

Indian River Lagoon Preserve State Park

APPROVED
Unit Management Plan

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks
April 29, 2015





**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**

MARJORY STONEMAN DOUGLAS BUILDING
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SECRETARY

April 29, 2015

Ms. Sine Murray
Division of Recreation and Parks
Department of Environmental Protection
3900 Commonwealth Boulevard, MS 525
Tallahassee, Florida 32399-3000

RE: Indian River Lagoon Preserve State Park - Lease #4305 and #4336

Dear Ms. Murray:

The Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the Indian River Lagoon Preserve State Park management plan. The next management plan update is due April 29, 2025.

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

Sincerely,

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



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INTRODUCTION

Indian River Lagoon Preserve State Park is located in Brevard County approximately 12 miles south-southeast of the City of Melbourne (see Vicinity Map). Access to the park is from State Road A1A via Old Florida Trail (see Reference Map). The Vicinity Map also reflects significant land and water resources existing near the park.

On September 29, 2000, the Board of Trustees of the Internal Improvement Fund (Trustees) obtained title to a 187-acre property, commonly known as the "Mullet Creek Parcel," that constituted the initial area of Indian River Lagoon Preserve State Park. The property was purchased through the Indian River Lagoon Blueways Conservation and Recreation Lands project. On June 1, 2001, the Trustees co-purchased a 256-acre property, known as the "Inlet Grove Property," with the St. Johns River Water Management District (SJRWMD) to be managed as part of the park. On September 28, 2005, the State of Florida Department of Environmental Protection's Division of Recreation and Parks (DRP) leased a 100-acre property, known as the "Church Property," from SJRWMD to be managed as part of the park. Currently, the park comprises 544.08 acres.

The Trustees and the SJRWMD hold fee simple title interest in Indian River Lagoon State Park. On March 16, 2001, the Trustees leased the Mullet Creek Parcel to the State of Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas (CAMA), under a fifty (50) year lease, Lease No. 4305. On October 15, 2001, CAMA entered into a management agreement with the Trustees and the SJRWMD to manage the Inlet Grove Property as part the Mullet Creek Parcel under a 50 (fifty)-year lease, Lease No. 4336. The two leases expire on March 15, 2051, and October 14, 2051, respectively. The combined property was then known as Indian River Lagoon State Buffer Preserve. The name changed to Indian River Lagoon Preserve State Park after CAMA assigned its leasehold interest in the two Leases (Lease No. 4305 and Lease No. 4336) to DRP on December 22, 2003. The DRP leased the Church Property from SJRWMD on September 28, 2005; this lease will expire October 14, 2051.

Indian River Lagoon Preserve State Park 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

The purpose of Indian River Lagoon Preserve State Park is to (1) provide a buffer for existing and future land uses such as development and agriculture near the Indian River Lagoon; (2) conserve, protect, restore and manage important ecosystems in order to enhance and protect the significant surface water, recreational, fish and wildlife resources of the Indian River Lagoon; and (3) help preserve and improve the aquatic natural communities of the Indian River Lagoon.

Park Significance

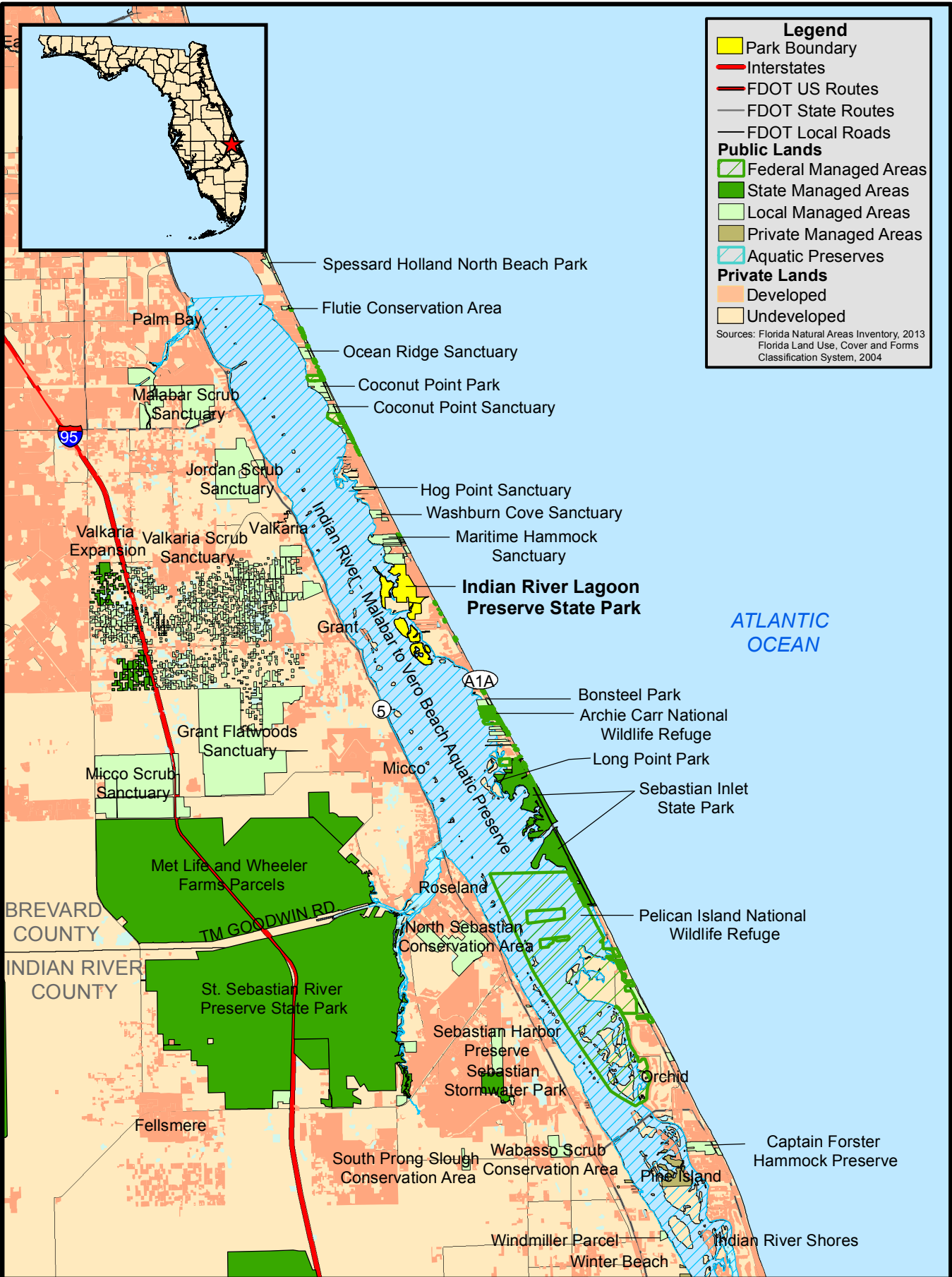
- The park helps to protect the Indian River Lagoon, one of the country's most productive, diverse and commercially and recreationally important estuaries.
- The park has a long history of vegetable and fruit production dating back to the mid 1800s. It was the site of one of the last barrier island citrus groves, representing the by-gone era of the Indian River Citrus production in Brevard County.
- The park protects critical habitat for migratory songbirds, wading birds, shorebirds, oceanic and estuarine fishes, sea turtles and Florida manatees.
- Indian River Lagoon Preserve State Park is one of the largest tracts of undeveloped public conservation land along the Indian River Lagoon between Vero Beach and Melbourne providing more than 500 acres for outdoor recreational opportunities in this highly urbanized area of Florida.

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

Purpose and Scope of the Plan

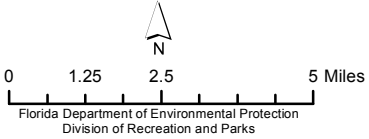
This plan serves as the basic statement of policy and direction for the management of Indian River Lagoon Preserve State Park as a unit of Florida's state park system. It identifies the goals, objectives, actions and criteria or standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives and provide balanced public utilization. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace CAMA's 2004 approved plan.

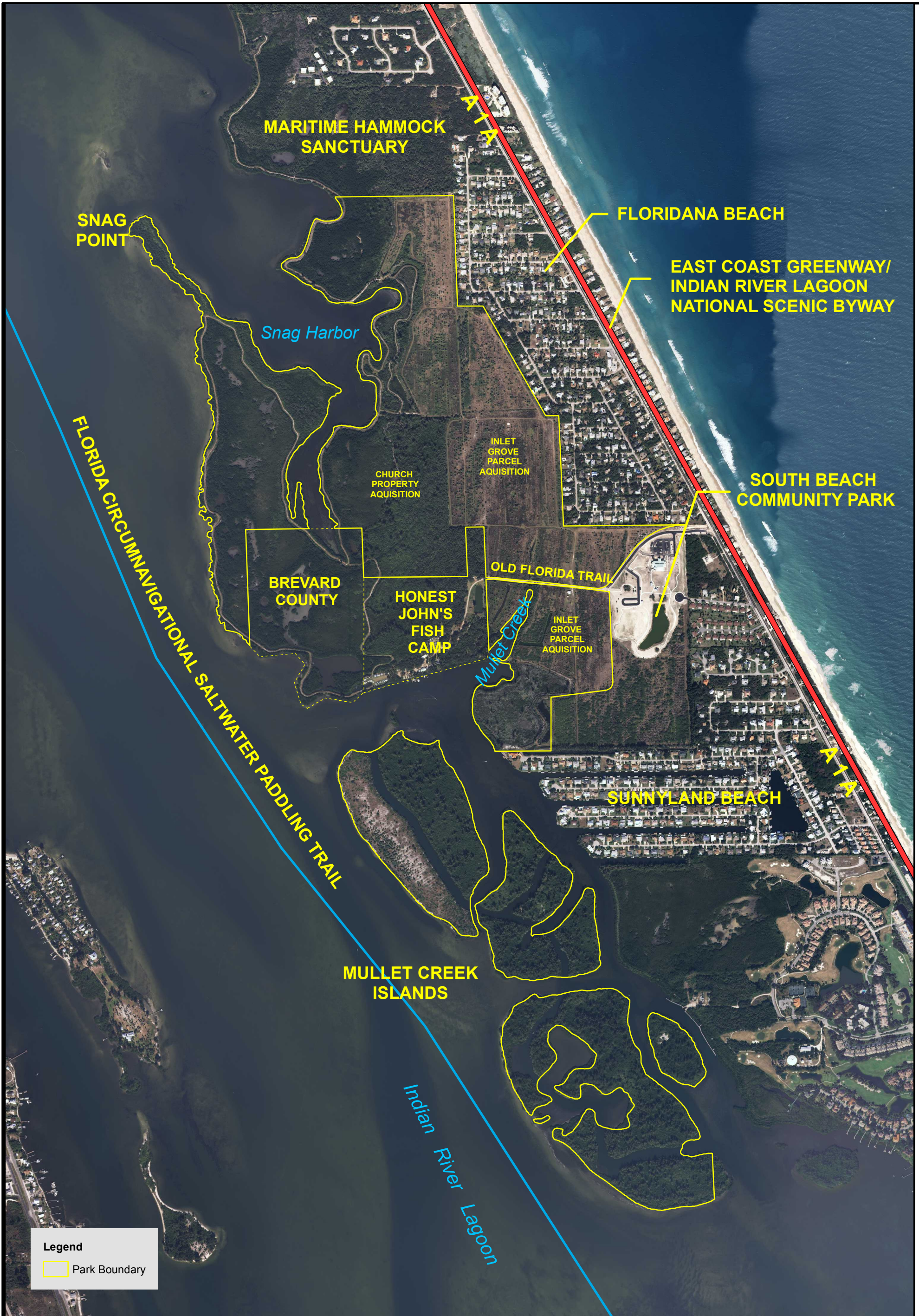
The plan consists of three interrelated components: the Resource Management Component, the Land Use Component and the Implementation Component. The Resource Management Component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management needs and 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.



INDIAN RIVER LAGOON PRESERVE STATE PARK

VICINITY MAP





Legend

□ Park Boundary

INDIAN RIVER LAGOON PRESERVE
STATE PARK



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

REFERENCE MAP

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

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

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

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

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

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 Visitor Service Provider (VSP) may provide services to park visitors in order to enhance the visitor experience. For example, a VSP could be authorized to sell merchandise and food and to rent recreational equipment for use in the park. A VSP 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 VSPs, 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 park is managed cooperatively with the St. Johns River Water Management District (SJRWMD). 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 (formerly Office of Coastal and Aquatic Managed Areas) 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 August 5 and 6, 2014, respectively. Meeting notices were published in the Florida Administrative Register, July 28, 2014, [VOL 40/145], 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

Indian River Lagoon Preserve State Park is not within an Area of Critical State Concern as defined in Section 380.05, Florida Statutes, and it is not presently under study for such designation.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. Surface waters in this park are also classified as Class III waters by the Department. This park is within or adjacent to the Indian River-Malabar to Vero Beach 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 DEP's overall mission in ecosystem management. Cited references are contained in Addendum 3.

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

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

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

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

Table 1: Indian River Preserve State Park Management Zones		
Management Zone	Acreage	Managed with Prescribed Fire
IR-01	47.4	N
IR-02	35.8	N
IR-03	21.4	N
IR-04	41.5	N
IR-05	63.5	N
IR-06	83.6	N
IR-07	16.5	N
IR-08	12.0	N
IR-09	12.2	N
IR-10	22.2	N
IR-11	20.5	N
IR-12	60.6	N
IR-13	41.4	N
IR-14	76.6	N
IR-15	8.9	N

Resource Description and Assessment

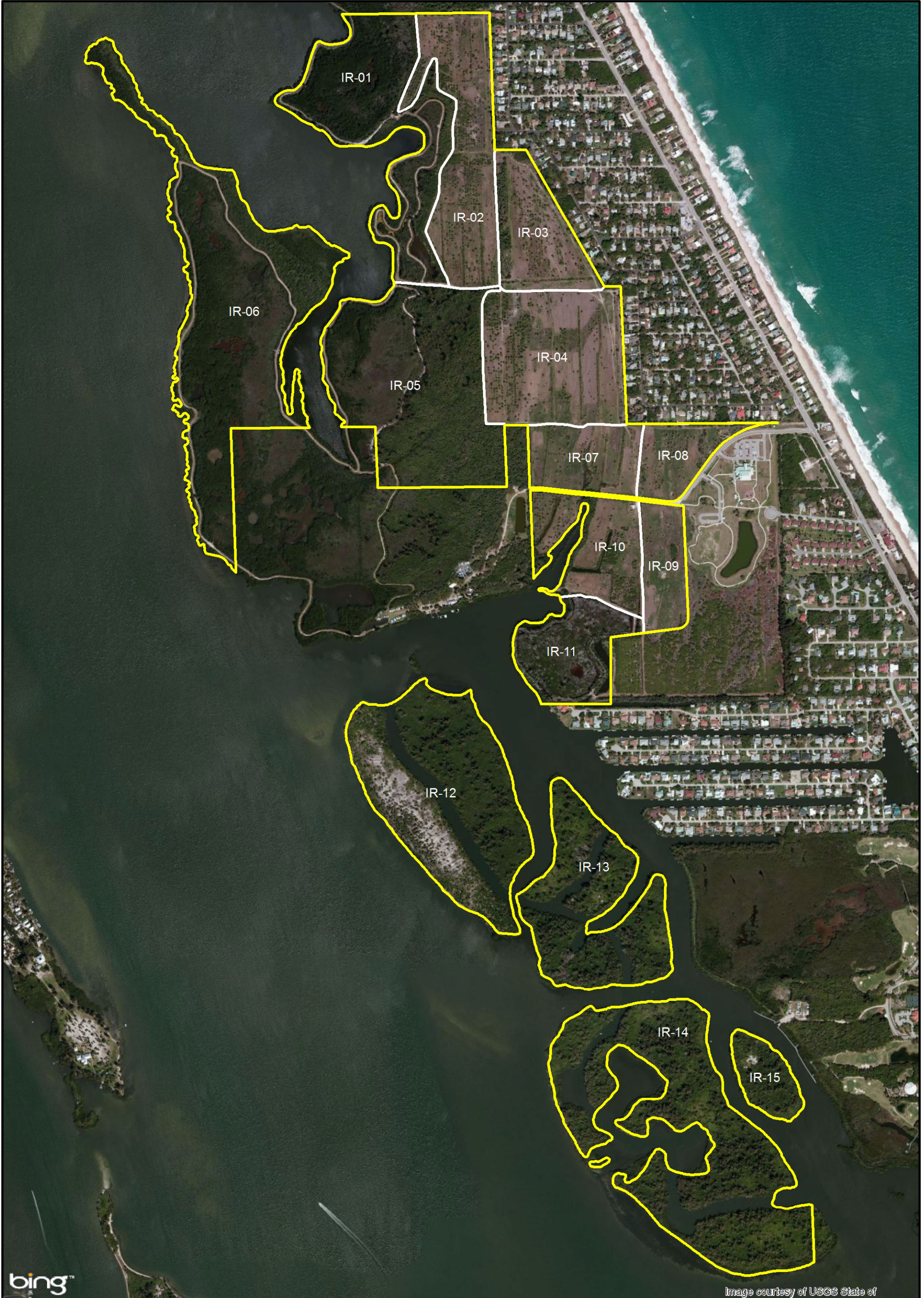
Natural Resources

Topography

The Indian River Lagoon Preserve State Park is in Florida's Coastal Lowlands, within the Mid-peninsular Zone of the state. More specifically, it is in the Atlantic Coastal Ridge province, which is bordered by the Eastern Valley province to the west and the Atlantic Ocean to the east. The Mid-peninsular Zone is characterized by discontinuous highlands in the form of sub-parallel ridges separated by broad valleys. The Atlantic Coastal Ridge is made up of multiple relict beach ridges, forming discontinuous highlands separated by broad valleys (White 1970). The major drainage system in the area is the Indian River Lagoon, a 156-mile long estuary located between the mainland and the barrier islands along central Florida's Atlantic coast.

The Inlet Grove parcel of the park is relatively flat, with very little variation in topography or elevation other than a gradual downward slope from east to west. Elevations at Inlet Grove range from roughly ten feet above mean sea level (msl) in the easternmost portion of the parcel to sea level along the shorelines at the western edge of the parcel. No elevation data are available for the Mullet Creek Islands parcel, but we do know that the parcels are at a higher elevation due to the placement of spoil material on the uplands in the 1950s.

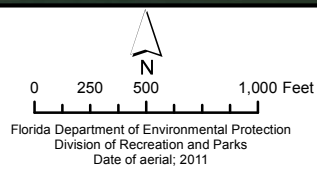
The topography of the park has been substantially altered by human disturbances. Past alterations to the topography of the Inlet Grove parcel include road construction, leveling of forested areas for conversion to agricultural use, installation of drainage ditches and containment berms, and construction of



bing™

Image courtesy of USGS State of

INDIAN RIVER LAGOON
PRESERVE STATE PARK



MANAGEMENT ZONES MAP

mosquito control impoundments with the resultant ditches, berms and borrow-pit ponds. The topography of the Mullet Creek Islands parcel was completely altered by channel dredging and piling the resulting spoil on the islands in the 1950s. In addition to creating ten smaller islands from the original four islands, the elevations and contours of the parcel were significantly altered.

Geology

Regionally, deposits of varied origin underlie the area. In descending order, these deposits include Holocene sediments, the Anastasia Formation, undifferentiated Quaternary sediments, Tertiary-Quaternary dunes, undifferentiated reworked Cypress head Formation, the Hawthorn Group (including the Peace River Formation and Arcadia Foundation), Suwannee Limestone, Ocala Limestone, and the Avon Park Formation. Described from youngest to oldest respectively, these deposits represent the Holocene, Pleistocene, Pliocene, Miocene, Oligocene and Eocene Series. Surface sediments are relatively new, dating only to the Holocene period (Scott et. al. 2001).

Where they occur, Holocene sediment deposits are made up of undifferentiated siliciclastics including carbonate sands and muds, quartz sands, and organics. In the vicinity of the Indian River Lagoon Preserve State Park these deposits range from less than one foot to approximately 20 feet in thickness and are generally not a reliable source of potable water.

The Anastasia Formation underlies the Atlantic Coastal Ridge and is estimated to be up to 100 feet in thickness. These deposits consist primarily of coquina limestone, often containing mollusk shell fragments mixed with sand. The deposits may contain a confining layer and are part of the surficial aquifer system.

The undifferentiated Quaternary sediments are from the Pleistocene and contain freshwater carbonates, organics and siliciclastics. The deposit is present in varying thickness and is not part of the surficial aquifer system. The Tertiary-Quaternary dunes are a quartz sand deposit from the Pleistocene to Pliocene periods. The undifferentiated reworked Cypresshead Formation is from the Pleistocene to Pliocene periods and contains coarse quartz sand mixed with quartz gravel and clay.

The undifferentiated Tertiary-Quaternary sediments are composed of the same siliciclastics as the Quaternary sediments and are distinguished from them based only on elevation. These sediments occur at approximately 100 feet mean sea level and are from the Pliocene. They contain sands, clays and organics, and are part of the aquifer system.

The Hawthorn Group is from the early Oligocene to middle Miocene, and ranges from between 100 - 300 feet below the surface soil. It consists of various formations, two of which are in the Indian River Lagoon Preserve State Park region. The Peace River Formation consists of clays, carbonates and sands with high phosphate content. It is part of the intermediate confining aquifer system. The

Arcadia Formation is part of the Oligocene-Miocene and is mainly comprised of carbonate and siliciclastics, with a bed of sands and clays. The lower part of the Arcadia Formation forms a part of the Floridan Aquifer System (FAS).

Another formation from the Oligocene is the Suwannee Limestone. This bed of limestone sits approximately 300-400 feet below the surface and contains a bed of fossilized mollusks, forams, echinoids and corals. It is not part of the FAS.

The Ocala Limestone is from the Eocene and contains much of the same fossil material as the Suwannee Limestone. This formation ranges in thickness across Florida, but is in between the Suwannee Limestone at 400 feet and the Avon Park Formation at approximately 600 feet below the surface. It consists of almost pure limestone, with some dolostone. The Ocala Limestone is a crucial aspect of the FAS.

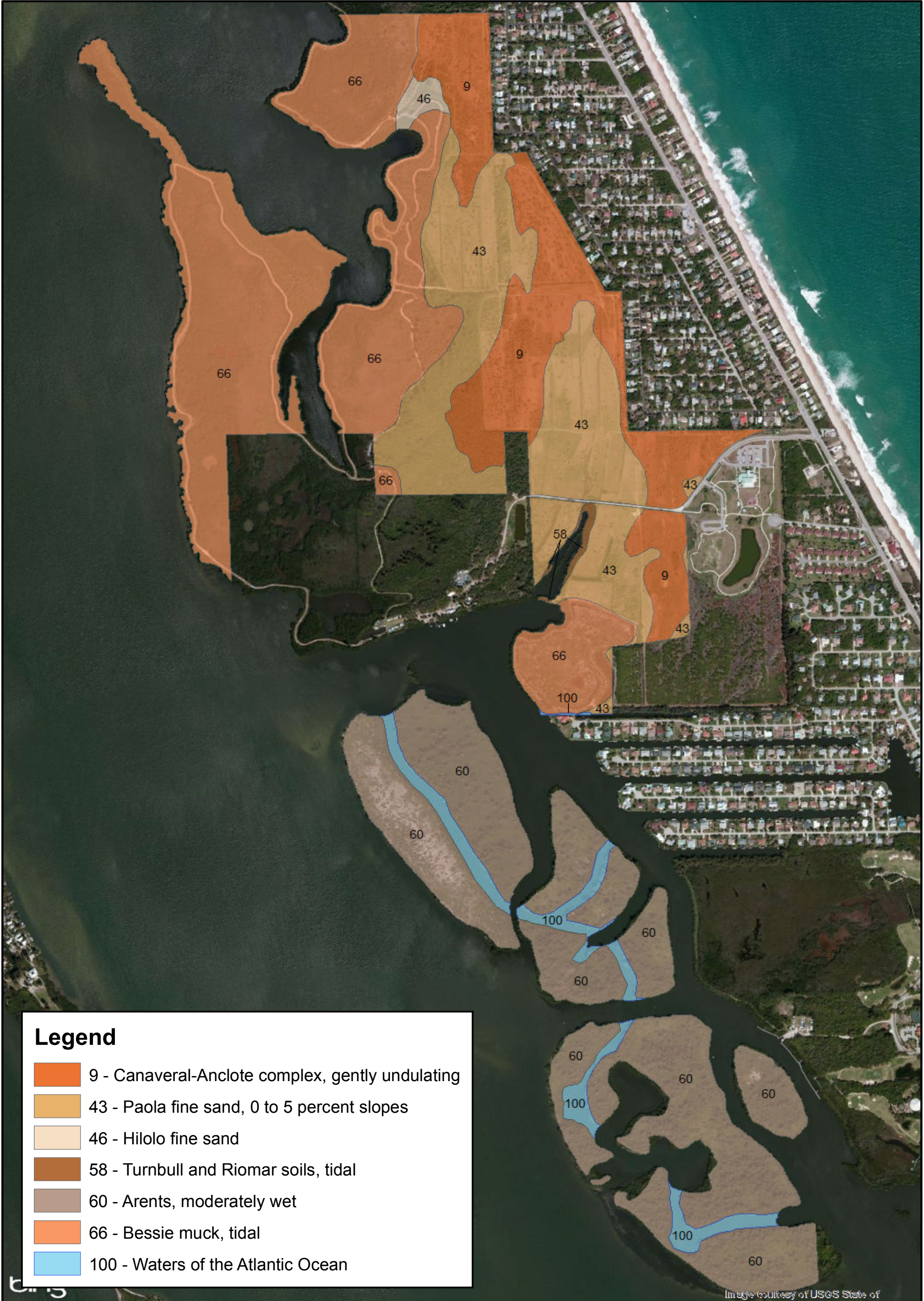
The Avon Park Formation is also part of the Eocene, consisting of limestone with dolostone and fossilized mollusks, echinoids, algae, plants, and forams. The Avon Park Formation is positioned under the Ocala Limestone Formation, at approximately 600-700 feet below the surface. It is also part of the FAS, and portions of the formation make up confining units of the aquifer (Scott et. al. 2001).

