



# FLORIDA DEPARTMENT OF Environmental Protection

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**Ron DeSantis**  
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Secretary

August 23, 2019

Mr. Steven Cutshaw  
Division of Recreation and Parks  
Department of Environmental Protection  
3900 Commonwealth Boulevard, MS 525  
Tallahassee, Florida 32399-3000

**RE: Cedar Key Scrub State Reserve – Lease No. 4523**

Dear Mr. Cutshaw:

On **August 16, 2019**, the Acquisition and Restoration Council (ARC) recommended approval of the **Cedar Key Scrub State Reserve** management plan. Therefore, Division of State Lands, Office of Environmental Services (OES), acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **Cedar Key Scrub State Reserve** management plan. The next management plan update is due August 16, 2029.

Pursuant to s. 253.034(5)(a), F.S., each management plan is required to “describe both short-term and long-term management goals, and include measurable objectives to achieve those goals. Short-term goals shall be achievable within a 2-year planning period, and long-term goals shall be achievable within a 10-year planning period.” Upon completion of short-term goals, please submit a signed letter identifying categories, goals, and results with attached methodology to the Division of State Lands, Office of Environmental Services.

Pursuant to s. 259.032(8)(g), F.S., by July 1 of each year, each governmental agency and each private entity designated to manage lands shall report to the Secretary of Environmental Protection, via the Division of State Lands, on the progress of funding, staffing, and resource management of every project for which the agency or entity is responsible.

Pursuant to s. 259.036(2), F.S., management areas that exceed 1,000 acres in size, shall be scheduled for a land management review at least every 5 years.

Pursuant to s. 259.032, F.S., and Chapter 18-2.021, F.A.C., management plans for areas less than 160 acres may be handled in accordance with the negative response process. This process requires small management plans and management plan amendments be

submitted to the Division of State Lands for review, and the Acquisition and Restoration Council (ARC) for public notification. The Division of State Lands will approve these plans or plan amendments submitted for review through delegated authority unless three or more ARC members request the division place the item on a future council meeting agenda for review. To create better efficiency, improve customer service, and assist members of the ARC, the Division of State Lands will notice negative response items on Thursdays except for weeks that have State or Federal holidays that fall on Thursday or Friday. The Division of State Lands will contact you on the appropriate Friday to inform you if the item is approved via delegated authority or if it will be placed on a future ARC agenda by request of the ARC members.

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

Sincerely,

A handwritten signature in cursive script that reads "Callie DeHaven".

Callie DeHaven  
Director, Division of State Lands  
Department of Environmental Protection

**Cedar Key Scrub State Reserve**

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**Lead Agency:** Department of Environmental Protection  
Division of Recreation and Parks

**Common Name of Property:** Cedar Key Scrub State Reserve

**Location:** Levy County

**Direct Economic Impact:** FY 17-18 \$1,410,868 and 20 jobs added to local economy

**Acreage:** 6,784.31 Acres

**Acreage Breakdown**

<b>Natural Communities</b>	<b>Acres</b>
Mesic Flatwoods	879.87
Sandhill	4.30
Scrub	136.84
Scrubby Flatwoods	837.75
Basin Marsh	786.15
Basin Swamp	523.73
Depression Marsh	95.95
Hydric Hammock	531.38
Mangrove Swamp	5.64
Salt Marsh	1599.26
Blackwater Stream	0.27
Estuarine Composite Substrate	791.60
Estuarine Mollusk Reef	39.86
Artificial Pond	4.90
Canal/Ditch	0.68
Clearcut Pine Plantation	106.08
Clearing/Regeneration	1.58
Developed	4.35
Pine Plantation	432.22
Spoil Area	1.89

**Lease/Management Agreement Number(s):** 4523

**Use:** Single Use

**Management Responsibilities**

**Agency:** Dept. of Environmental Protection, Division of Recreation and Parks

**Responsibility:** Public Outdoor Recreation and Conservation

**Designated Land Use:** Public outdoor recreation and conservation is the designated single use of the property

## Cedar Key Scrub State Reserve

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**Sublease:** None

**Encumbrances:** See Addendum 1 for details

**Type of Acquisition(s):** 1 (see Addendum 1 for details).

### Unique Features

**Overview:** Cedar Key Scrub State Reserve is located in Levy County. Access to the park is from State Road 24 and County Road 347. Cedar Key Scrub State Reserve was initially acquired on December 27, 1978 with funds from Environmentally Endangered Lands (EEL) program. Currently, the park comprises 6,784.31 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and in 2014, the Trustees leased (Lease Number 4523) the property to DRP under a fifty-year lease. [The purpose of Cedar Key Scrub State Reserve is to conserve and protect the distinct and significant biological and geological resources within the park for the benefit of the people of Florida. Cedar Key Scrub also plays a significant role in improving the water quality for adjacent estuaries.](#)

**Natural:** Cedar Key Scrub State Reserve contains biological and geological resources of considerable significance. The sand pine scrub natural community, with its rare endemic species, is considered imperiled not only in Florida but also around the world. The relative isolation of the particular example of scrub found at Cedar Key only serves to increase its ecological value. The development of a scrub community along this particular stretch of the Gulf Coast is due to the presence of ancient sand dunes that were created during periods of higher sea levels. These dune deposits are rare along the Big Bend coast and represent an important geological feature that has had a major role in the development of the natural and cultural resources of the area.

**Archaeological/Historical:** Eight archaeological and historical sites and two resource groups that fall into two broad periods, prehistoric and 1821 to the mid-20<sup>th</sup> Century have been recorded on the reserve property. Three of the locations found are historic twentieth century sites including two refuse sites and another associated with the turpentine industry. The other sites are prehistoric archaeological and consist of two artifact scatter sites, one shell midden, one prehistoric habitation site, and one lithic scatter site. An abandoned railroad bed, formerly the Florida Railroad that ran from Cedar Key to Fernandina between 1861 and 1932, lies southeast of State Road 24.

### Management Goals, Objectives and Actions

Measurable objectives and actions have been identified for each of the Division's management goals for Cedar Key Scrub [State Reserve](#). 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

## Cedar Key Scrub State Reserve

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to fulfill the management goals and objectives of this park.

While, the Division of Recreation and Parks 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 Division 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 Division 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 Division's resource management strategies are systematically evaluated to determine their effectiveness. The process and the information collected is used to refine techniques, methodologies and strategies, and ensures that each park's prescribed management actions are monitored and reported as required by Chapters 253.034 and 259.037, Florida Statutes. The goals, objectives and actions identified in this management plan will serve as the basis for developing annual work plans for the park. Since the plan is based on conditions that exist at the time the plan is developed, the annual work plans will 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.**

- *Objective A: Conduct/obtain an assessment of the park's hydrological restoration needs.*
- *Objective B: Restore natural hydrological conditions and function to approximately 288 acres of basin marsh, 459 acres of mesic flatwoods, 232 acres of hydric hammock, and 238 acres of basin swamp natural communities.*

#### Natural Communities Management

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

- *Objective A: Within 10 years, have 2400 acres of the park maintained within optimum fire return interval.*

## Cedar Key Scrub State Reserve

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- *Objective B: Conduct habitat/natural community restoration activities on 432 acres of pine plantation natural community.*
- *Objective C: Conduct natural community/habitat improvement activities on 500 acres of scrub and scrubby flatwoods natural communities to prepare zones for safe applications of prescribed fire.*
- *Objective D: Conduct natural community/habitat improvement activities on 106 acres of clearcut pine plantation.*

### **Imperiled Species Management**

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

- *Objective A: Develop/update baseline imperiled species occurrence inventory lists for plants and animals.*
- *Objective B: Monitor and document 7 selected imperiled animal species in the park.*
- *Objective C: Monitor and document 1 imperiled plant species in the park.*

### **Exotic Species Management**

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

- *Objective A: Annually treat 2 acres of exotic plant species in the park.*
- *Objective B: Implement control measures on 1 nuisance animal species in the park.*

## Cultural Resource Management

### **Cultural Resource Management**

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

- *Objective A: Assess and evaluate 9 of 9 recorded cultural resources in the park.*
- *Objective B: Compile reliable documentation for all recorded historic and archaeological resources.*
- *Objective C: Bring 1 of 9 recorded cultural resources into good condition.*

**Ten-Year Implementation Schedule and Cost Estimates:** See Table 8, pages 99—108.

**Acquisition Needs/Acreage:** Approximately 6,207 acres of lands are identified within the optimum boundary for Cedar Key Scrub State Reserve (see Optimum Boundary Map, page 79). Properties proposed around the park are proposed for acquisition to create a constant connection of conservation lands from the Lower Suwannee National Wildlife Refuge through Cedar Key

## Cedar Key Scrub State Reserve

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Scrub and continuing through Waccasassa Bay Preserve State Park. This connection would provide vital habitat connection for species throughout Dixie and Levy Counties. Additionally acquisition of these properties would ensure a buffer for the park with the growing population of Levy County.

**Surplus Lands/Acreage:** No lands are considered surplus to the needs of the park.

**Public Involvement:** DRP solicited public input by conducting a public workshop on Wednesday, February 27, 2019. The purpose was to present the Management plan to the public. On Thursday, February 28, 2019, an Advisory Group meeting was held. The purpose of this meeting was to provide the Advisory Group members the opportunity to review and discuss the management plan (see Addendum 2).

### **Summary of Significant Changes in the Management Plan Update**

New recreational opportunities and support facilities have been proposed that are appropriate for this park and consistent with the DRP mission. These include:

#### **Recreation Facilities**

##### State Road 24 Trailhead

Update Equestrian Facilities  
Horse Trailer Parking  
Small Corral  
Hitching Posts  
Install Potable Water  
High Efficiency Permanent Restroom  
Improve Interpretive Kiosks

##### Trail System

Reconfigure Trail System  
Update Trail Markers  
Update Trailhead Maps  
Add Interpretive Kiosks

##### County Road 347 Trailhead

Update Equestrian Facilities  
Horse Trailer Parking  
Small Corral  
Hitching Posts  
High Efficiency Portable Restroom

##### Panther Ridge Trailhead

Entrance for Hunters  
Hiking Trails (6 mi.)  
Parking Area

Checkpoint Station

#### **Support Facilities**

Existing Shop Area  
Update/Renovate Shop  
Pole Barn





# Cedar Key Scrub State Reserve

## **Approved Unit Management Plan**

**STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL PROTECTION**

**Division of Recreation and Parks  
August 2019**





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## INTRODUCTION

Cedar Key Scrub State Reserve is located in Levy County (see Vicinity Map). Access to the park is from State Road 24 and County Road 347 (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

Cedar Key Scrub State Reserve was initially acquired on December 27, 1978 with funds from Environmentally Endangered Lands (EEL) program. Currently, the park comprises 6,784.31 acres. The Board of Trustees of the Internal Improvement Trust Fund (Trustees) hold fee simple title to the park and in 2014, the Trustees leased (Lease Number 4523) the property to DRP under a fifty-year lease. The current lease will expire on July 10, 2064.

Cedar Key Scrub State Reserve is designated single-use to provide public outdoor recreation and other park-related uses. There are no legislative or executive directives that constrain the use of this property (see Addendum 1).

### **Purpose and Significance of the Park**

Cedar Key Scrub State Reserve contains biological and geological resources that are of considerable significance. The reserve's hydric hammock allows for temporary storage of surface water directly resulting in improved water quality and attenuation of freshwater pulses into the adjacent estuaries. The development of the scrub community at the reserve increases its ecological value significantly. Ancient sand dune deposits during a time of higher sea level played a major role in the development of the natural and cultural resources of the area.

### **Park Significance**

- The reserve protects the Florida scrub natural community which is among the rarest in the state. This provides visitors with unique wildlife viewing and interpretive opportunities to learn about this rare natural community.
- The reserve protects many endangered and imperiled species such as the Florida scrub-jay, gopher tortoise, and the manatee.
- The reserve protects a variety of natural communities including scrub, hydric hammock, mangrove swamp, and salt marsh which provide visitors with diverse wildlife viewing opportunities.
- The reserve offers resource-based recreation in the form of hiking and wildlife viewing on more than 13-miles of multi-use trails which are open to hikers, bicyclists, and equestrians. A portion of the Florida Circumnavigational Paddling Trail flows through the reserve. The reserve is one example in the state which allows seasonal hunting.

Cedar Key Scrub State Reserve is classified as a Reserve in the DRP's unit classification system. In the management of a Reserve, preservation and enhancement of natural conditions is all important. Resource considerations are

given priority over user considerations and development is restricted to the minimum necessary for ensuring its protection and maintenance, limited access, user safety and convenience, and appropriate interpretation. Permitted uses are primarily of a passive nature, related to the aesthetic, educational and recreational enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Program emphasis is placed on interpretation of the natural and cultural attributes of the preserve.

### **Purpose and Scope of the Plan**

This plan serves as the basic statement of policy and direction for the management of Cedar Key Scrub State Reserve 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 2005 approved plan.

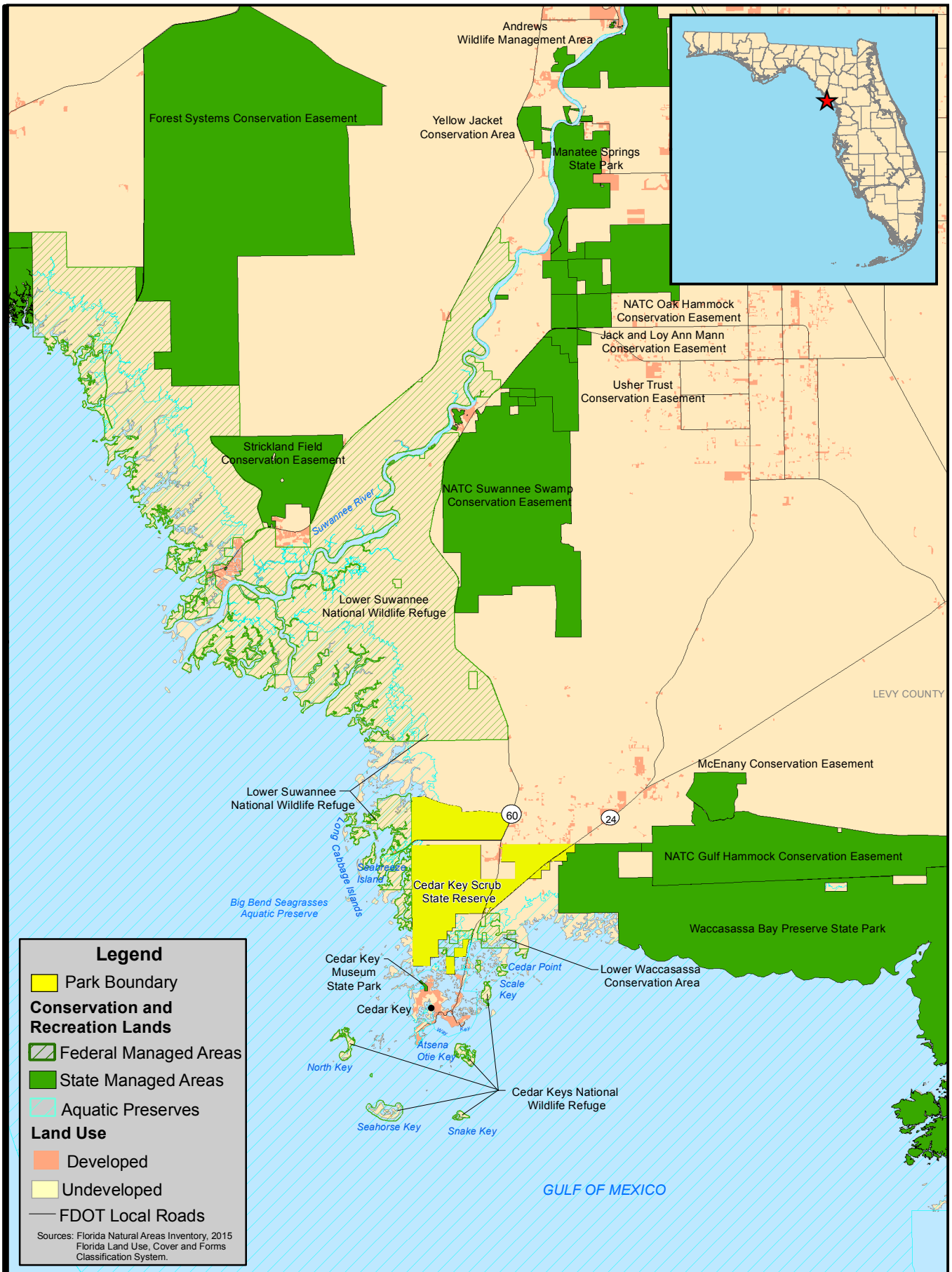
The plan consists of three interrelated components: the Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and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

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



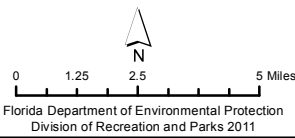


**Legend**

- Park Boundary
- Conservation and Recreation Lands**
- Federal Managed Areas
- State Managed Areas
- Aquatic Preserves
- Land Use**
- Developed
- Undeveloped
- FDOT Local Roads

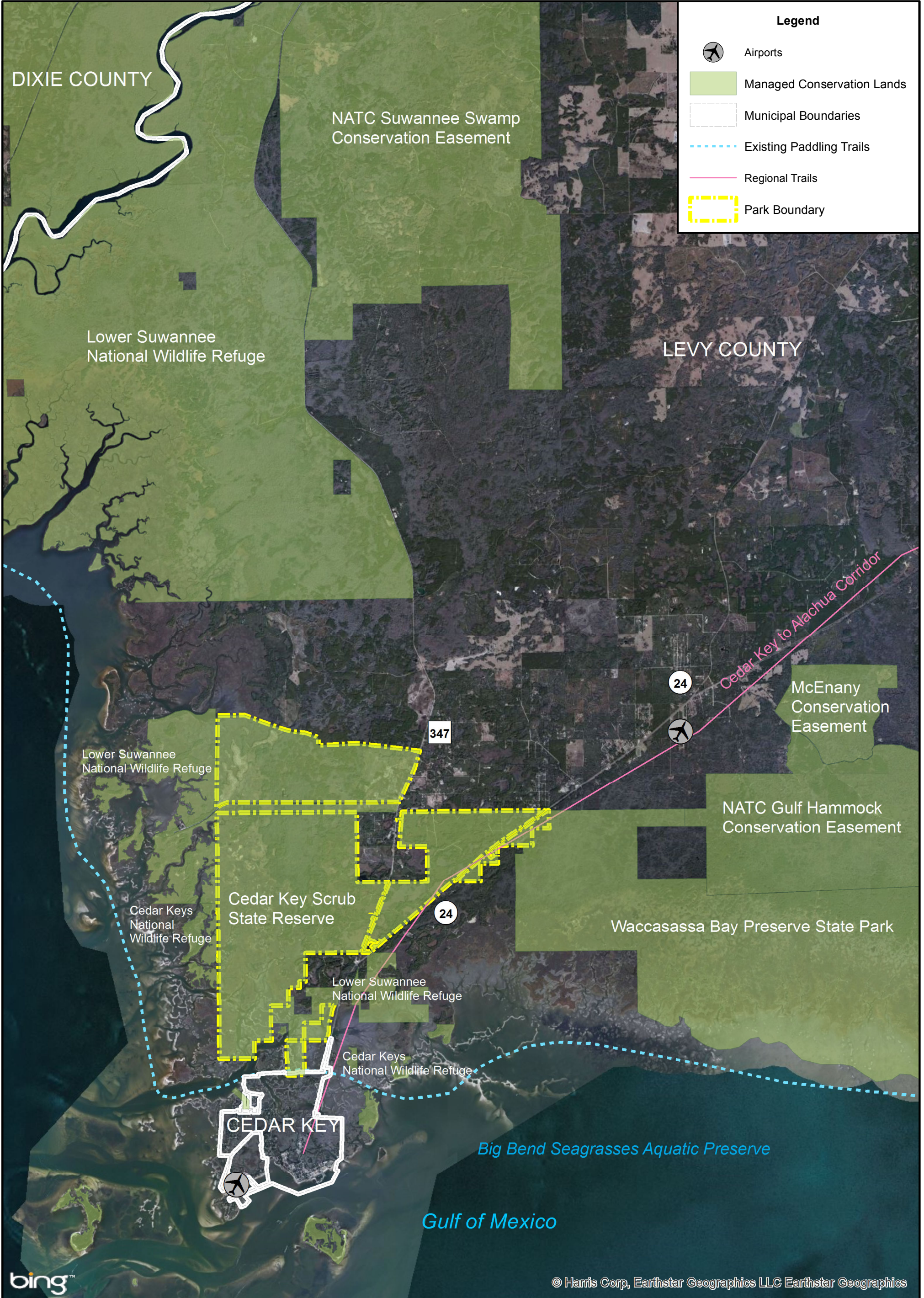
Sources: Florida Natural Areas Inventory, 2015  
Florida Land Use, Cover and Forms Classification System.

**CEDAR KEY SCRUB  
STATE PARK**



**VICINITY  
MAP**

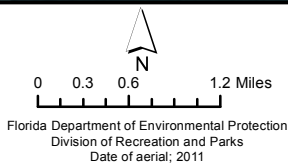




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**CEDAR KEY SCRUB  
STATE RESERVE**



**REFERENCE MAP**



from complying with the appropriate local, state or federal agencies. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes, and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

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

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

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 in order 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.*

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

Many operating procedures are standardized system-wide and are set by internal direction. These procedures are outlined in 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. The Florida Department of Environmental Protection (DEP), Florida Coastal Office (FCO) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Coastal Systems aids staff in planning and construction activities seaward of the Coastal Construction Control Line (CCCL). In addition, the Bureau of Beaches and Coastal Systems aid the staff in the development of erosion control projects.

## **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 [Wednesday February 27, 2019](#) and [Thursday February 28, 2019](#), respectively. Meeting notices were published in the Florida Administrative Register on [February 19, 2019 VOL 45/33](#), 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**

Cedar Key Scrub State Reserve 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 II or III waters by the Department. This park is adjacent to the Big Bend Seagrasses 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.

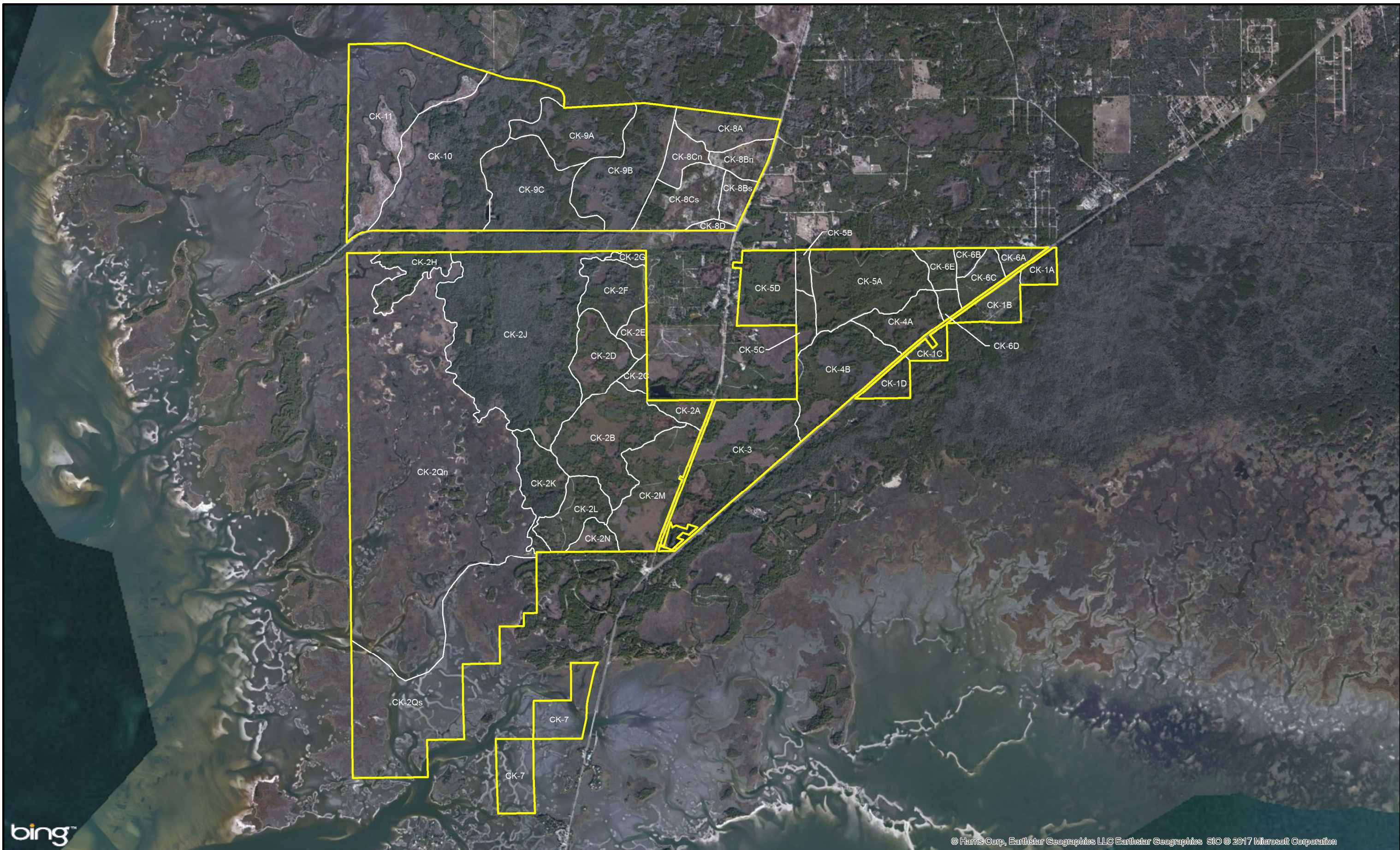
The DRP's philosophy of resource management is natural systems management. Primary emphasis is placed on restoring and maintaining, to the degree possible, the natural processes that shaped the structure, function, and species composition of Florida's diverse natural communities as they occurred in the 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.

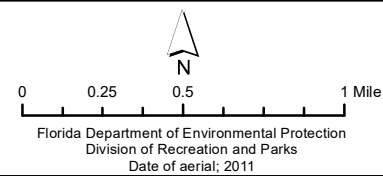
Because park units are often components of larger ecosystems, their proper management can be affected by conditions and events that occur beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program that assesses resource conditions, evaluates management 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 on the ground that are used to reference management activities (see Management Zones Map). The shape and size of each zone may be based on natural community type, burn zone, and the location of existing roads and natural fire breaks. It is important to note that all burn zones are management zones; however, not all management zones include fire-dependent natural communities. Table 1 reflects the management zones with the acres of each zone.

<b>Table 1. Cedar Key Scrub State Reserve Management Zones</b>			
<b>Management Zone</b>	<b>Acreage</b>	<b>Managed with Prescribed Fire</b>	<b>Contains Known Cultural Resources</b>
CK-1a	28.20	Y	Y
CK-1b	54.03	Y	Y
CK-1c	24.33	Y	Y
CK-1d	36.44	Y	Y
CK-2a	31.67	Y	
CK-2b	230.83	Y	
CK-2c	19.09	Y	
CK-2d	103.12	Y	Y
CK-2e	29.10	Y	
CK-2f	103.95	Y	
CK-2g	12.80	Y	
CK-2h	73.60	Y	
CK-2j	625.25	Y	Y
CK-2k	98.29	Y	Y
CK-2l	90.02	Y	Y
CK-2m	182.80	Y	
CK-2n	32.16	Y	
CK-2qn	1454.17	Y	Y
CK-2qs	542.99	Y	
CK-3	286.12	Y	
CK-4a	82.65	Y	
CK-4b	194.17	Y	Y
CK-5a	215.74	Y	
CK-5b	18.85	Y	
CK-5c	30.93	Y	
CK-5d	123.60	Y	
CK-6a	23.08	Y	Y
CK-6b	18.17	Y	
CK-6c	43.48	Y	
CK-6d	16.39	Y	
CK-6e	37.15	Y	
CK-7	160.15	Y	Y
CK-8a	87.54	Y	
CK-8bn	48.63	Y	
CK-8bs	38.67	Y	
CK-8cn	47.85	Y	
CK-8cs	118.13	Y	
CK-8d	11.54	Y	
CK-9a	152.74	Y	
CK-9b	211.25	Y	
CK-9c	220.28	Y	
CK-10	430.11	Y	
CK-11	384.26	Y	



CEDAR KEY SCRUB STATE RESERVE



MANAGEMENT ZONES MAP



## Resource Description and Assessment

### Natural Resources

#### Topography

Cedar Key Scrub State Reserve (Cedar Key Scrub) is located within the Gulf Coastal Lowlands of Florida's mid-peninsular physiographic zone (White 1970). This western Levy County coastal reserve lies squarely within the heart of an expansive wilderness called Florida's Big Bend region (Hine et al. 1988; Davis 1997). The Big Bend coastline spans an eight-county wide area on Florida's west coast from Ochlockonee River in Wakulla County southward to the Anclote River in Pasco County. Florida's Big Bend remains relatively undeveloped from Levy County northward except for small scattered tourist and fishing towns, such as the village of Cedar Key.

Much of the Big Bend coastline, including Waccasassa Bay to the south of the reserve and Suwannee Sound to the north, is also part of a Coastal Swamp sub-region that is characterized by low elevation coastal wetlands and a drowned karst topography (Hine et al. 1988; Wolfe et al. 1990). The Coastal Swamps are also a major discharge zone for the Floridan aquifer, which will be discussed further below under hydrology (SRWMD 2006; Raabe et al. 2010).

Cedar Key Scrub is unique in that it is part of an ancient dune field that formed sometime around the end of the Pleistocene epoch when the coastline was roughly 100 miles further to the west (McFadden and Palmiotto 2013). These relict paleodunes, including numerous offshore islands in the vicinity of Cedar Key, are predominately underlain by an ancient limestone escarpment and capped by substantial deposits of wind-blown quartz sand sediment of varying thicknesses. These deposits accumulated over the geologic past during a period of lowered sea levels (Vernon 1951; Faught and Carter 1998; Bryan et al. 2008). Elevations at Cedar Key Scrub can range from below mean sea level (msl) within the tidal flats along the reserves western boundary up to 32 feet at some of the largest dunes in the northeast portion of the park. Drainage is primarily towards the Gulf of Mexico through the numerous tidal creeks and marshes that extend into the reserve. In the interior of the reserve are numerous shallow depressions that vary widely in size and vegetative structure.

Several high elevation sand ridges are bisected by State Road 24 as it cuts through the reserve. Other topographic alterations include service roads, abandoned logging-tram beds, firebreaks, and ditches. Fire plow lines were cut during wildfire suppression activities on several occasions over the past fifty years. The most recent major fire suppression occurred in May 2009. While the long-term effects of fire plow scars on the topography and hydrology of the reserve are not yet understood, there is definitely cause for concern.

Given the low elevation nature of this park, potential impacts of sea level rise to the property's natural and cultural resources are an important management concern (Scavia et al. 2002; Ellis et al. 2004; Dean et al. 2004).

## **Geology**

Florida geologic history is long and composed of several distinct periods of time (Bryan et al. 2008). The deposition of Cenozoic sediments (i.e. ca. 65 million years ago) in Florida range in age from Paleocene to Recent (i.e. Holocene) times, but the carbonate rock strata that formed during the Eocene or younger are the only visible remnants that are exposed across the state (Chen 1965). Florida's most significant and oldest exposed surface carbonate rocks (i.e. Middle Eocene age) occur in Levy and Citrus counties.

The relevant geologic formations that underlie Cedar Key Scrub, in descending order (youngest to oldest), are Pleistocene age surficial marine deposits (i.e. Silver Bluff terrace), four Eocene age deposits that include Ocala Limestone (i.e. Crystal River, Williston and Inglis formations), Avon Park Limestone, Lake City Limestone and Oldsmar Limestone and Paleocene age Cedar Keys Limestone (Chen 1965; Hine et al. 1988; Slabaugh et al. 1996).

Undifferentiated surficial marine deposits occurring in the Cedar Key Scrub State Reserve consist of ancient dunes that likely originated from wind related processes (White 1970). These deposits vary in thickness due to erosion of the dune formations and solution within the underlying karst. Sand deposits in the reserve are part of the Silver Bluff marine terrace (Cooke 1945).

The Ocala Limestone, next in sequence, comprises three distinct carbonate limestone sediment deposits. In descending order, these deposits include the Crystal River Formation, the Williston Formation and the Inglis Formation (Slabaugh et al. 1996). The limestone formations that comprise these deposits can occur at the ground surface as exposed rock outcrops. These outcrops are commonly observed within low-lying coastal wetlands of the reserve (e.g., salt marshes) where overlying sands are less abundant. The Ocala Limestone is also an important aquifer-bearing unit, with enhanced porosity, cavernous flow, and permeable substrate. These permeable limestone features allow for extensive dissolution and abundant groundwater movement through numerous preferential flow pathways (Raabe and Bialkowska-Jelinska 2010). The Ocala Limestone is differentiated based on its physical characteristics (i.e. lithology) and fossil content. The Crystal River Formation and upper portions of the Williston Formation are typically white to cream, abundantly fossiliferous, chalky limestones. The lower Williston and the Inglis Formations commonly are alternating hard and soft, white, tan and gray, dolomitic and fossiliferous limestones. The Ocala Limestone may attain a thickness of 125 feet, but the average is 100 feet (Slabaugh et al. 1996).

Below the Ocala Limestone lies the Avon Park Limestone, which is variable in lithology. It is a tan, buff and brown dolomite that is often interbedded with white, cream and yellow-gray limestone. This limestone commonly contains varying amounts of peat, coal, and plant remains. Some fossils are also present. The Avon Park limestone is typically 150 feet thick; however, a thickness of 800 to 1,100 feet can be reached (Slabaugh et al. 1996).

In Levy County, Lake City Limestone is variable in composition. This fossiliferous limestone is tan to cream colored and is peat flecked; it sometimes contains

coquina (i.e. sedimentary rock composed of shells and other small invertebrates), the minerals gypsum and dolomite. The thickness of the formation varies from 575 to 900 feet.

Earliest of the Eocene deposits are the Oldsmar Limestone, pervasively dolomitized with seams of chert (i.e. mineralized limestone) and the mineral anhydrite. The thickness of this formation ranges from just under 400 feet to slightly over 550 feet.

The Cedar Keys Formation is composed of interbedded tan to gray, often fossiliferous limestone, and of tan to brown, crystalline to chalky dolomite. Gypsum has impregnated large sections and may occur as thin lenses. The Cedar Keys Formation is approximately 600 feet thick (Chen 1965).

There are no known alterations of the reserve's geological formations.

### **Soils**

There are nine soil types present within Cedar Key Scrub State Reserve (Slabaugh et al. 1996). These soil types range from well-drained sandy soils in the uplands to poorly drained, frequently flooded, mucky soils in areas of tidal marsh (see Soils Map). Addendum 4 contains a complete list and descriptions of these soils.

Several areas within the reserve have experienced some degree of soil erosion. Where service roads run along the edges of stabilized dunes and where State Road 24 slices deeply through the dunes, sands tend to destabilize and the dunes become more prone to erosion.

Illegal foot and vehicular access to the dune ridges traversed by State Road 24 have caused some slumping of the cut edges of the dunes. Some soil disturbance has also occurred where service roads intersect wetland sites.

Lastly, and most significantly, fire plow scars remaining from several wildfire suppression events have impacted soils within the reserve. While the older plow lines are relatively stable and have become somewhat restored with the passage of time, some of the more recent ones may require additional re-contouring. On the other hand, most of the regular firebreaks installed in the reserve under non-emergency conditions do not appear to be causing impacts to soil or water resources. Management activities will follow generally accepted best management practices to minimize or prevent soil erosion and to conserve soil and water resources on site.

### **Minerals**

Although no mining is known to have occurred within the reserve, several borrow pits are located within the park or near the park boundary. In most cases these borrows were excavated for fill dirt or sand. No other mineral deposits are known to occur within the reserve.

## **Hydrology**

In addition to being part of the Big Bend region as described under topography, Cedar Key Scrub is also positioned at the northern extent of a unique karst-dominated landscape called the Springs Coast (Wolfe 1990). In its southern reaches, the Springs Coast hosts some of the largest spring groups in the state (Spechler and Schiffer 1995). Although there are no major spring run streams found on the reserve, there are at least three significant groundwater discharge points associated with two of Cedar Key Scrub's western tidal systems, namely Lukens and Goose Creeks (Raabe and Bialkowska-Jelinska 2010). The most prominent hydrological features of the reserve are its diverse freshwater wetlands, coastal hydric hammocks, brackish ecosystems containing portions of five major tidal creeks and the above mentioned submarine groundwater discharge (SGD) fractures (Xinya et al. 2009).

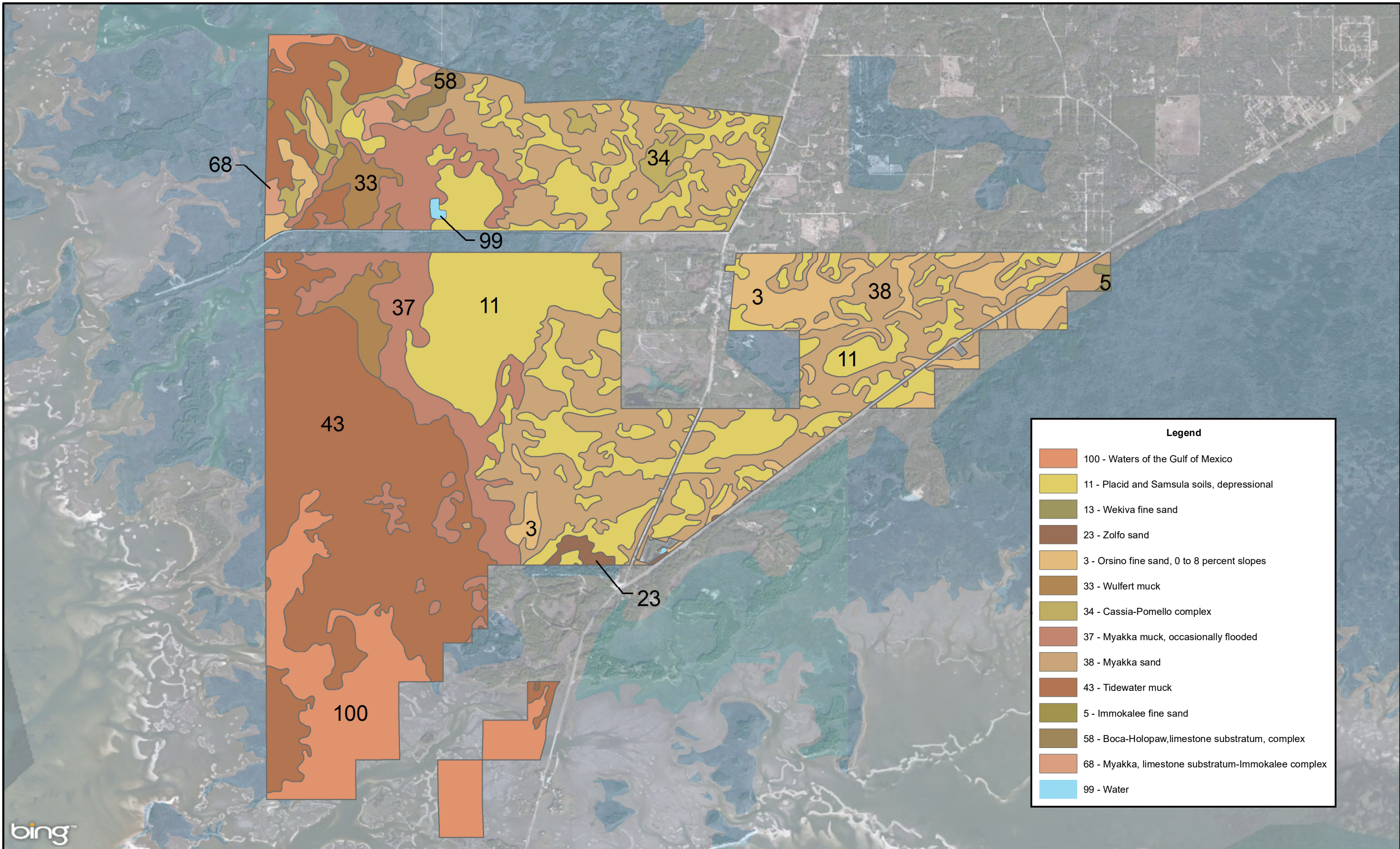
These SGD fractures that are scattered throughout the Big Bend region, as well as the numerous well-known spring-fed rivers within the Springs Coast, are all embedded within a large matrix of coastal hydric hammock, salt marsh, mangrove swamp, seagrass and other nearshore habitats that provide a constant source of freshwater to a relatively stable estuarine environment (Zieman and Zieman 1989; Raabe and Stumpf 1996). The origin, density and locations of important underground fracture traces in western Levy County have been documented and discussed (Vernon 1951; Raabe and Bialkowska-Jelinska 2010; Lines et al. 2012). The aforementioned SGD limestone features formed as a result of extensive chemical erosion that occurred over geologic time that was associated with sea level changes, freshwater discharges, and is closely aligned with regional geology of fractures and faults. (Raabe and Bialkowska-Jelinska 2010). It is important to understand that the SGD fractures are directly connected to the Floridan aquifer system (Vernon 1951; Hine et al. 1988).

Scientists that have worked in Big Bend region over the past three decades have also documented that Florida's west coast shorelines have been undergoing a dramatic natural community transformation from previously dominated freshwater systems to one that is predominately salt water (Casteneda and Putz 2007). It is unknown how many freshwater wetlands in Cedar Key region have converted into brackish systems as a result of lowered aquifer levels from significant historic droughts, increased groundwater demand or changes associated with global sea level rise (Johnston and Bush 1988; Williams et al. 1999; Raabe et al. 2004; Knight 2015; Williams et al. 2003).

