condition.

Garage (8HG0656), 1931 to present, also known as Building 42, is a one-story, wood frame vernacular garage building that has a hip roof with flared eaves, board-and-batten exterior wall fabric, and three bays for vehicle storage. The building is currently used for storage. It retains much of its original integrity, and is in good condition.

Ranger's Residence (8HG0657), 1936 to present, also known as Building 4, is a one-story, wood frame vernacular residential building that has a hip roof with flared eaves, eyebrow dormers, entrance porch, stoop with knee braces, extension, brick chimney, drop siding exterior wall fabric, and 6/6 double-hung sash windows. The building is currently used as a residence. It retains much of its original integrity and is in good condition.

Ranger's Residence (8HG0658), 1936 to present, also known as Building 40, is a one-story, wood frame vernacular residential building with a hip roof, entrance porch, stoop with knee braces, brick chimney, drop siding exterior wall fabric, and 6/6 double-hung sash windows. The building is currently used as a residence. It retains much of its original integrity, and is in good condition.

Ranger's Residence (8HG0659), 1931 to present, also known as Building 41, is a one-story, wood frame vernacular building that has a gable roof, entrance porch with knee wall and screen, drop siding exterior wall fabric, exposed rafter ends, and double hung sash windows. The building is currently used for official visitors. It retains much of its original integrity and is in good condition.

Vehicle/Storage Shed (8HG0660), 1931 to present, also known as Building 26, is a one-story, wood frame vernacular garage/storage building that has a gable roof with 3-V crimp surfacing, drop siding exterior wall fabric, and post-and-grit construction at the garage entries. The building is currently used for storage. It retains much of its original integrity and is in good condition.

Lumber Shed (8HG0661), 1940 to present, is a one-story, masonry vernacular storage shed that has a gable roof and no sides. The building currently is not being used. It retains much of its original integrity, but is in fair condition due to needing new support trusses and a new roof.

Assistant Manager's Residence (8HG0663), 1938 to present, also known as Building 23, is a one-story, wood frame vernacular building that has a hip roof with flared eaves, entrance porch with knee wall and screen, drop siding exterior wall fabric, exposed rafter ends, and 6/6 double-hung sash windows. This structure served as the residence of Allen Altvater during his tenure as CCC Superintendent of Highlands Hammock, and is currently used as a residence. It is in good condition.

Ranger's Residence (8HG0664), 1930 to present, also known as Building 5, is a one-story, wood frame vernacular residential building that has a gable roof, gable extension, entrance porch, brick chimney, drop siding exterior wall fabric, and 6/1-light double-hung sash windows. Alterations to the building include the entrance porch addition and the replacement of some windows with metal sash windows. It is currently used as a residence. It is in good condition.

Several park buildings (BL036002, BL036029, BL036030, BL036031, BL036036, BL036043, BL036044, and BL036049) were constructed in the period from 1957-1965 and are now considered historic. These buildings are currently in the process of being recorded by Bureau of Natural and Cultural Resources staff in coordination with park staff.

The one resource group in the park, Sandy Gully Line (HG1251), was recorded in 2012 as a southwest-northeast oriented linear resource three to four meters in width situated across scrub and highly visible as an area of white sand primarily absent of vegetation. It was speculated by the surveyor that the line may be the remains of a tram or railbed used for logging (Dunn, 2012). Its current condition has not been evaluated.

General management measures: Structures will be brought into or maintained in good condition following best practices as outlined in the preservation plan completed in 2008 (Stevenson Architects 2008).

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: HHSP has a Scope of Collections statement draft (November 1993) that is used to guide in the acquisition and preservation of objects that are directly related to the history, activities and personnel of the Civilian Conservation Corp of Florida.

In 2013, a statewide collections management program was initiated for the DRP and the parks' collections to be inventoried and recorded; this information is now mostly stored and available for reference through the Past Perfect software database. The process of recording collections on Past Perfect has begun at the park, with staff and volunteers trained on updating and using the software. Currently, there are 2,331 collection items registered in the park's Past Perfect records. The items range from artifacts to natural history items – from furniture and figurines to bird skulls, from photos, paintings, clothing and soaps, to snake skins, and so on. Descriptive data about, and the assessment of, each item is included in its Past Perfect record and reports on this information may be obtained via queries made through that system.

Condition assessment: Of the 2,331 objects in Past Perfect, 296 have a condition of Poor (12.70%), 752 have a condition of Fair (32.26%), 798 have a condition of Good (34.24%), 154 have a condition of excellent (6.60%), and 331 have not been rated (14.20%).

Many of the objects are on display at the CCC Museum, and many are stored in closets and collection areas in the Museum or in dedicated storage areas in the historic structures. All exhibition and storage locations are locked when not in use.

The museum needs to have a fire suppression sprinkler system installed to protect all artifacts, and the building, in the event of a fire. All maps and blueprints need to be digitized and the originals stored at a facility with a climate-controlled storage unit. If the maps cannot be stored at a facility, then a bi-monthly or monthly pest control action will need to be implemented to stop further deterioration of the maps. A full-time museum curator would help with the collections and categorizing of objects into Past Perfect and could also be involved with interpretation and the leading of tours within the museum.

General management measures: Continue to address items rated as poor by improving them or by de-accessioning them; it is recommended that specimens past their useful life be de-accessioned. Continue to update collections data, including unrated items. The remaining maps, collections and other displays could be consolidated and replaced with modern interpretive displays, continuing to include the cultural history of the park. Management objectives in this plan will address storage improvement needs.

Table 4 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 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
8HG635 Burial Mound	Historic/St. Johns (nonspecific)	Archaeological Site	NE	G	P
8HG708 Multicomponent Artifact Scatter	Historic/Unspecified	Archaeological Site	NE	G	P
8HG1268 Dam/Water Control Structure	Historic/American 20 th Century	Archaeological Site	NE	NE	P
8HG1269 Building Remains	Historic/American 20 th Century	Archaeological Site	NE	NE	P
8HG0642 (1935) Herbarium	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0643 (1942) Greenhouse	Historic/New Deal Era	Historic Structure	NE	F	RS
8HG0644 (1937) Truck Shed	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0645 (1937) Paint/Tool House	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0646 (1936) Lumber Shed	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0647 (1937) Latrine	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0648 (1940) Picnic Shelter	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0649 (1939) Concessions	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0650 (1939) Interpretive Center	Historic/New Deal Era	Historic Structure	NE	G	P

Table 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
8HG0651 (1940) Picnic Shelter	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0652 (1940) Picnic Shelter	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0653 (1940) Picnic Shelter	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0654 (1938) Pumphouse	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0655 (1931) Ranger's Residence	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0656 (1931) Garage	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0657 (1936) Ranger's Residence	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0658 (1936) Ranger's Residence	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0659 (1931) Ranger's Residence	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0660 (1931) Vehicle/Storage Shed	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0661 (1940) Lumber Shed	Historic/New Deal Era	Historic Structure	NE	F	RS
8HG0662 (1930) *Fire Tower	Historic/New Deal Era	Historic Structure	N/A	N/A	N/A
8HG0663 (1938) Assistant Mgr's Residence	Historic/New Deal Era	Historic Structure	NE	G	P
8HG0664 (1930) Ranger's Residence	Historic/New Deal Era	Historic Structure	NE	G	P

Table 4. Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
8HG0869 (1940) **Silver Fox Ranch	Historic/New Deal Era	Historic Structure	N/A	N/A	N/A
8HG1251 Sandy Gully Line	Historic/American, 20 th Century	Resource Group (Linear Resource)	NE	NE	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 the DRP's management goals for Highlands Hammock 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, the 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 the 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, the 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 Sections 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. 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 A: Obtain an assessment of the park's hydrologic restoration needs.

- | | |
|----------|--------------------|
| Action 1 | Conduct assessment |
| Action 2 | Implement project |

The hydrology assessment project comprises a thorough study of surface water movements across the entire park property. This project will require the services of a qualified contractor. The project includes an assessment of the impacts of all

currently existing introduced changes (e.g., canals, ditches, stormwater drainages, borrow pits, roadways) to the park's natural wetlands, sloughs and streams. The resulting deliverable will include a set of recommendations for hydrology corrections or restoration, if any, and the designs, specifications and probable permitting and budget needs for each recommendation. The services to be requested in the SOW include: perform data collection and site reconnaissance; develop conceptual designs for restoration needs or other corrective measures, and provide the budgets and permitting requirements for such; and provide progress meetings. The SOW will include a project term and calendar.

Objective B: Restore natural hydrologic conditions and functions to at least three areas.

- Action 1 Research and evaluate methods for blocking and backfilling ditches. Determine if the three restoration projects recommended by PBS&J Inc. (SWFWMD 2006) are the best to implement
- Action 2 Consider the most logical progression of areas needing work, establish timelines and feasibility
- Action 3 Implement projects as per engineered design

The hydrology restoration report prepared by PBS&J Inc., for SWFWMD in 2006, recommended that the park backfill two specified ditches in the Seven Lakes parcel and block one indicated ditch in the South parcel. The conceptual plan offered by PBS&J in 2006 for ditch blocking was to: provide a "low impact rock barrier across the ditch alignment" at an appropriate elevation to match the seasonal high water elevation for the upstream wetland; add material to the downstream side of the block, as needed, in order to stabilize the streambed during overflow events; and then plant the top of the bank and the ditch side slopes with appropriate vegetation, as needed, above and below the seasonal high water elevation. Other methods may have since been developed and should be considered. Also, if a full hydrology study of the park is completed, it may indicate that other sites should have priority for this work.

Objective C: Study and ameliorate the impacts from the discharges from adjacent citrus groves.

- Action 1 Conduct assessment
- Action 2 Implement project

Adjacent citrus groves along the southwest corner of the park discharge water from grove maintenance and from storm runoff. The runoff into the park follows different hydroperiods and levels than would naturally occur. Also, the Association that runs the groves uses pesticides, fertilizers and other chemicals that are not labeled for Natural Areas. The full impact on the park soil, plant and wildlife, and ultimately on the hydrology of the local Charlie Bowleg's Creek watershed, needs to be evaluated.

Natural Communities Management

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

The 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 FDACS, Florida Forest Service (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

Objective A: Within 10 years, have 5,500 acres of the park maintained within the optimum fire return interval.

- Action 1 Develop/update annual burn plan
- Action 2 Manage fire dependent communities by burning between 1,299-2,816 acres annually
- Action 3 Develop scrub and scrubby flatwoods for optimum Florida scrub-jay habitat, while considering the needs of other imperiled scrub species
- Action 4 Develop wet flatwoods and wet prairie for optimum cutthroat grass and pitcherplant communities, while considering the needs of other imperiled wetland species

Table 5 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.

Table 5. Prescribed Fire Management		
<i>Natural Community</i>	Acres	Optimal Fire Return Interval (Years)
Sandhill	47	1-3
+ Xeric Hammock to become Sandhill	121	1-3
Wet Prairie	158	1-3
Wet Flatwoods (grassy)	881	1-4
+ Baygall to become Wet Flatwoods	465	1-4
+ Abandoned Pasture to become Wet Flatwoods	40	1-4

Table 5. Prescribed Fire Management		
<i>Natural Community</i>	Acres	Optimal Fire Return Interval (Years)
Depression Marsh	147	2-4
Mesic Flatwoods	2349	2-4
+ Abandoned Pasture to become Mesic Flatwoods	270	2-4
Dome Swamp (within pyric communities)	79	2-4
Basin Marsh	415	2-8
Scrubby Flatwoods	417	8-15
Scrub	876	5-20
+ Abandoned Pasture to become Scrub	80	5-10
Total Fire Type Acres	6345	
Annual Target Acreage	1,299-2,816	

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.

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.

The bulk of the fire-type acres at the park are mesic flatwoods with a fire return interval (FRI) of 2-4 years if dominated by saw palmetto/gallberry, and 1-3 years for those with a grass-dominated groundcover. The mesic flatwoods within the original section of the park are within the FRI, and are in good fuel condition. The exceptions are overgrown pockets along the south boundary in HH-H027 and along a section of Hammock Road (CR-634) adjacent to the park’s namesake hydric hammock. The accumulation of decades of needle drop (pine duff) in the flatwoods near the hammock have raised concern about smoke management and potential pine mortality, if burned under prescribed conditions. A goal during this planning period is to get the mesic flatwoods on the addition properties to the south out of backlog and into the FRI for this community.

Frequently associated with the management zones containing mesic flatwoods are those communities dominated by cutthroat grass as a groundcover, including wet

flatwoods and wet prairie/cutthroat seep. In general, these communities are within the FRI of 2-4 years in the original section of the park with most approaching maintenance condition, while those on the east property and south property are in need of restoration fire.

The remnant sandhill at the park is in need of frequent fire (1-3 years) and is not considered in maintenance condition because of hardwood encroachment. Hardwood reduction and frequent fire are needed in this community.

The scrub (oak-dominated scrub), approximately 876 acres, has a FRI of 5-20 years. The fire return interval for the oak scrub will be adjusted and planned to meet the long-term goal to achieve having 70% of the acreage as optimum habitat for Florida scrub-jays. To meet this objective, 70% of the potential habitat should be in optimal condition: at least 10% of the oaks between 4-5.5 ft., no more than one acre taller than 5.5 feet per 25 acres of habitat, and the remainder either 4-5.5 ft. or less than four feet tall; 10-50% of the acreage having bare sandy patches; and canopy trees averaging less than one canopy pine tree per acre (FWC and FNAI 2010). The remaining 30% of the oak scrub should be less than four feet tall (i.e., recently managed) or slightly taller than optimal (i.e., shrubs averaging 5-10 ft. and scheduled for management soon). Imbedded within the oak-dominated scrub, there are pockets of the rosemary scrub variant. The rosemary scrub has a less frequent FRI of 15-30+ years. The longer fire return interval is required to meet the life history needs of Florida rosemary and the federally-listed, Small's jointweed and Florida jointweed. Since the rosemary scrub is imbedded in a matrix of oak-dominated scrub, it will be included with the oak-dominated scrub prescribed fires. The longer fire return interval can be achieved by allowing the rosemary scrub to burn naturally in a mosaic and not intentionally burning all the vegetation. The discontinuous fuels in rosemary scrub will also help achieve a mosaic burn.

The 417 acres of scrubby flatwoods have fire return intervals of 8-15 years. In general, the scrubby flatwoods will initially require restoration burning to reduce the high fuel loads accumulated after years of fire exclusion and/or prescribed burning at a longer interval than the optimum FRI. Restoration burning should be conducted more frequently, at the lower range of the FRI -- every 4-8 years, for example, in the non-growing season. After fuels are reduced, maintenance prescribed fires can be conducted in the early growing season. Growing season burning allows for better hardwood reduction because of the greater likelihood of hardwood mortality. Early growing season burning more closely replicates the historic lightning season fire regime, when most fires naturally started, and to which the plants and animals are adapted. The scrubby flatwoods will be managed similarly to the scrub, with the percent of optimum scrub-jay habitat used as the benchmark for success of the fire program.

A Florida scrub-jay (scrub and scrubby flatwoods) management plan should be developed for the property, with the goal of meeting the optimum habitat conditions described in the 2010 FWC and FNAI Scrub Management Guidelines or updates to those guidelines. Burning should be prioritized so that management zones that are overgrown and not occupied by scrub-jays are burned first. Long-

term planning of prescribed burning should limit the displacement of scrub-jay family groups by ensuring that too much scrub is not burned at once.

It is anticipated that by getting all the natural communities in maintenance condition within the recommended FRI, some of the area currently mapped as baygall, as described earlier in the natural community section on baygall, is actually one of the fire-dependent natural communities. The natural community maps and prescribed fire-type acreage will be adjusted as needed.

An overall goal of the fire program at the park is to have at least one out of three burns conducted in the growing season for each management zone.

Interior fire breaks at this park also serve as park service roads and trails. Except for short sections with needle drop or grass, the fire breaks are mineral (deep sugar sand) and they are approximately 10 feet wide. Maintenance of interior fire breaks by tilling or plowing is only done to sections that need to be refreshed back to mineral soils. Mineral line preparation is minimized to reduce potential damage to sand skinks and other listed species. Temporary mowed lines are also used as fire breaks to allow for burning a section of zone, for example, to exclude the section of a zone in the nesting eagle buffer.

In general, prescribed fire preparation should be minimized because of listed species concerns. However, additional preparation is required near eagle nest trees to reduce fuel loading and ladder fuels and reduce intensity on the nest tree. Care should also be taken to avoid preparatory work near gopher tortoise burrows to protect them from collapsing. Those assigned preparatory work at this park should be familiar with the identification and locations of listed plants.

Because of the potential to take federally-listed species with a prescribed fire, the park's fire program takes steps to minimize the risk to endangered species. Minimizing the amount of fire line preparation, allowing unburned pockets to remain, minimizing foot traffic in the zone interior, keeping vehicles on the perimeter fire breaks, modifying firing techniques and providing information to the crew during the pre-burn briefing are ways to minimize take.

There are several altered land cover types that will and are benefitting from prescribed fire. Prescribed fire is being used to enhance conditions for native species persisting in areas that were altered for agricultural purposes. The FRI for these altered land cover types, for example abandoned pasture, should be that of the former natural community being restored.

In order to track fire management activities, the 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 and experience, backlog, etc. The database is also used for annual burn planning which allows the 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 Community Restoration: In some cases, the reintroduction and maintenance of natural processes is not enough to reach the desired future conditions for natural communities 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 may 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, and small-scale vegetation management.

Following are the natural community/habitat restoration, improvement and maintenance actions recommended to create the desired future conditions in the existing altered upland communities (abandoned pasture and clearing) communities (see Desired Future Conditions Map). Restoration, improvement and maintenance actions for wetland communities will be addressed in the hydrology assessment.

Objective B: Conduct habitat/natural community restoration activities on 2 acres of altered clearing community to bring to desired scrubby flatwoods community

- | | |
|----------|--|
| Action 1 | Develop site specific restoration plan |
| Action 2 | Implement restoration plan and monitoring schedule |

This restoration project is a medium-to-low priority activity, with all implementation of prescribed fire and exotics removal projects ranking higher. It is offered as an objective here based on the belief that this area will not revert to a natural type without such assistance. It is a project that could potentially be managed by the CSO or the Lake Wales Ridge Rangers, with approval and supervision from qualified park staff.

Natural Community 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 C: Conduct natural community/habitat improvement activities on 2 acres of sensitive xeric hammock natural community to bring it to sandhill

- Action 1 Define two acres in the xeric hammock of H005 to surround the imperiled plants
- Action 2 Adjust and monitor all prescribed fire related activities so that the species is properly protected

This is a high priority activity, as this area could readily become sandhill by simply re-establishing proper fire return intervals. However, these two acres are meant to contain and protect a naturally-occurring population of Florida goldenaster, possibly one of the last in Highlands County. Attention must be paid to all fire preparation activities, to ensure that the plants are not inadvertently dug up, and to the timing of prescribed fire, as this plant should never be burned in the fall or early winter. Early growing- or lightning-season fires are best and will encourage recruitment of this goldenaster. If burns cannot be implemented during the proper seasons and encroachment continues on the goldenaster population, then hardwood species should be manually removed and the leaf litter in the area reduced by using leaf blowers.

Objective D: Conduct natural community/habitat improvement activities on 100 acres of altered abandoned pasture to bring it to scrub/scrubby flatwoods, sandhill, and mesic flatwoods natural communities

- Action 1 Set burn plans to restoration-level FRI
- Action 2 Treat/eliminate the bahia grass in patches, monitoring patches for native plant recruitment, and for the retention of occasional bare sandy patches in the scrubby part of the zone

This is a medium- to high-priority project. The scrubby portion of this zone (HH-H029) has been noted by FWC and The Nature Conservancy (TNC) as potential habitat for Florida sand skink. Implementing a restoration-oriented burn plan and eliminating the bahia in increasingly large patches (while controlling other exotics species) will likely result in the native seed bank establishing a good diversity of Florida scrub species in this zone and making the area habitable for the skink. There is a high density of gopher tortoises, with an estimated population of 624, that would also benefit from prescribed fire and habitat improvements.

Imperiled Species Management

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

The DRP strives to maintain and restore viable 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 FWC'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.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet the 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 A: Develop/Update baseline imperiled species occurrence inventory lists for plants and animals.

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

- Action 1 Identify the bat species at the park
- Action 2 Implement monitoring protocols for at least five imperiled animal species including Florida scrub-jay, Florida sand skink, gopher tortoise, and at least one of the bats. Survey and monitoring protocols already exist for these species (FWC, USFWS). Some levels of monitoring are already active at the park for Florida scrub-jay and gopher tortoise.
- Action 3 Use existing monitoring protocols and FNAI reporting structures to establish baseline occurrence data and determine follow-up monitoring schedules for Florida sand skink, Sherman's fox squirrel, Florida mouse, and any imperiled bats found after identification of these mammals at the park has been completed.
- Action 4 Compile reports, complete with management guidelines; submit data to FNAI

Assistance for implementing surveys and monitoring will likely be needed, and should be sought from the local and regional research and academic communities, organizations and agencies, such as Archbold Biological Research Station, Florida Bat Conservancy, USF, U.S. Fish and Wildlife Service, and FWC. Resources for monitoring and management are currently available on the FWC and USFWS websites. Resources for FNAI data reporting structure are available on the FNAI website.

In 2017 a gopher tortoise survey was conducted at the park by FNAI, as part of FWCs initiative to survey tortoise populations on conservation lands (FNAI 2017). FWC recommends that the population should be re-surveyed in 5-10 years, during the term of this plan, using the same Line Transect Distance Sampling methodology. The survey should show if the tortoise population is increasing, decreasing, or staying the same, and where resource management actions (prescribed fire, hardwood removal, restoration, and other activities) resulted in changes to the population, or burrow occupancy. Additional monitoring can also document unexpected mortality events from disease or natural disaster.

Objective C: Monitor and document 22 selected imperiled plant species in the park.

- Action 1 Use existing monitoring protocols and FNAI reporting structures, at the Tier level recommended in Table 2; group species by community or habitat type
- Action 2 Create voucher specimens as needed; submit at least one to District
- Action 3 Compile reports, complete with management guidelines; submit data to FNAI

The species to include are: pinewoods bluestem, pygmy fringetree, Florida goldenaster, highlands goldenaster, Florida hartwrightia, nodding pinweed, scrub blazing star, Britton's bear grass, swamp plume polypody, blue-flowered and yellow-flowered butterworts, papery nailwort, Florida jointweed, Small's jointweed, hooded pitcherplant, scrub bluestem, northern needleleaf, cardinal airplant, giant airplant, soft-leaved wild pine, Carter's warea, and redmargin zephyrlily (*Zephyranthes simpsonii*). There are currently protocols, data, and reports in place for the scrub species on this list, and for the hooded pitcherplant. The species that are usually found in open to fairly-open wetland (e.g., hartwrightia and the butterworts) would now be combined with the hooded pitcherplant monitoring. The hammock and other miscellaneous species will need to be organized into a bloom-time calendar to facilitate surveys and monitoring. Baseline data on the airplant populations is needed as soon as possible, as these species' populations are crashing in southern Florida; subsequent surveys will tell if protection and augmentation measures are needed within the term of this plan. The frequency of repeat surveys is determined by the findings in the initial search and by recommendations in the individual plant protocols.

Exotic Species Management

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

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

Objective A: Annually treat at least 96 infested acres of exotic plant species in the park.

- Action 1 Annually develop/update exotic plant management work plan
- Action 2 Implement annual work plan by treating 96 infested acres (roughly equivalent to 1200 gross acres) annually, including second treatments for grasses, ferns and vines

Overall *infested* acres estimated at the time of writing this plan was about 920 acres, based on at least 95% of the park being fully surveyed within the last two years. Most of the grasses, ferns and vines require two treatments per year, which increases infested acres to be treated annually by another 70%, approximately. With an overall cover class of 20%, roughly 7,600 on-the-ground "gross" acres must be worked, as there is no possible way to address "infested acres" without having to walk all of the related area. With this management objective, other resources are needed to work roughly 760 acres each year, including re-treatments.

Objective B: Implement control measures on one exotic animal species in the park.

- Action 1 Continue to authorize qualified staff to remove wild hogs
- Action 2 Develop SOW for contracted removal of wild hogs, where more than one technique for removal is used. Development of the SOW will require making a reasonable population estimate and setting the minimum quota at that number.
- Action 3 Implement contracted services
- Action 4 Develop better public awareness about the dangers and damages associated with wild hogs. Increase public education

Wild or feral hogs have become a significant problem at the park. Control methods include hunting, trapping, shooting, and exclusion. Toxicants and repellents are being studied, but none are currently registered for use in the United States; management should keep up with the study findings and be prepared to make use of approved materials. 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, as resources permit. Contracted removal should be based on an assigned minimum quota, such as 250 or 300 per year, with bonus payment allowances for going over that number. If there is contracted removal, management must verify that removal is not placing live hogs in areas that might directly or eventually give the animals access to public lands; also, any live transportation must observe FDACS rule 5C-21.015, Swine Movement Requirements.

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. The DRP will implement the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in the 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 must be submitted to the FDOS, Division of Historical Resources (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 the DHR for consultation and the 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 the DHR.

Objective A: Assess and evaluate all recorded cultural resources in the park.

- Action 1 Obtain assessment forms from the park service Historic Preservationists.
- Action 2 Implement assessments of all recorded cultural resources

The assessments should help determine potential National Register significance of archaeological sites. This may apply particularly for 8HG1268 (dam or water control structure) and 8HG1269 (brick chimney remains).

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

- Action 1 Ensure all known sites are recorded or updated in the Florida Master Site File
- Action 2 Conduct a level 1 archaeological survey for priority zones identified by the predictive model
- Action 3 Engage full-time cultural resource professional to manage documentation and protection of HHSP's numerous cultural sites, structures, and collections

Objective C: Bring 4 of the recorded cultural resources in the park into good condition.

- Action 1 Using the assessments and evaluations and prioritizing the needs for stabilization, restoration and rehabilitation, choose four sites for conditions improvement.
- Action 2 Develop relevant plans, budgets and implementation schedules
- Action 3 Complete condition improvements

Note that changes to the dam or water control structure as recommended in a cultural site assessment or evaluation may need to be adjusted to suit the recommendations found in a cross-park hydrology study. Any such adjustments should be explained and made part of the park's interpretive material. The detailed assessment will direct the work needed to bring the structures into good condition.

The AIST survey developed an archaeological sensitivity model designed to determine where archaeological deposits are likely to occur and where Level 1 surveys need to occur. The survey located new sites, which they recorded with FMSF. Documentation for the all currently recorded sites needs to be complete and up to date. Implementing a full-time position for the cultural assessments and management is appropriate for this park.