Soils

Six soil types have been identified within the Indian River Lagoon Preserve State Park according to the U.S. Department of Agriculture (USDA) Soil Conservation Service (1988). The distribution of soil types at the park is shown on the following Soils Map. Five of these soil types occur at the Inlet Grove parcel, and one, Arents, occurs at the Mullet Creek Islands parcel. Soils at Inlet Grove range from fairly well drained types such as Canaveral, Hilolo and Paola series in the upland portions to inundated types such as Bessie and Turnbull series along the shorelines and within the impoundments. Detailed soil descriptions are provided in Addendum 4.

Arents: This is the only soil type present at Mullet Creek Islands, and is the result of formerly submerged soil being dredged and piled on the existing islands. Arents soils are generally extremely well drained and have low organic content. They typically consist of a mixture of sand, loam and shell fragments with no visible horizon stratification. This soil type comprises 30 percent of the total acreage of the park.

Bessie: The Bessie soil series is found along and near the shorelines of the lagoon. These soils are very poorly drained and have high organic content. Bessie series soils typically occur in low-lying coastal areas and support mangroves and other estuarine mangrove swamp species. At Inlet Grove parcel, these areas have been disturbed by the construction of mosquito impoundment berms. They still support native mangroves, but are also heavily invaded by invasive exotic plant species such as Australian pine (*Casuarina equisetifolia*) and Brazilian pepper (*Schinus terebinthifolius*). This soil type comprises 32 percent of the total acreage of the park.

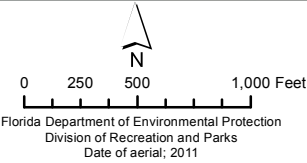


Legend

- 9 - Canaveral-Anclote complex, gently undulating
- 43 - Paola fine sand, 0 to 5 percent slopes
- 46 - Hilolo fine sand
- 58 - Turnbull and Riomar soils, tidal
- 60 - Arents, moderately wet
- 66 - Bessie muck, tidal
- 100 - Waters of the Atlantic Ocean

Image courtesy of USGS State of

INDIAN RIVER LAGOON
PRESERVE STATE PARK



SOILS MAP

Turnbull: A very small amount of the Turnbull series is also found along the shoreline in the only area which has not been impounded, which is a remnant tidal creek in the southwest portion of the grove. Turnbull soils are very poorly drained and have a high clay component. If undisturbed, they support a variety of herbaceous vegetation typically found in salt marsh, such as needle rush and cordgrass. At Inlet Grove, vegetative cover in the Turnbull soil areas has been altered by hydrological disturbances and now more closely resembles mangrove swamp than salt marsh. This soil type comprises less than 1 percent of the total acreage of the park.

Hilolo: A small pocket of Hilolo series soil occurs in the northern portion of the Inlet Grove parcel. This pocket is situated along the transition between what is currently impoundment and abandoned field, but what historically was the transition between coastal estuarine communities and higher hammock communities. These poorly drained soils are typically found adjacent to wetlands and support hammocks predominated by cabbage palms. This area at Inlet Grove still supports hammock species, but is also heavily invaded by exotic plant species. This soil type comprises less than 1 percent of the total acreage of the park.

Paola: Paola is one of the most abundant soil types at the Inlet Grove parcel. It occurs primarily in a wide, uneven band between areas of Bessie series soils to the west and Canaveral series soils to the east. Paola soils are deep, sandy and very well drained and, if undisturbed would typically support a range of native vegetation that can include pines, saw palmettos and xeric oak species. At the Inlet Grove parcel, most of the vegetative cover in Paola series soil areas is now abandoned citrus grove fields and maritime hammock. This soil type comprises 20 percent of the total acreage of the park.

Canaveral: This soil series occurs primarily in upland areas in the eastern half of the Inlet Grove parcel. It consists of sand and shell fragments and is moderately to poorly drained. Prior to human disturbances, this soil series typically supported hammock vegetation such as palms and bays. At the Inlet Grove parcel, Canaveral series soil areas are now abandoned fields with a very small portion being maritime hammock. This soil type comprises 16 percent of the total acreage of the park.

Minerals

No known mineral deposits of commercial value are evident on this property.

Hydrology

The Indian River Lagoon Preserve State Park is located in the Indian River Lagoon watershed. Significant water bodies in the region are the Atlantic Ocean and the Indian River Lagoon, which is designated as an Outstanding Florida Waterway, an Estuary of National Significance and a SWIM Priority Waterbody. The Indian River Lagoon-Malabar to Vero Beach Aquatic Preserve borders the parcels that currently comprise the park. Water movement in the lagoon is wind-driven. Saltwater sources to the lagoon are the numerous inlets including the Ponce Inlet to the north

and the Sebastian, Ft. Pierce, St. Lucie and Jupiter Inlets to the south of the current park boundary. Natural freshwater sources to the lagoon include the Eau Gallie, St. Sebastian and St. Lucie Rivers, Turkey Creek, Crane Creek, and numerous other smaller creeks. Water quality in the lagoon has been adversely affected by many factors, including increasing levels of human settlement, stormwater runoff and alteration of adjacent wetlands.

The Inlet Grove parcel is an island in a sea of urban development which will make the hydrological restoration more difficult. Most of the eastern perimeter of the park is bordered by the Floridana Beach subdivision. It is estimated that the park receives some of the stormwater from this subdivision but that has not been determined. It may be that in some areas of the park, especially the central portion of the park, the natural drainage of the landscape was to the east, toward the Floridana subdivision. The southeastern perimeter of the park is bordered by Old Florida Drive and a Brevard County recreational facility that has numerous stormwater retention ponds. These ponds catch a majority of the runoff from the road and hold it there until it percolates into the ground. Along the southern boundary of the park is an old citrus grove managed by the county. This parcel contains numerous surface water ditches that connect to some of the ditches within the park. Surface water is directed from Mullet Creek Road and surrounding areas to the south via two surface water ditches. These ditches connect up with other ditches that empty into a canal on the south side of the park. The south-central perimeter of the park is bordered by the Indian River Lagoon. Water exchange between the uplands and wetlands in this area are very limited due to large control berms that were constructed to keep the salt water out of the groves and the mosquito impoundments used to control mosquito populations. There is a large channel that comes up through the park from the south to Mullet Creek Road and terminates at the road. Beyond the road, a brackish to freshwater ditch/wetland extends for 1500 feet to the north. Historically, a great deal of the sheet flow from the area of the Floridana Subdivision would flow into the wetland and out to the Indian River lagoon. The southeastern portion of the property is bordered by Honest Johns Fish Camp, a local fish camp that has been around since the turn of the century. In order to restore historic sheet flow patterns, water would need to drain onto the fish camp property which is not possible at the point in time. The perimeter ditch that runs along the boundary at this location most likely will need to remain to catch surface water and direct it to other areas in the park. The western perimeter of the park is mainly mosquito impoundments and lagoon.

The surface water bodies at the Indian River Lagoon Preserve State Park are all man-made and consist of numerous drainage ditches in and around the old citrus groves as well as several borrow-pit ponds that resulted from dredging activities associated with the construction of impoundments. No natural, undisturbed wetland areas are found within the upland portions of Mullet Creek Islands or Inlet Grove. No natural springs or sinkholes are known to occur at the Indian River Lagoon Preserve State Park.

Hydrology at the Indian River Lagoon Preserve State Park has been seriously impacted by human alterations that include drainage ditches, wells and impoundments at Inlet Grove and dredging operations at Mullet Creek Islands.

Drainage ditches: There are numerous ditches at Inlet Grove, which were installed in the 1940s and 50s to drain the site for agricultural use. Smaller ditches run between sections of grove and drain into larger perimeter ditches. Historically, the groves were actively dewatered with pumps that discharged water from the perimeter ditches out into the lagoon. This practice has been discontinued, and presently only passive dewatering of the groves occurs via the existing drainage ditches and culverts. These ditches hydrologically isolate the grove from the impounded marshes, which protected the citrus trees from saltwater intrusion.

Impoundments: Mosquito impoundment construction in the Indian River Lagoon region of Florida was undertaken primarily in the 1940s and 1950s, and the impoundments at Inlet Grove were constructed in 1956 (Scott Taylor, personal communication 2003). The mosquito control impoundments at Inlet Grove have greatly impacted the site's hydrology. A higher water level is maintained within the impoundments than would have historically occurred, which alters the natural community composition. Salt marsh, discernible in older aerial photography of the site, is no longer a component because of the elevated water within the impoundments. There is also less water, nutrient and organism exchange between the impounded mangrove swamps and the lagoon than historically occurred.

Wells: Numerous irrigation wells existed within the abandoned fields, but a number of these wells were capped in 2005 by the SJRWMD. These Floridan aquifer wells were regulated by a consumptive use permit from SJRWMD. Three wells were left to be used for fire suppression and irrigation purposes of future restoration efforts.

Dredging and spoiling: The Mullet Creek Islands parcel originally consisted of four larger islands. These islands contained low, salt marsh areas that provided breeding habitat for salt marsh mosquitoes. Residential development in the 1950s spurred the need for mosquito control along the Indian River Lagoon. Prior to mosquito control activities, the mullet creek islands were vegetated by salt marsh and mangrove swamp communities. In the 1958, the Brevard County Mosquito Control District dredged a series of canals through Mullet Creek Islands (Scott Taylor, Brevard County EEL's, personal communication 2003), subdividing the four original islands into ten. Spoil from the dredging activities was deposited on the salt marsh and mangrove communities to eliminate mosquito breeding areas. In addition to creating navigable channels through the islands, it is possible that the dredging of these channels altered local flow patterns within the lagoon.

Drainage patterns within the park have been greatly impacted by the extensive hydrological alterations to the site. Historically, surface water at Inlet Grove would have drained downslope from hydric and maritime hammocks, through freshwater wetlands, then into salt marsh and mangrove swamps along the lagoon shoreline and gradually flowed into the lagoon. Currently, very little remains in the way of natural communities, and surface water is drained rapidly from the uplands by the

extensive network of ditches. Drainage within Mullet Creek Islands has also been impacted by hydrological disturbances. Surface water from rainfall still flows downslope from the islands into the lagoon, however, it reaches the lagoon more rapidly because the shallow areas in which it would have historically pooled were filled with spoil.

To date, one hydrological restoration project has been initiated at the park, the reconnection of the impoundments to the Indian River Lagoon. Several culverts and pump stations were installed in the impoundments through a cooperative effort between the FCO (Florida Coastal Office), the Brevard County Mosquito Control District and the SJRWMD. Through this effort, the impoundments were placed under rotational impoundment management (RIM). Specifics of this effort are described elsewhere in the plan. No water quality/quantity monitoring efforts have been initiated at the park.

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

When a natural community within a park reaches the desired future condition, it is considered to be in a "maintenance condition." Required actions for sustaining a community's maintenance condition may include, maintaining optimal fire return intervals for fire 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 linking natural communities across the landscape.

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

Maritime Hammock

Desired Future Condition: A coastal evergreen hardwood forest occurring in narrow bands along stabilized coastal dunes. Canopy species will typically consist of sand live oak (*Quercus geminata*), red bay (*Persea borbonia*), and cabbage palm (*Sabal palmetto*). The canopy is typically dense and often salt-spray pruned. Understory species may consist of yaupon holly (*Ilex vomitoria*), saw palmetto (*Serenoa repens*), marlberry (*Ardisia escallonioides*), wild coffee, ferns, and myrsine (*Rapanea punctata*). Very sparse or absent herbaceous groundcover will exist. Variation in species composition exists along the coast as you head southward, tropical species become more prevalent.

Description and Assessment: The majority of the maritime hammock community occurs on the western portion of the Inlet Grove property on the parcel referred to as the Church property which was purchased by the St. Johns Water Management District. This community is considered to be in fair condition. Hydrological alterations and some exotic plant species impact the majority of the maritime hammock acreage on the park. Besides Australian pine and Brazilian pepper, exotics such as air potato, two-leaf nightshade and rosary pea can be found in the shady areas of the hammock. Maritime hammocks onsite are characterized by an overstory of abundant sand live oaks and cabbage palms with minor components of red bay and strangler fig, and myrsine. The understory vegetation includes abundant marlberry, wild coffee and ferns such as lacy bracken and swamp fern. Listed species such as butterfly orchids, Simpson stopper and hand ferns are also present in small numbers.

There are several ditches within and along the perimeter of the hammocks that have affected the way that water sheet flows through these areas and how long it stays. Removing these ditches would significantly improve the condition of the maritime hammocks on the park. In 2008, the rectangular portion of maritime hammock located in the abandon fields was accidentally mowed by a contractor while removing Brazilian pepper and other unwanted species. This allowed more grassy invasive plants to move into the groundcover and also changed the microclimate of the hammock. Future work in this hammock should be done by hand or by focused chemical means in order to cause the least amount of damage to this very fragile habitat.

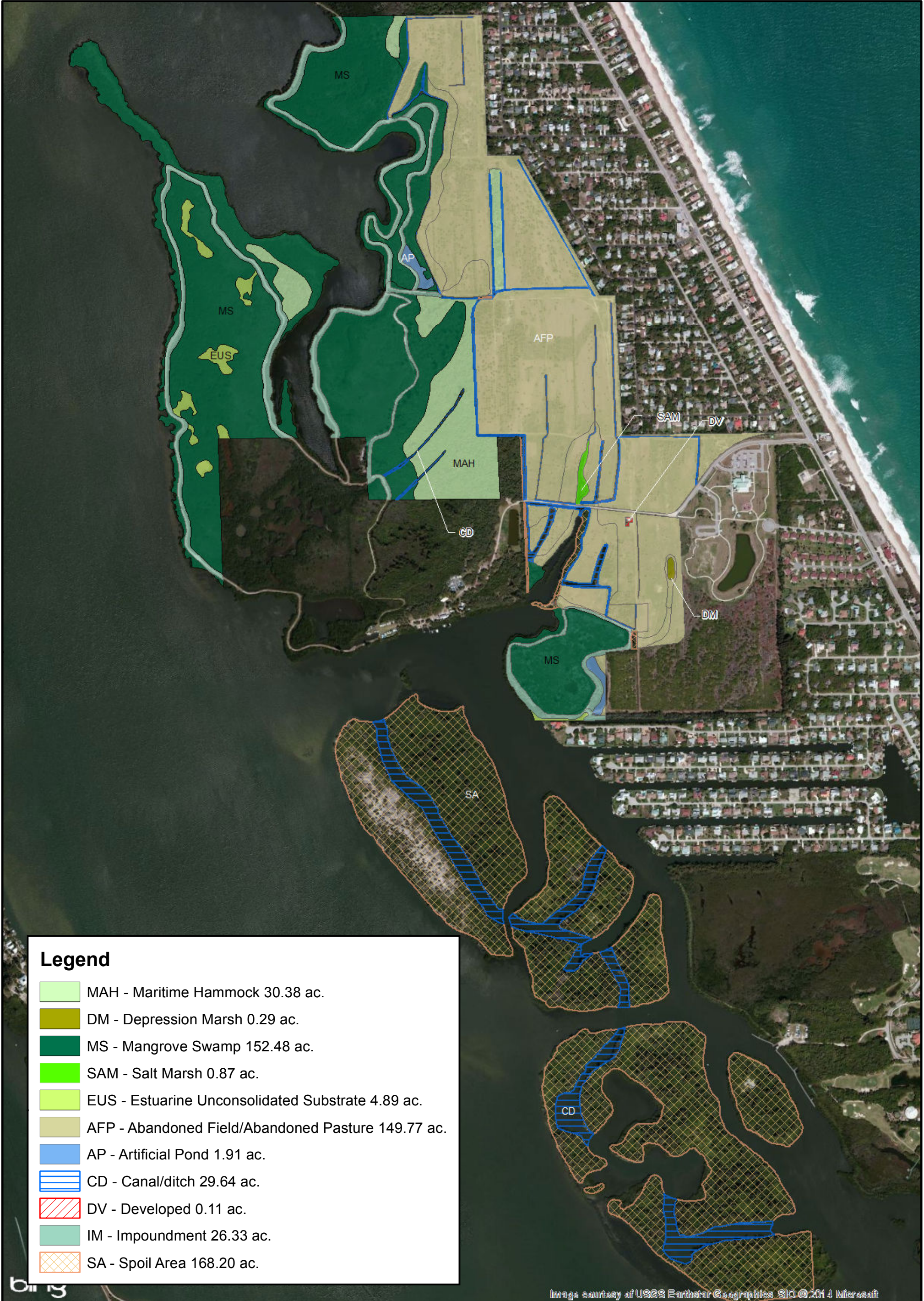
General Management Measures: Filling ditches and controlling invasive exotic plant species are two main projects that the park should work on to restore or enhance this community. In May 2010, the park received \$47,000 from FWC to hire an herbicide contractor to treat Category I and II FFLEPC invasive plants in the maritime hammock in the Church parcel, from the grove to the impoundment. They treated 40 acres of Brazilian pepper, 12 acres of Australian pine, two acres of rosary pea, and three acres of torpedo grass. In August 2011, another \$24,000 was

received from the same grant source to retreat this area and treatment took place in March 2012.

Mangrove Swamp

Desired Future Condition: Typically a dense forest occurring along relatively flat, low wave energy, marine and estuarine shorelines. The dominant overstory includes red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). These four species can occur either in mixed stands or often in differentiated, monospecific zones based on varying degrees of tidal influence, levels of salinity, and types of substrate. Red mangroves typically dominated the deepest water, followed by black mangrove in the intermediate zone, and white mangroves and buttonwood in the highest, least tidally influenced zone. Mangroves typically occur in dense stands (with little to no understory) but may be sparse, particularly in the upper tidal reaches where salt marsh species predominate. When present, shrub species can include seaside oxeye (*Borrchia arborescens*, *B. frutescens*), and vines including gray nicker (*Caesalpinia bonduc*), coinvine (*Dalbergia ecastaphyllum*), and rubbervine (*Rhabdadenia biflora*), and herbaceous species such as saltwort (*Batis maritime*), shoregrass (*Monanthocloe littoralis*), perennial glasswort (*Sarcocornia perennis*), and giant leather fern (*Acrostichum danaeifolium*). Soils are generally anaerobic and are saturated with brackish water at all times, becoming inundated at high tides. Mangrove swamps occur on a wide variety of soils, ranging from sands and mud to solid limestone rock. Soils in South Florida are primarily calcareous marl muds or calcareous sands and along Central Florida coastlines, siliceous sands. In older mangrove swamps containing red mangroves, a layer of peat can build up over the soil from decaying plant material (primarily red and black mangrove roots).

Description and Assessment: Mangrove swamp occurs mainly within the mosquito control impoundments of the park and are considered to be in good condition. Red, white and black mangroves are all present, in addition to buttonwood. Mangroves can be found along the shorelines of the Mullet Creek Islands as well and along some of the shorelines, but these areas are mainly remnant patches of what was once a more expansive area. The invasion by exotic plants is the main threat to this community, primarily Brazilian pepper on the impoundment berms. Based on a review of historic aerial photographs, prior to construction of the impoundments for mosquito control in the 1950s, the area supported a mosaic of mangrove swamp and salt marsh, with interspersed pockets of open water. Salt marsh has been entirely eliminated from the park as a result of the mosquito control efforts. On Mullet Creek Islands, spoil was deposited over the mangrove swamp and salt marsh communities, burying them under several feet of sand and mud. This eliminated all but a narrow fringe of mangroves, which persists along the shorelines of the islands.



Legend

- MAH - Maritime Hammock 30.38 ac.
- DM - Depression Marsh 0.29 ac.
- MS - Mangrove Swamp 152.48 ac.
- SAM - Salt Marsh 0.87 ac.
- EUS - Estuarine Unconsolidated Substrate 4.89 ac.
- AFP - Abandoned Field/Abandoned Pasture 149.77 ac.
- AP - Artificial Pond 1.91 ac.
- CD - Canal/ditch 29.64 ac.
- DV - Developed 0.11 ac.
- IM - Impoundment 26.33 ac.
- SA - Spoil Area 168.20 ac.

Image courtesy of USGS Earthstar Geographics SIO © 2014 Microsoft

Some of the mangrove swamps in the park have been reconnected to some degree to the lagoon and placed under rotational impoundment management (RIM). Under this management strategy, impoundments are flooded during summer months to control mosquitoes and opened to tidal exchange with the lagoon during the remainder of the year. Research indicates that following a reconnection of closed impoundments, water quality, sediment sulfides and biological communities quickly return to more natural conditions typical of salt marsh communities (Brockmeyer, et al. 1997). The primary goal of the reconnection effort is to: reduce or inhibit the invasion of exotic plant species by increasing salinity in the impoundments; restore physical, chemical and biological parameters back to conditions more typical of mangrove swamp/marsh communities; allow access of estuarine organisms to foraging and nursery habitats in the impounded tidal communities; and maintain salt marsh mosquito control.

General Management Measures: Monitoring the previous impoundment reconnection effort will be needed to ensure that the desired results are being met and if additional reconnection efforts or water level controls are needed. The two newest acquisitions are located along Snag Harbor and contain mangrove swamp that has not been assessed for impoundment reconnection to the lagoon. It may be that there are additional culverts needed.

The north impoundment, next to the large clear artificial pond on the north end of the property, contains two impoundment berms that run very close to one another to the point where they almost intersect. Based on some preliminary evaluations by the SJRWMD and a private consultant, it may be feasible to remove the interior impoundment berm and reconstruct a low berm toward the uplands in the old abandoned fields. This would allow for a better connection to the lagoon, reduce exotic plant species coverage and help recreate a more natural transition to uplands.

Limited restoration of the historical extent of mangrove swamp/marsh communities on Mullet Creek Islands may be possible through re-contouring the existing grades on several of the islands.

Estuarine Unconsolidated Substrate

Desired Future Condition: Consists of expansive unvegetated, open areas of mineral based substrate composed of shell, marl and mud. Desired conditions include preventing soil compaction, dredging activities and disturbances such as the accumulation of pollutants and exotic plant infestations.

Description and Assessment: A majority of the estuarine unconsolidated substrate occurs in the deeper channels within Mullet Creek Islands and unvegetated areas in the mangrove swamp community and is considered to be in good condition. The Mullet Creek Islands channels were created in 1950s and are currently mapped as canal/ditch on the natural communities map. These channels are several feet deeper than the average depth in the lagoon and are not known to support

seagrasses or other submerged vegetation. They are characterized by anaerobic conditions, muck deposits and turbidity from boat traffic in the area.

The unconsolidated substrate in the mangrove swamp mainly consists of open water where water depths do not allow vegetation to grow. These areas are great places for oysters and other bivalves as well as fish to swim and breed.

General Management Measures: Management actions include monitoring for exotic invasive plant species and the presence of imperiled species. The prevention of soil compacting and disturbing activities is also recommended.

Salt Marsh

Desired Future Condition: 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 has distinct zones of vegetation based on water depth and tidal fluctuations. Saltmarsh cordgrass (*Spartina alterniflora*) dominates the seaward edge; the area most frequently inundated by tides. Needle rush (*Juncus roemerianus*) dominates the higher, less frequently flooded areas. Other characteristic species include Carolina sea lavender (*Limonium carolinianum*), perennial saltmarsh aster (*Symphotrichum tenuifolium*), wand loosestrife (*Lythrum lineare*), marsh fimbry (*Fimbristylis spadicea*), and shoreline seapurslane (*Sesuvium portulacastrum*). A landward border of salt-tolerant shrubs including groundsel tree (*Baccharis halimifolia*), saltwater falsewillow (*Baccharis angustifolia*), marshelder (*Iva frutescens*), and Christmasberry (*Lycium carolinianum*) may exist. Soil salinity and flooding are the two major environmental factors that influence salt marsh vegetation. While there is little data on natural fire frequency in salt marshes, fire probably occurred sporadically and with a mosaic pattern, given the patchiness of the fuels intermixed with creeks, salt flats, etc.