Technically, the Cedar Key Scrub lies within the Waccasassa River drainage basin (SRWMD 2006). Due to the close proximity of the Gulf of Mexico, however, no surface water from the reserve actually enters the Waccasassa River or its tributaries. The reserve's ancient paleodunes occupy a very distinct topographically elevated area between the Lower Suwannee River and the Waccasassa River drainage basins. Within the reserve, surface water is part of a matrix of freshwater wetlands that gradually drain toward the estuarine ecosystems.

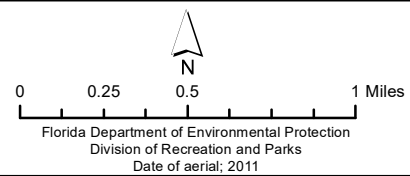
Big Bend Sea Grasses Aquatic Preserve lies adjacent to and shares a common





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CEDAR KEY SCRUB STATE RESERVE



SOILS MAP



boundary with the western portion of Cedar Key Scrub State Reserve. This aquatic preserve is Florida's most significant publicly managed estuary and contains the largest seagrass beds in the state (Mattson et al. 2007; FDEP 2014). All of the freshwater wetlands in the reserve are considered Class III waters, while the estuarine areas are classified as Class II waters, although there are restrictions on shellfish harvesting (FDEP 2014). The tidal creeks and adjacent estuarine areas within the reserve are classified as either Conditionally Restricted or Conditionally Approved shellfish harvesting areas.

Cedar Key Scrub has five primary wetland types including basin marshes with predominantly sawgrass (*Cladium jamaicense*), basin swamps containing cypress (*Taxodium ascendens*) with one locally known as Black Point Swamp, hydric hammocks, depression marshes within flatwoods, as well as brackish tidal marshes and creeks. There are six major tidal creeks, Lukens, Goose, Seabreeze, Sand, Dennis and Clark, that intermingle with the westernmost areas of the reserve and capture surface water flow from hydric hammocks and SGD seepage.

The coastal hydric hammock natural community, which occurs inland from the salt marsh, has a significant impact on hydrologic processes within the landscape (Wharton et al. 1977; Vince et al. 1989). During periods of heavy rainfall, hydric hammocks often flood. Surface water travels through this community as sheet flow, eventually entering tidal creeks that connect to estuarine waters. Through the temporary storage of surface water, hydric hammock improves water quality and attenuates freshwater pulses into estuarine systems (Vince et al. 1989; Wolfe 1990). For at least 25 years, sea level rise has played a pivotal role in the conversion of several hydric hammock stands just south of Cedar Key Scrub, within the Waccasassa Bay and Crystal River Preserves into salt-dominated communities (e.g., salt marsh/mangrove) (Williams 2003; Ellis et al. 2004).

The quality of surface waters within the reserve is generally considered good; relatively few impacts to wetland systems have been observed. Nonetheless, protection of surface waters and wetlands within the reserve is critical for the preservation of water quality within down-gradient salt marsh and estuarine systems.

Groundwater resources in the reserve include the Floridan aquifer and localized surficial aquifers. In some areas, particularly in flatwoods and certain isolated wetlands, localized development of hardpans or impermeable organic layers may occur, creating perched water tables. These function as surficial aquifers that are connected to the Floridan aquifer. Surface waters may freely enter either of these aquifers. Additionally, during periods of low groundwater levels salt water from the Gulf of Mexico may flow inland through SGD fracture channels and mix with the Upper Floridan in a process called reverse flow (Tihansky 2004). It is unknown what contribution of groundwater resources are shared between the SGD fractures of the western marshes of the reserve and the groundwater connections with the Waccasassa River. A Minimum Flows and Levels (MFL) determination was set for the Waccasassa River in 2006 (SRWMD 2006).

Due to these circumstances, the potential for localized groundwater contamination may be high at times. Within western Levy County, the direction of groundwater

movement through the maze of underground fractures and faults (i.e. preferential flow pathways) can be from both northeast to southwest or northwest to southeast (Lines et al. 2012). Primary mechanism of Floridan aquifer recharge is by rainfall that percolates through the permeable sands of the northwestern and eastern portions of Levy County. The coastal hydric hammock, tidal marshes, and exposed limestone flats of the western portions of the reserve all serve as potential SGD sites for groundwater discharge since the Floridan aquifer system lies at or near the surface, especially where limestone rock is visible (Slabaugh et al. 1996; Raabe et al. 2011).

Saltwater encroachment along Florida's coasts, including the Big Bend region, has long been recognized as a threat to groundwater quality (Fairchild and Bentley 1977; Fretwell 1983). The drinking water wells that supply the town of Cedar Key are located at two sites within or adjacent to the reserve. One well is located on County Road 347 about 0.5 mile north of the intersection of County Road 347 and State Road 24, while the other is located about 1.2 miles northeast of the same intersection along State Road 24.

Generally, the water quality of the Floridan aquifer is good; however, in the Springs Coast region, including Cedar Key Scrub State Reserve, a natural saltwater wedge that diminishes in thickness landward extends inland from the Gulf, intruding into the Floridan aquifer. The depth of the saline wedge ranges from zero at the coast to around 250 feet inland (Fernald and Purdum 1998; Guvanasekera et al. 2011). Boundaries of the zone of transition from saltwater (19,000 mg/L chloride) to freshwater (25 mg/L chloride) can fluctuate in response to changes in aquifer recharge and discharge (Fretwell 1983).

During the statewide drought of 2010-12, drinking water wells in Cedar Key were one of the many coastal regions significantly impacted by salt water intrusion. Similarly, during the major drought of 1998-2002, water managers were equally concerned about the significant human-induced influence to surface and groundwater resources statewide (Copeland et al. 2011). It is highly probable that saltwater encroachment within the Floridan aquifer contributes to the brackish nature of surface waters within the reserve, and that this phenomenon may alter the water chemistry of freshwater ponds over time.

Freshwater systems in the western half of the reserve have certainly been partially compromised by service roads that cross narrow wetland linkages between basin marshes. In the spring of 1996, one concrete bridge and two concrete fording mats were installed to minimize road impacts and to provide consistent, all-weather access for service vehicles and fire equipment. Funding for the project was provided through the state's Pollution Recovery Trust Fund. Additional wetland crossings are still required for all-weather access, particularly in the flatwoods west of County Road 347.

Some of the freshwater wetlands have also been impacted by partial impoundment, when State Road 24, County Road 347, and County Road 326 were constructed. Other impacts include fire plow lines installed during emergency wildfire suppression activities. Many of the more recent plow lines have been re-contoured, but certain areas may still require additional work.

According to FDEP basin status reports, the water quality of some estuary waters along the western edge of the reserve were labeled as potentially impaired in 2003 because of excessive nutrients, and mercury in fish tissue (Silvanima et al. 2008; FDEP 2003; FDEP 2013a). Based on the Impaired Waters Rule (IWR), the EPA in 2003 verified that those waterbodies were indeed impaired, which meant that their surface waters did not meet applicable state water quality standards (IWR, Chapter 62-303 F.A.C). This designation triggered a long chain of mandatory requirements that Florida would have to accomplish to achieve compliance with EPA regulations concerning polluted waterbodies. For the some coastal estuary portions of the park the compliance process started in 2013 with the assignment of a TMDL Numeric Nutrient Criteria (FDEP 2013b) and the initiation of a Basin Management Action Planning (BMAP). As of 2019, the BMAP for these coastal estuarine waters had not been completed.

### **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, 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 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 (including those that are imperiled or endemic), and preserving intact ecotones that link natural communities across the landscape.

The park contains 15 distinct natural communities as well as altered landcover types (see Natural Communities Map). A list of known plants and animals occurring in the park is contained in Addendum 5.

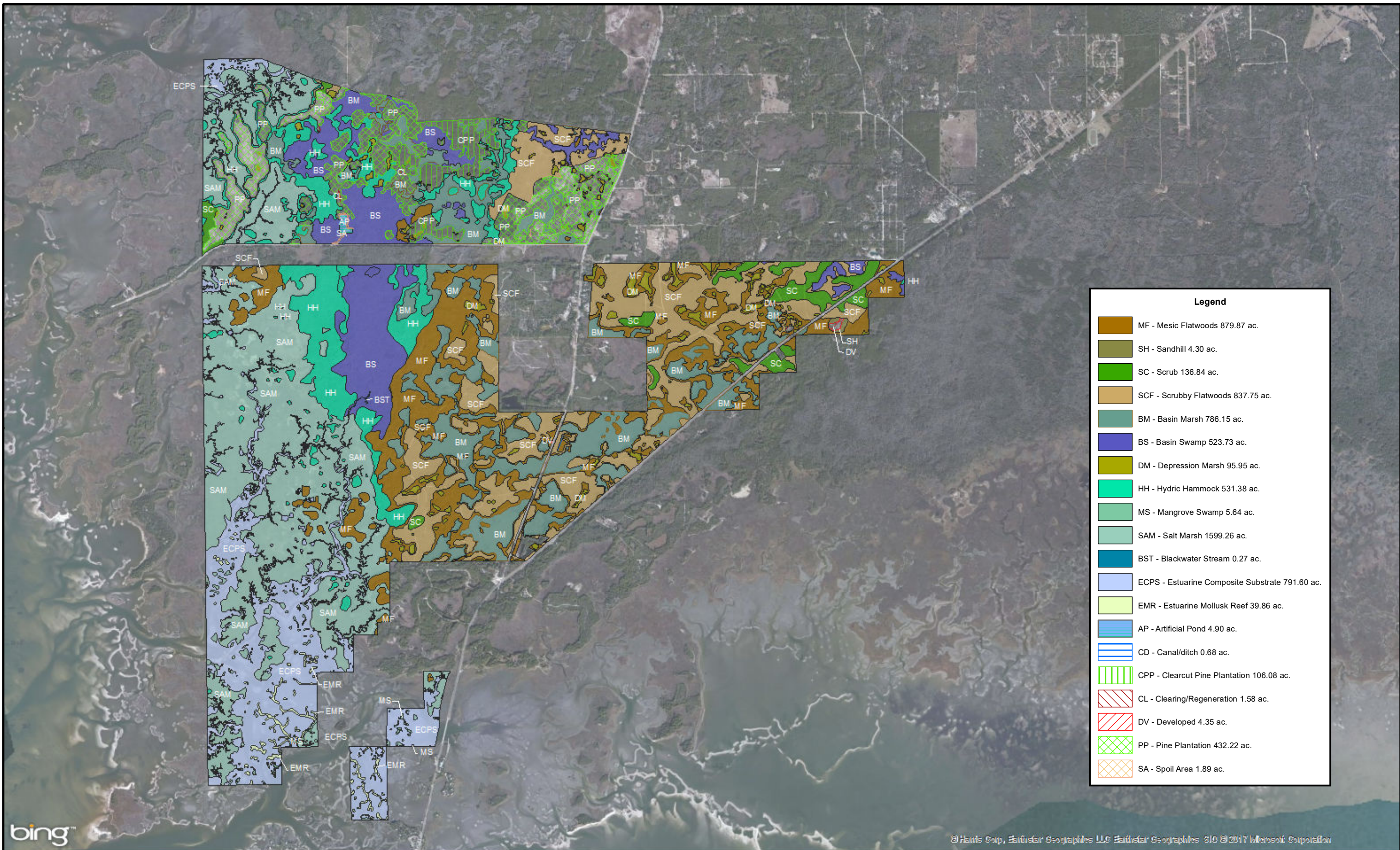
## MESIC FLATWOODS

*Desired future condition:* In the typical mesic flatwoods of west central Florida, the dominant pine will generally be longleaf pine (*Pinus palustris*) with occasional stands of slash (*Pinus elliottii*) in coastal conditions adjacent to tidal and basin marshes. Native herbaceous groundcover will cover at least 50% of the area at a height of less than three feet. Saw palmetto (*Serenoa repens*) will comprise less than 50% of the total shrub cover, also at a height of less than 3 feet. Other common shrub species may include gallberry (*Ilex glabra*), winged sumac (*Rhus copallinum*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), yaupon holly (*Ilex vomitoria*), running oak (*Quercus pumila*), pawpaw (*Asimina* spp.), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), coontie (*Zamia pumila*), bracken fern (*Pteridium aquilinum*) and dwarf huckleberry (*Gaylussacia dumosa*). These shrubs will generally be knee-high or less in height. Few if any large trunks of saw palmetto will run prostrate along the ground. Herbaceous species diversity will be high, vary with site moisture, and may include peas (*Galactia* spp.), goldenrods (*Solidago* spp.), queens delight (*Stillingia sylvatica*), blackroot (*Pterocaulon virgatum*), foxtail grass (*Setaria parviflora*), wiregrass (*Aristida stricta*), silkgrass (*Pityopsis graminifolia*) and multiple species from the *Liatris* and *Carphephorus* genera. The optimal fire return interval for this community is 2 to 4 years.

*Description and assessment:* The mesic flatwoods natural community occurs at slightly lower elevations than the scrub and scrubby flatwoods communities, and often borders basin marsh or other wetland communities. The distinctions among mesic flatwoods, scrubby flatwoods, and scrub are based not only on differences in topographic elevation, but also on soil characteristics and, to some extent, on the fire history of a site.

Both longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) occur within the mesic flatwoods at Cedar Key Scrub, but slash pines predominate in most areas. Selective removal of longleaf pines during past logging operations may have encouraged proliferation of the slash pine, which normally is found on wetter sites within the mesic flatwoods. The logging and turpentine activities that took place before establishment of the reserve undoubtedly altered not only the species composition of the mesic flatwoods, but other basic characteristics as well.

The most serious threat to the mesic flatwoods community is fire exclusion. The mesic flatwoods tend to burn whenever the surrounding scrubby flatwoods and scrub burn. However, the scrubby flatwoods and scrub communities have much longer fire return intervals and only burn during more extreme fire weather conditions. Presumably, the mesic flatwoods in the reserve would burn more frequently and under more moderate conditions than the scrub and scrubby flatwoods, often when the latter would not have even ignited. Past fire suppression activities and the intrinsic difficulty of conducting prescribed burns in adjacent scrub and scrubby flatwoods combine to foster the accumulation of heavy fuel loads in

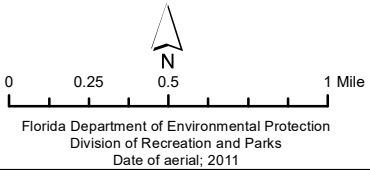


Legend	
	MF - Mesic Flatwoods 879.87 ac.
	SH - Sandhill 4.30 ac.
	SC - Scrub 136.84 ac.
	SCF - Scrubby Flatwoods 837.75 ac.
	BM - Basin Marsh 786.15 ac.
	BS - Basin Swamp 523.73 ac.
	DM - Depression Marsh 95.95 ac.
	HH - Hydric Hammock 531.38 ac.
	MS - Mangrove Swamp 5.64 ac.
	SAM - Salt Marsh 1599.26 ac.
	BST - Blackwater Stream 0.27 ac.
	ECPS - Estuarine Composite Substrate 791.60 ac.
	EMR - Estuarine Mollusk Reef 39.86 ac.
	AP - Artificial Pond 4.90 ac.
	CD - Canal/ditch 0.68 ac.
	CPP - Clearcut Pine Plantation 106.08 ac.
	CL - Clearing/Regeneration 1.58 ac.
	DV - Developed 4.35 ac.
	PP - Pine Plantation 432.22 ac.
	SA - Spoil Area 1.89 ac.

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CEDAR KEY SCRUB STATE RESERVE



NATURAL COMMUNITIES MAP





many areas of mesic flatwoods within the reserve. Recent prescribed fires have significantly reduced fuel loads in several of these areas. Condition of the mesic flatwoods in the reserve ranges from fair to good.

Past fire suppression activities have possibly impacted the mesic flatwoods more than any other community in the reserve. Numerous fire plow lines, which are discernible in historical aerial photographs still remain today. Although most plow scars have re-vegetated, their effects on local topography remain. Old scars may continue to cause problems, particularly in wetter areas of the mesic flatwoods. Some channeling of runoff and localized de-watering may occur where old plow lines function as ditches.

Significant areas of mesic flatwoods on the Panther Ridge tract have been cleared, bedded, and planted with slash pines one or more times. These areas are predominantly mapped as pine plantation or clearcut pine plantation. Some of these areas retain native groundcovers and shrubs, but other sites may lack nearly all native vegetation due to past site preparation techniques or herbicide applications. Fortunately, none of these areas appear to have ever been windrowed.

*General Management Measures:* Frequent use of prescribed fire and longleaf pine plantings are critical to continuing the restoration process in the mesic flatwoods. In some of the flatwoods, the presence of a dense saw palmetto and gallberry understory may require the use of chemical or mechanical site preparation in order to facilitate the establishment of planted longleaf pines. Portions of the reserve may need additional removal of offsite hardwoods, planting of longleaf pines, and enhancement plantings of native groundcover, particularly within the newest Panther Ridge tract.

## **SANDHILL**

*Desired future condition:* The dominant tree in the sandhills of north Florida will be longleaf pine (*Pinus palustris*). Herbaceous cover, dominated by wiregrass (*Aristida stricta*), will be 80% or greater and reach a height of less than three feet. In addition to the characteristic groundcover species and longleaf pines, the sandhill community will contain scattered individual trees, clumps, or ridges of onsite oak species such as turkey oak (*Quercus laevis*), sand post oak (*Quercus margaretta*), and bluejack oak (*Quercus incana*). In old growth conditions, sand post oaks will commonly be 150-200 years old, and some turkey oaks will be over 100 years old. The optimal fire return interval for this community is 1 to 3 years.

*Description and assessment:* The small amount of sandhill in the reserve is located south of State Road 24. This happens to be the area selected in the past for the construction of park facilities such as staff residences, the park office and a shop complex. The sandhill in this area has certainly been impacted by the development, but representative plant species remain and the site is still managed as a natural area. The condition of this community is poor.

*General Management Measures:* Offsite hardwoods and long-term fire exclusion in the small section of sandhill is obvious. These areas will require additional hardwood reduction and prescribed fire to release suppressed herbaceous species

and encourage longleaf pine recruitment. Continued use of frequent prescribed fire will be essential to maintaining community structure and ecological integrity of this remnant community as a demonstration/interpretation site.

## **SCRUB**

*Desired future condition:* Within scrub communities, the dominant plant species will generally consist of three middle and understory signature hardwood species that include sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), and Chapman's oak (*Quercus chapmanii*), as well as other shrubby species like saw palmetto (*Serenoa repens*), rusty staggerbush (*Lyonia ferruginea*), Florida rosemary (*Ceratiola ericoides*), and tarflower (*Bejaria racemosa*). At the reserve, this xeric upland ecosystem is composed of two different scrub variants; primarily sand pine scrub, but also small remnants of rosemary scrub (FNAI 2010). Peninsular sand pine scrub has an overstory of sand pine (*Pinus clausa*) as well as the three above-named signature oaks. Rosemary scrubs, also known as a rosemary bald, include large areas of bare sand between shrubs that are dominated by Florida rosemary.

Scrub will often have a variety of oak age classes and heights across different scrub patches. There will be scattered openings in the canopy with bare patches of sand that support many scrub endemic plant species; these species will be regularly flowering and replenishing their seed banks. The optimal fire return interval for scrub is 8-15 years when aiming to achieve a mosaic of burned and unburned areas. However, the recommended interval for rosemary balds are 10-40 years, a time span that will allow patchy burns to provide refuges for older rosemary plants.

*Description and assessment:* The scrub community at the reserve is considered the northernmost example of peninsular sand pine scrub on the Gulf Coast (Myers 1990). Most of the scrub habitats at Cedar Key Scrub occur on Orsino fine sand. These scrub communities are strongly associated with the crests and slopes of ancient dune ridges that are composed of deep infertile sand deposits. The largest expanses of continuous scrub habitat are located in the eastern portion of the reserve. However, intermediate-sized patches of scrub are scattered within the central and western areas of the reserve, including areas at the new Panther Ridge parcel in the northwest corner.

Because of the geologic history of Cedar Key, the scrub community in this west coastal region is relatively young compared to other peninsular scrubs, such as Florida's largest contiguous complex in Ocala National Forest. Generally speaking, these young coastal scrubs have not yet had a chance to develop the diversity of rare plant species like those that evolved within older inland ridge systems that underwent long periods of geologic isolation. Cedar Key Scrub, however, does support populations of rare animal species that require sand pine scrub or scrubby flatwoods habitat, such as the gopher tortoise, eastern indigo snake, Florida mouse and Florida scrub-jay. The Florida scrub-jay population found in the Cedar Key region is an important but declining group in the northern limit of this species range (Cox et al. 1994). See below under imperiled species section for more information on this population of the Florida scrub-jay.

Unlike most fire-maintained natural communities in Florida, peninsular sand pine scrub is adapted to longer fire return intervals and catastrophic fires. Such fires usually kill all sand pines and kill the aboveground portions of the scrubby shrubs, which subsequently resprout. The sand pines typically only recolonize burned sites from seed.

The only recorded large catastrophic scrub fire in the Cedar Key region occurred on June 8, 1955 (Peeples 1976). A first-hand account states: "the fire consumed about 20,000 acres in one 8-mile run to the east". "The run ended in the only true fire storm which I have ever observed". The fire that day likely consumed all of the sand pine scrub east of what is now County Road (CR) 347. A solid wall of fire was reported to have crossed County Road 345 near the Rosewood fire tower. During the previous three days, the fire had burned much of the flatwoods and coastal areas west of County Road 347 (Peeples 1976).

Since the state acquired the reserve in 1978, there have been numerous arson or lightning strike wildfires within Cedar Key Scrub that have burned into scrub communities, but generally speaking, suppression activities have limited their size to small patches. Historical aerial photos reveal that multiple fire lines were plowed in response to some of these wildfires during the 1970s and 1980s, primarily in mesic flatwoods, scrubby flatwoods, and smaller areas of sand pine scrub.

Some of the initial prescribed burns in scrub communities (i.e. mostly west of CR 347) occurred from 1981 through 1990. Management zone CK-4a was the first unit in the eastern sections of the reserve to received prescribed fire by park staff. Tree ring cores were collected in 1990 from four stands of sand pines in the eastern half of the reserve to estimate the ages of the sand pines. The adult trees ranged in age from 17 to over 36 years, with most trees in the 23 to 27 year range at that time. Considering all the complexities associated with burning scrub habitat, park staff learned quickly that management of these areas with fire alone would be a challenging task.

As a result of lessons learned by park and district staff in the 1980s and 1990s, a series of restoration efforts have been implemented in scrub communities (i.e. scrub and scrubby flatwoods communities) to mechanically reduce fuel heights to assist with safer prescribed fire operations. Some of the initial treatments occurred as early as 1985, when park and district staffs mechanically widened firelines and utilized various mowing techniques in adjacent shrubby fuels. In 1995-96, the USFWS provided grant funding for scrub habitat improvement to assist Division staff in preparing firebreaks and producing a Habitat Improvement Plan for the reserve. The funding was specifically targeted for habitat restoration and monitoring activities that would benefit imperiled species such as Florida scrub-jays, Florida mice and gopher tortoises.

The first major scrub restoration efforts at the reserve were implemented in fall 2000 with a mature sand pine harvest within a majority of the scrub habitat east of CR 347 (i.e. management zones CK-1b, 1c, 4a, 5a, 6a, 6b, 6c, and 6e). A total of about 85 acres of sand pine were harvested. The sand pines were removed to allow the scrub areas to be burned under less hazardous fuel conditions. During the logging of the sand pines, much of the shrub layer was crushed, creating a more

available fuel source closer to the ground surface. In 2001, staff conducted prescribed burns in two of the resource management zones where sand pines had been harvested.

In June 2002, 34 acres of mixed scrub and scrubby flatwoods (zone CK-3) were mowed under contract and an additional 49 acres of scrub and scrubby flatwoods were roller-chopped by park staff in preparation for burning. In January 2003, a 475-acre prescribed aerial ignition burned all of the mowed and roller-chopped areas as well as much of the standing scrubby flatwoods. Two of the remaining stands of mature sand pines in the reserve did not ignite during the burn. In October 2003 another 85 acres of overgrown scrub and scrubby flatwoods (zones CK-2L, 2M, 2B) were mowed under contract and much of this area was then burned in March 2004.

In 2005, about 200 acres of overgrown scrub and scrubby flatwoods were again mechanically treated by mowing (zones CK-1A, 1B, 1C, 1D, 4B, 5A, 5D). This contracted restoration effort was possible because of a habitat restoration grant from USFWS. Prescribed fire was subsequently applied to several of these treated zones.

In the spring of 2013, a large-scale restoration timber harvest project was conducted at Cedar Key Scrub as a combined effort from several partners, including DRP, USFWS, FWC and FFS. Prior to implementation of this project these partners conducted an analysis of historic tree density from 1961 to 2008. In summary, tree density in Florida scrub-jay scrub habitat had significantly increased several-fold during this 40+ year time period. The final 125-acre timber harvest contract was managed through the Florida Forest Service (i.e. zones CK-4A, 4B, 5A, 5B, 5C, 5D, 6D, and 6E) following specific management recommendations that were aimed at reducing tree density in scrub as well as targeting fire shadows adjacent to many freshwater wetlands within this matrix. All of these zones were subsequently treated with prescribed fire from 2014-2016.

The scrub ridges on the western end of the Panther Ridge addition were planted with slash pines at least twice. The last harvest and replanting occurred prior to 2010. These areas are currently mapped as pine plantations. The cutting and subsequent bedding activities reduced the shrub densities and increased the amount of bare sand onsite. The site retains a dense planting of young slash pines on deep and well drained sands.

While the scrub community is still in good condition as of 2016, continued successful restoration of this ecosystem will need to rely upon management tools.

*General Management Measures:* There is no doubt that the series of restoration and habitat improvement projects that have been implemented within the reserve have greatly improved the condition of the scrub community. A long-term continuous effort with multiple partners will be needed at Cedar Key Scrub State Reserve in order to restore its scrub communities (i.e. scrub and scrubby flatwoods communities) and hold them in a historic maintenance condition. The complexities of properly managing this highly pyrogenic landscape will be a never-ending experiment. Mechanical treatment is highly recommended to help knock down fuel

heights and produce spatial openings that are characteristic of a healthy scrub. Mowing and cutting could be the best options to achieve desired results, but nonetheless treatments such as these should always be followed by prescribed fire.

It would be preferable to maintain a number of different "age classes" or successional stages of scrub within the reserve in order to maximize habitat diversity for plant and animal species, particularly imperiled species. Given the wide range of fire-return intervals for scrub (5-40+ years) (FNAI 2010), it would be prudent to maintain some limited areas of mature scrub.

Restoration of the scrub ridges on the western side of the Panther Ridge addition will only require removal of the young offsite slash pines mechanically or with prescribed fire. It is expected that these ridges will be in good condition once the pines are removed, with scattered scrub oaks and an appropriate amount of bare sand areas.

## **SCRUBBY FLATWOODS**

*Desired future condition:* The dominant tree in the scrubby flatwoods of north Florida will usually be longleaf pine (*Pinus palustris*) or slash pine (*Pinus elliotii*). Mature sand pines (*Pinus clausa*) will typically be absent. A diverse shrub understory will be characteristic, with up to 25 percent bare sand coverage. A scrub-type oak "canopy" will often be present that will vary in height from three to eight feet, and there will be a variety of oak age classes/heights across the landscape. Dominant shrubs will include sand live oak, myrtle oak, Chapman's oak (*Quercus chapmanii*), saw palmetto, rusty staggerbush (*Lyonia ferruginea*), and tarflower (*Bejaria racemosa*). Herbaceous species cover will often be well below 40 percent. The optimal fire return interval for this community is regionally variable, but coastal scrub has shown an ability to reach fuel height and fire carrying potential faster than interior examples. Areas may be burned as frequently as every 5-15 years when burn prescriptions are designed to achieve a mosaic of burned and unburned areas.

*Description and assessment:* The scrubby flatwoods community is often described as a transition zone between the mesic flatwoods occurring at slightly lower elevations and the true scrub that tends to occupy the higher elevations. Species composition seems to be intermediate between the two, although the same shrub species that dominate the scrub also dominate the scrubby flatwoods in the reserve. The sand pine overstory is lacking, however. Scrubby flatwoods have a fire return interval intermediate between mesic flatwoods and scrub, typically 8 to 15 years (FNAI 2010). Scrubby flatwoods typically have a sparse canopy of either longleaf pine or slash pine, but these pines are historically relatively uncommon in the scrubby flatwoods at Cedar Key Scrub. This may be due to the site's history of wildfire, logging and/or a regional variation of this coastal scrub community type.

Most scrubby flatwoods zones that have received prescribed fire since the state acquired the property are in significantly better condition than those areas where fire has not yet been able to penetrate. In some limited areas within the reserve, the scrubby flatwoods are trending towards senescence and therefore have begun to succeed to xeric hammock, with a resultant loss of bare sand patches and an

increase in canopy closure. Previous scrubby flatwoods restoration actions within the reserve are detailed in the scrub natural community description above.

Significant areas of scrubby flatwoods were converted in the past to pine plantations on the newly acquired Panther Ridge parcel. The clearing and bedding during site preparation has not impacted the loose sand of the scrubby flatwoods as much as in the mesic flatwoods. Herbicide use and extensive site preparation efforts may have reduced the oak densities below optimal levels.

As with the scrub community, scrubby flatwoods in the reserve provide critical habitat for several imperiled species including the gopher tortoise, eastern indigo snake Florida mouse, and the Florida scrub-jay. The early regeneration stages of scrub and scrubby flatwoods are the preferred habitat for Florida scrub-jays. A fire return interval of eight to twenty years is considered optimal for Florida scrub-jays (Fitzpatrick et al. 1991), with sand pine scrub burning somewhat less frequently on average than scrubby flatwoods. Presumably gopher tortoises, eastern indigo snakes, and Florida mice also prefer these younger successional stages due to the openness of the vegetation structure.

*General Management Measures:* The series of restoration and habitat improvement projects that have been implemented within the reserve have greatly improved the condition of the scrubby flatwoods community. Nonetheless, continued efforts from multiple stakeholders will be necessary to maintain community structure in perpetuity for this ecosystem.

A long-term continuous effort will be needed at Cedar Key Scrub State Reserve in order to restore its scrubby flatwoods and hold them in a historic maintenance condition. Mechanical treatment is highly recommended to help knock down fuel heights and produce spatial openings that are characteristic of healthy scrubby flatwoods. Mowing and cutting could be the best options to achieve desired results, but nonetheless treatments such as these should always be followed by prescribed fire.

On the Panther Ridge addition, pine plantations that are identified with a desired future condition of scrubby flatwoods should be logged as soon as possible to reduce the slash pine density to one tree per acre or less. Restoration of a natural fire regime will not be possible until the slash pines are removed.

## **BASIN MARSH**

*Desired future condition:* Basin marshes include emergent herbaceous and low shrub species dominating most of the area with an open vista. Trees will be few and if present occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning; one will be able to see the soil surface through the vegetation when the community is not inundated. Dominant vegetation in basin marsh will include sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), cutgrass (*Leersia* sp.), common reed (*Phragmites australis*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* sp.), buttonbush (*Cephalanthus occidentalis*), St. John's wort

(*Hypericum fasciculatum*), and coastalplain willow (*Salix caroliniana*). The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

*Description and assessment:* Sawgrass, a very flammable grass, dominates these marshes. Many of the basin marshes are hydrologically connected and many extend across the reserve boundary onto private lands. The marshes normally burn when the surrounding mesic flatwoods burn. During prescribed burns, problems may arise as marshes can easily carry fire across the boundaries of the reserve. The basin marshes are generally in good condition, although some have been impacted by service roads or by fire plow lines.

*General Management Measures:* Basin marshes should be protected from unnatural disturbances. Additionally, it is important to allow fires conducted in adjacent fire-maintained natural communities to burn through the ecotone periodically, under conditions appropriate for restoring the natural transition zone and maintaining the natural fire regime. Removal of feral hogs would be beneficial. Park staff will regularly monitor the basin marshes for the appearance of invasive exotic plants and will remove any found.

## **BASIN SWAMP**

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

*Description and assessment:* The basin swamps in the eastern side of the reserve tend to be relatively small and are dominated by cypress. The large basin swamp in the western half of the reserve, Black Point Swamp, is dominated by sabal palms (*Sabal palmetto*) and by hardwood species such as swamp tupelo, swamp bay (*Persea palustris*), sweetbay, dahoon holly and red maple. Although the eastern basin swamps have at times been identified as cypress domes (Amoroso 1993), their irregular shape, geological origins, and topographic situation would seem to indicate that basin swamp would be a more appropriate classification (FNAI 2010).

The basin swamps within the reserve are generally in good condition, although past impacts included selective harvesting of cypress and hardwoods. Impacts that are

more recent include fire plow lines near the perimeter of the Black Point Swamp and service roads along perimeters of some of the eastern cypress swamps.

*General Management Measures:* Prescribed fires should be allowed to burn into the edges of basin swamps to maintain the natural ecotone between them and surrounding habitats. Park staff should monitor basin marshes for the appearance of invasive exotic plants and remove any that are found.

## **DEPRESSION MARSH**

*Desired future condition:* Depression marshes in coastal north Florida characteristically will be smaller open vista wetlands dominated by low, emergent herbaceous and shrub species. Trees will be few, and if present, will occur primarily in the deeper portions of the community. There will be little accumulation of dead grassy fuels due to frequent burning. The soil surface will often be visible through the vegetation when the community is not inundated. Dominant vegetation will typically include maidencane, panicgrasses (*Panicum* spp.), cutgrass (*Leersia* sp.), sand cordgrass (*Spartina bakeri*), pickerelweed (*Pontederia cordata*), arrowheads (*Sagittaria* spp.), common buttonbush (*Cephalanthus occidentalis*), St. John's-wort (*Hypericum tetrapetalum*), and coastalplain willow (*Salix caroliniana*). The optimal fire return interval for this community is two to ten years depending on the fire frequency of adjacent communities.

*Description and assessment:* While some of these marshes have considerable overlap floristically with basin marshes, depression marshes tend to be smaller and are often more regular in shape. Typically, these small wetlands will carry fire during periods of low water or when emergent grassy fuels are continuous over standing water. Depression marshes that dry out during extended droughts act as ephemeral wetlands that are critical breeding sites for many invertebrate and amphibian species whose larvae cannot coexist with fish in more permanent wetlands (Moler and Franz 1987). The gopher frog, a species of special concern that spends its non-breeding life in nearby scrub and scrubby flatwoods, is one such species.

Invasion of the depression marshes by woody plant species is normally kept in check by prescribed burning and natural flooding. However, adaptable invaders such as slash pine remain in some of the depression marshes despite the application of fire. In some cases, the ability of trees and shrubs to compete is enhanced by ditching along roads or some other artificial manipulations that prevent the marsh from maintaining a higher water level that would help to exclude these species. Reductions in the regional water table may also lead to more frequent droughts and additional incursions by hardwoods, and may eventually encourage succession of some marshes. The depression marshes at the reserve are currently in good condition.

*General Management Measures:* Where appropriate, the park should burn depression marshes at the same time as adjacent fire-type natural communities. Maintenance of a natural ecotone is important, as is keeping the marshes free of invasive exotic species.



## HYDRIC HAMMOCK

*Desired future condition:* Hydric hammock is characterized as a closed canopy, evergreen hardwood and/or palm forest with a variable understory dominated by palms and with a sparse to moderate groundcover of grasses and ferns. Typical canopy species in the Big Bend region will include laurel oak (*Quercus laurifolia*), pignut hickory (*Carya glabra*), southern magnolia (*Magnolia grandiflora*), cabbage palm, sugar hackberry (*Celtis laevigata*), live oak, sweetbay (*Magnolia virginiana*), red cedar (*Juniperus virginiana*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), American elm (*Ulmus Americana*), red maple and other hydrophytic tree species. Yaupon holly (*Ilex vomitoria*) and needle palm (*Rhapidophyllum hystrix*) will be among the sparse understory components. Soils will be poorly drained but only occasionally flooded. Hydric hammock will occasionally burn when fires are allowed to spread naturally across ecotones from adjacent upland natural communities.

*Description and assessment:* The hydric hammock in the reserve lies along the upland edge of the tidal marsh and in scattered locations near Black Point Swamp. The hydric hammock occupies transitional areas between Black Point Swamp and the tidal marsh and between mesic flatwoods and the tidal marsh. Although hydric hammock is much more common to the south along the coast of Waccasassa Bay, its extent within Cedar Key Scrub State Reserve is limited due to the structure of the overlying sediments in this part of the Big Bend coastline.

Hydric hammocks play a critical role in the regional hydrology (Simons et al. 1989). They serve the important function of temporarily storing water in high rainfall periods, but typically retain scattered small pockets of standing water up to 70 days per year. Hydric hammocks occur on a variety of sand to muck soils, but are always low lying and situated over a limestone substratum that occasionally projects above ground as exposed outcrops or bare rock areas. Soil depth can be as little as 20 cm in these areas. Over the past 25 years researchers have documented the gradual recession of the hydric hammock to salt-dominated communities along the Big Bend coastline, but this has not yet been observed at Cedar Key Scrub (Ellis et al. 2004).

*General Management Measures:* A general reduction of feral hog numbers within the preserve would greatly benefit the hydric hammock. Staff will continue to monitor hydric hammocks for the presence of exotic plants and any changes in hydric hammock community that might be related to sea level rise. Staff should continue to allow fires to burn into the fringes of hydric hammock in order to push its boundaries back to historic limits.

## MANGROVE SWAMP

*Desired future condition:* Mangrove swamp occurs as a dense forest along relatively flat, low wave energy, marine and estuarine shorelines. The dominant overstory will typically be black mangrove (*Avicennia germinans*), with some red mangrove (*Rhizophora mangle*) as it expands its range to the north. These species may occur in mixed stands, or in monospecific zones based on varying degrees of tidal influence, levels of salinity, and types of substrate. Red mangroves will typically dominate the deepest water, followed by black mangroves in the intermediate zone.

Mangroves will typically occur in dense stands with little to no understory, but may be sparse, particularly in the upper tidal reaches where saltmarsh species predominate. Soils will generally be anaerobic and are saturated with brackish water at all times, becoming inundated at high tides.

*Description and assessment:* Within the park, this community type occurs primarily south of Lukens Creek. Cedar Key is near the northern limit for this system on the Gulf Coast. Mangroves are common in the area of Cedar Key but uncommon in areas further to the east to the Waccasassa River and south to Turtle Creek. Why this occurs is unknown, but the prevailing ocean currents or salinity levels may be responsible. Black mangrove may grow in relatively dense stands or as scattered individuals in tidal marsh. Hard freezes can damage black mangrove, so its dominance in the tidal marsh can vary with the severity of recent winters. The mangrove swamp appears to be in excellent condition.

Over the past 20 years there has been a tremendous expansion of mangroves within the saltmarsh and tidal creeks in the region. Comparison of aerial photography from 1994 to 2016 shows an order of magnitude increase in mangrove density, but not range. The mangroves have expanded along the seaward margins of the salt marsh and along the tidal creeks that flow through the salt marsh.

*General Management Measures:* The primary threat to the mangrove swamp is Brazilian pepper, which like mangroves, is expanding its range northward. Fortunately, Brazilian pepper is limited by salinity and may not be able to germinate or survive in mangrove swamps in areas of higher salinity. Surveys for Brazilian pepper in these remote areas are difficult and time consuming. Staff will pursue surveys via aerial photography or watercraft to determine locations of Brazilian peppers for treatment.

## **SALT MARSH**

*Desired future condition:* Salt marsh is a largely herbaceous community that occurs in the portion of the coastal zone affected by tides and seawater and protected from large waves. Salt marsh typically will have distinct zones of vegetation based on water depth and tidal fluctuations. Dominant plant species in this community include black needlerush (*Juncus roemerianus*) and saltmarsh cordgrass (*Spartina alterniflora*). Saltgrass (*Distichlis spicata*) will dominate the higher, less frequently flooded areas. Other characteristic species will include saltmeadow cordgrass (*Spartina patens*), Carolina sea lavender (*Limonium carolinianum*), perennial saltmarsh aster (*Symphotrichum tenuifolium*), wand loosestrife (*Lythrum lineare*), and shoreline seapurslane (*Sesuvium portulacastrum*). A landward border of salt-tolerant shrubs including groundsel tree (*Baccharis halimifolia*), saltwater falsewillow (*Baccharis angustifolia*), marshelder (*Iva microcephala*), and Christmasberry (*Lycium carolinianum*) may occur. Soil salinity and flooding will be the two major environmental factors that influence salt marsh vegetation. While there is little data on natural fire frequency in salt marsh, fire probably will occur there sporadically and in a mosaic pattern, given the patchiness of the fuels and the influence of creeks and salt flats.

*Description and assessment:* Salt marsh represents the seaward extent of the reserve on its western boundary. As with the other estuarine natural communities, salt marsh ecosystems are very sensitive to contaminants associated with stormwater runoff from adjacent uplands. Salt marsh systems at Cedar Key Scrub State Reserve are linked to adjacent upland areas by a band of hydric hammock and basin swamp that function in such a way as to modify the quantity, timing, and quality of some freshwater inputs to the marsh (Vince et al. 1989). Additional freshwater inputs have been recently described as SGD, and they occur in at least three locations within the reserve as described above in the hydrology section.

If the quantity, quality, or timing parameters of freshwater inputs rapidly change, this consequence can greatly modify the structure and productivity of a tidal community. Specifically, significant fluctuations of salinity outside of an extremely narrow water quality range could negatively impact this sensitive estuarine tidal community; one that acts as nursery for numerous invertebrate and fish species. The overall quality of the coastal salt marsh community appears to be in excellent condition.

*General Management Measures:* In general, salt marsh communities are quite resilient and require very little active management.

## **BLACKWATER STREAM**

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

*Description and assessment:* A short stretch of blackwater stream flows out of the southern end of the Black Point Swamp and merges with the tidally influenced upper reach of Lukens Creek. The blackwater stream is considered to be in good condition.

*General Management Measures:* Maintenance of the natural hydrology of Black Point Swamp should suffice to protect the blackwater stream.