Objective D: Provide secure and safe environment for the museum and for collection materials.

- Action 1 Install a fire suppression sprinkler system in the museum
- Action 2 Establish a storage facility for maps and blueprints and other collections as needed, that is climate and pest controlled. This facility may need to be outside the park.

The museum needs a fire suppression sprinkler system installed, to protect all artifacts, and the building, in the event of a fire. All paper-based maps and blueprints need to be stored in climate-controlled conditions, with regular pest control treatments; there are too many paper-based materials to store all at the museum. It is possible that the best solution for the storage needs will be found off-site.

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 the 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, except for 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 park could be met without conducting any significant timber management activities, although some tree removal will be needed. The areas where tree removal is likely to be needed are discussed in the Natural

Communities section of this plan. If workdays and projects should prove insufficient to maintain quality habitat, then the park will investigate the use of selective contracted timbering projects as a supplemental strategy.

Arthropod Control Plan

All DRP lands are designated as “environmentally sensitive and biologically highly productive” in accordance with Ch. 388 and Ch. 388.4111 Florida Statutes. If a local mosquito control district proposes a treatment plan, the DRP works with the local mosquito control district to achieve consensus. Larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed, although HHSP needs to be judicious in these applications as they can negatively impact the important firefly and other arthropod populations at the park. The DRP does not authorize new physical alterations of marshes through ditching or water control structures. Mosquito control plans temporarily may be set aside under declared threats to public or animal health, or during a Governor’s Emergency Proclamation. HHSP operates under DRP designations for mosquito control; there is currently no separate mosquito control plan for this park.

Additional Considerations

Additional acquisitions are needed at this park, most importantly to connect the two disjunct western parcels that are presently separated, north and south. Beyond that, the acquisition of adjacent lands is needed to acquire the upper drainage basin south of the park, so that the best possible scheme of hydrological restoration can be devised. Adjacent Florida Scrub jay habitat is also needed so that additional numbers of birds can be brought under protection. The needed properties referred to here, and more besides, are identified on a SWFWMD, Save Our Rivers project that would purchase a large tract, north and south of the park to protect the Charlie Creek Watershed.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is located in the Implementation Component of this management plan.

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 considered recommendations of the land management review team and updated this plan accordingly.

The park was subject to a land management review on February 27, 2013. The review team made the following determinations:

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

The 2013 LMR notes were reviewed as part of developing this plan and the agreed upon changes and recommendations were made to this management plan.

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 that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management. Additional input is received through public workshops, and through environmental and recreational-user groups. With this approach, the DRP objective is to provide quality development for resource-based recreation throughout the state with a high-level of sensitivity to the natural and cultural resources at each park.

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 expressed 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.

Highlands Hammock State Park is located primarily within Highlands County, near the western boundary of Highlands and Hardee counties, about 7.5 miles west of Sebring and 90 miles south of Orlando in the central part of the state. Approximately 213,000 people live within 30 miles of the park (U.S. Census 2010).

According to the U.S. Census Data (2016), approximately 14.5% of residents in Highlands County and 11.6% in Hardee County identify as black, Hispanic or Latino, or another minority group. Approximately 52% and 42% of residents in Highlands and Hardee can be described as youth or seniors respectively (U.S. Census 2016). For Highlands County, 43% of the population is of working age (ages 16-65), and

51% in Hardee County are of working age (U.S. Census Bureau 2016). Highlands County's per capita personal income was \$21,916 in 2016 and Hardee County's per capita personal income was \$17,179 (U.S. Census Bureau 2016).

A significant amount of resource-based recreation opportunities exist within 15 miles of Highlands Hammock State Park. Lake June-in-Winter Scrub State Park offers biking, fishing, and hiking. Lake Wales Ridge Wildlife and Environmental Area, maintained by FWC, includes a variety of conservation lands in the area. Some of these areas are open to horseback riding, hiking, and biking.

A large preserve managed by Highlands County is in the vicinity of the park- Sun'n Lake Preserve allows wildlife viewing, fishing, hiking, bird watching, and hiking. Several conservation easements are also located within the vicinity of the park; these easements are federally-managed lands under the U.S.D.A.

The park is located in the Central Vacation Region, which includes Marion, Lake, Sumter, Seminole, Orange, Polk, Osceola, Hardee, and Highlands counties (Visit Florida 2014). According to the 2014 Florida Visitor Survey, approximately 36.1% of domestic visitors to Florida visited this region. Roughly 90% visitors to the region traveled from the Northeast for leisure purposes. The top activities for domestic visitors were theme, amusement, and water parks as well as shopping. Summer was the most popular travel season, but visitation was generally spread throughout the year. Travel method was nearly split with 48% traveling by air and 52% by non-air transportation. The region also reports an average of 4.6 nights and spending an average of \$187 per person per day (the highest expenditures in the state) (Visit Florida 2014).

Existing Use of Adjacent Lands

The land uses surrounding Highlands Hammock State Park include medium density residential and high density residential to the east of the park. Driving into the park, visitors can see evidence of the Heartland's past through its current land use, which is largely agricultural. In a tradition that continues today, a large portion of the area is dedicated to cattle and citrus groves. Dispersed throughout the rural lands are pockets of urban development and amenities, such as the County Club of Sebring which sits just along the parks eastern border. As Highlands and Hardee counties have evolved, they have also increased connectivity in the region through trail and roads. The county road that travels up to the park boundary carries a number of recreating individuals, including cyclists that frequently go into the park off the county road.

Planned Use of Adjacent Lands

Surrounding property in Highlands County are designated for medium and high residential development as well as some agriculture to the north, west, and south (Highlands County Comprehensive Plan 2010). Areas in Hardee County are designated for agricultural uses; it is likely these areas under agriculture

designation will remain undeveloped (Hardee County 2030 Comprehensive Plan 2010).

Highlands County lists two Development of Regional Impact projects in the area around Highlands Hammock State Park. To the east of the park is the Country Club at Sebring and to the northeast of the park is the Lakeshore Mall (Highlands County Economic Development Commission).

Highlands and Hardee County are members of the Central Florida Regional Planning Council. Highlands County is expected to add nearly 22,000 people in the next 30 years while Hardee is expected to add approximately 1,000. These counties are not projected to receive the bulk of the population growth in the region (BEBR 2015).

Florida Greenways and Trails System (FGTS)

The Florida Greenways and Trails System (FGTS) is made up of existing, planned and conceptual non-motorized trails and ecological greenways that form a connected, integrated statewide network. The FGTS serves as a green infrastructure plan for Florida, tying together the greenways and trails plans and planning activities of communities, agencies and non-profit organizations throughout Florida. Trails include paddling, hiking, biking, multi-use, and equestrian trails. The Office of Greenways and Trails maintains a priority trails map and gap analysis for the FGTS to focus attention and resources on closing key gaps in the system.

In some cases, existing or planned priority trails run through or are adjacent to state parks, or they may be in close proximity and can be connected by a spur trail. State parks can often serve as trailheads, points-of-interest, and offer amenities such as camping, showers and laundry, providing valuable services for trail users.

Numerous opportunity trails have been identified to intersect the park and border the southern tract. The primary corridors proposed include the Highlands – Hardee Connector Corridor which will go through the park’s northern tract, and a 2161 – CR 635 Connector Corridor which will run perpendicular to the Highlands – Hardee connector corridor, connecting to the Florida Cracker Trail Corridor that has also been identified as an opportunity trail.

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.

Recreational Resource Elements

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

Land Area

The uplands of Highlands Hammock consist of natural communities that vary from sandhill to dome swamp. Elevation changes with the communities from 80 to 150 ft. above sea level. Geologically, it is part of Lakes Wales Ridge. The original park is developed with trails, camping, picnicking facilities and the historic CCC buildings. The hydric hammock is the major attraction in the original park. Remaining areas of the park were more recently acquired and present a broad array of recreational and educational opportunities.

Water Area

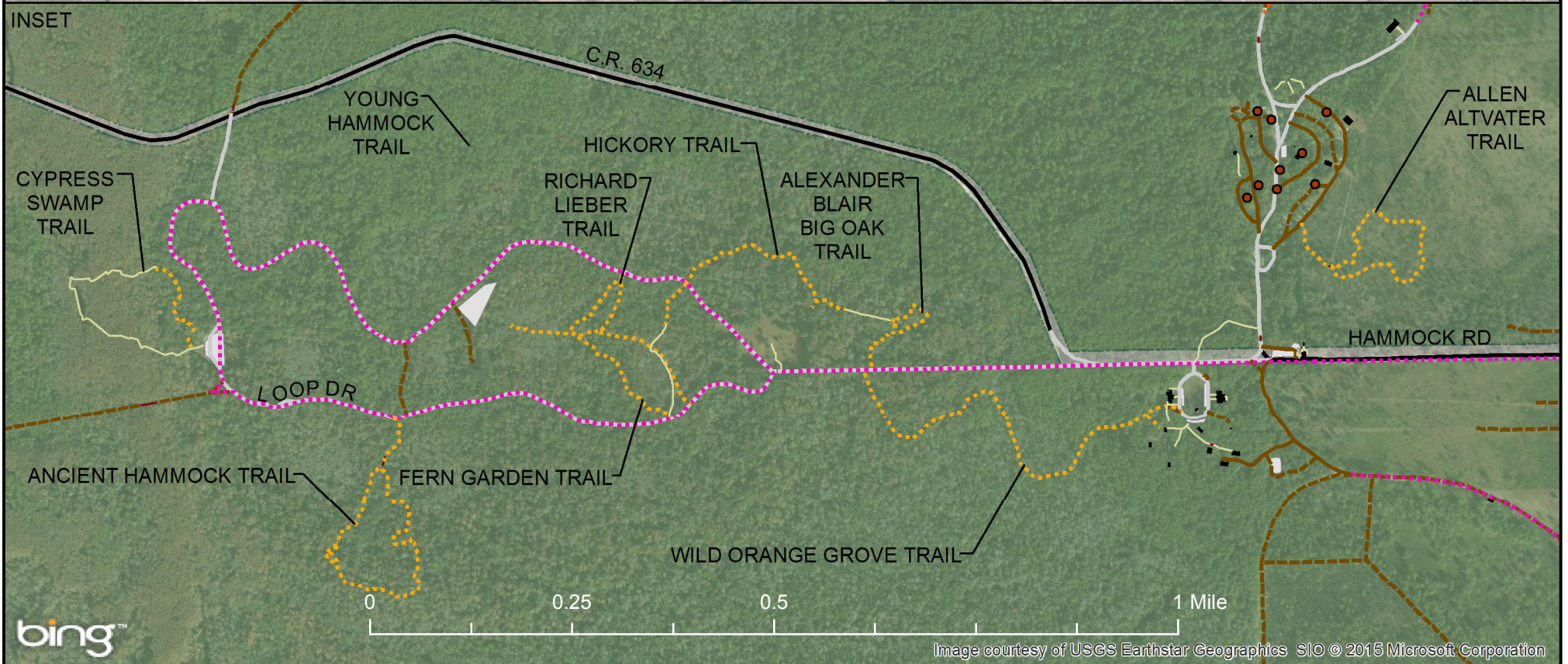
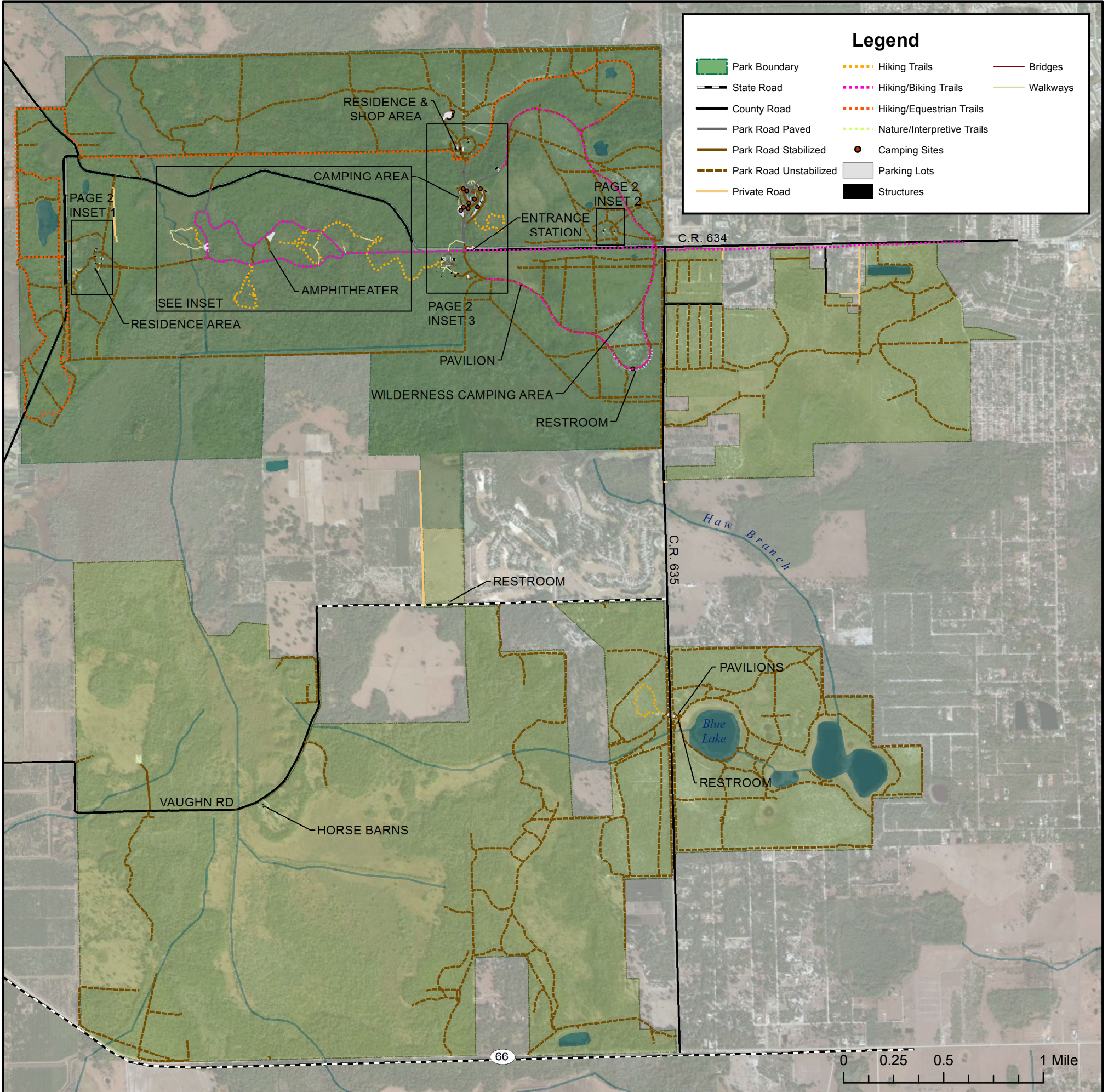
There are three blackwater streams in Highlands Hammock State Park: Little Charlie Bowlegs Creek, Haw Branch and Tiger Branch. The natural hydrology of these streams has been considerably modified resulting in very limited opportunities for water-based recreation. There are approximately 90 acres of sandhill lake on the property, most of which are in the Seven Lakes Parcel. Paddling and fishing are possible in the larger lakes but these activities are dependent on water levels and shoreline conditions, which vary widely depending on rainfall.

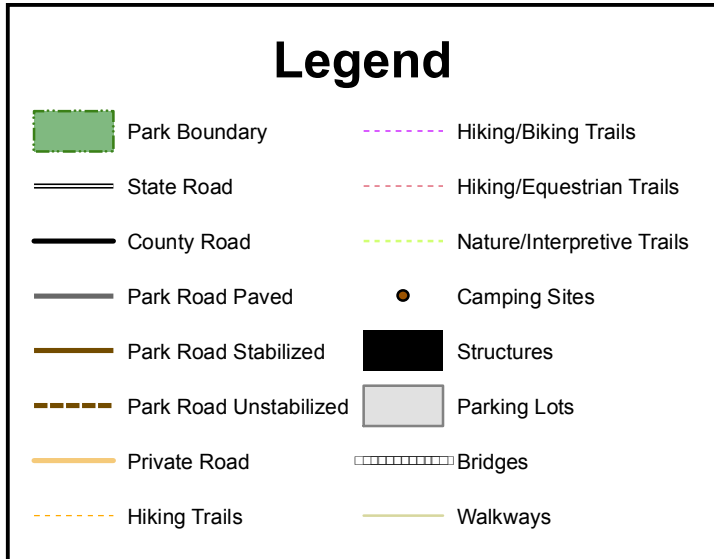
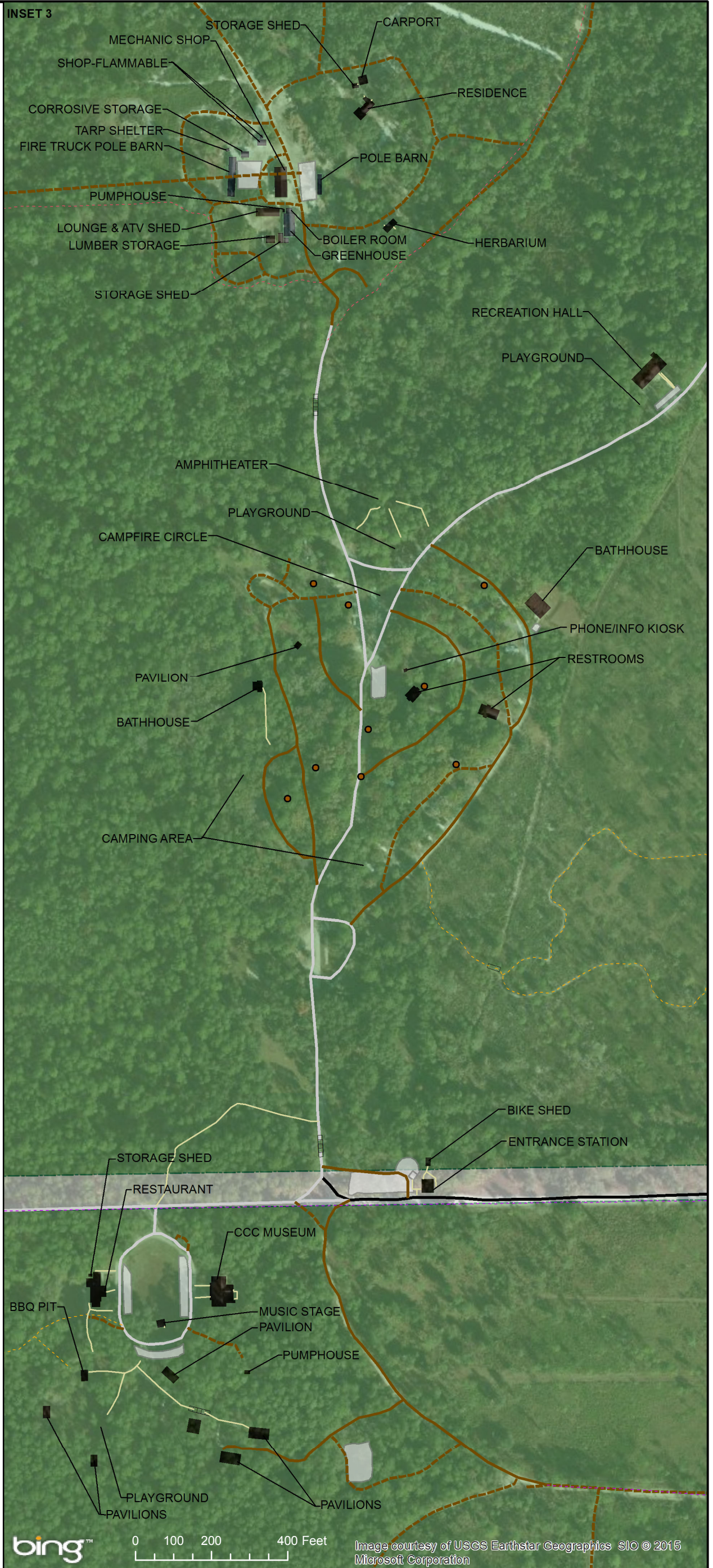
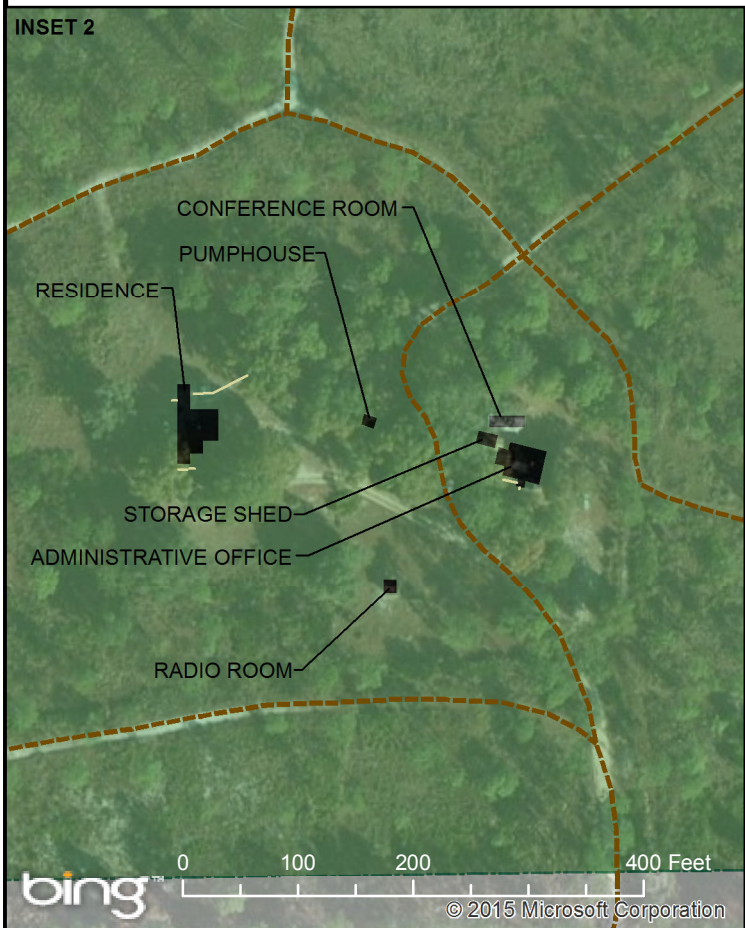
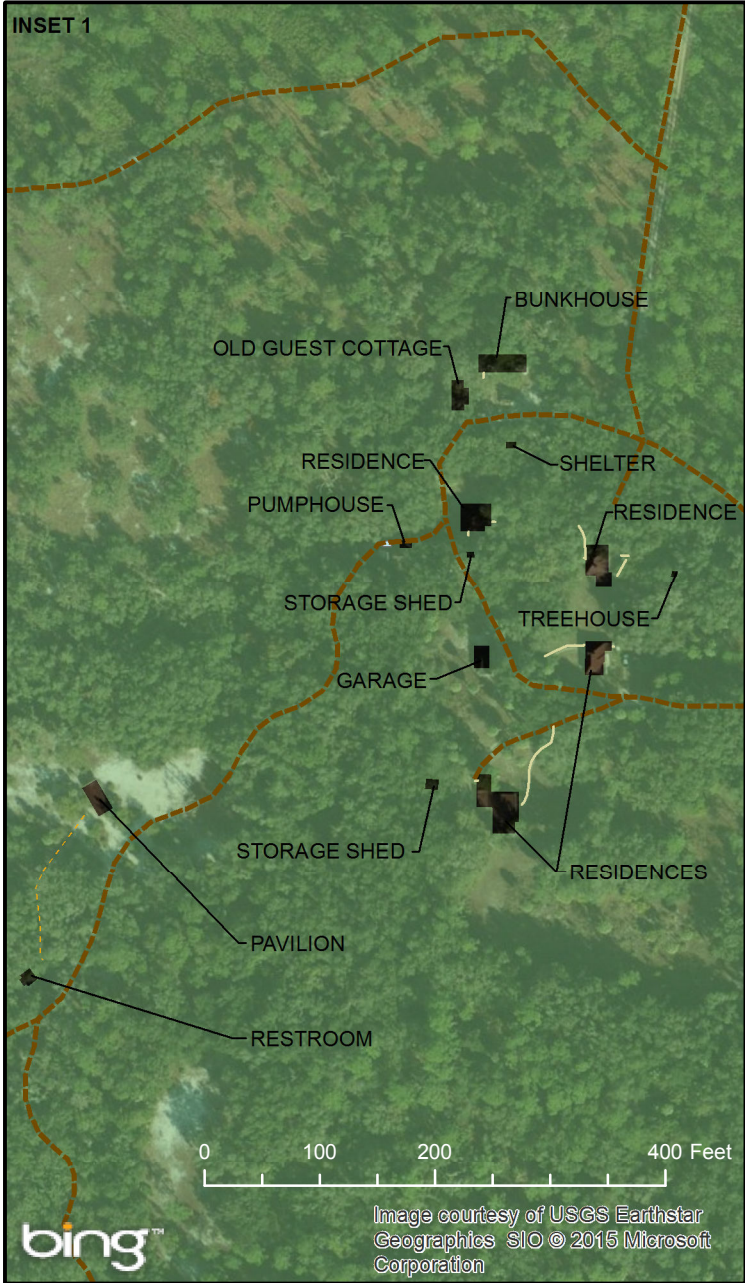
Natural Scenery

The visual resources of this state park are exceptional, the most notable being the hydric hammock. The dense canopy of the hammock filters the light giving visitors a unique visual experience. The hydric hammock and the contrast with the mesic flatwoods present the visitor with a rare opportunity to experience two very different environments in close proximity. The interpretative trails allow visitors to view many of these natural communities and their inhabitants at close range. The visual character of this state park provides a quality setting for nature observation, scenery appreciation and nature photography.

Significant Habitat

The park has documented forty-six designated animal species. The Florida Scrub jay is the only species requiring special management measures. The Florida panther is an occasional visitor. The park has been designated an Important Bird Area by Audubon of Florida and is a stop on the East Section of the Great Florida Birding Trail. Most of the 158 acres of wet prairie in the park is classified as cutthroat grass seeps, an imperiled plant community that provides habitat for a number of rare





wildflowers and native grasses.

Natural Features

The most significant of the natural features in the park is the approximately 690 acres of hydric hammock. The abundant cutthroat seeps and upland natural communities, especially sandhill and scrub, are of utmost regional importance since the park is one of the few remaining areas in the region where these communities remain.