Description and Assessment: A small remnant patch of highly disturbed salt marsh exists along Mullet Creek Road and extends 600 feet to the north and is approximately 100 feet wide in some areas and is considered to be in poor condition. In preparation of the land for agriculture, the marsh was ditched and connected to a large network of drainage ditches that severely altered the hydroperiod and water salinity of the marsh, making it more resemble a freshwater marsh. Because of the constant flushing of freshwater from the groves, a number of chemicals from the grove operation were also carried into the marsh, affecting it to some degree. As the citrus grove began to expand, a majority of the marsh was cleared and artificially filled using surrounding material dug up from ditches or from other areas of the park. What exists today is mainly a ditch with some salt marsh grass species and leather fern along the edges and a large weir structure to the south of the marsh. Approximately six years ago, a board was removed from this weir to allow for salt water to naturally flow into the marsh during tidal fluctuations which has drastically changed the species composition of the marsh. Before that time, freshwater was held back at the weir that came from surface water and ditches and no exchange occurred between the marsh and the lagoon.

General Management Measures: There is currently a plan to restore this community to a more natural appearance by using mitigation funding permitted through the SJRWMD and the USACE. A MOA (Memorandum of Agreement) is being drafted that will be between DRP and a private company. If the MOA is approved and all permits are obtained, approximately 10.5 acres of salt marsh will be either recreated or restored (see the Future Desired Condition map). The other historic salt marsh to be restored is located south of Mullet Creek Road, to the east and west of the lagoon channel leading up to the road. In the meantime, exotic plant removal will be placed on the top of the list for enhancement of this area. Brazilian pepper can be found along the edges of the remnant community as well as within the extent of the historic marsh area. The SJRWMD should also be consulted to determine if ditch filling or ditch blocks are viable options to be used to enhance the hydroperiod and water salinity.

Depression Marsh

Desired Future Condition: Emergent herbaceous and low shrub species will be dominant over most of the area with open vistas. Trees are few and if present, will occur primarily in the deeper portions of the community. Dominant vegetation within a depression marsh would include maidencane (*Panicum hemitomon*), panic grasses (*Panicum spp.*), 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*). Floodplain marsh dominants also typically include sand cordgrass (*Spartina alterniflora*) and sawgrass (*Cladium jamaicense*). Swales are typically dominated by sawgrass. The Optimal Fire Return Interval for this community is 2-10 years depending on fire frequency of adjacent communities.

Description and Assessment: The depression marsh at the park is located south of Mullet Creek Road on the east side of the property and is considered to be in poor condition. This depression pond is highly disturbed and contains many exotic grass species, Brazilian pepper and Carolina willow. Based on historic aerial photographs, the marsh was approximately twice as large as it now and may have been connected to the mangrove swamp (historically salt marsh) during very high tides or extreme rain fall events. The marsh may have been used as a dumping location for debris and unwanted liquids but that is purely speculation. Just to the south of the marsh was an old grove building that was used to store and mix herbicides, pesticides and other chemicals used in citrus grove management, one of which contained copper. It appears that this depression marsh did not burn frequently because it was surrounded by maritime hammock but could historically burn due to prolonged drought.

General Management Measures: Filling ditches and controlling invasive exotic plant species are ways that the park could begin to restore or enhance this community. DRP will continue to seek grants and mitigation funds in order to restore this community.

Altered Land Cover Types

These areas comprise approximately 67 percent of the park's total acreage. The five major types of altered landcover on the parcels that currently comprise the Indian River Lagoon Preserve State Park are spoil areas, abandoned fields, impoundment/artificial pond, canal/ditch, and developed. Based on observations of adjacent conservation lands such as the Brevard County EEL's Maritime Hammock Sanctuary, most of the acreage that was once occupied by citrus groves was probably a combination of salt marsh and maritime hammock with some coastal strand prior to conversion to agricultural use. Older aerial photographs indicate that the altered areas within the impoundments probably contained a combination of salt marsh, mangrove swamp and open water prior to the implementation of mosquito control strategies.

Spoil Areas

Desired Future Condition: The spoil areas at the Indian River Lagoon Preserve State Park on the Mullet Creek Islands were once comprised of approximately 166 acres of mangrove swamp and salt marsh before they were destroyed by dumping dredge material on them when canals were dug for mosquito control purposes in the 1950s. The goal for these areas would be to restore them back to a natural community to match or mimic the desired future condition for each community described above.

Description and Assessment: In the mid-1950s, Leon "Jack" Salmella, Southern Brevard County's Mosquito Control Supervisor, began a one and a half year project to control salt marsh mosquitoes on Mullet Creek Islands. The project dredged channels through the four natural islands and created ten separate islands (Leon Salmella, Personal Communication, 2003). Spoil from the dredging activities was used to bury the mangrove swamp and salt marsh communities on the islands, thereby, eliminating breeding habitat for the mosquitoes.

The majority of upland spoil areas within Mullet Creek Islands are so infested with exotics that no natural community types are recognizable. The exception is a portion of the northwest island that has comparatively fewer exotics and more native vegetation, including some coastal strand species. The island was mechanically treated with a brontosaurus machine in early 2006, targeting the abundant Australian pines and Brazilian pepper that were present on the island. The canopy cover of the other islands consists of approximately 60 percent of Austrian Pine with some Hercules-club (*Zanthoxylum clava-herculis*) and sable palms intermixed.

There is a long spoil berm along the Indian River Lagoon where the lagoon protrudes into the park up to the Mullet Creek Road. This large berm was created before 1943 and most likely came from the mangrove swamp that was right next to the berm while the grove was being constructed. This berm was used to block the flow of salt water into the grove and also to create a deep ditch that could be used to more quickly drain the water from the uplands through the weir.

General Management Measures: Exotic species control to protect adjacent communities would be the top priority for this altered community by the use of grant and mitigation funding. Due to limited access and complications involved with trying to remove the dredged material, restoration may be cost prohibitive and impractical. During the period of this plan, the DRP will assess the feasibility of restoring all or portions of the Mullet Creek Islands.

Abandoned Field

Desired Future Condition: The abandoned fields at the Indian River Lagoon Preserve State Park were once comprised of approximately 127 acres of maritime hammock, 19 acres of salt marsh, and 1.2 acres of mangrove swamp before they were converted for agricultural uses as described below. When possible, the goal for these fields would be restore them back to a natural community and would match or mimic the desired future condition for each community described above. Hydrologic, agronomic and topographic alterations that have occurred over the last 100 years may make restoration impossible in some areas.

Description and Assessment: Abandoned fields account for approximately 150 acres of the altered landcover within the Indian River Lagoon Preserve State Park that were once citrus groves. A good majority of the fields are overgrown with grasses and vines, and heavily infested with non-native plants. Because of long-term, high-intensity agricultural use of the site that dates back to the late 1800s, considerable alterations to the soil, topography, and the hydrology has occurred in the grove areas.

Many of the areas that are near the water or near the maritime hammock community to the west were ditched and all of the material was spread in the uplands to raise the elevation. This allowed these areas to drain more rapidly, to stay drier longer and to prevent flooding from the lagoon so that more trees could be planted. Many other surface water ditches can be found throughout the interior and perimeter of the fields and the larger ones are shown on the attached natural communities map.

When the grove was abandoned in 2004, the areas that were once being managed for citrus quickly became invaded by invasive exotic plants such as Brazilian pepper, cogongrass, Guinea grass and Australian pine. In 2004-2006, DRP obtained several thousand dollars from DEP BIPM (Bureau of Invasive Plant Management) to begin removing exotic plants from the fields using herbicide and mowing machines. The process has continued to present. Removal of the citrus trees began in 2005 by mowing, mulching and burning of the trees due to the threat of citrus canker and the restrictions that it might impose on the park.

Citrus canker is a bacterial disease that causes leaf, fruit and stem spotting on citrus trees. It is spread by a variety of methods, but of most concern here is that it is rapidly spread by people's skin, clothing and equipment (Chung et. al. 2003). Citrus canker control regulations require all individuals and equipment to be decontaminated when entering and leaving a citrus grove. This would include all

park visitors, staff members and equipment. There are significant fines in place for violations, including revocation of the Grove/Caretaker Compliance Agreement. A more detailed description of restoration activities will be discussed in the management needs and problems and restoration sections of this plan.

In 2007, a Remedial Action Plan (RAP) was prepared by LFR Inc. (LFR 2007) for the Florida Department of Environmental Protection (FDEP) State Owned Lands Cleanup Program (SOLCP) to assess the soils at the park to determine if contaminated soils existed and if so, to what level of contamination existed. LFR Inc. determined that 127 acres of the abandon fields were contaminated to some degree with the mineral copper which was used by citrus growers in the past to help sweeten the fruit. Those areas had to undergo extensive soil grubbing and blending in attempts to remediate the amount of copper on the surface of the soil. Soil blending targeted the top 18 inches of the soil column and was performed by HSA Engineers and Scientists (2010) from Tampa, FL between April and August 2009. The company used a standard roadway soil-mixing machine to blend all of the soil in the top 18 inches so that the copper would be mixed evenly throughout the soil. The goal of the project was to reduce the amount of copper someone could be exposed to while onsite and that goal was achieved. After extensive testing and a second mixing event in March thru June 2010, HSA (2010) concluded that all areas treated by soil blending were now within acceptable exposure levels, levels that were set by the Environmental Protection Agency (EPA) and the Department of Health (FDEP 2005).

General Management Measures: Exotic species control will continue to be a problem in the ongoing years. Exotic plant removal will be the sole focus of DRP to help deal with the current and expanding exotic plant problem. Partnerships with the SJRWMD, USACE, Brevard County EELS program, and Brevard County Recreation and Parks will be needed to tackle the hundreds of acres of altered landcover types here at the park. A significant effort will be necessary to restore the abandoned fields back to their historic natural community. DRP will continue to work on expanding existing partnerships for restoration purposes.

Impoundment/Artificial Pond

Desired Future Condition: All of the impoundments and artificial ponds at the park were once mangrove swamp or salt marsh communities. To the best degree practical, DRP should strive to restore some of these areas back to these communities to fit the description of each community described above. However, due to public health concerns and high mosquito breeding, removing impoundments may not be in the best interest of the park and the community.

Description and Assessment: Impounded mangrove swamps comprise 28 acres of the park and are in active rotational impoundment management (RIM) by the Brevard County Mosquito Control District. These impoundments are approximately 30 feet wide and 6 feet tall constructed of the material dug from either side of the impoundment to form the berm. The MCD maintains these berms by mowing back the encroaching vegetation and rebuilding the berms when needed. The impoundments have been heavily invaded by exotic plants, the type and extent

varying according to whether or not the impoundment has been maintained for vehicle traffic. Major infestations of Brazilian pepper are dominant within the impoundment and exotic grasses such as smutgrass and Guinea grass are common on the containment berms.

There is a one acre artificial pond that was dug to the east of the north impoundment area. The material that was dug out of the pond most likely was used to construct the impoundment berms surrounding the mangrove swamp in that general vicinity. The lake is fairly clear and many types of wildlife can be seen utilizing the water and its surroundings. This lake can be restored back to mangrove swamp by removing the interior (east) impoundment berm that lies immediately to the west of it, therefore connecting it with the neighboring swamp.

General Management Measures: The north impoundment, next to the large clear artificial pond on the north end of the property, contains two impoundment berms that run very close to one another to the point where they almost intersect. Based on some preliminary evaluations by the SJRWMD and a private consultant, it may be feasible to remove the interior impoundment berm and reconstruct a low berm toward the uplands in the old abandoned fields. This would allow for a better connection to the lagoon, reduce exotic plant species coverage, recreate salt marsh community and help recreate a more natural transition to uplands.

Canal/Ditch

Desired Future Condition: The canal and ditches at the Indian River Lagoon Preserve State Park were once comprised of approximately 21 acres of mangrove swamp and salt marsh on the Mullet Creek Islands and 8 acres of maritime hammock in the Inlet Grove before they were converted. When possible, the goal for these areas would be restore them back to a natural community and would match or mimic the desired future condition for each community described above. Hydrologic, agronomic and topographic alterations that have occurred over the last 100 years may make restoration impossible in some areas.

Description and Assessment: The canals that were cut through the Mullet Creek Islands were constructed in the 1950s as described in the above mangrove swamp and spoil areas descriptions. These canals consist of open water that are relatively shallow, estimated to be between 1-4 feet deep with the deeper areas being toward the center of the main channels and being 75-130 feet in diameter.

There are numerous ditches throughout the old Inlet Grove parcel that appear to have been there for up to 100 years or more. Most of these ditches are small shallow depressions not mapped on the natural communities map and go from 1-2 feet in depth to grade. The larger ditches are mapped on the natural communities map and are much larger and deeper, ranging from 6 to 45 feet wide and up to five feet deep in some places. As described in the abandoned field and maritime hammock description above, many of these ditches can be filled and removed. Because of the surrounding development areas to the west, north and east of the

property, a hydrologic model will have to be developed in order to determine which ditches can be filled and which ones will have to remain.

General Management Measures: Exotic species control is the main management action needed in this altered community. Brazilian pepper and torpedo grass has infested many of these ditches and is continuing to spread throughout the park into areas that these species have not been seen before. In 2010 and 2011, DRP has received funding through FWC to treat these ditches for invasive plants, but many more ditches still need to be treated.

During the period of this plan, the DRP will assess the feasibility of restoring all or portions of the Mullet Creek Islands. The restoration of the canals on the Mullet Creek Islands back to mangrove swamp and salt marsh communities may not be a viable option due to the anticipated costs, regulatory constraints, and consensus among the local management partners that there would be minimal environmental benefit to this restoration.

Developed

Desired Future Condition: Developed areas within the park account for a total of less than one acre. Where possible, these areas will be restored to their historic natural community unless they are to be used as recreational facilities in the future.

Description and Assessment: There are several developed areas within the groves including: two old houses, one standing barn and the remains of a second barn that burned down, several pump houses, an old herbicide storage shed and a fuel tank storage area. Several of these structures are built on concrete slabs or foundations. Exotic food crops such as banana and sugarcane along with exotic ornamentals such as poisonbulb (*Crinum asiaticum*) and bowstring hemp, can be found in the vicinity of the two houses.

General Management Measures: The developed areas within the park will be managed to minimize the effect of the developed areas on adjacent natural areas. Priority invasive plant species (EPPC Category I and II species) will be removed from all developed areas. Other management measures include proper stormwater management and development guidelines that are compatible with prescribed fire management in adjacent natural areas.

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.

FNAI lists 22 types of plants and 70 vertebrates as rare or endangered in Brevard County. Park staff has documented five listed plants, one listed mammal, nine listed

birds, six listed reptiles, and one listed fish within the park. DRP is currently working with FNAI to update known occurrences of listed species at the park

Preliminary surveys for listed species have been conducted by park staff in all high-quality natural communities. Listed animal observations have been opportunistic and additional formal surveys are needed. It is likely that additional listed species will be found on the site with future surveys.

Listed Plant Species

Five listed plant species are known to occur on the park. Most notable among these are the epiphytic hand ferns and cardinal airplants. Other listed plant species occurring at the Indian River Lagoon site include Simpson's stopper, erect prickly-pear cactus and Florida butterfly orchid.

Hand Fern (*Ophioglossum palmatum*): The state-endangered hand fern has been documented in the remnant Maritime Hammocks in the Inlet Grove, where it was said to grow epiphytically on cabbage palms. Recent attempts to locate the hand ferns have failed, leaving its status on the park as undetermined. Threats to hand ferns include hydrological alterations which have been extensive on this site along with illegal collecting. The population of hand ferns at the park is small and is vulnerable because of the lack of suitable habitat and the presence of invasive exotic plant species.

Cardinal airplant (*Tillandsia fasciculata* var. *densispica*): The state-endangered cardinal airplant, an epiphyte found primarily on cypress trees or hardwoods, occurs at Mullet Creek Islands. Like several other large, native Tillandsias, it was listed as endangered in 2000 because of extensive population damage by the Mexican bromeliad-eating weevil, *Metamasius callizona*. In addition to herbivory by the weevil, it is also vulnerable to illegal collecting.

Simpson's stopper (*Myrcianthes fragrans*): The state-threatened shrub Simpson's stopper occurs in Maritime Hammock at Inlet Grove. The major threats to the population are lack of suitable habitat and displacement by exotic plant species.

Erect prickly-pear cactus (*Opuntia stricta*): Erect prickly-pear cactus, a state-threatened species, occurs in higher upland areas on one of the islands within the Mullet Creek Islands parcel. Threats include illegal collecting and displacement by exotic plant species.

Florida butterfly orchid (*Encyclia tampensis*): The epiphytic Florida butterfly orchid occurs in Maritime Hammocks at Inlet Grove. It is listed in Florida as a commercially exploited species, and is vulnerable throughout its range due to illegal collecting. At Inlet Grove, it is also threatened by a lack of suitable habitat.

Listed Animal Species

Fourteen confirmed listed animal species are known to occur on the Indian River Lagoon Preserve State Park (Table 2). These include wading birds such as herons and egrets, and marine animals such as sea turtles and manatees. An additional nine listed animal species are likely to occur on the park, based on the presence of suitable habitat and their occurrence on other nearby conservation lands on the barrier island.

Scrub jays are not known to occur at the Indian River Lagoon Preserve State Park or in the vicinity.

American alligator (*Alligator mississippiensis*): Alligators, which are listed as a species of special concern in Florida and a federally threatened species (due to its physical similarities to crocodiles), occur within the impoundments and in larger ditches and canals at the Park. The major threat to the species is illegal hunting.

Common snook (*Centropomus undecimalis*): Snook, which are listed as a Florida species of special concern, reside in the Indian River Lagoon and utilize impoundments such as those at Inlet Grove as juvenile nurseries. The species is vulnerable to habitat destruction and over-fishing.

Florida manatee (*Trichechus manatus latirostris*): It is estimated that one third of the U.S. population of manatees resides in the Indian River Lagoon. Manatees inhabit the shallow waters of the lagoon, including the near-shore areas and dredged channels at the Indian River Lagoon Preserve State Park. The manatee, which is listed as endangered by state and federal authorities, has been greatly impacted by recreational activities such as boating and fishing. The major threats to the species are destruction of seagrass beds, accidental entanglements, and injuries incurred from collisions with boats (Smithsonian Marine Station 2011).

Gopher tortoise (*Gopherus polyphemus*): The gopher tortoise is currently listed as threatened by the FWC and is also being examined by the USFWS for possible listing. Tortoises are mainly found on the drier areas of the park along the eastern perimeter where soils are dry and sandy. Tortoises may have been removed from the park when the park was being used for agricultural purposes because of the severe site preparation and equipment, herbicide, and pesticide use. When found, tortoise burrows will be marked and protected.

Shorebirds: Shorebirds such as the state-threatened least tern (*Sterna antillarum*) and the brown pelican (*Pelicanus occidentalis*), which is listed as a species of special concern, have been observed foraging in the Mullet Creek Islands parcel but are not known to nest on the park. There are at least three known pelican rookeries within five miles of the park (FWC 1999 Waterbird Colony Locator). Shorebirds are vulnerable to contamination of their food source and loss of nesting habitat.

Wading birds: The wetlands of the park provide foraging habitat for numerous wading birds that are listed as Florida Species of Special Concern, including the

little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), snowy egret (*Egretta thula*), tri-colored heron (*Egretta tricolor*), White Ibis (*Eudocimus albus*) and Wood Stork (*Mycteria americana*). These wading birds utilize freshwater and coastal wetlands as foraging habitat. The major threat to these species is habitat destruction.

Sea turtles: The endangered green turtle (*Chelonia mydas*) and threatened loggerhead turtle (*Caretta caretta*) inhabit the Indian River Lagoon and have been recorded in the Mullet Creek Islands area. The lagoon is particularly important as developmental habitat for juvenile and sub-adult turtles. Sea turtle populations are adversely impacted by many human activities, including development of waterfront property, excess beach lighting, commercial fisheries, accidental entanglements, seagrass destruction, pollution and collisions with boats. Additional threats to these species are nest predation by raccoons and other predators, and the disease fibropapillomatosis (Smithsonian Marine Station 2011).

Table 2 contains a list of all known imperiled species within the park and identifies their status as defined by various entities. It also identifies the types of management actions that are currently being taken by DRP staff or others, and identifies the current level of monitoring effort. The codes used under the column headings for management actions and monitoring level are defined following the table. Explanations for federal and state status as well as FNAI global and state rank are provided in Addendum 6.

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
PLANTS						
Cardinal flower <i>Lobelia cardinalis</i>			LE		2	Tier1
Erect prickly-pear cactus <i>Opuntia stricta</i>			LT		2	Tier1
Hand fern <i>Ophioglossum palmatum</i>			LE	G4 S2	2	Tier3
Simpson's stopper <i>Myrcianthes fragrans</i>			LT		2	Tier1
Florida butterfly orchid <i>Encyclia tampensis</i>			C		2	Tier1
REPTILES						
Gopher tortoise <i>Gopherus polyphemus</i>	ST	LT		G3S3	13	Tier 2

Table 2: Imperiled Species Inventory						
Common and Scientific Name	Imperiled Species Status				Management Actions	Monitoring Level
	FWC	USFWS	FDACS	FNAI		
American alligator <i>Alligator mississippiensis</i>	FT(S/A)			G5S4	4	Tier1
Loggerhead turtle <i>Caretta caretta</i>	FT	LT		G3S3	13	Tier1
Green turtle <i>Chelonia mydas</i>		LE		G3S2	13	Tier1
Eastern indigo snake <i>Drymarchon corais couperi</i>	FT	LT		G3S3	2	Tier2
BIRDS						
Little blue heron <i>Egretta caerulea</i>	SSC			G5S4	2	Tier1
Reddish egret <i>Egretta rufescens</i>	SSC			G4S2	2	Tier1
Snowy egret <i>Egretta thula</i>	SSC			G5S3	2	Tier1
Tri-colored heron <i>Egretta tricolor</i>	SSC			G5S4	2	Tier1
White ibis <i>Eudocimus albus</i>	SSC			G5S4	2	Tier1
Wood stork <i>Mycteria americana</i>	FT	LE		G4S2	2	Tier1
Brown pelican <i>Pelicanus occidentalis</i>	SSC			G4S3	None	Tier1
Least tern <i>Sterna antillarum</i>	ST			G4S3	None	Tier2
MAMMALS						
Florida manatee (<i>Trichechus manatus latirostris</i>)	FT	LE		G2S2	13	Tier1

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 out-compete, displace or destroy native species and their habitats, often because they have been released from the natural controls of their native range, such as diseases, predatory insects, etc. If left unchecked, invasive exotic plants and animals alter the character, productivity and conservation values of the natural areas they invade.

Plants

The Indian River Lagoon Preserve State Park is heavily invaded with non-native plants and are present in all natural community types on the park. At least 43 plant and 10 animal non-native species have been found onsite. A list of non-native plant species is included in Table 3. Non-native animal species are discussed in the text and listed in Addendum 5. According to the Florida Exotic Pest Plant Council, 13 of these plant species are considered Category I and an additional 11 are considered Category II invasive exotics (FLEPPC 2011). The most problematic exotic plant species in terms of extent of coverage and cost of treatment are Brazilian pepper, Australian pine, rosary pea, Guinea grass and cogongrass.

Brazilian pepper (*Schinus terebinthifolius*): Brazilian pepper, a FLEPPC Category I invasive exotic species, is widespread throughout the Indian River Lagoon Preserve State Park. It is especially prevalent on the islands in the Mullet Creek Islands parcel, and in disturbed areas such as the inactive groves and impoundments in the Inlet Grove parcel. Brazilian pepper has invaded all of the natural community types and ruderal areas on the park to varying degrees. High infestations (over 50 percent cover) occur within the impoundments and on the islands, accounting for roughly 127 acres, or roughly 31 percent of the total acreage of the park.

Treatment of Brazilian pepper on the islands and in the impoundments will be costly due to the difficulty of accessing the areas with staff and equipment.

Australian pine (Casuarina equisetifolia): Australian pine, another FLEPPC Category I invasive exotic species, is also widespread throughout the Mullet Creek Islands parcel and in the impoundments at the Inlet Grove parcel. At Inlet Grove, it was also planted in numerous dense windrows around the edges of the citrus groves. Many of the windrows are adjacent to residential neighborhoods. Mature Australian pine trees fall easily during storm events due to their shallow roots and dense, heavy wood. This poses an additional management concern given the proximity of private residences. The area with over 50 percent cover of Australian pine is estimated to be approximately 87 acres, or roughly 21 percent of the total acreage of the park. Treatment of Australian pine on the islands and in the impoundments will also be costly due to the difficulty of accessing the areas with staff and equipment. Within the groves, the existence of berms, ditches, powerlines and nearby residences will make removal of the pines extremely challenging.

Rosary Pea (Abrus precatorius): Rosary pea is Category I invasive exotic vine that can be found in the intact Maritime hammock of the Church property on the western side of the park. There are five main infestation areas that were discovered and treated in May 2011 with FWC Mosquito Coastal Working Group funding with the project being called MC111. The distribution of the species appears to be limited to the hammock in .25 to .5 acre infestations.