## **ESTUARINE COMPOSITE SUBSTRATE**

Estuarine composite substrates will consist of a combination of natural communities that may include small patches of consolidated and unconsolidated substrate with or without sessile floral and faunal populations. Composite substrates may also be dominated by any combination of flora, fauna or mineral substrate such as mollusk reefs or seagrass beds that are situated within the subtidal, intertidal, and supratidal zones along the reserves western boundary. Because of the potential

combination of community types in composite substrate ecosystems, species diversity is often times greater than the surrounding habitats.

Due to the difficulties of mapping subtidal and intertidal natural communities individually, several are lumped as estuarine composite substrate for mapping purposes. The estuarine communities are listed separately below to identify the specific community types found within the reserve, including estuarine consolidated substrate, estuarine mollusk reef, estuarine seagrass bed, and estuarine unconsolidated substrate. Where possible, estuarine mollusk reefs have been mapped separately. Estuarine composite substrates are found along tidal creeks, salt marshes and coastal shore habitats of the western portions of Cedar Key Scrub. These substrates are important since shellfish, particularly oysters, and seagrasses often colonize them.

Any contaminant disturbance to this natural community such as heavy metals, oils, pesticides or high nutrient inputs can become problematic and impact the local food web. Significant amounts of pollutant compounds in the sediments can be detrimental at multiple organismal scales, but especially can kill infaunal organisms, thereby eliminating a food source for certain fishes, birds, and other vertebrates.

## **ESTUARINE CONSOLIDATED SUBSTRATE**

*Desired Future Condition:* Estuarine consolidated substrates are mineral based natural communities generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species. This community consists of open, relatively unvegetated areas, with solidified rock or other hardened substrates that are typically composed of limerock, or shell conglomerate material. Limerock-based substrates primarily occur as outcrops of bedded sedimentary deposits consisting primarily of calcium carbonate.

These hardened substrate communities are important because they form the foundation for the development of other estuarine natural communities when conditions become appropriate. They may be sparsely inhabited by sessile, planktonic, epifaunal, and pelagic plants and animals but house few infaunal organisms. Desired conditions include minimizing disturbance attributed to placement of fill material, vehicular traffic, or the accumulation of pollutants.

*Description and assessment:* Estuarine limestone or shell-based substrates are found along tidal creeks, salt marshes and coastal shore habitats of the western portions of Cedar Key Scrub. These substrates are important since shellfish, particularly oysters, and seagrass bed often colonize them. Where this community type is observed, such as the three documented SGD sites recently described, it appears to be in good condition, however the full extent of this community within the reserve is still unknown at this time (Raabe and Bialkowska-Jelinska 2010). Trends associated with significant historic droughts and increased human consumption of groundwater has been particularly visible in the Cedar Key region (Copeland et al. 2011).

*General Management Measures:* Like salt marshes, this community is fairly resilient and requires little active management other than periodic checks for damage from storms or human activity. It is important to continue to locate and map new occurrences of limestone outcrops.

## **ESTUARINE MOLLUSK REEF**

*Desired future condition:* Estuarine mollusk reefs are faunal based natural communities typically characterized as expansive concentrations of sessile mollusks occurring in intertidal and subtidal zones to a depth of 40 feet (FDEP 2014). Mollusk reefs occupy a unique position among estuarine invertebrates. They present a dynamic community of estuarine ecology, forming refugia, nursery grounds and feeding areas for a myriad of other estuarine organisms (FDEP 2014). In Florida, the most developed mollusk reefs are generally restricted to estuarine areas and are dominated by the eastern oyster (*Crassostrea virginica*). Additionally, there are numerous sessile and benthic invertebrates that are also strongly associated with these mollusk reef communities. Some common invertebrate inhabitants are burrowing sponge (*Hadromerida*), mussels, clams, oyster drill (*Urosalpinx* spp.), polychaetes, oyster leech (*Stylochus* spp.), barnacles, blue crab (*Callinectes sapidus*), mud crab (Xanthidae), stone crab (*Menippe mercenaria*), amphipods, and starfish (Asteroidea). Several fish also frequently occur near or feed among mollusk reefs, including gulf menhaden (*Brevoortia patronus*), gafftopsail catfish (*Bagre marinus*), pinfish (*Lagodon rhomboides*), spotted seatrout (*Cynoscion nebulosus*), and striped mullet (*Mugil cephalus*).

Desired conditions of mollusk reef communities are hardened consolidated substrates on which the planktonic larvae (i.e., spat) settle and complete development as well as an estuarine water quality with salinities between 15 and 30 parts per thousand (ppt). Significant increases or decreases in salinity levels that result from both natural and/or anthropogenic alterations of freshwater inflow can be detrimental to oyster communities (Seavey et al. 2011).

*Description and assessment:* Mollusk reef communities occur at scattered locations within the tidal creeks and estuary of the reserve. Where possible they have been mapped as a distinct estuarine community type, although some examples may not be distinguishable and are included within the estuarine composite substrate.

Mollusk reefs that are exposed during low tides, including those that occur in the western portions of Cedar Key Scrub, are frequented by a multitude of shorebirds, wading birds, and other vertebrates. One of the largest wintering populations of American oystercatchers in the United States is located in the Cedar Key region (Schulte et al. 2007).

In the Big Bend region, including the five major tidal creeks of the reserve, research has shown a 66 percent net loss of oyster bar area (306.7 acres) with losses concentrated on offshore (88 percent), followed by nearshore (61 percent), and inshore bars (50 percent) between 1982 and 2011 (Seavey et al. 2011). Evidence suggests that increasing human uses of freshwater inland may be an important factor resulting in habitat loss. This rapid loss is due to a decreased

freshwater input, thus causing existing bars to be vulnerable to increased wave action and higher estuarine salinities.

Mollusks are filter feeders, filtering up to 100 gallons of water a day. In addition to filtering food, they also filter and accumulate toxins from polluted waters (Guequen et al. 2011). In 2009, scientists estimated that there had been an 85% reduction in global oyster reefs communities from historic times (Beck et al. 2009). Given these unprecedented declines and the fact that oysters are extremely efficient bioaccumulators of pollutants and toxins, including the large-scale algae blooms occurring in Florida's Gulf, scientists place this natural community among the world's most endangered ecosystems (Seavey et al. 2011; Griffith et al. 2013).

*General Management Measures:* It is important to locate and map individual occurrences of mollusk reef structures and periodically monitor them for damage from storms or human activity. Any contaminant disturbance to these mollusk reef structures such as heavy metals, oils, pesticides or high nutrient inputs can become problematic and impact the local food web. Significant amounts of pollutant compounds in the sediments can be detrimental at multiple organismal scales, but especially can kill infaunal organisms, thereby eliminating a food source for certain fishes, birds, and other vertebrates.

## **ESTUARINE SEAGRASS BED**

*Desired future condition:* Estuarine seagrass beds are typically characterized as expansive stands of vascular plants and are one of the most productive communities in the world (Zeiman and Zeiman 1989). Seagrass beds occur in clear, coastal waters where wave energy is moderate. The three most common species of seagrasses in Florida are turtle grass, (*Thalassia testudinum*), manatee grass, (*Syringodium filiforme*), and shoalweed (*Halodule wrightii*). Other seagrasses of the genus *Halophila* may also occur but will be considerably less common.

Seagrass beds require unconsolidated substrate in order to establish their underground biomass root structure. They will typically be found in waters ranging from 20° to 30°C (68° to 86°F), and require clear water for photosynthesis. Seagrass beds will not generally thrive in waters where there is high nutrient loads increased turbidity levels or where there is increased competition of undesirable algal species.

*Description and assessment:* Seagrass beds occur at scattered locations within estuarine tidal creeks of the reserve, but have not yet been mapped, so acreage figures are unavailable, therefore this community is combined for mapping purposes within estuarine composite substrate. The waters in the western tidal creeks of the reserve and around the Cedar Key region tend to be brownish in color and therefore do not effectively transmit sunlight. Due to a decreased water clarity and shallow bathymetry, the seagrasses in this area are predominantly sparse grass beds of shoalweed, which tend to be more tolerant of low light conditions than other seagrasses (FDEP 2014). Turtle grass beds can also be found in the waters around Cedar Key on shallow flats and shoals, where the light attenuation is

less due to shallow neritic waters (FWC 2015). The full extent of seagrass beds community within the reserve is unknown at this time.

This estuarine ecosystem is critically important for wildlife such as marine turtles that may use the reserve as nursery grounds (Schmid 1998). Additionally, when these areas are tidally inundated, they can be used as resting/feeding grounds for other wildlife such as ornate diamond-backed terrapins (*Malaclemys terrapin macropilota*) and gulf salt marsh snake (*Nerodia clarkii clarkii*).

*General Management Measures:* The estuarine seagrass bed community found in Cedar Key Scrub's western estuarine areas has not yet been mapped. It is important to locate and map individual occurrences of seagrass beds and periodically monitor them for damage from storms or human activity. Any contaminant disturbance to these seagrass beds such as heavy metals, oils, pesticides or high nutrient inputs can become problematic and impact the local food web. Significant amounts of pollutant compounds in the sediments can be detrimental at multiple organismal scales, but especially can kill infaunal organisms, thereby eliminating a food source for certain fishes, birds, and other vertebrates.

## **ESTUARINE UNCONSOLIDATED SUBSTRATE**

*Desired Future Condition:* Estuarine unconsolidated substrates are mineral based natural communities generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species. This community consists of primarily unconsolidated substrate such as shell, marl, mud, and/or sand. These soft substrates are important in that they form the foundation for the development of other estuarine natural communities when conditions become appropriate. Unconsolidated substrate communities are associated with and often grade into salt marsh, seagrass beds, and mollusk reef.

Estuarine consolidated substrates may support large populations of infaunal organisms as well as a variety of transient planktonic and pelagic organisms such as tube worms, sand dollar (*Clypeasteroidea*), mollusks, isopods, amphipods, burrowing shrimp (*Thalassinidea*), and an assortment of crabs. While these areas may seem relatively barren, the densities of infaunal organisms in subtidal zones can reach the tens of thousands per meter square, making these areas important feeding grounds for many bottom feeding fish, such as red drum (*Sciaenops ocellatus*), southern flounder (*Paralichthys lethostigma*), spot (*Leiostomus xanthurus*), and sheepshead (*Archosargus probatocephalus*). The intertidal and supratidal zones are extremely important feeding grounds for many shorebirds and invertebrates. Desired conditions include preventing soil compaction, dredging activities, and disturbances such as the accumulation of pollutants.

*Description and assessment:* Due to the difficulties of mapping these estuarine tidal ecosystems individually, this community is combined within estuarine composite substrate for mapping purposes. Estuarine unconsolidated substrates are found along tidal creeks, salt marshes and nearby coastal habitats of the western portions of Cedar Key Scrub. Most of the estuarine tidal creeks within the reserve have mud bottoms and many have extensive supratidal mud flats that are important feeding

areas for wading birds and shorebirds. Although some areas of estuarine unconsolidated substrate may have limited amounts of sand deposition derived from adjacent uplands, mud deposits are usually more dominant along this low energy coastline. Where this community type is observed it appears to be in good condition.

*General Management Measures:* Like salt marshes, this community is fairly resilient and requires little active management other than periodic checks for damage from storms or human activity. Any contaminant disturbance within these unconsolidated substrates such as heavy metals, oils, pesticides or high nutrient inputs from nearby upland development or distant interconnected watersheds (i.e. SGD) in the reserve can become problematic and impact the local food web. Significant amounts of pollutant compounds in the sediments can be detrimental at multiple organismal scales, but especially can kill infaunal organisms, thereby eliminating a food source for certain fishes, birds, and other vertebrates.

### **Altered Landcover Types**

#### **ARTIFICIAL POND**

A large borrow area used to provide fill for road construction of Shell Mound Road is located just north of the road in the Panther Ridge parcel. The borrow area was dug prior to 1961. This borrow area is water-filled and classified as an artificial pond. The pond provides open freshwater habitat, and there are no plans to restore it due to the high costs and potentially low return on investment.

#### **CANAL/DITCH**

A short ditch lies within the reserve in zone CK-3 alongside CR 347. It was apparently dug during fill removal for road construction. The borrow area to the east of the ditch was scraped and the fill was used in construction of CR 347. This area now supports mesic flatwoods vegetation and is mapped as such. Although it is likely that it was formerly scrubby flatwoods. The ditch will need a hydrological assessment before it can be determined if restoration efforts are necessary.

#### **CLEARCUT PINE PLANTATION**

Several areas of planted slash pines were clearcut just prior to state acquisition on the Panther Ridge parcel. Most of these areas appear to have been mesic flatwoods, and retain many species of native groundcover and shrubs. Restoration to mesic flatwoods will require periodic prescribed fires and replanting with longleaf pines. Most of the clearcuts retain about 4 slash pines per acre. Staff will monitor for EPPC Category I and II invasive plant species in these disturbed areas. These areas should be burned on a 2 to 4 year fire return interval.

#### **CLEARING/REGENERATION**

Several small clearings occur on the Panther Ridge addition within the mesic flatwoods. These grassing clearings may have been used as food plots and are



adjacent to service roads. These areas should be burned with the surrounding mesic flatwoods and allowed to naturally regenerate slash or longleaf pines.

## **DEVELOPED**

There are no current plans to convert any of the developed areas back to their original natural community. Resource management in the developed areas will focus on removal of all priority invasive exotic plants (i.e. Florida Exotic Pest Plant Council (FLEPPC) Category I and II species) and replace landscaping with native species where possible. Other management measures will include maintenance of proper storm water and waste water management facilities and the designing of future development so that it is compatible with prescribed fire management in adjacent natural areas.

## **PINE PLANTATION**

Pine plantations are located on the recently acquired Panther Ridge parcel. The pine plantations have a desired future condition of mesic flatwoods, scrubby flatwoods, or scrub. In most cases these pine plantations were site prepped by clearing and bedding, and possibly root raking in some cases. Some areas may also have received herbicide applications. Some areas were harvested and replanted, and most of the mature plantations have been thinned at least once. The end result is that these areas are dominated by dense stands of small to mature slash pines on moderately raised beds. The native groundcover and shrub layers are highly variable depending on the site preparation methods used. Some areas retain a normal density of shrubs with some groundcover remnants, while limited areas lack remnant vegetation.

Restoration of pine plantations to mesic flatwoods will require extensive thinning of the slash pines and planting with scattered longleaf pines. Groundcover restoration needs will be assessed after a prescribed fire program is initiated on the new acquisition. The scrubby flatwoods restoration will require removal of slash pines down to a density of no more than one tree per acre. Scrub restoration will require the removal of all slash pines. In most areas remnant scrub oaks and *Lyonia* species persist on site. Bedding and site preparation activities actually have helped to create more open sandy areas in scrubby flatwoods and scrub areas. Removal of the planted slash pines coupled with prescribed fire may be all that is necessary to restore high quality habitat patches for the Florida scrub-jay, Florida mouse, and gopher tortoise. The pine plantations should be burned with a 2 to 8 year fire return interval depending on fuel loading and desired future condition. In some cases, prescribed fires may not be possible until the slash pines have been thinned or, in the case of scrub and scrubby flatwoods, removed to very low densities.

Control of priority invasive plant species is particularly important in these areas, since many invasive species take advantage of disturbed areas. Further information about restoration of altered landcover types will be discussed in the resource management section below.

## SPOIL AREA

Limited spoil areas are located in association with the artificial pond on the Panther Ridge parcel and the ditch in zone CK-3. Staff will monitor for EPPC Category I and II invasive plant species in these disturbed areas.

### 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.

Fifteen imperiled plant species and 24 imperiled animal species have been recorded at Cedar Key Scrub State Reserve (see Table 2 below). Given the wide variety of natural communities in the reserve, from coastal salt marsh to fire-maintained scrub habitat, it is not surprising that this property contains a high diversity of imperiled floral and faunal species. Cedar Key Scrub was purchased under the Environmentally Endangered Lands program in part to protect the endangered, threatened, rare and unique species that occur on the site. A focus of the reserve is the protection and management of imperiled species as well as the natural communities in which they occur.

Several of the reserve's rare plant species were documented during an early 1990's floristic study (Amoroso 1993). Many of these imperiled plants are orchids or carnivorous plant species. Two of Cedar Key Scrub's notable imperiled orchids are manyflowered grasspink (*Calopogon multiflorus*) and bearded grasspink (*C. barbatus*). These plants are a fire-maintained species with populations that generally consist of only a few plants. Continued use of prescribed fire, maintenance of natural hydroperiods, and protection of wetlands from impacts are all vital tools for conserving these and several other imperiled plants in the park, including water sundew (*Drosera intermedia*), yellow-flowered butterwort (*Pinguicula lutea*), blueflower butterwort (*Pinguicula caerulea*), gypsy-spikes (*Platanthera flava*), and rose pogonia (*Pogonia ophioglossoides*).

The prescribed fire program at Cedar Key Scrub should benefit both imperiled plant and animal species that inhabit the fire-maintained communities at the park, including several scrub-associated invertebrates including red widow spider (*Latrodectus bishopi*), scabrous tiger beetle (*Cincindela scabrosa*), and moustashed tiger beetle (*Ellipsoptera hirtalabris*). The specific effects of fire on these species are largely unknown, but the retention of unburned refugia within suitable habitats and adjustments to the frequency and seasonality of prescribed burns are likely critical elements for continued survival of imperiled species such as these invertebrates (Schweitzer et al. 2011).

Several imperiled reptiles occur within the reserve, including gulf salt marsh snake (*Nerodia clarki clarki*), ornate diamond-backed terrapin (*Malaclemys terrapin macropilota*), eastern indigo snake (*Drymarchon couperi*), gopher tortoise (*Gopherus polyphemus*), and three marine turtle species to be discussed below.

The gulf salt marsh snake has been observed within the estuarine communities along the western boundary of the reserve. This species is known to have a wide zone of intergradation throughout Citrus and Levy counties with a southern form known as the mangrove water snake. The ornate diamond-backed terrapin is another important and highly vulnerable species of greatest conservation need that resides within estuarine habitats of the reserve and the adjacent aquatic preserve (FWC 2012).

The eastern indigo snake is a federally listed upland species that is becoming increasingly rare throughout its range due to loss and fragmentation of its critical habitat (Enge et al. 2013). The eastern indigo snake (*Drymarchon couperi*) was recently recognized as two genetically distinct species with the Gulf coastal form known as *Drymarchon kolpobasileus* (Krysko et al. 2016). Indigo snakes, which are often found in association with gopher tortoises, have historically been observed more frequently in the reserve as compared to other areas within its range. They are known to utilize tortoise burrows as refugia and for thermoregulation, especially during periods of cold weather. Anecdotal observations, or lack of observations, indicate that the indigo snake population within the reserve and the Gulf Hammock region has declined (Godley and Moler 2013).

The gopher tortoise is one of the better known imperiled reptiles in Florida. These terrestrial turtles and the deep burrows they construct typically are found in well-drained sandy soils of the reserve including scrub, scrubby flatwoods, sandhill, and mesic flatwoods. Gopher tortoises are generally less common in scrubby flatwoods and sand pine scrub than in open sandhills, however tortoises thrive in the early regeneration stages of scrubby flatwoods and scrub where the required open areas and herbaceous growth are present. Scrub in later stages of regeneration may become too shady or overgrown, even under a natural fire regime. Like other pyric community species, prescribed fire is a vital tool used by managers to maintain tortoise habitat. In the absence of frequent fire, hardwood trees invade upland communities and shade out herbaceous plants required by tortoises for forage. It is likely that much of the gopher tortoise population at Cedar Key Scrub persists in habitat that is less than ideal due to the relative infrequency of fire in the landscape. A typical response of tortoises to lack of fire in an area is to locate burrows along roadsides or utility easements where the shrub or tree canopy is more open (McCoy and Mushinsky 1991).

Gopher tortoises are recognized as a keystone species of critical importance because hundreds of commensal species, mostly invertebrates, utilize their burrows as refugia (Jackson and Milstrey 1994). Because of its keystone status, the gopher tortoise is considered an indicator of upland natural community health. FWC has adopted a statewide protocol for monitoring gopher tortoises based on a line transect distance sampling method (LTDS) (Smith et al. 2009). In January 2018, FNAI, under contract with FWC conducted a gopher tortoise LTDS pilot survey at Cedar Key Scrub (FNAI 2018). The purpose of this pilot survey was to calculate the effort required for a full survey to reliably estimate population size. The survey resulted in only 2 occupied gopher tortoise burrows along 5,737.3 m of transect, indicating Cedar Key Scrub has a low density gopher tortoise population that is likely not currently viable.

Based on these results, a full population survey was not warranted at this time; FWC recommends repeating this pilot survey in 5-10 years, or following habitat management, to determine if a full LTDS surveys is warranted in the future.

Three species of marine turtle occur within the waters of the Gulf of Mexico as well as utilizing the adjacent estuaries on Cedar Key Scrub's western boundary, namely Kemp's ridley (*Lepidochelys kempi*), loggerhead (*Caretta caretta*) and green turtle (*Chelonia mydas*). It is well known that nearshore estuarine habitats adjacent to the reserve are important as an "early-age" feeding ground for these species. The estuarine resources of the Big Bend region are exceptionally diverse with lush beds of submerged aquatic vegetation (SAV) and highly productive benthic macroinvertebrate communities that attract young marine turtles year-round. The constant pulses of freshwater into estuaries that characterize this region are critical to maintaining natural hydrology and sustaining water quality and quantity in the lush SAV and benthic communities.

Marian's marsh wren (*Cistothorus palustris marianae*) and Scott's seaside sparrow (*Ammodramus maritimus peninsulae*) are two imperiled salt marsh habitat-dwelling birds known to occur at Cedar Key Scrub State Reserve. The population status of these two species is still relatively unknown (Post et al. 1983; Kale 1996; Sauer et al. 2014). A recent biological review of Marian's marsh wren and Scott's seaside sparrow conducted by avian experts and FWC concluded that increased monitoring efforts were needed because of ongoing threats to salt marsh habitat along the Gulf Coast and a trend of declining marsh wren populations in the area (FWC 2011; FWC 2013a). In 2016, FWC research staff collected updated observations within the Big Bend region, including at Cedar Key Scrub.

To varying degrees, the natural communities and the imperiled species at Cedar Key Scrub have suffered from fire exclusion both within the reserve and on surrounding private lands over several decades. The early successional stages of both scrub and scrubby flatwoods are the preferred breeding and foraging habitat for Florida scrub-jays, as well as several other imperiled species including gopher tortoises, Florida mice, and an entire assemblage of scrub-associated invertebrates (Woolfenden and Fitzpatrick 1984; Jackson and Milstrey 1994). The Florida scrub-jay is one species found at the reserve that has received a large amount of management attention because of its rarity, small population size, and significantly declining numbers of individuals.

The Florida scrub-jay is one of the most iconic imperiled species in the state. The Florida scrub-jay is endemic to Florida, and the Cedar Key Scrub population is one of 21 designated population groups throughout its range (Stith 1999a). Recent work on Florida scrub-jay genetic structure has delineated the Cedar Key Scrub metapopulation as one of 10 genetically different groups (Coulon et al. 2008). This distinct isolated Cedar Key group is considered to be the northwesternmost metapopulation in the state.

In 1999, avian research experts conducted a statewide metapopulation viability analysis (MVA) for the Florida scrub-jay, one that ultimately resulted in a recognition of a significant vulnerability of the Cedar Key group to extinction (Stith 1999b). This metapopulation was given an extinction vulnerability (i.e. 5<sup>th</sup> in state)

that ranked it as the #2 priority within the state, with some experts even suggesting that it should be ranked as the top priority if it is to be recovered (USFWS 1990; Stith et al. 1996; Stith 1999a; Coulon et al. 2008; Boughton and Bowman 2011). According to the MVA report, acquisition and restoration of more than 30% of the remaining scrub-jay habitat will be required to remove the threat of extinction from the Cedar Key metapopulation. However, increases in residential development in this area continue to threaten, destroy and fragment large tracts of remnant scrub habitat before it can be protected. Even if all existing scrub habitats in the reserve were restored to optimal condition, the Cedar Key scrub-jay metapopulation may still be vulnerable to extinction (Cox et al. 1994). However, the Cedar Key group does have a strong potential for improvement given the existing undeveloped scrub habitat that remains adjacent to and nearby to the reserve. Avian experts strongly agree that there is an overwhelming need to acquire additional scrub-jay habitat and to accelerate restoration of existing public lands within the Cedar Key region (Boughton and Bowman 2011; Coulon et al. 2008). Acquisition of the Panther Ridge addition to Cedar Key Scrub in 2015 added a significant number of acres of scrub and scrubby flatwoods to the reserve. Although the majority of these areas were planted with slash pines, removal of the slash pines, coupled with fire and mechanical treatment, should restore the natural vegetation structure and increase the available habitat for scrub-jays.

If sufficient scrub-jay habitat can be acquired, restored, and maintained in proper condition on public lands in the Cedar Key Scrub area, consideration should be given to translocation of scrub-jays to Cedar Key Scrub to augment the declining population. FWC has discussed the possibility of translocating scrub-jays from healthy populations, most likely from the Ocala National Forest.

As mentioned above, there have been many restoration and monitoring activities associated with recovering the Cedar Key Scrub Florida scrub-jay metapopulation. The Division of Recreation and Parks is sincerely indebted to numerous stakeholders for their integral support of scrub habitat restoration and scrub-jay management in the Cedar Key region, including FWC, USFWS, US Marshal Service, FFS, The Nature Conservancy, Florida Museum of Natural History (University of Florida), Florida Audubon Jay Watch, Dr. Karl Miller, Vic Doig, and many volunteers. Below is a synopsis of the Division's multiple stakeholder scrub restoration management approach at the reserve.

The earliest recorded Florida scrub-jay metapopulation assessment in the Cedar Key region was in 1979-1981 (Cox 1981; Cox 1987). This was also the earliest documented Christmas Bird Count (CBC) data obtained for the reserve. A complete listing of other Cedar Key Scrub State Reserve CBC's can be accessed from the ebird website (E-Bird 2016). During this 1979-1981 work, the total size of Cedar Key Scrub's scrub-jay population was estimated to be around 100 individuals. This early assessment consisted of several surveys, of which the highest number of scrub-jay individuals counted at any one time was 21 on the reserve and 35 on private lands (Cox 1981).

Besides the scrub-jays at the reserve, the Cedar Key metapopulation consisted of several other family territories or groups located on private lands, including areas to the north of the park along County Road (CR) 347, and others near the Town of Rosewood on CR345, about five miles northeast of the reserve. In 1992-1993, an

updated statewide scrub-jay survey and mapping effort estimated a total of eight family groups within the entire Cedar Key metapopulation (Fitzpatrick et al. 1994). In 1997-2003, researchers documented as many as four family groups within the Rosewood area, as many as four groups adjacent to the reserve along or nearby to CR 347, and as many as 4 groups in the reserve (FDEP 1997; FDEP 1998; Miller et al 2003). In May 2004, the entire Cedar Key metapopulation was estimated to include a minimum of 32 known birds in 8 family groups.

Florida scrub-jay reproductive success studies have also been conducted on the Cedar Key metapopulation since 1997 (Miller et al. 2001; Miller et al 2003). During this period, researchers have marked as many as 55 Florida scrub-jays with a unique color-coded leg bands and as well as analyzed territory movements, family recruitment and fledgling dispersal (FDEP 1998; Miller et al 2001; Miller et al 2003). Interestingly, the birds at Cedar Key Scrub apparently do not exhibit as strong of a territorial behavior as compared to scrub-jays from other metapopulations that have higher densities (FDEP 1998).

The Cedar Key Scrub Jay Working Group formed in 2008 with multiple agency and stakeholder involvement. From 2004-2009, Cedar Key Scrub reserve staff and volunteers implemented an intensive effort to survey all known scrub-jays within and adjacent to the reserve several times each month (DRP District 2 files). Beginning in 2009, the Florida Park Service cooperated with Florida Audubon Society Jay Watch to implement a statewide annual assessment at all known Florida scrub-jay state park sites, including the birds in the Cedar Key metapopulation (Audubon Jay Watch 2016).

Florida scrub-jays continued to decline within the reserve and surrounding areas. An extensive survey in 2009 by FWC outside the reserve on private lands failed to detect any scrub-jays in the surrounding areas. Annual surveys by Jay Watch have shown a decline in the number of birds. As of 2016 no family groups are known to be breeding inside the reserve or on adjacent lands. A single bird is occasionally sighted along CR 346 within the reserve, and rarely are two birds reported at that location. The status of scrub-jays on private lands in the Rosewood area is unknown.

Below is a brief synopsis of other salient Florida scrub-jay monitoring activities at the reserve:

- 1995-96 USFWS Habitat Improvement Grant (HIG) to monitor scrub-jays, Florida mice and gopher tortoises
- From 1997-2009, banding study of Cedar Key scrub-jay metapopulation
- 1997-98 USFWS HIG for Dr. Tom Webber to monitor and band scrub-jays (funds also included monitoring projects for Florida mice, gopher tortoises and eastern indigo snakes)
- In 2000, FWC funded Dr. Karl Miller to conduct monitoring and band scrub-jays as part of a reproductive success study
- In 2008 Formation of the Cedar Key Scrub Jay Working Group
- In 2006 FWC developed a scrub-jay database

- In 2009, FWC/DRP conducted scrub-jay bio-blitz

### Habitat Restoration, Improvement, and Acquisition

Please see above under scrub natural community section for additional details about habitat restoration/improvement activities at the reserve. Below is a brief synopsis of other salient scrub habitat restoration activities at the reserve:

- In 1995-96 USFWS HIG; mow/disk for fire line improvement and produce Cedar Key Scrub Habitat Improvement Plan
- In 2000, FFS timber harvest 100 acres of sand and slash pine
- In 2001, Park staff roller-chopped 49 acres of scrub and fire lines
- In 2002, DEP Resource Restoration \$12,000; mow 34 acres of scrub
- In 2003, DEP Resource Restoration \$25,000; Kershaw mow 87 acres of scrub
- In 2005, USFWS grant \$30,000; Gyro-Track mow 275 acres of scrub
- In 2009, TNC scrub-jay grant; mowing and disking for fire line improvement
- In 2009, FFS/DEP federal stimulus funds; roller-chop & fire line improvement
- In 2009, Nature Conservancy acquisition of DeCarlo parcel (CK-5D) from U.S. Marshal Service; subsequently donated to state.
- In 2012 FWC/DRP conducted a tree density analysis from 1961-2008. Result suggested significantly increased tree density in scrub habitats and adjacent mesic flatwoods.
- In 2013, FFS/DRP/FWC implemented timber harvest to reduce tree density
- In 2015, DEP acquisition of Panther Ridge with Florida Forever funds

Historical data on the Florida mouse population at Cedar Key Scrub State Reserve are available from research conducted by Dr. Jim Layne. Dr. Layne began monitoring small mammals at Cedar Key Scrub in 1957 subsequent to the catastrophic fire of 1955. He trapped a site in the northeast corner of the reserve, known as Levy 10, irregularly for more than 40 years. The Levy 10 Florida mouse population underwent a major decline about 10 years post-burn, although the mice have persisted at the site (Layne 1990).

The FWC and the Division also trapped Florida mice in the reserve during 1995-1997. The FWC began a multi-year project in 1995, just prior to the Division receipt of the USFWS Habitat Improvement Grant. Multiple locations within the reserve were surveyed for Florida mice, with almost all areas of appropriate habitat, discovered to support a robust population of Florida mice (Morgan 1998). In 2012, researchers implemented a statewide genetic analysis study for the Florida Mouse that included Cedar Key Scrub (FWC 2013b).

One animal species that occupies estuarine salt marsh habitat is the Florida salt marsh vole. This species has both state and federal listed status, and FNAI ranks it as critically imperiled within Florida.

The Florida salt marsh vole has been a challenging small mammal for researchers to study, primarily due to the inaccessibility of their preferred habitat, namely salt marsh (Woods et al. 1982). This genetically distinct subspecies of the common

meadow vole is currently only known from three disjunct areas within the Big Bend Region, including Lower Suwannee National Wildlife Refuge, Cedar Key Scrub State Reserve and Waccasassa Bay Preserve State Park (Hotaling et al., 2010; Austin et al. 2014). In 2009, University of Florida researchers discovered a novel monitoring technique (i.e. camera trap) that can effectively be used to study the distribution and demography of this endangered mammal. In addition, researchers are successfully documenting another rare mammal, namely the Gulf Salt Marsh Mink (*Neovison vison halilimnetes*) within the same estuarine habitats.

Completion of important acquisition projects to ensure preservation of the remaining unprotected Cedar Key Scrub habitat is vital to restore and sustain the populations of the local scrub-jay, salt marsh vole as well as the remaining imperiled species. More about essential acquisition projects is discussed under the Land Use Component.

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.

<b>Table 2. Imperiled Species Inventory</b>						
<b>Common and Scientific Name</b>	<b>Imperiled Species Status</b>				<b>Management Actions</b>	<b>Monitoring Level</b>
	<b>FWC</b>	<b>USFWS</b>	<b>FDACS</b>	<b>FNAI</b>		
<b>PLANTS</b>						
Bearded grass pink <i>Calopogon barbatus</i>			LT			Tier 1
Manyflowered grasspink <i>Calopogon multiflorus</i>			LT	G2G3, S2S3	1,10,13	Tier 1
Water sundew <i>Drosera intermedia</i>			LT		1,4,13	Tier 1
Pantropical widelipped orchid <i>Liparis nervosa</i>			LE		4	Tier 1
Angle pod <i>Gonolobus suberosus</i>			LT			Tier 1
Cardinalflower <i>Lobelia cardinalis</i>			LT		4	Tier 1



Table 2. Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Erect pricklypear <i>Opuntia stricta</i>			LT			Tier 1
Blueflower butterwort <i>Pinguicula caerulea</i>			LT		1,4	Tier 1
Yellow-flowered butterwort <i>Pinguicula lutea</i>			LT		1,4	Tier 1
Gypsy-spikes <i>Platanthera flava</i>			LT		1,4	Tier 1
Rose pogonia <i>Pogonia ophioglossoides</i>			LT		1,4	Tier 1
<b>INVERTEBRATE</b>						
Red widow spider <i>Latrodectus bishopi</i>				G2G3, S2S3		Tier 1
<b>REPTILES</b>						
American alligator <i>Alligator mississippiensis</i>	FT (S/A)	T (S/A)		G5,S4	4,10,13	Tier 1
Loggerhead turtle <i>Caretta caretta</i>	FT	LT		G3,S3	4,13	Tier 1
Green turtle <i>Chelonia mydas</i>	FT	LT		G3,S2 S3	4,13	Tier 1
Eastern indigo snake <i>Drymarchon couperi</i>	FT	LT		G3,S3	1,7,10,13	Tier 1
Gopher tortoise <i>Gopherus polyphemus</i>	ST	C		G3,S3	1,7,10,13	Tier 2
Kemp's ridley turtle <i>Lepidochelys kempii</i>	FE	LE		G1,S1	4,13	Tier 1
Gulf salt marsh snake <i>Nerodia clarkii clarkii</i>				G4T3, S2	4	Tier 1
<b>BIRDS</b>						

**Table 2. Imperiled Species Inventory**

Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
Scott's seaside sparrow <i>Ammodramus maritimus peninsulae</i>	ST			G4T3Q, S3	2,4,13	Tier 2
Florida scrub-jay <i>Apelocoma coerulescens</i>	FT	LT		G2,S2	1,3,6,7,13	Tier 3
Short-tailed hawk <i>Buteo brachyurus</i>				G4G5, S1	4,13	Tier 1
Marian's marsh wren <i>(Cistothorus palustris marianae)</i>	ST			G5T3, S3	2,4,13	Tier 2
Little blue heron <i>Egretta caerulea</i>	ST			G5,S4	4,10,13	Tier 1
Tricolored heron <i>Egretta tricolor</i>	ST			G5,S4	4,10,13	Tier 1
Swallow-tailed kite <i>Elanoides forficatus</i>				G5,S2	4	Tier 1
American oystercatcher <i>Haematopus palliatus</i>	ST			G5,S2	4,10,13	Tier 2
Wood stork <i>Mycteria americana</i>	FT	LT		G4,S2	4,10,13	Tier 1
<b>MAMMALS</b>						
Salt marsh vole <i>Microtus pennsylvanicus dukecambelli</i>	FE	LE		G5T1, S1	4	Tier 2
West Indian manatee <i>Trichechus manatus latirostris</i>	FT	LT		G2,S2	4,10,13	Tier 1

**Management Actions**

1. Prescribed Fire
2. Exotic Plant Removal
3. Population Translocation/Augmentation/Restocking
4. Hydrological Maintenance/Restoration
5. Nest Boxes/Artificial Cavities
6. Hardwood Removal
7. Mechanical Treatment
8. Predator Control
9. Erosion Control
10. Protection from visitor impacts (establish buffers)/law enforcement
11. Decoys (shorebirds)
12. Vegetation planting
13. Outreach and Education
14. Other

**Monitoring Level**

- Tier 1. Non-Targeted Observation/Documentation: includes documentation of species presence through casual/passive observation during routine park activities (i.e. not conducting species-specific searches). Documentation may be in the form of Wildlife Observation Forms, or other district specific methods used to communicate observations.
- Tier 2. Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.
- Tier 3. Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.
- Tier 4. Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.
- Tier 5. Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

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

### **Exotic and Nuisance Species**

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

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. 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 exotic and nuisance animals are discussed in the Resource Management Program section of this component.

Cedar Key Scrub Reserve has three known invasive exotic plant species present, Brazilian pepper (*Schinus terebinthifolius*), torpedograss (*Panicum repens*) and cogongrass (*Imperata cylindrica*). Each presents its own difficulties. Due to the difficulty in surveying the area, the extent of Brazilian pepper in the reserve is not known. Torpedograss is known to be present only on roadsides or where logging activity has occurred in the past. A thorough survey for the extent of Brazilian pepper is needed before complete treatment can occur. Cogongrass has been documented in two locations within the new Panther Ridge addition. Invasive plant surveys are needed for all the newly designated resource management zones in the new addition. Treatment of all species should occur annually.

Since the last plan, 15.9 acres of exotics have been treated.

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 2017). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following

the table. For an inventory of all exotic species found within the park, see Addendum 5.

<b>Table 3. Inventory of FLEPPC Category I and II Exotic Plant Species</b>			
<b>Common and Scientific Name</b>	<b>FLEPPC Category</b>	<b>Distribution</b>	<b>Management Zone (s)</b>
<b>PLANTS</b>			
Torpedograss <i>Panicum repens</i>	I	1	CKS-1B
		2	CK-1A, CK-1B, CK-1C, CK-1D, CK-2A, CK-2M, CK-3, CK-4A, CK-6A, CK-6C, CK-6D
Brazilian pepper <i>Schinus terebinthifolius</i>	I	2	CK-2H, CK-2J, CK-2K, CK-2Qn
Cogongrass <i>Imperata cylindrica</i>	I	1	CK-10, CK-11

**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.

Feral hogs occur within the reserve and are hunted during the regularly scheduled hunting periods administered by FWC. Should feral hog cause unacceptable damages to natural or cultural resources, staff will investigate implementing additional control measures in addition to the FWC hunts.

In 2002, the red bay ambrosia beetle (*Xyloborus glabratus*) was first detected in the United States in southeast Georgia. The beetle carries the fungal pathogen (*Raffaelea lauricola*) which it transmits to red bay trees (*Persea borbonia*) and other species in the Lauraceae family, causing laurel wilt disease and death. The beetle and its associated pathogen spread rapidly, and by 2005 it had appeared in Duval County, Florida. In 2010, the disease was discovered in Levy County. The beetle (and laurel wilt) has now spread throughout most of Florida and into many of the neighboring states. Although most of the adult red bays have been top-killed, the trees continue to resprout from their roots. It may be that members of the Lauraceae family will continue to survive in shrub form as the remnant tree root systems continue to resprout. At this point, much remains unknown about the long-term impacts of this disease on red bays and other Lauraceae. Staff should

continue to restrict the movement of firewood into and out of the preserve and educate visitors about the issue.

### **Special Natural Features**

Cedar Key Scrub State Reserve contains biological and geological resources of considerable significance. The sand pine scrub natural community, with its rare endemic species, is considered imperiled not only in Florida but also around the world. The relative isolation of the particular example of scrub found at Cedar Key only serves to increase its ecological value. The development of a scrub community along this particular stretch of the Gulf Coast is due to the presence of ancient sand dunes that were created during periods of higher sea levels. These dune deposits are rare along the Big Bend coast and represent an important geological feature that has had a major role in the development of the natural and cultural resources of the area.

### **Cultural Resources**

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

### **Condition Assessment**

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

## **Level of Significance**

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

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

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

## **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:* The park has nine recorded archaeological sites and one resource groups that fall into two broad periods, prehistoric and 1821 to the mid-20<sup>th</sup> Century. Many of the prehistoric sites cannot be allocated to a particular period. Two sites (LV528 and LV536) have been designated as Deptford and Weeden Island respectively.

Other cultural sites in the park fall into the territorial, early statehood and early 20<sup>th</sup> Century periods and represent development activities during European colonization in Florida. Key among those are the Fernandina to Cedar Key Railroad (LV228), the indicators of the logging and naval stores industry (LV534).

Two known but unrecorded cultural sites exist in the park. One is a linear resource group that is discussed in the predictive model for the park. It is a portion of a corduroy road or log road discovered during a prescribed burn. It is probably associated with the 19<sup>th</sup> Century Tilghman Logging Company that had a mill in the area. This site should be located and recorded with the FMSF.

The second site was also discovered during a prescribed fire and exists close to the corduroy road. It appears to be an unmarked cemetery as evidenced by regular sunken areas. The location of this site needs to be recorded and a file submitted to the FMSF. The site should also be protected from ground disturbance. The park should develop a protocol to alert staff and possibly other agencies so it is not disturbed during any fire activities.

A predictive model has been completed for the park (Collins et al. 2012).

Archaeological sites within the Cedar Key and Waccasassa Bay coastal region are usually situated in cabbage palm hammock islands, on limestone highs around artesian sources, and on relict dunes and tidal bars. Because most of the Big Bend region is undergoing rapid change due to sea level rise, land subsidence, and wave/tidal action, it is expected that landscape modifications in the form of hammock and upland loss and scouring of limestone islands may cause a future loss of archaeological sites at Cedar Key Scrub.