Archaeological and Historic Features

Twenty-four sites of pre-historic and historic importance are included in the Master Site File for Highlands Hammock State Park. It is one of the original nine parks in the Florida State park system. In 1933, the CCC installed Company 453 (Florida SP-3, and later State Park-10) near Highlands Hammock. Between 1933 and 1941, over twenty-four structures, including a dam, herbarium, picnic shelters, museum, park residences, and other structures were constructed.

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 Florida Forest and Park Service began operating Highlands Hammock as a state park on August 1, 1935. Before that, Highlands Hammock was a private park owned and financed by Highlands Hammock, Inc., composed of local citizens, and the later partner Florida Botanical Garden and Arboretum Association. This private park was opened to the public in March 1931. By 1935, funding difficulties convinced the association's board to place the park in state custody. As noted earlier, between October 1936 and 1941 a CCC camp was set-up near Highlands Hammock and construction of many of the existing buildings occurred.

Future Land Use and Zoning

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

Highlands Hammock State Park is zoned as conservation land for the parcels located within Hardee County and conservation/management lands for the majority of the Highlands county portion. However, a section of the park is zoned for agriculture in Highlands County.

Current Recreational Use and Visitor Programs

Recreational uses currently available in the park include hiking, birding, camping (primitive, and general), geo-seeking, wildlife viewing, biking, and walking as well as tours and other interpretive educational resources. The park hosts several 5k runs/walks throughout the year. The park offers tours of remote areas of the park in which visitors may observe alligators, turtles, birds, and other wildlife. The park is also home to a museum which provides visitors with insight into the New Deal Era and the CCC.

Highlands Hammock is part of the Great Florida Birding and Wildlife Trail.

Highlands Hammock recorded 166,871 visitors in FY 2016/2017. By DRP estimates, the FY 2016/2017 visitors contributed \$16.1 million in direct economic impact, the equivalent of adding 257 jobs to the local economy (FDEP 2017).

Other Uses

No other uses for this park have been identified.

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 Highlands Hammock State Park all wetlands and floodplains as well as known imperiled species habitat have been designated as protected zones. The park's current protected zone is delineated on the Conceptual Land Use Plan.

Existing Facilities

Highlands Hammock is one of the first state parks established in Florida. At present, recreational opportunities are concentrated in the area that was originally established as a park. Many of the structures, built through the CCC program, have been preserved. The statewide CCC Museum is located in one of these buildings. The museum serves as an excellent resource for cultural interpretation. A similar building, located across a central green, houses the Hammock Inn, a camp store and gift shop operated by a contracted concession operator. Tram tours through the hammock and flatwoods leave from this area. At the back of this green is a picnic area with pavilions built both by the CCC and of construction that is more recent.

The Seven Lakes Day Use Area provides picnicking opportunities on Blue Lake. The area contains two large picnic pavilions and a restroom.

Camping is a popular recreational activity at the park. The park contains a 138-site standard campground with four bathhouses. Most of these facilities are quite old with the exception of a more recently constructed bathhouse. Additional amenities include a shuffleboard court, campfire circle, playground and a dump station. A paved access road runs through the center of the campground and provides access to the park shop and recreation hall. The park's wilderness camping area accommodates additional RVs, tent campers, and small groups but provides no power or water. A second primitive group camping area is located off South Hammock Road. A campground has been constructed in the southern section of the park at the end of Vaughn Road. This facility currently has 5 campsites, a bathhouse, and horse stable, but will be adapted for tent camping. This campground is currently not open for use but will open pending the vacation of Vaughn Road once the DRP and Highlands County come to an agreement on public access to a section of Vaughn Road (see Base Map).

Recreation Facilities

Entrance Area

Ranger station
Bicycle storage shed

Campground

138 campsites with utilities
Shuffleboard court
Campfire circle
Playground
Recreation Hall w/playground
Bathhouses (4)
Dump station

Equestrian Camping Area

5 sites w/o utilities
Bathhouse
Horse Stable

Primitive Group Camp

Tables and grilles
Picnic shelter, medium
Bathhouse

CCC Picnic Area

CCC Museum
Hammock Inn
Picnic shelters, medium (3)
Picnic shelter, large
Playground
Tables and grilles
Parking (90 spaces)

Seven Lakes Day Use Area

Picnic pavilions (2)
Restroom
Parking (10 spaces)

Wilderness Camping Area

16 individual sites
Group campsites (2)
Tables and grilles
Open playing field (also used as parking area)
Picnic shelter, medium
Composting restroom

Trails

Wild Orange Grove Nature Trail
(0.5 mi.)
Alexander Blair Big Oak Nature Trail (0.2 mi.)
Hickory Nature Trail (0.3 mi.)
Richard Lieber Nature Trail (0.5 mi.)
Fern Garden Nature Trail (0.35 mi.)
Young Hammock Nature Trail (0.4 mi.)
Ancient Hammock Nature Trail (0.65 mi.)
Cypress Swamp Catwalk (0.4 mi.)
Allen Altvater Trail (0.5 mi.)
Equestrian Trail (11 mi.)
Bicycle Trail (8 mi.)
Interpretive displays
Open-air amphitheater (Vesper Ground)
Park tram

Support Facilities

Shop

Carpenter shop
Mechanic shop
Wood shed
Lounge and staff lockers
Detail supply shed
Tool shed
Pole barn
Tram shed
ATV shed
Flammable storage shed

Administrative Area

Interpretive office/conference room
Residence
Stabilized parking (5 vehicles)

East Residence Area

Residence
Pumphouse / water well

West Residence Area

Residences (4)
Bunkhouse
Cottage
Garage
Pumphouse

Parkwide

Loop Drive (paved, 2 mi.)
Hammock Road (paved, 4.3 mi.)
Tiger Branch Drive (stabilized,
1.7 mi.)
North Branch Drive (stabilized,
1.7 mi.)
Stabilized Service Roads (14.5 mi.)
Administrative office with shed

Conceptual Land Use Plan

The following narrative represents the current conceptual land use proposal for this park. The conceptual land use plan 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 (see Conceptual Land Use Plan). The conceptual land use plan is modified or amended, as new information becomes available regarding the park's natural and cultural resources or trends in recreational uses, in order to adapt to changing conditions. Additionally, the acquisition of new parkland may provide opportunities for alternative or expanded land uses. The DRP develops a detailed development plan for the park and a site plan for specific facilities based on this conceptual land use plan, as funding becomes available.

During the development of the conceptual land use plan, the DRP assessed the potential impact of proposed uses or development on the park resources and applied that analysis to determine the future physical plan of the park as well as the scale and character of proposed development. Potential resource impacts are also 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 investigated in greater detail. Municipal sewer connections, advanced wastewater treatment, or best available technology systems are applied for on-site sewage disposal. Creation of impervious surfaces is minimized to the greatest extent feasible in order to limit the need for stormwater management systems, and all facilities are designed and constructed using best management practices to limit and avoid resource impacts. Federal, state, and local permit and regulatory requirements are addressed during facility development. 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, park staff monitors conditions to ensure that impacts remain within acceptable levels.

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/or improved] activities and programs are also recommended and discussed below.

Objective: Maintain the park's current recreational carrying capacity of 2,512 users per day.

The park will continue to provide opportunities for camping, picnicking, nature observation, hiking, and horseback riding. Interpretive exhibits and programs will continue to be offered at the museum.

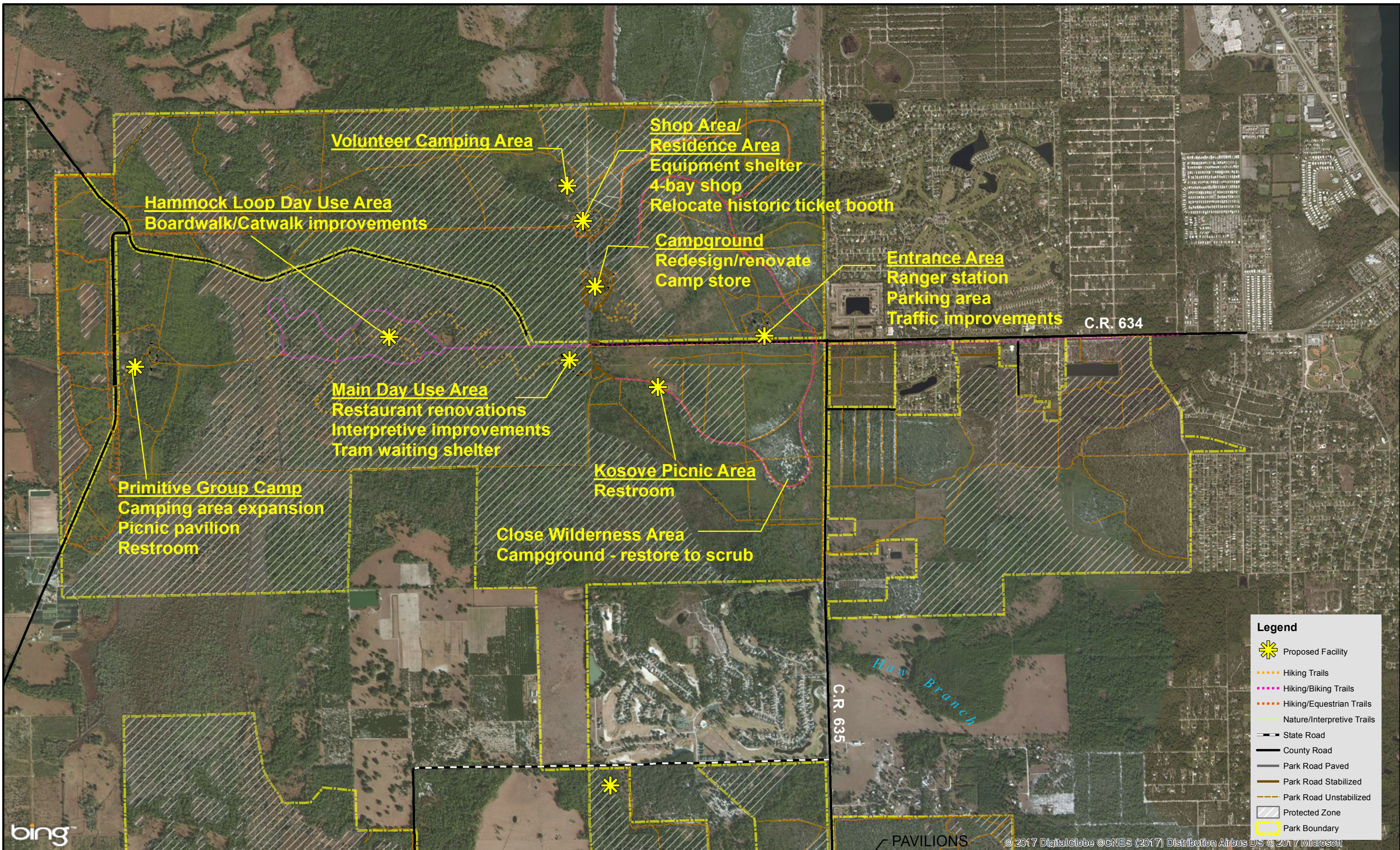
Objective: Expand the park's recreational carrying capacity by 444 users per day.

Camping opportunities will be expanded in the park with the redesign and renovation of the existing camping area. Interpretive opportunities will be added with the addition of a nature center that will focus on telling the story of the park's significant natural resources.

Objective: Continue to provide the current repertoire of 4 interpretive, educational and recreational programs on a regular basis.

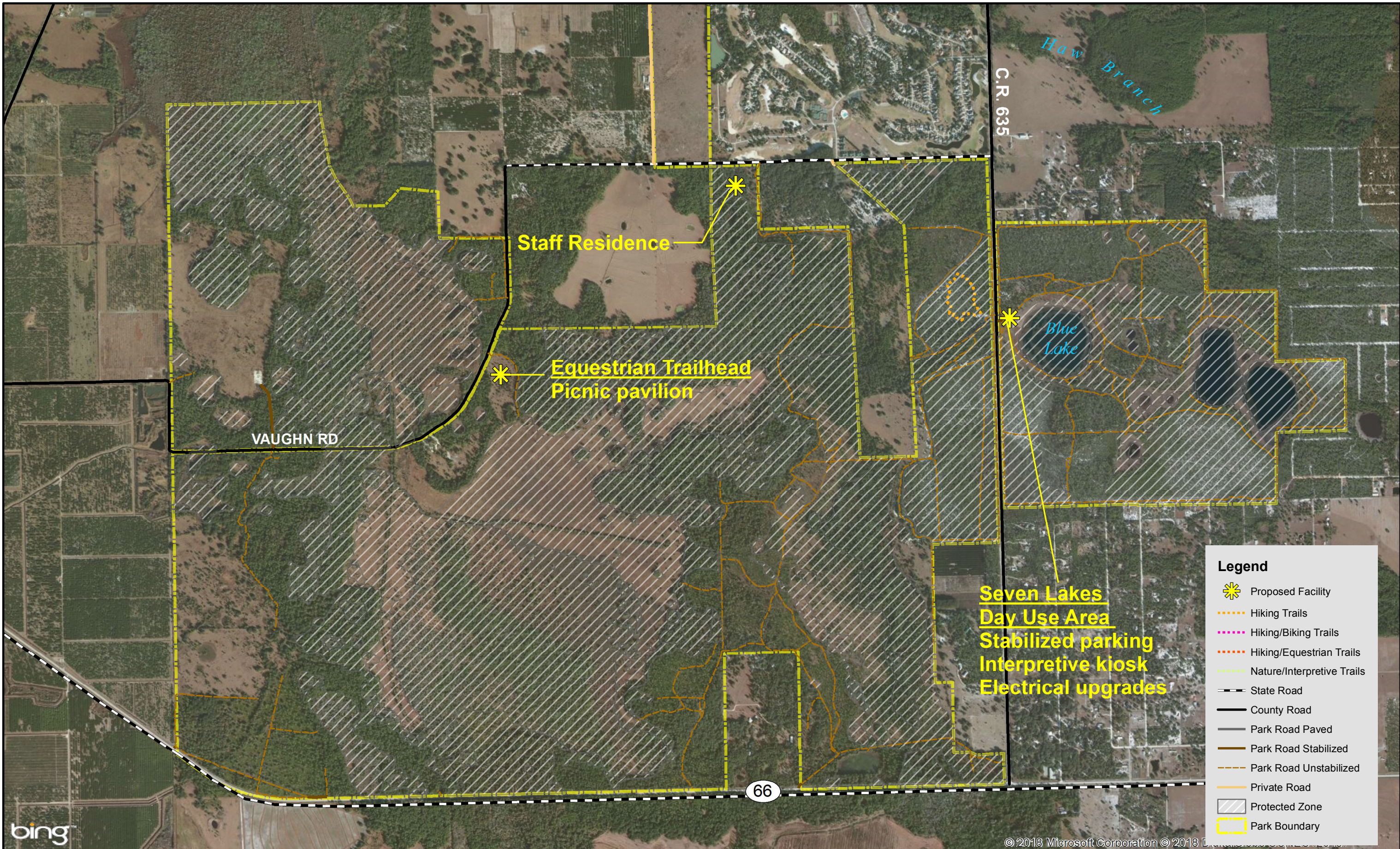
The park currently provides 4 types of interpretive programs annually. This includes the popular Tram Tours of the Hammock carried out 3 days a week, except during the summer months, and pertain to the cultural and natural history of the park. Staff can provide as many as six such tours weekly. Staff, as well as visiting interpreters, offer weekly Saturday Night Campfire programs covering various natural and cultural subjects of the southern Central Florida area. These programs are offered during the height of the camping season, November to April. The park's dedicated volunteers alongside staff make available Monday Morning Nature Walks in the Hammock historic trail system from November to April; the walk details native plant communities, plant identification, animal life, and park development history. To aid in community awareness and support of prescribed fire, interpretation is provided for local homeowner associations, neighborhood groups, and civic clubs. This has begun with focusing on the local residents who to come to the park during the spring through fall, a timeframe that mirrors summer wildfire season; interpretation is also available to the park's seasonal winter visitors, though to a slightly lesser extent.

The park also provides the public with 5 annual special events: the CCC Festival in November, Firefly Tram Tours in March, National Public Lands Day in September, Literacy Day in September, and the Haunted Hammock Event in October. The CCC event has been going on annually for over 30 years and represents the CCC contribution to establishing this park as well as the New Deal Era in general. The Firefly Tram Tours last two weeks and coincide with firefly season (March/April) at the park. The event is very popular and up to two tram tours may run per night for the duration of the insects' presence. National Public Lands Day along with Literacy Day are smaller events in September which bring in volunteers to work on trail maintenance and other park projects as well as storytelling and a children's book reading, respectively. The Haunted Hammock Event in October has been going on for 3 years, is very well attended, and is a Halloween event similar to other events at Florida State



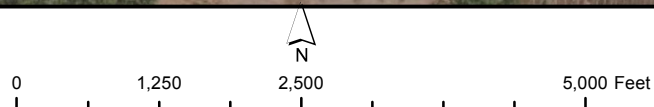
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Parks. On top of these events, the Friends of Highlands Hammock sponsors over 10 races each year ranging from 5K's to half marathons. These have been successful financially to the CSO, as have been the 7 concerts also hosted annually by the CSO. Starting in October and running until May, these musical performances involve various musical styles from folk to rock and range in visitation from 300 to 900 attendees per night. The park also hosts the annual Florida Humanities Council Speaker Series; the four speakers that come to the park for the event each bring in 300 or more guests.

Objective: Develop 4 new interpretive, educational and recreational programs.

Improved as well as new programming is needed to appropriately relay information on the park's rich natural and cultural resources. These programs would come in multiple forms on a range of topics such as the history of human activity along the Lake Wales Ridge before 1900, the scrub community of Lake Wales Ridge and how it fits into the greater wetlands communities and drainage of South Central Florida, and the water issues within and surrounding the park.

The park has always represented the CCC/Roebling Era through its events, the CCC Museum, and various historic structures of that time period. But less is understood or visually obvious of those Native Americans and early settlers/ranchers that came before. Research done through the State Archives and De Soto County can shed light on human activities before 1900. With only three known archaeological sites and one known historic site of that period within park boundaries there is currently little to grow upon, but a better effort could be made besides the references to WB Hooker's cattle operations and the Skipper and Eiland family residences. An understanding of sparse and nomadic human use up until 1900 by early peoples of the Lake Wales Ridge compared to the river basins east (Kissimmee) and west (Peace) of the park may help public understanding of the park's cultural development.

A program on the scrub communities would be particularly relevant considering its importance to the park's environment. With both the East and Seven Lakes Properties purchased to protect scrub habitats and the sequential burning restoration of the properties, it will become important for the park to improve and perfect a specific presentation on the unique qualities of scrub communities.

Like programming regarding the scrub communities, water issues, which are socially and politically charged, should be brought to visitors' attention. The park's lowlands, where water pools on the surface before draining into larger streams, would be discussed in such programming. A discussion on how the

recent developments outside the park alter the natural systems in and around park boundaries will also be discussed in such programming.

In addition to new programming, it is also recommended that a nature center be developed and equipped with state of the art exhibits and displays that highlight the numerous imperiled species that take refuge in the park. Two new wildlife observation areas will also be designated along existing trails in the form of low-impact bird blinds.

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 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, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of improved, renovated, and new facilities needed to implement the conceptual land use plan for Highlands Hammock 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 9 existing facilities.

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.

Campground: Improvements will be made to the campground to enhance the camping experience. The circulation pattern and campsite layout will be redesigned and the number of sites reduced to a maximum of 100. The new design will segregate tent-only camping areas from areas that can accommodate larger recreational vehicles. The development of a new entrance area (described below) will provide an opportunity to adaptively reuse the existing ranger station. One option is to provide a camp store at this location. Discussions and negotiations with interested concessionaires will be considered to determine the best use for the building.

The existing Wilderness Camping Area is currently in one of the park's scrub remnants. This area will be closed to camping so that it may be restored and improved to provide more habitat for imperiled species. It is anticipated that campers who prefer this low-key, quiet area will find the main campground more appealing after the redesign.

Kosove Picnic Area: Improvements for this area include the addition of a restroom and the reduction of the size of the adjacent lawn.

Shop/Residence Area: Additional facilities that will be provided for this area include a 4-bay shop and equipment shelter.

Main Day Use Area: The continuation of the food service use for the old Hammock Inn is anticipated but is contingent on future discussions and negotiations with interested concessionaires. Renovations will be necessary to improve the functionality of this facility. A waiting shelter was proposed at the tram stop to provide shelter from rain and sun for tram riders. It is recommended that the old ticket booth, currently located in the shop/residence area, be renovated and moved to the museum area and used for interpretive purposes.

Hammock Loop Day Use Area: The boardwalk decking at the Cypress Swamp Trail will be replaced. Replacement with recycled material is recommended. Improvements to the catwalk include marking trip hazards such as root overgrowth and replacing structural elements showing signs of rot. An accessible connector path should be constructed between both ends of the boardwalk/catwalk to improve accessibility

Primitive Group Camping Area: This area will be reorganized and improved to expand camping opportunities. Two camping areas will be provided to accommodate up to 30 campers each. Currently, there is one existing restroom and one large picnic pavilion in this area. An additional large picnic pavilion and restroom (with outdoor shower) will be added so that each site will have its own.

Seven Lakes Day Use Area: With the expected increase in the number of special events such as wedding and reunions in this area, additional stabilized parking is needed (10-12 spaces) as well as upgrades to the electrical service and provision of air conditioning for the small office. A trailhead interpretive kiosk is also recommended to enhance the hiking experience in this area.

Equestrian Campground: After careful consideration it was decided that due to the flood-prone natural communities surrounding the area, the lack of appropriate equestrian facilities, and the general increase in tent camping trends, the equestrian campground will be adapted for tent camping and accessible by the general public once Vaughn Road has been formally vacated.

Equestrian Trailhead: This area will be improved with the addition of one large picnic pavilion.

Objective: Construct 3 new facilities.

Volunteer Camping Area: A volunteer camping area is proposed for the old equestrian camping area near the shop. Facilities that will be provided for this area include 10 to 12 campsites, a bathhouse, potable water, and electric service.

Entrance Area: The entrance area will be relocated along CR 634 to the east of its current location. This new facility will be designed to improve traffic safety and better coordinate the flow of local traffic with that of park visitors. Pull-off and parking areas will be designed to provide for safe and convenient visitor contact and camper check-in.

Staff Residence: A new staff residence will be provided to establish a staff presence in the park's southern section. A location along Vaughn Road across from the golf course/subdivision is recommended.

Nature Center: A nature center will be developed to better interpret the park's significant and biologically diverse natural resources. While the location is to be determined, one of the sites being considered is the current Ranger Station location as well as a site in the Hammock Loop Day Use Area.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 7) located in the 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:

Campground

Redesign/renovate camping loops (3)
Camp store

Hammock Loop Day Use Area

Cypress Swamp Trail boardwalk improvements

Kosove Picnic Area

Restroom

Volunteer Camping Area

Campsites (10-12)
Bathhouse
Potable water
Electric service

Main Day Use Area

Renovate restaurant
Tram waiting shelter
Interpretive improvements

Equestrian Trailhead

Large picnic pavilion

Primitive Group Camping Area

Camping area expansion (30 campers)

Restroom with outdoor shower

Large picnic pavilion

Seven Lakes Day Use Area

Stabilized parking (10-12 cars)

Electrical upgrades

Trailhead kiosk

Parkwide

Staff residence

Nature Center

Shop/Residence Area

4-bay shop

Equipment shelter

Entrance Area

Ranger station

Parking area

Traffic improvements

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 preserve 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 6).

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 as shown in Table 6.

Table 6. Recreational Carrying Capacity

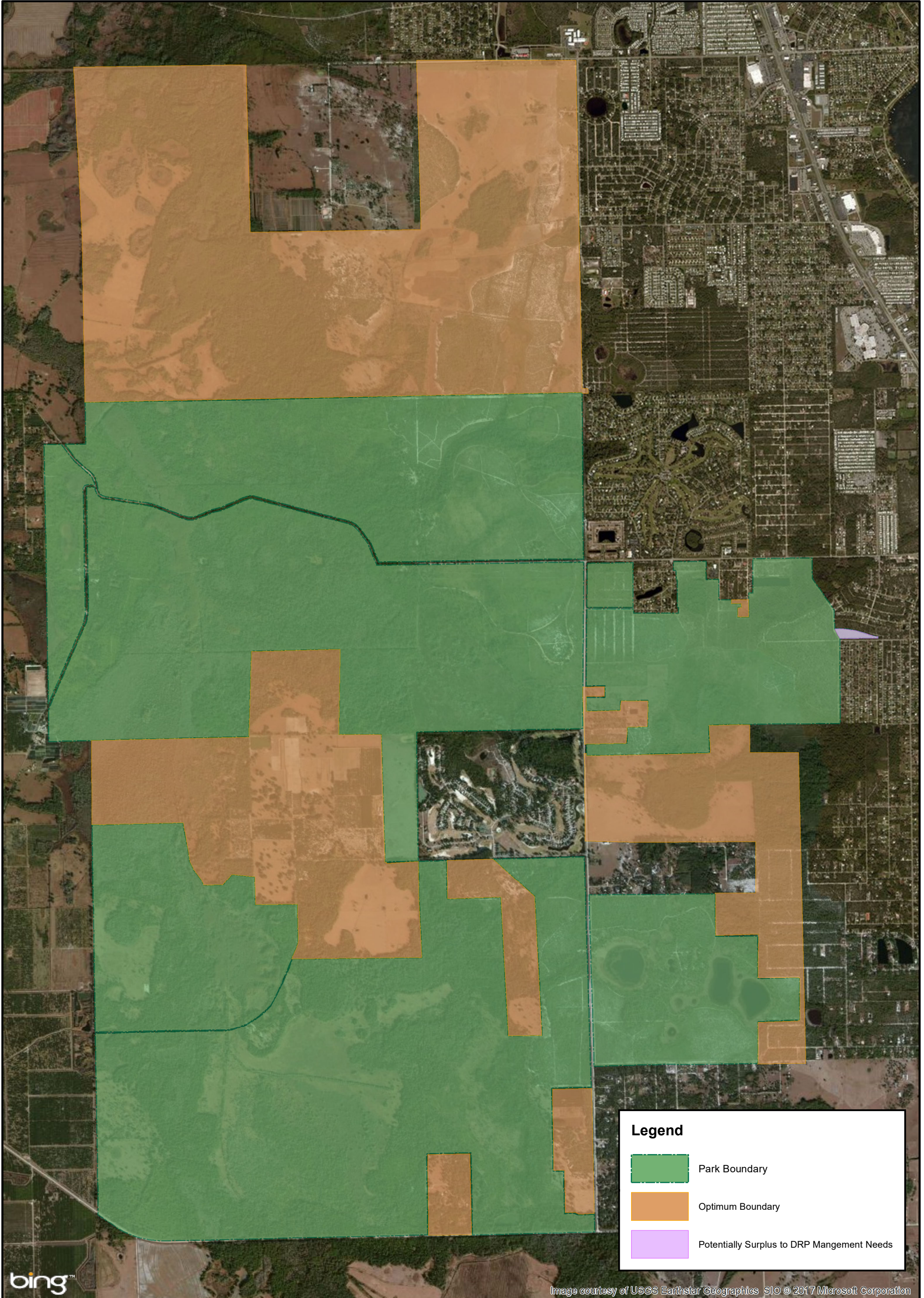
Activity/Facility	Existing Capacity*		Proposed Additional Capacity		Estimated Recreational Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Trails						
Equestrian	220	440			220	440
Biking	80	320			80	320
Nature	80	320			80	320
Picnicking	176	352			176	352
Camping						
Camping	556	556	244	244	800	800
Equestrian	40	40			40	40
Primitive Group	60	60			60	60
CCC Museum	50	200			50	200
Nature Center			50	200	50	200
Restaurant	40	160			40	160
Tram Tours	32	64			32	64
TOTAL	1334	2512	294	444	1628	2956

*Existing capacity revised from approved plan according to DRP guidelines

Optimum Boundary

The optimum boundary map reflects lands considered desirable for direct management by the DRP as part of the state park. These parcels may include public or privately-owned land that would improve the continuity of existing parklands, provide the most efficient boundary configuration, improve access to the park, provide additional natural and cultural resource protection or allow for future expansion of recreational activities. Parklands that are potentially surplus to the management needs of DRP are also identified. As additional needs are identified through park use, development, and research, and as land use changes on adjacent property, modification of the park’s optimum boundary may be necessary.