Guineagrass (Panicum maximum): Guinea grass is a Category II FLEPPC invasive exotic grass that has begun to take a foothold in the abandoned fields in the park where there were once citrus groves. This species has been spreading throughout these open areas due to the use of mowing equipment.

Cogongrass (Imperata cylindrical): Cogongrass can be found throughout the uplands in the abandon fields north of Mullet Creek Rd in the Inlet Grove parcel. This species has been spread by the use of mowing equipment and from the soil grubbing machines used to remediate the soil contaminates. Total area that is infested with this species is approximately three acres.

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 2011). The table also identifies relative distribution for each species and the management zones in which they are known to occur. An explanation of the codes is provided following the table. For an inventory of all exotic species found within the park, see Addendum 5.

Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species			
Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
PLANTS			
Silktree, mimosa <i>Albizia julibrissin</i>	I	2	All zones
Rosary pea <i>Abrus precatorius</i>	I	3	5
Australian pine <i>Casuarina equisetifolia</i>	I	2	1-5, 7,8,10-15
Carrotwood <i>Cupaniospis anacardioides</i>	I	1	5
Air potato <i>Dioscorea bulbifera</i>	I	2	2,5
Golden pothos <i>Epipremnum pinnatum</i>	II	1	
Mahoe, sea hibiscus <i>Hibiscus tiliaceus</i>	II	1	
Lantana <i>Lantana camara</i>	I	3	2-4,7-10
Cogongrass <i>Imperata cylindrica</i>	I	2	2-4,7,8
Chinaberry <i>Melia azedarach</i>	II	1	
Guineagrass <i>Panicum maximum</i>	II	4	2-4,7-10
Torpedo grass <i>Panicum repens</i>	I	3	2-4,7-10
Guava <i>Psidium guajava</i>	I	2	
Rose natalgrass <i>Melinis repens</i>	I	3	2-4,7-10
Castorbean <i>Ricinus communis</i>	II	2	2-4,7,8
Mexican Petunia <i>Ruellia brittoniana</i>	I	1	2,3
Bowstring hemp <i>Sansevieria hyacinthoides</i>	II	1	
Umbrella tree <i>Schefflera actinophylla</i>	I	2	10
Brazilian pepper <i>Schinus terebinthifolius</i>	I	5	1-15
Twoleaf nightshade <i>Solanum diphyllum</i>	II	1	
Oyster-plant <i>Tradescantia spathacea</i>	II	2	2-6

Common and Scientific Name	FLEPPC Category	Distribution	Management Zone (s)
Burrnut <i>Tribulus cistoides</i>	II	1	
Creeping oxeye <i>Wedelia trilobata</i>	II	1	3
Grapefruit <i>Citrus x paradisi</i>	II	2	2,3,4,7-10

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.

Monitoring and treatment efforts for invasive exotic plant species are on-going. Efforts are underway to GPS and map all locations of exotic plants in the park. Since the park has no staff or funding, all exotic control efforts are performed by staff from Sebastian Inlet State Park and from the district office in Apopka. A majority of the funding and labor to control exotic plant on this park have come from grant funding provided by the FWC invasive plant program and its predecessor, BIPM (Bureau of Invasive Plant Management, DEP). DRP has been successful in obtaining over \$360,000 in exotic plant removal funding since 2004 when DRP became the lead managers of this property.

Many of the documented exotic plant species onsite are ornamentals that occur around the old home sites and near the urban interface along the eastern perimeter of the park. Control efforts will not focus on most of these species unless they show signs of spreading. Most of these plants will be removed and replaced with native species during restoration activities

Grapefruit (*Citrus x paradisi*), was one of the most widespread species on site, historically occurring on 134 acres of the Inlet Grove site. The grove produced one of the sweetest ruby red grapefruit that existed on the barrier island. Fruit from the grove was shipped overseas to the Japan where they were sold for up to \$10 per fruit. In 2001-2003, 73 acres of the grove was being actively managed under a ten year agreement with The Nature Conservancy and approximately 61 acres of the grove has been abandoned due to poor quality trees, low productivity and poor growing conditions. Abandoned grove quickly became invaded by exotic plants and old field weeds. While plans were being made to manage the abandoned grove, additional parts of the active grove began to die which further showed the need for a major replanting exercise. The decision was made to abandon active grove

management on the Inlet Grove parcel because it proved to be problematic and unprofitable due the cost of replanting and reestablishing the grove.

In late 2003, citrus tree removal began to the threat and potential spread of citrus canker to other groves in the nearby areas. A brontosaurus mowing machine was used to grind down the trees and the surrounding exotic vegetation, with only mulch and the below ground root system remaining. This effort continued until 2008 when all but only a few citrus trees remained.

Animals

Exotic animal species include non-native wildlife species, free ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to exotic animals, DRP actively removes exotic animals from state parks, with priority being given to those species causing the 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 raccoons, venomous snakes and alligators that are in public areas. Nuisance animals are dealt with on a case-by-case basis in accordance with 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.

Non-native animal species present on the Indian River Lagoon Preserve State Park include the Cuban tree frog, brown anole, Mexican bromeliad-eating weevil, European honeybee, nine-banded armadillo, fire ant, European Starling and the Eurasian Collared Dove. These species are most abundant in the park's altered landscapes. Due to the close proximity of residential neighborhoods, it is possible that feral cats, house mice, Norway rats and black rats may also occur onsite. Feral hogs have not been documented on the park, and no hog damage has been observed. Hogs are not known to occur on other nearby conservation lands on the barrier island.

The main nuisance species identified on the park are salt marsh mosquitoes (*Ochlerotatus taeniorhynchus* and *Ochlerotatus sollicitans*). Lands around the park are densely populated and these species of native mosquitoes are aggressive biters of humans, as well as vectors for a number of different diseases such as West Nile Virus. Control of these species is conducted by the Brevard County Mosquito Control District, primarily through impoundment management and is necessary for the health and comfort of residents (O'Bryan and Mason 2003). Flooding the impoundments during the summer months when mosquitoes are active limits the availability of ovipositing sites, thereby limiting the number of hatching mosquitoes. During times of the year when mosquitoes are less active, water levels in the impoundments will be allowed to fluctuate with lagoon levels to mimic natural

marsh conditions. This mosquito control method greatly reduces the need to use insecticides that may harm the natural communities surrounding the impoundment area (Rey and Rutledge 2001). Pesticide applications will be conducted under an approved arthropod control plan developed by the Mosquito Control District and approved by DRP. This plan limits the types of pesticides and control methods able for use on state conservation lands.

Cultural Resources

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

Condition Assessment

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

Level of Significance

Applying the criteria for listing in the National Register of Historic Places involves the use of contexts as well as an evaluation of integrity of the site. A cultural resource's significance derives from its historical, architectural, ethnographic or archaeological context. Evaluation of cultural resources will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district),

NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

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

Pre-Historic and Historic Archaeological Sites

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

Description: Florida's coastal areas, especially uplands contiguous with water, often have a rich history of human settlement. The history of the park was collected from various sources including, *Crossroad Towns Remembered: A look back at Brevard and Indian River Pioneer Communities*, authored by Weona Cleveland, *Uses of the Indian River Lagoon*, a Technical Report prepared by Woodward-Clyde Consultants (1994), Master Site File records and artifacts, research into deeds and transactions at the Brevard County courthouse, and interviews with local area residents. These references attest to more than nine cultures and nine site types represented in the vicinity of the current park boundary. Cultures represented in the vicinity of park include Prehistoric (unspecified), Malabar II, American, Depression/New Deal, St. Johns, Jaega and Ais. Site types documented near the park include campsites (prehistoric), prehistoric burial mounds, prehistoric shell middens, prehistoric middens, ceramic scatter, and historic wells. Cultures like the Jaega and Ais were nomadic people who lived in small communities and roamed throughout the Southern Lagoon with little impact to the natural resources.

Spanish Exploration in the 1500s and English Colonization in the 1700s, encouraged permanent settlement and cultivation of the land. The earliest record of pioneer activities in the Inlet Grove area was around 1883. Brevard County records indicate that Mr. George Ensey of Tropic, Florida owned land in the area. Mr. Ensey was one of the largest pineapple growers in the area, and purchased pineapple "slips" from the West Indies for planting and resale (Shofner 1995). By all accounts, Mr. Ensey was probably the first person to cultivate the Mullet Creek area by planting pineapples. In 1886, Mr. Charles Horne of Cincinnati, Ohio, purchased 170 acres from Mr. Ensey. There is no record that either man resided on the property. Sharecropping was a popular form of crop production at that time, so it is likely that both men visited occasionally to oversee sharecropping activities.

Mr. Horne continued growing pineapples on the property until a freeze in 1894. After that, most growers opted not to replant pineapples, but instead planted more cold tolerant crops such as hemp, vegetables, citrus and guava. Mr. Horne expanded farming operations in 1913 when he acquiring the final 60 acres that would become Inlet Grove. After his death, Mr. Horne's widow, Kate Horne, sold the property to D. St. Clair Nisbet in 1923. In 1925 John A. Rostan, a trustee of the Nisbet property, sold the property to John (Johnny) H. Evans and Associates.

John Evans was a local entrepreneur who purchased numerous properties in Brevard and Indian River Counties for agricultural uses. Mr. Evans was responsible for establishing the citrus grove and irrigation system on Inlet Grove, erecting the barge landing and ferrying the harvest to the mainland. His company, renamed Florida Gold Citrus Corporation, continued to improve conditions at the grove for the next 20 years. Aside from a squatter who worked for a local fish camp named Honest Johns, no residences occurred on Mullet Creek Islands. Latham Island, one of the four Mullet Creek Islands, was used to raise hogs for the family and guests at the nearby Oak Lodge.

From 1945 to 1951, Triple E Development Corporation purchased approximately 300 acres from Florida Gold Citrus Corporation. Triple E Development Corporation was quickly bought out by the Deerfield Citrus Corporation, who then sold the property to the Deerfield Partnership in 1987. The Deerfield Partnership continued citrus production on Inlet Grove until it was sold to State of Florida in 2001.

Condition Assessment: The DHR maintains a Master Site File that documents many of Florida's archaeological and historical features. A review of information obtained from the Florida Master Site File (FMSF) in July of 2011 disclosed seven archeological and historical sites to be within or near the Indian River Lagoon Preserve State Park. Of these, two sites are within the park and five sites are near the park. Both sites found within the park boundary are located in the same general vicinity on the Indian River Lagoon near the mouth of a tidal creek. One is a prehistoric shell midden (8BR121) and the other is a 1930s Citrus Barge Dock (8BR2316). Two other archeological sites, the Fuel Depot and the Central Pumphouse are currently not FMSF registered sites. These sites are remnants of support facilities from the old citrus operation.

Historic alteration of the topography in the park has caused substantial changes, especially in the Inlet Grove parcel over time that has affected the condition of the two historical sites. Road construction, drainage ditching and mosquito ditches and impoundments, soil grubbing, borrow pits and berms are all evident alterations through time. Mullet Creek islands were completely altered by the dredging of channels in the 1950s, including the creation of new land and islands. The prehistoric shell midden site 8BR121 was originally recorded by Irving Rouse in 1951 and is considered to be in poor condition. Rouse's description of the site as described by Collins et. al. (2010) is a shell midden on the east side of the Indian River, 12.6 miles from the Melbourne Bridge. The site is located right near the water on a small cove off the Indian River Lagoon. Rouse also states that the dense

midden had been scavenged for its shell resources with an area of about one-acre with four to six feet of shell remaining (Collins et. al. 2010). Some of the material most likely was used to build the Citrus Barge Dock (8BR2316) and to build up low areas and roads throughout the Inlet Groves. The site is evaluated by the SHPO as ineligible for the NRHP. Archaeological surveyors recently tried to relocate the site within the area listed with the FMSF, and found no sub-surface or surface indication of the midden within the defined area (Florida History LL 2008). The Citrus Barge Dock BR2316 is a recently documented site that contains building remains from the 20th Century (Florida History LLC 2008). The site was evaluated by the surveyors as ineligible for listing on the NRHP and is considered to be in poor condition. Native and exotic vegetation has grown through most of the structure. Removing the above ground vegetation may prove valuable in protecting the site but it may expose the structure to more of the elements therefore increasing the level of deterioration.

Besides the preserve-level 1 survey that was conducted by Florida History LLC (2008) to locate cultural resources, there are other surveys conducted within the area or close-by to the preserve boundary. A pre-GIS predictability model for six selected areas including the Indian River Lagoon region found seven new archaeological sites and re-visited 75 previously recorded sites (Collins et. al. 2010). Factors in the area found to be associated with site location and settlement patterning were elevational crest areas associated with dune lines along the ocean areas, relative elevation, and lagoon and river resource exploitation areas (Collins et. al. 2010). Many of these locations were first identified during surveying the Indian River archaeology by Irving Rouse. To the north of the Indian River Lagoon Preserve State Park, CARL archaeologists conducted site assessment and archaeological survey at the Archie Carr Sea Turtle Refuge property in Brevard County (Collins et. al. 2010).

Based on information received from the Master Site File, it is possible that additional cultural resources are present on the park, especially in areas that have been acquired recently or in areas where vegetation is dense. The fuel depot consists of a large metal drum suspended up on at concrete stand where the structure next to it was demolished in 2004. The central pumphouse was an old wooden structure approximately 8ft by 8ft used to cover the well head and the pump that ran the well. The structure was also removed and the well was capped in 2004.

Level of Significance: Indian River Lagoon Preserve State Park contains two recorded archaeological sites, both of which have been determined ineligible for listing on the National Register of Historic Places by the State Historic Preservation Officer. The shell midden (8BR121) has not been securely relocated, and was reported as being heavily damaged by shell mining activity in the first half of the twentieth century. The citrus barge dock was potentially significant for its association with Brevard County's early 20th century citrus industry; however, its deteriorated condition undermines its eligibility. Additionally, the park possesses several additional recently recorded historic structures and archaeological sites also associated with the citrus industry whose significance has not been evaluated yet.

No sites listed on the National Register of Historic Places occur within the Indian River Lagoon Preserve State Park.

General Management Measures: No specific management measures are suggested for sites 8BR121, 8BR2316, fuel depot, or the central pump house at this time due to their condition and lack of significance. However, it may prove to be valuable to consider removing some of the vegetation that has grown up through the Citrus Barge Dock 8BR2316 site if the park deems it valuable to use it as an interpretive site. If vegetation removal is deemed to be necessary for the long term protection of the site, it is recommended that only a small area is removed in order to evaluate the success of the removal. Removing vegetation that was once shielding the structure from the elements may increase the rate of decay of the site.

Historic Structures

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

Description: Indian River Lagoon Preserve State Park contains four historic structures that have not been evaluated yet for significance. All of these structures were built in the 1950s to support the citrus groves that once occupied a majority of the uplands in the park. These structures include a maintenance building, a pesticide storage building, and two PTO driven pumps used to dewater the site in the event of heavy rains. All structures remain intact in some shape or form. Other structures were demolished in 2004-2006 little to no material remains of the structure.

No pictures or documentation exists for the demolished structures but a number of staff members recall what these structures looked like. The small white house was located just north of the intersection of Mullet Creek Road and Old Florida Drive and consisted of a single story house with a garage situated on a slightly elevated knoll within the grove. The orange house was located on the south side of Mullet Creek Road, just past the PTO weir structure. The small wood house appeared to be built in the 1940s and was raised off the ground on bricks due to the low lying landscape that was prone to flooding. Banana trees, sugarcane and some ornamental plants can be found near the old home site. The storage barn was located 700 feet directly east of the south end of the north mosquito impoundment and of the north PTO pump. The structure was similar in construction to that of the maintenance building without the concrete floor. It consisted of multiple pull through bays for storing equipment. The two demolished pump houses were five feet by five feet structure that was all wood and painted white. The structure was used to protect the well head pump and its associated equipment.

Approximately 300 feet to the west of the white house, along a road that begins at Mullet Creek Drive and heads north, is the fuel depot which consists of a large

rusted metal tank approximately 300 gallons elevated off the ground four feet on a concrete stand. The maintenance building and herbicide shed are still being used by the park and are located along Mullet Creek Road, 75 feet south of the road. The both buildings have a concrete slab, have a wood frame and are covered with rusted corrugated steel roofing material on the roof and sides. The maintenance building had a covered bay on the east side of the structure that has been falling down and parts of it have been removed. On the west side of the building, the covered bay is falling through. The PTO pump and weir structure are located just south of Mullet Creek Road where a channelized drainage crosses under the road. The structure consists of two large concrete gates that were used to pump water out into the lagoon during major rain events. Three main ditches terminate at and lead to this structure. On top of this structure sat a large PTO driven pump that is no longer there.

Condition Assessment: As stated above, the white and orange houses, the south pesticide storage building, a storage barn, and central and south pump houses were all demolished between 2004 and 2006. All of these structures were in poor condition at the time of demolition. The remaining 4 structures are all in fair condition as shown in Table 4. The main threat to the remaining structures are vegetation encroachment and storm events. The remaining North PTO pump and PTO pump and Weir Structure are all slated for demolition in lieu of the hydrological restoration that is proposed for the park. The weir and pumps are no longer needed to protect the citrus grove or to dewater the site.

The maintenance building and herbicide shed are both in fair condition and will be maintained in order to be used to store equipment and chemicals. The main threats to these structures are storm events and vandalism. Steps should be taken prior to a storm to secure the structure and tie down any loose boards or metal panels. Because the structures are along the road near the fence with no staff or law enforcement onsite, the structures will always be prone to vandalism and theft.

Level of Significance: All of the remaining historic structures in the park are not considered significant historical resources. They were constructed in the 1950s and have been modified many times since then. The grove for which they were built is no longer there and the weir and pumps are in disrepair and can be considered to be a safety hazard.

General Management Measures: The main threats to maintenance building and herbicide shed are storm events and vandalism. Steps should be taken prior to a storm to secure the structure and tie down any loose boards or metal panels. Because the structures are along the road near the fence with no staff or law enforcement onsite, the structures will always be prone to vandalism and theft. The weir structure and PTO pumps are slated for demolition. They are in disrepair and can be considered to be a safety hazard since they are deep and people could fall into them. BNCR will assist with the condition assessment, significance evaluation and compliance review of these structures.

Collections

There are no collections found within or held by the Indian River Lagoon Preserve State Park.

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.

Table 4: Cultural Sites Listed in the Florida Master Site File					
Site Name and FMSF #	Culture/Period	Description	Significance	Condition	Treatment
Shell Midden 8BR121	Prehistoric/unspecified	Archaeological Site	NS	G	P
Citrus Barge Dock 8BR2316	20th Century American, 1920s	Archaeological Site	NS	F	P
North PTO Pump (FMSF # pending)	20th Century American, 1950s	Historic Structure	NE	F	R
Central Pump House (FMSF# pending)	20th Century American, 1950s	Archaeological Site	NE	F	R
Fuel Depot (FMSF# pending)	20th Century American, 1950s	Archaeological Site	NE	F	R
PTO Pump and Weir Structure (FMSF# pending)	20th Century American, 1950s	Historic Structure	NE	F	R
Maintenance Building (FMSF# pending)	20th Century American, 1950s	Historic Structure	NE	F	RH
Herbicide Storage Shed (FMSF# pending)	20th Century American, 1950s	Historic Structure	NE	F	RH

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
<u>Recommended Treatment:</u>	
RS	Restoration
RH	Rehabilitation
ST	Stabilization
P	Preservation
R	Removal
N/A	Not applicable

RESOURCE MANAGEMENT PROGRAM

Management Goals, Objectives and Actions

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

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

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

Due to the level of disturbance, lack of information on historical conditions, and unfeasibility of conducting certain types of restoration activities on the park (i.e. removing mosquito control impoundment berms, removing spoiled material from Mullet Creek Islands, completing 100 percent hydrological restoration of Inlet Grove), achievable benchmarks for restoration on the park are difficult to determine. By evaluation of adjacent or nearby natural areas, evaluation of available historical information and consensus within local working groups, key long-term goals and objectives were established. These goals and objectives are presented and discussed in the following sections.

Funding will be the primary constraint to achieving the stated goals and objectives for restoration since the park currently does not have a budget or staff of its own. Funding levels required to fully restore all areas is unknown; however, costs are expected to range upwards of 10 to 15 million dollars. Restoration of altered communities will require a significant portion of that total. Restoration of park will only be realized through use of alternative funding sources such as grants, cooperative partnerships and mitigation funds.

Natural Resource Management

Hydrological Management

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

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

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

Before initiating any hydrological restoration activities, a comprehensive hydrological study will be needed in order to identify priorities and ensure that off-site development and on-site resources will not be negatively impacted. Based on preliminary assessments and some localized modeling, the proposed methodology for restoration will be to partition the Inlet Grove parcel into several compartments or hydrological units. This will permit hydrological and community restoration to proceed without negatively impacting future restoration efforts.

A majority of the park and its surroundings have been heavily impacted by human alteration. Because of these alterations, it will be difficult to restore the natural communities back to what they once were. The restoration process will take many decades to complete and will require millions of dollars. Partnerships with local land management agencies such as Brevard County Recreation and Parks, the Brevard County's EEL (Environmentally Endangered Lands) program, and SJRWMD along with permitting agencies such as the United States Army Corps of Engineers and DEP will all be needed in order to tackle and complete the restoration needed onsite.

Opportunities for hydrological restoration on Mullet Creek Islands are limited. Restoration via filling most likely will not be an option. Backfilling the canals dug through the islands with the deposited spoil is not considered a viable option due to the anticipated costs, regulatory constraints to dredge and fill in an aquatic preserve, and consensus among the local management partners that there would be minimal environmental benefit. These features do allow manatees and dolphins to use this area. In addition, most of these channels are used for navigation and they provide access to areas that would otherwise not be available for recreation. Therefore, no hydrological restoration is proposed for this area at this time.

Objective: Restore natural hydrological conditions and function to approximately 40 acres of maritime hammock and abandoned field.

There are many ditches that extend throughout the upland and wetlands at Indian River Lagoon Preserve State Park. Each of these ditches or ditch networks serves a particular purpose and function that may make it impossible to fill and restore areas surrounding them.

Historically, the citrus groves were actively dewatered with pumps that discharged water from the perimeter ditches out into the lagoon. This practice has been discontinued, and presently only passive dewatering of the groves occurs via the existing drainage ditches and culverts. These ditches hydrologically protect the uplands from the impounded mangrove swamp, which protected the citrus trees from saltwater intrusion. A majority of these ditches can be filled, especially those within the interior of the park. Filling and removing some of the perimeter ditches have proven to be challenging and difficult.

There is a large perimeter ditch that runs along the boundary of Honest Johns Fish camp toward the southwestern portion of the property. This ditch catches the surface water run-off from the park and directs it to the south through ditches to the lagoon. This ditch also is tidally influenced and fills up with brackish water during high tide bring and with it a variety of lagoon fauna. In order to restore historic westerly sheet flow patterns in this area, the ditch would have to be filled which is not possible at this point in time. This ditch most likely will need to remain in order to catch surface water and direct it to other areas in the park.

Other eastern perimeter ditches run along the border of Floridana Beach subdivision which may be collecting stormwater from the neighborhood. It may be difficult to

fill this ditch at this time unless it can be proven in a hydrologic model that it is safe to do so.

There is a large channel that comes up through the park from the south to Mullet Creek Road and terminates at a large concrete weir structure next to the road. Beyond the road, a brackish to freshwater ditch/wetland extends for 1500 feet to the north. Historically, a great deal of the sheet flow from the area of the Floridana Subdivision would flow into the wetland and out to the Indian River lagoon, but when the ditch network and weir structure were constructed, the connection was severed. The weir structure control boards have been removed, allowing a more natural exchange of fresh and salt water to occur in this area.

There are several cross ditches that extend across the impoundments, some of which may be suitable for restoration. Restoration of these ditches will be evaluated with the management partners and as part of the comprehensive hydrological study. If possible, these areas will be restored back to mangrove swamp or salt marsh communities.

Natural Communities Management

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

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

Prescribed Fire Management

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

All prescribed burns in the Florida state park system are conducted with authorization from the FDACS, Florida Forest Service (FFS). Wildfire suppression activities in the park are coordinated with the FFS.

Presently the Indian River Lagoon Preserve State Park contains no fire dependent communities. Likewise, community types expected after restoration is completed will not be fire dependent. A small depression marsh does exist on the south side of the park but most likely was maintained by hydrology and not fire since it was historically surrounded by maritime hammock. The physiognomy of barrier island plant communities in this part of Florida is thought to be primarily dependent on

their interaction with the physical processes of sand movement, salt spray deposition, erosion, accretion, and overwash (Johnson and Barbour 1990). While the effects of these processes are somewhat diminished along the lagoon side of the barrier island, particularly where the islands are broadest, effects to plant community composition and structure remain observable. Forested communities such as maritime hammock or hydric hammock on barrier islands typically occur on stabilized coastal dunes and swales (FNAI 2010). Natural fire may periodically occur in some of the more pyric community types on the barrier island, such as coastal grasslands or coastal strand. However, the wet to mesic conditions found in mature hydric and maritime hammock typically inhibit natural fires (FNAI 2010). Therefore, fire management is not considered a requirement to maintain plant community structure or biodiversity on the park and will be only used to remove debris prior to natural community restoration.