*Condition Assessment:* All sites are in good condition except LV125 which was destroyed at some point perhaps during the widening of State Road 24 and LV528 which was discovered while establishing a fire break.

*General Management Measures:* All sites should be protected from soil disturbance associated with prescribed fire and wildfire. Cultural sites should be monitored annually and DHR's Management Procedures should be consulted and followed prior to any ground disturbing activities or facility development.

Detailed management goals, objectives and actions for the management of cultural resources in this park are discussed in the Cultural Resource Management Program section of this component. Table 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.

<b>Table 4. Cultural Sites Listed in the Florida Master Site File</b>					
<b>Site Name and FMSF #</b>	<b>Culture/Period</b>	<b>Description</b>	<b>Significance</b>	<b>Condition</b>	<b>Treatment</b>
8LV125 Hunter's Ridge	Prehistoric	Archaeological Site	NE	P	P
8LV274 Eureka Island	Prehistoric	Archaeological Site	NE	G	P
8LV522 Cappuccio	20 <sup>th</sup> Century American	Archaeological Site	NS	NE	N/A
8LV528 Pierson's Cut Midden	Deptford Prehistoric	Archaeological Site	NE	G	P
8LV533 Spinach Patch	Prehistoric, possibly Archaic	Archaeological Site	NE	G	P
8LV534 Herty	Early 20 <sup>th</sup> Century – 1940s Historic/ Naval stores	Archaeological Site	NE	G	P
8LV535 Rusted Car Knoll	Early 20 <sup>th</sup> Century Historic refuse/Dump	Archaeological Site	NE	G	P
8LV536 Cedar Key Scrub	Weeden Island	Archaeological Site	NE	G	P
8LV228 Fernandina Cedar - Key Railroad	1821 to present	Resource Group	NR	G	P
8LV753 Gulf Hammock G	Prehistoric	Archaeological Site	NS	NE	N/A

**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 Cedar Key Scrub State Reserve. 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: Conduct/obtain an assessment of the park's hydrological restoration needs.***

- Action 1 Continue to cooperate with other agencies and independent researchers in hydrological research and monitoring programs.
- Action 2 Continue to monitor and track surface and groundwater quality issues within the region, especially concerning natural and cultural resource impacts associated with sea level rise..
- Action 3 Continue to monitor land use or zoning changes in the region and offer comments as appropriate.
- Action 4 Conduct dye trace studies to determine groundwater sources for karst features within the reserve.
- Action 5 Continue to cooperate with the SRWMD to allow minimum flows and levels (MFL) implementation in order to ensure maintenance of historic groundwater levels.

Significant hydrological features in Cedar Key Scrub State Reserve include coastal hydric hammocks, brackish ecosystems containing portions of five major tidal creeks and the several submarine groundwater discharge karst fractures. Preservation of surface water and groundwater quality, and control of erosion and sedimentation into the reserve's freshwater wetlands, estuarine creek systems and karst features, will remain top priorities for the DRP. The following are hydrological assessment actions recommended for the reserve.

The DRP will continue its tradition of close cooperation with state and federal agencies and independent researchers engaged in hydrological research and monitoring programs within the reserve and the adjacent coastal resources, and it will encourage and facilitate additional research in those areas. Agencies such as the SRWMD, USGS, and FDEP will be relied upon to keep the DRP apprised of any declines in surface water quality or any suspected contamination of groundwater in the region. Park and District staff will continue to monitor and document any potential changes within hydric hammock or coastal forest communities as well as any known archeological resources that might be impacted by sea level rise. District 2 staff will continue to monitor Environmental Resource Permit (ERP) and Water Use Permit (WUP) requests for the region in order to provide timely and constructive comments that promote protection of the preserve's water resources. Additional cooperative efforts may include facilitating the review and approval of research permits and providing researchers with assistance in the field. Recommendations derived from the monitoring and research activities will be essential to the decision making process during management planning.

The proximal sources of flow from the Floridan aquifer to SGD karst features in the reserve are still unknown. To remedy that, the DRP should continue to encourage hydrological studies that are designed to understand their sources (as discussed in the Hydrology section above). Previous dye trace studies in Florida have provided park managers with invaluable information about the various sources of springs and the timing of surface to groundwater interactions that potentially affect important surface water bodies. In order for water managers to protect water quality and potentially restore groundwater levels to their historic levels, they will need to know the extent of these sources.

Staff will continue to monitor land use or zoning changes within lands bordering the reserve. Major ground disturbances on neighboring properties or inadequate treatment of runoff into local streams could ultimately cause significant degradation of resources in the reserve. When appropriate, District 2 staff will provide comments to other agencies regarding proposed changes in land use or zoning that may affect the reserve. In addition, District 2 staff will closely monitor major mining operations in the watershed upstream of the park and watch for significant changes that may adversely affect resources in the reserve.

The DRP will continue to work closely with the SRWMD to ensure that MFLs developed for the Waccasassa River are implemented conscientiously and that historic groundwater flows are protected.

***Objective B: Restore natural hydrological conditions and functions to approximately 288 acres of basin marsh, 459 acres of mesic flatwoods, 232 acres of hydric hammock, and 238 acres of basin swamp natural communities***

- Action 1 Conduct an assessment and evaluate the hydrological impacts in the reserve including drainage ditches, and areas where natural sheetflow has been interrupted
- Action 2 Develop a hydrological restoration plan with prioritized projects for the reserve
- Action 4 Implement installation of low-water crossing in all areas west of CR 347 (16,440 square feet) to improve wetland sheetflow

Staff will initiate hydrological restoration measures for natural systems in the reserve wherever wetland communities have been artificially impounded or ditched and where ecological functions have been disrupted. If the park and district staffs determine that roads passing through wetland communities are significantly altering natural hydrological regimes, then the DRP, using best management practices, will initiate corrective actions such as installing low water crossings or culverts in appropriate locations. In some cases, complete removal of above-grade roads may be warranted, especially if they no longer serve a useful purpose. These roads should be abandoned and elevations restored to the historic grade of the adjacent natural landscape.

## **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 2,400 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 455-1,340 acres annually.

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.

<b>Natural Community</b>	<b>Acres</b>	<b>Optimal Fire Return Interval (Years)</b>
Sandhill	4	1-3
Mesic flatwoods	880	2-4
Scrubby flatwoods	838	5-15
Scrub	137	8-15
Depression marsh	96	2-10
Basin marsh	786	2-10
Pine plantation	432	2-8
Clearcut pine plantation	106	2-4
Annual Target Acreage	455-1340	

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.

Cedar Key Scrub has six types fire adapted natural communities, with the greatest acreages represented by mesic flatwoods, freshwater marshes and scrubby flatwoods. The marshes include basin marshes and depression marshes, many of which are dominated by sawgrass. There are also ridges of sand pine scrub and sandhill, both requiring fire application to maintain optimum ecosystem health. Between 455 and 1,340 acres should be burned annually to restore and maintain the fire dependent communities in the reserve.

Prescribed burning is the most important and critical natural resource management tool at the reserve. The primary goal of the prescribed burn program is to restore a natural fire regime to the natural communities within the reserve. Most of the burn zones in the reserve consist of a complex mosaic of sand pine scrub, scrubby and mesic flatwoods, and freshwater marshes and basin swamps. The wide community diversity within each zone, as well as the overall zone size, can greatly complicate a manager's ability to implement burns on this property since each community type has a different set of optimal conditions. This coupled with the extreme fire behavior that is characteristic of scrub and scrubby flatwoods fires, makes Cedar Key Scrub a very challenging place to apply prescribed fires.

The mesic flatwoods community has a natural fire return interval ranging from 2 to 4 years, while the scrubby flatwoods may burn as frequently as every 5 to 15 years, with sand pine scrub burning every 8 to 15 years (FNAI 2010). Rosemary bald areas (i.e. a variant of scrub) within the reserve, however, typically have a longer fire return interval that can be between 10 to 40 years. Ideally, fire return intervals should fluctuate within what is considered the natural range for a community type in order to maximize habitat diversity at any one time. Although short fire return intervals in sand pine scrub obviously benefit the Florida scrub-jay, there are other species in the community that require longer intervals between fires. The sand pine scrub community should be burned at varying intervals within the natural range. The fringes of sand pine scrub areas that are adjacent to scrubby and mesic flatwoods will likely burn more frequently than the interiors of the larger scrub patches. Scrubby flatwoods, which provide most of the habitat for Florida scrub-jays at Cedar Key Scrub, will be burned on a shorter interval, with most areas receiving fire every 5 to 15 years to maximize acorn production and maintain optimal scrub-jay breeding habitat.

Fires in the reserve can be very intense because of the volatile nature of fuel types within scrub and flatwood communities. Additionally, the naturally uneven aged fuels and often high fuel loads across the landscape can elevate the complexity within individual burn zones. These conditions often make it very difficult to isolate burn zones effectively and to prevent prescribed fires from escaping into adjacent

burn zones or onto neighboring private lands. One simple example of this issue are basin marshes that straddle the reserve boundary. These marshes have light, flashy fuels that are relatively inaccessible to fire equipment due to standing water or hydric soils. There are multiple examples of wildland urban interface (WUI) issues at Cedar Key Scrub including State Road 24 on the south boundary, and numerous residential houses to the north and east of the reserve.

It is for this reason that park and district management have solicited a great deal of funding to apply a variety of restoration treatments to these fire-type communities in order to reduce the fuel loading and more safely use prescribed fire. In more complex blocks, wide fire lines need to be established between burn zones and some form of mechanical treatment can be used to reduce fuel loads and facilitate burning. In the past, emphasis has been placed on mowing scrub vegetation adjacent to mineral soil fire lines as well as fuel reduction mowing within zones prior to a planned burn. This combination of mechanical treatment followed by prescribed fire will undoubtedly continue to be an integral process in managing the upland communities at Cedar Key Scrub. Please see above under the Natural Communities scrub description for details of past restoration activities at the reserve.

The park and district staffs have been increasingly successful in implementing prescribed burns in the reserve since the first control burns occurred on the reserve in 1985 (DRP District 2 files). During the first 30 years since fire was reintroduced, managers have applied fire to as many as 3,300 acres of the reserve's fire-type habitats. During the first ten years of burning only 263 acres were treated. A significant increase of prescribed burning occurred during the past 20 years with 1,570 acres burned in 1996-2006 and 1,467 acres burned in 2006-2016. The highest number of acres ever burned at the reserve was in 2003 when 554 acres were treated. In 2014, managers were able to burn 439 acres, which is close to the recommended minimum annual target acreage as described above in Table 5.

Wildfires are commonplace at Cedar Key Scrub State Reserve. Several small wildfires, most less than 10 acres, occur annually at the reserve. Reserve staff work directly with the FFS during wildfire suppression activities, and in 2016 a lightning strike wildfire within the Panther Ridge tract was expanded into a prescribed fire with a quick response strike team that burned out a 194-acre area (zone CK-9A). When possible and safe to do these types of burnout operations, managers of Cedar Key Scrub should take advantage of this type of option. Another similar lightning strike occurred in 2008 in CK-2B, where the reserve manager was allowed to conduct a burnout operation of this 230-acre zone.

On at least two separate occasions, one in 1996 and the other in 2009, reserve staff have conducted a prescribed fire that ultimately led to a large-scale escape from the burn zone of intent. In 1996, a controlled burn on the western side of the reserve spotted across a basin marsh, escaped from the zone and burned a total of 269 acres of basin marsh, mesic flatwoods, and scrubby flatwoods. Similarly, in 2009, a controlled burn on the same west side of the reserve burned a total of 210 acres of basin marsh, mesic flatwoods, and scrubby flatwoods. Unfortunately, the

2009 wildfire also escaped off of the DRP managed lands onto adjacent private timberland. Despite the uncontrolled nature of these fires, both did provide an ecologically beneficial effect to the affected natural communities. Fortunately, there was no negative consequences to humans or structures from either escaped burn. Many other smaller-scale (50 acres or less) escapes during prescribed fires have occurred throughout the reserve.

In January 2003, reserve managers used aerial ignition at Cedar Key Scrub to prescribe burn zones CK-3 and CK-4B for a total area of 475 ac. Burn zone CK-3, CK-6a, CK-6b, and CK-6c have only received one burn in the past 30 years because of their complexity and volatile scrub fuels. Other than the new Panther Ridge tract, CK-3 is the largest burn unit of the reserve and is located between two highways as well as being adjacent to a WUI residential area on its north side. Zones CK-6A, CK-6B, and CK-6C are all composed of mainly sand pine scrub with embedded basin swamps and are also adjacent to WUI.

Zone CK-5A is also one of the more challenging and complicated large burn units in the reserve. This burn unit is perhaps one of the most ecologically diverse areas of the reserve since it contains five different natural communities including scrub, scrubby and mesic flatwoods as well as depression and basin marshes. A great deal of mechanical treatment has been done in this zone over the years, and the zone has only recently received its first prescribed burn in 2016.

Burn zone CK-2D that is situated in area west of CR 347 is unit that has received the most prescribed fire within the reserve. This zone has been burned four times in the past 30 years. Four other burn zones, namely CK-1A, CK-2K, CK-2L, and CK-4A, have received three treatments over the same 30-year period. With the exception of the Panther Ridge addition, all burn zones in the reserve have had prescribed burns at least one time since 1985.

Fire dependent wildlife species in the reserve include the gopher tortoise, indigo snake, Florida mouse, gopher frog, eastern diamondback rattlesnake (*Crotalus adamanteus*) and Florida scrub-jay. All of these species favor areas that support vegetation and prey that are enhanced by regular burning. The lack of a natural fire regime can impact plant and animal species that are adapted to scrub and scrubby flatwoods communities, most notably, the Florida scrub-jay that requires early successional stages of scrub habitats.

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 and maintenance actions recommended to create the desired future conditions in pine plantation altered landcover types (see Desired Future Conditions Map).

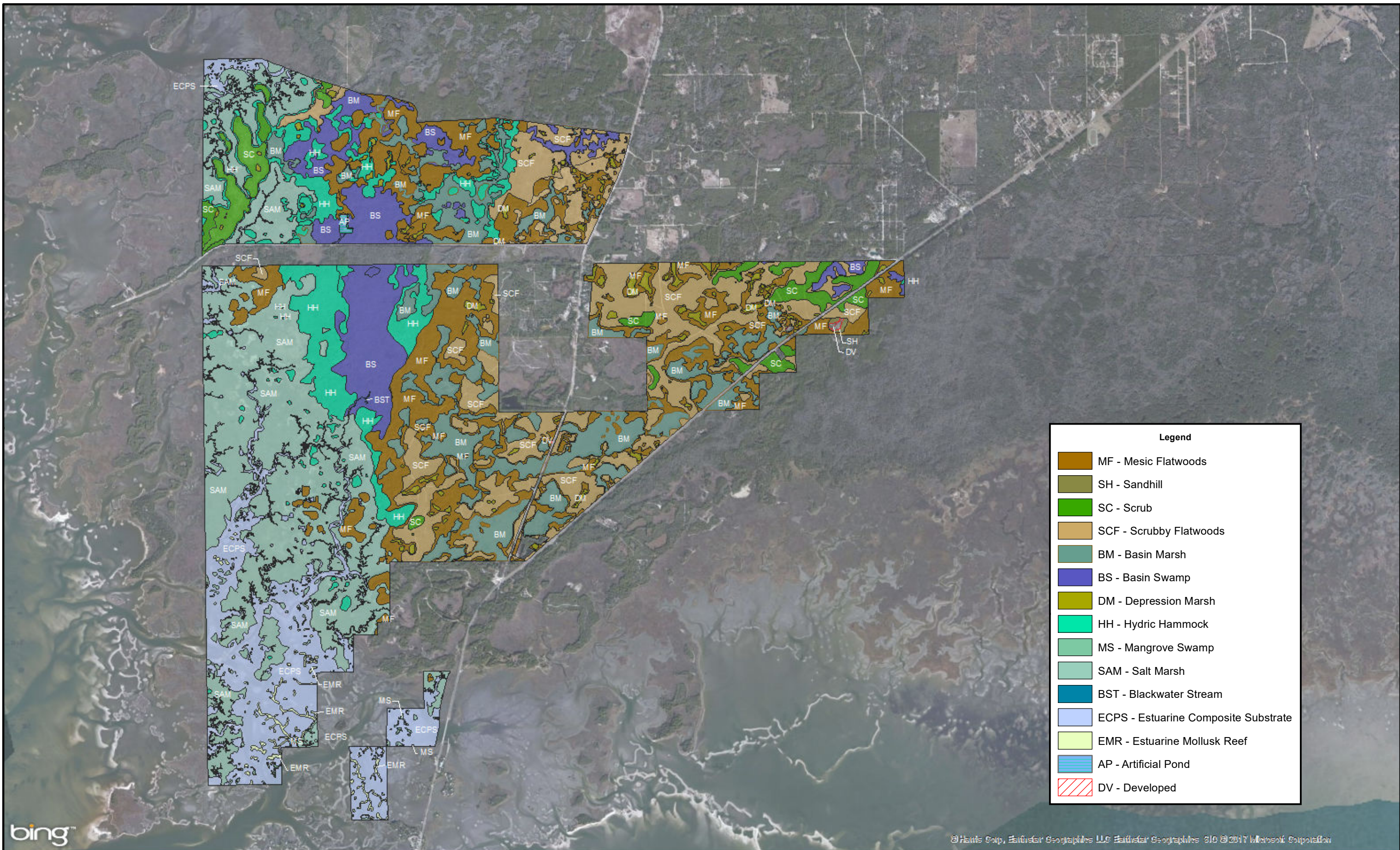
### ***Objective B: Conduct habitat/natural community restoration activities on 432 acres of pine plantation natural community***















- |          |   |
|----------|---|
| Action 1 | Develop/update restoration plan for the Panther Ridge parcel                      |
| Action 2 | Implement restoration plan for the Panther Ridge parcel                           |
| Action 3 | Monitor the progress of restoration including native groundcover and shrub layers |

The pine plantations associated with the new Panther Ridge parcel may need substantial restoration efforts, including herbicide treatments to control hardwoods in mesic flatwoods areas. Staff will initiate habitat restoration measures where ecological functions have been disrupted by this altered landscape. The highest priorities for restoration actions will be those areas identified as former scrub and scrubby flatwoods.

Restoration of the scrub and scrubby flatwoods areas will initially require removal of nearly all the planted slash pines. All slash pines will be harvested, or in some cases burned or mowed, on the scrub ridges. In the scrubby flatwoods the pines will be harvested down to less than one tree per acre. Depending on the density of scrub oaks and other native shrubs, logging equipment can be encouraged to crush the scrub vegetation to reduce fuel height for subsequent prescribed fires. Where oak densities are too low due to previous herbicide treatments or site preparation, logging equipment should avoid damaging the remaining oaks.



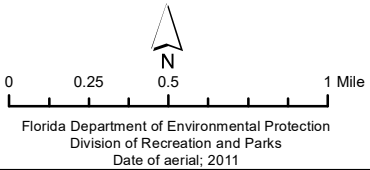


Legend	
	MF - Mesic Flatwoods
	SH - Sandhill
	SC - Scrub
	SCF - Scrubby Flatwoods
	BM - Basin Marsh
	BS - Basin Swamp
	DM - Depression Marsh
	HH - Hydric Hammock
	MS - Mangrove Swamp
	SAM - Salt Marsh
	BST - Blackwater Stream
	ECPS - Estuarine Composite Substrate
	EMR - Estuarine Mollusk Reef
	AP - Artificial Pond
	DV - Developed

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CEDAR KEY SCRUB STATE RESERVE



NATURAL COMMUNITIES MAP



The mesic flatwoods areas will need varying amounts of overstory slash pine thinning to bring the area back to historic pine densities (ca. 30-40 basal area). Fortunately, in some areas the groundcover appears to have only undergone partial disturbance and the seed bank may be intact. Longleaf pine seedlings will have to be planted to restore the appropriate overstory component on most of the pine plantation after thinning. Native groundcover reintroduction, offsite hardwood removal, and possibly some loblolly pine removal may be needed in the ongoing restoration. Some areas may need a substantial amount of mechanical and chemical treatment of offsite hardwood species such as laurel oak, sweetgum and others.

Park and District 2 staffs will need to monitor the progress of the pine thinning and hardwood treatment efforts. Supplemental chemical and mechanical treatments will occur as needed to achieve effective control of the offsite hardwoods. Monitoring requirements will include checking for native groundcover survival and for the reestablishment of offsite hardwoods. Hardwood sprouts will likely require retreatment. Prescribed fire is an integral part of this restoration project, particularly growing season fire.

#### 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 500 acres of scrub and scrubby flatwoods natural communities to prepare zones for safe applications of prescribed fire.***

- Action 1      Use mechanical treatment to widen firebreaks prior to prescribed burns
- Action 2      Use mechanical treatment to mow scrub vegetation in the interior of zones prior to prescribed burns

Prescribed burning is the most important and critical natural resource management tool at the reserve. The primary goal of the prescribed burn program is to restore a natural fire regime to the natural communities within the reserve.

A combination of mechanical treatment followed by prescribed fire will undoubtedly continue to be an integral necessary process in order to effectively manage the upland communities at Cedar Key Scrub. Staff will initiate the necessary habitat improvement measures for natural systems in the reserve in order to safely and successfully implement prescribed fire.

#### ***Objective D: Conduct natural community/habitat improvement activities on 106 acres of clearcut pine plantation.***

- Action 1      Conduct initial prescribed fires on Panther Ridge clearcuts
- Action 2      Plant longleaf pines in Panther Ridge clearcuts

The mesic flatwoods clearcuts on the Panther Ridge addition will need to be burned and then hand planted with longleaf pine seedlings. Some offsite hardwood control may also be required.

### **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, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

Ongoing inventory and monitoring of imperiled species in the state park system is necessary to meet 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.***

- Action 1      Develop imperiled species occurrence inventory for the Panther Ridge addition to Cedar Key Scrub State Reserve
- Action 2      Update imperiled species occurrence inventory for Cedar Key Scrub State Reserve

**Objective B: Monitor and document 7 selected imperiled animal species in the park.**

- Action 1      Develop monitoring protocols for 7 selected imperiled animal species
- Action 2      Implement monitoring protocols for 7 imperiled animal species including Florida scrub-jay, Florida mouse, indigo snake, gopher tortoise, salt marsh vole, Scott's seaside sparrow and Marian's marsh wren

The reserve has a long history of monitoring imperiled animal species due to its unique habitats and disjunct location. Monitoring of Florida scrub-jays will continue in cooperation with FWC, Audubon Jay Watch, and park volunteers. Likewise, research on Florida mouse populations and genetics will continue in cooperation with FWC and the University of Florida. Documentation of sightings of eastern indigo snakes will provide important information about the status of this species in the reserve. Any sightings of indigo snakes will be reported to FWC and the Florida Museum of Natural History. Monitoring of Scott's seaside sparrow and Marian's marsh wren will be conducted through cooperative survey efforts with FWC. Any additional monitoring of the salt marsh vole will be conducted by FWC and the University of Florida in cooperation with the USFWS.

As upland natural community restoration and improvement projects proceed, particularly prescribed burning, it will be increasingly important to track Florida scrub-jays, Florida mice, and gopher tortoise abundance. If staff and equipment funding are available, future gopher tortoise surveys should utilize GPS and burrow camera based LTDS methods.

Cedar Key Scrub State Reserve will continue to serve as one of the primary monitoring locations for the annual National Audubon Christmas Bird Count (CBC) in the Cedar Key region.

**Objective C: Monitor and document 1 selected imperiled plant species in the park.**

- Action 1      Develop monitoring protocols for 1 selected imperiled plant species
- Action 2      Implement monitoring protocols for 1 imperiled plant species

The manyflowered grasspink (*Calopogon multiflorus*) is the only known FNAI-tracked imperiled plant species in the reserve. Specific protocols will be developed and implemented for this species in cooperation with the Florida Natural Areas Inventory.

## **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 2 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 2 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.

A survey of the coastal portions of park for Brazilian pepper is needed. A plan to implement a thorough treatment of pepper should be developed and implemented. Treatment of torpedograss should continue annually. A complete survey of the new Panther Ridge addition is needed to document any additional invasive species and their locations.

***Objective B: Implement control measures on 1 exotic animal species in the park.***

- Action 1      Control feral hogs as needed.

Cedar Key Scrub has a minimal problem with exotic animals at this time. Feral hogs are present and are hunted during the limited hunting periods administered by FWC. If feral hog damage reaches unacceptable levels, staff will pursue actions to reduce the population in accordance with DRP policies.

## **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 Cedar Key Scrub State Reserve.

**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, pre-testing of the project site by a certified archaeological monitor, 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 10 of 10 recorded cultural resources in the park.***

Action 1 Complete 10 assessments of archaeological sites.

All cultural sites should have a baseline assessment against which site changes can be documented. Impacts from fireline preparation and other disturbances should be noted.

Archaeological sites along this coastline region are currently subject to greater wave action, higher tidal surges, and unknown changes due to sea level rise. As the threat of significant disturbance from these factors at Cedar Key Scrub increases, additional precautions may be needed, including more intensive archaeological evaluation.

No Historic Structure Reports are needed because there are no historic structures.

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

Action 1 Record the log corduroy road, the presumed unmarked cemetery and any future sites that are encountered with the FMSF.

Action 2 Conduct a cultural resource survey for any high probability area where ground disturbing activities are planned.

Action 3 Develop and adopt a Scope of Collections Statement.

Two unrecorded sites, the old corduroy road and an unmarked cemetery, need to be recorded with the FMSF. The road should be recorded as a linear resource group. If possible supporting documentation should be compiled on the history of these sites to submit with the site descriptions.

According to the predictive model completed in 2011, 38 percent of Cedar Key Scrub Reserve has a high probability of archaeological sites. Rather than conduct a level 1 survey of a particular site or area, the Division's matrix should be followed for any area where ground disturbing activities are planned. A high probability area would need a cultural resource survey if ground disturbing activities are planned and no previous survey had been conducted.

Develop a scope of collections statement indicating that the park does not have any collections and that they are not appropriate for the park.

***Objective C: Bring 1 of 10 recorded cultural resources into good condition.***

Action 1 Monitor all cultural sites on an annual basis.

Action 2 Consult and follow DHR's Management Procedures prior to any ground disturbing activities or facility development.

Cultural sites should be visited and monitored on a regular basis. Develop and implement a program to monitor all sites at least 1 time every 2 years or after a prescribed fire or wildfire. Park staff will keep a record of each site and any associated the impacts affecting each site.

Sites that previously have been impacted by fireline construction should be evaluated for methods to reduce these impacts. Options such as reduced depth of soil disturbance or relocating a section of fireline may be appropriate. Sensitive areas should be designated on maps and made available to equipment operators.

**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, with the exception of those communities specifically managed as early successional.

Cedar Key Scrub State Reserve (Cedar Key Scrub) is designated as a single-use park. As such, timber management is only permitted as a method of natural community restoration and maintenance rather than as an ongoing extractive activity. The feasibility of managing/harvesting timber at Cedar Key Scrub during the period covered by the UMP was considered pursuant to the DRP statutory responsibilities to analyze 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 natural characteristics to the degree practicable, except in those natural communities specifically managed for a structure that differs from that described in the timber assessment found at reference sites for those communities established by the Florida Natural Areas Inventory (FNAI). In the case of imperiled species, the management of certain natural communities may differ from standard treatments to provide optimum habitat conditions within the park.



Most natural communities evaluated at Cedar Key Scrub had pine and non-pine (hardwood) overstory stocking levels within or above the range identified for corresponding FNAI Reference Sites. The Timber Management Analysis found in Addendum 8 provides additional details. Overstory thinning is a management tool that may be utilized in areas which have overstocked conditions. However, the specific management goals and objectives for each natural community are detailed in the Resource Management Component. Activities related to stand improvement, including palmetto and midstory reduction, are ongoing in many areas, as well.

### **Coastal/Beach Management**

The DRP manages over 100 miles of sandy beach, which represents one-eighth of Florida's total sandy beach shoreline. Approximately one-quarter of Florida's state parks are beach-oriented parks and account for more than 60 percent of statewide park visitation. The management and maintenance of beaches and their associated systems and processes is complicated by the presence of inlets and various structures (jetties, groins, breakwaters) all along the coast. As a result, beach restoration and nourishment have become increasingly necessary and costly procedures for protecting valuable infrastructure. Beach and inlet management practices affect beaches for long distances on either side of a particular project. DRP staff needs to be aware of and participate in the planning, design and implementation of these projects to ensure that park resources and recreational use are adequately considered and protected.

In Levy County there are very few open sandy beaches as measured for available shoreline (Clark 1993) The reserve, with its multitude of coastal islands adjacent to the Gulf of Mexico, includes very little open beach habitat, none of which is considered critically eroded. There are no beaches in the reserve. Several imperiled species depend upon these isolated areas of the reserve as well as its estuarine tidal creek and salt marsh communities for protection, resting and feeding. Three species of marine turtle, numerous avifauna and the Florida manatee are a few examples of imperiled wildlife that use these discrete coastal resources. Cedar Key Scrub State Reserve uses interpretive signage at key public access points to educate visitors about these sensitive coastal resources.

### **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. By policy of DEP since 1987, aerial adulticiding is not allowed, but larviciding and ground adulticiding (truck spraying in public use areas) is typically allowed. 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.

Cedar Key Scrub State Reserve does not have an Arthropod Management Plan.

## **Sea Level Rise**

Potential sea level rise is now under study and will be addressed by Florida's residents and governments in the future. The DRP will stay current on existing research and predictive models, in coordination with other DEP programs and federal, state, and local agencies. The DRP will continue to observe and document the changes that occur to the park's shorelines, natural features, imperiled species populations, and cultural resources. This ongoing data collection and analysis will inform the Division's adaptive management response to future conditions, including the effects of sea level rise, as they develop. All throughout the Big Bend region, sea level rise has dramatically influenced both natural and cultural resources as described above under the hydrology, natural communities and cultural sections of this plan. At this time Cedar Key Scrub, however, has minimal observable impacts that could be attributed to sea level rise.

Nonetheless, sea level rise, substantial changes to the Floridan aquifer, salt water intrusion and abnormal storm surge events have all contributed to a regional vegetation die-off's within the coastal hydric hammock communities within the Cedar Key Scrub region. Specific alterations that are occurring within the region are hydric hammock communities being converted into salt-dominated communities, conversion of freshwater wetlands into brackish systems, and erosion and loss of important archeological resources. Planning efforts concerning these changes will need well thought out monitoring and research initiatives in order for park staff to best preserve, protect and conserve any park resource at risk.

## **Additional Considerations**

Levy County's population is growing at a steady rate like the majority of the state of Florida. This growth is causing northward expansion toward Cedar Key Scrub and Waccasassa Bay Preserve at a steady rate. Parcels within the optimum boundary should be monitored and pursued as they become available to prevent encroachment on the parks.

## **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.

Cedar Key Scrub State Reserve was subject to a land management review on June 8, 2018. 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.

## **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.

Cedar Key Scrub State Reserve is located within Levy County, about 1 mile north of Cedar Key in the north central part of the state. Approximately 61,000 people live within 30 miles of the park (U.S. Census 2010). According to U.S. Census data (2010), approximately 15% of residents in Levy County identify as black, Hispanic or Latino, or another minority group. About 62% of the population in Levy County is considered to be of working age, which is defined

as being between 16 and 65 years old. In 2015, Levy County's per capita personal income ranked 40<sup>th</sup> in the state at \$32,457, below the statewide average of \$42,429 (U.S. Bureau of Economic Analysis 2016).

The table below identifies significant resource-based recreation opportunities within 15 miles of Cedar Key Scrub State Reserve. Property managers include the U.S. Fish and Wildlife Service (USFWS), Florida Department of Environmental Protection (FDEP), Suwannee River Water Management District (SRWMD), Levy County, and Florida Forest Service (FFS).

<b>Table 5. Resource-Based Recreational Opportunities Near Cedar Key Scrub State Reserve</b>									
<b>Name</b>	<b>Biking</b>	<b>Hiking</b>	<b>Swim/ Beach Access</b>	<b>Boating/ Paddling</b>	<b>Fishing</b>	<b>Wildlife Viewing</b>	<b>Overnight Stay</b>	<b>Hunting</b>	<b>Equestrian Facilities</b>
Lower Suwannee National Wildlife Refuge (USFWS)	✓	✓		✓	✓	✓		✓	
Manatee Springs State Park (FDEP)	✓	✓	✓	✓	✓	✓	✓		
Yellow Jacket Conservation Area (SRWMD)		✓	✓	✓	✓	✓	✓	✓	
Andrews Wildlife Management Area (FWC)	✓	✓		✓	✓	✓		✓	
Waccasassa Bay Preserve State Park (FDEP)				✓	✓	✓	✓		
Upper Waccasassa Conservation Area (SRWMD)	✓	✓				✓			
Devil's Hammock (Levy County)	✓	✓			✓	✓		✓	
Goethe State Forest (FFS)	✓	✓				✓		✓	✓

**Table 5. Resource-Based Recreational Opportunities Near Cedar Key Scrub State Reserve**

Name	Biking	Hiking	Swim/ Beach Access	Boating/ Paddling	Fishing	Wildlife Viewing	Overnight Stay	Hunting	Equestrian Facilities
Big Bend Seagrasses Aquatic Preserve (FDEP)	✓	✓	✓	✓	✓	✓			
Cedar Key National Wildlife Refuge (USFWS)				✓	✓	✓			

The park is located in the North Central Vacation Region, which includes Alachua, Bradford, Columbia, Dixie, Gadsden, Gilchrist, Hamilton, Jefferson, Lafayette, Leon, Levy, Madison, Suwannee, Taylor, Union, and Wakulla counties (Visit Florida 2014). According to the 2014 Florida Visitor Survey, approximately 1.8% of domestic visitors to Florida visited this region. Roughly 89% visitors to the region traveled to the North Central for leisure purposes. The top activities for domestic visitors were visiting friends or relatives. Winter (36%) was the most popular travel season, but fall visitation was a close second at 34%. Nearly all visitors traveled by non-air (91%), reporting an average of 3.7 nights and spending an average of \$63 per person per day (Visit Florida 2014).

Florida’s Statewide Comprehensive Outdoor Recreation Plan (SCORP) indicates that participation rates in this region for freshwater beach activities, saltwater boat fishing, saltwater and freshwater boat ramp use, freshwater (boat and non-boat) fishing, paddling, visiting archaeological and historic sites, wildlife viewing, nature study, bicycle riding, hiking, horseback riding, picnicking, camping, and hunting are higher than the state average with demand for additional facilities increasing through 2020 (FDEP 2013).

**Existing Use of Adjacent Lands**

Lands uses adjacent to Cedar Key Scrub State Reserve are largely rural in nature and sparsely populated. Agricultural activities in the form of timber harvesting are taking place adjacent to the northernmost park boundary. Limited commercial activity occurs mainly along County Road 347 in the outparcel on the interior of the park. The Lower Suwannee National Wildlife Refuge is adjacent to the park’s western and southern boundary.

### **Planned Use of Adjacent Lands**

The Levy County future land use map indicates that all of the land surrounding Cedar Key Scrub State Reserve have a future land use designation of forestry/rural residential. According to the Levy County Land Development Code (2016), forest products are an essential part of the local economy and preserving this land base from encroaching uses is essential. As such, the forestry/rural residential district is intended to allow limited low-density residential and prioritize commercial forests.

### **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 while increasing state park visitation.

The Florida Circumnavigational Saltwater Paddling Trail, or the CT, spans 1,515 miles along Florida's coast, from Big Lagoon State Park in Pensacola to Fort Clinch State Park north of Jacksonville. Segment 6 (the Big Bend segment) spans 153.5 miles, beginning at the Lower Aucilla River launch and ending at the Cross Florida Greenway spoil island campsite near Yankeetown. This segment runs past Cedar Key Scrub State Park, and a launching point can be found along State Road 24, near the park's disjointed southern parcels.

### **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**

North of the town of Cedar Key, Cedar Key Scrub State Reserve consists of 6,784 acres that are jointly managed by DRP, the FWC, and the FFS. The reserve is minimally developed for public use, in keeping with the management objective of perpetuating the environmental values of the unit.

### **Water Area**

The reserve includes some submerged lands in the Gulf of Mexico. The submerged lands included in the reserve are part of the Big Bend Seagrasses Aquatic Preserve. The park also contains shallow waters and numerous creeks near the salt marshes that are ideal for kayaking and canoeing and fishing.

### **Shoreline**

The low-energy Gulf coast shoreline of the reserve is dominated by a salt marsh community. Numerous tidal creeks form a dendritic network dissecting the marsh. These creeks are an integral part of the highly productive estuarine salt marsh community.

### **Natural Scenery**

The reserve contains diverse habitats such as salt marsh, pine flatwoods and scrub. Although much of the property is relatively low and flat, elevations range from sea level on the western edge to 30 feet above mean sea level on the relict dune ridge in the northwestern portion. These ridges are the highest and driest elevations on the property, and support scrub and scrubby flatwoods.

### **Significant Habitat**

The scrub and scrubby flatwoods of the reserve support populations of rare animal species such as the Florida Scrub-Jay, Florida mouse, eastern indigo snake and gopher tortoise. The reserve also supports at least one active bald eagle nest and several imperiled plant species.

### **Natural Features**

The scrub community is an important natural community within the reserve and is considered imperiled both globally and within Florida. This community supports several rare endemic species.

### **Archaeological and Historical Features**

Eight archaeological and historical sites have been recorded on the reserve property. Three of the locations found are historic twentieth century sites including two refuse sites and another associated with the turpentine industry. The other sites are prehistoric archaeological and consist of two artifact scatter sites, one shell midden, one prehistoric habitation site, and one lithic scatter site. An abandoned railroad bed, formerly the Florida Railroad that ran from Cedar Key to Fernandina between 1861 and 1932, lies southeast of State Road 24. Additional information regarding the site's cultural resources is contained in the resource management component.

### **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**

Portions of the uplands were used for turpentine production, as evidenced by the presence of numerous lighter stumps, many of which have cat faces.

### **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.

The Future Land Use and zoning designation for the the park is Natural Reservation (NR). Development of structures within the NR category shall be limited to the type and intensity that is compatible with the operation and management of these areas (Levy County 2016). Existing land use and zoning designations are consistent with current and projected future uses of the park.

### **Current Recreational Use and Visitor Programs**

The existing jeep roads are utilized as multi-use trails, totaling about four miles in length on the eastern side and about six miles on the western side of the reserve. These trails are primarily used for hiking, but are also available for bicycling and horseback riding. The diverse habitats of the reserve provide opportunities for nature study and wildlife observation. Hunting activities, which usually occur from September through mid-November, are regulated by the Florida Fish and Wildlife Conservation Commission. Saltwater fishing is popular in the adjacent waters. The shallow waters near the salt marsh provide excellent opportunities for canoeing and kayaking. Rental canoes and kayaks



are available in nearby Cedar Key. Boat launching facilities are available near the northwest border of the reserve and in Cedar Key.

Cedar Key Scrub State Reserve recorded 12,198 visitors in FY 2016/2017. By DRP estimates, the FY 2016/2017 visitors contributed \$1.12 million in direct economic impact, the equivalent of adding 18 jobs to the local economy (FDEP 2018).

### **Other Uses**

Overhead power lines parallel the state roads that pass through the reserve. Because these power lines are adjacent to the roads, the aesthetic and physical impact is minimized. The town of Cedar Key utilizes two wells located on outparcels within the reserve for their drinking water supply.

### **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 Cedar Key Scrub State Reserve all wetlands and floodplain 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**

The park currently has basic trail facilities and an extensive trail system which support the primary activity of hiking and hunting. In addition to recreation facilities, the park also has a support area which provides shop space and equipment for both Cedar Key Scrub and Waccasassa Bay Preserve State Park (see Base Map).

### **Recreation Facilities**

#### State Road 24 Trailhead

Restroom  
Parking Area  
Picnic Tables  
Main Park Entrance

#### County Road 347 Trailhead

Park Entrance  
Parking Area

#### Parkwide

Trails (12 miles)

### **Support Facilities**

#### Residence/Shop Area

Residence (2)

Carports (2)

Sheds (4)

Storage Buildings (2)

Shop Building

Pumphouse

Flammable Storage

Office Building

Breakroom Building

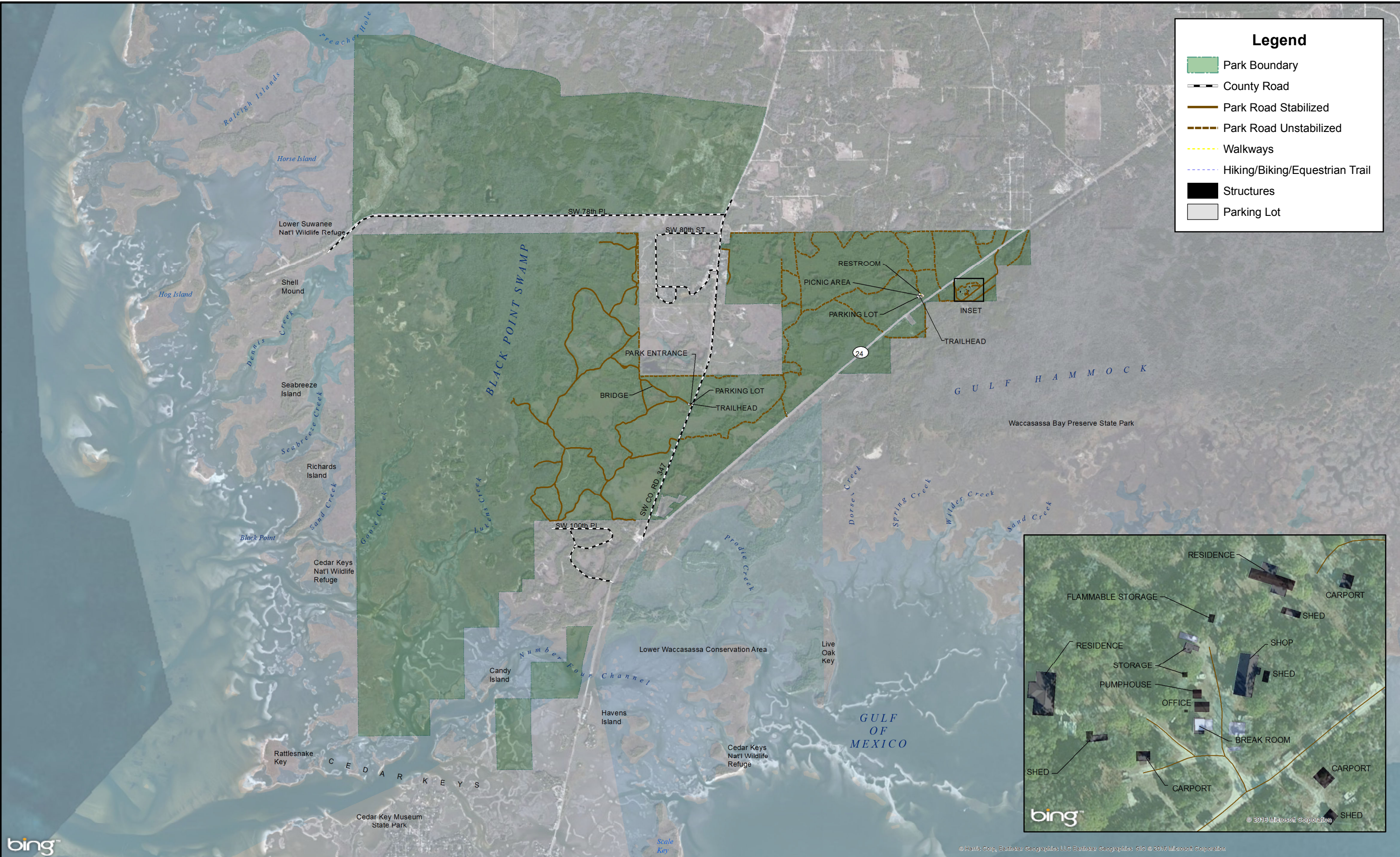
### **Conceptual Land Use Plan**

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.