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. Any party or governmental entity should not use a property’s identification on the optimum boundary map to reduce or restrict the lawful rights of private landowners. Identification on the map does not empower or



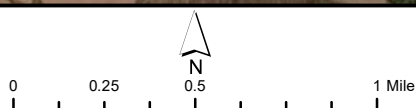
Legend

- Park Boundary
- Optimum Boundary
- Potentially Surplus to DRP Management Needs

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Image courtesy of USGS Earthstar Geographics SIO © 2017 Microsoft Corporation

HIGHLANDS HAMMOCK STATE PARK



Florida Department of Environmental Protection
 Division of Recreation and Parks
 Date of aerial, 2011

OPTIMUM BOUNDARY MAP

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 denial or the imposition of permit conditions.

Several parcels of land, totaling more than 5,000 acres, have been identified to complete the optimum boundary of Highlands Hammock State Park. These properties are important to provide additional scrub-jay habitat, improve resource and recreational linkages, buffer the park from incompatible uses, protect the water quality of Little Charlie Bowlegs Creek and Haw Branch, and facilitate resource management. The parcels identified along with others are referred to in the Save Our Rivers project by the SWFWMD. Aside from resource management interests, the additions will help provide more uniform park boundaries. One small parcel near the park's northeast corner is considered surplus to the needs of the park.

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 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 Highlands Hammock State Park in 2007, significant work has been accomplished and progress made towards meeting the 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 the DRP.

Park Administration and Operations

- Negotiated a park mowing contract with the Gravely Corporation Research Facility.
- Established an FWC law enforcement office in the herbarium.
- Partnered with the Highlands County Tourist Development Council, the FFS, and Archbold Research Station to market park programs, particularly prescribed burning.
- Worked with Highlands County and the City of Sebring on water, septic, road, and trail issues.
- Recruited two AmeriCorps personnel annually.

Resource Management

Natural Resources

- Increased the prescribed fire program to decrease the number of backlogged acres.
- Acquired equipment through the CSO and the FFS to better manage the park's prescribed fire program.
- The park is moving to prepare boundary lines four times per year and preparing all planned burned zones at the start of each fiscal year.
- Surveyed and treated exotic invasive plants over the past five years to achieve 100% of the annual goal each year.
- Maintained an exotic animal removal contract for feral hogs resulting in the removal of approximately 50 hogs over the past few years.
- Park staff have worked to control exotic reptiles, amphibians, and fish within the park.

- Accelerated natural community restoration over the past four years on cutthroat seeps, scrub-jay habitat, and rare native plant habitat.

Cultural Resources

- The park completes monthly building inspections to aid in the maintenance of historic structures.
- Completed archaeological predictive modeling with the University of South Florida in 2014.
- Maintained a large collection of CCC era photos, maps, and other materials.

Recreation and Visitor Services

- Continued longstanding tram tours on Hammock Loop Drive. Park staff and the CSO put on 8 tram tours weekly during the winter and spring to interpret the park's natural and cultural history.
- Presented weekly Saturday night programs in the amphitheater.
- Added a spring Firefly tram tour and a fall haunted hammock event.
- Applied for and received funding for the Florida Humanities Council for four speakers annually.
- Added a Literacy Day and a National Public Lands Day to the public events calendar.

Park Facilities

- Completed improvements to the Ranger Station waiting area.
- Constructed an events stage and two picnic pavilions in the main day use area.
- Developed an equestrian camping area.
- Provided restrooms and two picnic pavilions at the Seven Lakes Day Use Area.
- Provided electrical upgrades for the recreation hall.
- Added ADA accessible campsites and a new dump station in the campground.
- Provided new support facilities including a fuel storage building, a staff conference room, and new air conditioners for four staff residences.

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 7) 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 the 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 the 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 the DRP's annual legislative budget requests. When preparing these annual requests, the 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, the 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 7
Highlands Hammock State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 1 of 8

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 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	\$1,856,000
Objective B	Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.	Administrative support expanded	UFN	\$328,000
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	Obtain an assessment of the park's hydrological needs.	Assessment conducted	LT	\$104,000
Action 1	Develop Scope of Work and request proposals from qualified contractors	Scope of Work developed/proposals requested	UFN	\$3,000
Action 2	Select contractor and implement assessment	Contractor selected/assessment implemented	UFN	\$101,000
Objective B	Restore natural hydrological conditions and functions to at least three areas.	# Acres restored or with restoration underway	UFN	\$24,000
Action 1	Backfill two ditches in the Seven Lakes parcel and block ditch in the South parcel as indicated in 2006 PBS&J plan	# Miles of ditches filled	UFN	\$17,000
Action 2	Assess 2006 plan and select one project for implementation	Project selected	UFN	\$1,000
Action 3	Implement project as per engineered design	Project implemented	UFN	\$6,000
Objective C	Study and ameliorate the impacts from the discharges from the Crewsville Association citrus groves.	# Acres restored or with restoration underway	UFN	\$10,000
Action 1	Implement study/assessment.	# Miles of ditches filled	UFN	\$3,000
Action 2	Implement project as per engineered design	Project implemented	UFN	\$7,000

* 2015 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

Table 7
Highlands Hammock State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 2 of 8

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 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 5,500 acres of the park maintained within optimal fire return interval.	# Acres within fire return interval target	LT	\$1,130,000
Action 1	Develop/update annual burn plan.	Plan updated	C	\$14,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning between 1,299 - 2,816 acres annually, as identified by the annual burn plan.	Average # acres burned annually	C	\$900,000
Action 3	Develop scrub and scrubby flatwoods for optimum Florida scrub-jay habitat, while considering the needs of other imperiled scrub species.	# Acres developed	UFN	\$90,000
Action 4	Develop wet flatwoods and wet prairie for optimum cutthroat grass and pitcherplant communities, while considering the needs of other imperiled wetland species.	# Acres developed	UFN	\$126,000
Action 5	Improve access to management zones and better fireline prep by providing low-water crossings in several areas.	Water features can be safely crossed		\$10,000
Objective B	Conduct habitat/natural community restoration activities on 2 acres of altered clearing community to scrubby flatwoods community.	# Acres restored or with restoration underway	UFN	\$4,000
Action 1	Develop/update site specific restoration plan	Plan developed/updated	ST	\$1,000
Action 2	Implement restoration plan	# Acres with restoration underway	UFN	\$3,000
Objective C	Conduct natural community/habitat improvement activities on 100 acres of altered abandoned pasture to bring it to scrub/scrubby flatwoods and mesic flatwoods natural communities	# Acres improved or with improvement underway	UFN	\$150,000
Action 1	Set burn plans to restoration-level FRI	Restoration burn plan implemented	C	<i>Included</i>
Action 2	Treat/eliminate patches of bahia grass, monitor patches for native recruitment, manage bare sandy patches	# Acres patches managed	UFN	\$150,000
Objective D	Conduct habitat/natural community improvement activities on 2 acres of sensitive xeric hammock community to bring it to sandhill.	# Acres improved or with improvements underway	LT	\$5,000
Action 1	Define two acres in the xeric hammock of H005 to surround the imperiled plants (Florida goldenaster).	Area defined	ST	\$500
Action 2	Adjust and monitor all prescribed fire related activities so that the species is properly protected	Burning adjusted and monitored	C	\$4,500

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Table 7
Highlands Hammock State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 3 of 8

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 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	\$12,000
Objective B	Monitor and document 5 selected imperiled animal species in the park.	# Species monitored	C	\$40,000
Action 1	Identify the bat species at the park.			\$2,000
Action 2	Implement existing monitoring protocols for at least 5 imperiled animal species including Florida scrub-jay, Florida sand skink, gopher tortoise, and at least one bat.	# Species monitored	C	\$30,000
Action 3	Use existing monitoring protocols and FNAI reporting structures to establish baseline occurrence data and determine follow-up monitoring schedules for Florida sand skink, Sherman's fox squirrel, Florida mouse, and any imperiled bats found after identification of these mammals at the park has been completed.	# Species monitored; baseline data established	C	\$5,000
Action 4	Compile reports, complete with management guidelines; submit data to FNAI.	Reports compiled/data submitted	C	\$5,000
Objective C	Monitor and document 22 selected imperiled plant species in the park.	# Species monitored	C	\$11,000
Action 1	Use existing monitoring protocols and FNAI reporting structures, at the Tier level recommended in Table 2; group species by community or habitat type.	# Species monitored	C	\$8,000
Action 2	Create voucher specimens as needed; submit one to District.	Voucher specimens created	C	\$1,500
Action 3	Compile reports, complete with management guidelines; submit data to FNAI.	Reports compiled/data submitted	C	\$1,500
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 at least 96 infested acres of exotic plant species in the park.	# Acres treated	C	\$3,298,000
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	\$14,000
Action 2	Implement annual work plan by treating at least 96 infested acres (roughly equivalent to 760 gross acres) in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	\$2,284,000
Action 3	Improve access to natural communities in by providing crossings for various water features - low-water strategies can be implemented in many, but some kind of bridge is needed in East Parcel.	Access improved		\$1,000,000

* 2015 Dollars

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Table 7
Highlands Hammock State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 5 of 8

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 B	Implement control measures on 1 exotic and nuisance animal species in the park.	# Species for which control measures implemented	C	\$102,000
Action 1	Continue to authorize qualified staff to remove wild hogs.	Staff authorized	C	\$8,000
Action 2	Develop contract removal of wild hogs.	Contract developed	ST	\$2,000
Action 3	Implement contract.	Contract implemented	UFN	\$60,000
Action 4	Implement educational outreach with adjacent landowners and public.	Outreach implemented	C	\$32,000
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 28 of 28 recorded cultural resources in the park.	Documentation complete	LT	\$3,000
Action 1	Obtain assessments forms from the FPS Historic Preservationists.	Assessments complete	UFN	\$0
Action 2	Implement assessments of all recorded cultural resources	Reports and priority lists completed	UFN	\$3,000
Objective B	Compile reliable documentation for all recorded historic and archaeological sites.	Documentation complete	LT	\$48,000
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	\$1,000
Action 2	Conduct Level 1 archaeological survey for priority areas identified in the predictive model in areas planned for restoration or development.	Survey completed	UFN	\$9,000
Action 3	Engage curator full-time to manage documentation and protection of HHSP's numerous cultural sites, structures, and collections	Curator engaged	UFN	\$38,000

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Table 7
Highlands Hammock State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 6 of 8

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	Bring 4 of 28 recorded cultural resources into good condition.	# Sites in good condition	LT	\$187,000
Action 1	Using the assessments and evaluations and prioritizing the needs for stabilization, restoration and rehabilitation, choose four sites for conditions improvement.	# Sites selected	UFN	\$80,000
Action 2	Develop relevant plans, budgets and implementation schedules.	Plans developed	C	\$7,000
Action 3	Complete condition improvements.	Improvements completed		\$100,000
Objective D	Provide secure and safe environment for the museum and for collection materials.	Collections secured	UFN	\$112,000
Action 1	Install a fire suppression sprinkler system in the museum.	Sprinklers installed	UFN	\$32,000
Action 2	Establish a storage facility for maps and blueprints, and other collections as needed, that is climate and pest controlled.	Storage facility established	UFN	\$80,000
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 2,512 users per day.	# Recreation/visitor	C	\$1,857,000
Objective B	Expand the park's recreational carrying capacity by 444 users per day.	# Recreation/visitor	UFN	\$328,000
Objective C	Continue to provide the current repertoire of 4 interpretive, educational and recreational programs on a regular basis.	# Interpretive/education programs	C	\$60,000
Objective D	Develop 4 new interpretive, educational and recreational programs.	# Interpretive/education programs	UFN	\$250,000
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	\$2,079,000
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	\$200,000
Objective C	Improve and/or repair 9 existing facilities as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	UFN	\$10,402,000
Objective D	Construct 3 new facilities as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	UFN	\$1,994,000
Objective E	Expand maintenance activities as existing facilities are improved and new facilities are developed.	Facilities maintained	UFN	\$500,000

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Table 7
 Highlands Hammock State Park Ten-Year Implementation Schedule and Cost Estimates
 Sheet 7 of 8

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.

Summary of Estimated Costs

Management Categories	Total Estimated Manpower and Expense Cost* (10-years)
Resource Management	\$5,218,000
Administration and Support	\$2,184,000
Capital Improvements	\$12,596,000
Recreation Visitor Services	\$5,074,000
Law Enforcement Activities	Note: Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.

* 2015 Dollars
 ST = actions within 2 years
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Addendum 1—Acquisition History

Highlands Hammock State Park Acquisition History

LAND ACQUISITION HISTORY REPORT					
Park Name	Highlands Hammock State Park				
Date Updated	5/18/2016				
County	Highlands County, Florida				
Trustees Lease Number	3622 (Original lease, Lease No. 2324)				
Current Park Size	9251.24 acres				
Purpose of Acquisition	The state of Florida acquired Highlands Hammock State Park primarily to manage and operate the property as a state park.				
Acquisition History					
Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
MDID 15361	3/11/1999	Iris Hart Young	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees)	1,961.90	Warranty Deed
MDID367573	7/31/1935	Highlands Hammock, Inc.	Florida Board of Forestry	1,064.90	Warranty Deed
MDID 367570	4/10/1934	Highlands Hammock, Inc.	The Trustees of the Internal Improvement Fund of the State of Florida	857.82	Warranty Deed
MDID 456	12/4/1990	The Naure Conservancy	Trustees	799.65	Warranty Deed
MDID 310294	1/7/2001	The Worldwide Investment Group	Trustees	781.53	Quit Claim Deed
MDID367577	11/6/1945	Trustees of the Internal Improvement Fund of the state of Florida	Florida Board of Forestry and Parks	709.00	Deed
MDID 367574	8/18/1936	The Florida Botanical Garden and Arboretum Association, Inc.	Florida Board of Forestry	648.07	Warranty Deed
MDID 14191	8/4/1997	John W. Burton	Trustees	615.11	Warranty Deed
MDID 367572	10/9/1936	J. Warren Dilworth and his wife Bessie C. Dilworth	Trustees of the Internal Improvement Fund of the State of Florida	322.81	Warranty Deed
MDID348433	9/9/2004	Leto Brothers Family Partnership	Trustees	250.62	Corrected Warranty Deed
MDID11933	4/11/1994	Hollenberg Farm, Inc.	Trustees	203.10	Warranty Deed
MDID367581	7/13/1942	The Desoto State Forest Park	Florida Board of Forestry and Parks	164.32	Special Warranty Deed

Highlands Hammock State Park Acquisition History

Management Lease					
Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Original Lease 2324	1/23/1968	The Trustees of the Internal Improvement of the State of Florida	The Florida Board of Parks and Historic Memorials	99 years	1/22/2067
Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue		Term of the Outstanding Issue	
There is no known deed restriction on the parcels that constitute Highlands Hammock State Park.					

Addendum 2—Advisory Group Members and Report

**Highlands Hammock State Park
Advisory Group Members and Report**

Addendum 3—References Cited

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Addendum 4—Soil Description

HIGHLANDS HAMMOCK STATE PARK

SOIL DESCRIPTIONS

HHSP is primarily in Highlands County, but crosses into Hardee County in the northwest. These descriptions are in numeric order by Highlands County's 1989 map-unit codes. Where Hardee County's 1989 map-unit code numbers do not match Highland County's, the Hardee code is shown in parentheses.

2 (Hardee: 38) - St. Lucie sand, 0 to 2% or to 8% slopes. This component is on ridges on marine terraces on coastal plains, on ridgetops, knolls, and dunes in areas of sand hills. Individual areas range from 5 to 20 acres in size. The parent material consists of eolian or sandy marine deposits. Typically, the surface layer is dark gray fine sand about 4 inches thick, and the underlying material is white fine sand to a depth of 80 inches. Organic matter content in the surface horizon is about 1 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Excessively Drained; water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation includes sand pine, scrub live oak, scattered turkey oak, and an understory of scattered saw palmetto, creeping dodder, rosemary, cactus, and lichens. This soil is rated severely unfavorable for recreational development due to deep, dry sands. Included with this soil in mapping are small areas of Pomello and Tavares soils. In most areas, the included soils make up 5 to 15% of the map unit.

3 Basinger fine sand, depressional. This very poorly Drained, sandy soil is in wet depressions. The parent material consists of sandy marine deposits. The mapped areas are irregular in shape and range from 5 to more than 50 acres. The slopes are smooth to concave and range from 0 to 2%. Typically, the surface layer is very dark gray fine sand about 6 inches thick and the underlying material to a depth of 80 inches or more has dark to light grayish brown and gray sands. Organic matter content in the surface horizon is about 5 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded, but it is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, June, July, August, September, October, November, and December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of pickerelweed, maidencane,

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cutgrass, sand cordgrass, St. John's wort, and chalky bluestem. A few areas have water-tolerant trees. This soil is rated severely unfavorable for recreational development, mostly due to ponding. Included in mapping are small areas of Immokalee, Myakka, Placid, and Valkaria soils. In most areas, the included soils make up 10 to 30% of the map unit.

6 (Hardee: 5) - Tavares sand, 0 to 5% slope. This component is on low to moderately high sandy ridges and knolls. The slopes are smooth to convex. The parent material consists of eolian or sandy marine deposits. The mapped areas are irregular in shape and range from five to about 50 acres. Typically, the surface layer is dark grayish-brown fine sand 5 - 6 inches thick and the underlying material may be yellow, very pale brown, or white. Organic matter content in the surface horizon is about 1 percent. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Moderately Well Drained. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded and is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, and November. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of sand pine, slash pines, longleaf pine, turkey oak, sand live oak, sand post oak (in Hardee County), and an understory of scattered saw palmetto, pineland threeawn, broomsedge bluestem, and various other forbs. This soil is rated severely unfavorable for recreational development, mostly due to sandiness. In mapping, included with this soil are small areas of Adamsville, Candler, Sparr, and Zolfo soils.

7 (Hardee: 21) - Placid fine sand, depressional. This nearly level (slopes 0 to 2%) component is in depressional areas or poorly defined drainage-ways in the flatwoods, and along the edges of swamps and marshes in the county. Depressional areas are circular and the areas along the edges of swamps and marshes are irregular in shape; map units may range from less than 1 acre to about 70 acres. The slopes are smooth to concave. The parent material consists of sandy marine deposits. Organic matter content in the surface horizon is about 6 percent. Typically, the upper surface layer is black, to 3" (Highlands) or 6" (Hardee), and the lower layers range from dark to light grays or browns. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded, but it is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August,

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September, October, November, and December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The native vegetation consists of pond pine, bay, cypress, gum, pickerelweed, rushes, sedges, cutthroat grass, maidencane, redroot, some St. John's Worts, and other water-tolerant grasses. This soil is rated severely unfavorable for recreational development, due to ponding and sandiness. Included with this soil in mapping are small areas of Basinger, Felda, Samsula, and Sanibel soils (and Pompano in Hardee). In most the mapped areas, the included soils make up 10 to 17% of the acreage.

8 (Hardee: 15, fine sand) - Immokalee sand. This component is on coastal plains and broad, low ridges, and low knolls in flatwoods. The slopes are smooth to concave and range from 0 to 2%. Individual areas are irregular in shape and range from 10 to 60 acres in Hardee County and from 15 to more than 500 acres in Highlands County. The parent material consists of sandy marine deposits. Organic matter content in the surface horizon is about 2 percent; natural fertility is low. Typically, the surface layer is black to very dark gray fine sand about 5 to 6 inches thick and the underlying material may be gray to black (Highlands County) or gray fine sand to dark reddish brown (Hardee County). Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, and November. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of slash pine, south Florida slash pine, longleaf pine, wax myrtle, running oak, saw palmetto, gallberry, fetterbush, pineland threeawn, chalky bluestem, low panicum, and various other native grasses. This soil is rated severely unfavorable for recreational development, mostly due to extremes between wetness/ponding and rapid permeability at the surface over dry periods. Included with this soil in mapping are small areas of Basinger, Felda, Myakka, Pomello, Satellite, and Smyrna soils (Hardee County includes Myakka, Ona, Placid, and Pomello soils). In most areas, the included soils make up 10 to 15% of the map unit.

10 (Hardee: 16) - Myakka fine sand. This component occurs primarily in mesic flatwoods in peninsular Florida. The mapped areas are irregular in shape and range from 10 to 200 acres. The slopes are smooth and range from 0 to 2%. The parent material consists of sandy marine deposits.

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Organic matter content in the surface horizon is about 2 percent. Typically, the surface layer is black or very dark grayish brown fine sand and the material underneath ranges from dark to light greys and browns. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural vegetation consists mainly of slash pine, south Florida slash pine, longleaf pine, fetterbush, gallberry, running oak, wax myrtle, and saw palmetto. Pineland threeawn is the dominant grass; but depending on range condition, there are significant amounts of creeping bluestem, lopsided indiagrass, chalky bluestem, and other grasses. This soil is rated severely unfavorable for recreational development, due to wetness and sandiness. Included with this soil in mapping are small areas of Adamsville, Basinger, Immokalee, Placid, Pomona, Pompano, Satellite, Smyrna, and Valkaria soils. In most areas, the included soils make up 10 to 35% of the map unit.

12 (Hardee: 7) - Basinger fine sand. This component is on drainageways on marine terraces, on the low flatwoods. The mapped areas are irregular in shape and range from 10 to 50 acres or more. The slopes are smooth and range from 0 to 2%. The parent material consists of sandy marine deposits. Organic matter content in the surface horizon is about 1 percent. Typically, the surface layer is black or dark gray fine sand about 6 inches thick and the underlying material ranges from light grey and brownish-gray to brown fine sand, with the lower layer, to a depth of 80 inches, a grayish brown loamy fine sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July and August. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of slash pine, south Florida slash pine, longleaf pine, with an understory of wax myrtle, gallberry, saw palmetto, pineland threeawn, cutthroat grass, maidencane, bluestem, St. Johnswort, and cordgrass. This soil is rated severely unfavorable for recreational development and building, due to wetness. Included with this soil in mapping are small areas of Felda, Immokalee, Myakka, Placid, and Valkaria soils (also Ona and Smyrna soils in

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Hardee County). In most of the mapped areas, the included soils make up 10 to 17%

13 - Felda fine sand. This component is on drainageways on coastal plains and on broad, low flats and in large drainageways in the flatwoods. The mapped areas are irregular in shape and range from 20 to more than 500 acres. The slopes are smooth and range from 0 to 2%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 3 percent. Typically, the surface layer is gray fine sand about 7 inches thick and the underlying material is light gray and dark grayish brown fine sand to gray very fine sand or sandy loam. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August, September, October, and November. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation of this soil consists of slash pine, south Florida slash pine, cabbage palm, wax myrtle, pineland threeawn, various species of bluestems, sand cordgrass, maidencane, saw palmetto, and fetterbush. This soil is rated severely unfavorable for recreational development and building, due to wetness and sandiness. Included with this soil in mapping are small areas of Bradenton, Hicoria, Malabar, Pineda, Tequesta, and Valkaria soils. In most areas, the included soils make up 10 to 20% of the map unit.

14 - Satellite sand. This component is on rises on marine terraces on coastal plains, on slightly elevated ridges on the flatwoods, and on lower ridges in the ridge part of the county. The mapped areas are irregular in shape and range from 10 to more than 100 acres. The slopes are generally smooth to convex and range from 0 to 2%. The parent material consists of sandy marine deposits. Organic matter content in the surface horizon is about 1 percent. Typically, the surface layer is dark gray sand about 4 inches thick and the underlying material to a depth of 80 inches is white fine sand that has brown mottles in the upper part of this horizon. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Somewhat Poorly Drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 18 inches during July, August, and September. This soil does not meet hydric criteria. There are no

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saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of slash pine, south Florida slash pine, longleaf pine, myrtle oak, Chapman oak, and sand live oak, with an understory of saw palmetto and pineland threeawn. This soil is rated severely unfavorable for recreational development and building, due to seasonal wetness. Included with this soil in mapping are small areas of Archbold, Basinger, Daytona, Duette, Immokalee, Myakka, and Pomello soils. In most areas, the included soils make up 10 to 20% of the map unit.

15 - Bradenton fine sand. This component is on flats on marine terraces on coastal plains, rises on marine terraces on coastal plains, hammocks and open areas on the flatwoods. The mapped areas are irregular in shape and range from 5 to more than 50 acres. The slopes are smooth and range from 0 to 2%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 4%. Typically, the surface layer is dark gray fine sand about 4 inches thick; the underlying material is light gray fine sand to gray very fine sandy loam with white calcium carbonate nodules in the lower part of the subsoil and the substratum to a depth of 80 inches is light brownish gray and greenish gray loamy sand and very fine sandy loam. The calcium carbonate equivalent within 40 inches, typically, does not exceed 5%. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during June, July, August, September, October, and November. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation of this soil consists mostly of live oak, cabbage palm, a few pines, saw palmetto, and various species of bluestems and panicums. This soil is rated severely unfavorable for recreational development and building, due to wetness. Included with this soil in mapping are small areas of Felda, Hicoria, Malabar, and Pineda soils. In most areas, the included soils make up 15 to 20% of the map unit.