Natural Communities Restoration

In some cases, the reintroduction and maintenance of natural processes is not enough to reach the natural community desired future conditions in the park, and active restoration programs are required. Restoration of altered natural communities to healthy, fully functioning natural landscapes often requires substantial efforts that 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, small-scale vegetation management and so forth.

Following are the natural community/habitat restoration and maintenance actions recommended to create the desired future conditions in the historic salt marsh and maritime hammock communities (see Desired Future Conditions Map).

Objective: Restore 10.5 acres of historic salt marsh in the south central corner of the park.

There is a large channel that comes up into the park from the lagoon to the south and extends to Mullet Creek Road and terminates at a large concrete weir structure next to the road. Beyond the road, a brackish to freshwater ditch and wetland extends for 1500 feet to the north. Historically, this ditch was salt marsh a few hundred feet in width that extended from the Indian River lagoon north to Floridana Beach subdivision. The salt marsh was channelized in the 1950s and the dewatering

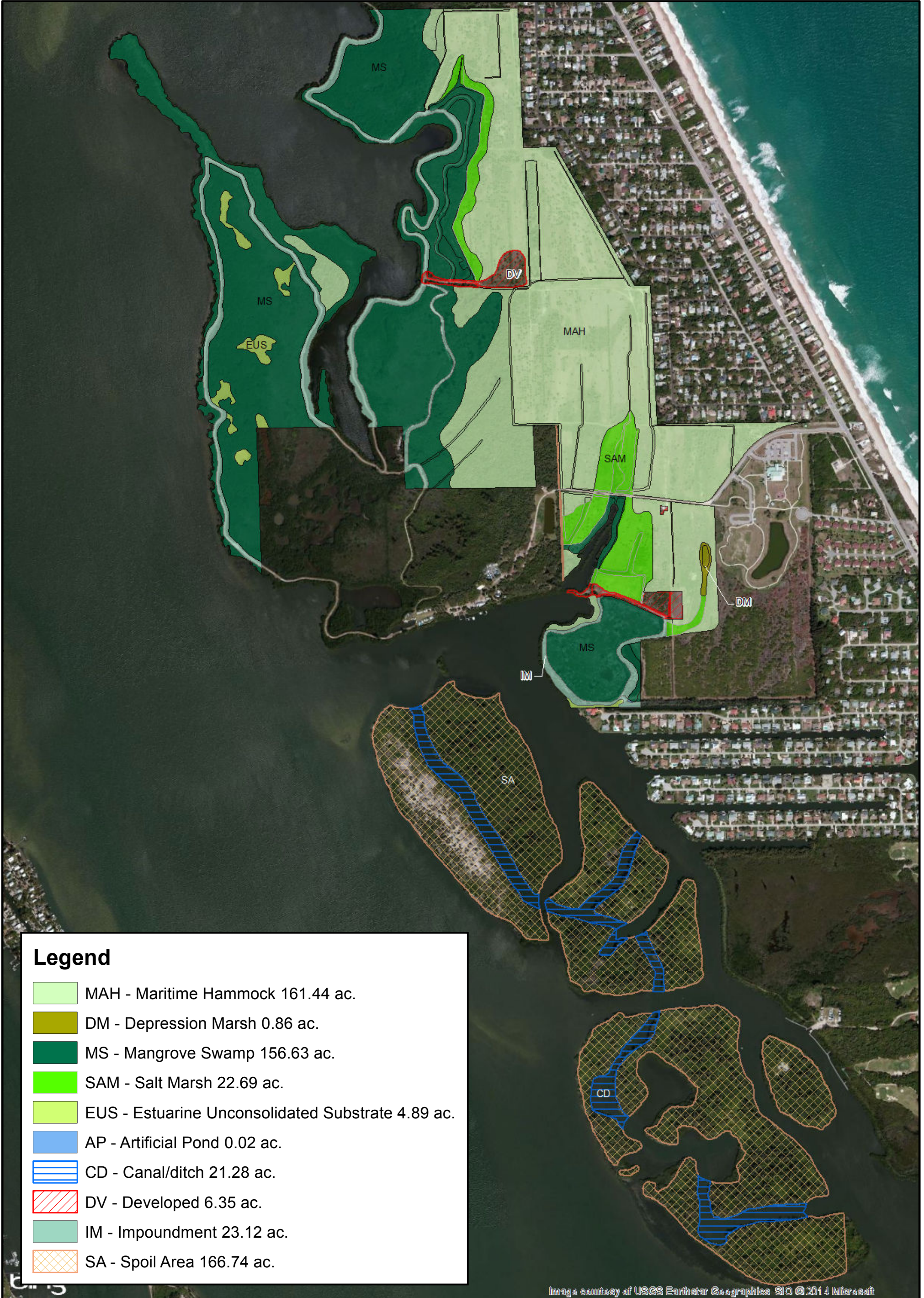
and topographic modifications to the remaining marsh continued for 30 years after the initial channelization. A great deal of the material that was at the bottom of the marsh or old tidal creek was brought up onto the uplands to construct long earthen berms or to raise the elevation of surrounding areas. The berms were constructed to keep salt water and tides out of the uplands. These berms are most visible on the eastern side of the channel, south of Mullet Creek Road where it extends from the road south to the lagoon at the old grove loading pier.

DRP staff have been working on a restoration plan for six years that would restore this marsh and the surrounding areas to resemble a more natural appearance. Through the use of the mitigation process, a private consulting firm has developed a plan that DRP and the SJRWMD feel will restore the historic salt marsh and its surrounding uplands to the greatest degree allowable by reestablishing tidal flow into the area, removing exotic plants, and replanting with native salt marsh species. Because Indian River Lagoon is an outstanding waterway, impacts to the lagoon have to stay to a minimum during the pre and post construction phases. This will limit construction and ditch filling to the areas north of Mullet Creek Road and to the existing water level line along the lagoon.

At this time, it has been determined that filling the channel south of Mullet Creek Road would be problematic. There would be many impacts to the current wetlands and lagoon which includes the flora, fauna and water quality. The restoration plan also includes enhancement and restoration to upland habitats that would be adjacent to the salt marsh habitat. These enhancements would include but are not limited to: ditch filling, topographic modifications, reestablishment of historic sheet flow patterns, reestablishment of tidal flow, maritime hammock habitat creation and plantings, and a large irrigation pump system that would water the plantings. All of the proposed area is to be kept in a less than 10 percent exotic state for the entire length of the project which is estimated to be between 5 to 15 years. The maritime hammock restoration portion of this project is discussed further in detail in next objective.

Objective: Convert 4.45 acres of ditch and canal to mangrove swamp to the greatest degree practical.

There are numerous ditches and canals that currently exist along the border of the uplands and the Indian River Lagoon. Grading and filling these areas back to a natural grade and then replanting with mangrove will restore these areas back to a more natural appearance and allow tidal flow into the adjacent marshes.



Legend

- MAH - Maritime Hammock 161.44 ac.
- DM - Depression Marsh 0.86 ac.
- MS - Mangrove Swamp 156.63 ac.
- SAM - Salt Marsh 22.69 ac.
- EUS - Estuarine Unconsolidated Substrate 4.89 ac.
- AP - Artificial Pond 0.02 ac.
- CD - Canal/ditch 21.28 ac.
- DV - Developed 6.35 ac.
- IM - Impoundment 23.12 ac.
- SA - Spoil Area 166.74 ac.

Image courtesy of USGS Earthstar Geographics SIO © 2014 Microsoft

Objective: Convert 12 acres of abandoned field back to historic maritime hammock natural community to the greatest degree practical.

Within the current proposal to restore the salt marsh habitat near Mullet Creek Road are plans to restore 12 acres of maritime hammock. Because of over a century of extreme human manipulation of the landscape, more than just exotic plant removal and plantings will be needed to restore natural landscapes and vistas to this park. As described elsewhere in this plan, almost the entire site that was historically maritime hammock was cleared in order to be used for agricultural purposes. Ditches were dug and the site was dewatered. The current plan is to regrade the outlined areas, plant native hammock tree and shrub species, seed the area with native groundcover, and install a drip irrigation system to water the area for five years until the plants become established. Restoration of this community is contingent on funding and obtaining the necessary permits required from the permitting agencies.

Objective: Convert portions of the Mullet Creek Islands back to tidal swamp and salt marsh to the greatest degree practical.

There is consensus among the local management partners that there would be minimal environmental benefit to the restoration of the historical extent of mangrove swamp and marsh communities on Mullet Creek Islands. However, there may be a way to recreate a more natural appearance to these islands. Tidal creeks, swales and low areas at various locations can be created throughout the islands to increase habitat diversity and provide foraging and nursery areas for estuarine organisms. The tidal areas could connect to the lagoon and support mangrove swamp and marsh communities. The spoil being excavated to create these low areas could be deposited on existing spoil mounds on the islands and re-contoured to meet the restoration needs of other community types.

If such an effort is determined feasible, a detailed plan describing desired elevations, drainage patterns, and the locations of various community types will need to be developed prior to initiating any activities. Initial efforts on the islands will focus on removing considerable populations of invasive exotic plants. Heavy equipment could then be barged to the island to establish desired grades, and create tidal creeks and swales per the developed plan. Replanting natural communities would follow completion of the earthwork. Generally, the intended replanting scheme on the island would create a dense mangrove fringe around the shoreline, a mix of tidal swamp and tidal marsh communities in the creeks and swales. Over time a mix of hammock community types could be established upslope of the mangroves, and a mix of shrub scrub and coastal dune communities could be established along the dry sandy ridges.

Natural Communities Improvement

Improvements are similar to restoration but on a smaller, less intense scale. This typically includes small-scale vegetative management activities or minor habitat

manipulation. Following are the natural community/habitat improvement actions recommended at the park.

Objective: Conduct natural community/habitat improvement activities on 42 acres of intact maritime hammock.

Within the intact maritime hammock located within the Church parcel are numerous exotic plant species that have invaded and are taking over the natural community in some places. Because this is some of the best habitat that is still intact on the property, exotic plant priorities should be focused in this area.

Objective: Enhance the impounded mangrove swamp community by installing 2 culverts while determining if salt marsh restoration is feasible.

The mangrove swamp communities at Indian River Lagoon Preserve State Park are found within multiple mosquito control impoundments. Most of the mangrove swamp seen today historically was salt marsh, but because the construction of the impoundments and RIM management, marsh habitat was artificially converted to mangrove swamp due to an altered hydro-period and a differing water level. Discussions between local partners, DRP and the SJRWMD have yielded some possibilities for restoration of some of the salt marsh but restoration will be difficult. When mangrove swamp is converted to marsh, protected mangrove species will need to be removed and permanently excluded from the marsh therefore making permitting more difficult. The complete removal of the impoundment also does not seem to be a viable option to due to public health concerns because of the potential for increased mosquito production.

Most of the intact mangrove swamps are heavily invaded by invasive exotic plant species, primarily Brazilian pepper and Australian pine. Removal of these species from the swamps has proven to be difficult, mainly due to reduced access to the treatment areas. The impoundments provide access to only a small amount of the swamp, leaving a great deal of it inaccessible. The creation of tidal creeks throughout the swamp is being explored as a restoration option that could provide better access to the infested areas that need to be treated.

The reconnection of the impoundment with the lagoon would reduce or inhibit the invasion of exotic plant species by increasing salinity in the impoundments; restore physical, chemical and biological parameters back to conditions more typical of mangrove swamp/marsh communities; allow access of estuarine organisms to foraging and nursery habitats in the impounded tidal communities; and maintain salt marsh mosquito control. The reconnection effort would also be monitored to ensure desired results and determine if additional reconnection efforts or water level controls are needed.

Imperiled Species Management

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

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 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: Develop/update baseline imperiled species occurrence inventory lists for plants and animals.

DRP will continue to survey, document and record species as they are discovered and report imperiled species to FNAI. Most of the species have been discovered while on the property for another purpose. The only taxa specific survey known to have occurred was performed on fish species by the FCO. Species specific surveys would help to document species that are more difficult to identify and elusive.

Objective: Monitor and document 3 selected imperiled animal species in the park.

Gopher tortoises can be found in the drier areas of the park, along the eastern perimeter and in the abandoned fields where soils are dry and sandy. When found, tortoise burrows will be marked and GPS coordinates will be recorded in order to map the current distribution of this species in the park. This data will be valuable when beginning the upland restoration process in order to plan appropriately for the project. If tortoises need to be relocated onsite or offsite, an FWC Authorized Agent must conduct the translocation and determine where to move the tortoises. DRP will continue to work with FWC and mitigation consultants to find the best way to protect gopher tortoises at the park.

Eastern diamondback rattlesnakes (*Crotalus adamanteus*) have been found in the area of the park but none have been documented as of yet. There is a high likelihood that this species exists onsite due to the large open grassy fields that harbor a great deal of prey for this species.

Eastern indigo snakes have been observed onsite by laymen but their overall abundance and habitat utilization is unknown. When a snake is found, GPS coordinates will be recorded and a site form will be submitted to FNAI for documentation purposes.

Objective: Monitor and survey for 1 imperiled plant species in the park.

The state-endangered hand fern (*Ophioglossum palmatum*) has been documented in the remnant maritime hammock community within the park, where it was said to grow epiphytically on cabbage palms. Recent attempts to locate the hand ferns have failed, leaving its status on the park as undetermined. Surveying should focus on intact hammock community but can also expand out to include some remnant patches along the perimeter of the park and into the transition areas from hammock to mangrove swamp.

Exotic Species Management

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

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

Objective: Annually treat 3 acres of exotic plant species in the park.

All exotic control efforts are performed by staff from Sebastian Inlet State Park and from the district office in Apopka. A majority of the funding and labor to control exotic plant on this park have come from grant funding provided by the FWC invasive plant program and its predecessor, BIPM (Bureau of Invasive Plant

Management, DEP). Plant removal efforts will focus on removing invasive exotic plants from the intact maritime hammock and mangrove swamp communities while continuing to treat plants along the eastern Florida Beach perimeter line and fence. All previously treated areas will be maintained.

Objective: Implement control measures on 2 nuisance animal species in the park.

The main nuisance species identified on the park are 2 species of salt marsh mosquitoes. Control of these species is conducted by the Brevard County Mosquito Control District, primarily through impoundment management. Pesticide applications will be conducted under an approved arthropod control plan developed by the Mosquito Control District and approved by DRP. This plan limits the types of pesticides and control methods able for use on state conservation lands.

DRP will also continue to pursue methods and procedures to increase the amount of flow and flushing of water in the impoundments via reconnection methods using culverts. Management zones IR5 and IR6 contain many areas where mangrove swamp grades into the uplands, producing many pockets where water pools. These pools are used by mosquitoes for breeding purposes. DRP will continue to work with the Brevard County Mosquito Control District to determine if any additional improvements are warranted.

Cultural Resource Management

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

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

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

comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of DHR.

Objective: Assess and evaluate 2 of 2 recorded cultural resources in the park.

Both of the recorded sites that reside on the park, 8BR2316 and 8BR121, were assessed and evaluated by Florida History LLC in 2008 and Collins et.al. in 2010. Both organizations rated these sites in poor condition with neither one of them meeting SHPO's requirements for being eligible for the NRHP. DRP intends to conduct annual condition assessments on these sites. Two other sites, the fuel depot and the central pumphouse have not been evaluated but will be evaluated during the compliance review process with BNCR.

Objective: Continue to compile reliable documentation for all recorded historic and archaeological resources.

A level I archaeological survey was conducted of the park by Florida History LLC in 2008 in preparation of the soil remediation and blending project by HSA Engineers and Consultants. Within the Florida History LLC (2008) report, they described the condition of each site, evaluated the survey history of those sites and sites nearby and assembled documentation and FMSF forms for each site. Florida History LLC only evaluated the extent of the old Inlet Grove site and did not survey the Church property or any of the submerged wetland areas which could be evaluated at a later time. DRP will continue to add documentation material to its collection as it presents itself.

In 2009, DRP contracted with the University of South Florida to conduct an Archaeological Sensitivity Predictive Modeling Project which included data mining and background literature review. The project produced GIS-based archaeological sensitivity models showing areas of low, medium, and high sensitivity for each park examined, including the Indian River Lagoon Preserve State Park (Collins et. al. 2010). This model will not be used as a substitute for on the ground investigation but instead, is to be used as an effective planning tool that better target and survey areas (Collins et. al. 2010). Many pages of old surveys, maps, and data were collected during this project that will drastically improve the protection of existing cultural resources as well as those resources that have yet to be discovered.

Objective: Bring 1 of 2 recorded cultural resources into good condition.

It may prove to be valuable to consider removing some of the vegetation that has grown up through the Citrus Barge Dock 8BR2316 site if the park deems it valuable to use it as an interpretive site. If vegetation removal is deemed to be necessary for the long term protection of the site, it is recommended that only a small area is removed in order to evaluate the success of the removal. Removing vegetation that was once shielding the structure from the elements may increase the rate of decay of the site.

Special Management Considerations

Timber Management Analysis

Chapters 253 and 259, Florida Statutes, require an assessment of the feasibility of managing timber in land management plans for parcels greater than 1,000 acres if the lead agency determines that timber management is not in conflict with the primary management objectives of the land. The feasibility of harvesting timber at this park during the period covered by this plan was considered in context of 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.

A timber management analysis was not conducted for this park since its total acreage is below the 1,000-acre threshold established by statute. There are no pines or large hardwood species on the site. Historical information and observations in adjacent natural areas indicate that timber-producing species such as longleaf pine or slash pine were not important components of the flora of the barrier island. Therefore, there are no plans to replant timber producing species on the site.

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, DRP works with the local mosquito control district to achieve consensus and develop a plan. 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. 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. Currently, there is no arthropod control plan for the park. An access agreement exists between the Brevard County Mosquito Control District and the DRP for the routine maintenance and operation of mosquito control impoundments constructed prior to state ownership.

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.

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

The Indian River Lagoon Preserve State Park is not subject to a land management review because it is less than 1,000 acres in size.

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, through public workshops, and environmental groups. With this approach, 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 described and located in general terms.

External Conditions

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

Indian River Lagoon Preserve State Park is located on the Atlantic coast barrier island in south Brevard County approximately 12 miles south-southeast of the City of Melbourne in the east central part of the state. There are many resource-based recreation areas within 15 miles of the park including Archie Carr National Wildlife Refuge, Pelican Island National Wildlife Refuge, Sebastian Inlet State Park, Barrier Island Sanctuary, Maritime Hammock Sanctuary, Washburn Cove Sanctuary, Hog Point Sanctuary, Coconut Point Sanctuary, Bonsteel Park and Long Point Park (see Vicinity Map). Designated trails and byways adjacent to the park include The East Coast Greenway, The Florida

Circumnavigational Saltwater Paddling Trail and a segment of the Indian River Lagoon National Scenic Byway (See Reference Map). These lands and waters support an array of resource-based outdoor activities including swimming, fishing, surfing, canoeing/kayaking, boating, camping, picnicking, hiking, biking and wildlife viewing.

Existing Use of Adjacent Lands

SR A1A, the main road on the barrier island, is just east of the park. Land uses around the park include Maritime Hammock Sanctuary, a Brevard County managed conservation area to the north and the single family residential developments of Floridana Beach to the northeast and Sunnyland Beach to the south. South Beach Community Park, a user-oriented recreation facility managed by Brevard County, is located on the east side of the park. Honest John's Fish Camp, a private marina offering boat rentals, storage, and fishing supplies, is located on Indian River Lagoon on the southwest side of the Inlet Grove parcel. The park is bisected by Old Florida Trail which provides access to South Beach Community Park and Honest John's Fish Camp from A1A. This road effectively splits the park into two parcels, each with its own gated entrance. The park is bounded on the west by Indian River – Malabar to Vero Beach Aquatic Preserve that was established to protect the living waters of the Indian River Lagoon, a shallow lagoon estuary.

Planned Use of Adjacent Lands

Future Land Use designations around the park include Public-Conservation to the north and Residential-1 to the east and south. The Residential-1 category permits low density residential development with a maximum density of one unit per acre. Public-Conservation provides protection of environmentally sensitive areas managed by federal, state and local governments. Continued development of residential properties in the area is expected but will be very limited as the majority of lots have been developed (Brevard County Comprehensive Plan 2008).

Approximately one million people reside within 50 miles of the park, which includes the cities of Port St. Lucie, Fort Pierce, Vero Beach, Melbourne, Satellite Beach, and Titusville. Brevard County is ranked tenth and twelfth out of Florida's 67 counties in terms of total population and population density, respectively. The estimated 2010 population was 543,400 and is projected to grow another 17 percent by 2020. It is anticipated that the majority of this growth will take place on the mainland as the barrier island is largely built out.

Property Analysis

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for

recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

Recreation Resource Elements

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

Land Area

The park includes three parcels, Mullet Creek Islands, Inlet Grove Property, and Church Property. The Inlet Grove and Church Properties are accessed from State Road A1A (SR A1A) via Old Florida Trail. The Mullet Creek Islands can be accessed only by boat from the Indian River Lagoon. Upland areas account for approximately 380 acres of the park and are comprised of three types of disturbed areas (abandoned field, spoil islands, and impoundment berms) and small patches of maritime hammock.

The east side of the park consists of the 150 acre Inlet Groves parcel. The old citrus grove was cleared away and the area is now an open, sunny abandoned field interlaced with a network of shallow ditches that were used to dewater the grove. As tree cover becomes established and ditches are filled during the planned maritime hammock restoration, this area will be well suited for hiking, biking and nature study.

The majority of the 30 acres of existing maritime hammock occurs on the Church Property, to the west of Inlet Groves. These small remnants are all that remain of the original natural landscape and should be protected to the greatest degree practical. Activities with minimal resource impact such as hiking, wildlife viewing and interpretation, may be appropriate for these areas.

The Mullet Creek Islands are comprised of ten spoil areas totaling 170 acres. The islands were created in the 1950's by burying former mangrove swamp and salt marsh with dredge materials for mosquito control purposes. The islands are accessible only by boat and have become infested with exotic invasive plants. The northwestern-most island has recently been mechanically treated revealing areas that may be suitable for primitive camping by paddlers and boaters.

There are approximately five miles of spoil berms that encircle the mosquito impoundments on the west side of the park along the Indian River Lagoon. The berms, approximately 30 feet wide and six feet tall, are currently maintained by the Brevard County Mosquito Control District. They provide access for service vehicles and are well-suited for hiking and biking.

Water Area

Most of the wetlands on the property are mangrove swamp communities that were impounded in the 1950's for mosquito control purposes. Totalling approximately 150 acres, these areas are currently being managed by the Brevard County Mosquito Control District and are unsuitable for recreational activities.

Shoreline

The park has approximately 13.5 miles of shoreline on the Indian River Lagoon – four miles around the mosquito impoundments on the west side of the Inlet Grove Parcel and 8.5 miles around the Mullet Creek Islands. For the most part the shoreline is densely vegetated with very limited access to the Indian River. There are a few locations on the impoundments where it may be possible to make improvements for paddling access and wildlife viewing.

Natural Scenery

Views of the Indian River Lagoon from the park are screened, for the most part, by a dense fringe of mangroves along the shoreline. Where breaks in the screen occur, beautiful vistas of the Lagoon can be experienced from the mosquito impoundment berms.

Significant Habitat

The most significant wildlife habitat are the mangrove swamps along the shoreline of the Indian River Lagoon. This habitat is a productive nursery zone for all manner of fish. Manatees often feed in the shallow waters in and around the mangroves.

The small patches of maritime hammock are the other important habitat areas, particularly for migrating neotropical songbirds. There will be much more of this habitat in the future as restoration efforts proceed.