### Legend

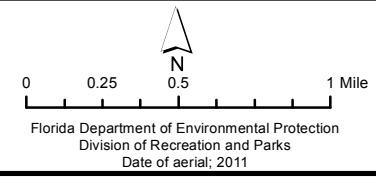
- Park Boundary
- County Road
- Park Road Stabilized
- Park Road Unstabilized
- Walkways
- Hiking/Biking/Equestrian Trail
- Structures
- Parking Lot



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CEDAR KEY SCRUB STATE RESERVE



BASE MAP



## **Potential Uses**

### **Public Access and Recreational Opportunities**

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

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

#### ***Objective: Maintain the park's current recreational carrying capacity of 2,010 users per day.***

The current recreation opportunities are centered on the trail system and the ability to hunt in the reserve. The extensive trail system provides for multiple experiences for visitors. There are also limited picnicking opportunities.

#### ***Objective: Expand the park's recreational carrying capacity by 505 users per day.***

The northern Panther Ridge parcel will be open seasonally to limited entry quota hunting opportunities for a maximum of 25 people. The hunting will be managed and operated by FWC. The parcel will have 6 miles of hiking trails added that can be accessed by the public during the off season for hunting. The 6 miles of trails will be able to accommodate recreational use by up to 480 people daily.

#### ***Objective: Continue to provide the current repertoire of 1 interpretive, educational and recreational programs on a regular basis.***

Throughout the year, park staff host several guided hikes through the scrub to highlight important natural features and species.

#### ***Objective: Develop new interpretive, educational and recreational programs.***

Cedar Key Scrub will add additional programming that will interpret and educate visitors on the natural and cultural resources of the park. These new programs may be accomplished through a variety of different interpretive, educational, and recreational programs or activities at the park or in the community.

## **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 development concept for Cedar Key Scrub envisions the park as a haven of natural resources that are unique to the state as well as a recreational asset for visitors. Development in the park will be focused on minimal facilities that are needed to support the park's current recreational uses and potential future usage. Developments will be supporting or accompanying facilities at the two trailheads, the Panther Ridge hunting parcel, the shop area, and a parkwide update of the trail systems with updated markings and maps. The Panther Ridge parcel will consist of facilities to help better manage and support FWC in managing the parcel for limited entry quota hunts. The development is proposed for the 10-year timeframe of this management plan and will be prioritized into a phased approach.

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 and new facilities needed to implement the conceptual land use plan for Cedar Key Scrub State Reserve:

***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 4 existing facilities and 12 miles of trail.***

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.

#### **State Road 24 Trailhead**

This trailhead located on the eastern side of the park acts as the main park entrance. The existing facilities are not adequate and should be expanded,

especially in regard to equestrian facilities. The parking area at this trailhead should be expanded to accommodate horse trailers. Additional equestrian facilities needed include a small corral and hitching posts. Potable water should be installed for both horses and hikers. The existing interpretive kiosk at the trailhead should be updated and improved. Lastly, the existing waterless restroom should be replaced with a permanent restroom.

#### County Road 347 Trailhead

This trailhead acts as the gateway to the western portion of the park. It is connected to the eastern trailhead at SR 24 through the trail system. This trailhead needs similar upgrades including parking for horse trailers, a small corral, and hitching posts. A high efficiency portable restroom should also be constructed at this trailhead for visitor convenience.

#### Trail System

The entire trail system should be reconfigured to make a more continuous hike while experiencing the important natural features at Cedar Key Scrub. Trail markers should be improved to aid visitors in wayfinding and reduce the volume of lost hikers. Additionally, the trail maps should be improved and updated to reflect the changes and make it easier for visitors to find their way.

#### Shop Area

The existing shop building should be updated/renovated in its current location.

#### ***Objective: Construct 3 new facilities.***

#### Panther Ridge South Entrance

This entrance will act as the trailhead for hunters in the Panther Ridge parcel. A natural buffer has been highlighted to separate the hunting area from the northern private property owners land. As a trailhead for hunters, this area will need checkpoint facilities as well. The existing wildlife management area has been expanded to include the Panther Ridge parcel.

#### Panther Ridge Trail System

A 6 mile trail system primarily following service roads and fire breaks should be outlined in the Panther Ridge parcel for use by hunters. A wayfinding system should be established and interpretive kiosks should be constructed.

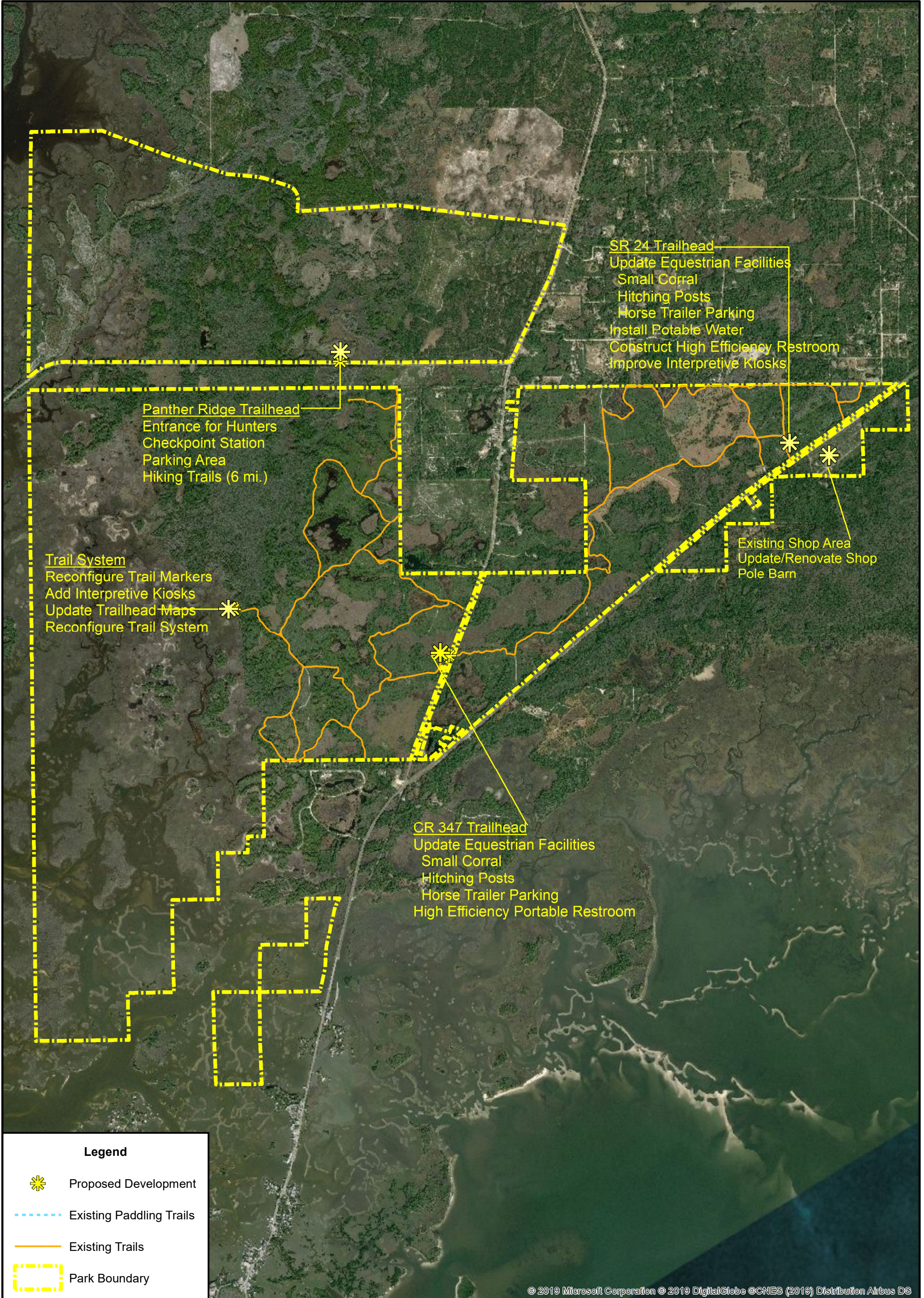
#### Shop Area

In addition to existing facilities, a new pole barn should be constructed in the shop area.

## **Facilities Development**

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 8) 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:





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### **Recreation Facilities**

#### State Road 24 Trailhead

Update Facilities  
Horse Trailer Parking  
Small Corral  
Potable Water  
Hitching Posts  
High Efficiency Restroom  
Interpretive Kiosks

#### Trail System

Reconfigure Trail System  
Update Trail Markers  
Hitching Posts  
Update Trailhead Maps  
Interpretive Kiosks

#### County Road 347 Trailhead

Update Facilities  
Horse Trailer Parking  
Small Corral  
Hitching Posts  
High Efficiency Portable  
Restroom

#### Panther Ridge Trailhead

Entrance for Hunters  
Hiking Trails (6mi.)  
Parking Area  
Checkpoint for Hunters

### **Support Facilities**

Existing Shop Area  
Update/Renovate Shop  
Pole Barn

### **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 7](#)).

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 7](#).

**Table 7. Recreational Carrying Capacity**

<b>Activity/Facility</b>	<b>Existing Capacity*</b>		<b>Proposed Additional Capacity</b>		<b>Estimated Recreational Capacity</b>	
	<b>One Time</b>	<b>Daily</b>	<b>One Time</b>	<b>Daily</b>	<b>One Time</b>	<b>Daily</b>
Trails						
Nature	480	1920	120	480	600	2400
Picnicking	20	40			20	40
Hunting	50	50	25	25	75	75
<b>TOTAL</b>	<b>550</b>	<b>2010</b>	<b>145</b>	<b>505</b>	<b>695</b>	<b>2515</b>

\*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 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.

The rate of population growth in western Levy County is relatively low in comparison to that of other, more southerly counties along the Gulf Coast. However, the Cedar Key residential area is expanding northward at a steady rate along State Road 24 into uplands near Cedar Key Scrub. The narrow strip of uplands between Cedar Key Scrub State Reserve and Waccasassa Bay Preserve State Park along State Road 24 encompasses only about 400 acres, so developable real estate in proximity to the town of Cedar Key is at a premium. Most of these lands are included within the Optimal Boundaries for the reserve and for Waccasassa Bay Preserve State Park. A development company acquired much of this land for the construction of home sites and at one point, a golf course was considered. An already platted subdivision adjacent to Cedar Key Scrub State Reserve was purchased by the same company, and single-family residential lots were sold despite attempts by the State to purchase this property. Even now, lots as far away as those in Section 4 along County Road 347 are selling at a moderate rate. The unique characteristics of the reserve's natural areas are such that even scattered development outside the reserve can severely hamper the proper management and preservation of the natural resources within the reserve.

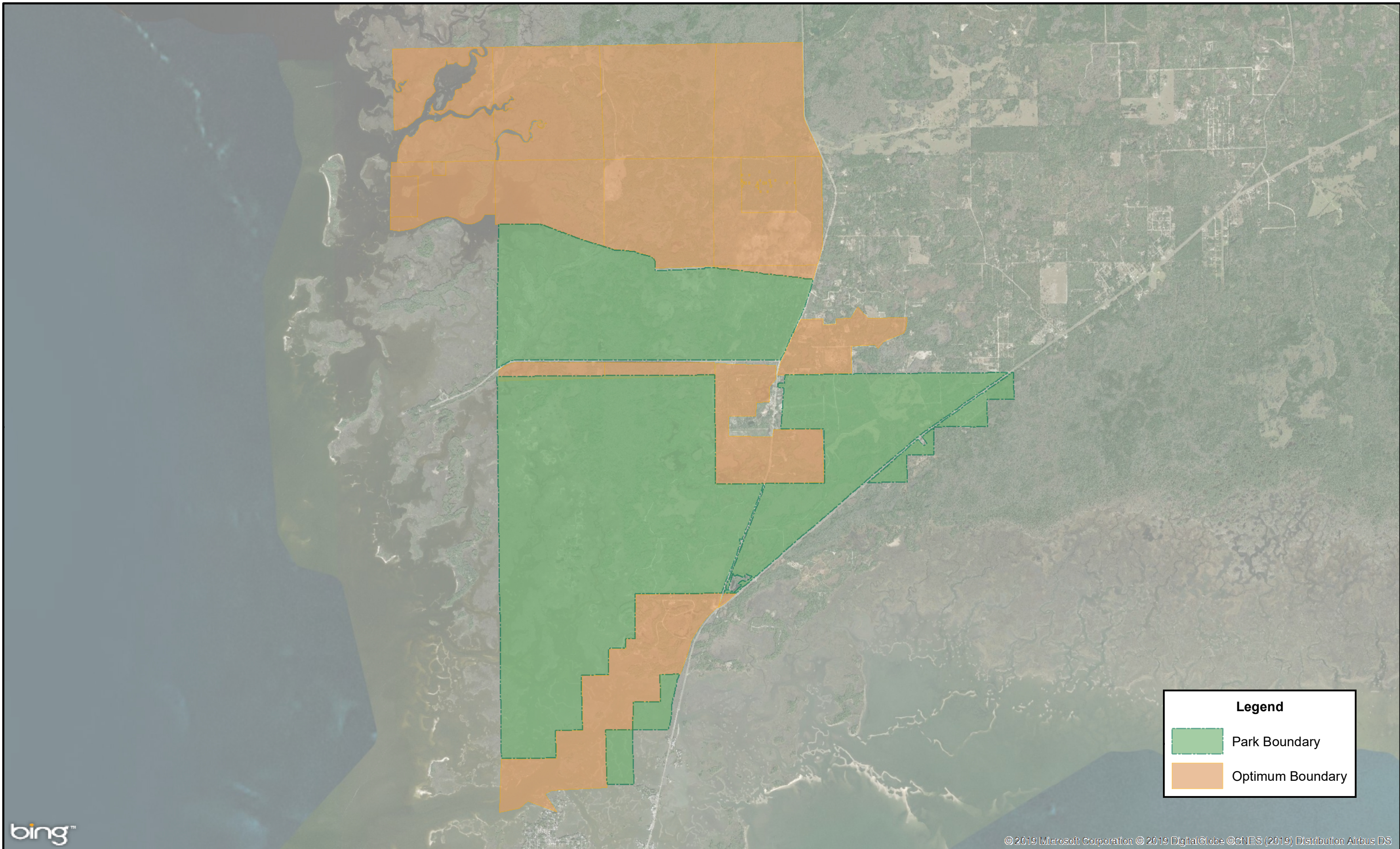
Fortunately, the optimum boundary parcels south of SR 24, originally purchased for development, have now been incorporated into the Florida Gulf Coast Mitigation Bank. As the wetlands and uplands in the mitigation bank are restored, and the credits are sold, it is likely that the properties will be transferred into public ownership for management in perpetuity.

Encompassed within the relatively narrow confines of the Additions & Inholdings projects for Cedar Key Scrub State Reserve and Waccasassa Bay Preserve State Park are such disparate natural communities as scrub, scrubby flatwoods, hydric hammock, and salt marsh. These communities form the Cedar Key Scrub/Gulf Hammock complex that has long been recognized as one of the state's truly unique natural systems. The area attracts much research interest because of the geographic isolation of its wildlife populations and its abundance of rare and threatened plant and animal species.

Acquisition of the Additions and Inholdings parcels would preserve the linkages among the natural areas of this remarkable region. It would greatly enhance the prospect that one day a continuous band of public land would extend north from Yankeetown through the Big Bend region of the Gulf Coast. Completion of

these acquisition projects would ensure preservation of the remaining unprotected Cedar Key Scrub habitat so vital to the local scrub-jay population and it would save unspoiled salt marshes that provide the last refuge for the endangered salt marsh vole. Cultural resources, including three archaeological sites registered in the Florida Master Site File, would also be protected. Finally, by adding to the reserve adjacent lands that likewise contain highly volatile natural fuels, the management goals for fire-maintained habitats already under state ownership would be made more attainable. Only by acquiring these lands will prescribed burning of the existing reserve become a relatively safer procedure.

The long-term preservation of the existing reserve and all of its components depends on the future protection and preservation of the entire ecosystem within which it lies. Development and destruction of the lands surrounding the scrub could irreparably harm one of Florida's major remaining natural assets.



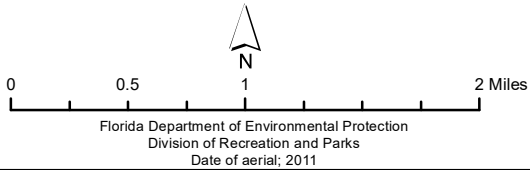
**Legend**

- Park Boundary
- Optimum Boundary

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CEDAR KEY SCRUB STATE RESERVE



OPTIMUM BOUNDARY MAP





## **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 Cedar Key Scrub in 2005, 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.

#### **Acquisition**

- In 2010-11 DSL acquired deed from The Nature Conservancy for the DeCarlo parcel and leased it to DRP for management.
- In 2015, DSL purchased a 1500-acre parcel known as Panther Ridge Estates within the Caber Coastal Connector Florida Forever project and leased it to DRP for management.

#### **Park Administration and Operations**

- Since 2005 approximately 1,437 volunteer hours have been contributed to the park to assist with park maintenance, visitor services, administration, interpretation, protection and resource management activities.

#### **Resource Management**

##### **Natural Resources**

- In 2009, TNC Scrub Jay grant funded OPS/private contractor to widen 16 miles of fireline.
- In 2009, Federal stimulus grant funded Florida Forest Service Mitigation Team to mow/rollerchop 1.8 acres (3/4 mile) of boundary fireline
- In 2012, FFS Mitigation Team created 0.2 miles of new park boundary firebreaks in CK 5D
- In 2013, BNCR dedicated \$13,000 for new firelines (Primarily DeCarlo parcel, 125-ac.)
- In 2013, fire shadow timber harvest and mechanical treatment project (FFS/FWC/USFWS/FPS) to remove slash pines adjacent to potential Florida scrub jay breeding habitat.

- In 2017 the park was awarded a FFS Prescribed Fire Enhancement Grant for \$35,000 worth of new perimeter and internal firebreaks on the Panther Ridge Estates Addition.
- From 2010-13 numerous fire equipment updates including ATV 12-gallon water tank UTV 25-gallon, Type 6 engine pump, plumbing and safety lights, and repairs to engine water fill plumbing
- From 2005 to 2017, over 950 acres burned.
- Over 400 areas of scrub and scrubby flatwoods were mechanically treated in 2016-17 to restore habitat and permit safer prescribed fires.
- In 2010, cooperated with University of Florida (UF) USFWS Cooperative Fish & Wildlife Research Unit for an assessment of the federally imperiled saltmarsh vole
- In 2012-13 cooperated with UF statewide assessment /genetics study for the Florida mouse
- Received FWC Invasive Plant Mgmt (IPM) grant in 2011-12 to treat torpedo grass issues and in 2013-14 received an additional IPM grant to retreat some holdout areas
- In 2012-13, focused Brazilian Pepper mapping efforts in zone 2Q, and
- Continued to achieve 100% of annual exotic plant removal goals by specifically treating up to 6 Category I exotic plant species (22.5 acres treated from 2008-2016) including threats such as Brazilian pepper, cogongrass, mimosa, chinaberry, torpedo grass and Japanese climbing fern. In addition, park staff removed nearly 31 feral hogs from the park over the same eight-year period.
- Secured FDEP Springs Initiative funding in 2009-10 and cooperatively implemented Thermal Imaging project with USGS
- 2015 - cooperated with the Florida Forest Service on fire line work including 50' mowed edges around management zones and widening boundary fire breaks to 50'.
- 2015/16 - exceeded burn goals by more than double, including back-logged and "no history" acreage.
- 2016 - completed 2 low water crossings to improve drivability for park vehicles, particularly fire vehicles.
- Added multiple species to species list.

### **Cultural Resources**

- The park underwent a cultural resource Predictive Model Assessment in 2011. The outcome of the predictive model assessment will be used to further understand the placement of protected zones in the park.

### **Recreation and Visitor Services**

- In 2009, new park brochure, including updated trail map.
- In 2010, AmeriCorps-led improvement project to the park's trail system that included updated trail blaze marks, updated signs with number and color designation, and updated trail maps. Also installed kiosks, provided self-guided brochures, and installed ADA parking space at picnic area.
- In 2011, installed ADA ramp hand rail at the portable restroom for the SR 24 parking area entrance.

- In 2013, several trailhead upgrades at CR 347 entrance including fencing, kiosk and brochure rack, trash receptacles, opening up of parking visibility, and signage.
- 2014 - introduced Bird List brochure
- 2015 - new fencing and park sign installed at State Road 24 entrance
- Park offers quarterly guided hikes and/or paddles.

### **Park Facilities**

- In 2012 two new volunteer RV sites were installed near the shop.
- 2015 – At Park Office replaced outside walls and insulation.
- 2015 - replaced FWC information kiosks at both entrances.
- 2016 - office restoration project, with new flooring, interior walls, and added shelf space.

### **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 8) 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 8  
Cedar Key Scrub State Reserve Ten-Year Implementation Schedule  
and Cost Estimates Sheet 1 of 5**

<b>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.</b>				
<b>Goal I: Provide administrative support for all park functions.</b>				
		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Continue day-to-day administrative support at current levels.</b>	Administrative support ongoing	C	<b>\$195,352</b>
<b>Objective B</b>	<b>Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.</b>	Administrative support expanded	C	<b>\$198,342</b>
<b>Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.</b>				
		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Conduct/obtain an assessment of the park's hydrological needs.</b>	Assessment conducted	ST or LT	<b>\$39,000</b>
Action 1	Continue to cooperate with other agencies and independent researchers in hydrological research and monitoring programs	Cooperation on-going	C	\$3,500
Action 2	Continue to monitor and track surface and groundwater quality issues within the region	Monitoring on-going	C	\$2,500
Action 3	Continue to monitor land use or zoning changes in the region and offer comments as appropriate	Monitoring on-going	C	\$1,500
Action 4	Conduct dye trace studies to determine groundwater sources for karst features within the reserve	Project completed	UFN	\$30,000
Action 5	Continue to cooperate with the SRWMD to allow MFL implementation to ensure maintenance of historic groundwater levels	Cooperation on-going	C	\$1,500
<b>Objective B</b>	<b>Restore natural hydrological conditions and functions to approximately 288 acres of basin marsh, 459 acres of mesic flatwoods, 232 acres of hydric hammock, and 238 acres of basin swamp natural communities</b>	# Acres restored or with restoration underway	UFN	<b>\$38,400</b>
Action 1	Conduct an assessment and evaluate hydrological impacts in the reserve including drainage ditches and areas where natural sheetflow has been interrupted	Assessment conducted	ST	\$2,000
Action 2	Develop a hydrological restoration plan with prioritized projects for the reserve	Plan developed	ST	\$1,000
Action 3	Implement installation of low-water crossings (LWCs) in all areas west of CR 347 (16,440 square feet) to improve wetland sheetflow	LWCs installed	UFN	\$35,400
		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>

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**Table 8  
Cedar Key Scrub State Reserve Ten-Year Implementation Schedule  
and Cost Estimates Sheet 2 of 5**

<b>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.</b>				
<b>Objective A</b>	<b>Within 10 years, have 2400 acres of the park maintained within the optimal fire return interval.</b>	# Acres within fire return interval target	LT	<b>\$716,000</b>
Action 1	Develop/update annual burn plan	Plan updated	C	\$16,000
Action 2	Manage fire dependent communities for ecosystem function, structure and processes by burning between 455 - 1340 acres annually, as identified by the annual burn plan	Average # acres burned annually	C	\$675,000
Action 3	Establish 2.5 miles of new firebreaks	# Miles established	ST	\$25,000
<b>Objective B</b>	<b>Conduct habitat/natural community restoration activities on 432 acres of pine plantation community.</b>	# Acres restored or with restoration underway	ST or LT	<b>\$35,000</b>
Action 1	Develop a restoration plan for the Panther Ridge parcel	Plan developed/updated	ST	\$2,500
Action 2	Implement restoration plan for the Panther Ridge parcel	# Acres with restoration underway	LT	\$27,500
Action 3	Monitor the progress of restoration including native groundcover and shrub layers	Monitoring completed	LT	\$5,000
<b>Objective C</b>	<b>Conduct habitat/natural community improvement activities on 500 acres of scrub and scrubby flatwoods communities to prepare zones for safe application of fire.</b>	# Acres improved or with improvements underway	ST	<b>\$94,000</b>
Action 1	Use mechanical treatment to widen firebreaks prior to prescribed burns	Improvement completed	ST	\$27,000
Action 2	Use mechanical treatment to mow scrub vegetation in the interior of zones prior to prescribed burns	Improvement completed	ST	\$67,000
<b>Objective D</b>	<b>Conduct natural community/habitat improvement activities on 106 acres of clearcut pine plantation.</b>	# Acres improved or with improvements underway	ST	<b>\$23,000</b>
Action 1	Conduct initial prescribed fires on Panther Ridge clearcuts	Improvement completed	ST	\$5,000
Action 2	Plant longleaf pines in Panther Ridge clearcuts	Improvement completed	ST	\$18,000
<b>Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.</b>	List updated	C	<b>\$3,500</b>
<b>Objective B</b>	<b>Monitor and document 7 selected imperiled animal species in the park.</b>	# Species monitored	C	<b>\$7,000</b>
Action 1	Develop monitoring protocols for 7 selected imperiled animal species	# Protocols developed	ST	\$0
Action 2	Implement monitoring protocols for 7 imperiled animal species including Florida scrub-jay, Florida mouse, indigo snake, gopher tortoise, salt marsh vole, Scott's seaside sparrow and Marian's marsh wren	# Species monitored	C	\$7,000
<b>Objective C</b>	<b>Monitor and document 1 selected imperiled plant species in the park.</b>	# Species monitored	C	<b>\$2,000</b>
Action 1	Develop monitoring protocol for 1 selected imperiled plant species including the manyflowered grasspink	# Protocols developed	ST	\$200
Action 2	Implement monitoring protocol for 1 imperiled plant species including that listed in Action 1 above	# Species monitored	C	\$1,800

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**Table 8  
Cedar Key Scrub State Reserve Ten-Year Implementation Schedule  
and Cost Estimates Sheet 3 of 5**

**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.**

<b>Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Annually treat 2 acres of exotic plant species in the park.</b>	# Acres treated	C	<b>\$9,250</b>
Action 1	Annually develop/update exotic plant management work plan	Plan developed/updated	C	\$8,000
Action 2	Implement annual work plan by treating 2 acres in park, annually, and continuing maintenance and follow-up treatments, as needed	Plan implemented	C	\$1,250
<b>Objective B</b>	<b>Implement control measures on 1 exotic and nuisance animal species in the park.</b>	# Species for which control measures implemented	C	<b>\$10,000</b>
Action 1	Control feral hogs as needed	Control implemented	C	\$10,000
<b>Goal VI: Protect, preserve and maintain the cultural resources of the park.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Assess and evaluate 10 of 10 recorded cultural resources in the park.</b>	Documentation complete	LT	<b>\$15,000</b>
Action 1	Complete 10 assessments of archaeological sites	Assessments complete	LT, ST	\$15,000
<b>Objective B</b>	<b>Compile reliable documentation for all recorded historic and archaeological sites.</b>	Documentation complete	LT	<b>\$14,800</b>
Action 1	Record the log corduroy road, the presumed unmarked cemetery and any future sites that are encountered with the FMSF	# Sites recorded or updated	ST	\$800
Action 2	Conduct a cultural resource survey for any high probability area where ground disturbing activities are planned	survey completed	ST	\$11,500
Action 3	Develop and adopt a Scope of Collections Statement	Document completed	ST	\$2,500
<b>Objective C</b>	<b>Bring 1 of 10 recorded cultural resources into good condition.</b>	# Sites in good condition	LT	<b>\$9,000</b>
Action 1	Monitor all cultural resources on an annual basis.	# Sites monitored	C	\$5,000
Action 2	Consult and follow DHR's Management Procedures prior to any ground disturbing activities or facility development.	Programs implemented	C	\$4,000
<b>Goal VII: Provide public access and recreational opportunities in the park.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Maintain the park's current recreational carrying capacity of 1960 users per day.</b>	# Recreation/visitor	C	<b>\$195,352</b>
<b>Objective B</b>	<b>Expand the park's recreational carrying capacity by 30 users per day.</b>	# Recreation/visitor	ST or LT	<b>\$198,342</b>

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**Table 8  
Cedar Key Scrub State Reserve Ten-Year Implementation Schedule  
and Cost Estimates Sheet 4 of 5**

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<b>Objective C</b>	<b>Continue to provide the current repertoire of 1 interpretive, educational and recreational program on a regular basis.</b>	<b># Interpretive/education programs</b>	<b>C</b>	<b>\$5,000</b>
<b>Objective D</b>	<b>Develop 3 new interpretive, educational and recreational programs.</b>	<b># Interpretive/education programs</b>	<b>ST or LT</b>	<b>\$21,000</b>
<b>Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Maintain all public and support facilities in the park.</b>	<b>Facilities maintained</b>	<b>C</b>	<b>\$293,028</b>
<b>Objective B</b>	<b>Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990.</b>	<b>Plan implemented</b>	<b>ST or LT</b>	<b>\$10,000</b>
<b>Objective C</b>	<b>Improve and/or repair 4 existing facilities and 12 miles of trail as identified in the Land Use Component.</b>	<b># Facilities/Miles of Trail/Miles of Road</b>	<b>LT</b>	<b>\$1,484,433</b>
<b>Objective D</b>	<b>Construct 3 new facilities as identified in the Land Use Component.</b>	<b># Facilities/Miles of Trail/Miles of Road</b>	<b>LT</b>	<b>\$5,361,464</b>
<b>Objective E</b>	<b>Expand maintenance activities as existing facilities are improved and new facilities are developed.</b>	<b>Facilities maintained</b>	<b>C</b>	<b>\$297,513</b>

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**Table 8**  
**Cedar Key Scrub State Reserve Ten-Year Implementation Schedule**  
**and Cost Estimates Sheet 5 of 5**

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**Summary of Estimated Costs**

Management Categories	Total Estimated Manpower and Expense Cost* (10-years)
Resource Management	\$1,015,950
Administration and Support	\$393,694
Capital Improvements	\$6,855,897
Recreation Visitor Services	\$393,694
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.

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## **Addendum 1—Acquisition History**





## Cedar Key Scrub State Reserve Acquisition History

LAND ACQUISITION HISTORY REPORT					
Park Name	Cedar Key Scrub State Reserve				
Date Updated	10/18/2016				
County	Levy County, Florida				
Trustees Lease Number	Lease No. 4523				
Legal Description	A legal description is available upon request from the Department of Environmental Protection				
Current Park Size	6784.31 acres				
Purpose of Acquisition	The State of Florida acquired Cedar Key Scrub State Reserve to protect and preserve the lands.				
<b>Acquisition History</b> (includes only acquisitions with areas of 10 acres or more)					
Parcel Name or Parcel DM-ID	Date Acquired	Initial Seller	Initial Purchaser	Size in acres	Instrument Type
MDID 4002	12/27/1978	Joseph N. Messana and his wife Ruth B. Messana	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees)	4875	Warranty Deed
MDID 365559	12/16/2010	The Nature Conservancy	Trustees	124.618	Special Warranty Deed
<b>Management Lease</b>					
Parcel Name or Lease Number	Date Leased	Initial Lessor	Initial Lessee	Current Term	Expiration Date
Trustees' Lease No. 4523	8/11/2014	The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida	The State of Florida Department of Environmental Protection, Division of Recreation and Parks	50 years	8/10/2064
Outstanding Issue	Type of Instrument	Brief Description of the Outstanding Issue		Term of the Outstanding Issue	
There are no known deed-related outstanding issues such as restrictions and reservations					

## Cedar Key Scrub State Reserve Acquisition History

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## **Addendum 2—Advisory Group Members and Report**



**Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park  
Advisory Group Members and Report**

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**Dale Register**  
Mayor  
City of Cedar Key

**John Meeks**  
Commissioner  
Levy County Commission

**Jacob Sache**  
Chairman  
Levy County Soil and Water

**Virginia Johns**  
Chair  
Suwannee River WMD

**Norberto Fernandez**  
Biologist  
FWC North Central Region

**Matt Chopp**  
Hunting Biologist  
FWC North Central Region

**Michael Edwards**  
Senior Forester  
Florida Forest Service

**Ferlain Hoover**  
Park Manager  
Division of Recreation and Parks

**John Kimball**  
Local Property Owner

**Katherine Dunlap**  
Local Property Owner

**Charles & Nancy Reed**  
Local Property Owner

**Rick Anthony**  
President  
Florida Nature Coast Conservancy

**Andrew Gude**  
Manager  
Lower Suwannee National Wildlife  
Refuge

**Gail Taylor**  
President  
Florida Native Plant-Citrus Chapter

**Jay Bushnell**  
President  
Cedar Key Audubon Society

**Bob Simons**  
President  
Sierra Club Suwannee-St. Johns

**Greg McCandless**  
President  
Levy County Horse Club

**Jeff Glen**  
Chair  
Florida Trail Association-Sandhill

**Brack Barker**  
Owner  
Wild Florida Adventures

**David Poeklik**  
Executive Director  
Nature Coast Development Council

**Dr. Michael Allen**  
UF-IFAS Nature Coast Biological  
Station

## **Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park Advisory Group Members and Report**

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The Advisory Group meeting to review the proposed unit management plans (UMP) for Cedar Key Scrub State Reserve and Waccasassa Bay Preserve State Park was held in Cedar Key at the FWC Senator George G. Kirkpatrick Marine Laboratory on Thursday February 28, 2019 at 9:00 AM.

Doug Maple joined Jay Bushnell in representing the Cedar Keys Audubon Society. Tara Maillard attended the meeting representing Levy Soil and Water in place of Jacob Sache. Appointed members unable to attend included Dale Register, John Meeks, Virginia Johns, Matt Chopp, Michael Edwards, John Kimball, Charles & Nancy Reed, Andrew Gude, Gail Taylor, Bob Simons, Jeff Glen, and Brack Barker.

Attending Division of Recreation and Parks (DRP) staff members from the two parks, district office, and the Office of Park Planning were Richard Owen, Daniel Pearson, Ferlain Hoover, Brian Fugate, Clif Maxwell, Chris Camargo, and Joel Allbritton.

Mr. Allbritton began the meeting by explaining the purpose of the advisory group and thanked everyone for attending. Mr. Allbritton then asked each member of the advisory group to express their comments on the draft management plans. After all the comments were shared, Mr. Allbritton described the next steps for drafting the plans and the meeting was adjourned.

### **Summary of Advisory Group Comments**

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**Dr. Michael Allen (UF-IFAS)** began the meeting by commenting on the comprehensiveness of the plans. Mr. Allen stated that some of the data on imperiled and endangered species is dated and that we should try to work with FWC to update the data as we can. Mr. Allen commented on access to the parks and ways to make the parks more accessible especially in regard to kayak and canoe access to Waccasassa Bay. Mr. Allen explained thermal imaging in regards to hydrological issues like mangrove migration and tropical fish species and how using this data could help the park and surrounding areas to combat these and other issues in the future. Mr. Allen encouraged the participation with other agencies and groups to regularly map groundwater seeps. Dan Pearson commented on importance of this topic and explained funding constraints and the need to partner with other agencies to work on these issues. Mr. Allen explained the future grants and opportunities that may be available in the coming years and how we should pursue them as a united group. Clif Maxwell commented the need to show this as an action item for the life of the plan and explained the differences between federal researching and park service researching. Dan Pearson explain the Hydrological Management Objectives and how they relate to the topic. Rick Owen commented on the dye trace studies that are mentioned in the Hydrology sections and how we could expand further to include these mapping opportunities. Mr. Allen asked about the timing of the management plans and Clif Maxwell detailed the 10-year timing of management plan updates. Rick Owen commented on the Scrub Jay and other outdated data and how they did not want to lose any of the historical data for these species. Dan Pearson commented on the Scrub Jay populations in Cedar Key Scrub.

## **Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park Advisory Group Members and Report**

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Mr. Allen asked when was the last time that Scrub Jays were observed in the park. Chris Camargo detailed that the last Scrub Jay sighting was May of 2018. Mr. Camargo commented on the kayak access for Waccasassa Bay and the priority of the plan to better maintain the campsites that are currently on the property.

**David Poeklik (Nature Coast Development Council)** applauded the authors and efforts put into both plans. Mr. Poeklik commented that the scrub jay data and explanations at the public meeting and advisory group meeting was eye opening. Mr. Poeklik explained parallels of challenges in plans with the challenges that the development council faces in regard to sea level rise, salt water intrusion, and other issues. Mr. Poeklik stated that the Nature Coast Development Council supports the efforts that were put into the plans and the implications that are presented. Mr. Poeklik commented that it was great to have a better awareness of the impacts that these two parks have for the region and state as a whole.

**Jay Bushnell (Cedar Keys Audubon Society)** asked about increased access to the land portion of Waccasassa Bay and any trails that could be made available. Mr. Bushnell commented that they are currently in the process of developing a strategic plan that better identifies the commitment to Florida wildlife. Mr. Bushnell commented that he had given Chris some signage made by The Florida Wildlife Federation that talks about gopher tortoises and could educate people on this species. Mr. Bushnell encouraged park staff to put the signage up to aid in saving gopher tortoises. Mr. Bushnell asked where the planting of the longleaf pines was going to take place at. Dan Pearson explained the areas where the longleaf pines would be planted in and detailed the differences between longleaf and slash pines. Mr. Bushnell talked about the cabbage palms and how they are taking over in some areas as well as control measures for the palms. Dan Pearson explained how fire can aid in removing young cabbage palms and the need to have more frequent fire return intervals for areas with cabbage palms. Clif Maxwell talked about the changes of natural community types and how the parks can address this issue. Ferlain Hoover explained future access of Waccasassa Bay and access to the trails. Dan Pearson and Clif Maxwell further explained additional access of Waccasassa Bay and difficulties of getting to the upland areas of the park. Mr. Maxwell commented on the difficulties of kayak and canoe access. Mr. Bushnell asked how the areas held up to the hurricane, if they were stable, and of tree loss. Chris Camargo commented on the current conditions of sites as well as tree fall that was a result of hurricanes.

**Katherine Dunlop (Adjacent Property Owner)** detailed the plant ID cards for the Railroad Trestle Nature Trail that have been made to educate users on the plants that can be seen in the area. Mrs. Dunlop stated that the plant ID cards will be posted on the Florida's Nature Coast Conservancy website for educational interpretation for everyone. Mrs. Dunlop applauded the efforts of putting the plans together and thanked the group for the inclusion of equestrian opportunities in the plan.

**Greg McCandless (Levy County Horse Club)** stated that his comments are strictly for Cedar Key Scrub oriented. Mr. McCandless commented that he found the

## **Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park Advisory Group Members and Report**

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discussions on preservation of water quality and slash pines importance for species protection from the public meeting very interesting. Mr. McCandless detailed scrub jay data collection efforts and how they have not seen any since slash pines were cut down along the trails. Mr. McCandless commented that he would like to see a balance of trees along the edges of the trails to provide shade for trail users. Mr. McCandless stated that if there are more trees along the trails and more shade that more visitors would use the trails. Mr. McCandless commented on the additional kayak or canoe access to Waccasassa Bay and that we should share our trail maps to local users' groups. Additionally, Mr. McCandless commented that we should model our paddling trail maps after the Lower Suwannee Refuge trail maps and explained how their maps look and are made. Clif Maxwell explained that once the plans are approved that there would be an interest in reaching out for assistance in figuring out what the needed equestrian and paddling improvements would be. Chris Camargo commented that research shows that scrub jays are poor flyers and that they do better with lower tree cover and then detailed that this is why trees were removed. Mr. Camargo commented that he is hopeful that the tree removal and brush mowing will bring back any neighboring scrub jays to the park as well as detailing the potential efforts to relocate scrub jays to the area through FWC cooperation. Mr. McCandless asked if an increase or decrease in raptors had been noticed at the parks over the last ten years. Mr. Camargo detailed that he has seen less of some birds. Mr. Maxwell commented a reason that scrub jays do not like tall trees is that they help predator birds prey on lesser birds. Mr. McCandless restated that his comments were to add some taller trees for shade along the perimeter of areas to provide shade for trail users. Doug Maples detailed how he participates in bird rescues and that they had rescued multiple owls in the area.