18 - Kaliga muck. This component is on depressions in flatwoods on marine terraces on coastal plains, in swamps and marshes. This soil is, in large, irregularly shaped areas that range from 15 to 200 acres. The slopes are smooth to concave and range from 0 to 1%. The parent material consists of herbaceous organic material over stratified loamy marine

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deposits. Organic matter content in the surface horizon is about 74%. Typically, the upper part of the surface layer is black muck about 6 inches thick and the underlying material is dark brown muck grading to grayish brown very fine sand, dark gray very fine sandy loam, and then grayish brown very fine sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded (6 to 9 months most years). A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, and December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural vegetation consists of sweetbay, cypress, red maple, swamp tupelo, willow, St. Johnswort, sawgrass, arrowhead, pickerelweed, and maidencane. This soil is rated severely unfavorable for recreational development and building, due to wetness. Included with this soil in mapping are small areas of Felda, Hicoria, Samsula, and Tequesta soils. In most areas, the included soils make up 10 to 15% of the map unit.

19 – NOTE: Highlands County and Hardee County soils assigned #19 differ:

19, Highlands County - Hicoria mucky sand, depressional. This component is in wet depressions on marine terraces on coastal plains. The mapped areas range from three to 40 acres. The slopes are smooth to concave and range from 0 to 2%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 15%. Typically, the upper part of the surface layer is black mucky sand about 4 inches thick and the underlying material grades from black fine sand to light gray sand and then dark gray fine sandy loam to grayish brown fine sandy loam. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, and December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of cypress, red maple, swamp tupelo, willow, and bay trees and pickerelweed, arrowhead, maidencane, sawgrass, and other water-tolerant plants. This soil is rated severely unfavorable for recreational

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development and building, due to excess humus, ponding, and low percolation. Included with this soil in mapping are small areas of Felda, Placid, Sanibel, and Tequesta soils. The included soils make up 10 to 15% of the map unit.

19, Hardee County - Ona fine sand. This component is on flats on marine terraces on coastal plains, on flatwoods. Individual areas are irregular in shape and range from 3 to 100 acres in size. Slopes are smooth to concave and range from 0 to 2%. The parent material consists of sandy marine deposits. The content of organic matter in the surface horizon is about 3%. Typically, the surface layer is black fine sand about 9 inches thick; the underlying material is dark reddish brown loamy fine sand grading to brown, pale brown, light gray and then brown. Depth to a root-restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water capacity to a depth of 60 inches is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at a depth of 12 inches during June, July, August, and September. This soil does not meet hydric criteria. The natural vegetation includes slash and longleaf pine, gallberry, and widely spaced saw palmetto, huckleberry, and pineland threeawn. Included with this soil in mapping are small areas of Basinger, EauGallie, Immokalee, Myakka, and Placid soils. Also included are wet spots and small ponds. In most of the mapped areas, the included soils make up 12 to 17% of the acreage.

20 - Samsula muck. This component is in depressions, swamps, and marshes. The mapped areas vary considerably in shape and size; generally, the smaller areas are circular and range from 3 to 15 acres, and the larger areas are very irregular in shape and range from 50 to more than 200 acres. The slopes are smooth to concave and range from 0 to 1%. The parent material consists of herbaceous organic material over sandy marine deposits. Organic matter content in the Samsula muck surface horizon is about 60%. Typically, the surface layer is black muck about 25 to 36 inches thick and the underlying material is black sand or fine sand grading to dark gray, grayish brown, and light gray sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, May, June, July, August, September, October, November, and December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the

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soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural native vegetation consists of cypress, sweetbay, sweetgum, red maple, greenbrier, ferns, St. John's wort, sawgrass, arrowhead, pickerelweed, and maidencane. This soil is rated severely unfavorable for recreational development and building, due to low strength, excess humus, and ponding. Included with this soil in mapping are small areas of Basinger, Hontoon, Placid, and Sanibel soils. In most areas, the included soils make up 10 to 15% of the map unit.

21 - Hontoon muck. This component is in the depressions of marshes and swampy areas. Most mapped areas range from 5 to 50 acres, but a few areas range from 100 to more than 500 acres. These areas are irregular in shape. The slopes are smooth to concave and range from 0 to 1%. The parent material consists of herbaceous organic material. Organic matter content in the surface horizon is about 80%. Typically, the upper surface layer is dark reddish-brown muck 15 inches thick and the underlying material grades from black muck to black mucky sand, and then the lower part, to a depth of more than 80 inches, is dark gray sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very Poorly Drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, and November. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural vegetation consists of sweetbay, swamp tupelo, and other water-tolerant trees, and an understory of ferns, maidencane, sawgrass, and pickerelweed. This soil is rated severely unfavorable for recreational development and building, due to low strength, excess humus, and ponding. Included with this soil in mapping are small areas of Basinger, Placid, and Samsula soils. In most areas, the included soils make up 10 to 20% of the map unit.

25 - Chobee fine sandy loam, depressional. This component is on coastal plains, in depressions on the flatwoods and in swamps and marshes. The mapped areas range from 3 to 40 acres. The slopes are smooth to concave and range from 0 to 1%. The parent material consists of loamy alluvium. Organic matter content in the surface horizon is about 6%. Typically, the surface layer is black fine sandy loam about 18 inches thick and the underlying material has 3 inches of stratified muck and fine sandy loam and then grades through gray and dark gray sandy clay loam and fine

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sandy loam and then to gray fine sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is moderate. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, and December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural vegetation consists of cypress, bays, red maple, and other water-tolerant trees. The understory in marsh areas consists of pickerelweed, arrowhead, wax myrtle, sawgrass, and other water-tolerant plants. This soil is rated severely unfavorable for recreational development and building, due to excess humus, and ponding. Included with this soil in mapping are small areas of Felda, Hicoria, Placid, and Tequesta soils. In most areas, the included soils make up 10 to 15%.

26 - Tequesta muck. This component is on marshes and depressions on marine terraces on coastal plains. Generally, the mapped areas range from 5 to 300 acres, but a few areas are much larger. The slopes are smooth to concave and range from 0 to 2%. The parent material consists of stratified sandy and loamy marine deposits. Organic matter content in the surface horizon is about 48%. Typically, the organic surface layer is black muck about 12 inches thick and the underlying material grades from black fine sand to light brownish gray fine sand to dark gray fine sandy loam and then light gray fine sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, and November. This soil meets hydric criteria. The calcium carbonate equivalent within 40 inches, typically, does not exceed 1 percent. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation of this soil consists of arrowhead, wax myrtle, pickerelweed, sawgrass, and other water-tolerant grasses. A few areas have water-tolerant trees. This soil is rated severely unfavorable for recreational development and building, due to excess humus, and ponding. Included with this soil in mapping are small areas of Basinger, Hicoria, Kaliga, and Sanibel soils. In most areas, the included soils make up 10 to 15% of the map unit.

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28 - Archbold sand, 0 to 5% slopes, 0 to 5% slopes. This component on moderately high ridges in the ridge part of the county. The mapped areas are irregular in shape and range from 15 to 75 acres. The slopes are smooth to convex. The parent material consists of eolian or sandy marine deposits. Organic matter content in the surface horizon is about 1%. Typically, the surface layer is gray sand about 4 inches thick and the underlying material to a depth of 80 inches or more is white sand. The available water capacity of the Archbold soil is very low. The permeability is very rapid. The water table is at a depth of 40 to 60 inches during the summer rainy season. It recedes to a lower depth during the rest of the year. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 57 inches during June, July, August, September, October, and November. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of sand pine, south Florida slash pine, Chapman oak, myrtle oak, and sand live oak. The understory consists of saw palmetto and scattered pineland threeawn. This soil is rated severely unfavorable for recreational development due to sandiness, but for building, the rating varies by purpose. Included with this soil in mapping are small areas of Duette, Orsino, Paola, Pomello, St. Lucie and Satellite soils. In most areas. The included soils make up 10 to 15% of the map unit.

29 (Hardee: 10) - Pomona sand. This component is on flatwoods on marine terraces on coastal plains, in the low areas adjacent to both sides of the Hardee/Highlands County line. The mapped areas are irregular in shape and range from 10 to 50 acres. The slopes are smooth and range from 0 to 2%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 2%. Typically, the surface layer is black sand or fine sand about 6 inches thick and the underlying material grades from gray and light gray sand to dark brown, reddish brown or very dark grayish brown sand coated with organic matter, and then to light brownish gray sand and gray sandy loam. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of slash pine, south Florida slash pine,

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longleaf pine, wax myrtle, fetterbush, gallberry, and saw palmetto. Pineland threeawn is the dominant grass; but depending on conditions, there are significant amounts of creeping bluestem, chalky bluestem, bushy bluestem, lopsided indiagrass, maidencane, and other grasses. This soil is rated severely restricted for recreational development and building due to wetness. Included with this soil in mapping are small areas of Basinger, EauGallie, Felda, Myakka, and Placid soils, also Smyrna and Wauchula soils in Hardee County. In most areas, the included soils make up 20 to 50% of the map unit.

30 - Oldsmar fine sand. This component is in the fatwood areas that are adjacent to sloughs and streams in the county. The mapped areas are irregular in shape and range from 10 to 50 acres. The slopes are smooth and range from 0 to 2%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 2 percent. Typically, the surface layer is very dark gray fine sand about 4 inches thick and the underlying material grades from gray and light gray fine sand to black, dark brown, and brown fine sand, and then from grayish brown sandy clay loam to yellowish brown fine sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, and November. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation of this soil consists of slash pine, south Florida slash pine, longleaf pine, saw palmetto, gallberry, fetterbush, chalky bluestem, pineland threeawn, low panicum, scattered hypericum, and other native forbs and grasses. Included with this soil in mapping are areas of EauGallie, Immokalee, Myakka, and Smyrna soils. In most areas, the included soils make up 10 to 15% of the map unit.

31 (Hardee: 32) - Felda fine sand, depressional. This component is on depressions on marine terraces on coastal plains. Individual areas are irregular in shape and range from 10 to 60 acres in size. Slopes are smooth to concave and are less than 2%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 3%. Typically, the surface layer is black fine sand about 5 inches thick and the underlying material is fine sand that grades from grayish brown to light gray and then it is sandy loam grading from gray to light gray sand.

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Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, and November. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists mainly of cypress, cattails, cabbage palm, maidencane, and sawgrass. This soil is rated severely restrictive for recreational development and building due to ponding. Included with this soil in mapping are small areas of Bradenton and Holopaw soils and a few small areas of organic soils. In 15% of the mapped areas, the included soils make up either more or less than 8%.

33 - Basinger, St. Johns, and Placid soils. All three components are on seeps on marine terraces on coastal plains. Seeps are areas where literally water seeps along the surface from a higher to a lower position on the landscape, creating areas that tend to remain wetter for longer periods than similar soils outside the seep areas. The mapped areas range from 50 to more than 1,000 acres. The slopes are dominantly 0 to 2% but occasionally range up to 5% near the edge of ridges. While generally categorized as having roughly 30% of each component, the composition of soils in seep areas is highly variable. Similarity of landscape position, land use, and management preclude mapping the soils separately even though some areas contain all three soils while others contain only one of the named soils. The parent material in all three components consists of sandy marine deposits. The organic matter content in the surface horizon is about 1% in Basinger, 3% in St. Johns, and 3% in Placid. Typically, the surface layer of Basinger soil is dark gray fine sand about 6 inches thick and the underlying material grades from light gray and light brownish gray fine sand to brown fine sand with many bodies of dark grayish brown fine sand to light brownish gray fine sand, becoming grayish brown loamy fine sand. Typically, the surface layer of St. Johns and Placid soils is black sand. In St. Johns soil, this layer is about 11 inches thick; the underlying material grades from light brownish gray sand to very dark brown sand, black sand and then to dark yellowish brown sand and very dark gray sand. In Placid soils the surface layer is about 7 inches thick; the underlying material grades from very dark gray sand to gray sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained for Basinger and St. Johns; it is Very Poorly Drained in Placid. Water movement in the most restrictive layer is high for Basinger and Placid soils; it is moderately high in St. Johns.

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SOIL DESCRIPTIONS

Available water to a depth of 60 inches (or restricted depth) is moderate in Basinger and St. Johns soils; it is low in Placid. Shrink-swell potential is low. These soils are not flooded. Placid soil is occasionally ponded. A seasonal zone of water saturation for Basinger soil is at 6 inches during June, July, August, September, October; for St. Johns it is at 3 inches during June, July, August, September, October; and for Placid, it is at 0 inches during June, July, August, September, October. All three soils meet hydric criteria. All three soils have no saline horizons within 30 inches of the soil surface and have a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of cutthroat grass, pineland threeawn, longleaf pine, south Florida slash pine, and slash pine. Other vegetation may include (generally where fire is suppressed) wax myrtle, creeping bluestem, fetterbush, gallberry, maidencane, and saw palmetto and bay trees. This soil is rated severely restrictive for recreational development and building due to wetness. Included in mapping are small areas of Myakka, Samsula, Sanibel, and Smyrna soils. Some places have small areas of a soil that is similar to Placid soil, but the soil has a surface layer that is more than 24 inches thick. *NOTE: The Highlands County 1989 soil survey states that areas that have this soil complex are locally known as cutthroat seeps.*

35 - Sanibel muck. This component is on depressions on marine terraces on coastal plains, in marshes, swamps, and poorly defined drainageways. The mapped areas are irregular in shape and mostly range from 10 to 100 acres. The slopes are smooth to concave and range from 0 to 2%. The parent material consists of thin organic material over sandy marine deposits. Organic matter content in the surface horizon is about 35%. Typically, the organic surface layer is black muck about 8 inches thick and the underlying material grades from black mucky fine sand to gray sand and then light brownish gray sand. The available water capacity of this Sanibel soil is low. The permeability is rapid. Runoff is slow. Under natural conditions, the water table is above the surface for 2 to 6 months during the wet seasons. During the rest of the year, it is at a depth of less than 10 inches. Natural fertility is moderate, and the content of organic matter is high. Natural vegetation in this soil consists of cypress and other water-tolerant trees and pickerelweed, maidencane, and other water-tolerant grasses. This soil is rated severely restrictive for recreational development and building due to ponding. Included with this soil in mapping are small areas of Basinger, Kaliga, Placid, Samsula, and Tequesta soils. In most areas, the included soils make up 15 to 30% of the map unit.

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36 - Pomello sand, 0 to 5% slopes. This component is on slightly elevated ridges and knolls in the flatwoods part of the county and is also to a small extent in the ridge part of the county. The mapped areas are irregular in shape and mostly range from 10 to 30 acres. The slopes are generally smooth to convex. The parent material consists of sandy marine deposits. The organic matter content is about 1%. Typically, the surface layer is dark gray sand about 4 inches thick and the underlying material is white sand to a depth of 56 inches, and then grades to mixed dark reddish brown and dark brown sand to brown sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Moderately Well Drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 33 inches during June, July, August, September, October, and November. Pomello sand does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural vegetation in this soil consists of south Florida slash pine, longleaf pine, slash pine, sand live oak, Chapman oak, myrtle oak, fetterbush, saw palmetto, and scattered pineland threeawn. This soil is rated severely restrictive for recreational development due to sandiness and moderately restrictive for building due to sandiness and wetness. Included with this soil in mapping are small areas of Daytona, Duette, Immokalee, Orsino, and Satellite soils. In most areas, the included soils make up 10 to 15% of the map unit.

37 - Malabar sand, depressional. This component is in the concave areas on the flatwoods and along the edges of swamps and marshes. The mapped areas are irregular in shape and range from 10 to 50 acres. The slopes are smooth to concave and range from 0 to 1%. The parent material consists of sandy and loamy marine deposits. Organic matter content in the surface horizon is about 2%. Typically, the surface layer is dark gray sand about 5 inches thick and the underlying material grades from light gray sand to brownish yellow and yellowish brown sand, and then to gray sandy loam, light gray sand and loamy sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly Drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural

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vegetation of this soil consists of arrowhead, maidencane, pickerelweed, and St. Johnswort. A few areas have water-tolerant trees. This soil is rated severely restrictive for recreational development due to ponding and sandiness. Included with this soil in mapping are small areas of Basinger, Felda, Hickoria, Placid, and Valkaria soils. In most areas, the included soils make up 20 to 30% of the map unit.

39 (Hardee: 17) - Smyrna sand. This component is on flatwoods on marine terraces on coastal plains. The mapped areas are irregular in shape and range from 20 to 500 acres (3 to 20 acres in Hardee County). The slopes are smooth and range from 0 to 2%. The parent material consists of sandy marine deposits. The organic matter content in the surface horizon is about 3%. Typically, the surface layer is dark to very dark gray sand about 5 inches thick and the underlying material grades from light gray fine sand to black, dark brown, and brown fine sand, and then from light yellowish brown fine sand to light gray fine sand to white sand. (In Hardee County, the subsoil is described as having organic-coated sand to a depth of 29 inches, with the upper part black, the lower dark reddish brown and dark brown, and then light gray sand grading to dark brown sand). Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Poorly Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. Smyrna sand is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, and September. This soil does not meet hydric criteria. The natural vegetation of this soil consists of slash pine, south Florida slash pine, longleaf pine, saw palmetto, gallberry, fetterbush, wax myrtle, and running oak. Pineland threeawn is the dominant grass; but depending on range conditions, there are significant amounts of creeping bluestem, lopsided indiagrass, panicum, and other grasses. This soil is rated severely restrictive for recreational development due to wetness and sandiness. Included with this soil in mapping are small areas of Basinger, Immokalee, Myakka, Placid, and Valkaria soils (Hardee County also includes Ona soils). In most areas, the included soils make up 10 to 20% of the map unit.

44 – Satellite-Basinger-Urban land complex. Urban land consists of areas that are 75%, or more, covered with streets, buildings, parking lots, and other urban structures. Small areas of unconstructed areas are mostly in lawns, playgrounds, or vacant lots, on soils altered by filling, grading and shaping. The slopes for this component range from 0 to 2%. In this area, soils that tend to be included in mapping this component are Archbold, Astatula, Satellite, and Tavares; usually these areas are too small to

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delineate separately. The Urban land component can make up 50% of this complex.

The Satellite component of this complex (roughly 40%) is on flats on marine terraces on coastal plains, while the Basinger component (roughly 20%) is in drainageways on marine terraces on coastal plains. The parent material for both consists of sandy marine deposits. Organic matter content in the surface horizon is about 1 percent. Typically, Satellite soil has a surface layer of dark gray sand about 4 inches thick, with an underlying material of white fine sand to 80 inches or more. Basinger soils have a surface layer of dark gray fine sand about 6 inches thick, with the underlying material grading from light gray and light brownish gray fine sand to brown fine sand, and then light brownish gray fine sand to grayish loamy fine sand. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Somewhat Poorly Drained for Satellite soils and Poorly Drained for Basinger. Water movement in the most restrictive layer is high to very high. Available water to a depth of 60 inches (or restricted depth) is very low in Satellite soils, moderate in Basinger. Shrink-swell potential is low for both. These soils are not flooded nor ponded. A seasonal zone of water saturation is at 18 inches for Satellite soils during June, July, August, September, October. For the same months, a seasonal zone of water saturation is at 6 inches for Basinger soils. Satellite soil does not meet hydric criteria, but Basinger soil does. For both soils, there are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. Natural vegetation is typically no longer available in this complex, although some remnants of natural vegetation may subsist in pockets of unaltered component soils. Included in mapping are the multitude of soils that may be included in mapping any of the individual components of the complex.

46 (Hardee: 36) - Kaliga muck, frequently flooded. This component is on flood plains on marine terraces on coastal plains. The mapped areas range from 25 to more than 100 acres. The slopes are smooth and range from 0 to 2%. The parent material consists of herbaceous organic material over stratified loamy marine deposits. The organic content in the surface horizon is about 74%. Typically, the surface layer is black muck about 6 inches thick, with a layer of dark brown muck for the next 30 inches or so; the underlying material grades from a thin layer of grayish brown very fine sand to dark gray very fine sandy loam and then grayish brown very fine sand. Layers occasionally change due to flooding and the deposition and removal of sands and other sediment and debris. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is Very Poorly

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Drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is frequently flooded. It is not ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October, and November. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface; the soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface. The natural vegetation consists of maidencane, duck potato, arrowhead, pickerelweed, wax myrtle, buttonbush, bays, red maple, swamp tupelo, and cypress trees. Included with this soil in mapping are small areas of Basinger, Felda, Hicoria, Samsula, Sanibel, and Tequesta soils. In most areas, the included soils make up 15 to 35% of the map unit

Addendum 5—Plant and Animal List

Highlands Hammock State Park Plants

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for imperiled species)
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PTERIDOPHYTES & RELATED

Giant leather fern.....	<i>Acrostichum danaeifolium</i>	
American waterfern; mosquitofern	<i>Azolla filiculoides</i>	
Toothed midsorus fern.....	<i>Blechnum serrulatum</i>	
Southern grape-fern.....	<i>Botrychium biternatum</i>	
Long strap fern	<i>Campyloneurum phyllitidis</i>	
Water horn fern	<i>Ceratopteris pteridoides</i>	
Southern wood fern.....	<i>Dryopteris ludoviciana</i>	
Creeping bramble fern.....	<i>Hypolepis repens</i>	
Foxtail clubmoss	<i>Lycopodiella alopecuroides</i>	
Southern bog clubmoss	<i>Lycopodiella appressa</i>	
Slender clubmoss.....	<i>Lycopodiella caroliniana</i>	
Nodding clubmoss.....	<i>Lycopodiella cernua</i>	
Japanese climbing fern	<i>Lygodium japonicum</i> *	
Old World climbing fern	<i>Lygodium microphyllum</i> *	
Marianna maiden fern.....	<i>Macrothelypteris torresiana</i> *	
Hairy water-clover	<i>Marsilea vestita</i> *	
Giant sword fern	<i>Nephrolepis biserrata</i>	WF, BF, HH, BST
Asian sword fern	<i>Nephrolepis brownii</i> *	
Tuberous sword fern.....	<i>Nephrolepis cordifolia</i> *	
Wild Boston fern	<i>Nephrolepis exaltata</i>	
Cinnamon fern.....	<i>Osmunda cinnamomea</i>	
Royal fern	<i>Osmunda regalis</i> var. <i>spectabilis</i>	
Comb polypody.....	<i>Pecluma ptilota</i> var. <i>bourgeauana</i> ..	MEH, BF, HH, BS
Golden polypody	<i>Phlebodium aureum</i>	
Resurrection fern	<i>Pleopeltis polypodioides</i> var. <i>michauxiana</i>	
Whisk fern	<i>Psilotum nudum</i>	
Giant break.....	<i>Pteris tripartita</i> *	
Water spangles.....	<i>Salvinia minima</i> *	
Sand spikemoss.....	<i>Selaginella arenicola</i>	
Downy maiden fern	<i>Thelypteris dentata</i> *	
Hottentot fern.....	<i>Thelypteris interrupta</i>	
Widespread maiden fern	<i>Thelypteris kunthii</i>	
Marsh fern	<i>Thelypteris palustris</i> var. <i>pubescens</i>	
Shoestring fern.....	<i>Vittaria lineata</i>	
Netted chain fern	<i>Woodwardia areolata</i>	
Virginia chain fern.....	<i>Woodwardia virginica</i>	

GYMNOSPERMS

White cypress-pine.....	<i>Callitris glaucophylla</i> *
Sand pine	<i>Pinus clausa</i>
Slash pine	<i>Pinus elliottii</i>
Longleaf pine.....	<i>Pinus palustris</i>

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Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Pond-cypress.....	<i>Taxodium ascendens</i>	
Bald-cypress	<i>Taxodium distichum</i>	
ANGIOSPERMS		
Rosary pea.....	<i>Abrus precatorius</i> *	
Slender copperleaf	<i>Acalypha gracilens</i>	
Hispid starburr.....	<i>Acanthospermum hispidum</i> *	
Red maple.....	<i>Acer rubrum</i>	
Seminole false-foxglove.....	<i>Agalinis filifolia</i>	
Beach false-foxglove	<i>Agalinis fasciculata</i>	
Flax-leaf false-foxglove.....	<i>Agalinis linifolia</i>	
Ten-lobe false-foxglove.....	<i>Agalinis obtusifolia</i>	
Hammock snakeroot.....	<i>Ageratina jucunda</i>	
Woman's tongue.....	<i>Albizia lebeck</i>	
Yellow colicroot.....	<i>Aletris lutea</i>	
Taro	<i>Alocasia odora</i> *	
Spiny amaranth.....	<i>Amaranthus spinosus</i> *	
Common ragweed.....	<i>Ambrosia artemisiifolia</i>	
Pepper-vine.....	<i>Ampelopsis arborea</i>	
Blue maidencane	<i>Amphicarpum muhlenbergianum</i>	
Pinewoods bluestem.....	<i>Andropogon arctatus</i>	BS,SCF,WF
Shortspike bluestem.....	<i>Andropogon brachystachyus</i>	
Florida bluestem	<i>Andropogon floridanus</i>	
Bushy bluestem	<i>Andropogon glomeratus</i> var. <i>pumilus</i>	
Splitbeard bluestem	<i>Andropogon ternarius</i>	
Broomsedge bluestem	<i>Andropogon virginicus</i>	
Broomsedge bluestem	<i>Andropogon virginicus</i> var. <i>decipiens</i>	
Chalky bluestem	<i>Andropogon virginicus</i> var. <i>glaucus</i>	
Groundnut	<i>Apios americana</i>	
Nodding nixie	<i>Apteria aphylla</i>	
Coralberry.....	<i>Ardisia crenata</i> *	
Marlberry.....	<i>Ardisia escallonioides</i>	
Jack-in-the-pulpit.....	<i>Arisaema triphyllum</i>	
Corkscrew threeawn.....	<i>Aristida gyrans</i>	
Threeawn.....	<i>Aristida purpurascens</i>	
Bottlebrush threeawn	<i>Aristida spiciformis</i>	
Wiregrass.....	<i>Aristida stricta</i>	
Florida Indian plantain.....	<i>Arnoglossum floridanum</i>	
Curtiss' milkweed.....	<i>Asclepias curtissii</i>	SC,SH
Florida milkweed.....	<i>Asclepias feayi</i>	
Pinewoods milkweed	<i>Asclepias humistrata</i>	
Few-flower milkweed.....	<i>Asclepias lanceolata</i>	
Savannah milkweed	<i>Asclepias pedicellata</i>	
Butterflyweed.....	<i>Asclepias tuberosa</i>	
Showy milkwort.....	<i>Asemeia violacea</i>	