Natural Features

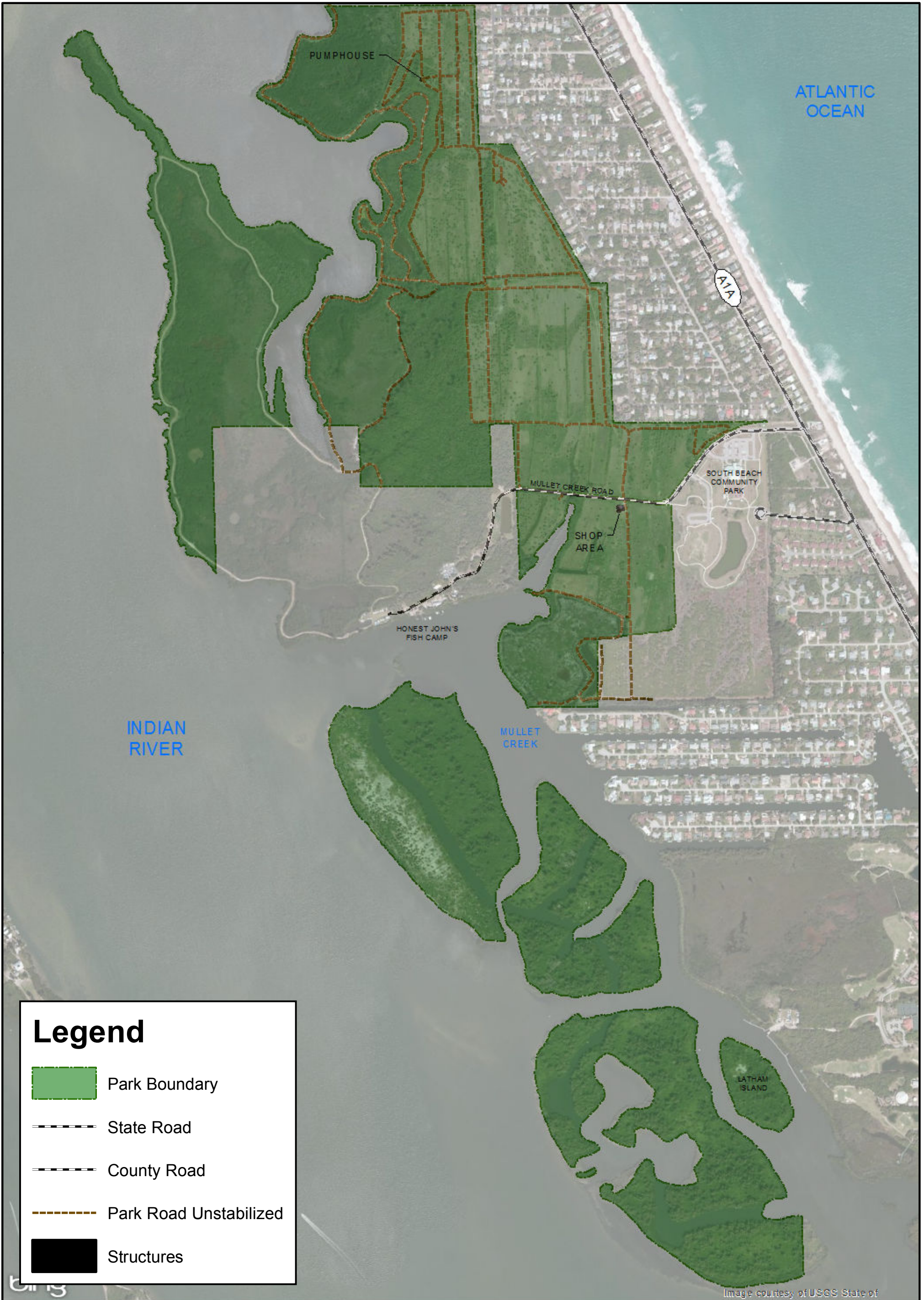
The most significant natural feature is the Indian River Lagoon. This is one of the country's most productive, diverse and commercially and recreationally important estuaries. A third of the country's manatee population lives in the Lagoon and the area is important for many migratory birds as well as for oceanic and estuarine fishes.

Archaeological and Historical Features

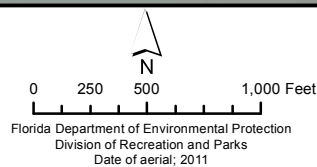
Remnants of the old orange grove and support facilities provide tangible evidence of the early Indian River citrus industry. Interpretive programming can utilize these features to tell the story of this economically important enterprise that once flourished here.

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.



INDIAN RIVER LAGOON
PRESERVE STATE PARK



BASE MAP

Image courtesy of USGS State of

Past Uses

The property has been used to cultivate a variety of crops since the late 1800's. Citrus was first planted on the site around 1925 and continued to be cultivated until acquisition by the state in 2001. In the 1950's, a series of canals was excavated through Mullet Creek Islands, subdividing the original islands into ten. Spoil from the dredging activities was deposited on the salt marsh and mangrove communities to eliminate mosquito breeding areas. The tidal swamp and marshes around Inlet Grove and Snag Point were also impounded in the 1950's for mosquito control. In 2000 and 2001, the Trustees acquired the 443 acre property and leased it to DEP's Office of Coastal and Aquatic Managed Areas (CAMA) to manage as the Indian River Lagoon State Buffer Preserve for the purpose of preserving and improving the aquatic natural communities of the Indian River Lagoon. CAMA assigned its lease to DRP in 2003 at which time the name of the property was changed to Indian River Lagoon Preserve State Park. DRP leased the Church Property from the St. John's River Water Management District in 2008, increasing the size of the park by 100 acres for a total of 553 acres.

Future Land Use and Zoning

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 opportunities. Future land use and zoning designations not clearly related to state park uses generally reflect patterns of previous ownership or a lack of specific options dedicated to accommodate such uses.

The Future Land Use designation for the park property is Public Conservation with the exception of one small parcel on the Indian River Lagoon just to the west of Honest John's Fish Camp which is classified as Residential-1. The Public Conservation category provides protection of publicly held environmentally sensitive areas managed by public agencies for conservation or preservation uses. Residential densities should not exceed one (1) dwelling unit per fifty (50) acres. Dwelling units are limited to accommodating park rangers or other authorized personnel needed to manage the property. The Residential-1 category provides for a maximum density of one (1) dwelling unit per acre.

The zoning classifications for the park include Government Managed Lands-Parks (GML-P), Environmental Areas (EA), Productive Agriculture (PA), Agricultural Residential (AU), Single Family Residential (RU-1-11), and General Use (GU). GML-P applies to the mosquito impoundments and maritime hammock just north of Honest John's Fish Camp in the Inlet Grove Parcel. EA includes the Mullet Islands and some of the mosquito impounded areas of the Inlet Grove Parcel. PA and AU apply to the old citrus grove area in the Inlet Grove Parcel. The RU-1-11 applies to an area near mosquito impoundments on the west side of the Inlet Grove Parcel near Snag Point. GU applies to a small parcel to the west the fish camp on Indian River Lagoon. Typical state park

uses and facilities are currently permissible within the land use and zoning categories.

It will be important for Division staff to participate in the review of all Comprehensive Plan amendments, proposed zoning changes and development plans in the vicinity of the park to ensure that protection of park resources is given due consideration.

Current Recreational Use and Visitor Programs

The park has recently been opened to the public so use is currently minimal. There is some hiking on the old service roads in the Inlet Grove parcel. Access to Mullet Creek Islands is limited. Some picnicking and primitive camping does occur but there are no facilities or designated access points. Recreational uses and visitor programs for the ten-year planning cycle are proposed below in the Conceptual Land Use Plan section. The collection of economic impact data will begin during the upcoming planning cycle.

Other Uses

The mosquito control impoundments located in the park along the Indian River Lagoon continue to be managed by the Brevard County Mosquito Control District in cooperation with DRP and the St. John's River Water Management District.

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 Indian River Lagoon Preserve State Park, 30 acres of maritime hammock, 150 acres of mangrove swamp, and one acre of salt marsh have been designated as protected zones as delineated on the Conceptual Land Use Plan.

Existing Facilities

Recreation Facilities

There are no recreation facilities on the property.

Support Facilities

The park's network of service roads is the primary support facility. Indian River Lagoon Preserve State Park is operated as a satellite of nearby Sebastian Inlet State Park, which has additional support facilities. There are four structures on the property including a small maintenance building, a former pesticide storage shed, and two old grove dewatering pumps. These structures, and others that have since been demolished, were built in the 1950's to support the former citrus groves. There are currently no plans to use these structures for park operations.

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 will be reassessed during the next update of the park management plan. As new information is provided regarding the environment of the park, cultural resources, recreational use, and as new land is acquired, the conceptual land use plan may be amended to address the new conditions as needed. A detailed development plan for the park and a site plan for specific facilities will be developed based on this conceptual land use plan, as funding becomes available. During the development of the conceptual land use plan, DRP assessed the potential impacts of proposed uses or development on the park resources and applied that analysis to decisions for the future physical plan of the park as well as the scale and character of proposed development. Potential impacts are more thoroughly identified and assessed as part of the site planning process once funding is available for facility development. At that stage, design elements (such as existing topography and vegetation, sewage disposal and stormwater management) and design constraints (such as imperiled species or cultural site locations) are more thoroughly investigated. Municipal sewer connections, advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Stormwater management systems are designed to minimize impervious surfaces to the greatest extent feasible, and all facilities are designed and constructed using best management practices to 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, the park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses

Public Access and Recreational Opportunities

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

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

Objective: Maintain the park's current recreational carrying capacity of 120 users per day.

The park will continue to provide opportunities for hiking and nature observation.

Objective: Expand the park's recreational carrying capacity by 304 users per day.

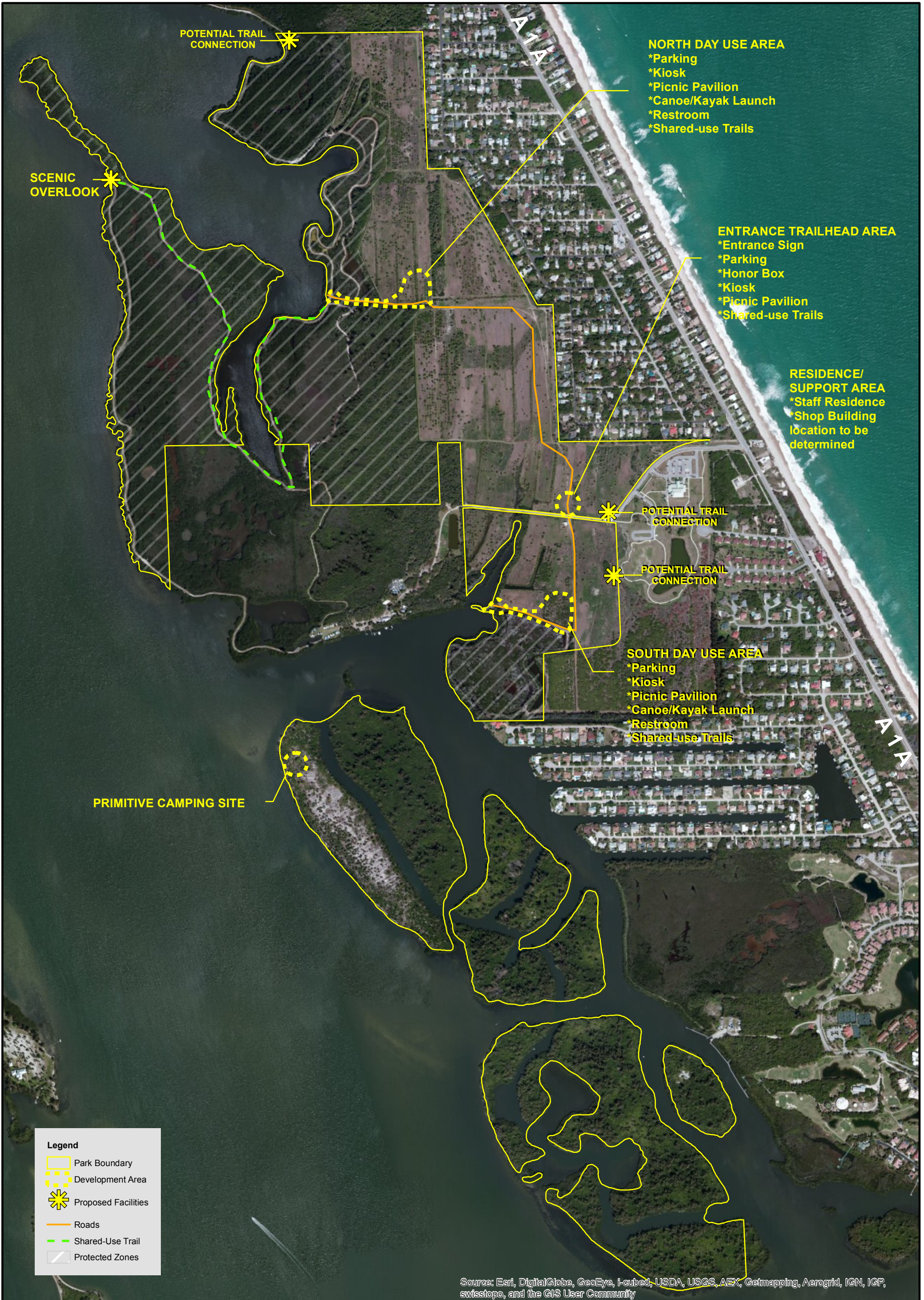
Florida's Statewide Comprehensive Outdoor Recreation Plan (SCORP) indicates that participation rates in this region for hiking, off-road biking, nature study, canoeing/kayaking, and camping are higher than the state average with demand for additional facilities increasing through 2020. To address this need, shared-use trails, camping, and paddling support facilities will be provided in the park.

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

A ranger-led tour of the park is provided by request to organized groups. Topics addressed include the natural and cultural history of the park and the planned restoration of natural communities.

Objective: Develop 1 new interpretive program.

Interpretive kiosks and wayside signs will be installed to provide a self-guided interpretive experience along future trails. The intent is to inform and educate the public about the park's natural and cultural history. Featured topics include the planned natural community restoration and the history of settlement and agriculture in the park.



Legend

- Park Boundary
- Development Area
- Proposed Facilities
- Roads
- Shared-Use Trail
- Protected Zones

NORTH DAY USE AREA
 *Parking
 *Kiosk
 *Picnic Pavilion
 *Canoe/Kayak Launch
 *Restroom
 *Shared-use Trails

ENTRANCE TRAILHEAD AREA
 *Entrance Sign
 *Parking
 *Honor Box
 *Kiosk
 *Picnic Pavilion
 *Shared-use Trails

**RESIDENCE/
SUPPORT AREA**
 *Staff Residence
 *Shop Building
 location to be determined

POTENTIAL TRAIL CONNECTION
 *Kiosk
 *Picnic Pavilion
 *Canoe/Kayak Launch
 *Restroom
 *Shared-use Trails

SOUTH DAY USE AREA
 *Parking
 *Kiosk
 *Picnic Pavilion
 *Canoe/Kayak Launch
 *Restroom
 *Shared-use Trails

PRIMITIVE CAMPING SITE

Source: Esri, DigitalGlobe, GeoEye, i-cubed, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User 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.

Currently, there are no recreational facilities in the park. New construction, as discussed further below, is recommended to provide safe, high quality recreational opportunities, to improve the protection of park resources, and to streamline the efficiency of park operations. The following is a summary of new facilities needed to implement the conceptual land use plan for Indian River Lagoon Preserve State Park:

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

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

Objective: Improve/repair 1 existing facility and 2.5 miles of road.

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

Support Facilities: It is recommended that new fencing be installed along the Floridana Beach subdivision boundary to control access and minimize encroachments for the safety, security, and protection of Floridana Beach residents, park visitors, and park resources. New fencing should also be installed along Old Florida Drive and along the eastern perimeter south of Old Florida Drive. Approximately 2.5 miles of existing service roads will need to be improved and stabilized to provide public access to new recreation areas proposed for the park.

Objective: Construct 5 new facilities and 6 miles of trail.

Entrance Trailhead Area: It is recommended that a trailhead be established on the north side of Old Florida Trail between Mullet Creek and the eastern park boundary. This facility can be phased in with the initial installation of a pedestrian gate and honor box to provide hikers and bikers access to loop trails in the north parcel. Additional trailhead amenities that can be provided in a later phase include stabilized parking for 10 to 15 vehicles, a medium picnic pavilion, and a kiosk with trail information and interpretive panels to describe natural communities restoration activities. A vehicular gate will be installed at the trailhead to provide car and truck access to the proposed north side day use area once that facility is developed.

The park has over six miles of existing unimproved two track roads associated with the old citrus grove and mosquito impoundments. Some of the old road segments will be incorporated into a new shared-use trail network that will be developed throughout the park.

The trail experience will be enhanced by providing an observation area near Snag Point where trail users can stop to enjoy scenic views over Indian River Lagoon. DRP will consider providing trail access to the park from Maritime Hammock Sanctuary and South Beach Community Park if requested by Brevard County.

North Day Use Area: A day use area will be developed on the parcel north of Old Florida Trail. This area will provide a canoe/kayak launch for paddling access to the Indian River Lagoon via Snag Harbor. Additional amenities proposed for this area include stabilized parking, a restroom, and a picnic pavilion as well as a trailhead kiosk and access to shared-use loop trails. Vehicular access to this facility will be provided through a gate at the trailhead on Old Florida Trail.

South Day Use Area: A second day use area will be developed on the parcel south of Old Florida Trail. The main purpose of the area is to provide a canoe/kayak launch for paddling access to the Indian River Lagoon at the mouth of Mullet Creek. Stabilized parking, a restroom, and a picnic pavilion will be provided as well as a trailhead kiosk and access to loop trails in this parcel. Access to this facility will be provided through a gate and honor box on Old Florida Trail.

Primitive Camping Area: It is recommended that one primitive camping area be developed in the park. The area is proposed for the Mullet Creek Islands to provide camping opportunities for boaters and paddlers. The site will accommodate up to 8 campers.

Residence/Support Area: It is recommended that a staff residence and shop building be provided to facilitate park operations and management. The most appropriate location of the residence/shop area will be determined in the future as recreational facilities are constructed and natural communities restoration gets underway.

Facilities Development

Preliminary cost estimates for these recommended facilities and improvements are provided in the Ten-Year Implementation Schedule and Cost Estimates (Table 6) 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:

Entrance Trailhead Area

Entrance sign
 Honor box
 Parking (10-15 vehicles)
 Kiosk
 Picnic pavilion (medium)

North Day Use Area

Parking (10 vehicles)
 Restroom
 Picnic pavilion (medium)
 Kiosk
 Canoe/Kayak launch
 Shared-use trail (5 mi.)
 Scenic overlook

South Day Use Area

Parking (10 vehicles)
 Honor box

Restroom
 Picnic pavilion (medium)
 Kiosk
 Canoe/Kayak launch
 Shared-use trail (1 mi.)

**Primitive Camping Area
(Mullet Creek Islands)**

Tent sites (2)

Shop Area

Staff residence
 Shop building

Parkwide

Boundary fencing
 Road stabilization

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 5).

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 5.

Table 5. Recreational Carrying Capacity						
Activity/Facility	Existing Capacity*		Proposed Additional Capacity		Future Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Trails						
Shared Use	60	120	0	0	60	120
Picnicking	0	0	64	128	64	128
Primitive Camping			8	8	8	8
Boating						
Canoeing/Kayaking	0	0	80	160	80	160
TOTAL	60	120	152	296	212	416

*Existing capacity revised from approved plan to better DRP guidelines

Optimum Boundary

The optimum boundary map reflects lands that have been identified as desirable for direct management by DRP as part of the state park. These parcels may include public as well as privately owned lands that improve the continuity of existing 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. The map also identifies lands that are potentially surplus to the management needs of DRP. As additional needs are identified through park use, development, or research, and changes to land use on adjacent private property occurs, 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.

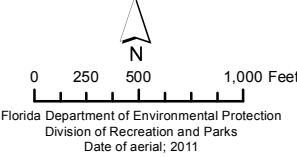
The majority of land identified on the Indian River Lagoon Preserve State Park optimum boundary map lies to the south of the Church Property. This 100-acre

area would improve park continuity and public access by connecting the western-most parcel, currently separated by a Brevard County-owned property, to the main body of the park. This area would also provide additional protection for an area of maritime hammock and it would allow for the future expansion of recreational activities on the Lagoon. Another 5-acre parcel proposed for the optimum boundary is a small area of Brevard County-owned land at the southeast corner of the Inlet Groves property. This area would provide a more efficient boundary configuration and added buffering for the proposed South Day Use Area.



Image courtesy of USGS Earthstar Geographics SIO © AND

INDIAN RIVER LAGOON
PRESERVE STATE PARK



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 Indian River Lagoon Preserve State Park in 2004, significant work has been accomplished and progress made towards meeting the DRP's management objectives for the park. These accomplishments fall within three of the five general categories that encompass the mission of the park and the DRP.

Park Administration and Operations

- Secured two AmeriCorps positions.
- Obtained funding for one OPS staff position.
- Obtained tractor for property maintenance.
- Obtained boat for Mullet Creek Islands access and protection.

Resource Management

Natural Resources

- Treated 150 acres of exotic invasive plants per year for the last five years.
- Conducted soil remediation on 80 acres of former citrus grove.
- Conducted biological inventories.

Park Facilities

- Stabilized approximately two miles of service roads.
- Installed 2,000 feet of boundary fencing.
-

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 6) 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 6 may need to be adjusted during the ten-year management planning cycle.

Table 6
Indian River Lagoon Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 1 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal I: Provide administrative support for all park functions.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Continue day-to-day administrative support at current levels.	Administrative support ongoing	C	\$120,000
Objective B	Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.	Administrative support expanded	C	\$305,000
Goal II: Protect water quality and quantity in the park, restore hydrology to the extent feasible, and maintain the restored condition.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Conduct/obtain an assessment of the park's hydrological needs.	Assessment conducted	LT	\$53,000
	Action 1 Conduct comprehensive hydrological study.	Study completed	UFN	\$40,000
	Action 2 Partition Inlet Grove parcel into hydrological units as determined by hydrological study.	Partitioning completed	UFN	\$5,000
	Action 3 Develop partnerships with local, state and federal agencies for hydrological restoration.	Partnerships developed	C	\$8,000
Objective B	Restore natural hydrological conditions and function to approximately 40 acres of watershed.	# Acres restored or with restoration underway	UFN	\$135,000
	Action 1 Restore historic sheet flow by filling ditches as determined in hydrological study.	# Miles of ditches filled	UFN	\$120,000
	Action 2 Modify culvert and weir structure at Mullet Creek Road to improve fresh and saltwater exchange in Mullet Creek as determined in the hydrological study.	Modification made	UFN	\$15,000
Goal III: Restore and maintain the natural communities/habitats of the park.		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Conduct habitat/natural community restoration activities on 10.5 acres of salt marsh in the south central corner of the park.	# Acres restored or with restoration underway	UFN	\$80,000
	Action 1 Remove exotic plants.	# Acres treated	C	\$60,000
	Action 2 Plant native salt marsh species.	# Planted	UFN	\$20,000
Objective B	Conduct habitat/natural community restoration activities on 4.45 acres of mangrove wetlands in south central corner of the park	# Acres restored or with restoration underway	UFN	\$48,000
	Action 1 Grade and fill ditches and canals.	Acres of levees graded or removed	UFN	\$40,000
	Action 2 Plant mangroves.	Acres of trees planted	UFN	\$8,000
Objective C	Restore 12 acres of abandoned field back to historic maritime hammock to the greatest degree practical.	# Acres restored or with restoration underway	UFN	\$137,000
	Action 1 Remove exotic plants.	# Acres treated	C	\$12,000
	Action 2 Regrade abandoned fields.	# Acres regraded	UFN	\$60,000
	Action 3 Plant native hammock tree and shrub species.	# Trees and shrubs planted	UFN	\$30,000
	Action 4 Seed areas with native groundcover.	# Acres seeded	UFN	\$15,000
	Action 5 Install drip irrigation system to water new plantings.	Irrigation system installed	UFN	\$20,000
Objective D	Convert portions of the Mullet Creek Islands back to tidal swamp and salt marsh to the greatest degree practical.	# Acres restored or with restoration underway	UFN	\$1,852,000
	Action 1 Remove exotic plants and other desirable species from the area.	# Acres treated	LT	\$167,000
	Action 2 Assess the feasibility of restoring all or portions of the Mullet Creek Islands.	Assesment complete	ST	\$15,000
	Action 3 Complete a detailed restoration plan for the Mullet Creek Islands describing desired elevations, drainage patterns, hydrology, soil type boundaries, and the proposed locations of various community types.	Plan complete	UFN	\$1,670,000
Objective E	Conduct habitat/natural community improvement activities on 42 acres of intact maritime hammock.	# Acres improved or with improvements underway	UFN	\$40,000
	Action 1 Complete exotic invasive plant treatment projects.	# Acres treated	ST	\$5,000

* 2014 Dollars
ST = actions within 2 years
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C = long term or short term actions that are continuous or cyclical
UFN = currently unfunded need

Table 6
Indian River Lagoon Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 2 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.					
	Action 2	Retreat previously treated areas of exotic plants as necessary.	# Acres treated	C	\$35,000
Objective F		Enhance the impounded mangrove swamp community while determining if salt marsh restoration is feasible.	# Enhancements implemented	ST	\$9,000
	Action 1	Install 2 culverts to reconnect the impoundment with the lagoon	Culverts installed	UFN	\$4,000
	Action 2	Monitor the reconnection to determine the need for additional reconnections	Reconnection monitored	C	\$3,000
	Action 3	Determine the feasibility of salt marsh restoration	Feasibility determined	LT	\$2,000
Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.			Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A		Update baseline imperiled species occurrence inventory lists for plants and animals, as needed.	List updated	C	\$10,000
Objective B		Monitor and document 3 selected imperiled animal species in the park.	# Species monitored	C	\$13,000
	Action 1	Develop monitoring protocols for 4 selected imperiled animal species including gopher tortoises, Eastern diamondback rattlesnakes, and Eastern indigo snakes.	# Protocols developed	ST	\$3,000
	Action 2	Implement monitoring protocols for 4 imperiled animal species including those listed in Action 1 above.	# Species monitored	C	\$10,000
Objective C		Monitor and document 1 selected imperiled plant specie in the park.	# Species monitored	C	\$4,000
	Action 1	Develop monitoring protocols for 1 selected imperiled plant species including hand fern.	# Protocols developed	ST	\$2,000
	Action 2	Implement monitoring protocols for 1 selected imperiled plant specie including the one listed in Action 1 above.	# Species monitored	C	\$2,000
Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.			Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A		Annually treat 3 acres of exotic plant species in the park.	# Acres treated	C	\$96,000
	Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	\$16,000
	Action 2	Implement annual work plan by treating 3 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	\$80,000
Objective B		Implement control measures on 1 nuisance animal specie in the park including the salt marsh mosquito.	# Species for which control measures implemented	C	\$8,000
	Action 1	Flood impoundments during the summer months.	# Impoundments flooded	C	Brevard County
	Action 2	Apply pesticides as specified in the Brevard County Mosquito Control District approved arthropod control plan.	# Impoundments treated with	C	Brevard County
	Action 3	Continue to work with Brevard County Mosquito Control District to determine additional mosquito control improvements	# Improvements determined	C	\$8,000