**Tara Maillard (Levy County Soil and Water)** detailed that at this time she did not have any comments but that they were having a board meeting the following week and she would provide any comments that came up at the meeting to Joel Allbritton. Mrs. Maillard commented that she was very excited for the trail riders of Levy County to use the parks and the idea of additional paddling access. Joel Allbritton detailed that ways that comments could be given to him within the two-week commenting period.

**Rick Anthony (Florida Nature Coast Conservancy)** asked about the permanent restroom that is proposed without a lot of detail and whether it would be an advanced system or septic. Mr. Anthony asked about the carrying capacity numbers that were established for the park and how we came up with the capacity. Mr. Anthony asked if we are considering opening permanent trails on the south side on highway 24. Mr. Anthony detailed that there are numerous organizations that could be partners in surveying for scrub jays or other species. Mr. Anthony asked about the park being used as a gopher tortoise mitigation area and if we had thought about participating. Mr. Anthony commented that he likes the preserve designation for Waccasassa Bay. Clif Maxwell commented that the parks would want to partner with local birding organizations or anyone that could help. Mr. Maxwell detailed the process and statutes that constrain our management of imperiled or endangered species as well as the balance that we strive to achieve with managing these



## **Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park Advisory Group Members and Report**

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species. Dan Pearson explained the carrying capacity increases and how the carrying capacities numbers are derived. Mr. Pearson explained how FWC wanted to do a gopher tortoise survey at Cedar Key Scrub and that the gopher tortoise density was too low to justify the efforts to count them. Mr. Maxwell detailed the short-term goal of a grass parking lot off of highway 24 to allow access to the trails in Waccasassa Bay. Brian Fugate commented that the new restrooms would be advanced septic systems. Joel Allbritton explained the current efforts of the Office of Park Planning in looking into a more scientific method of evaluating carrying capacities at parks throughout the state based off of methods that the national park service uses. Mr. Maxwell clarified the changing of carrying capacities would be based on changes to the resources and actions taken based on degradation that we may observe.

**Norberto Fernandez (Florida Fish and Wildlife)** stated that he did not have any comments at this time. Tara Maillard asked about FWC incentive programs for gopher tortoise habitat. Mr. Fernandez detailed that there are programs and grants that are available to help private landowners in this area. Joel Allbritton asked if there were any go backs or additional comments that anyone would like to give. Joel Allbritton detailed the next steps for the management plans and the meeting was adjourned.

### **Written Advisory Group Comments**

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**Matt Chopp (Florida Fish and Wildlife)** provided comments via email and suggested changing hunting language to read that the Panther Ridge area would be a limited entry quota hunt to align with the FWC hunting brochure. Additional suggestions included edits to the carrying capacity to accurately depict the hunting that is currently happening at the park and for the Panther Ridge area to be a more flexible carrying capacity number to allow for future growth.

**Michael Edwards (Florida Forest Service)** provide comments via email for both parks. For Cedar Key Scrub Mr. Edwards suggests that each natural community needs to have specific goals and objectives describing how the desired future conditions will be accomplished. Mr. Edwards also suggests that the 2018 Timber Assessment should include the Panther Ridge Tract and potential timber sale for the tract as well as restoration for the Pine Plantation clear cut. Mr. Edwards would like to see new goals and objective in the plan for the scrub that is more broadly focused on multiple species. Mr. Edwards suggest that the UMP describe specific goals and objectives for monitoring and surveying natural communities for listed species, fire effects, other habitats, and invasive species. Mr. Edwards commented that the property needs a comprehensive study for archaeological and historic sites and a protection plan for sites that are rated as fair to poor. Mr. Edwards stated that the UMP should address the control of pests and pathogens as well as discussing the process that is used to determine if there are any surplus lands at the park. For Waccasassa Bay Preserve Mr. Edwards suggests that each natural community needs to have specific goals and objectives describing how the desired

## **Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park Advisory Group Members and Report**

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future conditions will be accomplished. MR. Edwards also suggests that the 2005 Timber Assessment should be updated and a thinning timber sale be conducted in conjunction with Cedar Key Scrub to make a viable timber sale. Mr. Edwards would like to see the UMP develop a treatment plan that targets brazilian pepper in the mangrove swamps on the south side of Waccasassa Bay as well as working with local hunt clubs for assistance with feral hog removal. Mr. Edwards stated that new fire lines need to be installed as well as increased fire frequency for the park. Mr. Edwards suggests that the shop be improved to provide additional shelter for equipment. Mr. Edwards suggests that the primitive sites need to be better maintained and interpretive signage added to the sites.

### **Summary of Public Comments**

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**Leslie Stunner (UF Shellfish Researcher)** commented that she was not able to attend the public meeting so she wanted to sit in and listen to the comments about the management plan. Chris Camargo asked about if there is any work being done in Waccasassa Bay for shellfish. Mrs. Stunner explained the research areas that are assessed for shellfish and that they do not currently work in Waccasassa Bay but there may be potential to look at sites in Waccasassa Bay. Mr. Allen asked if the water monitoring stops at Corgan's Reef. Mrs. Stunner commented that no the monitoring is maintained in Waccasassa Bay as well. Dan Pearson asked if the clams prefer soft substrate to which Mrs. Stunner commented that they need soft substrate but not too soft or too rocky.

**Doug Maple (Cedar Keys Audubon)** commented that he was encouraged from the public meeting that the scrub will be managed for eventual scrub jay habitat and that there is talk about additional access to Waccasassa Bay. Mr. Maple detailed the critical nesting habitat areas at Cedar Key and Waccasassa Bay and the need to ensure that nesting birds are minimally disturbed while they are preparing for their return migrations. Mr. Maple detailed the birds that are in the area and that are in need of nesting habitats. Mr. Maple commented that we need to keep this minimal disturbance in mind when planning for additional kayak or canoe access to the area.

### **Staff Recommendations**

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- The species list for both parks will be updated to reflect any updated status changes for plants and animals.
- Additional language will be added to the plans to detail new restrooms should have high efficiency advanced septic systems to protect the hydrology of the area.

### **Notes on Composition of Advisory Group**

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

## **Cedar Key Scrub State Reserve & Waccasassa Bay Preserve State Park Advisory Group Members and Report**

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

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



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## **Addendum 4—Soil Descriptions**



## Cedar Key Scrub State Reserve Soil Descriptions

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**(3) Orsino fine sand, 0 to 8 percent slopes** - This unit consists of moderately well-drained, very deep Orsino soils. These nearly level to gently rolling soils are on dunes and ridges. Typically, the surface layer is gray fine sand and extends to a depth of 8 inches. The subsurface layer is fine sand and extends to a depth of about 13 inches. It is very pale brown in the upper 4 inches, and white below. The subsoil is fine sand and extends to a depth of about 70 inches. It is brownish yellow to a depth of about 48 inches, light yellowish brown to a depth of about 58 inches, and brownish yellow below that. The underlying material is white fine sand.

**(5) Immokalee fine sand** - This unit consists of poorly drained, very deep Immokalee soils. These nearly level soils are in flatwoods areas. Typically, the surface layer is very dark gray fine sand, and extends to a depth of about 9 inches. The subsurface layer is fine sand and extends to a depth of about 38 inches. It is gray in the upper 16 inches, and light gray below that. The subsoil extends to beyond a depth of 80 inches. It is very dark grayish brown, organically coated fine sand to a depth of about 43 inches, and dark brown fine sand below that.

**(11) Placid and Samsula soils, depressional** - This unit consists of very poorly drained, very deep Placid and Samsula soils. These nearly level, ponded soils are on depressions. Typically, the surface layer of the Placid soil extends to a depth of about 14 inches. It is black muck in the upper 3 inches, and very dark gray fine sand below. The underlying material extends beyond a depth of 80 inches. It is light gray fine sand to a depth of about 24 inches, brown fine sand to a depth of about 45 inches, and very pale brown fine sand below that. Typically, the surface layer of the Samsula soil extends to a depth of about 80 inches. It is dark brown muck in the upper 6 inches, and black muck below that to a depth of 47 inches. The underlying material extends beyond a depth of 80 inches. It is grayish brown fine sand in the upper 15 inches, and light brownish gray fine sand below that.

**(13) Wekiva fine sand** - This unit consists of poorly drained, shallow to moderately deep Wekiva soils. These nearly level soils are on low ridges. Typically, the surface layer is 4 inches thick and very dark gray fine sand. The subsurface layer is grayish brown fine sand to a depth of 9 inches. Below this, the subsoil is yellowish brown sandy clay loam to 18 inches and underlain by limestone bedrock.

**(23) Zolfo sand** - This unit consists of somewhat poorly drained, very deep Zolfo soils. These nearly level soils are on low ridges and knolls in flatwoods. Typically, the surface layer is very dark gray sand, and is about 4 inches thick. The subsurface layer extends to a depth of about 71 inches. It is pale brown sand to a depth of about 8 inches, gray sand to a depth of about 32 inches, pale brown sand to a depth of about 65 inches, and light brownish gray sand below

## Cedar Key Scrub State Reserve Soil Descriptions

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that. The subsoil layer extends from a depth of 71 inches to beyond a depth of 80 inches. It is very dark grayish brown, organically coated sand.

**(33) Wulfert muck, frequently flooded** - This unit consists of very poorly drained, very deep Wulfert soils. These nearly level, frequently flooded soils are on areas of tidal marsh. Typically, the surface layer is very dark brown muck, and is about 30 inches thick. The underlying material extends to beyond a depth of 80 inches. It is very dark gray mucky, loamy fine sand to a depth of about 56 inches, and very dark gray fine sand below that.

**(34) Cassia-Pomello complex**– This unit is a poorly drained, very deep, nearly level soils are on low knolls and ridges on flatwoods. Individual areas are generally oval or elongated and range from 2 to nearly 1,200 acres in size. Slopes range from 0 to 2 percent. Typically, the surface layer of the Cassia soil is gray fine sand about 6 inches thick. The subsurface layer is light gray fine sand to a depth of about 24 inches.

**(37) Myakka mucky sand, occasionally flooded**- This unit consists of poorly drained, very deep Myakka soils. These nearly level, occasionally flooded soils are on areas of flatwoods that are adjacent to the tidal marsh or the Suwannee River flood plain. Typically, the surface layer is about 10 inches thick. It is black muck in the upper 2 inches, and very dark gray mucky sand below that. The subsurface layer is gray sand and extends to a depth of about 21 inches. The subsoil extends from a depth of 21 inches to beyond a depth of 80 inches. It is very dark gray sand in the upper 19 inches, and very dark grayish brown sand below that.

**(38) Myakka sand** - This unit consists of poorly drained, very deep Myakka soils. These nearly level soils are on areas of flatwoods. Typically, the surface layer is very dark gray sand, and is about 5 inches thick. The subsurface layer extends to a depth of about 26 inches. It is grayish brown sand in the upper 13 inches, and light gray sand below that. The subsoil layer is organically coated sand, and extends to a depth of about 58 inches. It is black in the upper 14 inches, and very dark gray below that. The underlying material is a pale brown sand that extends from a depth of 58 inches to beyond a depth of 80 inches.

**(43) Tidewater mucky clay, frequently flooded** - This unit consists of very poorly drained, deep to very deep Tidewater soils. These nearly level, frequently flooded soils are on areas of tidal marsh. Typically, the surface layer extends to a depth of about 40 inches. It is very dark brown mucky clay to a depth of about 10 inches, black silty clay to a depth of about 24 inches, and black sandy clay loam below that. The underlying material extends from a depth of 40 inches to a depth of 76 inches. It is a mixture of black and very dark grayish brown loamy fine sand. Limestone bedrock is at a depth of 76 inches.

## Cedar Key Scrub State Reserve Soil Descriptions

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**(45) Cracker mucky clay, frequently flooded** - This very poorly drained, shallow or very shallow, nearly level soil is in areas of tidal marsh. It is frequently flooded. Individual areas are generally irregular in shape and range from 9 to nearly 5,900 acres in size. Slopes are 0 to 1 percent. Typically, the surface layer is black mucky clay to a depth of about 4 inches and very dark gray sandy clay loam to a depth of 12 inches. Limestone bedrock is at a depth of about 12 inches.

**(58) Boca-Holopaw, limestone substratum complex** - This map unit consists of a moderately deep Boca soil and a deep or very deep Holopaw soil. These poorly drained, nearly level soils are on low ridges and flatwoods. Individual areas are generally irregular in shape and range from 3 to nearly 1,000 acres in size. Slopes range from 0 to 2 percent.

**(68) Myakka, limestone substratum-Immokalee complex** - This map unit consists of a deep or very deep Myakka soil and a very deep Immokalee soil. These poorly drained, nearly level soils are on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 800 acres in size. Slopes range from 0 to 2 percent.



**Addendum 5—Plant and Animal List**





## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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### PTERIDOPHYTES

Giant leather fern.....	<i>Acrostichum danaeifolium</i>	
Florida shield fern .....	<i>Dryopteris ludoviciana</i>	
Clubmoss.....	<i>Lycopodium prostratum</i>	
Cinnamon fern.....	<i>Osmunda cinnamomea</i> .....	HH
Royal fern .....	<i>Osmunda regalis</i> .....	HH
Golden polypody .....	<i>Phlebodium aureum</i>	
Resurrection fern .....	<i>Polypodium polypodiodes</i>	
Bracken fern.....	<i>Pteridium aquilinum</i>	
Marsh fern .....	<i>Thelypteris palustris</i>	
Netted chain fern .....	<i>Woodwardia areolata</i>	
Virginia chain fern.....	<i>Woodwardia virginica</i>	

### GYMNOSPERMS

Southern red cedar .....	<i>Juniperus virginiana</i>	
Sand pine .....	<i>Pinus clausa</i>	
Slash pine .....	<i>Pinus elliotii</i>	
Longleaf pine.....	<i>Pinus palustris</i>	
Pond cypress .....	<i>Taxodium ascendens</i>	
Bald cypress.....	<i>Taxodium distichum</i>	
Coontie.....	<i>Zamia pumila</i> .....	SFC

### ANGIOSPERMS

#### Monocots

White colic-root .....	<i>Aletris obovata</i>	
Florida bluestem .....	<i>Andropogon floridanus</i>	
Bushy bluestem.....	<i>Andropogon glomeratus</i>	
Splitbeard bluestem .....	<i>Andropogon tenarius</i>	
Broomsedge .....	<i>Andropogon virginicus</i>	
Nodding nixie .....	<i>Apteria aphylla</i>	
Jack-in-the-pulpit.....	<i>Arisaema triphyllum</i>	
Wiregrass.....	<i>Aristida beyrichiana</i>	
Slimspike threeawn .....	<i>Aristida longespica</i>	
Arrowfeather .....	<i>Aristida purpurescens</i>	
Bottlebrush threeawn .....	<i>Aristida spiciformis</i>	
Capillary hair sedge.....	<i>Bulbostylis ciliatifolia</i>	
Blue thread .....	<i>Burmannia biflora</i>	
Bearded grass pink .....	<i>Calopogon barbatus</i> .....	MF
Many flowered pink grass.....	<i>Calopogon multiflorous</i> .....	MF
Grass pink.....	<i>Calopogon tuberosus</i>	
Broadwing sedge .....	<i>Carex alata</i>	
Bristlystalked sedge .....	<i>Carex leptalea</i>	
Coast sandspur .....	<i>Cenchrus incertus</i>	
Longleaf chasmanthium .....	<i>Chasmanthium sessiliflorum</i>	
Sawgrass .....	<i>Cladium jamaicense</i>	

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Erect dayflower.....	<i>Commelina erecta</i>	
Marshland flat sedge .....	<i>Cyperus distinctus</i>	
Redroot flatsedge.....	<i>Cyperus erythrorhizos</i>	
Haspan flatsedge .....	<i>Cyperus haspan</i>	
Texas sedge .....	<i>Cyperus polystachyos</i>	
Cylindric sedge .....	<i>Cyperus retrorsus</i>	
Straw-color flat sedge.....	<i>Cyperus strigosus</i>	
Needleleaf witchgrass .....	<i>Dichanthelium aciculare</i>	
Variable witchgrass .....	<i>Dichanthelium commutatum</i>	
Cypress witchgrass .....	<i>Dichanthelium dichotomum</i>	
Erectleaf witchgrass .....	<i>Dichanthelium erectifolium</i>	
Hemlock witchgrass.....	<i>Dichanthelium portoricense</i>	
Roughhair witchgrass .....	<i>Dichanthelium strigosum</i>	
Saltgrass .....	<i>Distichlis spicata</i>	
Coast cockspur .....	<i>Echinochloa walteri</i>	
White spikerush.....	<i>Eleocharis albida</i>	
Roadgrass.....	<i>Eleocharis baldwinii</i>	
Creeping spikerush.....	<i>Eleocharis elongata</i>	
Pale spikerush .....	<i>Eleocharis flavescens</i>	
Viviparous spikerush .....	<i>Eleocharis vivipara</i>	
Mediterranean lovegrass .....	<i>Eragrostis barrelieri</i> *	
Fortyflower lovegrass .....	<i>Eragrostis cumingii</i>	
Elliott lovegrass .....	<i>Eragrostis elliotii</i>	
Big top love grass .....	<i>Eragrostis hirsuta</i>	
Centipede grass.....	<i>Eremochloa ophiuroides</i> *	
Sugarcane plume grass.....	<i>Erianthus giganteus</i>	
Pipewort .....	<i>Eriocaulon compressum</i>	
Hardheaded pipewort .....	<i>Eriocaulon decangulare</i>	
Pipewort .....	<i>Eriocaulon ravenelii</i>	
Saltmarsh fingergrass.....	<i>Eustachys glauca</i>	
Rock fingergrass .....	<i>Eustachys petreae</i>	
Fringerush .....	<i>Fimbristylis puberula</i>	
Fringerush .....	<i>Fimbristylis spadicea = castanea</i>	
Short-bristled umbrella grass ...	<i>Fuirena breviseta</i>	
Rush fuirena.....	<i>Fuirena scirpoides</i>	
Umbrella grass .....	<i>Fuirena squarrosa</i>	
Green-cross orchid.....	<i>Habenaria odontopetala</i>	
Spider lily .....	<i>Hymenocallis crassifolia</i>	
Common star grass .....	<i>Hypoxis juncea</i>	
Prairie iris .....	<i>Iris hexagona</i>	
Two-parted rush .....	<i>Juncus dichotomus</i>	
Bog rush.....	<i>Juncus elliotii</i>	
Shore rush .....	<i>Juncus marginatus</i>	
Large-headed rush.....	<i>Juncus megacephalus</i>	
Many headed rush.....	<i>Juncus polycephallis</i>	
Needle rush; Black rush.....	<i>Juncus roemerianus</i>	

\* Non-native species

**Cedar Key Scrub State Reserve Plants**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Primary Habitat Codes (for imperiled species)</b>
Needlepod rush.....	<i>Juncus scirpoides</i>	
Redroot .....	<i>Lachnanthes caroliniana</i>	
Little white bog-button .....	<i>Lachnocaulon anceps</i>	
Pantropical widelip orchid.....	<i>Liparis nervosa</i> .....	BS
Goldcrest .....	<i>Lophiola americana</i>	
Florida addersmouth orchid .....	<i>Malaxis spicata</i>	
Wrinkled jointtail.....	<i>Manisuris rugosa</i>	
Twoflower melic.....	<i>Melica mutica</i>	
Wood grass .....	<i>Oplismenus hirtellus</i>	
Beaked panicum .....	<i>Panicum anceps</i>	
Fringed panicum .....	<i>Panicum ciliatum</i>	
Maidencane.....	<i>Panicum hemitomom</i>	
Redtop panicum.....	<i>Panicum rigidulum</i>	
Bluejoint panicum .....	<i>Panicum tenerum</i>	
Switchgrass.....	<i>Panicum virgatum</i>	
Field paspalum .....	<i>Paspalum laeve</i>	
Pensacola Bahia grass .....	<i>Paspalum notatum</i> *	
Early paspalum.....	<i>Paspalum praecox</i>	
Thin paspalum .....	<i>Paspalum setaceum</i>	
Vasey grass.....	<i>Paspalum urvillei</i>	
Seashore paspalum .....	<i>Paspalum vaginatum</i>	
Green arum.....	<i>Peltandra virginica</i>	
Carolina canarygrass .....	<i>Phalaris caroliniana</i>	
Southern tubercled orchid .....	<i>Platanthera flava</i> .....	BS
Jug orchid .....	<i>Platythelys latifolia</i>	
Rose pogonia.....	<i>Pogonia ophioglossoides</i>	
Pickerelweed .....	<i>Pontederia cordata</i>	
White-top sedge .....	<i>Rhynchospora colorata</i>	
Clustered beakrush .....	<i>Rhynchospora fascicularis</i>	
Pinebarren beaksedge .....	<i>Rhynchospora intermedia</i>	
Inundated beakrush .....	<i>Rhynchospora inundata</i>	
Largefruited beakrush.....	<i>Rhynchospora megalocarpa</i>	
Bunched beaksedge .....	<i>Rhynchospora microcephala</i>	
Millet beakrush .....	<i>Rhynchospora miliacea</i>	
Wire-grass beakrush .....	<i>Rhynchospora plumosa</i>	
Fewflower beaksedge .....	<i>Rhynchospora rariflora</i>	
Tracy's beaksedge.....	<i>Rhynchospora tracyi</i>	
Sabal palm.....	<i>Sabal palmetto</i>	
American cupscale .....	<i>Sacciolepis striata</i>	
India cupscale .....	<i>Sacciolepis indica</i> *	
Slender arrowhead.....	<i>Sagittaria graminea</i>	
Arrowroot .....	<i>Sagittaria lancifolia</i>	
Lizard's tail.....	<i>Saururus cernuus</i>	
Little bluestem.....	<i>Schizachyrium scoparium</i>	
Fringed nutrush .....	<i>Scleria ciliata</i>	
Netted nutrush .....	<i>Scleria reticularis</i>	

\* Non-native species

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Tall nutgrass .....	<i>Scleria triglomerata</i>	
Low nutrush .....	<i>Scleria verticillata</i>	
Saw palmetto .....	<i>Serenoa repens</i>	
Coastal foxtail .....	<i>Setaria corrugata</i>	
Knotroot foxtail.....	<i>Setaria geniculata</i>	
Coral foxtail.....	<i>Setaria macrosperma</i>	
Narrowleaf blue-eyed grass .....	<i>Sisyrinchium angustifolium</i>	
Earleaf greenbrier .....	<i>Smilax auriculata</i>	
Saw greenbrier .....	<i>Smilax bona-nox</i>	
Wild sarsaparilla .....	<i>Smilax glauca</i>	
Laurel greenbrier .....	<i>Smilax laurifolia</i>	
Bristly greenbrier .....	<i>Smilax tamnoides</i>	
Lopsided indiagrass .....	<i>Sorghastrum secundum</i>	
Saltmarsh cordgrass.....	<i>Spartina alterniflora</i>	
Sand cordgrass.....	<i>Spartina bakeri</i>	
Marshhay cordgrass .....	<i>Spartina patens</i>	
Gulf cordgrass .....	<i>Spartina spartinae</i>	
Prairie wedgescale .....	<i>Sphenolepis obtusata</i>	
Grassleaved ladies tresses .....	<i>Spiranthes praecox</i>	
Seashore dropseed.....	<i>Sporobolus virginicus</i>	
St. Augustine grass .....	<i>Stenotaphrum secundatum</i>	
Bantam buttons .....	<i>Syngonanthus flavidulus</i>	
Bartram's airplant .....	<i>Tillandsia bartramii</i>	
Ballmoss .....	<i>Tillandsia recurvata</i>	
Spanish moss .....	<i>Tillandsia usneoides</i>	
Arrowgrass.....	<i>Triglochin striata</i>	
Perennial sand grass .....	<i>Triplasis americana</i>	
Eastern gamagrass.....	<i>Tripsacum dactyloides</i>	
Southern cattail .....	<i>Typha domingensis</i>	
Sixweeks fescue .....	<i>Vulpia octoflora</i>	
Coastalplain yelloweyed grass ..	<i>Xyris ambigua</i>	
Shortleaf yelloweyed grass.....	<i>Xyris brevifolia</i>	
Carolinia yelloweyed grass .....	<i>Xyris caroliniana</i>	
Bog yelloweyed grass .....	<i>Xyris difformis</i>	
Elliott's yelloweyed grass .....	<i>Xyris elliotii</i>	
Savannah yelloweyed grass.....	<i>Xyris flabelliformis</i>	
Richard's yelloweyed grass.....	<i>Xyris jupicai</i>	
Spanish bayonet .....	<i>Yucca aloifolia</i> *	
Lawn orchid.....	<i>Zeuxine strateumatica</i> *	

### Dicots

Three-seeded mercury.....	<i>Acalypha gracilens</i>	
Red maple.....	<i>Acer rubrum</i>	
Creeping spotflower .....	<i>Acmella oppositifolia</i>	
Joint-vetch .....	<i>Aeschynomene viscidula</i> *	
Pineland false-foxglove .....	<i>Agalinis divaricata</i>	

\* Non-native species

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Fine-leaf agalinus.....	<i>Agalinis filifolia</i>	
Flax-leaved agalinis.....	<i>Agalinis linifolia</i>	
Seaside agalinis.....	<i>Agalinis maritima</i>	
Tenlobe false foxglove.....	<i>Agalinis obtusifolia</i>	
Smooth agalinis.....	<i>Agalinis purpurea</i>	
False moneywort.....	<i>Alysicarpus vaginalis</i>	
Sauer giant amaranth.....	<i>Amaranthus australis</i>	
Common ragweed.....	<i>Ambrosia artemisiifolia</i>	
Toothcups.....	<i>Ammannia latifolia</i>	
False indigo-bush.....	<i>Amorpha fruticosa</i>	
Pepper vine.....	<i>Ampelopsis arborea</i>	
Texas anemone.....	<i>Anemone berlandieri</i> .....	SCF
Groundnut.....	<i>Apios americana</i>	
Marsh parsley.....	<i>Apium leptophyllum</i>	
Red milkweed.....	<i>Asclepias lanceolata</i>	
Pedicillate milkweed.....	<i>Asclepias pedicellata</i>	
Aquatic milkweed.....	<i>Asclepias perennis</i>	
Velvet-leaf milkweed.....	<i>Asclepias tomentosa</i>	
Dwarf pawpaw.....	<i>Asimina pygmaea</i>	
Comb oakleach.....	<i>Aureolaria pedicularia</i>	
Black mangrove.....	<i>Avicennia germinans</i>	
Falsewillow.....	<i>Baccharis angustifolia</i>	
Stalkless groundsel bush.....	<i>Baccharis glomeruliflora</i>	
Groundsel tree; sea-myrtle.....	<i>Baccharis halimifolia</i>	
Blue hyssop.....	<i>Bacopa caroliniana</i>	
Smooth water-hyssop.....	<i>Bacopa monnieri</i>	
Yellow buttons.....	<i>Balduina angustifolia</i>	
Saltwort.....	<i>Batis maritima</i>	
Tarflower.....	<i>Bejaria racemosa</i>	
Rattan vine.....	<i>Berchemia scandens</i>	
Beggarticks.....	<i>Bidens alba</i>	
Smallfruit beggarticks.....	<i>Bidens mitis</i>	
Mears samphire.....	<i>Blutaparon vermiculare</i>	
False nettle.....	<i>Boehmeria cylindrica</i>	
Doll's daisy.....	<i>Boltonia diffusa</i>	
Sea oxeye.....	<i>Borrichia frutescens</i>	
Blueheart.....	<i>Buchnera americana</i>	
Saffron plum.....	<i>Bumelia celastrina</i>	
Florida bully.....	<i>Bumelia reclinata</i>	
Buckthorn.....	<i>Bumelia rufotomentosa</i>	
Bearded grass pink.....	<i>Calopogon barbatus</i> .....	BM, DM, MF
Manyflowered grass pink.....	<i>Calopogon multiflorus</i> .....	BM, DM, MF
American beautyberry.....	<i>Callicarpa americana</i>	
Florida bellflower.....	<i>Campanula floridana</i>	
Trumpet-creeper.....	<i>Campsis radicans</i>	
Deer tongue.....	<i>Carphephorus corymbosus</i>	

**Cedar Key Scrub State Reserve Plants**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Primary Habitat Codes (for imperiled species)</b>
Vanilla plant .....	<i>Carphephorus ordoratissimus</i>	
Pignut hickory .....	<i>Carya glabra</i>	
Sugarberry; hackberry.....	<i>Celtis laevigata</i>	
Coinwort .....	<i>Centella asiatica</i>	
Climbing butterfly pea .....	<i>Centrosema virginianum</i>	
Common buttonbush .....	<i>Cephalanthus occidentalis</i>	
Florida rosemary .....	<i>Ceratiola ericoides</i>	
Partridge pea.....	<i>Chamaecrista fasciculata</i>	
Wild sensitive plant .....	<i>Chamaecrista nictitans</i>	
Eyebane .....	<i>Chamaesyce hyssopifolia</i>	
Milk purslane .....	<i>Chamaesyce maculata</i>	
Rough leaf goldenaster .....	<i>Chrysopsis scabrella</i>	
Horrid thistle .....	<i>Cirsium horridulum</i>	
Nuttall's thistle .....	<i>Cirsium nuttallii</i>	
Atlantic pigeonwings.....	<i>Clitoria mariana</i>	
Tread-softly.....	<i>Cnidosculus stimulosus</i>	
Blue mistflower.....	<i>Conoclinium coelestinum</i>	
Horseweed .....	<i>Conyza canadensis</i>	
Dye flower .....	<i>Coreopsis basilis</i> *	
Common tickseed .....	<i>Coreopsis leavenworthii</i>	
Swamp dogwood.....	<i>Cornus foemina</i>	
Rabbitbells .....	<i>Crotalaria rotundifolia</i>	
Tropical croton.....	<i>Croton glandulosus</i>	
Rushfoil .....	<i>Crotonopsis linearis</i>	
Compact dodder .....	<i>Cuscuta compacta</i>	
Coastal cynanchum .....	<i>Cynanchum angustifolium</i>	
Western tansy-mustard .....	<i>Descurainia pinnata</i>	
Tickclover .....	<i>Desmodium incanum</i>	
Panicled tick-trefoil.....	<i>Desmodium paniculatum</i>	
Rough buttonweed .....	<i>Diodia teres</i>	
Persimmon.....	<i>Diospyros virginiana</i>	
Pink sundew .....	<i>Drosera capillaris</i>	
Water sundew .....	<i>Drosera intermedia</i> .....	DM, BM, MF
Florida elephant's foot .....	<i>Elephantopus elatus</i>	
Green-fly orchid.....	<i>Epidendrum conopseum</i> .....	HH
Fireweed.....	<i>Erechtites hieracifolia</i>	
Southern fleabane.....	<i>Erigeron quercifolius</i>	
Daisy fleabane .....	<i>Erigeron strigosus</i>	
Marsh fleabane .....	<i>Erigeron vernus</i>	
Corn snakeroot .....	<i>Eryngium aquaticum</i>	
Fragrant eryngium .....	<i>Eryngium aromaticum</i>	
Matted button snakeroot.....	<i>Eryngium baldwinii</i>	
Rattlesnake master .....	<i>Eryngium yuccifolium</i>	
Yankeeweed .....	<i>Eupatorium compositifolium</i>	
Falsefennel.....	<i>Eupatorium leptophyllum</i>	
Semaphore eupatorium .....	<i>Eupatorium mikanioides</i>	

\* Non-native species

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Mohr's eupatorium .....	<i>Eupatorium mohrii</i>	
Boneset .....	<i>Eupatorium perfoliatum</i>	
False hoarhound .....	<i>Eupatorium rotundifolium</i>	
Late thoroughwort .....	<i>Eupatorium serotinum</i>	
Catchfly gentian.....	<i>Eustoma exaltatum</i>	
Flattopped goldenrod.....	<i>Euthamia tenuifolia</i>	
Yellow-top.....	<i>Flaveria linearis</i>	
Florida privet.....	<i>Forestiera segregata</i>	
Cottonweed.....	<i>Froelichia floridana</i>	
Lanceleaf blanketflower .....	<i>Gaillardia aestivalis</i>	
Firewheel .....	<i>Gaillardia pulchella</i>	
Elliot's milkpea .....	<i>Galactia elliotii</i>	
Florida milkpea .....	<i>Galactia regularis</i>	
Coastal bedstraw .....	<i>Galium hispidulum</i>	
Southern gaura.....	<i>Gaura angustifolia</i>	
Dwarf huckleberry.....	<i>Gaylussacia dumosa</i>	
Dangleberry .....	<i>Gaylussacia nana</i>	
Cranesbill.....	<i>Geranium carolinianum</i>	
Moss verbena .....	<i>Glandularia pulchella</i> *	
Cudweed .....	<i>Gnaphalium falcatum</i>	
Sweet everlasting .....	<i>Gnaphalium obtusifolium</i>	
Purple cudweed .....	<i>Gnaphalium purpureum</i>	
Scrub hedge hyssop.....	<i>Gratiola hispida</i>	
Hairy hedge hyssop.....	<i>Gratiola pilosa</i>	
Creeping hedge hyssop.....	<i>Gratiola ramosa</i>	
Innocence .....	<i>Hedyotis procumbens</i>	
Clustered bluet .....	<i>Hedyotis uniflora</i>	
Swamp sneezeweed .....	<i>Helenium pinnatifidum</i>	
Pine barren rock-rose .....	<i>Helianthemum corymbosum</i>	
Scrub rock rose .....	<i>Helianthemum nashii</i>	
Narrowleaved sunflower.....	<i>Helianthus angustifolius</i>	
Camphor weed .....	<i>Heterotheca subaxillaris</i>	
Swamp hibiscus.....	<i>Hibiscus coccineus</i>	
Large-head hawkweed.....	<i>Hieracium megacephalon</i>	
Marsh pennywort .....	<i>Hydrocotyle umbellata</i>	
Swamp pennywort .....	<i>Hydrocotyle verticillata</i>	
Skyflower.....	<i>Hydrolea corymbosa</i>	
Short-leaved sandweed .....	<i>Hypericum brachyphyllum</i>	
St. John's wort .....	<i>Hypericum cistifolium</i>	
Pineweed .....	<i>Hypericum gentianoides</i>	
St. Andrew's cross .....	<i>Hypericum hypericoides</i>	
Dwarf St. John's-wort.....	<i>Hypericum mutilum</i>	
Four-petaled St. John's-wort ....	<i>Hypericum tetrapetalum</i>	
Bittermint .....	<i>Hyptis alata</i>	
Carolina holly .....	<i>Ilex ambigua</i>	
Dahoon.....	<i>Ilex cassine</i>	

\* Non-native species

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Gallberry.....	<i>Ilex glabra</i>	
Yaupon holly .....	<i>Ilex vomitoria</i>	
Carolina indigo .....	<i>Indigofera caroliniana</i>	
Florida coastal indigo.....	<i>Indigofera miniata</i>	
Creeping indigo.....	<i>Indigofera spicata</i> *	
Glades morning glory .....	<i>Ipomoea sagittata</i>	
Sharp-pod morning glory .....	<i>Ipomoea trichocarpa</i>	
Standing cypress .....	<i>Ipomopsis rubra</i>	
Virginia sweetspire .....	<i>Itea virginica</i>	
Marsh elder .....	<i>Iva frutescens</i>	
Narrowleaved elder .....	<i>Iva microcephala</i>	
Saltmarsh mallow .....	<i>Kosteletzkya virginica</i>	
Virginia dwarf dandelion .....	<i>Krigia virginica</i>	
Common wild lettuce.....	<i>Lactuca graminifolia</i>	
Thyme-leaved pinweed.....	<i>Lechea minor</i>	
Compact pinweed.....	<i>Lechea torreyi</i>	
Poorman's pepper .....	<i>Lepidium virginicum</i>	
Long-leaf blazing star .....	<i>Liatris laevigata</i>	
Gopher apple.....	<i>Licania michauxii</i>	
Sea lavender .....	<i>Limonium carolinianum</i>	
Blue toadflax .....	<i>Linaria canadensis</i>	
Florida toadflax.....	<i>Linaria floridana</i>	
Florida flax .....	<i>Linum floridanum</i>	
Yellow flax .....	<i>Linum medium</i>	
Pantropical widelipped orchid....	<i>Liparis nervosa</i> .....	BM, DM, MF
Sweetgum.....	<i>Liquidambar styraciflua</i>	
Cardinal flower .....	<i>Lobelia cardinalis</i> .....	BM, BST
Coastal plain lobelia .....	<i>Lobelia glandulosa</i>	
White swamp lobelia.....	<i>Lobelia paludosa</i>	
Winged water-primrose .....	<i>Ludwigia alata</i>	
Coastal plain seedbox.....	<i>Ludwigia maritima</i>	
Tiny seedbox .....	<i>Ludwigia microcarpa</i>	
Christmasberry .....	<i>Lycium carolinianum</i>	
Rusty staggerbush .....	<i>Lyonia ferruginea</i>	
Staggerbush.....	<i>Lyonia fruticosa</i>	
Fetterbush .....	<i>Lyonia lucida</i>	
Lance-leaved loosestrife.....	<i>Lythrum alatum</i>	
Saltmarsh loosestrife .....	<i>Lythrum lineare</i>	
Sweetbay.....	<i>Magnolia virginiana</i>	
Angle-pod .....	<i>Gonolobus suberosus</i> .....	SH, SCF
Purple-axil flower .....	<i>Mecardonia acuminata</i>	
Hop clover .....	<i>Medicago lupulina</i> *	
Annual yellow sweetclover .....	<i>Melilotus indica</i> *	
Alamo vine.....	<i>Merremia dissecta</i>	
Florida Keys hempvine.....	<i>Mikania cordifolia</i>	
Climbing hempvine.....	<i>Mikania scandens</i>	

\* Non-native species



## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Baby's bath brush .....	<i>Mimosa strigillosa</i>	
Miterwort .....	<i>Mitreola petiolata</i>	
Miterwort .....	<i>Mitreola sessilifolia</i>	
Horsemint .....	<i>Monarda punctata</i>	
Indianpipe .....	<i>Monotropa uniflora</i>	
Red mulberry .....	<i>Morus rubra</i>	
Wax-myrtle .....	<i>Myrica cerifera</i>	
Watercress .....	<i>Nasturtium microphyllum</i> *	
Waterlily .....	<i>Nymphaea odorata</i>	
Big floating hearts .....	<i>Nymphoides aquatica</i>	
Black gum .....	<i>Nyssa biflora</i>	
Seaside evening primrose .....	<i>Oenothera humifusa</i>	
Pricklypear .....	<i>Opuntia humifusa</i>	
Erect pricklypear .....	<i>Opuntia stricta</i> .....	SC, SCF
Wild olive .....	<i>Osmanthus americanus</i>	
Cinnamon fern .....	<i>Osmunda cinnamomea</i> .....	HH, BS
Royal fern .....	<i>Osmunda regalis</i> L. var. <i>spectabilis</i> .....	HH, BS
Yellow wood-sorrel .....	<i>Oxalis florida</i>	
Water dropwort .....	<i>Oxypolis filiformis</i>	
Many wing polypteris .....	<i>Palafoxia integrifolia</i>	
Sand squares .....	<i>Paronychia rugelii</i>	
Virginia creeper .....	<i>Parthenocissus quinquefolia</i>	
Many-flower beard tongue .....	<i>Penstemon multiflorus</i>	
Swampbay .....	<i>Persea palustris</i>	
Annual garden phlox .....	<i>Phlox drummondii</i> *	
Red chokeberry .....	<i>Photinia pyrifolia</i>	
Carpetweed .....	<i>Phyla nodiflora</i>	
Abnormal phyllanthus .....	<i>Phyllanthus abnormis</i>	
False dragonhead .....	<i>Physostegia virginiana</i>	
Pokeberry .....	<i>Phytolacca rigida</i>	
Blue butterwort .....	<i>Pinguicula caerulea</i> .....	MF, DM, BM
Yellow butterwort .....	<i>Pinguicula lutea</i> .....	MF, DM, BM
Small butterwort .....	<i>Pinguicula pumila</i>	
Carolina stripeseed .....	<i>Piriqueta caroliniana</i>	
Narrowleaf silkgrass .....	<i>Pityopsis graminifolia</i>	
Southern plantain .....	<i>Plantago virginica</i>	
Gypsy-spikes .....	<i>Plantanthera flava</i> .....	MF
Rosy camphorweed .....	<i>Pluchea baccharis</i>	
Marsh camphorweed .....	<i>Pluchea camphorata</i>	
Stinking camphorweed .....	<i>Pluchea foetida</i>	
Longleaf camphorweed .....	<i>Pluchea longifolia</i>	
Sweetscent .....	<i>Pluchea odorata</i>	
Slenderleaf clammyweed .....	<i>Polanisia tenuifolia</i>	
White bachelor's button .....	<i>Polygala balduinii</i>	
Large-flowerer polygala .....	<i>Polygala grandiflora</i>	
Procession flower .....	<i>Polygala incarnata</i>	