* Non-native Species. ∞, β, Ω – see p. 28

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Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Woolly pawpaw	<i>Asimina incana</i>	
Bigflower pawpaw	<i>Asimina obovata</i>	
Smallflower pawpaw.....	<i>Asimina parviflora</i>	
Dwarf pawpaw	<i>Asimina pygmea</i>	
Netted pawpaw.....	<i>Asimina reticulata</i>	
Garden asparagus.....	<i>Asparagus officinalis</i>	
Tropical carpetgrass	<i>Axonopus compressus</i>	
Big carpetgrass.....	<i>Axonopus furcatus</i>	
Groundsel tree.....	<i>Baccharis halimifolia</i>	
Lemon bacopa	<i>Bacopa caroliniana</i>	
Herb-of-Grace	<i>Bacopa monnieri</i>	
Coastalplain honeycombhead.....	<i>Balduina angustifolia</i>	
Hedge bamboo, silverstripe bamboo	<i>Bambusa multiplex</i> *	
Common bamboo.....	<i>Bambusa vulgaris</i> *	
White screwstem	<i>Bartonia verna</i>	
Tarflower	<i>Bejaria racemosa</i>	
Rattan-vine; supplejack	<i>Berchemia scandens</i>	
Florida greeneyes.....	<i>Berlandiera subacaulis</i>	
Beggarticks	<i>Bidens alba</i> var. <i>radiata</i>	
Smallfruit beggarticks.....	<i>Bidens mitis</i>	
Pineland rayless goldenrod.....	<i>Bigelovia nudata</i> subsp. <i>australis</i>	
False-nettle	<i>Boehmeria cylindrica</i>	
Red spiderling.....	<i>Boerhavia diffusa</i>	
Smallhead doll's-daisy	<i>Boltonia diffusa</i>	
American bluehearts.....	<i>Buchnera americana</i>	
Watergrass.....	<i>Bulbostylis barbata</i> *	
Capillary hairsedge.....	<i>Bulbostylis ciliatifolia</i>	
Ware's hairsedge	<i>Bulbostylis warei</i>	
Northern bluethread.....	<i>Burmannia biflora</i>	
Southern bluethread.....	<i>Burmannia capitata</i>	
American beautyberry	<i>Callicarpa americana</i>	
Grassleaf roseling	<i>Callisia graminea</i>	
Florida scrub roseling	<i>Callisia ornata</i>	
Bottlebrush	<i>Callistemon viminale</i>	
Bearded grasspink	<i>Calopogon barbatus</i>	
Manyflower grasspink	<i>Calopogon multiflorus</i>	MF, SCF
Pale grasspink	<i>Calopogon pallidus</i>	
Tuberous grasspink	<i>Calopogon tuberosus</i>	
Trumpet creeper	<i>Campsis radicans</i>	
Golden canna	<i>Canna flaccida</i>	
Indian shot.....	<i>Canna indica</i> *	
Pennsylvania bittercress	<i>Cardamine pensylvanica</i>	
Broadwing sedge	<i>Carex alata</i>	
Prickly bog sedge	<i>Carex atlantica</i> subsp. <i>capillacea</i>	
Longhair sedge	<i>Carex comosa</i> ∞	
Elliott's sedge	<i>Carex elliotii</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Long's sedge	<i>Carex longii</i>	
Hop sedge.....	<i>Carex lupuliformis</i>	
Florida paintbrush	<i>Carphephorus corymbosus</i>	
False vanillaleaf	<i>Carphephorus odoratissimus</i> var. <i>subtropicanus</i>	
Hairy chaffhead	<i>Carphephorus paniculatus</i>	
Scrub hickory	<i>Carya floridana</i>	
Pignut hickory	<i>Carya glabra</i>	
Madagascar periwinkle.....	<i>Catharanthus roseus</i>	
New Jersey tea	<i>Ceanothus americanus</i>	
Little-leaf buckbrush.....	<i>Ceanothus microphyllus</i>	
Sugarberry.....	<i>Celtis laevigata</i>	
Southern sandpur	<i>Cenchrus echinatus</i>	
Slender sandpur	<i>Cenchrus gracillimus</i>	
Coastal sandspur	<i>Cenchrus spinifex</i>	
Spadeleaf coinwort.....	<i>Centella asiatica</i>	
Spurred butterfly pea	<i>Centrosema virginianum</i>	
Buttonbush	<i>Cephalanthus occidentalis</i>	
Rosemary	<i>Ceratiola ericoides</i>	
Partridge pea.....	<i>Chamaecrista fasciculata</i>	
Sensitive pea.....	<i>Chamaecrista nictitans</i> var. <i>aspera</i>	
Bamboo palm	<i>Chamaedorea seifrizii</i> *	
Pillpod sandmat	<i>Chamaesyce hirta</i>	
Hyssopleaf sandmat	<i>Chamaesyce hyssopifolia</i>	
Spotted sandmat	<i>Chamaesyce maculata</i>	
Florida alicia	<i>Chapmannia floridana</i>	
Woolly sunbonnets	<i>Chaptalia tomentosa</i>	
Slender wood oats	<i>Chasmanthium laxum</i>	
Longleaf wood oats	<i>Chasmanthium laxum</i> var. <i>sessiliflorum</i>	
Pigweed	<i>Chenopodium album</i> *	
Pygmy fringetree	<i>Chionanthus pygmaeus</i>	SC,SH,XH
White fringetree.....	<i>Chionanthus virginicus</i>	
Florida false beardgrass	<i>Chrysopogon pauciflorus</i>	
Florida goldenaster.....	<i>Chrysopsis floridana</i>	SC,SCF,SH
Highlands goldenaster	<i>Chrysopsis highlandsensis</i>	SC
Coastalplain goldenaster	<i>Chrysopsis scabrella</i>	
Scrubland goldenaster	<i>Chrysopsis subulata</i>	
Water hemlock	<i>Cicuta maculata</i>	
Camphortree	<i>Cinnamomum camphora</i>	
Purple thistle	<i>Cirsium horridulum</i>	
Nuttall's thistle	<i>Cirsium nuttallii</i>	
Sour orange	<i>Citrus x aurantium</i> *	
Pine-hyacinth	<i>Clematis baldwinii</i>	
Turk's turban.....	<i>Clerodendrum indicum</i> *	
Tread-softly.....	<i>Cnidocolus stimulosus</i>	
Wrinkled jointtail grass	<i>Coelorachis rugosa</i>	
Cutthroatgrass.....	<i>Coleataenia abscissa</i>	MF,MEH,WF,BG,SSL,WP

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Beaked panicum	<i>Coleataenia anceps</i>	
Ciliate redtop panicum.....	<i>Coleataenia longifolia</i>	
Redtop panicum.....	<i>Coleataenia rigidula</i>	
Wild taro.....	<i>Colocasia esculenta</i>	
Common dayflower	<i>Commelina diffusa</i> *	
Erect dayflower.....	<i>Commelina erecta</i>	
Blue mistflower	<i>Conoclinium coelestinum</i>	
Dwarf Canadian horseweed	<i>Conyza canadensis</i> var. <i>pusilla</i>	
Spring coralroot.....	<i>Corallorhiza wisteriana</i>	
Florida tickseed.....	<i>Coreopsis floridana</i>	
Leavenworth's tickseed.....	<i>Coreopsis leavenworthii</i>	
Swamp dogwood.....	<i>Cornus foemina</i>	
String-lily.....	<i>Crinum americanum</i>	
Florida scrub frostweed.....	<i>Crocantemum nashii</i>	
(Pale) smooth rattlebox	<i>Crotalaria pallida</i> var. <i>obovata</i> *	
Rattleweed.....	<i>Crotalaria retusa</i> *	
Rabbitbells	<i>Crotalaria rotundifolia</i>	
Showy rattlebox.....	<i>Crotalaria spectabilis</i> *	
Michaux's croton	<i>Croton michauxii</i>	
Toothachegrass	<i>Ctenium aromaticum</i>	
Columbian waxweed.....	<i>Cuphea carthagenensis</i> *	
Dodder	<i>Cuscuta americana</i>	
Leafless swallowwort	<i>Cynanchum scoparium</i>	
Bermudagrass	<i>Cynodon dactylon</i> *	
Cuban bulrush	<i>Cyperus blepharoleptos</i> *	
Shortleaf spikesedge	<i>Cyperus brevifolius</i> *	
Coastal plain flatsedge.....	<i>Cyperus cuspidatus</i>	
Chufa flatsedge.....	<i>Cyperus esculentus</i> *	
Wiry flatsedge	<i>Cyperus filiculmis</i>	
Haspan flatsedge	<i>Cyperus haspan</i>	
Low spikesedge	<i>Cyperus hortensis</i>	
Leconte's flatsedge.....	<i>Cyperus lecontei</i>	
Swamp flatsedge	<i>Cyperus ligularis</i>	
Asian spikesedge	<i>Cyperus metzii</i> *	
Pinebarren flatsedge.....	<i>Cyperus ovatus</i>	
Manyspike flatsedge.....	<i>Cyperus polystachyos</i>	
Nutgrass.....	<i>Cyperus rotundus</i> *	
Fragrant spikesedge	<i>Cyperus sesquiflorus</i>	
Strawcolored flatsedge	<i>Cyperus strigosus</i>	
Tropical flatsedge.....	<i>Cyperus surinamensis</i>	
Fourangle flatsedge.....	<i>Cyperus tetragonus</i>	
Titi.....	<i>Cyrilla racemiflora</i>	
Crowfootgrass	<i>Dactyloctenium aegyptium</i> *	
Whitetassels.....	<i>Dalea carnea</i>	
Feay's prairieclover	<i>Dalea feayi</i>	
Summer farewell.....	<i>Dalea pinnata</i> var. <i>adenopoda</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Western tansymustard.....	<i>Descurainia pinnata</i>	
Paniced ticktrefoil.....	<i>Desmodium paniculatum</i>	
Dixie ticktrefoil	<i>Desmodium tortuosum</i> *	
Threeflower ticktrefoil.....	<i>Desmodium triflorum</i> *	
Dianella lily; Cerulean flaxlily.....	<i>Dianella ensifolia</i> *	
Needle-leaf witchgrass.....	<i>Dichantherium aciculare</i>	
Variable witchgrass	<i>Dichantherium commutatum</i>	
Cypress witchgrass	<i>Dichantherium dichotomum</i>	
Cypress witchgrass	<i>Dichantherium ensifolium</i>	
Dwarf cypress witchgrass.....	<i>Dichantherium ensifolium</i> var. <i>breve</i>	
Cypress witchgrass	<i>Dichantherium ensifolium</i> var. <i>unciphyllum</i>	
Erect-leaf witchgrass	<i>Dichantherium erectifolium</i>	
openflower witchgrass	<i>Dichantherium laxiflorum</i>	
Egg-leaf witchgrass	<i>Dichantherium ovale</i>	
Hemlock witchgrass.....	<i>Dichantherium portoricense</i>	
Woolly witch grass	<i>Dichantherium scabriusculum</i>	
Carolina ponysfoot	<i>Dichondra carolinensis</i>	
Sixangle foldwing	<i>Dicliptera sexangularis</i>	
Southern crabgrass	<i>Digitaria ciliaris</i>	
Slender crabgrass	<i>Digitaria filiformis</i>	
Longleaf crabgrass	<i>Digitaria gracillima</i> ∞	
Indian crabgrass	<i>Digitaria longifolia</i> *	
Poor Joe.....	<i>Diodia teres</i>	
Virginia buttonweed	<i>Diodia virginiana</i>	
Air potato.....	<i>Dioscorea bulbifera</i> *	
Persimmon.....	<i>Diospyros virginiana</i>	
Pink sundew	<i>Drosera capillaris</i>	
West Indian chickweed	<i>Drymaria cordata</i> *	
Threeway sedge.....	<i>Dulichium arundinaceum</i>	
Pineland snakeherb	<i>Dyschoriste angusta</i>	
Twinflower	<i>Dyschoriste oblongifolia</i>	
Mexican tea.....	<i>Dysphania ambrosioides</i> *	
Florida cockspur.....	<i>Echinochloa paludigena</i>	
Common water hyacinth	<i>Eichhornia crassipes</i>	
Roadgrass.....	<i>Eleocharis baldwinii</i>	
Jointed spikerush	<i>Eleocharis equisetoides</i>	
Yellow spikerush	<i>Eleocharis flavescens</i>	
Viviparous spikerush	<i>Eleocharis vivipara</i>	
Tall elephantsfoot	<i>Elephantopus elatus</i>	
Longclaw orchid.....	<i>Eltroplectris calcarata</i>MEH	
Carolina scalystem	<i>Elytraria caroliniensis</i>	
Florida tasselflower	<i>Emilia fosbergii</i> *	
Lilac tassel flower.....	<i>Emilia sonchifolia</i> *	
Florida butterfly orchid.....	<i>Encyclia tampensis</i>	
Green-fly orchid.....	<i>Epidendrum conopseum</i>	
Feather lovegrass.....	<i>Eragrostis amabilis</i> ∞	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Elliott lovegrass	<i>Eragrostis elliotii</i>	
Coastal lovegrass	<i>Eragrostis virginica</i>	
Fireweed	<i>Erechtites hieraciifolius</i>	
Centipedegrass	<i>Eremochloa ophiuroides</i> *	
Oakleaf fleabane	<i>Erigeron quercifolius</i>	
Prairie fleabane.....	<i>Erigeron strigosus</i>	
Early whitetop fleabane	<i>Erigeron vernus</i>	
Flattened pipewort	<i>Eriocaulon compressum</i>	
Ten-angled pipewort.....	<i>Eriocaulon decangulare</i>	
Fragrant eryngo.....	<i>Eryngium aromaticum</i>	
Baldwin's eryngo.....	<i>Eryngium baldwinii</i>	
Button eryngo	<i>Eryngium yuccifolium</i>	
Southeastern coralbean	<i>Erythrina herbacea</i>	
Swamp doghobble.....	<i>Eubotrys racemosa</i>	
Surinam cherry.....	<i>Eugenia uniflora</i>	
Wild coco	<i>Eulophia alta</i>	
American strawberrybush.....	<i>Euonymus americanus</i>	
Dogfennel	<i>Eupatorium capillifolium</i>	
Yankeeweed	<i>Eupatorium compositifolium</i>	
Mohr's thoroughwort	<i>Eupatorium mohrii</i>	
Falsehorehound; Boneset.....	<i>Eupatorium rotundifolium</i>	
Lesser Florida spurge.....	<i>Euphorbia polyphylla</i>	
Slender flattopped goldenrod.....	<i>Euthamia caroliniana</i>	
Common fig	<i>Ficus carica</i>	
Slender fimbry	<i>Fimbristylis autumnalis</i>	
Hairy fimbry	<i>Fimbristylis puberula</i>	
Pop ash; Carolina ash.....	<i>Fraxinus caroliniana</i>	
Cottonweed.....	<i>Froelichia floridana</i>	
Saltmarsh umbrellasedge.....	<i>Fuirena breviseta</i>	
Dwarf umbrellasedge.....	<i>Fuirena pumila</i>	
Southern umbrellasedge	<i>Fuirena scirpoidea</i>	
Drug fumitory.....	<i>Fumaria officinalis</i>	
Lanceleaf blanket flower	<i>Gaillardia aestivalis</i>	
Elliott's milkpea	<i>Galactia elliotii</i>	
Eastern milkpea.....	<i>Galactia regularis</i>	
Downy milkpea	<i>Galactia volubilis</i>	
Coastal bedstraw	<i>Galium hispidulum</i>	
Hairy bedstraw	<i>Galium pilosum</i>	
Stiff marsh bedstraw	<i>Galium tinctorium</i>	
Pennsylvania everlasting.....	<i>Gamochaeta pensylvanica</i> *	
Spoonleaf purple everlasting	<i>Gamochaeta purpurea</i>	
Garberia	<i>Garberia heterophylla</i>	SC,SH,XH
Southern beeblossum	<i>Gaura angustifolia</i>	
Dwarf huckleberry.....	<i>Gaylussacia dumosa</i>	
Blue huckleberry	<i>Gaylussacia frondosa</i> var. <i>tomentosa</i>	
Yellow jessamine	<i>Gelsemium sempervirens</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Wild geranium: Cranesbill	<i>Geranium carolinianum</i>	
Globe amaranth	<i>Gomphrena serrata</i> *	
Angularfruit milkvine	<i>Gonolobus suberosus</i>	
Loblolly-bay	<i>Gordonia lasianthus</i>	
Rough hedge-hyssop	<i>Gratiola hispida</i>	
Branched hedge-hyssop	<i>Gratiola ramosa</i>	
Silk-oak	<i>Grevillea robusta</i> *	
Hammock false reinorchid	<i>Habenaria distans</i>	HH,MEH
Toothpetal false reinorchid	<i>Habenaria floribunda</i>	
Longhorn false reinorchid	<i>Habenaria quinqueseta</i>	
Waterspider false reinorchid	<i>Habenaria repens</i>	
Fire bush	<i>Hamelia patens</i>	
Threadroot orchid	<i>Harrisella porrecta</i>	FS,HH
Florida hartwrightia	<i>Hartwrightia floridana</i> [∞]	BG,SSL,WF,WP
Spanish daisy	<i>Helenium amarum</i>	
Pinebarren frostweed	<i>Helianthemum corymbosum</i>	
Narrowleaf sunflower	<i>Helianthus angustifolius</i>	
Stiff sunflower	<i>Helianthus radula</i>	
Scarlet rosemallow	<i>Hibiscus coccineus</i>	
Swamp rosemallow	<i>Hibiscus grandiflorus</i>	
Hawkweed	<i>Hieracium gronovii</i>	
Coastal plain hawkweed	<i>Hieracium megacephalon</i>	
Round-leaf bluet	<i>Houstonia procumbens</i>	
Manyflower marsh pennywort	<i>Hydrocotyle umbellata</i>	
Whorled pennywort	<i>Hydrocotyle verticillata</i>	
Skyflower	<i>Hydrolea corymbosa</i>	
Trompetilla	<i>Hymenachne amplexicaulis</i> *	
Spring-run spider-lily	<i>Hymenocallis rotata</i>	
Coastalplain St. John's-wort	<i>Hypericum brachyphyllum</i>	
Roundpod St. John's-wort	<i>Hypericum cistifolium</i>	
Peelbark St. John's-wort	<i>Hypericum fasciculatum</i>	
Pineweed	<i>Hypericum gentianoides</i>	
St. Andrew's-cross	<i>Hypericum hypericoides</i>	
Dwarf St. John's-wort	<i>Hypericum mutilum</i>	
Myrtleleaf St. John's-wort	<i>Hypericum myrtifolium</i>	
Atlantic St. John's-wort	<i>Hypericum tenuifolium</i>	
Fourpetal St. John's-wort	<i>Hypericum tetrapetalum</i>	
Yellow stargrass	<i>Hypoxis curtissii</i>	
Fringed yellow stargrass	<i>Hypoxis juncea</i>	
Musky mint	<i>Hyptis alata</i>	
Carolina holly	<i>Ilex ambigua</i>	
Dahoon holly	<i>Ilex cassine</i>	
Gallberry	<i>Ilex glabra</i>	
Scrub holly	<i>Ilex opaca</i> var. <i>arenicola</i>	
Yaupon	<i>Ilex vomitoria</i>	
Cogongrass	<i>Imperata cylindrica</i> *	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Carolina indigo	<i>Indigofera caroliniana</i>	
Hairy indigo.....	<i>Indigofera hirsuta</i> *	
Trailing indigo.....	<i>Indigofera spicata</i> *	
Moonflower	<i>Ipomoea alba</i>	
Tievine	<i>Ipomoea cordatotriloba</i>	
Ivyleaf morning glory	<i>Ipomoea hederacea</i> *	
Oceanblue morning glory	<i>Ipomoea indica</i> var. <i>acuminata</i>	
Salt marsh morning glory.....	<i>Ipomoea sagittata</i>	
Little bell.....	<i>Ipomoea triloba</i>	
Juba's bush	<i>Iresine diffusa</i>	
Prairie iris	<i>Iris hexagona</i>	
Virginia-willow	<i>Itea virginica</i>	
Soft rush.....	<i>Juncus effusus</i> subsp. <i>solutus</i>	
Bog rush	<i>Juncus elliotii</i>	
Grassleaf rush	<i>Juncus marginatus</i>	
Manyhead rush	<i>Juncus polycephalos</i>	
Lesser creeping rush	<i>Juncus repens</i>	
Needlepod rush.....	<i>Juncus scirpoides</i>	
Pineland waterwillow	<i>Justicia angusta</i>	
Warty panicum	<i>Kellochloa verrucosa</i>	
Virginia saltmarsh mallow	<i>Kosteletzkya pentacarpos</i>	
Carolina redroot.....	<i>Lachnanthes caroliana</i>	
Whitehead bogbutton	<i>Lachnocaulon anceps</i>	
Small's bogbutton	<i>Lachnocaulon minus</i>	
Woodland lettuce	<i>Lactuca floridana</i>	
Shrub verbena	<i>Lantana camara</i> *	
Nodding pinweed	<i>Lechea cernua</i>	SC,SFW
Deckert's pinweed.....	<i>Lechea deckertii</i>	
Thymeleaf pinweed	<i>Lechea minor</i>	
Piedmont pinweed.....	<i>Lechea torreyi</i>	
Southern cutgrass.....	<i>Leersia hexandra</i>	
Little duckweed.....	<i>Lemna obscura</i>	
Valdivia duckweed.....	<i>Lemna valdiviana</i>	
Virginia pepperweed.....	<i>Lepidium virginicum</i>	
White leadtree	<i>Leucaena leucocephala</i> *	
Chapman's blazing-star	<i>Liatris chapmanii</i>	
Garber's blazing-star	<i>Liatris garberi</i>	
Slender gayfeather	<i>Liatris gracilis</i>	
Scrub blazing-star	<i>Liatris ohlingerae</i>	SC,SCF
Shortleaf blazing-star	<i>Liatris tenuifolia</i> var. <i>quadriflora</i>	
Gopher apple.....	<i>Licania michauxii</i>	
Pine lily.....	<i>Lilium catesbaei</i>	MF,SH,WF
Frog's-bit	<i>Limnobium spongia</i>	
Canadian toadflax	<i>Linaria canadensis</i>	
Apalachicola toadflax	<i>Linaria floridana</i>	
Malaysian false-pimpernel.....	<i>Lindernia crustacea</i> *	

* Non-native Species. ∞, β, Ω – see p. 28

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Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Yellowseed false-pimpernel	<i>Lindernia dubia</i> var. <i>anagallidea</i>	
Savannah false-pimpernel.....	<i>Lindernia grandiflora</i>	
Awned haldchaff sedge	<i>Lipocarpha aristulata</i> *	
Sweetgum.....	<i>Liquidambar styraciflua</i>	
Bay lobelia	<i>Lobelia feayana</i>	
Glade lobelia	<i>Lobelia glandulosa</i>	
White lobelia	<i>Lobelia paludosa</i>	
Winged primrosewillow	<i>Ludwigia alata</i>	
Yerba de jicotea.....	<i>Ludwigia erecta</i>	
Southeastern primrosewillow	<i>Ludwigia linifolia</i>	
Seaside primrosewillow.....	<i>Ludwigia maritima</i>	
Smallfruit primrosewillow	<i>Ludwigia microcarpa</i>	
Mexican primrosewillow	<i>Ludwigia octovalvis</i>	
Marsh seedbox	<i>Ludwigia palustris</i>	
Peruvian primrosewillow	<i>Ludwigia peruviana</i> *	
Creeping primrosewillow	<i>Ludwigia repens</i>	
Shrubby primrosewillow.....	<i>Ludwigia suffruticosa</i>	
Skyblue lupine.....	<i>Lupinus diffusus</i>	
Taperleaf waterhoarhound	<i>Lycopus rubellus</i>	
Rose-rush	<i>Lygodesmia aphylla</i>	
Rusty staggerbush	<i>Lyonia ferruginea</i>	
Coastalplain staggerbush	<i>Lyonia fruticosa</i>	
Maleberry.....	<i>Lyonia ligustrina</i> var. <i>foliosiflora</i>	
Fetterbush	<i>Lyonia lucida</i>	
Winged angle loosestrife	<i>Lythrum alatum</i> var. <i>lanceolatum</i>	
Southern magnolia	<i>Magnolia grandiflora</i>	
Sweetbay.....	<i>Magnolia virginiana</i>	
Florida addersmouth orchid.....	<i>Malaxis spicata</i>	
Grassleaf Barbara's buttons.....	<i>Marshallia graminifolia</i>	
Melaleuca.....	<i>Melaleuca quinquenervia</i> *	
Chinaberrytree	<i>Melia azedarach</i> *	
Natalgrass.....	<i>Melinis repens</i> *	
Creeping cucumber	<i>Melothria pendula</i>	
Noyau vine.....	<i>Merremia dissecta</i>	
Manatee mudflower	<i>Micranthemum glomeratum</i>	
Shade mudflower	<i>Micranthemum umbros</i>	
Florida Key hempvine	<i>Mikania cordifolia</i>	
Climbing hempvine.....	<i>Mikania scandens</i>	
Sensitive brier	<i>Mimosa quadrivalvis</i> var. <i>angustata</i>	
Florida sensitive brier	<i>Mimosa quadrivalvis</i> var. <i>floridana</i>	
American partridgeberry	<i>Mitchella repens</i>	
Swamp hornpod.....	<i>Mitreola sessilifolia</i>	
Indian chickweed	<i>Mollugo verticillata</i> *	
Balsam pear	<i>Momordica charantia</i> *	
Indian pipe.....	<i>Monotropa uniflora</i>	
Evergreen bayberry.....	<i>Morella caroliniensis</i>	