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UFN = currently unfunded need

Table 6
Indian River Lagoon Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
Sheet 3 of 4

NOTE: THE DIVISION'S ABILITY TO COMPLETE THE OBJECTIVES OUTLINED BY THE MANAGEMENT PLAN IS CONTINGENT ON THE AVAILABILITY OF FUNDING AND OTHER RESOURCES FOR THESE PURPOSES.				
Goal VI: Protect, preserve and maintain the cultural resources of the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Assess and evaluate 2 of 2 recorded cultural resources in the park.	Documentation complete	LT	\$2,600
	Action 1 Complete 2 assessments/evaluations of historic sites. Prioritize preservation and stabilization projects.	Assessments complete	LT	\$1,000
	Action 2 Complete Historic Structures Reports (HSR's) for historic buildings as determined by historic site evaluations. Prioritize stabilization, restoration and rehabilitation projects.	Reports and priority lists completed	UFN	\$1,600
Objective B	Compile reliable documentation for all recorded historic and archaeological sites.	Documentation complete	ST	\$2,300
	Action 1 Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	\$2,300
Objective C	Record and document 12 cultural resources associated with the old citrus grove operation		ST	\$2,500
Objective D	Bring 1 of 2 recorded cultural resources into good condition.	# Sites in good condition	C	\$9,600
	Action 1 Design and implement regular monitoring programs for x cultural sites.	# Sites monitored	C	\$800
	Action 2 Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	\$800
	Action 3 Remove a portion of the vegetation growing through the Citrus Barge Dock and evaluate the results.	Vegetation removal completed	ST	\$8,000
Goal VII: Provide public access and recreational opportunities in the park.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Maintain the park's current recreational carrying capacity of 120 users per day.	# Recreation/visitor opportunities per day	C	\$240,000
Objective B	Expand the park's recreational carrying capacity by 304 users per day.	# Recreation/visitor	UFN	\$610,000
Objective C	Continue to provide the current repertoire of 1 interpretive, educational and recreational programs on a regular	# Interpretive/education	C	\$10,000
Objective D	Develop 1 new interpretive, educational and recreational programs.	# Interpretive/education programs	UFN	\$10,000
Goal VIII: Develop and maintain the capital facilities and infrastructure necessary to meet the goals and objectives of this management plan.				
		Measure	Planning Period	Estimated Manpower and Expense Cost* (10-years)
Objective A	Maintain all public and support facilities in the park.	Facilities maintained	C	\$240,000
Objective B	Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the	Plan implemented	LT	\$175,000
Objective C	Improve and/or repair 1 existing facility and 2.5 miles of road as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	UFN	\$725,000
Objective D	Construct 5 new facilities and 6 miles of trail as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	UFN	\$1,750,000
Objective E	Expand maintenance activities as existing facilities are improved and new facilities are developed.	Facilities maintained	C	\$370,000

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Table 6
 Indian River Lagoon Preserve State Park Ten-Year Implementation Schedule and Cost Estimates
 Sheet 4 of 4

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

Summary of Estimated Costs		
Management Categories		Total Estimated Manpower and Expense Cost* (10-years)
Resource Management		\$2,502,000
Administration and Support		\$425,000
Capital Improvements		\$2,650,000
Recreation Visitor Services		\$1,480,000
Law Enforcement Activities ¹		
	1Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.	

* 2014 Dollars
 ST = actions within 2 years
 LT = actions within 10 years
 C = long term or short term actions that are continuous or cyclical
 UFN = currently unfunded need

Addendum 1—Acquisition History

Indian River Lagoon Preserve State Park Acquisition History

Purpose of Acquisition:

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) purchased Indian River Lagoon Preserve State Park to (1) provide a buffer for existing and future land uses such as development and agriculture near the Indian River Lagoon; (2) conserve, protect, restore and manage important ecosystems in order to enhance and protect the significant surface water, recreational, fish and wildlife resources of the Indian River Lagoon; and (3) help preserve and improve the aquatic natural communities of the Indian River Lagoon which (a) are one of the country's most productive, diverse and commercially and recreationally important estuaries, (b) have a third of the county's manatee population, and (c) are important for many migratory birds as well as for oceanic and estuarine fishes.

Sequence of Acquisition:

On September 29, 2000, the Trustees obtained title to a 187.48-acre property, commonly known as "Mullet Creek Parcel", that constituted the initial area of Indian River Lagoon Preserve State Park. This property was purchased from Brevard County, Florida, for \$ 1,575,000. The purchase was funded through the Indian River Lagoon Blueways Conservation and Recreation Lands (CARL) project.

On June 1, 2001, the Trustees co-purchased a 256-acre property, commonly referred to be as "Inlet Grove Property," with the St. Johns River Water Management District (SJRWMD) to be managed as part of Indian River Lagoon Preserve State Park. On September 28, 2005, the State of Florida Department of Environmental Protection's Division of Recreation and Parks (DRP) leased a 100-acre property, commonly known as "Church Property," from SJRWMD to manage as part of the park. SJRWMD has 100% fee title interest in the Church Property.

Management Leases:

On March 16, 2001, the Trustees leased the Mullet Creek Parcel to the State of Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas (CAMA), under a fifty (50)-year lease, Lease No. 4305. On October 15, 2001, CAMA entered into a management agreement with the Trustees and the SJRWMD to manage the Inlet Grove Property as part the Mullet Creek Parcel under a 50 (fifty)-year lease, Lease No. 4336. The two leases expire on March 15, 2051, and October 14, 2051, respectively. The combined property was then known as Indian River Lagoon State Buffer Preserve. The name changed to Indian River Lagoon Preserve State Park after CAMA assigned its leasehold interest in the two Leases (Lease No. 4305 and Lease No. 4336) to DRP on December 22, 2003.

Since DRP assumed leasehold interest in Indian River Lagoon Preserve State Park, the Trustees has acquired a new parcel under Florida Forever program and added it to Indian River Lagoon Preserve State Park. DRP has also leased the Church Property from SJRWMD and added it to the park. DRP leased the Church Property from SJRWMD on September 28, 2005; this lease will expire October 14, 2051.

Indian River Lagoon Preserve State Park Acquisition History

According to Trustees, Trustees/SJRWMD, and SJRWMD leases, DRP manages Indian River Lagoon Preserve State Park for conservation and protection of natural and historical resources and resource-based public outdoor recreation which is compatible with the conservation and protection of this public property.

Title Interest:

The Trustees and the SJRWMD hold fee simple title interest in Indian River Lagoon Preserve State Park.

Special Conditions on Use

Indian River Lagoon Preserve State Park is designated single-use to provide resource-based public outdoor recreation and other park related uses. Uses such as water resource development projects, water supply projects, storm-water management projects, and linear facilities and sustainable agriculture and forestry other than (or except) those forest management activities specifically identified in this park's Unit Management Plan are not consistent with the management purposes of the park and will be discouraged.

Addendum 2—Advisory Group Members and Report

**Indian River Lagoon Preserve State Park
Advisory Group Members and Report**

Local Government Officials

Mary Bolin Lewis, Chair
Brevard County Board of
Commissioners
400 South Street, Suite 1-A
Titusville, Florida 32780

Agency Representatives

Kevin Jones, Park Manager
Sebastian Inlet State Park
9700 South Highway A1A
Melbourne Beach, Florida 32951

Charlie Pelizza, Manager
Archie Carr National Wildlife Refuge
1339 20th Street
Vero Beach, Florida 32960

Brian Sharpe, Manager
Indian River Lagoon Aquatic Preserve
3300 Lewis Street
Ft. Pierce, Florida 34981

Tina Hannon
Florida Fish and Wildlife Conservation
Commission
1231 Prairie Lakes Road
Kenansville, Florida 34739

J.B. Miller
St. John's River Water Management
District
4049 Reid Street
Palatka, Florida 32177

Henry Minneboo, Vice Chair
Brevard County Soil and Water
Conservation District
811 East Crisafulli Road
Merritt Island, Florida 32953

Tourist Development Council

Tom Bartosek
Brevard County Tourism
Development Council
430 Brevard Avenue, Suite 150
Cocoa Village, Florida 32922

Environmental Representatives

Mark Wallace, President
Space Coast Audubon Society
P.O. Box 147
Cocoa, Florida 32923

Vince Lamb
Florida Native Plant Society
Conradina Chapter
P.O. Box 1543
Melbourne, Florida 32902

User Groups

Lynette Foster, Regional Director
Indian River Region J
Florida Paddling Trails Association
2212 NW 20th Avenue
Stuart, Florida 34994

Glenn Hawks, President
Brevard Mountain Bike Association
P.O. Box 100548
Palm Bay, Florida 32910

Citizen Support Organization

Dave Pasley
Friends of Sebastian Inlet State Park
c/o McLarty Treasure Museum
13180 North A1A
Vero Beach, Florida 32963

**Indian River Lagoon Preserve State Park
Advisory Group Members and Report**

Adjacent Landowners

Robert Arthur
Honest John's Fish Camp
750 Old Florida Trail
Melbourne Beach, Florida 32951

Beth Glover, President
Floridana Beach Civic Organization
6630 Floridana Avenue
Melbourne Beach, Florida 32951

Indian River Lagoon Preserve State Park Advisory Group Members and Report

The Advisory Group meeting for Indian River Lagoon Preserve State Park was held at Sebastian Inlet State Park, Melbourne Beach, Florida on August 6, 2014. Commissioner Chuck Nelson and Ray Mojica represented Commissioner Mary Bolin Lewis. Charlie Pelizza and Mark Wallace were not able to attend. All other Advisory Group members were in attendance. Ms. Glover and Mr. Arthur sent in written comments after the meeting. Attending staff were Robert Yero, Jason DePue, Kevin Jones, and David Copps.

Mr. Copps began the meeting by explaining the purpose of the Advisory Group, reviewing the meeting agenda, and summarizing the comments from public workshop that was held the previous evening at South Beach Community Park. Mr. Copps then asked each member of the Advisory Group to express his or her comments on the draft plan.

Summary of Advisory Group Comments

Beth Glover (Adjacent Landowner - Floridana Beach Civic Association) stated that the Floridana Beach residents support natural habitat restoration in the park and passive recreation. She stated that many residents would be willing to volunteer to restore plant communities and remove exotic invasive vegetation. She recommended that the park take advantage of their volunteer services. She suggested that the Florida Park Service partner with local education institutions to obtain grants for scientific research projects in the park. Ms. Glover supports trail connectivity with adjacent county parks but recommended against paved trails. She said that trail surfacing should be similar to that used by Archie Carr National Wildlife Refuge the Brevard County Environmentally Endangered Lands (EEL) properties. Ms. Glover stated that the two day-use areas (including the canoe/kayak launches) and the primitive campsites should be removed from the plan. She said that the park should not construct new buildings and septic systems. She reiterated that passive recreation and natural habitat restoration is all that is needed in this park. Ms. Glover recommended that the potential negative impacts of hydrological restoration on the adjacent neighborhoods be assessed before moving forward with activities such as ditch plugging. She stated that she and some other neighbors know how to propagate native plants and would be willing to grow out plants such as gumbo limbo and donate them for habitat restoration.

Brian Sharpe (Indian River Lagoon Aquatic Preserve) stated that he pleased with the upland restoration goals as that will benefit the water quality in the Indian River Lagoon. He said that he understands that achieving the restoration goals is constrained by limited budgets and resources.

J.B. Miller (St. Johns River Water Management District) asked that the SJRWMD be mentioned in the Management Coordination section of the plan Introduction. He suggested that the plan clarify that the salt marsh mosquito is a native animal. He recommended that one of the day-use areas be removed from the plan. Mr. Miller said that a semi-stabilized access road to the day-use area should be adequate with the expected low level of use. He said that asphalt would be appropriate only if the

Indian River Lagoon Preserve State Park Advisory Group Members and Report

area started to experience high usage. He stated that the Mullet Creek Islands should be restored and that the plan should include this goal. He recognized the significant expense of the restoration but said that the goal should be stated in the plan just in case grant money became available at some point in the future. Mr. Miller stated that barbed wire should not be used for fencing. He recommended the four imperiled animal species that were proposed in the plan for monitoring and documenting should be replaced with the Atlantic salt marsh snake, diamondback terrapin, and the small fish known as rivulus. Mr. Miller commented that the plan was well written and that he approves of its ambitious goals.

Ray Mojica (Brevard County) said the Brevard County EEL program would be willing to discuss a possible trail connection between the Maritime Hammock Sanctuary and the park. He also stated that the county would like to explore the possibility of collaborating on resource management projects. Mr. Mojica described the special attributes of Snag Harbor and stated that this would be a good area for a canoe/kayak launch. He recommended that if a launch is constructed here that the area be well monitored/policed. Mr. Mojica stated that the park property line should be well demarcated to minimize encroachments. He recommended that the park explore the possibility of installing a park entrance with honor box to serve the Floridana Beach neighborhood. Staff stated that such an entrance would have to be available for use by the general public, not just neighborhood residents. Mr. Mojica asked how we deal with paddlers that may stay out too late and become stuck behind closed gates. Staff replied that a staff residence on site would help with this type of problem.

Vince Lamb (Florida Native Plant Society, Conradina Chapter) stated that he advocates for conservation land in Florida and wants the park to do the best job possible to provide good passive recreation in the park. He stated that he favors facilities such as boardwalks, observation decks, and canoe/kayak launches that enable visitors to enjoy nature. Mr. Lamb stated that he approves of the maritime hammock restoration described in the plan.

Glenn Hawks (Brevard Mountain Bike Association) stated that he had no comments at this time but may submit written comments after this meeting.

Tina Hannon (Florida Fish and Wildlife Conservation Commission) stated her approval of the restoration work proposed in the plan. She recommended that a hydrological assessment be completed before initiating actions such ditch plugging. Ms. Hannon stated her approval of the park's efforts to eradicate exotic invasive species and recommended that the park partner with other organizations and local groups on control efforts.

Dave Pasley (Friends of Sebastian Inlet State Park) urged the park to take advantage of volunteers and call on them to implement park projects.

Robert Arthur (Adjacent Landowner – Honest Johns Fish Camp) stated that he is worried about the park's negative impact on the privacy and security of his

Indian River Lagoon Preserve State Park Advisory Group Members and Report

property. He stated that he is also concerned about the impacts to his business from the proposed canoe/kayak launches. He stated that he is opposed to the canoe/kayak launch that is proposed for the south day-use area as it is directly across from his business and he is concerned about the competition. Mr. Arthur stated that he wants the park to figure out where the boundary is and fence and sign it. He recommended using barbed wire as it would be more effective at keeping park visitors from straying onto his property. He stated that his security concern comes from the fact that he stores boats on the property and fears an uptick in theft once the park becomes more accessible to the public. Mr. Arthur stated that he wants to see more of a staff presence in the park to improve security and visitor management. He wants to prevent situations where park visitors experience problems and come to him for help. He commented that the Snag Harbor area is a very desirable boating and paddling area.

Tom Bartosek (Brevard County Tourism and Development Council) stated that the TDC markets the ecotourism and promotes it through the "Outdoor Adventure Guide," a publication of the Brevard Nature Alliance. He stated that when the park comes to fruition that he would like to include it in this guide. He would also like to promote the park in another TDC publication called the "Space Coast Vacation Planner." Mr. Bartosek stated that he supports any of the activities in the plan that improve water quality and access to the lagoon. He recommended that the park request visitor traffic information from the Brevard County's EEL program to get an idea of the numbers of people that may be expected to use the park. Mr. Bartosek asked the park to consider septic tank alternatives such as composting toilets.

Lynette Foster (Florida Paddling Trails Association) expressed support for the canoe/kayak launches. She supports the installation of both of the launches proposed in the plan.

Kevin Jones (Park Manager) had no comments.

Chuck Nelson (Brevard County Commissioner) stated that providing public access to the park is important and that it can be done in a sensitive way that won't impact the adjacent neighborhood. He said that the restoration efforts proposed in the plan are very important and he supports their implementation.

Henry Minneboo (Brevard County Soil and Water Conservation District) suggested that the park consider alternatives other than asphalt for stabilizing the surfaces of access roads. He said that there are other options that are much better.

Summary of Written Comments

Beth Glover (Adjacent Landowner – Florida Beach Civic Association) provided written comments by email after the meeting. She stated that Floridana Beach does not want to be fenced out and that residents don't support putting up a fence between the park and the neighborhood.

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Robert Arthur (Adjacent Landowner – Honest John’s Fish Camp) provided written comments by email after the meeting. He stated that the security and impact to his property is of great concern and requested that joint boundaries be fenced, preferably with barbed wire. He stated that the canoe/kayak launch proposed on the north side to provide access to Snag Harbor makes sense but the launch proposed for the south side is unnecessary as existing launching facilities at Honest John’s Fish Camp, Aquarina boat ramp, and Jorgensen’s Landing adequately service this area. Mr. Arthur asked what measures are being taken to address accidents on the preserve and access points. He also asked if the property will be supervised 24/7 and if signage will be installed to address safety issues. Mr. Arthur said that wildfires are always a concern and stated that fire issues need to be addressed by the state if camping is to be allowed in the park, including Mullet Creek Islands. He pointed out that there is a dedicated (50 foot right-of-way) access point to the park at the end of Del Valle Street in the Floridana Beach subdivision. He pointed out that Brevard County may require the park to widen Old Florida Trail due to the generation of additional traffic on the road. Mr. Arthur offered to provide information about the park and the historical structures that were located in the old grove.

Summary of Public Comments

Nancy Higgs recommended that the park restore the Mullet Creek Islands as was the intent of the Batchelor family who originally donated the land. She stated that the exotic invasive plants should be removed at the very least. Ms. Higgs said that the park property should first be restored and protected after which public access can be provided but in a minimalist way. She urged the park to be careful and not mess up this very unique and special place.

Staff Recommendations

The staff recommends approval of the proposed management plan for Indian River Lagoon Preserve State Park as presented, with the following significant changes.

- Remove the proposed north side primitive camping area from the conceptual land use plan. The day use areas will remain as shown in the draft plan to provide access to the park’s resource-based outdoor recreation opportunities.
- Incorporate text stating that the feasibility of restoring all or portions of the Mullet Creek Islands will be assessed.

Beth Glover stated the residents of Floridana Beach do not want a fence installed along the park boundary adjacent to the neighborhood. The Division plans to move forward with installing the perimeter fencing. Language will be added to the plan stating that fencing will be installed to provide for the safety, security, and protection of Floridana Beach residents, park visitors, and park resources.

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

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Advisory Group Members and Report**

Notes on Composition of the Advisory Group

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

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

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

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Addendum 3—References Cited

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Addendum 4—Soil Descriptions

Indian River Lagoon Preserve State Park Soil Descriptions

(9) Canaveral - The Canaveral series consists of deep, moderately well to somewhat poorly drained, very rapidly permeable soils that formed in thick marine deposits of sand and shell fragments. They occur on nearly level to gentle side slopes on dune-like ridges bordering depressions and sloughs along the coast in Peninsular Florida. Slopes are dominantly less than 3 percent but range to 5 percent. These soils are found in central and southern part of Peninsular Florida along Atlantic and Gulf Coasts and is small in extent.

This type of soil type is typically found in Brevard County, Florida; in Floridana Beach, 0.25 mile west of State Highway A1A on Carman Street and 50 feet south of north turn in road.

Competing soil types are Adamsville, Broward, and Satellite series in the same family. All these soils lack shells within depths of 80 inches. In addition, Broward soils have limestone within depths of 20 to 40 inches.

Canaveral soils are on nearly level to gentle side slopes on low dune-like ridges bordering depressions and sloughs along the coast in the lower Coastal Plain. Slopes are dominantly 0 to 3 percent but range to 5 percent. The soil formed in a thick marine deposit of sand and shell fragments. Average annual precipitation is about 55 inches and the mean annual air temperature is about 73 degrees F. near the type location.

Associated soils are Anclote, Delray, Palm Beach, Paola, Pompano, St. Lucie, and Welaka series. All the associated soils except Palm Beach and Welaka soils lack shells within depths of 80 inches. Anclote, Delray, and Pompano soils are on lower elevations and more poorly drained. In addition, Anclote and Delray soils have molic epipedons. Palm Beach, Paola, St. Lucie, and Welaka soils are on higher elevations and better drained. In addition, Paola and Welaka soils have sandy B horizons with high chroma.

Soils are moderately well to somewhat poorly drained; slow runoff; very rapid permeability. Internal drainage is impeded by a shallow water table. The water table is at depths of 10 to 40 inches for periods of 2 to 6 months or more.

Most areas are in native vegetation consisting of cabbage palms, scattered sawpalmettos, magnolias, bays, and scattered slash pine with an understory of gallberry and pineland threawn. A few areas are used for building sites.

(43) Paola - The Paola series consists of very deep, excessively drained, very rapidly permeable soils on uplands. They formed in thick sandy marine deposits. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 55 inches. Slopes range from 0 to 20 percent.

This soil type was first described in Seminole County, Florida. Approximately 1.25 miles northwest of the intersection of State Road 426 and 419 in Oviedo, Florida.

Indian River Lagoon Preserve State Park Soil Descriptions

There are a few soils that compete with the Paola soil which includes the Dade, Orsino, and Welaka series in the same family. Dade soils are moderately deep to limestone. The moderately well drained Orsino soils have a water table at depths of 48 to 60 inches. Welaka soils have common to many shell fragments in the substratum.

These soils are on uplands of the Coastal Plain with dominant. They formed sandy marine deposits more than 7 feet thick. The climate is humid semitropical. Slopes range from 0 to 20 percent. The average annual temperature is about 70 to 74 degrees F., and the average annual rainfall ranges from 50 to 60 inches.

Other soils that are associated with this soil are the Astatula, Candler, Immokalee, Myakka, Pomello, and St. Lucie series soils. Astatula, Candler, and St. Lucie soils lack spodic properties. Immokalee, Myakka, and Pomello soils are on lower positions and are Spodosols.

Paola soils are excessively drained and are very rapid permeability and are primarily in forest communities. Native vegetation consists of sand pine, slash pine, longleaf pine, scrub live oak, scattered turkey oak, and bluejack oak. The undergrowth consists of cacti, mosses, lichens, creeping dodder, rosemary, and scattered saw palmetto.

(46) Hilolo - The Hilolo series consists of deep, poorly drained slowly permeable soils formed in sandy and loamy marine sediments influenced by underlying alkaline materials. They occur on nearly level areas and along borders of depressions and sloughs in Peninsular Florida. Slopes are less than 2 percent. Rainfall averages about 55 inches near the type location and is heaviest in the summer months. Mean annual air temperature near the type location is about 73 degrees F.

These soils were first typed in St. Lucie County, Florida; about 2.5 miles west of Fort Pierce; 0.25 mile south of Florida Highway 68; 0.2 mile east of Hartman Road, and 50 feet north of Delaware Avenue. NW1/4SW1/4 sec. 8, T. 35 S., R. 40 E.

There are no other series in the same family that compete with the Hilolo soil series. The Parkwood series is in a closely similar coarse-loamy family.

Hilolo soils are on cabbage palm hammocks and along borders of depressions and sloughs. Slope is dominantly less than 1 percent but ranges up to 2 percent. These soils are formed in sandy and loamy marine sediments influenced by underlying alkaline materials. Near the type location, average annual rainfall is about 55 inches and average annual air temperature is about 73 degrees F.

Soils that are associated with this series are the Bradenton, Chobee, EauGallie, Hallandale, Manatee, Pineda, Pinellas, Riviera, Wabasso, and Winder series. Bradenton, Hallandale, and Pinellas soils occur in about the same landscapes as Hilolo soils. Bradenton soils lack calcareous Bt horizons and are in a coarse-loamy family. Hallandale soils have limestone. Pinellas soils have calcareous A2 horizons

Indian River Lagoon Preserve State Park Soil Descriptions

and Bt horizons between depths of 20 to 40 inches. EauGallie and Wabasso soils occur in the flatwoods and have spodic horizons. Chobee and Manatee soils have mollic epipedons and are in low areas. Pineda, Riviera, and Winder soils are in sloughs and broad flats. Pineda soils have Bir horizons. Riviera soils have A horizons 20 to 40 inches thick and Winder soils lack calcareous Bt horizons.