\* Non-native species

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Bog bachelor's button.....	<i>Polygala lutea</i>	
Wild bachelor's button .....	<i>Polygala nana</i>	
Racemed milkwort .....	<i>Polygala polygama</i>	
Yellow bachelor's button .....	<i>Polygala rugelii</i>	
Slender milkwort.....	<i>Polygala setacea</i>	
Wireweed.....	<i>Polygonella gracilis</i>	
Mild water-pepper .....	<i>Polygonum hydropiperoides</i>	
Dotted smartweed.....	<i>Polygonum punctatum</i>	
Rustweed.....	<i>Polypremum procumbens</i>	
Pink purslane.....	<i>Portulaca pilosa</i>	
Marsh mermaid weed .....	<i>Proserpinaca palustris</i>	
Mermaid weed .....	<i>Proserpinaca pectinata</i>	
Blackroot .....	<i>Pterocaulon pycnostaschyum</i>	
Mock bishop's-weed .....	<i>Ptilimnium capillaceum</i>	
Carolina false dandelion.....	<i>Pyrrhopappus carolinianus</i>	
Chapman's oak .....	<i>Quercus chapmanii</i>	
Sand live oak.....	<i>Quercus geminata</i>	
Turkey oak.....	<i>Quercus laevis</i>	
Laurel oak; Diamond oak .....	<i>Quercus laurifolia</i>	
Myrtle oak.....	<i>Quercus myrtifolia</i>	
Running oak .....	<i>Quercus pumila</i>	
Live oak .....	<i>Quercus virginiana</i>	
Pale meadow beauty .....	<i>Rhexia mariana</i>	
Clustered meadow beauty .....	<i>Rhexia nashii</i>	
Nuttall's meadow beauty.....	<i>Rhexia nuttallii</i>	
Coastal plain meadow beauty ...	<i>Rhexia petiolata</i>	
Winged sumac .....	<i>Rhus copallina</i>	
One-leaf rhynchosia .....	<i>Rhynchosia michauxii</i>	
Tropical Mexican clover.....	<i>Richardia brasiliensis</i> *	
Swamp rose .....	<i>Rosa palustris</i>	
Highbush blackberry.....	<i>Rubus argutus</i>	
Sand blackberry.....	<i>Rubus cuneifolius</i>	
Southern dewberry.....	<i>Rubus trivialis</i>	
Hastate-leaved dock.....	<i>Rumex hastatulus</i>	
Swamp dock.....	<i>Rumex verticillatus</i>	
Ten-petal sabatia .....	<i>Sabatia bartramii</i>	
Coastal rose-gentian .....	<i>Sabatia calycina</i>	
Large-flowered sabatia .....	<i>Sabatia grandiflora</i>	
Fourangle rosegentian .....	<i>Sabatia quadrangula</i>	
Star sabatia .....	<i>Sabatia stellaris</i>	
Perennial glasswort .....	<i>Salicornia virginica</i>	
Carolina willow .....	<i>Salix caroliniana</i>	
Elderberry .....	<i>Sambucus canadensis</i>	
Water pimpernel .....	<i>Samolus ebracteatus</i>	
Pineland pimpernel.....	<i>Samolus parviflorus</i>	
Brazilian pepper.....	<i>Schinus terebinthifolius</i> *	

\* Non-native species

## Cedar Key Scrub State Reserve Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Sweet broom.....	<i>Scoparia dulcis</i>	
Whitetop aster.....	<i>Sericocarpus tortifolius</i>	
Bladderpod.....	<i>Sesbania vesicaria</i>	
Sea purslane.....	<i>Sesuvium portulacastrum</i>	
Seymeria.....	<i>Seymeria pectinata</i>	
Broomweed.....	<i>Sida acuta</i>	
Sleepy catchfly.....	<i>Silene antirrhina</i>	
Chapman's goldenrod.....	<i>Solidago chapmanii</i>	
Goldenrod.....	<i>Solidago fistulosa</i>	
Seaside goldenrod.....	<i>Solidago sempervirens</i>	
Slender goldenrod.....	<i>Solidago stricta</i>	
Large leaf buttonwood.....	<i>Spermacoce assurgens</i>	
Spreading scaleseed.....	<i>Spermolepis divaricata</i>	
Hedge nettle.....	<i>Stachys floridana</i>	
Sea blite.....	<i>Suaeda linearis</i>	
Climbing aster.....	<i>Symphyotrichum carolinianum</i>	
Rice button aster.....	<i>Symphyotrichum dumosum</i>	
Annual saltmarsh aster.....	<i>Symphyotrichum subulatum</i>	
Perennial saltmarsh aster.....	<i>Symphyotrichum tenuifolium</i>	
Golden hoary pea.....	<i>Tephrosia chrysophylla</i>	
Hoary pea.....	<i>Tephrosia rugelii</i>	
Wood sage.....	<i>Teucrium canadense</i>	
Eastern poison ivy.....	<i>Toxicodendron radicans</i>	
Forked bluecurls.....	<i>Trichostema dichotomum</i>	
Low hopclover.....	<i>Trifolium campestre</i>	
White lawn clover.....	<i>Trifolium repens</i> *	
Venus' looking-glass.....	<i>Triodanis perfoliata</i>	
American elm.....	<i>Ulmus americana</i>	
Cedar elm.....	<i>Ulmus crassifolia</i>	
Horned bladderwort.....	<i>Utricularia cornuta</i>	
Bladderwort.....	<i>Utricularia foliosa</i>	
Floating bladderwort.....	<i>Utricularia inflata</i>	
Purple bladderwort.....	<i>Utricularia purpurea</i>	
Zigzag bladderwort.....	<i>Utricularia subulata</i>	
Sparkleberry.....	<i>Vaccinium arboreum</i>	
Darrow's blueberry.....	<i>Vaccinium darrowi</i>	
Shiny blueberry.....	<i>Vaccinium myrsinites</i>	
Purple-stamen mullen.....	<i>Verbascum virginatum</i> *	
European vervain.....	<i>Verbena officinalis</i> *	
Harsh verbena.....	<i>Verbena scabra</i>	
Frostweed.....	<i>Verbesina virginica</i>	
Four-leaf vetch.....	<i>Vicia acutifolia</i>	
Bog white violet.....	<i>Viola lanceolata</i>	
Three-lobed violet.....	<i>Viola triloba</i>	
Simpson's grape.....	<i>Vitis cinerea</i>	
Muscadine grape.....	<i>Vitis rotundifolia</i>	

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
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### INVERTEBRATES

#### Beetles

Moustached Tiger Beetle .....	<i>Cicindela hirtilabris</i> .....	SC, SCF
Scabrous Tiger Beetle .....	<i>Cicindela scabrosa</i> .....	SC, SCF
Tiger Beetle .....	<i>Cicindela togata</i> .....	EUS

#### Spiders

Red Widow .....	<i>Latrodectus bishopi</i> .....	SC, SCF
Trap Door Spider .....	<i>Ummidia</i> sp. ....	SC, SCF

#### Dragonflies and Damselflies

Bar-winged Skimmer .....	<i>Libellula axilena</i> .....	BM, DM
Great Blue Skimmer .....	<i>Libellula vibrans</i> .....	BM, DM
Blue Dasher .....	<i>Pachydiplax longipennis</i> .....	BM

#### Butterflies and Moths

Arogos Skipper .....	<i>Atrytone arogos</i> .....	SAM
Red-banded Hairstreak .....	<i>Calycopsis cecrops</i> .....	MTC
Imperial Moth .....	<i>Eacles imperialis</i> .....	MTC
Tulip-tree Beauty .....	<i>Epimecis hortaria</i> .....	MTC
Ceranus Blue .....	<i>Hemiargus ceranus</i> .....	MTC
Carolina Satyr .....	<i>Hermeuptychia sosybius</i> .....	HH
Ocola Skipper .....	<i>Panoquina ocola</i> .....	MTC
Phaon Crescent .....	<i>Phyciodes phaon</i> .....	MTC
Whirlabout .....	<i>Polites vibex</i> .....	MTC
Tropical Checkered Skipper .....	<i>Pyrgus oileus</i> .....	MTC
Gray Hairstreak .....	<i>Strymon melinus</i> .....	MTC

### FISH

Lined Sole .....	<i>Achirus lineatus</i> .....	ECPS
Sheepshead .....	<i>Archosargus probatocephalus</i> .....	ECPS
Hardhead Catfish .....	<i>Arius felis</i> .....	ECPS
Southern Stargazer .....	<i>Astroscopus y-graecum</i> .....	ECPS
Gulf Menhaden .....	<i>Brevoortia patronus</i> .....	ECPS
Grass Porgy .....	<i>Calamus arctifrons</i> .....	ECPS
Florida Blenny .....	<i>Chasmodes saburrae</i> .....	ECPS
Striped Burrfish .....	<i>Chilomycterus schoepfi</i> .....	ECPS
Sand Seatrout .....	<i>Cynoscion arenarius</i> .....	ECPS
Spotted Seatrout .....	<i>Cynoscion nebulosus</i> .....	ECPS
Sheepshead Minnow .....	<i>Cyprinodon variegatus</i> .....	ECPS
Atlantic Stingray .....	<i>Dasyatis sabina</i> .....	ECPS
Bluntnose Stingray .....	<i>Dasyatis sayi</i> .....	ECPS
Sand Perch .....	<i>Diplectrum formosum</i> .....	ECPS
Spottail Pinfish .....	<i>Diplodus holbrooki</i> .....	ECPS
Fringed Flounder .....	<i>Etropus crossotus</i> .....	ECPS

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Smallmouth Flounder .....	<i>Etropus microstomus</i> .....	ECPS
Gray Flounder.....	<i>Etropus rimosus</i> .....	ECPS
Silver Jenny .....	<i>Eucinostomus gula</i> .....	ECPS
Tidewater Mojarra .....	<i>Eucinostomus harengulus</i> .....	ECPS
Gulf Killifish.....	<i>Fundulus grandis</i> .....	ECPS
Striped Killifish .....	<i>Fundulus majalis</i> .....	ECPS
Skilletfish.....	<i>Gobiosox strumosus</i> .....	ECPS
Naked Goby .....	<i>Gobiosoma bosc</i> .....	ECPS
Two-scale Goby .....	<i>Gobiosoma longipala</i> .....	ECPS
Code Goby .....	<i>Gobiosoma robustum</i> .....	ECPS
Smooth Butterfly Ray .....	<i>Gymnura micrura</i> .....	ECPS
Scaled Sardine.....	<i>Harengula jaguana</i> .....	ECPS
Lined Seahorse.....	<i>Hippocampus erectus</i> .....	ECPS
Dwarf Seahorse .....	<i>Hippocampus zosterae</i> .....	ECPS
Crested Blenny .....	<i>Hypleurochilus geminatus</i> .....	ECPS
Halfbeak .....	<i>Hyporhamphus unifasciatus</i> .....	ECPS
Feather Blenny .....	<i>Hypsoblennius hertz</i> .....	ECPS
Scrawled Cowfish.....	<i>Lactophrys quadricornis</i> .....	ECPS
Pinfish .....	<i>Lagodon rhomboides</i> .....	ECPS
Spot .....	<i>Leiostomus xanthurus</i> .....	ECPS
Rainwater Killifish .....	<i>Lucania parva</i> .....	ECPS
Rough Silverside .....	<i>Membras martinica</i> .....	ECPS
Inland Silverside .....	<i>Menidia beryllina</i> .....	ECPS
Tidewater Silverside .....	<i>Menidia peninsulae</i> .....	ECPS
Southern Kingfish .....	<i>Menticirrhus americanus</i> .....	ECPS
Northern Kingfish.....	<i>Menticirrhus saxatilis</i> .....	ECPS
Green Goby.....	<i>Microgobius thalassinus</i> .....	ECPS
Fringed Filefish .....	<i>Monacanthus ciliatus</i> .....	ECPS
Planehead Filefish .....	<i>Monacanthus hispidus</i> .....	ECPS
Striped Mullet.....	<i>Mugil cephalus</i> .....	ECPS
White Mullet .....	<i>Mugil curema</i> .....	ECPS
Gag.....	<i>Mycteroperca microlepis</i> .....	ECPS
Speckled Worm Eel .....	<i>Myrophis punctatus</i> .....	ECPS
Atlantic Thread Herring.....	<i>Opisthonema oglinum</i> .....	ECPS
Gulf Toadfish .....	<i>Opsanus beta</i> .....	ECPS
Pigfish .....	<i>Orthopristis chrysoptera</i> .....	ECPS
Seaweed Blenny .....	<i>Parablennius marmoreus</i> .....	ECPS
Gulf Flounder.....	<i>Paralichthys albigutta</i> .....	ECPS
Harvestfish.....	<i>Peprilus alepidotus</i> .....	ECPS
Bluefish .....	<i>Pomatomus saltatrix</i> .....	ECPS
Bighead Searobin.....	<i>Prionotus tribulus</i> .....	ECPS
Clearnose Skate.....	<i>Raja eglanteria</i> .....	ECPS
Red Drum .....	<i>Sciaenops ocellatus</i> .....	ECPS
Barbfish .....	<i>Scorpaena brasiliensis</i> .....	ECPS
Northern Sennet .....	<i>Sphyraena borealis</i> .....	ECPS
Atlantic Needlefish .....	<i>Strongylura marina</i> .....	ECPS

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Redfin Needlefish .....	<i>Strongylura notata</i> .....	ECPS
Blackcheek Tonguefish.....	<i>Symphurus plagiusa</i> .....	ECPS
Dusky Pipefish .....	<i>Syngnathus floridae</i> .....	ECPS
Chain Pipefish.....	<i>Syngnathus louisianae</i> .....	ECPS
Gulf Pipefish .....	<i>Syngnathus scovelli</i> .....	ECPS
Inshore Lizardfish .....	<i>Synodus foetens</i> .....	ECPS
Hogchoker .....	<i>Trinectes maculatus</i> .....	ECPS
Southern Hake.....	<i>Urophycis floridana</i> .....	ECPS
Spotted Hake .....	<i>Urophycis regia</i> .....	ECPS

### AMPHIBIANS

#### Frogs and Toads

Southern Cricket Frog.....	<i>Acris gryllus</i> .....	MF
Oak Toad .....	<i>Anaxyrus quercicus</i> .....	MF
Southern Toad .....	<i>Anaxyrus terrestris</i> .....	MF
Eastern Narrowmouth Toad .....	<i>Gastrophryne carolinensis</i> .....	MTC
Cope's Gray Treefrog .....	<i>Hyla chrysocelis</i> .....	HH
Green Treefrog .....	<i>Hyla cinerea</i> .....	MF
Pinewoods Treefrog .....	<i>Hyla femoralis</i> .....	MF
Barking Treefrog .....	<i>Hyla gratiosa</i> .....	BS
Squirrel Treefrog .....	<i>Hyla squirella</i> .....	MF
Little Grass Frog .....	<i>Pseudacris ocularis</i> .....	MF
Southern Chorus Frog.....	<i>Pseudacris nigrita verucosa</i> .....	MF
Eastern Spadefoot .....	<i>Scaphiopus holbrookii</i> .....	MF
Gopher Frog .....	<i>Lithobates capito</i> .....	SFC
Bull Frog .....	<i>Lithobates catesbeiana</i> .....	BS
Pig Frog .....	<i>Lithobates grylio</i> .....	BM
Southern Leopard Frog .....	<i>Lithobates sphenoccephala</i> .....	BM

#### Salamanders

Two-toed Amphiuma .....	<i>Amphiuma means</i> .....	BM
Eastern Newt.....	<i>Notophthalmus viridescens</i> .....	BS, BM
Eastern Lesser Siren.....	<i>Siren intermedia</i> .....	BS
Greater Siren .....	<i>Siren lacertina</i> .....	BM

### REPTILES

#### Crocodylians

American Alligator.....	<i>Alligator mississippiensis</i> .....	BM, ECPS
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#### Turtles

Florida Softshell.....	<i>Apalone ferox</i> .....	BM
Chicken Turtle .....	<i>Deirochelys reticularia</i> .....	BM, DM
Gopher Tortoise.....	<i>Gopherus polyphemus</i> .....	SC, SFC, MF
Florida Mud Turtle.....	<i>Kinosternon subrubrum steindachneri</i> .....	BM, DM
Ornate diamondback Terrapin...	<i>Malaclemys terrapin macrospilota</i> .....	ECPS, SAM

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Florida Cooter.....	<i>Pseudemys floridana</i> .....	BST
Florida Redbelly Cooter.....	<i>Pseudemys nelsoni</i> .....	BM
Eastern Musk Turtle .....	<i>Sternotherus odoratus</i> .....	BM,DM
Eastern Box Turtle .....	<i>Terrapene carolina bauri</i> .....	MF, HH
Yellowbelly Slider .....	<i>Trachemys scripta scripta</i> .....	ECPS
<b>Snakes</b>		
Cottonmouth .....	<i>Agkistrodon piscivorus</i> .....	BS, HH
Southern Black Racer .....	<i>Coluber constrictor priapus</i> .....	MF
E. Diamondback Rattlesnake ....	<i>Crotalus adamanteus</i> .....	MF, SFC
Southern Ringneck Snake .....	<i>Diadophis punctatus punctatus</i> .....	MTC
Eastern Indigo Snake .....	<i>Drymarchon corais couperi</i> .....	SC, SFC
Eastern Mud Snake .....	<i>Farancia abacura abacura</i> .....	BS
Eastern Kingsnake .....	<i>Lampropeltis getulus</i> .....	MF
Eastern Coachwhip.....	<i>Masticophis flagellum flagellum</i> .....	SC, SCF
Eastern Coral Snake.....	<i>Micrurus fulvius fulvius</i> .....	MF, SFC
Florida Water Snake.....	<i>Nerodia fasciata</i> .....	BM, DM
Florida Green Water Snake.....	<i>Nerodia floridana</i> .....	BM, HH
Gulf Salt Marsh Snake .....	<i>Nerodia clarkii clarkii</i> .....	SAM
Rough Green Snake .....	<i>Opheodrys aestivus</i> .....	MTC
Eastern Corn Snake.....	<i>Pantherophis guttatus</i> .....	MTC
Eastern Rat Snake .....	<i>Pantherophis alleghaniensis</i> .....	MTC
Striped Crayfish Snake .....	<i>Regina alleni</i> .....	BM, BS
Dusky Pigmy Rattlesnake.....	<i>Sistrurus miliarius barbouri</i> .....	SC, SCF, MF, HH
Florida Red-bellied Snake.....	<i>Storeria occipitomaculata obscura</i> .....	HH
Blue-striped Ribbon Snake .....	<i>Thamnophis sauritus nitae</i> .....	MF
Blue-striped Garter Snake.....	<i>Thamnophis sirtalis similis</i> .....	MF
<b>Lizards</b>		
Carolina Anole .....	<i>Anolis carolinensis</i> .....	MTC
Six-lined Racerunner .....	<i>Cnemidophorus sexlineatus</i> .....	SC, SFC
Island Glass Lizard .....	<i>Ophisaurus compressus</i> .....	SC, SFC
Mole Skink .....	<i>Plestiodon egregius</i> .....	SC, SCF
Southeastern Five-lined Skink ..	<i>Plestiodon inexpectatus</i> .....	MF
Southern Fence Lizard .....	<i>Sceloporus undulatus</i> .....	MF
Ground Skink .....	<i>Scincella lateralis</i> .....	MTC
<b>BIRDS</b>		
<b>Waterfowl</b>		
Red-breasted Merganser .....	<i>Mergus serrator</i> .....	OF
<b>New World Quails</b>		
Northern Bobwhite .....	<i>Colinus virginianus</i> .....	MF
<b>Pigeons and Doves</b>		
Common Ground-Dove .....	<i>Columbina passerina</i> .....	SFC

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
White-winged Dove .....	<i>Zenaida asiatica</i> .....	MTC
Mourning Dove .....	<i>Zenaida macroura</i> .....	MTC
<b>Hummingbirds</b>		
Ruby-throated Hummingbird ....	<i>Archilochus colubris</i> .....	MTC
<b>Rails and Coots</b>		
Clapper Rail.....	<i>Rallus crepitans</i> .....	SAM
<b>Oystercatchers</b>		
American Oystercatcher .....	<i>Haematopus palliates</i> .....	SAM, EMR
<b>Plovers</b>		
Black-bellied-Plover .....	<i>Pluvialis squatarola</i> .....	EUS
<b>Sandpipers</b>		
Marbled Godwit.....	<i>Limosa fedoa</i> .....	EUS
Ruddy Turnstone.....	<i>Arenaria interpres</i> .....	EUS
Dunlin .....	<i>Calidris alpina</i> .....	EUS
Least Sandpiper .....	<i>Calidris minutilla</i> .....	EUS
Short-billed Dowitcher .....	<i>Limnodromus griseus</i> .....	EUS
Solitary Sandpiper.....	<i>Tringa solitaria</i> .....	OF
Willet.....	<i>Tringa semipalmata</i> .....	EUS
<b>Gulls, Terns, and Skimmers</b>		
Caspian Tern .....	<i>Hydroprogne caspia</i> .....	OF
Forster's Tern.....	<i>Sterna forsteri</i> .....	OF
<b>Storks</b>		
Wood Stork .....	<i>Mycteria americana</i> .....	BM, SAM
<b>Cormorants</b>		
Double-crested Cormorant .....	<i>Phalacrocorax auritus</i> .....	ECPS
<b>Pelicans</b>		
American White Pelican.....	<i>Pelecanus erythrorhynchos</i> .....	OF
Brown Pelican.....	<i>Pelecanus occidentalis</i> .....	ECPS
<b>Herons, Egrets, and Bitterns</b>		
Great Blue Heron .....	<i>Ardea herodias</i> .....	BM, SAM
Great Egret .....	<i>Ardea alba</i> .....	BM, SAM
Snowy Egret.....	<i>Egretta thula</i> .....	BM, SAM
Little Blue Heron .....	<i>Egretta caerulea</i> .....	BM, SAM
Tricolored Heron .....	<i>Egretta tricolor</i> .....	BM, SAM

\* Non-native species



## Cedar Key Scrub State Reserve Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
<b>Ibis and Spoonbills</b>		
White Ibis .....	<i>Eudocimus albus</i> .....	BM, SAM
<b>New World Vultures</b>		
Black Vulture .....	<i>Coragyps atratus</i> .....	MTC
Turkey Vulture .....	<i>Cathartes aura</i> .....	MTC
<b>Hawks, Eagles, and Kites</b>		
Osprey .....	<i>Pandion haliaetus</i> .....	SAM
Swallow-tailed Kite .....	<i>Elanoides forficatus</i> .....	SAM
Bald Eagle .....	<i>Haliaeetus leucocephalus</i> .....	MF
Sharp-shinned Hawk .....	<i>Accipiter striatus</i> .....	MF, SC
Red-shouldered Hawk .....	<i>Buteo lineatus</i> .....	MF
Short-tailed Hawk .....	<i>Buteo brachyurus</i> .....	BS
Red-tailed Hawk .....	<i>Buteo jamaicensis</i> .....	MF
<b>Owls</b>		
Eastern Screech-owl .....	<i>Megascops asio</i> .....	MTC
Great Horned Owl .....	<i>Bubo virginianus</i> .....	MF
Barred Owl .....	<i>Strix varia</i> .....	BS
<b>Kingfishers</b>		
Belted Kingfisher .....	<i>Megaceryle alcyon</i> .....	BM, SAM
<b>Woodpeckers</b>		
Red-bellied Woodpecker .....	<i>Melanerpes carolinus</i> .....	MTC
Yellow-bellied Sapsucker .....	<i>Sphyrapicus varius</i> .....	MF, HH
Downy Woodpecker .....	<i>Picoides pubescens</i> .....	MTC
Northern Flicker .....	<i>Colaptes auratus</i> .....	MF
Pileated Woodpecker .....	<i>Dryocopus pileatus</i> .....	HH
<b>Falcons and Caracaras</b>		
American Kestrel .....	<i>Falco sparverius</i> .....	MF, SFC
<b>Tyrant Flycatchers</b>		
Eastern Phoebe .....	<i>Sayornis phoebe</i> .....	MF
Great Crested Flycatcher .....	<i>Myiarchus crinitus</i> .....	MF
Gray Kingbird .....	<i>Tyrannus dominicensis</i> .....	MF
<b>Shrikes</b>		
Loggerhead Shrike .....	<i>Lanius ludovicianus</i> .....	MF
<b>Vireos and Allies</b>		
White-eyed Vireo .....	<i>Vireo griseus</i> .....	MTC
Yellow-throated Vireo .....	<i>Vireo flavifrons</i> .....	MF, SC
Blue-headed Vireo .....	<i>Vireo solitarius</i> .....	HH

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
Red-eyed Vireo .....	<i>Vireo olivaceus</i> .....	HH
<b>Crows and Jays</b>		
Blue Jay .....	<i>Cyanocitta cristata</i> .....	MTC
Florida Scrub-jay .....	<i>Aphelocoma coerulescens</i> .....	SC, SFC
American Crow .....	<i>Corvus brachyrhynchos</i> .....	MTC
Fish Crow.....	<i>Corvus ossifragus</i> .....	MTC
<b>Swallows</b>		
Purple Martin .....	<i>Progne subis</i> .....	OF
Tree Swallow .....	<i>Tachycineta bicolor</i> .....	SAM
Barn Swallow.....	<i>Hirundo rustica</i> .....	SAM
<b>Tits and Allies</b>		
Carolina Chickadee.....	<i>Poecile carolinensis</i> .....	MTC
Tufted Titmouse.....	<i>Baeolophus bicolor</i> .....	MTC
<b>Wrens</b>		
House Wren .....	<i>Troglodytes aedon</i> .....	MTC
Sedge Wren .....	<i>Cistothorus platensis</i> .....	SAM
Marsh Wren.....	<i>Cistothorus palustris</i> .....	SAM
Carolina Wren.....	<i>Thryothorus ludovicianus</i> .....	MTC
<b>Kinglets</b>		
Ruby-crowned Kinglet.....	<i>Regulus calendula</i> .....	MTC
<b>Old World Warblers</b>		
Blue-gray Gnatcatcher .....	<i>Polioptila caerulea</i> .....	MTC
<b>Thrushes</b>		
Eastern Bluebird .....	<i>Sialia sialis</i> .....	MF
Hermit Thrush .....	<i>Catharus guttatus</i> .....	HH
American Robin .....	<i>Turdus migratorius</i> .....	MTC
<b>Mockingbirds and Thrashers</b>		
Gray Catbird.....	<i>Dumetella carolinensis</i> .....	MF
Brown Thrasher .....	<i>Toxostoma rufum</i> .....	MF, SFC
Northern Mockingbird .....	<i>Mimus polyglottos</i> .....	MTC
<b>Starlings</b>		
European Starling .....	<i>Sturnus vulgaris</i> * .....	DV
<b>Waxwings</b>		
Cedar Waxwing.....	<i>Bombycilla cedrorum</i> .....	OF

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
<b>New World Warblers</b>		
Black-and-white Warbler .....	<i>Mniotilta varia</i> .....	MTC
Common Yellowthroat.....	<i>Geothlypis trichas</i> .....	BM, SAM
Northern Parula .....	<i>Setophaga americana</i> .....	MTC
Palm Warbler.....	<i>Setophaga palmarum</i> .....	MF
Pine Warbler.....	<i>Setophaga pinus</i> .....	MF
Yellow-rumped Warbler.....	<i>Setophaga coronata</i> .....	MTC
Yellow-throated Warbler .....	<i>Setophaga dominica</i> .....	MF
Prairie Warbler.....	<i>Setophaga discolor</i> .....	MF
<b>Sparrows and Allies</b>		
Eastern Towhee .....	<i>Pipilo erythrophthalmus</i> .....	MF, SC
Nelson's Sparrow .....	<i>Ammodramus nelsoni</i> .....	SAM
Seaside Sparrow .....	<i>Ammodramus maritimus</i> .....	SAM
Swamp Sparrow .....	<i>Melospiza georgiana</i> .....	BM
<b>Cardinals, Grosbeaks, and Allies</b>		
Summer Tanager .....	<i>Piranga rubra</i> .....	MF, SC
Northern Cardinal .....	<i>Cardinalis cardinalis</i> .....	MTC
Indigo Bunting.....	<i>Passerina cyanea</i> .....	MF
<b>Blackbirds and Allies</b>		
Red-winged Blackbird .....	<i>Agelaius phoeniceus</i> .....	BM, SAM
Eastern Meadowlark .....	<i>Sturnella magna</i> .....	MF
Common Grackle .....	<i>Quiscalus quiscula</i> .....	MTC
Boat-tailed Grackle.....	<i>Quiscalus major</i> .....	MTC
Brown-headed Cowbird .....	<i>Molothrus ater</i> .....	MF
<b>MAMMALS</b>		
<b>Didelphids</b>		
Virginia Opossum .....	<i>Didelphis virginiana</i> .....	MTC
<b>Insectivores</b>		
Least Shrew .....	<i>Cryptotis parva</i> .....	MF
Eastern Mole .....	<i>Scalopus aquaticus</i> .....	SC, SFC
<b>Edentates</b>		
Nine-banded Armadillo .....	<i>Dasypus novemcinctus</i> *	MTC
<b>Lagomorphs</b>		
Eastern Cottontail .....	<i>Sylvilagus floridanus</i> .....	MTC
<b>Rodents</b>		
Southeastern Pocket Gopher ....	<i>Geomys pinetis</i> .....	SH
Southern Flying Squirrel .....	<i>Glaucomys volans</i> .....	MF, HH
House Mouse.....	<i>Mus musculus</i> *	DV

\* Non-native species

## Cedar Key Scrub State Reserve Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Golden Mouse.....	<i>Ochrotomys nuttalli</i> .....	HH, MEH, SHF
Marsh Rice Rat .....	<i>Oryzomys palustris</i> .....	BM
Cotton Mouse .....	<i>Peromyscus gossypinus</i> .....	MF
Florida Mouse .....	<i>Podomys floridanus</i> .....	SC, SFC
Eastern Gray Squirrel .....	<i>Sciurus carolinensis</i> .....	MTC
Hispid Cotton Rat .....	<i>Sigmodon hispidus</i> .....	MF, SC, SCF
<b>Carnivores</b>		
River Otter .....	<i>Lutra canadensis</i> .....	SAM
Bobcat .....	<i>Lynx rufus</i> .....	MTC
Gulf Salt Marsh Vole .....	<i>Microtus pennsylvanicus dukecambelli</i> .....	SAM
Florida Long-tailed Weasel .....	<i>Mustela frenata peninsulae</i> .....	HH, BS
Gulf Salt Marsh Mink .....	<i>Neovison vison halilimnetes</i> .....	SAM
Raccoon.....	<i>Procyon lotor</i> .....	MTC
Gray Fox.....	<i>Urocyon cinereoargenteus</i> .....	MTC
Florida Black Bear .....	<i>Ursus americanus floridanus</i> .....	SC, SCF, HH, BS
<b>Sirens</b>		
West Indian Manatee .....	<i>Trichechus mantus latirostris</i> .....	ECPS
<b>Cetaceans</b>		
Bottlenose Dolphin .....	<i>Tursiops truncatus</i> .....	ECPS
<b>Artiodactyls</b>		
White-tailed Deer .....	<i>Odocoileus virginianus</i> .....	MTC
Feral Pig .....	<i>Sus scrofa</i> * .....	MTC

\* Non-native species

## Primary Habitat Codes

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### 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

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Wet Prairie ..... WP

### LACUSTRINE

Clastic Upland Lake ..... CULK  
Coastal Dune Lake ..... CDLK  
Coastal Rockland Lake ..... CRLK  
Flatwoods/Prairie ..... FPLK  
Marsh Lake ..... MLK  
River Floodplain Lake ..... RFLK  
Sandhill Upland Lake ..... SULK  
Sinkhole Lake ..... SKLK  
Swamp Lake ..... SWLK

### RIVERINE

Alluvial Stream ..... AST  
Blackwater Stream ..... BST  
Seepage Stream ..... SST  
Spring-run Stream ..... SRST

### SUBTERRANEAN

Aquatic Cave ..... ACV  
Terrestrial Cave ..... TCV

### ESTUARINE

Algal Bed ..... EAB  
Composite Substrate ..... ECPS  
Consolidated Substrate ..... ECNS  
Coral Reef ..... ECR  
Mollusk Reef ..... EMR  
Octocoral Bed ..... EOB  
Seagrass Bed ..... ESGB  
Sponge Bed ..... ESPB  
Unconsolidated Substrate ..... EUS  
Worm Reef ..... EWR

### MARINE

Algal Bed ..... MAB  
Composite Substrate ..... MCPS  
Consolidated Substrate ..... MCNS  
Coral Reef ..... MCR  
Mollusk Reef ..... MMR  
Octocoral Bed ..... MOB  
Seagrass Bed ..... MSGB  
Sponge Bed ..... MSPB  
Unconsolidated Substrate ..... MUS  
Worm Reef ..... MWR

## Primary Habitat Codes

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### ALTERED LANDCOVER TYPES

Abandoned field/Abandoned pasture .....	AFP
Agriculture .....	AG
Artificial Pond .....	AP
Borrow Area .....	BA
Canal/ditch .....	CD
Clearcut pine plantation .....	CPP
Clearing/Regeneration .....	CL
Developed .....	DV
Impoundment.....	IM
Invasive exotic monoculture .....	IEM
Pasture - improved.....	PI
Pasture - semi-improved.....	PSI
Pine plantation.....	PP
Restoration Natural Community .....	RNC
Road .....	RD
Spoil area .....	SA
Successional hardwood forest .....	SHF
Utility corridor .....	UC

### MISCELLANEOUS

Many Types of Communities .....	MTC
Overflying .....	OF





## **Addendum 6—Imperiled Species Ranking Definitions**



## **Imperiled Species Ranking Definitions**

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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

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- 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.

## Imperiled Species Ranking Definitions

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### LEGAL STATUS

#### **FEDERAL**

**(Listed by the U. S. Fish and Wildlife Service - USFWS)**

- LE ..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
- PE ..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT ..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.
- PT ..... Proposed for listing as Threatened Species.
- C ..... Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A) ..... Endangered due to similarity of appearance.
- T(S/A) ..... Threatened due to similarity of appearance.
- EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
- EXPN, XN.... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

#### **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

## Imperiled Species Ranking Definitions

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- ST..... Listed as Threatened Species by the FWC. Defined as a species, subspecies, or isolated population, which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat, is decreasing in area at a rapid rate and therefore is destined or very likely to become an endangered species within the near future.
- SSC..... Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species.

### **PLANTS .... (Listed by the Florida Department of Agriculture and Consumer Services - FDACS)**

- LE ..... Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.
- LT ..... Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

## **Addendum 7—Cultural Information**





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

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**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)**

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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](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

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The criteria to be used for evaluating eligibility for listing in the National Register of Historic Places are as follows:

- 1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
  - a) are associated with events that have made a significant contribution to the broad patterns of our history; and/or
  - b) are associated with the lives of persons significant in our past; and/or
  - c) embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
  - d) have yielded, or may be likely to yield, information important in prehistory or history.
  
- 2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
  - a) a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
  - b) a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
  - c) a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
  - d) a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or 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
  - e) 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

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**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—Timber Management Analysis**



## **Addendum 8 Timber Management Analysis**

### **1. *Management Context and Best Management Practices***

Timber management at Cedar Key Scrub State Reserve (Cedar Key Scrub) is based on the desired future condition (DFC) of a management zone or natural community (NatCom) as determined by the DRP Unit Management Plans, along with guidelines developed by the Florida Natural Areas Inventory (FNAI). In most cases, the DFC will be closely related to the historic NatCom. However, it is important to note, that in areas where the historic community has been severely altered by past land use practices, the DFC may not always be the same as the historic NatCom. All timber management activities undertaken will adhere to or exceed the current Florida Silvicultural Best Management Practices (BMPs) and Florida Forestry Wildlife BMPs for State Imperiled Species. DRP shall take all measures necessary to protect water quality and wildlife species of concern while conducting timber management activities. DRP has contracted with a private sector, professional forest management firm to complete this timber assessment: F4 Tech.

### **2. *Purpose of Timber Management Activities***

Timber management activities may be conducted to help improve or maintain current conditions to achieve the associated DFC. Timber management will primarily be conducted in upland NatComs. Candidate upland NatCom types may include mesic flatwoods, wet flatwoods, sandhill, upland pine, and upland mixed woodland along with scrubby flatwoods, scrub, and altered landcover types such as successional hardwood forest and pine plantations. There will likely be no scheduled timber management activities in historically hardwood-dominated or wetland NatCom types, e.g., upland hardwood forest, hydric hammock, and slope forest. In some circumstances, timber management may include the harvesting and removal of overstory invasive/exotic trees. Descriptions of community types are detailed in the Resource Management Component.

### **3. *Potential Silvicultural Treatments***

Several silvicultural treatments may be considered and utilized over the next ten years. The various types of timber harvests may include pine thinning, targeted hardwood overstory removal, and clearcutting. Silvicultural treatments will be selectively implemented to minimize potential impacts to water and soil resources, non-target vegetation, and wildlife (see BMPs). Depending upon the condition and marketability of the timber being manipulated, it is possible to generate revenue from the harvest. It is also possible the timber removal could be a cost to DRP. In all decisions, the mission of preserving and restoring natural communities will be the guiding factor.

Thinning is conducted to reduce the basal area (BA) or density of trees/stems in a stand to improve forest health and growth conditions for residual trees. Allowing trees more room to grow has the potential to increase tree and forest vigor, which helps mitigate the potential for damaging insect and disease outbreaks. Most tree harvesting/removals also increase sunlight reaching the forest floor and fine fuels that facilitate consistent fire return intervals and responses, which can benefit

groundcover vegetation abundance, species richness, and overall ecological diversity. The disruption of natural fire regimes and fire return intervals can often result in the need to remove undesirable or overstocked hardwood stems that currently occupy growing space in the canopy and sub-canopy. Clearcutting may be used to support restoration goals by removing off-site pine or hardwood species and is a precursor to establishing site-appropriate species. It can also be used to control insect infestations that are damaging or threatening forest resources and ecosystem conditions.

On occasion, salvage cuts may need to be conducted to remove small volumes of wood damaged by fire, wind storm, insect or other natural causes. The decision whether or not to harvest the affected timber will depend on the threat to the surrounding stands, risk of collateral ecological damage, and the volume/value of the trees involved. For example, small, isolated lightning-strike, beetle kills are a natural part of a healthy ecosystem and normally would not be cut. However, if a drought caused the insect infestation to spread, the affected trees and buffer zone might have to be removed to prevent significant damage.

#### ***4. Inventory Data and Potential Actions per Area of Interest or Management Zone***

Cedar Key Scrub comprises a total of 6,774 acres in Levy County. A total of 2,390 acres are associated with four (4) upland NatCom types that are potential candidates for timber management. From March to June 2016, an inventory based on field plots was conducted across and within a large percentage of these areas to quantify overstory, midstory and understory conditions. A second inventory was conducted in the recently-acquired Panther Tract from February to March 2019. Various park-level and NatCom-level summary statistics can be found in the following tables.

This timber assessment was based on management zone and NatCom boundary GIS data provided by DRP in September 2018. It is not intended to be prescriptive. Stakeholders and DRP staff are encouraged to view this timber assessment and inventory data as supplemental information for future consideration. Given the dynamic nature of property ownership and land management activities at Cedar Key Scrub, together with the timeframe required to create or update a UMP, it is possible that some tabular data may be dated. Therefore, NatCom acreages and recent treatments that occurred after the September 2018 period may not be reflected in the following tables.



**Florida State Parks  
Timber Management Analysis**

**Table 1. General summary statistics for Cedar Key Scrub State Reserve**

Number of Management Zones within the State Reserve	43
Upland NatCom acres	2,390

**Mesic Flatwoods (1,213.8 acres)**

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for mesic flatwoods contains longleaf pine at a basal area (BA) of 10 to 50 square feet per acre with non-pine at a density of 0 trees per acre (TPA). The following table shows the overstory condition for this natural community at Cedar Key Scrub and target overstory condition for mesic flatwoods in this region.

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CK-1A	22.2	23.3	9.5	18.0	20.0	50.8	13.6	31.6	10 - 50	0 - 0
CK-1B	22.1	42.5	39.0	32.7	8.8	23.3	5.4	38.1	10 - 50	0 - 0
CK-1C	3.4	40.0	35.0	28.5	20.0	18.1	0.0	28.5	10 - 50	0 - 0
CK-1D	15.1	24.0	32.1	18.7	38.0	154.8	16.9	35.6	10 - 50	0 - 0
CK-2A	6.3	--	--	--	--	--	--	--	--	--
CK-2B	75.4	42.0	44.7	31.3	2.0	15.8	0.0	31.3	10 - 50	0 - 0
CK-2C	2.1	--	--	--	--	--	--	--	--	--
CK-2D	44.8	43.3	62.0	30.6	1.7	13.3	0.0	30.6	10 - 50	0 - 0
CK-2E	8.6	--	--	--	--	--	--	--	--	--
CK-2F	73.8	25.5	29.2	19.2	15.5	28.5	1.0	20.2	10 - 50	0 - 0
CK-2G	10.9	17.5	23.8	9.3	17.5	106.8	0.0	9.3	10 - 50	0 - 0
CK-2H	42.8	43.8	44.5	31.6	15.0	24.8	3.0	34.7	10 - 50	0 - 0
CK-2J	89.2	28.8	20.8	26.1	18.8	48.3	0.7	26.8	10 - 50	0 - 0
CK-2K	46.4	71.4	117.6	56.9	0.0	0.0	0.0	56.9	10 - 50	0 - 0
CK-2L	31.0	40.0	75.5	28.3	0.0	0.0	0.0	28.3	10 - 50	0 - 0
CK-2M	38.6	23.3	63.4	16.4	1.7	10.9	0.0	16.4	10 - 50	0 - 0
CK-2N	11.3	100.0	152.2	69.2	0.0	0.0	0.0	69.2	10 - 50	0 - 0
CK-2Qn	37.0	--	--	--	--	--	--	--	--	--
CK-2Qs	15.6	30.0	25.2	22.8	0.0	0.0	0.0	22.8	10 - 50	0 - 0
CK-3	59.0	84.4	181.8	62.6	5.6	14.4	2.6	65.2	10 - 50	0 - 0
CK-4A	36.4	15.0	8.8	12.5	1.7	1.0	0.0	12.5	10 - 50	0 - 0
CK-4B	57.2	42.9	38.4	30.9	8.6	9.2	3.9	34.8	10 - 50	0 - 0

## Florida State Parks Timber Management Analysis

MZ ID	Mesic Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft2/ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft2/ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft2/ac)	FNAI Reference Condition Non-Pine TPA Range
CK-5A	63.4	17.3	16.0	14.3	2.7	16.5	0.5	14.8	10 - 50	0 - 0
CK-5B	6.4	25.0	118.0	18.7	0.0	0.0	0.0	18.7	10 - 50	0 - 0
CK-5C	8.1	46.7	22.5	37.9	6.7	49.6	0.0	37.9	10 - 50	0 - 0
CK-5D	25.5	10.0	9.9	5.4	0.0	0.0	0.0	5.4	10 - 50	0 - 0
CK-6A	2.4	--	--	--	--	--	--	--	--	--
CK-6D	4.9	--	--	--	--	--	--	--	--	--
CK-6E	3.7	5.0	2.0	4.1	0.0	0.0	0.0	4.1	10 - 50	0 - 0
CK-7	0.9	--	--	--	--	--	--	--	--	--
CK-8A	3.3	--	--	--	--	--	--	--	--	--
CK-8Bn	18.6	100.0	344.2	57.5	0.0	0.0	0.0	57.5	10 - 50	0 - 0
CK-8Bs	13.9	165.0	692.0	88.8	0.0	0.0	0.0	88.8	10 - 50	0 - 0
CK-8Cs	62.6	105.0	355.6	60.0	0.0	0.0	0.0	60.0	10 - 50	0 - 0
CK-8D	3.1	--	--	--	--	--	--	--	--	--
CK-9A	85.6	8.0	13.4	5.5	2.7	6.6	1.3	6.7	10 - 50	0 - 0
CK-9B	37.4	40.0	120.9	25.8	1.4	10.5	0.0	25.8	10 - 50	0 - 0
CK-9C	74.5	30.0	68.9	20.3	1.3	7.9	0.0	20.3	10 - 50	0 - 0
CK-10	50.5	57.0	110.1	40.2	3.0	23.9	0.0	40.2	10 - 50	0 - 0
<b>Total</b>	<b>1,213.8</b>									

### Sandhill (4.3 acres)

Longleaf pine (*Pinus palustris*) is the preferred overstory pine species in the region. The FNAI reference site in this region for sandhill contains longleaf pine at a basal area (BA) of 20 to 60 square feet per acre with non-pine species between 0 and 79 trees per acre (TPA). The following table shows the overstory condition for this natural community at Cedar Key Scrub and target overstory condition for sandhill in this region.