* Non-native Species. ∞, β, Ω – see p. 28

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Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Wax myrtle	<i>Morella cerifera</i>	
Latex plant	<i>Morrenia odorata</i> *	
Red mulberry	<i>Morus rubra</i>	
Nakedstem dewflower	<i>Murdannia nudiflora</i> *	
Myrsine; colicwood	<i>Myrsine cubana</i>	
Britton's beargrass	<i>Nolina brittoniana</i>	SC, SCF, SH, XH
Spatterdock	<i>Nuphar advena</i>	
American white waterlily	<i>Nymphaea odorata</i>	
Swamp tupelo	<i>Nyssa sylvatica</i> var. <i>biflora</i>	
Whitetop aster	<i>Oclemena reticulata</i>	
Lancewood	<i>Ocotea coriacea</i>	
Cutleaf eveningprimrose	<i>Oenothera laciniata</i>	
Zacatillo	<i>Oplismenus burmannii</i> *	
Woodsgrass	<i>Oplismenus hirtellus</i>	
Prickly pear	<i>Opuntia humifusa</i>	
Goldenclub	<i>Orontium aquaticum</i>	
Yellow wood-sorrel	<i>Oxalis corniculata</i>	
Pink wood-sorrel	<i>Oxalis debilis</i> *	
Feay's palafox	<i>Palafoxia feayi</i>	
Maidencane	<i>Panicum hemitomon</i>	
Torpedograss	<i>Panicum repens</i> *	
Switchgrass	<i>Panicum virgatum</i>	
Florida pellitory	<i>Parietaria floridana</i>	
American nailwort	<i>Paronychia americana</i>	
Papery nailwort	<i>Paronychia chartacea</i>	SC, SCF
Florida nailwort	<i>Paronychia discoveryi</i>	
Pineland nailwort	<i>Paronychia patula</i>	
Rugel's nailwort	<i>Paronychia rugelii</i>	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Bull crown grass	<i>Paspalum boscianum</i>	
Florida paspalum	<i>Paspalum floridanum</i>	
Bahiagrass	<i>Paspalum notatum</i> var. <i>saurae</i> *	
Brownseed paspalum	<i>Paspalum plicatulum</i>	
Early paspalum	<i>Paspalum praecox</i>	
Thin paspalum	<i>Paspalum setaceum</i>	
Vaseygrass	<i>Paspalum urvillei</i> *	
Purple passionflower	<i>Passiflora incarnata</i>	
Gingerbush	<i>Pavonia spinifex</i>	
Florida cinchweed	<i>Pectis linearifolia</i>	
Buckroot	<i>Pediomelum canescens</i>	
Spoonflower	<i>Peltandra sagittifolia</i>	
Green arrow arum	<i>Peltandra virginica</i>	
Many-flower beardtongue	<i>Penstemon multiflorus</i>	
Silk bay	<i>Persea borbonia</i> var. <i>humilis</i>	
Swamp bay	<i>Persea palustris</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Dense-flower knottweed	<i>Persicaria glabra</i>	
Swamp smartweed.....	<i>Persicaria hydropiperoides</i>	
Dotted smartweed.....	<i>Persicaria punctata</i>	
Bog smartweed.....	<i>Persicaria setacea</i>	
Savannah panicum.....	<i>Phanopyrum gymnocarpon</i>	
Sandhill bean	<i>Phaseolus polystachios var. sinuatus</i>	
Florida false sunflower	<i>Phoebanthus grandiflorus</i>	
Senegal date palm	<i>Phoenix reclinata</i> *	
Oak mistletoe	<i>Phoradendron leucarpum</i>	
Red chokeberry	<i>Photinia pyrifolia</i>	
Golden bamboo	<i>Phyllostachys aurea</i> *	
Cut-leaf ground-cherry	<i>Physalis angulata</i>	
Cypress-head ground-cherry	<i>Physalis arenicola</i>	
Walter's ground-cherry	<i>Physalis walteri</i>	
Pokeweed	<i>Phytolacca americana</i>	
Artillery plant	<i>Pilea microphylla</i>	
Wild pennyroyal.....	<i>Piloblephis rigida</i>	
Blueflower butterwort	<i>Pinguicula caerulea</i>	WF,WP
Yellow butterwort.....	<i>Pinguicula lutea</i>	MEH,WF
Small butterwort	<i>Pinguicula pumila</i>	
Pitted stripeseed	<i>Piriqueta cistoides subsp. caroliniana</i>	
Water-lettuce	<i>Pistia stratiotes</i>	
Narrowleaf goldenaster	<i>Pityopsis graminifolia</i>	
Virginia plantain.....	<i>Plantago virginica</i>	
White fringed orchid	<i>Platanthera blephariglottis</i>	
	var. <i>conspicua</i> [∞]	DM,SSL,WP
Yellow fringed orchid	<i>Platanthera ciliaris</i>	WF,WP
Crested fringed orchid	<i>Platanthera cristata</i>	
Jug orchid	<i>Platythelys latifolia</i>	
Stinking camphorweed	<i>Pluchea foetida</i>	
Sweetscent	<i>Pluchea odorata</i>	
Rose pogonia.....	<i>Pogonia ophioglossoides</i> [∞]	SSL,WP
Paintedleaf	<i>Poinsettia cyathophora</i>	
Slenderleaf clammyweed	<i>Polanisia tenuifolia</i>	
Drumheads	<i>Polygala cruciata</i>	
Tall pine barren milkwort	<i>Polygala cymosa</i>	
Procession flower	<i>Polygala incarnata</i>	
Lewton's milkwort	<i>Polygala lewtonii</i> [∞]	SC,SCF,SH
Orange milkwort	<i>Polygala lutea</i>	
Candyroot	<i>Polygala nana</i>	
Low pine barren milkwort.....	<i>Polygala ramosa</i>	
Yellow milkwort	<i>Polygala rugelii</i>	
Coastal plain milkwort	<i>Polygala setacea</i>	
Florida jointweed	<i>Polygonum basiramium</i>	SC
Small's jointweed.....	<i>Polygonum dentocerus</i>	SC
Large-flower jointweed	<i>Polygonum nesomii</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Tall jointweed	<i>Polygonum pinicola</i>	
October flower	<i>Polygonum polygamum</i>	
Rustweed	<i>Polypremum procumbens</i>	
Pickernelweed	<i>Pontederia cordata</i>	
Hairy shadow witch	<i>Ponthieva racemosa</i>	
Purslane	<i>Portulaca oleracea</i>	
Pink purslane.....	<i>Portulaca pilosa</i>	
Marsh mermaidweed	<i>Proserpinaca palustris</i>	
Carolina laurel-cherry	<i>Prunus caroliniana</i>	
Flatwoods plum	<i>Prunus umbellata</i>	
Sweet everlasting	<i>Pseudognaphalium obtusifolium</i>	
Arrow bamboo	<i>Pseudosasa japonica</i> *	
Strawberry guava	<i>Psidium cattleianum</i> *	
Wild coffee	<i>Psychotria nervosa</i>	
Shortleaf wild coffee.....	<i>Psychotria sulzneri</i>	
Blackroot	<i>Pterocaulon pycnostachyum</i>	
Giant orchid	<i>Pteroglossaspis ecristata</i>	SC,SH,SCF,MF
Mock bishopsweed	<i>Ptilimnium capillaceum</i>	
Carolina desert chicory	<i>Pyrrhopappus carolinianus</i>	
Chapman's oak	<i>Quercus chapmanii</i>	
Sand live oak.....	<i>Quercus geminata</i>	
Bluejack oak.....	<i>Quercus incana</i>	
Scrub oak	<i>Quercus inopina</i>	
Turkey oak.....	<i>Quercus laevis</i>	
Laurel oak; diamond oak.....	<i>Quercus laurifolia</i>	
Dwarf live oak	<i>Quercus minima</i>	
Myrtle oak.....	<i>Quercus myrtifolia</i>	
Water oak	<i>Quercus nigra</i>	
Running oak	<i>Quercus pumila</i>	
Live oak	<i>Quercus virginiana</i>	
Myrsine.....	<i>Rapanea punctata</i>	
Needle palm	<i>Rhapidophyllum hystrix</i>	
West Indian meadowbeauty	<i>Rhexia cubensis</i> *	
Pale meadowbeauty	<i>Rhexia mariana</i>	
Nash's meadowbeauty	<i>Rhexia nashii</i>	
Nuttall's meadowbeauty.....	<i>Rhexia nuttallii</i>	
Fringed meadowbeauty.....	<i>Rhexia petiolata</i>	
Swamp azalea	<i>Rhododendron viscosum</i>	
Downy rose myrtle	<i>Rhodomyrtus tomentosa</i> *	
Winged sumac	<i>Rhus copallinum</i>	
Brownhair snoutbean.....	<i>Rhynchosia cinerea</i>	
Michaux's snoutbean	<i>Rhynchosia michauxii</i>	
Anglestem beaksedge.....	<i>Rhynchospora caduca</i>	
Bunched beaksedge	<i>Rhynchospora cephalantha</i>	
Fringed beaksedge	<i>Rhynchospora ciliaris</i>	
Starrush whitetop	<i>Rhynchospora colorata</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Shortbristle horned beaksedge ...	<i>Rhynchospora corniculata</i>	
Fascicled beaksedge	<i>Rhynchospora fascicularis</i>	
Fernald's beaksedge	<i>Rhynchospora fernaldii</i>	
Sandswamp whitetop	<i>Rhynchospora latifolia</i>	
Sandyfield beaksedge	<i>Rhynchospora megalocarpa</i>	
Southern beaksedge.....	<i>Rhynchospora microcarpa</i>	
Bunched beaksedge	<i>Rhynchospora microcephala</i>	
Millet beaksedge	<i>Rhynchospora miliacea</i>	
Short-beak beaksedge.....	<i>Rhynchospora nitens</i>	
Plumed beaksedge	<i>Rhynchospora plumosa</i>	
Tropical Mexican-clover	<i>Richardia brasiliensis</i> *	
Rough Mexican-clover.....	<i>Richardia scabra</i> *	
Castorbean	<i>Ricinus communis</i> *	
Rouge plant.....	<i>Rivina humilis</i>	
Swamp rose	<i>Rosa palustris</i>	
Itchgrass	<i>Rottboellia cochinchinensis</i> *	
Sawtooth blackberry.....	<i>Rubus pensilvanicus</i>	
Southern dewberry.....	<i>Rubus trivialis</i>	
Blackeyed Susan.....	<i>Rudbeckia hirta</i>	
Carolina wild petunia	<i>Ruellia caroliniensis</i>	
Heartwing dock.....	<i>Rumex hastatulus</i>	
Scrub palmetto	<i>Sabal etonia</i>	
Dwarf palmetto.....	<i>Sabal minor</i>	
Cabbage palm	<i>Sabal palmetto</i>	
Shortleaf rosegentian	<i>Sabatia brevifolia</i>	
Lanceleaf rosegentian.....	<i>Sabatia difformis</i>	
Largeflower rosegentian.....	<i>Sabatia grandiflora</i>	
Sugarcane plumegrass	<i>Saccharum giganteum</i>	
India cupscale	<i>Sacciolepis indica</i> *	
American cupscale	<i>Sacciolepis striata</i>	
Leafless beaked ladies'-tresses ...	<i>Sacoila lanceolata</i>	
Small-flower mock-buckthorn	<i>Sageretia minutiflora</i>	
Grassy-leaf arrowhead.....	<i>Sagittaria graminea</i>	
Chapman's arrowhead	<i>Sagittaria graminea</i> var. <i>chapmanii</i>	
Bull-tongue arrowhead	<i>Sagittaria lancifolia</i>	
Carolina willow	<i>Salix caroliniana</i>	
Lyreleaf sage.....	<i>Salvia lyrata</i>	
Elderberry	<i>Sambucus nigra</i> subsp. <i>canadensis</i>	
Pineland pimpernel.....	<i>Samolus valerandi</i> subsp. <i>parviflorus</i>	
Soapberry	<i>Sapindus saponaria</i>	
Hooded pitcherplant	<i>Sarracenia minor</i>BG,SSL,WF,WP	
Lizard's-tail	<i>Saururus cernuus</i>	
Australian umbrella tree.....	<i>Schefflera actinophylla</i> *	
Brazilian pepper.....	<i>Schinus terebinthifolius</i> *	
Pinescrub bluestem	<i>Schizachyrium niveum</i>SC	
Little bluestem.....	<i>Schizachyrium scoparium</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Drooping bulrush	<i>Scirpus lineatus</i>	
Fringed nutrush	<i>Scleria ciliata</i>	
Tall nutgrass	<i>Scleria triglomerata</i>	
Sweetbroom; licorice-weed	<i>Scoparia dulcis</i>	
Florida scrub skullcap	<i>Scutellaria arenicola</i>	
Helmet skullcap	<i>Scutellaria integrifolia</i>	
Privet wild sensitive plant.....	<i>Senna ligustrina</i>	
Coffeeweed	<i>Senna obtusifolia</i>	
Septic weed	<i>Senna occidentalis</i> *	
Saw palmetto	<i>Serenoa repens</i>	
Whitetop aster	<i>Sericocarpus tortifolius</i>	
Giant bristlegrass	<i>Setaria magna</i>	
Yellow bristlegrass	<i>Setaria parviflora</i>	
Piedmont black senna	<i>Seymeria pectinata</i>	
Llima	<i>Sida cordifolia</i> *	
Indian hemp	<i>Sida rhombifolia</i>	
Common wireweed; common fanpetals	<i>Sida ulmifolia</i>	
Milk-buckthorn; Florida bully	<i>Sideroxylon reclinatum</i>	
Scrub-buckthorn	<i>Sideroxylon tenax</i>	
Narrowleaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>	
Annual blue-eyed grass	<i>Sisyrinchium rosulatum</i>	
Jeweled blue-eyed grass	<i>Sisyrinchium xerophyllum</i>	
Ear-leaf greenbrier	<i>Smilax auriculata</i>	
Saw greenbrier	<i>Smilax bona-nox</i>	
Laurel greenbrier	<i>Smilax laurifolia</i>	
Sarsaparilla vine	<i>Smilax pumila</i>	
Coral greenbrier.....	<i>Smilax walteri</i>	
Carolina horse-nettle	<i>Solanum carolinense</i>	
Black nightshade.....	<i>Solanum chenopodioides</i>	
Tropical soda apple	<i>Solanum viarum</i> *	
Pinebarren goldenrod	<i>Solidago fistulosa</i>	
Chapman's goldenrod	<i>Solidago odora</i> var. <i>chapmanii</i>	
Twistedleaf goldenrod.....	<i>Solidago tortifolia</i>	
Lopsided indiagrass	<i>Sorghastrum secundum</i>	
Bur-reed	<i>Sparganium americanum</i>	
Sand cordgrass.....	<i>Spartina bakeri</i>	
Woodland false-buttonweed	<i>Spermacoce remota</i>	
Cranichis ladies'-tresses.....	<i>Spiranthes cranichoides</i>	
Longlip ladies'-tresses	<i>Spiranthes longilabris</i> ∞	SSL,WF,WP
Green-vein ladies'-tresses	<i>Spiranthes praecox</i>	
Common duckweed	<i>Spirodela polyrhiza</i>	
Smutgrass	<i>Sporobolus indicus</i> *	
Pineywoods dropseed	<i>Sporobolus junceus</i>	
Osceola's plume.....	<i>Stenanthium densum</i>	
St. Augustinegrass	<i>Stenotaphrum secundatum</i>	
Corkwood.....	<i>Stillingia aquatica</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Queensdelight	<i>Stillingia sylvatica</i>	
Pineland scalypink.....	<i>Stipulicida setacea</i>	
Coastalplain dawnflower	<i>Stylisma patens</i>	
Hairy dawnflower	<i>Stylisma villosa</i>	
Carolina false-vervain	<i>Stylodon carneum</i>	
Bahaman aster	<i>Symphyotrichum bahamense</i>	
Climbing aster	<i>Symphyotrichum carolinianum</i>	
Eastern silver aster	<i>Symphyotrichum concolor</i>	
Rice button aster	<i>Symphyotrichum dumosum</i>	
Elliott's aster	<i>Symphyotrichum elliotii</i>	
Yellow hatpins	<i>Syngonanthus flavidulus</i>	
Scurf hoarypea	<i>Tephrosia chrysophylla</i>	
Spreading hoarypea	<i>Tephrosia hispidula</i>	
Spiked hoarypea	<i>Tephrosia spicata</i>	
Alligatorflag.....	<i>Thalia geniculata</i>	
Blackeyed susan vine	<i>Thunbergia alata</i> *	
Water cowbane.....	<i>Tiedemannia filiformis</i>	
Medusahead airplant	<i>Tillandsia balbisiana</i>	DS,MF,MEH,SCF
Bartram's airplant	<i>Tillandsia bartramii</i>	
Cardinal airplant	<i>Tillandsia fasciculata</i>	SH,MF,MEH,DM,DS
Ballmoss	<i>Tillandsia recurvata</i>	
Southern needleleaf	<i>Tillandsia setacea</i>	
Airplant	<i>Tillandsia simulata</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Giant airplant	<i>Tillandsia utriculata</i>	DS,HH,MEH,XH
Leatherleaf airplant	<i>Tillandsia variabilis</i>	HH,DS
Eastern poison ivy.....	<i>Toxicodendron radicans</i>	
Longleaf spiderwort.....	<i>Tradescantia roseolens</i>	
Wavyleaf noseburn.....	<i>Tragia urens</i>	
Virginia marsh St. John's-wort	<i>Triadenum virginicum</i>	
Forked bluecurls	<i>Trichostema dichotomum</i>	
Coatbuttons	<i>Tridax procumbens</i> *	
Tall redtop	<i>Tridens flavus</i>	
Eastern gamagrass.....	<i>Tripsacum dactyloides</i>	
Broadleaf cattail.....	<i>Typha latifolia</i>	
American elm; Florida elm	<i>Ulmus americana</i>	
Caesarweed	<i>Urena lobata</i> *	
Guineagrass	<i>Urochloa maxima</i> *	
Paragrass.....	<i>Urochloa mutica</i> *	
Humped bladderwort	<i>Utricularia gibba</i>	
Floating bladderwort.....	<i>Utricularia inflata</i>	
Eastern purple bladderwort	<i>Utricularia purpurea</i>	
Zigzag bladderwort	<i>Utricularia subulata</i>	
Highbush blueberry	<i>Vaccinium corymbosum</i>	
Darrow's blueberry.....	<i>Vaccinium darrowii</i>	
Shiny blueberry	<i>Vaccinium myrsinites</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Deerberry	<i>Vaccinium stamineum</i>	
Sandaper vervain.....	<i>Verbena scabra</i>	
White crownbeard	<i>Verbesina virginica</i>	
Possumhaw.....	<i>Viburnum nudum</i>	
Walter's viburnum.....	<i>Viburnum obovatum</i>	
Fourleaf vetch	<i>Vicia acutifolia</i>	
Long-leaf violet.....	<i>Viola lanceolata</i>	
Early blue violet.....	<i>Viola palmata</i>	
Primrose-leaved violet	<i>Viola primulifolia</i>	
Common blue violet	<i>Viola sororia</i>	
Chastetree	<i>Vitex trifolia</i> *	
Summer grape	<i>Vitis aestivalis</i>	
Florida grape	<i>Vitis cinerea var. floridana</i>	
Muscadine; fox grape	<i>Vitis rotundifolia</i>	
Caloose grape.....	<i>Vitis shuttleworthii</i>	
Carter's pinelandcress	<i>Warea carteri</i> ∞	SC,SCF,SH
Algal bulrush	<i>Websteria confervoides</i>	
Elephant ear.....	<i>Xanthosoma sagittifolium</i> *	
Tallowwood; hog-plum	<i>Ximenia americana</i>	
Short-leaf yellow-eyed grass	<i>Xyris brevifolia</i>	
Carolina yellow-eyed grass.....	<i>Xyris caroliniana</i>	
Elliott's yellow-eyed grass	<i>Xyris elliotii</i>	
Fringed yellow-eyed grass.....	<i>Xyris fimbriata</i>	
Richard's yellow-eyed grass	<i>Xyris jupicai</i>	
Tall yellow-eyed grass	<i>Xyris platylepis</i>	
Oriental false hawk's-beard	<i>Youngia japonica</i> *	
Spanish bayonet	<i>Yucca aloifolia</i>	
Adam's needle	<i>Yucca filamentosa</i>	
Hercules-club	<i>Zanthoxylum clava-herculis</i>	
Wild lime	<i>Zanthoxylum fagara</i>	
Rain-lily	<i>Zephyranthes simpsonii</i>	MF,WF
Soldier's orchid.....	<i>Zeuxine strateumatica</i> *	
Viperina	<i>Zornia bracteata</i>	

VERTEBRATES

FISH

Walking catfish	<i>Clarius batrachus</i> *
Swamp darter.....	<i>Etheostoma fusiforma</i>
Golden topminnow	<i>Fundulus chrysotus</i>
Mosquitofish	<i>Gambusia holbrooki</i>
African ewelfish	<i>Hemichromis letourneuxi</i> *

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Least killifish	<i>Heterandria formosa</i>	
Brown hoplo	<i>Hoplosternum littorale</i> *	
Brook silverside	<i>Labidesthes sicculus</i>	
Spotted sunfish.....	<i>Lepomis punctatus</i>	
Largemouth bass	<i>Micropterus salmoides</i>	
Sailfin suckermouth catfish.....	<i>Pterygoplichthys sp.</i> *	

AMPHIBIANS

Florida cricket frog	<i>Acris gryllus dorsalis</i>	
Two-toed amphiuma.....	<i>Amphiuma means</i>	
Oak toad.....	<i>Anaxyrus quercicus</i>	
Southern toad	<i>Anaxyrus terrestris</i>	
Greenhouse frog	<i>Eleutherodactylus planirostris</i> *	
Eastern narrowmouth toad.....	<i>Gastrophryne carolinensis</i>	
Green treefrog.....	<i>Hyla cinerea</i>	
Pinewoods treefrog.....	<i>Hyla femoralis</i>	
Squirrel treefrog	<i>Hyla squirella</i>	
Florida gopher frog.....	<i>Lithobates capito</i>	SC,DM
Bullfrog.....	<i>Lithobates catesbeianus</i>	
Pig frog.....	<i>Lithobates grylio</i>	
Southern leopard frog.....	<i>Lithobates sphenoccephalus</i>	
Peninsular newt	<i>Notophthalmus viridescens piaropicola</i>	
Cuban treefrog	<i>Osteopilus septentrionalis</i> *	
Little grass frog	<i>Pseudacris ocularis</i>	
Eastern spadefoot	<i>Scaphiopus holbrookii</i>	

REPTILES

Florida cottonmouth	<i>Agkistrodon piscivorus conanti</i>	
American alligator	<i>Alligator mississippiensis</i>	BM, BS, CDLK
Green anole	<i>Anolis carolinensis</i>	
Brown anole	<i>Norops sagrei</i> *	
Florida softshell	<i>Apalone ferox</i>	
Six-lined racerunner.....	<i>Aspidoscelis sexlineata</i>	
African-spur thigh tortoise.....	<i>Centrochelys sulcata</i> (syn. <i>Geochelone sulcata</i>) *	
Southern black racer	<i>Coluber constrictor priapus</i>	
Eastern diamondback rattlesnake...	<i>Crotalus adamanteus</i>	
.....	SH,MF,SCF,SC	
Southern ring-necked snake.....	<i>Diadophis p. punctatus</i>	
Eastern indigo snake	<i>Drymarchon couperi</i>	SH, MF, SCF
Eastern mud snake	<i>Farancia a. abacura</i>	
Gopher tortoise.....	<i>Gopherus polyphemus</i>	many
Southern hognose snake.....	<i>Heterodon simus</i>	SH,SC,XH
Scarlet kingsnake.....	<i>Lampropeltis elapsoides</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Northern curlytail lizard	<i>Leiocephalus carinatus</i> *	
Eastern coachwhip	<i>Masticophis flagellum flagellum</i>	
Eastern coral snake	<i>Micrurus fulvius</i>	
Florida water snake	<i>Nerodia fasciata pictiventris</i>	
Brown water snake.....	<i>Nerodia taxispilota</i>	
Rough green snake	<i>Opheodrys aestivus</i>	
Eastern glass lizard	<i>Ophisaurus ventralis</i>	
Eastern rat snake.....	<i>Pantherophis alleghaniensis</i>	
(aka yellow rat snake)		
Eastern corn snake.....	<i>Pantherophis guttatus</i>	
Florida pine snake	<i>Pituophis melanoleucus mugitus</i> ...	SH,SC,SCF
Bluetail mole skink	<i>Plestiodon egregius lividus</i>	SC,SCF
Southeastern five-lined skink	<i>Plestiodon inexpectatus</i>	
Florida sand skink	<i>Plestiodon reynoldsi</i>	SC,SCF
Florida cooter	<i>Pseudemys concina floridana</i>	
Florida redbelly cooter	<i>Pseudemys nelsoni</i>	
Peninsula cooter	<i>Pseudemys peninsularis</i>	
Striped crayfish snake	<i>Regina alleni</i>	
Florida scrub lizard	<i>Sceloporus woodi</i>	SC,SCF,SH
Ground skink	<i>Scincella lateralis</i>	
Southern Florida swamp snake	<i>Seminatrix pygaea cyclas</i>	
Dusky pigmy rattlesnake.....	<i>Sistrurus miliarius barbouri</i>	
Common musk turtle	<i>Sternotherus odoratus</i>	
Peninsula crowned snake	<i>Tantilla relictata relictata</i>	
Florida box turtle	<i>Terrapene carolina bauri</i>	
Peninsula ribbon snake	<i>Thamnophis sauritus sackeni</i>	
Eastern garter snake	<i>Thamnophis sirtalis sirtalis</i>	