MZ ID	Sandhill (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft2/ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft2/ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft2/ac)	FNAI Reference Condition Non-Pine TPA Range
CK-1B	4.3	--	--	--	--	--	--	--	--	--
<b>Total</b>	<b>4.3</b>									

## Florida State Parks Timber Management Analysis

### Scrub (240.8 acres)

Sand live oak (*Quercus geminata*), myrtle oak (*Q. myrtifolia*), Chapman's oak (*Q. chapmanii*), and sand pine (*Pinus clausa*) are common overstory species. Sand pine is the preferred overstory pine species in the region. The FNAI reference site in this region for scrub contains sand pine at a basal area (BA) of 0 to 20 square feet per acre with non-pine species between 0 and 13 trees per acre (TPA). The following table shows the overstory condition for this natural community at Cedar Key Scrub and target overstory condition for scrub in this region.

MZ ID	Scrub (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CK-1B	9.9	--	--	--	--	--	--	--	--	--
CK-1C	15.8	36.0	90.3	16.7	6.0	10.5	4.1	20.8	0 - 20	0 - 13
CK-2K	0.3	--	--	--	--	--	--	--	--	--
CK-2L	4.2	--	--	--	--	--	--	--	--	--
CK-4B	8.6	26.7	65.6	12.0	6.7	57.0	0.0	12.0	0 - 20	0 - 13
CK-5A	13.5	--	--	--	--	--	--	--	--	--
CK-5C	3.2	--	--	--	--	--	--	--	--	--
CK-5D	7.7	10.0	1.4	0.0	0.0	0.0	0.0	0.0	0 - 20	0 - 13
CK-6A	11.1	15.0	50.3	6.3	0.0	0.0	0.0	6.3	0 - 20	0 - 13
CK-6B	9.6	35.0	128.7	13.9	0.0	0.0	0.0	13.9	0 - 20	0 - 13
CK-6C	15.2	--	--	--	--	--	--	--	--	--
CK-6E	19.7	13.3	22.6	6.2	0.0	0.0	0.0	6.2	0 - 20	0 - 13
CK-10	15.5	25.0	213.1	2.0	0.0	0.0	0.0	2.0	0 - 20	0 - 13
CK-11	106.4	9.5	81.9	0.0	17.9	76.4	2.2	2.2	0 - 20	0 - 13
<b>Total</b>	<b>240.8</b>									

### Scrubby Flatwoods (931.1 acres)

Longleaf (*Pinus palustris*) and slash pine (*Pinus elliottii*) are the preferred overstory pine species in the region. The FNAI reference site in this region for scrubby flatwoods contains longleaf and slash pine at a basal area (BA) of 10 to 60 square feet per acre with non-pine at a density between 0 and 26 trees per acre (TPA). At Cedar Key Scrub, scrubby flatwoods are managed to enhance habitat conditions for the federally threatened Florida scrub jay (*Aphelocoma coerulescens*). As such, overstory pine BA may not meet the target overstory conditions found at the FNAI reference site for scrubby flatwoods. The following table shows the overstory condition for this natural community at Cedar Key Scrub and target overstory condition for scrubby flatwoods in this region.

**Florida State Parks  
Timber Management Analysis**

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft2/ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft2/ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft2/ac)	FNAI Reference Condition Non-Pine TPA Range
CK-1B	13.2	--	--	--	--	--	--	--	--	--
CK-1C	5.2	10.0	70.0	4.1	0.0	0.0	0.0	4.1	10 - 60	0 - 26
CK-1D	3.6	0.0	0.0	0.0	10.0	58.5	0.0	0.0	10 - 60	0 - 26
CK-2A	20.0	--	--	--	--	--	--	--	--	--
CK-2B	67.1	15.7	21.6	9.5	7.1	48.3	0.0	9.5	10 - 60	0 - 26
CK-2C	10.1	10.0	19.3	4.4	0.0	0.0	0.0	4.4	10 - 60	0 - 26
CK-2D	16.8	26.0	35.2	19.1	0.0	0.0	0.0	19.1	10 - 60	0 - 26
CK-2E	10.3	2.5	2.0	1.3	0.0	0.0	0.0	1.3	10 - 60	0 - 26
CK-2F	8.1	--	--	--	--	--	--	--	--	--
CK-2G	1.5	--	--	--	--	--	--	--	--	--
CK-2H	4.2	0.0	0.0	0.0	40.0	216.1	0.0	0.0	10 - 60	0 - 26
CK-2J	5.8	30.0	19.6	28.6	0.0	0.0	0.0	28.6	10 - 60	0 - 26
CK-2K	12.6	--	--	--	--	--	--	--	--	--
CK-2L	46.9	30.0	34.6	19.4	0.0	0.0	0.0	19.4	10 - 60	0 - 26
CK-2M	64.1	7.8	11.6	5.6	0.0	0.0	0.0	5.6	10 - 60	0 - 26
CK-2N	4.6	--	--	--	--	--	--	--	--	--
CK-3	91.8	30.0	53.8	22.3	10.0	47.7	0.0	22.3	10 - 60	0 - 26
CK-4A	13.0	--	--	--	--	--	--	--	--	--
CK-4B	63.0	7.7	16.9	4.8	1.5	7.6	0.0	4.8	10 - 60	0 - 26
CK-5A	117.8	2.9	3.7	1.8	2.9	27.2	0.0	1.8	10 - 60	0 - 26
CK-5B	9.7	--	--	--	--	--	--	--	--	--
CK-5C	12.8	20.0	7.7	18.5	0.0	0.0	0.0	18.5	10 - 60	0 - 26
CK-5D	64.9	16.2	41.6	9.5	0.0	0.0	0.0	9.5	10 - 60	0 - 26
CK-6A	2.6	--	--	--	--	--	--	--	--	--
CK-6B	5.1	10.0	57.0	4.0	0.0	0.0	0.0	4.0	10 - 60	0 - 26
CK-6C	17.5	15.0	50.3	7.1	0.0	0.0	0.0	7.1	10 - 60	0 - 26
CK-6D	9.3	10.0	5.4	7.1	0.0	0.0	0.0	7.1	10 - 60	0 - 26
CK-6E	13.3	--	--	--	--	--	--	--	--	--
CK-8A	54.2	--	--	--	--	--	--	--	--	--
CK-8Bn	24.9	80.0	260.6	49.5	0.0	0.0	0.0	49.5	10 - 60	0 - 26
CK-8Bs	18.7	71.7	382.7	39.6	0.0	0.0	0.0	39.6	10 - 60	0 - 26
CK-8Cn	46.0	--	--	--	--	--	--	--	--	--
CK-8Cs	28.4	74.3	255.7	46.9	0.0	0.0	0.0	46.9	10 - 60	0 - 26
CK-8D	2.7	110.0	477.2	68.0	0.0	0.0	0.0	68.0	10 - 60	0 - 26
CK-9B*	18.0	--	--	--	--	--	--	--	--	--
CK-10	10.7	16.7	125.1	0.0	0.0	0.0	0.0	0.0	10 - 60	0 - 26

**Florida State Parks  
Timber Management Analysis**

MZ ID	Scrubby Flatwoods (Acres)	Current Average Overstory Conditions							Target Overstory Conditions	
		Pine BA (ft <sup>2</sup> /ac)	Pine TPA	Pine Volume (tons/ac)	Non-Pine BA (ft <sup>2</sup> /ac)	Non-Pine TPA	Non-Pine Volume (tons/ac)	Total Pine and Non-Pine Volume (tons/ac)	FNAI Reference Condition Pine BA Range (ft <sup>2</sup> /ac)	FNAI Reference Condition Non-Pine TPA Range
CK-11	12.6	15.0	181.1	0.0	0.0	0.0	0.0	0.0	10 - 60	0 - 26
<b>Total</b>	<b>931.1</b>									



**Addendum 9 —Land Management Review**





Cedar Key Scrub State Reserve Land Management Review

**FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION**

**MEMORANDUM**

**TO:** Keith Singleton, Program Consultant  
Division of State Lands

**FROM:** Wes Howell, Chief, Bureau of Natural and Cultural Resources  
Division of Recreation and Parks

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Steve Cutshaw, Chief, Office of Park Planning  
Division of Recreation and Parks

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**SUBJECT:** Response to Draft Land Management Review (LMR)  
Cedar Key Scrub State Reserve

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The Land Management Review draft report provided to Division of Recreation and Parks (DRP) determined that management of \_\_\_\_\_ by the DRP 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.

Attached is DRP's Managing Agency Response to the draft LMR report. The responses were prepared via a coordinated effort of the park, district office, and our offices.

Thank you for your attention.

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# 2018 Land Management Review Team Report for Cedar Key Scrub State Reserve

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## Cedar Key Scrub State Reserve Land Management Review

### **1. Introduction**

Section 259.036, F.S. requires a periodic on-site review of conservation and recreation lands titled in the name of the Board of Trustees to determine (1) whether the lands are being managed for the purposes for which they were acquired and (2) whether they are being managed in accordance with their land management plan adopted pursuant to s. 259.032, F.S. In case where the managed areas exceed 1,000 acres in size, such a review must be scheduled at least every five years. In conducting this review, a statutorily constructed review team “shall evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan.”

The land management review teams are coordinated by the Division of State Lands and consist of representatives from the Division of Recreation and Parks (DEP), the Florida Forest Service (DACS), the Fish and Wildlife Conservation Commission, the local government in which the property is located, the DEP District in which the parcel is located, the local soil and water conservation district or jurisdictional water management district, a conservation organization member, and a local private land manager.

Each Land Management Review Report is divided into three sections. Section 1 provides the details of the property being reviewed as well as the overall results of the report. Section 2 provides details of the Field Review, in which the Review Team inspects the results of management actions on the site. Section 3 provides details of the Land Management Plan Review, in which the team determines the extent to which the Management Plan provides for and documents adequate natural and recreational resource protection.

Finally, each report may also contain an Appendix that lists individual team member comments. This is a compilation of feedback, concerns or other thoughts raised by individual team members, but not necessarily indicative of the final consensus reached by the Land Management Review Team.

# Cedar Key Scrub State Reserve Land Management Review

## 1.1. Property Reviewed in this Report

**Name of Site:** Cedar Key Scrub State Reserve

**Managed by:** Florida Department of Environmental Protection – Division of Recreation and Parks

**Acres:** 6,734.81

**County:** Levy

**Purpose(s) for Acquisition:** to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

**Acquisition Program(s):** EEL

**Original Acquisition Date:** 12/27/78

**Area Reviewed:** Entire Property

**Last Management Plan Approval Date:** 2/11/05

**Review Date:** 6/8/18

### Agency Manager and Key Staff Present:

- Tommy Pavao, Reserve Manager

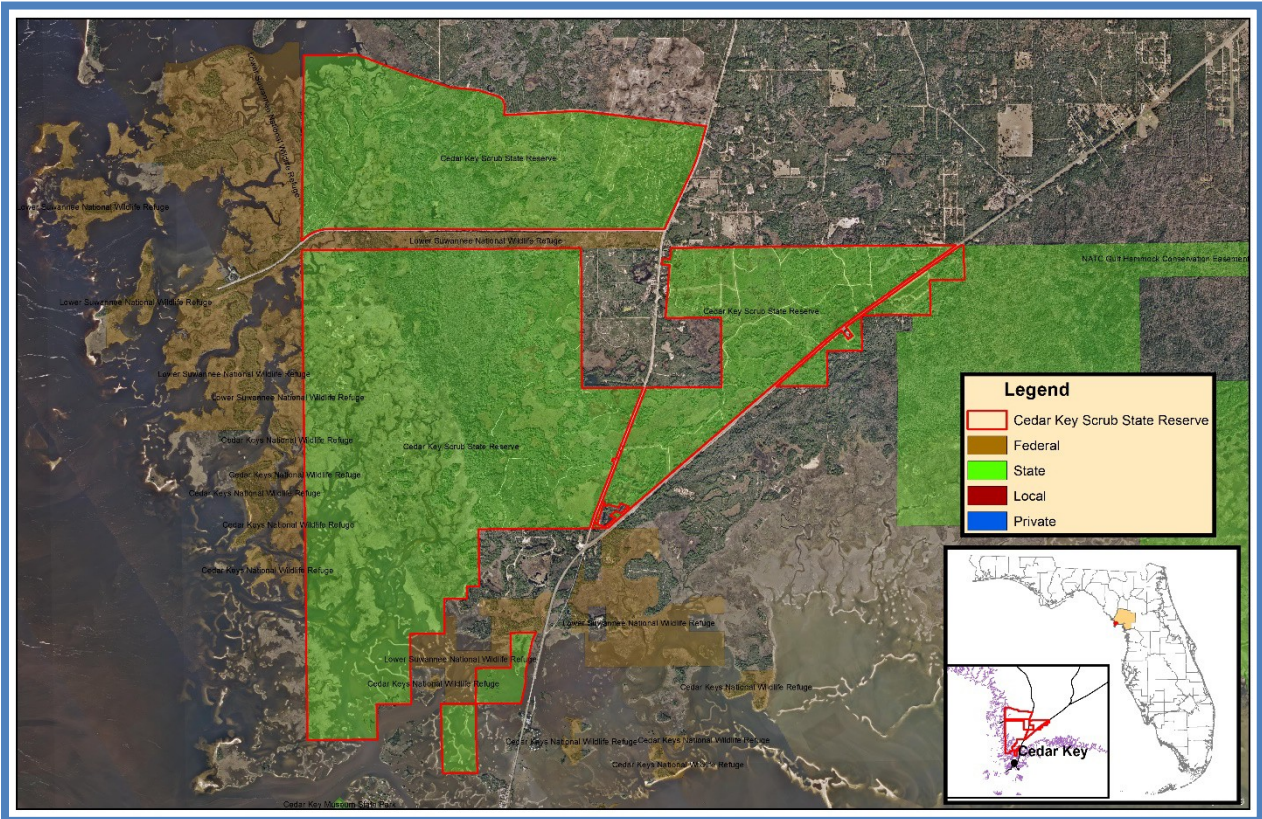
### Review Team Members Present (voting)

- Jason Neumann, DEP District
- Carl Salafrio, Private Land Manager
- Dan Pearson, DRP District
- William Irby, WMD
- Michael Edwards, FFS
- Scotland Talley, FWC
- Athena Philips, Conservation Org.
- Local Gov't., None

### Other Non-Team Members Present (attending)

- James Parker, DEP/DSL
- Keith Singleton, FDEP/DSL

## 1.2 Property Map



# Cedar Key Scrub State Reserve Land Management Review

## 1.3. Overview of Land Management Review Results

*Is the property managed for purposes that are compatible with conservation, preservation, or recreation?*

*Yes = 7, No = 0*

*Are the management practices, including public access, in compliance with the management plan?*

*Yes = 7, No = 0*

Table 1 shows the average scores received for each applicable category of review. *Field Review* scores refer to the adequacy of management actions in the field, while *Management Plan Review* scores refer to adequacy of discussion of these topics in the management plan. Scores range from 1 to 5 with 5 signifying excellence. For a more detailed key to the scores, please see *Appendix A*.

Table 1: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	4.28	3.60
Prescribed Fire / Habitat Restoration	4.17	4.15
Hydrology	3.83	3.38
Imperiled Species	3.97	3.82
Exotic / Invasive Species	3.91	3.37
Cultural Resources	3.93	3.50
Public Access / Education / Law Enforcement	3.69	3.40
Infrastructure / Equipment / Staffing	2.93	N/A

Color Code (See Appendix A for detail)

Excellent	Above Average	Below Average	Poor
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### 1.3.1 Consensus Commendations for the Managing Agency

The following commendations resulted from discussion and vote of the review team members:

1. The team commends the Florida Park Service (FPS) for excellent cooperation with partner agencies to achieve resource management goals and provide hunting and other recreation opportunities. (7+, 0-)
2. The team commends the FPS for excellent work on scrub restoration. Park manager is particularly good at coordinating his efforts with other State and Federal agencies, and adjacent large holdings and land owners. (7+, 0-)
3. The team commends the FPS for their work at improving fire implementation and removal of invasive hogs. (7+, 0-)

### 1.3.2. Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The next management plan update should include information about how these recommendations have been addressed:

1. The team recommends the FPS aggressively pursue increased funding and staff to address backlog in resource management needs and to provide for more proactive management. (7+, 0-)

***Managing Agency Response: Agree. 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. The updated unit management plan will address land management funding needs. Funding is determined annually by the Florida Legislature and funds are allocated to the 175 state parks and trails according to priority needs.***

# Cedar Key Scrub State Reserve Land Management Review

## 2. Field Review Details

### 2.1 Field Review Checklist Findings

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

1. **Natural communities, specifically scrub, scrubby flatwoods, basin marsh, basin swamp, depression marsh, hydric hammock, estuarine composite substrate, and tidal marsh.**
2. **Listed species: Protection & Preservation, specifically gopher tortoise and Florida salt marsh vole.**
3. **Natural resources survey/monitoring, specifically listed species or their habitat monitoring, other non-game species or their habitat monitoring, fire effects monitoring, and invasive species survey/monitoring.**
4. **Cultural resources, specifically cultural resource survey.**
5. **Resource management (prescribed fire), specifically quality.**
6. **Restoration, specifically scrub restoration.**
7. **Forest management, specifically timber inventory/assessment.**
8. **Non-native, invasive, and problem species, specifically control and prevention of plants and animals.**
9. **Hydrologic/geologic function Hydro alteration, specifically roads/low water crossings.**
10. **Adjacent property concerns, specifically inholdings/additions.**
11. **Public access and education, specifically boat access.**
12. **Environmental education and outreach, specifically wildlife, invasive species, habitat management activities, recreational opportunities, and management of visitor impacts.**
13. **Management Resources, specifically waste disposal and sanitary facilities.**

### 2.2. Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 3.0 score on average). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. **The management plan update should include information on how these items have been addressed:**

1. *Non-native, Invasive and Problem species, specifically control of pest/pathogens received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether control efforts are adequate.*

*Managing Agency Response: Agree. Cedar Key Scrub does not currently have an Arthropod Control Plan because the local Mosquito Control District has not requested one be developed. Staff will continue to monitor the progress of laurel wilt disease.*

2. *Resource Protection, specifically law enforcement presence received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether resources are sufficient to protect the property.*

*Managing Agency Response: Agree. Park staff will continue to request assistance from Florida Fish and Wildlife Conservation Commission's (FWC) law enforcement and local law enforcement as needed.*

## Cedar Key Scrub State Reserve Land Management Review

3. *Management Resources, specifically buildings, staff, and funding received below average scores. The review team is asked to evaluate, based on information provided by the managing agency, whether management resources are sufficient.*

*Managing Agency Response: Agree. 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 and funds are allocated to the 175 state parks and trails according to priority needs.*

### 2.3. Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
<b>Natural Communities ( I.A )</b>										
Mesic Flatwoods	I.A.1	3	4	4	3	4	3	4		3.57
Sandhill	I.A.2	4	5	5	3	3	3	4		3.86
Scrub	I.A.3	4	5	5	4	3	3	4		4.00
Scrubby Flatwoods	I.A.4	4	4	4	5	4	4	4		4.14
Basin Marsh	I.A.5	5	5	5	4	4	4	4		4.43
Basin Swamp	I.A.6	5	5	5	4	5	5	5		4.86
Depression Marsh	I.A.7	5	5	5	5	5	4	5		4.86
Hydric Hammock	I.A.8	4	4	5	4	4	5	5		4.43
Estuarine Composite Substrate	I.A.9	5	5	5	5	5	5	5		5.00
Estuarine Tidal Marsh	I.A.10	5	5	5	5	5	5	5		5.00
<b>Natural Communities Average Score</b>										4.41
<b>Listed species:Protection &amp; Preservation ( I.B )</b>										
Animals	I.B.1	4	4	x	4	4	3	4		3.83
Scrub jay	I.B.1.a	3	5	4	4	4	3	4		3.86
Gopher tortoise	I.B.1.b	4	4	5	5	4	3	4		4.14
Florida Salt Marsh Vole	I.B.1.c	4	4	5	5	4	3	4		4.14
Plants	I.B.2	4	4	4	5	3	3	4		3.86
<b>Listed Species Average Score</b>										3.97
<b>Natural Resources Survey/Management Resources (I.C)</b>										
Listed species or their habitat monitoring	I.C.2	3	5	4	4	5	4	4		4.14
Other non-game species or their habitat monitoring	I.C.3	3	4	5	5	5	3	4		4.14
Fire effects monitoring	I.C.4	4	4	5	4	3	4	4		4.00
Other habitat management effects monitoring	I.C.5	4	4	4	4	4	3	4		3.86
Invasive species survey / monitoring	I.C.6	3	5	5	4	4	4	4		4.14
<b>Cultural Resources (Archeological &amp; Historic sites) (II.A, II.B )</b>										
Cultural Res. Survey	II.A	3	5	4	4	4	4	4		4.00

## Cedar Key Scrub State Reserve Land Management Review

Protection and preservation	II.B	3	4	4	4	4	4	4		3.86
<b>Cultural Resources Average Score</b>										3.93
<b>Resource Management, Prescribed Fire (III.A)</b>										
Area Being Burned (no. acres)	III.A.1	5	4	4	4	2	3	3		3.57
Frequency	III.A.2	5	4	5	4	3	3	3		3.86
Quality	III.A.3	5	4	5	5	4	3	4		4.29
<b>Resource Management, Prescribed Fire Average Score</b>										3.90
<b>Restoration (III.B)</b>										
Scrub	III.B.1	4	5	5	5	4	4	4		4.43
<b>Restoration Average Score</b>										4.43
<b>Forest Management (III.C)</b>										
Timber Inventory	III.C.1	4	5	4	4	5	4	3		4.14
<b>Forest Management Average Score</b>										4.14
<b>Non-Native, Invasive &amp; Problem Species (III.D)</b>										
<b>Prevention</b>										
prevention - plants	III.D.1.a	5	5	5	4	4	4	4		4.43
prevention - animals	III.D.1.b	4	4	5	4	3	4	4		4.00
prevention - pests/pathogens	III.D.1.c	4		5	4	1	4			3.60
<b>Control</b>										
control - plants	III.D.2.a	4	5	5	4	4	4	4		4.29
control - animals	III.D.2.b	5	5	5	4	3	4	4		4.29
control - pest/pathogens	III.D.2.c	3	4	3	2	1	4	x		2.83
<b>Non-Native, Invasive &amp; Problem Species Average Score</b>										3.91
<b>Hydrologic/Geologic function Hydro-Alteration (III.E.1)</b>										
Roads/Low water crossings	III.E.1.a	4	4	5	4	4	4	5		4.29
Ditches	III.E.1.b	3	4	3	4	4	4	4		3.71
<b>Hydrologic/Geologic function, Hydro-Alteration Average Score</b>										4.00
<b>Ground Water Monitoring (III.E.2)</b>										
Ground water quality	III.E.2.a	4	4	4	4	4	4	3		3.86
Ground water quantity	III.E.2.b	4	4	3	4	4	4	3		3.71
<b>Ground Water Monitoring Average Score</b>										3.79
<b>Surface Water Monitoring (III.E.3)</b>										
Surface water quality	III.E.3.a	4	4	4	4	4	3	3		3.71
Surface water quantity	III.F.3.b	4	4	4	4	4	3	3		3.71
<b>Surface Water Monitoring Average Score</b>										3.71
<b>Resource Protection (III.F)</b>										
Boundary survey	III.F.1	4	4	4	4	4	4	3		3.86
Gates & fencing	III.F.2	3	4	4	3	4	4	3		3.57
Signage	III.F.3	4	4	4	3	4	4	3		3.71
Law enforcement presence	III.F.4	3	3	2	1	1	4	3		2.43



## Cedar Key Scrub State Reserve Land Management Review

Resource Protection Average Score										3.39
<b>Adjacent Property Concerns (III.G)</b>										
<b>Land Use</b>										
Expanding development	III.G.1.a	3	4	4	4	4	4	4		3.86
Inholdings/additions	III.G.2	4	4	4	4	4	4	4		4.00
<b>Public Access &amp; Education (IV.1, IV.2, IV.3, IV.4, IV.5)</b>										
<b>Public Access</b>										
Roads	IV.1.a	3	5	4	4	4	4	3		3.86
Parking	IV.1.b	3	4	4	4	4	4	3		3.71
Boat Access	IV.1.c	4	4	4	4	4	4	4		4.00
<b>Environmental Education &amp; Outreach</b>										
Wildlife	IV.2.a	3	4	4	4	4	5	4		4.00
Invasive Species	IV.2.b	3	4	4	4	4	5	4		4.00
Habitat Management Activities	IV.2.c	3	4	4	4	4	5	4		4.00
Interpretive facilities and signs	IV.3	3	4	4	4	4	5	3		3.86
Recreational Opportunities	IV.4	4	4	4	3	5	5	4		4.14
Management of Visitor Impacts	IV.5	4	4	4	4	5	5	4		4.29
<b>Public Access &amp; Education Average Score</b>										3.98
<b>Management Resources (V.1, V.2, V.3, V.4)</b>										
<b>Maintenance</b>										
Waste disposal	V.1.a	4	3	4	4	5	5	4		4.14
Sanitary facilities	V.1.b	3	3	4	4	5	5	4		4.00
<b>Infrastructure</b>										
Buildings	V.2.a	2	3	3	2	1	2	3		2.29
Equipment	V.2.b	3	4	3	4	5	4	3		3.71
Staff	V.3	2	2	2	2	1	1	2		1.71
Funding	V.4	2	3	1	2	1	1	2		1.71
<b>Management Resources Average Score</b>										2.93

Color Code:

Excellent	Above Average	Below Average	Poor
	Missing Vote	Insufficient Information	

See Appendix A for detail

### 3. Land Management Plan Review Details

#### 3.1 Items Requiring Improvements in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than 3.0 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The next management plan update should address the checklist items identified below:

## Cedar Key Scrub State Reserve Land Management Review

1. *Non-native, Invasive and Problem Species, specifically control of pest/pathogens, received a below average score. This is an indication the management plan does not sufficiently address control of pest/pathogens.*

*Managing Agency Response: Agree. The management plan does not currently have an Arthropod Control Plan because the local Mosquito Control District has not requested one be developed. The revised management plan will include information on laurel wilt disease and other pests and pathogens.*

2. *Adjacent Property Concerns, specifically discussion of potential surplus land determination, received a below average score. This is an indication the management plan does not sufficiently address surplus lands determination.*

*Managing Agency Response: Agree. The Division will address the determination of surplus lands in the update of the management plan.*

### 3.2 Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
<b>Natural Communities ( I.A )</b>										
Mesic Flatwoods	I.A.1	4	4	3	4	3	3	4		3.57
Sandhill	I.A.2	4	4	4	4	3	3	4		3.71
Scrub	I.A.3	4	4	5	5	4	3	4		4.14
Scrubby Flatwoods	I.A.4	4	4	5	4	4	3	4		4.00
Basin Marsh	I.A.5	4	4	5	4	3	3	4		3.86
Basin Swamp	I.A.6	4	4	5	4	3	3	4		3.86
Depression Marsh	I.A.7	4	4	5	5	3	3	4		4.00
Hydric Hammock	I.A.8	4	4	5	5	3	3	4		4.00
Estuarine Composite Substrate	I.A.9	4	4	5	5	3	3	4		4.00
Estuarine Tidal Marsh	I.A.10	4	4	5	5	3	3	4		4.00
<b>Natural Communities Average Score</b>										3.91
<b>Listed species: Protection &amp; Preservation ( I.B )</b>										
Animals	I.B.1	4	4	X	4	3	3	4		3.67
Scrub jay	I.B.1.a	3	5	5	4	3	3	4		3.86
Gopher tortoise	I.B.1.b	4	4	5	4	3	3	4		3.86
Florida Salt Marsh Vole	I.B.1.c	4	4	4	5	3	3	4		3.86
Plants	I.B.2	4	4	4	5	3	3	4		3.86
<b>Listed Species Average Score</b>										3.82
<b>Natural Resources Survey/Management Resources (I.C)</b>										
Listed species or their habitat monitoring	I.C.2	3	4	4	4	3	3	4		3.57
Other non-game species or their habitat monitoring	I.C.3	3	4	4	4	3	3	4		3.57

## Cedar Key Scrub State Reserve Land Management Review

Fire effects monitoring	I.C.4	4	3	4	4	3	3	4		3.57
Other habitat management effects monitoring	I.C.5	4	4	4	4	3	3	4		3.71
Invasive species survey / monitoring	I.C.6	3	4	5	4	3	3	4		3.71
<b>Cultural Resources (Archeological &amp; Historic sites) (II.A,II.B )</b>										
Cultural Res. Survey	II.A	3	4	4	4	3	3	4		3.57
Protection and preservation	II.B	3	4	3	4	3	3	4		3.43
<b>Cultural Resources Average Score</b>										3.50
<b>Resource Management, Prescribed Fire (III.A)</b>										
Area Being Burned (no. acres)	III.A.1	5	5	5	5	3	3	4		4.29
Frequency	III.A.2	5	5	4	4	3	3	4		4.00
Quality	III.A.3	5	5	X	5	3	3	4		4.17
<b>Resource Management, Prescribed Fire Average Score</b>										4.15
<b>Restoration (III.B)</b>										
Scrub	III.B.1	4	5	4	5	4	3	4		4.14
<b>Restoration Average Score</b>										4.14
<b>Forest Management (III.C)</b>										
Timber Inventory	III.C.1	4	4	4	4	1	3	3		3.29
<b>Forest Management Average Score</b>										3.29
<b>Non-Native, Invasive &amp; Problem Species (III.D)</b>										
<b>Prevention</b>										
prevention - plants	III.E.1.a	5	4	4	4	3	3	4		3.86
prevention - animals	III.E.1.b	5	4	4	4	3	3	4		3.86
prevention - pests/pathogens	III.E.1.c	4	2	x	4	3	3			3.20
<b>Control</b>										
control - plants	III.E.2.a	4	4	4	4	3	3	4		3.71
control - animals	III.E.2.b	5	4	4	4	3	3	4		3.86
control - pest/pathogens	III.E.2.c	2	2	1	2	3	1	1		1.71
<b>Non-Native, Invasive &amp; Problem Species Average Score</b>										3.37
<b>Hydrologic/Geologic function, Hydro-Alteration (III.E.1)</b>										
Roads/Low water crossings	III.F.1.a	4	4	3	4	4	1	3		3.29
Ditches	III.F.1.b	4	4	3	4	4	1	3		3.29
<b>Hydrologic/Geologic function, Hydro-Alteration Average Score</b>										3.29
<b>Ground Water Monitoring (III.E.2)</b>										
Ground water quality	III.F.2.a	4	4	3	4	3	3	3		3.43
Ground water quantity	III.F.2.b	4	4	3	4	3	3	3		3.43
<b>Ground Water Monitoring Average Score</b>										3.43
<b>Surface Water Monitoring (III.E.3)</b>										
Surface water quality	III.F.3.a	4	4	3	4	3	3	3		3.43
Surface water quantity	III.F.3.b	4	4	3	4	3	3	3		3.43
<b>Surface Water Monitoring Average Score</b>										3.43

## Cedar Key Scrub State Reserve Land Management Review

<b>Resource Protection (III.F)</b>										
Boundary survey	III.G.1	4	4	3	4	3	3	3		3.43
Gates & fencing	III.G.2	3	4	3	4	3	3	3		3.29
Signage	III.G.3	4	4	3	4	3	3	3		3.43
Law enforcement presence	III.G.4	3	4	3	4	3	3	3		3.29
<b>Resource Protection Average Score</b>										<b>3.36</b>
<b>Adjacent Property Concerns (III.G)</b>										
<b>Land Use</b>										
Expanding development	III.H.1.a	3	5	3	4	4	3	3		3.57
Inholdings/additions	III.H.2	4	4	3	4	4	1	3		3.29
Discussion of Potential Surplus Land Determination	III.H.3	3	3	3	3	1	1	2		2.29
Surplus Lands Identified?	III.H.4	4	5	4	4	5	1	4		3.86
<b>Public Access &amp; Education (IV.1, IV.2, IV.3, IV.4, IV.5)</b>										
<b>Public Access</b>										
Roads	IV.1.a	3	5	3	4	4	3	3		3.57
Parking	IV.1.b	3	5	3	4	4	3	3		3.57
Boat Access	IV.1.c	4	5	3	4	3	3	4		3.71
<b>Environmental Education &amp; Outreach</b>										
Wildlife	IV.2.a	3	4	3	4	3	3	3		3.29
Invasive Species	IV.2.b	3	4	3	4	3	3	3		3.29
Habitat Management Activities	IV.2.c	3	4	3	4	3	3	4		3.43
Interpretive facilities and signs	IV.3	3	4	3	4	3	3	3		3.29
Recreational Opportunities	IV.4	4	4	3	4	3	3	3		3.43
Management of Visitor Impacts	IV.5	4	4	3	4	3	3	3		3.43
<b>Public Access &amp; Education Average Score</b>										<b>3.44</b>
<b>Managed Area Uses (VI.A, VI.B)</b>										
<b>Existing Uses</b>										
Multi-use Trails	VI.A.1	5	5	5	4	5	5	4		4.71
Canoeing/Kayaking	VI.A.2	5	5	5	4	5	5	4		4.71
Hunting	VI.A.3	5	5	5	4	5	5	4		4.71
fishing	VI.A.4	5	5	5	4	5	5	4		4.71
Picnicking	VI.A.5	4	5	5	4	5	5	4		4.57
Wildlife Viewing	VI.A.6	5	5	4	4		5	4		4.50
<b>Proposed Uses</b>										

Color Code:

Excellent

Above  
Average

Below  
Average

Poor

Missing  
Vote

Insufficient  
Information

See  
Appendix A  
for detail

## **Cedar Key Scrub State Reserve Land Management Review**

### **Appendix A: Scoring System Detail**

#### **Explanation of Consensus Commendations:**

Often, the exceptional condition of some of the property's attributes impress review team members. In those instances, team members are encouraged to offer positive feedback to the managing agency in the form of a commendation. The teams develop commendations generally by standard consensus processes or by majority vote if they cannot obtain a true consensus.

#### **Explanation of Consensus Recommendations:**

Subsection 259.036(2), F.S., specifically states that the managing entity shall consider the findings and recommendations of the land management review. We ask team members to provide general recommendations for improving the management or public access and use of the property. The teams discuss these recommendations and develop consensus recommendations as described above. We provide these recommendations to the managing agency to consider when finalizing the required ten-year management plan update. We encourage the manager to respond directly to these recommendations and include their responses in the final report when received in a timely manner.

#### **Explanation of Field Review Checklist and Scores, and Management Plan Review Checklist and Scores:**

We provide team members with a checklist to fill out during the evaluation workshop phase of the Land Management Review. The checklist is the uniform tool used to evaluate both the management actions and condition of the managed area, and the sufficiency of the management plan elements. During the evaluation workshop, team members individually provide scores on each issue on the checklist, from their individual perspective. Team members also base their evaluations on information provided by the managing agency staff as well as other team member discussions. Staff averages these scores to evaluate the overall conditions on the ground, and how the management plan addresses the issues. Team members must score each management issue 1 to 5: 1 being the management practices are clearly insufficient, and 5 being that the management practices are excellent. Members may choose to abstain if they have inadequate expertise or information to make a cardinal numeric choice, as indicated by an "X" on the checklist scores, or they may not provide a vote for other unknown reasons, as indicated by a blank. If a majority of members failed to vote on any issue, that issue is determined to be irrelevant to management of that property or it was inadequately reviewed by the team to make an intelligent choice. In either case staff eliminated the issue from the report to the manager.

#### **Average scores are interpreted as follows:**

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*



**Addendum 10—Local Government Comprehensive Plan Compliance**





**From:** [Baxley, Demi](#)  
**To:** [Shenley Neely](#)  
**Cc:** [Wilbur Dean](#); [Allbritton, Joel](#)  
**Subject:** RE: Request to Review Florida State Park Unit Management Plan for Compliance w/Local Comprehensive Plans  
**Date:** Thursday, February 21, 2019 8:29:55 AM  
**Attachments:** [image001.png](#)

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Good Morning Ms. Shenley

Thank you very much for taking the time to review Cedar Key Scrub State Reserve's and Waccasessa Bay Preserve State Park's management plans. I have forwarded your responses to Joel Allbritton, the Planner assigned to handle the management planning for the two parks. Mr. Allbritton may be reaching out to you in the next few business days with possible questions or follow up to the information you provided. For communication purposes, Mr. Allbritton can be reached by email at [joel.allbritton@floridadep.gov](mailto:joel.allbritton@floridadep.gov) or by phone at 850.245.3051.

I'm sure we will be in touch again with another request at some point in the future. We greatly appreciate the assistance and look forward to working with you again.

Have a great rest of the day!



**Demi P. Baxley**

Florida Department of Environmental Protection  
Division of Recreation and Parks/Office of Park Planning  
Government Operations Consultant and  
Park Planning Administrative Assistant  
[Demi.Baxley@floridadep.gov](mailto:Demi.Baxley@floridadep.gov)  
Office: 850.245.3051  
Direct: 850.245.3052

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**From:** Shenley Neely <[neely-shenley@levycounty.org](mailto:neely-shenley@levycounty.org)>  
**Sent:** Wednesday, February 20, 2019 2:30 PM  
**To:** Baxley, Demi <[Demi.Baxley@dep.state.fl.us](mailto:Demi.Baxley@dep.state.fl.us)>  
**Cc:** Wilbur Dean <[dean-wilbur@levycounty.org](mailto:dean-wilbur@levycounty.org)>  
**Subject:** RE: Request to Review Florida State Park Unit Management Plan for Compliance w/Local Comprehensive Plans

Good Afternoon, Demi-

As requested, staff review of the Waccasassa Bay Preserve State Park, as well as the Cedar Key Scrub State Reserve Plan, both appear to be in compliance with the Levy County Comprehensive Plan. If you need additional information or have questions, please do not hesitate to give us a call. Thank you for the opportunity to review and comment on these two management plans.

Sincerely,  
Shenley

Shenley Neely  
Planning Director  
Levy County Planning Department  
352-486-5405

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**From:** Baxley, Demi <[Demi.Baxley@dep.state.fl.us](mailto:Demi.Baxley@dep.state.fl.us)>  
**Sent:** Monday, February 04, 2019 3:32 PM  
**To:** Shenley Neely <[neely-shenley@levycounty.org](mailto:neely-shenley@levycounty.org)>  
**Cc:** Allbritton, Joel <[Joel.Allbritton@dep.state.fl.us](mailto:Joel.Allbritton@dep.state.fl.us)>  
**Subject:** Request to Review Florida State Park Unit Management Plan for Compliance w/Local Comprehensive Plans

Good Afternoon Ms. Neely,

The Florida Department of Environmental Protection, Division of Recreation and Parks, Office of Park Planning had the pleasure of working with you last year regarding a review of the Manatee Springs State Park Draft Unit Management Plan. We are now asking for a review of two more plans; **Waccasassa Bay Preserve State Park** and **Cedar Key Scrub State Reserve**. As a reminder, we are responsible for the unit management planning of all Florida State Parks. As part of this planning process, prior to the unit management plan being presented to its Acquisition and Restoration Council for consideration, the Office of Park Planning is now required to connect and communicate with the area's agency that is responsible for the local comprehensive plan to determine if the park unit management plan is in compliance with the comprehensive plan. Specifically, we want to make sure we are accurately citing the future land use and zoning designations for the park and would like to confirm that our proposed developments in the conceptual land use section comply with those designations. The existing facilities section will also need to be reviewed. Please note that the Cedar Key Plan is being sent to you in a separate email; files were too large to send together.

Joel Allbritton, who is copied with this communication, is our point of contact regarding management of the parks. If you have any questions or concerns regarding the management plan, please direct them to Mr. Allbritton at [Joel.Allbritton@floridadep.gov](mailto:Joel.Allbritton@floridadep.gov) or 850.245.3051. Of course, as Mr. Maldonado's assistant, I am also available to you if you need any other information or have any questions.

Have a great day!



**Demi P. Baxley**

Florida Department of Environmental Protection  
Division of Recreation and Parks/Office of Park Planning  
Government Operations Consultant and  
Park Planning Administrative Assistant  
[Demi.Baxley@floridadep.gov](mailto:Demi.Baxley@floridadep.gov)  
Office: 850.245.3051