BIRDS

Cooper's hawk	<i>Accipiter cooperii</i>	
Sharp-shinned hawk.....	<i>Accipiter striatus</i>	
Spotted sandpiper.....	<i>Actitis macularia</i> ∞	
Red-winged blackbird	<i>Agelaius phoeniceus</i>	
Wood duck	<i>Aix sponsa</i>	
Henslow's sparrow	<i>Ammodramus henslowii</i> ∞	
Grasshopper sparrow.....	<i>Ammodramus savannarum</i> ∞	
Mottled duck	<i>Anas fulvigula</i>	
Mallard	<i>Anas platyrhynchos</i> ∞	
Anhinga	<i>Anhinga anhinga</i>	
American pipit	<i>Anthus rubescens</i> ∞	
Florida scrub-jay	<i>Aphelocoma coerulescens</i>	SC,SCF
Limpkin	<i>Aramus guarauna</i>	
Ruby-throated hummingbird.....	<i>Archilochus colubris</i>	
Great egret	<i>Ardea alba</i>	
Great blue heron.....	<i>Ardea herodias</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Lesser scaup	<i>Aythya affinis</i>	
Tufted titmouse	<i>Baeolophus bicolor</i>	
Upland sandpiper	<i>Bartramia longicauda</i> ∞	
Cedar waxwing	<i>Bombycilla cedrorum</i>	
American bittern	<i>Botaurus lentiginosus</i> ∞	
Great horned owl	<i>Bubo virginianus</i>	
Cattle egret	<i>Bubulcus ibis</i>	
Short-tailed hawk	<i>Buteo brachyurus</i>	
Red-tailed hawk	<i>Buteo jamaicensis</i>	
Red-shouldered hawk	<i>Buteo lineatus</i>	
Broad-winged hawk	<i>Buteo platypterus</i>	
Green heron	<i>Butorides virescens</i>	
Ivory-billed woodpecker	<i>Campephilus principalis</i> ∞ BF,HH
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	
Eastern whip-poor-will	<i>Caprimulgus vociferus</i>	
Crested caracara	<i>Caracara cheriway</i> AP,MF,SCF
Northern cardinal	<i>Cardinalis cardinalis</i>	
Turkey vulture	<i>Cathartes aura</i>	
Veery	<i>Catharus fuscescens</i>	
Hermit thrush	<i>Catharus guttatus</i>	
Gray-cheeked thrush	<i>Catharus minimus</i>	
Swainson's thrush	<i>Catharus ustulatus</i>	
Brown creeper	<i>Certhia americana</i>	
Chimney swift	<i>Chaetura pelagica</i>	
Killdeer	<i>Charadrius vociferus</i>	
Black tern	<i>Chlidonias niger</i> ∞	
Common nighthawk	<i>Chordeiles minor</i>	
Bonaparte's gull	<i>Chroicocephalus philadelphia</i>	
Northern harrier	<i>Circus cyaneus</i>	
Marsh wren	<i>Cistothorus palustris</i>	
Sedge wren	<i>Cistothorus platensis</i>	
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	
Black-billed cuckoo	<i>Coccyzus erythrophthalmus</i>	
Northern flicker	<i>Colaptes auratus</i>	
Northern bobwhite	<i>Colinus virginianus</i>	
Common ground-dove	<i>Columbina passerina</i>	
Eastern wood-pewee	<i>Contopus virens</i>	
Black vulture	<i>Coragyps atratus</i>	
American crow	<i>Corvus brachyrhynchos</i>	
Fish crow	<i>Corvus ossifragus</i>	
Smooth-billed ani	<i>Crotophaga ani</i>	
Blue jay	<i>Cyanocitta cristata</i>	
Bobolink	<i>Dolichonyx oryzivorus</i> ∞	
Pileated woodpecker	<i>Dryocopus pileatus</i>	
Gray catbird	<i>Dumetella carolinensis</i>	
Little blue heron	<i>Egretta caerulea</i> many

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Snowy egret.....	<i>Egretta thula</i>	many
Tricolored heron.....	<i>Egretta tricolor</i>	MLK,MS,STS
Swallow-tailed kite	<i>Elanoides forficatus</i>	DS,MEH,MF,WP
Acadian flycatcher.....	<i>Empidonax virescens</i>	
White ibis.....	<i>Eudocimus albus</i>	many
Scarlet ibis	<i>Eudocimus ruber</i>	
Rusty blackbird.....	<i>Euphagus carolinus</i>	
Merlin	<i>Falco columbarius</i>	
American kestrel.....	<i>Falco sparverius</i>	
Southeastern American kestrel	<i>Falco sparverius paulus</i>	DP,MF,SH,SCF
Magnificent frigatebird.....	<i>Fregata magnificens</i>	
Wilson's snipe.....	<i>Gallinago delicata</i>	
Common gallinule (moorhen)	<i>Gallinula galeata</i>	
Common yellowthroat.....	<i>Geothlypis trichas</i>	
Sandhill crane.....	<i>Grus canadensis</i>	DP,WP,BM,DM
Florida sandhill crane.....	<i>Grus canadensis pratensis</i> ...	DP,WP,BM,DM
Blue grosbeak.....	<i>Guiraca caerulea</i>	
Bald eagle.....	<i>Haliaeetus leucocephalus</i>	
Worm-eating warbler.....	<i>Helmitheros vermivorum</i>	
Barn swallow	<i>Hirundo rustica</i>	
Wood thrush.....	<i>Hylocichla mustelina</i>	
Baltimore oriole	<i>Icterus galbula</i>	
Orchard oriole	<i>Icterus spurius</i>	
Mississippi kite.....	<i>Ictinia mississippiensis</i>	
Least bittern.....	<i>Ixobrychus exilis</i>	
Loggerhead shrike.....	<i>Lanius ludovicianus</i>	
Herring gull	<i>Larus argentatus</i>	
Ring-billed gull	<i>Larus delawarensis</i>	
Black rail.....	<i>Laterallus jamaicensis</i> ∞	
Laughing gull.....	<i>Leucophaeus atricilla</i> ∞	
Hooded merganser.....	<i>Lophodytes cucullatus</i>	
Belted kingfisher	<i>Megaceryle alcyon</i>	
Eastern screech-owl	<i>Megascops asio</i>	
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>	
Wild turkey	<i>Meleagris gallopavo</i>	
Swamp sparrow.....	<i>Melospiza georgiana</i>	
Song sparrow	<i>Melospiza melodia</i> ∞	
Northern mockingbird.....	<i>Mimus polyglottos</i>	
Black and white warbler.....	<i>Mniotilta varia</i>	
Wood stork	<i>Mycteria americana</i>	Palustrine
Great crested flycatcher.....	<i>Myiarchus crinitus</i>	
Yellow-crowned night heron	<i>Nyctanassa violacea</i>	
Black-crowned night heron.....	<i>Nycticorax nycticorax</i>	
Connecticut warbler	<i>Oporornis agilis</i> ∞	
Orange-crowned warbler.....	<i>Oreothlypis celata</i>	

* Non-native Species. ∞, β, Ω - see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Tennessee warbler	<i>Oreothlypis peregrina</i>	
Osprey	<i>Pandion haliaetus</i>	BM, BS, CDLK
Louisiana waterthrush	<i>Parkesia motacilla</i>	
Northern waterthrush	<i>Parkesia noveboracensis</i>	
House sparrow.....	<i>Passer domesticus</i> *	
Savannah sparrow	<i>Passerculus sandwichensis</i>	
Fox sparrow	<i>Passerella iliaca</i>	
Painted bunting	<i>Passerina ciris</i>	
Indigo bunting	<i>Passerina cyanea</i>	
Brown pelican.....	<i>Pelecanus occidentalis</i>	CIS, BM
Bachman's sparrow	<i>Peucaea aestivalis</i>	
Double-crested cormorant.....	<i>Phalacrocorax auritus</i>	
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	
Red-cockaded woodpecker	<i>Picoides borealis</i> ∞	MF, SH
Downy woodpecker	<i>Picoides pubescens</i>	
Hairy woodpecker	<i>Picoides villosus</i>	
Eastern towhee.....	<i>Pipilo erythrophthalmus</i>	
Scarlet tanager	<i>Piranga olivacea</i>	
Summer tanager.....	<i>Piranga rubra</i>	
Roseate spoonbill	<i>Platalea ajaja</i>	BM, DM, SULK
Glossy ibis.....	<i>Plegadis falcinellus</i> ∞	
Pied-billed grebe	<i>Podilymbus podiceps</i>	
Carolina chickadee	<i>Poecile carolinensis</i>	
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	
Vesper sparrow.....	<i>Poocetes gramineus</i> ∞	
Purple gallinule	<i>Porphyrio martinica</i>	
Sora	<i>Porzana carolina</i>	
Purple martin	<i>Progne subis</i>	
Prothonotary warbler	<i>Protonotaria citrea</i>	
Boat-tailed grackle	<i>Quiscalus major</i>	
Common grackle	<i>Quiscalus quiscula</i>	
King rail	<i>Rallus elegans</i> ∞	
Virginia rail	<i>Rallus limicola</i> ∞	
Ruby-crowned kinglet.....	<i>Regulus calendula</i>	
Bank swallow.....	<i>Riparia riparia</i> ∞	
Snail kite	<i>Rostrhamus sociabilis</i>	BM, FM, SULK
Eastern phoebe.....	<i>Sayornis phoebe</i>	
American woodcock.....	<i>Scolopax minor</i>	
Ovenbird.....	<i>Seiurus aurocapilla</i>	
Northern parula	<i>Setophaga americana</i>	
Black-throated blue warbler	<i>Setophaga caerulescens</i>	
Bay-breasted warbler	<i>Setophaga castanea</i>	
Hooded warbler	<i>Setophaga citrina</i>	
Yellow-rumped warbler	<i>Setophaga coronata</i>	
Prairie warbler	<i>Setophaga discolor</i>	
Yellow-throated warbler	<i>Setophaga dominica</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Blackburnian warbler	<i>Setophaga fusca</i>	
Magnolia warbler.....	<i>Setophaga magnolia</i>	
Palm warbler	<i>Setophaga palmarum</i>	
Chestnut-sided warbler.....	<i>Setophaga pensylvanica</i>	
Yellow warbler	<i>Setophaga petechia</i>	
Pine warbler	<i>Setophaga pinus</i>	
American redstart	<i>Setophaga ruticilla</i>	
Blackpoll warbler.....	<i>Setophaga striata</i> ∞	
Cape May warbler	<i>Setophaga tigrina</i>	
Black-throated green warbler	<i>Setophaga virens</i>	
Eastern bluebird	<i>Sialia sialis</i>	
White-breasted nuthatch.....	<i>Sitta carolinensis</i>	
Brown-headed nuthatch.....	<i>Sitta pusilla</i>	
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	
American goldfinch.....	<i>Spinus tristis</i>	
Chipping sparrow	<i>Spizella passerina</i>	
Field sparrow.....	<i>Spizella pusilla</i> ∞	
Northern rough-winged swallow.....	<i>Stelgidopteryx serripennis</i> ∞	
Eurasian collared dove.....	<i>Streptopelia decaocto</i> *	
Barred owl	<i>Strix varia</i>	
Eastern meadowlark.....	<i>Sturnella magna</i>	
European starling.....	<i>Sturnus vulgaris</i> *	
Tree swallow	<i>Tachycineta bicolor</i>	
Carolina wren.....	<i>Thryothorus ludovicianus</i>	
Brown thrasher.....	<i>Toxostoma rufum</i>	
Lesser yellowlegs	<i>Tringa flavipes</i> ∞	
Solitary sandpiper	<i>Tringa solitaria</i> ∞	
House wren.....	<i>Troglodytes aedon</i>	
American robin	<i>Turdus migratorius</i>	
Eastern kingbird	<i>Tyrannus tyrannus</i>	
Western kingbird.....	<i>Tyrannus verticalis</i>	
Barn owl	<i>Tyto alba</i>	
Golden-winged warbler	<i>Vermivora chrysoptera</i>	
Blue-winged warbler.....	<i>Vermivora cyanoptera</i>	
Yellow-throated vireo	<i>Vireo flavifrons</i>	
Warbling vireo	<i>Vireo gilvus</i> ∞	
White-eyed vireo	<i>Vireo griseus</i>	
Red-eyed vireo	<i>Vireo olivaceus</i>	
Blue-headed vireo; solitary vireo ...	<i>Vireo solitarius</i>	
Mourning Dove	<i>Zenaida macroura</i>	

MAMMALS

Domestic or feral dog	<i>Canis familiaris</i>
Eastern Coyote	<i>Canis latrans</i>
Nine-banded armadillo.....	<i>Dasypus novemcinctus</i> *

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Virginia opossum	<i>Didelphis marsupialis</i>	
Domestic or feral cat	<i>Felis catus</i>	
Pocket gopher	<i>Geomys pinetus</i>	
Southern flying squirrel	<i>Glaucomys volans</i>	
Northern yellow bat.....	<i>Lasiurus intermedius</i>	
Seminole bat	<i>Lasiurus seminolus</i>	
River otter	<i>Lontra canadensis</i>	
Bobcat.....	<i>Lynx rufus</i>	
Striped skunk.....	<i>Mephites mephites</i>	
Florida long-tailed weasel.....	<i>Mustela frenata peninsulae</i>	
Eastern woodrat	<i>Neotoma floridana</i>	
Evening bat.....	<i>Nycticeius humeralis</i>	
White-tailed deer	<i>Odocoileus virginianus</i>	
Cotton mouse; cotton deermouse ...	<i>Peromyscus gossypinus</i>	
Florida mouse; Florida deermouse...	<i>Podomys floridanus</i>	SC, SCF, SH
Raccoon.....	<i>Procyon lotor</i>	
Florida panther	<i>Puma concolor coryi</i>	many
Eastern gray squirrel	<i>Sciurus carolinensis</i>	
Sherman's fox squirrel.....	<i>Sciurus niger shermani</i>	MF, SH
Hispid cotton rat	<i>Sigmodon hispidus</i>	
Eastern spotted skunk	<i>Spilogale putorius</i>	
Wild hog; feral hog; feral pig.....	<i>Sus scrofa</i>	
Eastern cottontail.....	<i>Sylvilagus floridanus</i>	
Marsh rabbit	<i>Sylvilagus palustris</i>	
Brazilian free-tailed bat.....	<i>Tadarida brasiliensis</i>	
Gray fox	<i>Urocyon cinereoargenteus</i>	
Florida black bear	<i>Ursus americanus floridanus</i>	many
Red fox.....	<i>Vulpes vulpes</i> *	
Tricolored bat	<i>Perimyotis subflavus</i>	
Shrew spp.....	<i>Soricidae</i> family	

INVERTEBRATES

Gulf fritillary	<i>Agraulis vanillae</i>
White peacock	<i>Anartia jatophae</i>
Least skipper.....	<i>Ancyloxypha numitor</i>
Archbold anomala scarab beetle.....	<i>Anomala eximia</i> ^Ω
Gopher tortoise aphodius beetle.....	<i>Aphodius troglodytes</i> ^Ω
Variable dancer.....	<i>Argia fumipennis atra</i>
North American black witch moth...	<i>Ascalapha odorata</i>
Scrub Long-Legged Fly	<i>Asyndetus archboldi</i>
Pipevine swallowtail.....	<i>Battus philener</i>
Little metalmark	<i>Calephelis virginiensis</i>
Ebony jewelwing	<i>Calopteryx maculata</i>
Giant scrub pasture bee	<i>Caupolicana floridana</i> ^Ω

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Halloween pennant.....	<i>Celithemis eponina</i>	
Gopher tortoise hister beetle	<i>Chelyoxenus xerobatis</i> ^Ω	
Sand Spikemoss Moth	<i>Chionodes latro</i>	
Highlands tiger beetle.....	<i>Cicindela highlandensis</i> ^Ω	
Tiger beetle.....	<i>Cicindela punctulata</i>	
Highlands tiger beetle.....	<i>Cicindela scabrosa</i>	
Scrub tiger beetle	<i>Cicindela scabrosa</i> ^Ω	
Mudflat tiger beetle	<i>Cicindela trifasciata</i>	
Queen	<i>Danaus gilipus</i>	
Monarch	<i>Danaus plexippus</i>	
Lake Wales ridge velvet ant.....	<i>Dasymutilla archboldi</i>	
Robber fly	<i>Diogmites esurians</i>	
Bi-colored scrub cone ant.....	<i>Dorymyrmex flavopectus</i> ^Ω	
Vesper bluet.....	<i>Enallagma versperum</i>	
Swamp darner	<i>Epiaeschna heros</i>	
Horace's duskywing.....	<i>Erynnis horatius</i>	
Duskywing	<i>Erynnis sp.</i>	
Zarucco duskywing.....	<i>Erynnis zarucco</i>	
Eastern pondhawk.....	<i>Erythemis simplicicollis</i>	
Little blue dragonlet	<i>Erythrodiplax miniscula</i>	
Dun skipper.....	<i>Euphyes vestris</i>	
Zebra swallowtail	<i>Eurytides marcellus</i>	
Hubbell's burrowing wolf spider	<i>Geolycosa hubbelli</i>	
Archbold's burrowing wolf spider....	<i>Geolycosa xera archboldi</i>	
Twilight darner	<i>Gynacantha nervosa</i>	
Zebra longwing.....	<i>Heliconius charitonius</i>	
Ceraunus blue	<i>Hemiargus ceraunus</i>	SC
Scrub rosemary wolf spider	<i>Hogna ceratiola</i>	
Fiery skipper	<i>Hylephila phyleus</i>	
Citrine forktail	<i>Ischnura hastata</i>	
Three spotted pleasing fungus beetle...	<i>Ischyryus dunedinensis</i>	
Common buckeye	<i>Junonia coenia</i>	
Conradina mirid bug.....	<i>Keltonia rubrofemorata</i> ^Ω	
Scrub Pygmy Twig Wasp.....	<i>Leptochilus krombeini</i>	
Clouded skipper	<i>Lerema accius</i>	
Viceroy	<i>Limenitis archippus</i>	
Orange and black beetle	<i>Lucidota luteicollis</i>	
Bee killers	<i>Mallophora bomboides</i>	
Puss caterpillar (S. flannel moth) ...	<i>Megalopyge opercularis</i>	
Tequesta grasshopper	<i>Melanoplus tequestae</i>	
Black-Bearded Mydas Fly	<i>Nemomydas melanopogon</i>	
Scrub pygmy mole cricket	<i>Neotridactylus archboldi</i>	
Sandyland onthophagus beetle	<i>Onthophagus aciculatulus</i>	
Punctate gopher tortoise beetle	<i>Onthophagus polyphemi</i> ^Ω	
Blue dasher.....	<i>Pachydiplax longipennis</i>	
Ocola skipper	<i>Panoquina ocola</i>	

* Non-native Species. ∞, β, Ω – see p. 28

Highlands Hammock State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Giant swallowtail.....	<i>Papilio cresphontes</i>	
Eastern tiger swallowtail	<i>Papilio glaucus</i>	
Palamedes swallowtail	<i>Papilio palamedes</i>	
Black swallowtail	<i>Papilio polyxenes</i>	
Spicebush swallowtail	<i>Papilio troilus</i>	
Eastern amberwing	<i>Perithemis tenera</i>	
Canopy jumping spider	<i>Phidippus otiosus</i>	
Regal jumping spider	<i>Phidippus regius</i>	
Workman's jumping spider	<i>Phidippus workmani</i> ^Ω	
Cloudless sulphur	<i>Phoebis sennae</i>	
Nocturnal scrub velvet ant	<i>Photomorphus archboldi</i>	
Highlands firefly.....	<i>Photuris lloydi</i>	
Pearl crescent.....	<i>Phyciodes tharos</i>	
Elongate june beetle.....	<i>Phyllophaga elongata</i>	
Whirlabout skipper	<i>Polites vibex</i>	
Question mark	<i>Polygonia interrogationis</i>	
Fine lined emerald.....	<i>Somatochlora filosa</i>	
Lake Placid funnel wolf spider	<i>Sosippus placidus</i> ^Ω	
Gray hairstreak.....	<i>Strymon melinus</i>	
Carolina saddlebags	<i>Tramea carolina</i>	
Scrub palmetto scarab beetle	<i>Trigonopeltastes floridana</i>	
Yellow-banded long-horned beetle .	<i>Typocerus fulvocinctus</i> ^Ω	
Long-tailed skipper.....	<i>Urbanus proteus</i>	
Southern broken dash	<i>Wallengrenia otho</i>	
Florida zelotes spider.....	<i>Zelotes florodes</i> ^Ω	
Tropical checkered-skipper	<i>Pyrgus oileus</i>	

Primary Habitat Codes

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

Primary Habitat Codes

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

Primary Habitat Codes

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

Superscript Codes in the Species Lists:

* - Non-native species

∞ - Old records, often greater than 40 years old. For plants: old records and/or no vouchers for County. For birds: 1937 HHSP Baynard list with no subsequent sightings reported.

Ω - Recommended for listing as SSC, Archbold Research Station study at HHSP. (Deyrup 2012).

Addendum 6—Imperiled Species Ranking Definitions

Imperiled Species Ranking Definitions

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element 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 element occurrence (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 Fish and Wildlife Conservation Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

FNAL GLOBAL RANK DEFINITIONS

- 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)

Imperiled Species Ranking Definitions

- 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.

Imperiled Species Ranking Definitions

- 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.

STATE

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.

Imperiled Species Ranking Definitions

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

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

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.

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties (revised March 2013)

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 .

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Deena S. Woodward
Division of Historical Resources
Bureau of Historic Preservation
Compliance and Review Section
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

Phone: (850) 245-6425

Toll Free: (800) 847-7278

Fax: (850) 245-6435

Eligibility Criteria for National Register of Historic Places

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.

Preservation Treatments as Defined by Secretary of Interior's Standards and Guidelines

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



**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**

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

RICK SCOTT
GOVERNOR

HERSCHEL T. VINYARD JR.
SECRETARY

MEMORANDUM

TO: Marianne Gengenbach, Program Administrator
Division of State Lands

FROM: Parks Small, Chief, Bureau of Natural and Cultural Resources
Division of Recreation and Parks

Lew Scruggs, Chief, Office of Park Planning *LPS*
Division of Recreation and Parks

SUBJECT: Response to Draft Land Management Review (LMR) Highlands Hammock State Park

DATE: September 2, 2013

The Land Management Review draft report provided to DRP determined that management of Highlands Hammock 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 pursue a biologist for this park given the biological richness and diversity and given the challenges of travel distance for the district biology staff. (VOTE: 7+, 0-)

Managing Agency Response: Agree. The need for additional staff will be included in the next Unit Management Plan. A park ranger position was converted to a Park Service Specialist focusing on Natural and Cultural resources in 2012. 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. Funding is determined annually by the Florida Legislature.

The team recommends that DRP continue efforts to reduce backlogged burn acreage to ensure progress towards achieving a much higher number of acres in fire maintenance, and to prioritize burning during growing season. (VOTE: 7+, 0-)

Managing Agency Response: Agree. However, while eventually conducting a majority of burns in the growing season is a worthy goal, waiting for growing season to conduct burns often

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results in less frequent burns per zone overall. We will strive to conduct prescribed burns in the growing season in appropriate areas. At this time, DRP and other land managers have concluded that the benefits of frequent fire, regardless of season, outweigh introducing fire in the growing season on a less frequent basis - especially during initial phases of burn programs.

The team recommends that DRP pursue a written scrub/scrubby flatwoods management plan that incorporates the guidelines for habitat structure, operational management tactics, and species monitoring protocol. (VOTE: 7+, 0-)

Managing Agency Response: Agree. An interim stand-alone document will be created that will incorporate guidelines for scrub and scrubby flatwoods habitat structure, operational management tactics, and species monitoring (imperiled and invasive). This document will be offered for peer review by local scientific expertise (such as Archbold Biological Research Station scientists, FWC scrub-jay scientists) and other Park Service biologists managing scrub-jay habitat elsewhere. This document can be a reference for the next unit management plan update.

The team recommends that DRP continue efforts to consolidate management guidelines for the federally-listed sand skink and other listed scrub species through the approval of a memorandum of understanding with the USFWS. (VOTE: 7+, 0-)

Managing Agency Response: Agree. The park will continue to seek biological opinions from the U.S. Fish & Wildlife Service and local scientific expertise for resource management activities relevant to xeric habitats at the park. This issue will also be addressed in the next management plan update.

The team recommends that DRP renew efforts to seek partnerships with other agencies to pursue hydrological assessment related to the removal of the ditch upstream of the Little Charlie Bowlegs Creek, and the restoration of the historical floodplain marsh. (VOTE: 7+, 0-)

Managing Agency Response: Agree. An assessment and feasibility study should be pursued to restore the hydrology in the floodplain of Little Charlie Bowlegs Creek. Private landowners control portions of the floodplain and drainage features associated with the ditch, and they would need to agree to a restoration plan that could cause changes to hydrology on their properties. District and Division input will be needed to help address these concerns.

Due to its globally imperiled condition, and its extensive occurrence at this park, the team recommends that DRP pursue specific guidelines for cutthroat grass habitat that identifies and maps cutthroat grass areas, and establishes management and monitoring protocols. (VOTE: 7+, 0-)

Managing Agency Response: Agree. An interim stand-alone document will be created that will incorporate guidelines for cutthroat grass habitat structure, operational management tactics, and species monitoring (imperiled and invasive). This document can be offered for peer review and eventually used as a reference for the next unit management plan.

PLAN REVIEW

The review team average score indicates a need for acknowledgement of natural communities, specifically sandhill. Please provide documentation in the management plan.

Managing Agency Response: Agree. The next unit management plan will incorporate guidelines for sandhill habitat structure, current conditions, desired future conditions, management tactics, and species monitoring (imperiled and invasive).

FIELD REVIEW

The review team average score indicates a need for acknowledgment of maintenance condition of natural communities, specifically sandhill, scrub, basin marsh and seepage slope. Please provide documentation in the management plan.

Managing Agency Response: Agree. The next unit management plan will incorporate assessments of current conditions of natural and altered community types in the park, with guidelines for desired future conditions and management measures needed to reach those conditions. Seepage slope will be changed to another community type, such as cutthroat seep variant of wet prairie; or cutthroat grass flatwoods variant of wet flatwoods, as described by most current FNAI natural community definitions.

The review team average score indicates a need for acknowledgement of resource management prescribed fire, specifically areas being burned (no. acres) and frequency. Please provide documentation in the management plan.

Managing Agency Response: Agree. The next unit management plan will incorporate more information about prescribed fire as required in the updated UMP boilerplate. However, there is a tool for such documentation in place: the park uses a statewide Burn database to establish goals, record acres burned, report on status of backlog and maintenance condition, etc.

The review team average score indicates a need for acknowledgement of restoration of ruderal areas, specifically floodplain marsh and restoration of pastures. Please provide documentation in the management plan.

Managing Agency Response: Agree. The next unit management plan will incorporate assessments of current conditions of natural and altered community types in the park, with guidelines for desired future conditions and the management measures needed to reach those conditions.

The review team average score indicates a need for acknowledgement of hydrologic/geologic function hydro-alteration, specifically hydro-period alteration. Please provide documentation in the management plan.

Managing Agency Response: Agree. The next unit management plan will set the need for assessments of current hydrologic conditions and needs, with guidelines for the management measures needed to reach those conditions.

The review team average score indicates a need for acknowledgement of adjacent property concerns, specifically the Cruiseville Association citrus groves. Please provide documentation in the management plan.

Managing Agency Response: Agree. The next unit management plan will acknowledge adjacent property concerns, including those related to the Cruiseville Association citrus groves.

The review team average score indicates a need for acknowledgement of infrastructure, specifically equipment, staff and funding. Please provide documentation in the management plan.

Managing Agency Response: Agree. The updated unit management plan will address land management funding needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 171 state parks and trails according to priority needs.

Thank you for your attention.

/gk

CC: Valinda Subic, Chief, Bureau of Parks District 4
BJ Givens, Assistant Chief, Bureau of Parks District 4
Steven Dale, Park Manager, Highlands Hammock State Park
Chris Becker, Environmental Specialist, Bureau of Parks District 4