These soils are poorly drained. Runoff is slow. Permeability is moderate to moderately slow in the B2tca horizon and slow to very slow in the C horizon. The water table is within depths of 10 inches for 2 to 4 months and at depths of 10 to 40 inches for 6 to 9 months in most years.

Much of the acreage of this soil has been cleared. Citrus is the major crop. Vegetables are grown in some areas. Native vegetation is primarily cabbage palm with scattered water oaks and longleaf and slash pines and an understory of wax myrtle, saw palmetto, and inkberry. Pineland threeawn is the dominant grass.

(58) Turnbull - The Turnbull series consists of very poorly drained soils formed in clayey and sandy estuarine deposits. They are near sea level and are flooded periodically by tidal overwash. These soils have organic surface layers less than 16 inches thick over clayey substratum that overlies sandy and shelly materials at depths of less than 40 inches. Slope is less than 1 percent. This soil is found along the Atlantic Coast of Central Florida.

These soils were first described in Volusia County, Florida; in a tidal marsh about 75 yards east of Bulow Creek and 50 feet northwest of connecting road between Old Dixie Highway and John Anderson Highway. Turnbull soils are in tidal marsh areas in estuaries. Elevations are approximately sea level. Near the type location, the precipitation is about 55 inches and the mean annual air temperature is about 72 degrees F.

There are no soils that are associated with Turnbull soil. The Myakka, Pomello and Wabasso series are adjacent to the tidal marsh. All these soils are mineral soils with Bh horizons, and they are better drained. Turnbull soils are very poorly drained. Permeability is very slow in the upper C horizon. Fluctuating tides overwash the surface periodically.

Turnbull soils are an important wildlife habitat. They serve as a spawning area and are an important link in the food chain of many commercial and sport fin fish as well as shellfish. Native vegetation is needlegrass rush, smooth cordgrass, bushy sea-oxeye, marshhay cordgrass, glasswort, bigleaf sumpweed, and seashore saltgrass.

(66) Bessie - The Bessie series consists of very poorly drained organic soils in coastal mangrove swamps. They formed in marine deposits of organic materials over clayey and sandy sediments. They are near sea level and are flooded daily or periodically by high tides. Slope is less than 1 percent. The Atlantic Coast of southeastern Florida. The series is of small to moderate extent.

Indian River Lagoon Preserve State Park Soil Descriptions

The type location is in Martin County, Florida; on Hutchinson Island about 2.0 miles south of the St. Lucie County line; 300 feet west of FL-A1A and 100 feet south of trail leading to Joe's Point.

Bessie soils are in tidal mangrove swamps in protected salt water or brackish water areas along the Indian River, the Intracoastal Waterway, and coastal tributary streams. Elevations are approximately at mean sea level. Near the type location, the average annual precipitation is about 57 inches and the average annual temperature is about 74 degrees F.

Competing soils types are canaveral soils which are better drained and lack organic surface layers. Drainage and Permeability: Bessie soils are very poorly drained. Runoff is slow and permeability is slow or very slow in the IIC horizon. Fluctuating tides flood the surface daily or during seasonal storm tides.

Bessie soils are an important wildlife habitat. They serve as spawning areas and are an important link in the food chain of many commercial sport fish as well as shellfish. They also serve as nesting and feeding areas for wading birds and many marine birds. Natural vegetation includes red, black, and white mangrove, bushy sea-oxeye, sea purslane, leather fern, and low growing succulents such as glasswort in more open areas.

Addendum 5—Plant and Animal List

Indian River Lagoon Preserve State Park Plants and Animals

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

Giant leather fern.....	Acrostichum danaeifolium	
Golden polypody	Phlebodium aureum	
Hand fern.....	Ophioglossum palmatum	
Resurrection fern	Pleopeltis polypodioides	
Shoestring fern.....	Vittaria lineate	
Wild Boston fern	Nephrolepis exaltata	

GYMNOSPERMS

Coontie.....	Zamia pumila	
Loblolly pine	Pinus taeda	
Slash pine	Pinus elliotii	

ANGIOSPERMS

MONOCOTS

.....	Typha domingensis	
Air-potato	Dioscorea bulbifera*	
Bahiagrass	Paspalum notatum*	
Bahiagrass	Paspalum notatum var. saurae	
Baldwin's spikerush	Eleocharis baldwinii	
Baldwin's flatsedge.....	Cyperus croceus	
Ballmoss	Tillandsia recurvata	
Basketgrass	Oplismenus hirtellus	
Bermudagrass	Cynodon dactylon*	
Southern crabgrass	Digitaria ciliaris	
Broomsedge bluestem	Andropogon virginicus var. virginicus	
Bushy bluestem	Andropogon glomeratus var. pumilus	
Cabbage palm	Sabal palmetto	
Canada spikerush.....	Eleocharis geniculata	
Cardinal airplant	Tillandsia fasciculata var. densispica	
Cardinal airplant	Tillandsia fasciculata	
Chufa flatsedge.....	Cyperus esculentus*	
Coast cockspur	Echinochloa walteri	
Coastal sandbur.....	Cenchrus incertus	
Coastal sandbur.....	Cenchrus spinifex	
Cogongrass	Imperata cylindrica*	
Durban crowfoot grass.....	Dactyloctenium aegyptium *	
Dwarf banana	Musa acuminata*	
Earleaf greenbrier	Smilax auriculata	
Elephantgrass.....	Pennisetum purpureum	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Florida airplant	<i>Tillandsia simulata</i>	
Forked fimbry	<i>Fimbristylis dichotoma</i>	
Fragrant flatsedge	<i>Cyperus odoratus</i>	
Fragrant spikesedge	<i>Kyllinga odorata</i>	
Giant airplant	<i>Tillandsia utriculata</i>	
Golden pothos	<i>Epipremnum pinnatum*</i>	
Green-fly orchid	<i>Epidendrum conopseum</i>	
Guineagrass	<i>Panicum maximum*</i>	
Hurricanegrass	<i>Fimbristylis cymosa</i>	
Knotroot foxtail	<i>Setaria parviflora</i>	
Lesser duckweed	<i>Lemna aequinoctialis</i>	
Long's sedge	<i>Carex longii</i>	
Longleaf woodoats	<i>Chasmanthium laxum</i> var. <i>sessiliflorum</i>	
Manyfinger flatsedge	<i>Cyperus polystachyos</i>	
Ohio spiderwort	<i>Tradescantia ohiensis</i>	
Paragrass	<i>Urochloa mutica*</i>	
Pinewoods fingergrass	<i>Eustachys petraea</i>	
Poisonbulb	<i>Crinum asiaticum*</i>	
Purple bluestem	<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>	
Rose natalgrass	<i>Melinis repens*</i>	
Saltmarsh cordgrass	<i>Spartina alterniflora</i>	
Saltmarsh fingergrass	<i>Eustachys glauca</i>	
Sand cordgrass	<i>Spartina bakeri</i>	
Saw greenbrier	<i>Smilax bona-nox</i>	
Saw palmetto	<i>Serenoa repens</i>	
Sawgrass	<i>Cladium jamaicense</i>	
Shoestring fern	<i>Vittaria lineata</i>	
Shortleaf spikesedge	<i>Kyllinga brevifolia*</i>	
Smutgrass	<i>Sporobolus indicus</i> var. <i>indicus*</i>	
Smutgrass	<i>Sporobolus indicus*</i>	
Soft rush	<i>Juncus effusus</i> subsp. <i>solutus</i>	
Southern cattail	<i>Typha domingensis</i>	
Southern needleleaf	<i>Tillandsia setacea</i>	
Southern sandbur	<i>Cenchrus echinatus</i>	
Spanish bayonet	<i>Yucca aloifolia</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
St. Augustinegrass	<i>Stenotaphrum secundatum</i>	
Sugarcane	<i>Saccharum officinarum*</i>	
Sugarcane plumegrass	<i>Saccharum giganteum</i>	
Swamp flatsedge	<i>Cyperus ligularis</i>	
Swamp flatsedge	<i>Cyperus distinctus</i>	
Swamp lily	<i>Crinum americanum</i>	
Thin paspalum	<i>Paspalum setaceum</i>	
Torpedograss	<i>Panicum repens*</i>	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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Tropical flatsedge.....	Cyperus surinamensis	
Vaseygrass.....	Paspalum urvillei	
West Indian dropseed.....	Sporobolus indicus var. pyramidalis*	
Whisk-fern.....	Psilotum nudum	
Whitemouth dayflower.....	Commelina erecta	
Whitetops.....	Rhynchospora colorata	
Woodsgrass.....	Oplismenus hirtellus	
Yellow bristlegrass.....	Setaria parviflora	

DICOTS

.....	Diodia virginiana	
.....	Gamochaeta antillana	
.....	Gamochaeta pensylvanica*	
.....	Houstonia procumbens	
.....	Hydrocotyle bonariensis	
.....	Hydrocotyle umbellata	
.....	Oldenlandia uniflora	
.....	Pluchea foetida	
.....	Pluchea odorata	
.....	Quercus laurifolia	
American beautyberry.....	Callicarpa americana	
American pokeweed.....	Phytolacca americana	
Annual glasswort.....	Salicornia bigelovii	
Australian-pine.....	Casuarina equisetifolia*	
Bagpod.....	Sesbania vesicaria	
Balsam apple.....	Momordica charantia*	
Bastard false indigo.....	Amorpha fruticosa	
Bastard indigo.....	Amorpha fruticosa	
Beebalm.....	Monarda punctata	
Black mangrove.....	Avicennia germinans	
Black medick.....	Medicago lupulina*	
Black nightshade.....	Solanum americanum	
Bloodleaf.....	Iresine diffusa	
Bog hemp.....	Boehmeria cylindrica	
Bowstring hemp.....	Sansevieria hyacinthoides*	
Brazilian-pepper.....	Schinus terebinthifolius*	
Browne's blechum.....	Ruellia blechum*	
Burrnut.....	Tribulus cistoides*	
Bushy seaside oxeye.....	Borrichia frutescens	
Buttonwood.....	Conocarpus erectus	
Caesarweed.....	Urena lobata*	
Calloose grape.....	Vitis shuttleworthii	
Camphorweed.....	Heterotheca subaxillaris	
Camphorweed.....	Heterotheca subaxillaris	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Canadian toadflax	<i>Linaria canadensis</i>	
Candlestick plant	<i>Senna alata</i> *	
Capeweed	<i>Phyla nodiflora</i>	
Carolina cranesbill.....	<i>Geranium carolinianum</i>	
Carolina desertchicory	<i>Pyrrhopappus carolinianus</i>	
Carolina willow	<i>Salix caroliniana</i>	
Carrotwood	<i>Cupaniopsis anacardioides</i> *	
Castorbean	<i>Ricinus communis</i> *	
Chinaberry	<i>Melia azedarach</i> *	
Citrus (grapefruit)	<i>Citrus x paradisi</i> *	
Climbing hempvine.....	<i>Mikania scandens</i>	
Clustered pellitory.....	<i>Parietaria praetermissa</i>	
Coco plum.....	<i>Chrysobalanus icaco</i>	
Coinvine	<i>Dalbergia ecastaphyllum</i>	
Common Fanpetals.....	<i>Sida ulmifolia</i>	
Common persimmon	<i>Diospyros virginiana</i>	
Common ragweed	<i>Ambrosia artemisiifolia</i>	
Common yellow woodsorrel.....	<i>Oxalis corniculata</i>	
Coralbean	<i>Erythrina herbacea</i>	
Corkstem passionflower	<i>Passiflora suberosa</i>	
Creeping cucumber	<i>Melothria pendula</i>	
Creeping oxeye.....	<i>Sphagneticola (=Wedelia) trilobata</i> *	
Cutleaf eveningprimrose	<i>Oenothera laciniata</i>	
Dog fennel	<i>Eupatorium capillifolium</i>	
Dwarf Canadian horseweed	<i>Conyza canadensis</i> var. <i>pusilla</i>	
Earpod tree	<i>Enterolobium contortisiliquum</i> *	
East coast dune sunflower.....	<i>Helianthus debilis</i> subsp. <i>debilis</i>	
Eastern milkpea.....	<i>Galactia regularis</i>	
Erect prickly-pear.....	<i>Opuntia stricta</i>	SA
Fireweed.....	<i>Erechtites hieraciifolius</i>	
Florida butterfly orchid.....	<i>Encyclia tampensis</i>	MAH, HH
Florida grape	<i>Vitis cinerea floridana</i>	
Florida Keys hempvine.....	<i>Mikania cordifolia</i>	
Florida pellitory.....	<i>Parietaria floridana</i>	
Florida swamp privet	<i>Forestiera segregata</i>	
Florida vetch	<i>Vicia floridana</i>	
Forked bluecurls	<i>Trichostema dichotomum</i>	
Fourleaf vetch	<i>Vicia acutifolia</i>	
Frostweed	<i>Verbesina virginica</i>	
Garden tomato	<i>Solanum lycopersicum</i>	
Globe amaranth.....	<i>Gomphrena serrata</i> *	
Grapefruit, sweet orange	<i>Citrus x aurantiuim</i>	
Grassleaf lettuce	<i>Lactuca graminifolia</i>	
Gray nicker	<i>Caesalpinia bonduc</i>	
Groundsel tree.....	<i>Baccharis halimifolia</i>	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Guava	<i>Psidium guajava</i> *	
Gulf coast swallowwort	<i>Cynanchum angustifolium</i>	
Gumbo-limbo	<i>Bursera simaruba</i>	
Hackberry, Sugarberry	<i>Celtis laevigata</i>	
Hairy indigo.....	<i>Indigofera hirsuta</i>	
Hairy pod cowpea	<i>Vigna luteola</i>	
Harsh vervain.....	<i>Verbena scabra</i>	
Herb-of-grace.....	<i>Bacopa monnieri</i>	
Hercules-club	<i>Zanthoxylum clava-herculis</i>	
Hyssopleaf sandmat	<i>Chamaesyce hyssopifolia</i>	
Indian hemp.....	<i>Sida rhombifolia</i>	
Indian sweetclover	<i>Melilotus indicus</i> *	
Lantana	<i>Lantana camara</i> *	
Largeflower Mexican clover	<i>Richardia grandiflora</i> *	
Lateflowering throughwort	<i>Eupatorium serotinum</i>	
Latexplant.....	<i>Morrenia odorata</i> *	
Leadtree	<i>Leucaena leucocephala</i> *	
Leafless swallowwort	<i>Cynanchum scoparium</i>	
Licoriceweed.....	<i>Scoparia dulcis</i>	
Lima.....	<i>Sida cordifolia</i> *	
Lindenleaf rosemallow	<i>Hibiscus furcellatus</i>	
Live oak.....	<i>Quercus virginiana</i>	
Loquat	<i>Eriobotrya japonicum</i>	
Lyreleaf sage.....	<i>Salvia lyrata</i>	
Madagascar periwinkle	<i>Catharanthus roseus</i> *	
Mahoe, Sea hibiscus.....	<i>Hibiscus tiliaceus</i> *	
Mangrove vine	<i>Rhaddadenia biflora</i>	
Many-flower marsh pennywort..	<i>Hydrocotyle umbellata</i>	
Marlberry	<i>Ardisia escallonioides</i>	
Marsh parsley.....	<i>Cyclosporum leptophyllum</i> *	
Marshgiant.....	<i>Eustoma exaltatum</i>	
Mexican petunia.....	<i>Ruellia brittoniana</i> *	
Mexican petunia.....	<i>Ruellia simplex</i> *	
Mexican primrosewillow	<i>Ludwigia octovalvis</i>	
Mock bishopsweed	<i>Ptilimnium capillaceum</i>	
Moonflowers	<i>Ipomoea alba</i>	
Muscadine	<i>Vitis rotundifolia</i>	
Myrsine.....	<i>Rapanea punctata</i>	
Myrsine.....	<i>Myrsine cubana</i>	
Narrowleaf yellowtops	<i>Flaveria linearis</i>	
Oakleaf fleabane	<i>Erigeron quercifolius</i>	
Oceanblue morning glory	<i>Ipomoea indica</i>	
Oriental false hawksbeard	<i>Youngia japonica</i> *	
Oyster-plant	<i>Tradescantia spathacea</i> *	
Paintedleaf	<i>Poinsettia cyathophora</i>	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Papaya	<i>Carica papaya</i> *	
Paraguayan purslane	<i>Portulaca amilis</i> *	
Partridge pea.....	<i>Chamaecrista fasciculata</i>	
Peppervine	<i>Ampelopsis arborea</i>	
Pillpod sandmat	<i>Chamaesyce hirta</i>	
Pineland pimpernel.....	<i>Samolus valerandi</i> L. subsp. <i>parviflorus</i>	
Pineland threeseed mercury	<i>Acalypha ostryifolia</i>	
Pink purslane.....	<i>Portulaca pilosa</i>	
Pink woodsorrel	<i>Oxalis debilis</i> var. <i>corymbosa</i> *	
Poison ivy	<i>Toxicodendron radicans</i>	
Pond apple	<i>Annona glabra</i>	
Poorman's patch	<i>Mentzelia floridana</i>	
Rabbitbells	<i>Crotalaria rotundifolia</i>	
Railroad vine	<i>Ipomoea pes-caprae</i>	
Red bay	<i>Persea borbonia</i> var. <i>borbonia</i>	
Red mangrove	<i>Rhizophora mangle</i>	
Red maple.....	<i>Acer rubrum</i>	
Red mulberry	<i>Morus rubra</i>	
Red spiderling.....	<i>Boerhavia diffusa</i>	
Rosary pea.....	<i>Abrus precatorius</i> *	
Rosy camphorweed	<i>Pluchea baccharis</i>	
Rougeplant.....	<i>Rivina humilis</i>	
Rougeplant.....	<i>Rivina humilis</i>	
Rubber plant	<i>Ficus elastica</i> *	
Rustweed.....	<i>Polypremum procumbens</i>	
Saltbush, Groundsel tree.....	<i>Baccharis halimifolia</i>	
Saltwater falsewillow	<i>Baccharis angustifolia</i>	
Sand live oak.....	<i>Quercus geminata</i>	
Scarlet milkweed	<i>Asclepias curassavica</i>	
Scorpionstail	<i>Heliotropium angiospermum</i>	
Scrubland goldenaster	<i>Chrysopsis subulata</i>	
Seagrape	<i>Coccoloba uvifera</i>	
Seaside heliotrope.....	<i>Heliotropium curassavicum</i>	
Shakeshake.....	<i>Crotalaria incana</i> *	
Showy milkwort	<i>Polygala grandiflora</i>	
Shrimp plant	<i>Justicia brandegeana</i> *	
Shrubby false buttonweed.....	<i>Spermacoce verticillata</i> *	
Shyleaf	<i>Aeschynomene americana</i>	
Sicklepod	<i>Senna obtusifolia</i> *	
Silktree, Mimosa	<i>Albizia julibrissin</i> *	
Simpson's stopper.....	<i>Myrcianthes fragrans</i>	MAH, HH
Slender amaranth	<i>Amaranthus viridis</i> *	
Slender threeseed mercury	<i>Acalypha gracilens</i>	
Snowberry	<i>Chiococca alba</i>	
Southern amaranth	<i>Amaranthus australis</i>	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Southern beeblossom	<i>Gaura angustifolia</i>	
Southern dewberry.....	<i>Rubus trivialis</i>	
Southern plantain	<i>Plantago virginica</i>	
Spadeleaf.....	<i>Centella asiatica</i>	
Spanish needles.....	<i>Bidens alba</i>	
Spiny sowthistle.....	<i>Sonchus asper*</i>	
Spotted sandmat	<i>Chamaesyce maculata</i>	
Stinging nettle	<i>Cnidocolus stimulosus</i>	
Straggler's daisy	<i>Calyptocarpus vialis*</i>	
Strangler fig	<i>Ficus aurea</i>	
Summer grape	<i>Vitis aestivalis</i>	
Surinam cherry.....	<i>Eugenia uniflora</i>	
Tasselflower	<i>Emilia fosbergii*</i>	
Thistle	<i>Cirsium nuttallii</i>	
Threeflower ticktrefoil.....	<i>Desmodium triflorum*</i>	
Toothcups	<i>Ammannia latifolia</i>	
Toothed midsorus fern.....	<i>Blechnum serrulatum</i>	
Tough bully	<i>Sideroxylon tenax</i>	
Trailing indigo.....	<i>Indigofera spicata*</i>	
Tropical sage	<i>Salvia coccinea</i>	
Trumpet creeper	<i>Campsis radicans</i>	
Turtleweed.....	<i>Batis maritima</i>	
Twoleaf nightshade	<i>Solanum diphyllum*</i>	
Umbrella tree	<i>Schefflera actinophylla *</i>	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Virginia pepperweed.....	<i>Lepidium virginicum</i>	
Virginia saltmarsh mallow	<i>Kosteletzkya virginica</i>	
Virginia saltmarsh mallow	<i>Kosteletzkya pentacarpos</i>	
Walter's groundcherry	<i>Physalis walteri</i>	
Wax myrtle	<i>Myrica cerifera</i>	
Weeping fig.....	<i>Ficus benjamina*</i>	
White mangrove	<i>Laguncularia racemosa</i>	
White stopper.....	<i>Eugenia axillaris</i>	
White sweetclover.....	<i>Melilotus albus*</i>	
White twinevine	<i>Sarcostemma clausum</i>	
Wild bushbean	<i>Macroptilium lathyroides*</i>	
Wild coffee	<i>Psychotria nervosa</i>	
Wild lime	<i>Zanthoxylum fagara</i>	
Wild taro.....	<i>Colocasia esculenta*</i>	
Winged sumac	<i>Rhus copallinum</i>	
Woman's tongue	<i>Albizia lebeck*</i>	
Wood sage	<i>Teucrium canadense</i>	
Woodland false buttonweed.....	<i>Spermacoce remota</i>	
Yellow necklacepod	<i>Sophora tomentosa var. truncata</i>	
Zarabacoa comun	<i>Desmodium incanum*</i>	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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CRUSTACEANS

Common blue crab	<i>Callinectes sapidus</i>
Great land crab	<i>Cardisoma guanhumi</i>
Common land hermit crab.....	<i>Coenobita clypeatus</i>
Land crab species	<i>Gecarcinus</i> sp.
Horseshoe crab	<i>Limulus polyphemus</i>

STICK INSECTS

Two-striped walkingstick.....	<i>Anisomorpha buprestoides</i>
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ANTLIONS, LACEWINGS AND OWLFLIES

Antlion sp.	<i>Myrmeleon</i> sp.
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FLIES & MOSQUITOES

Black saltmarsh mosquito	<i>Ochlerotatus taeniorhynchus</i>
Saltmarsh mosquito	<i>Ochlerotatus sollicitans</i>

BEETLES

Mexican bromeliad-eating weevil.....	<i>Metamasius callizona</i> *
.....	

BUTTERFLIES AND MOTHS

Butterflies and skippers

Gulf fritillary	<i>Agraulis vanillae</i>
White peacock	<i>Anartia iatrophe</i>
Great southern white	<i>Ascia monuste</i>
Monarch	<i>Danaus plexippus</i>
Variegated fritillary.....	<i>Euptoieta claudia</i>
Barred yellow	<i>Eurema daira</i>
Little yellow.....	<i>Eurema lisa</i>
Common buckeye	<i>Junonia coenia</i>
Giant Swallowtail	<i>Papilio cresphontes</i>
Cloudless sulphur	<i>Phoebis sennae</i>
Large Orange Sulfur	<i>Phoebis agarithe</i>

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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Phaon crescent	Phyciodes phaon	
Pearl crescent.....	Phyciodes tharos	
Checkered white	Pontia protodice	
Long-tailed skipper	Urbanus proteus.....	

ANTS, BEES AND WASPS

Honey bee	Apis mellifera*	
Florida carpenter ant	Camponotus floridanus.....	
Red imported fire ant	Solenopsis invicta*	

BONY FISHES

Lined sole	Achirus lineatus.....	
Bay anchovy.....	Anchoa mitchilli.....	
Sheepshead	Archosargus probatocephalus.....	
Sea bream	Archosargus rhomboidalis.....	
Hardhead catfish.....	Arius felis	
Gafftopsail catfish	Bagre marinus	
Silver perch.....	Bairdiella chrysoura	
Menhaden	Brevoortia spp.....	
Crevalle jack	Caranx hippos.....	
Common snook.....	Centropomus undecimalis.....	EUS, CD
Atlantic spadefish.....	Chaetodipterus faber.....	
Florida blenny.....	Chasmodes saburrae.....	
Striped burrfish	Chilomycterus schoepfi.....	
Bay whiff	Citharichthys spilopterus	
Spotted seatrout	Cynoscion nebulosus.....	
Sheepshead minnow	Cyprinodon variegatus	
Atlantic stingray.....	Dasyatis sabina	
Irish pompano	Diapterus auratus	
Fat sleeper	Dormitator maculatus	
Ladyfish.....	Elops saurus	
Silver jenny.....	Eucinostomus gula.....	
Tidewater mojarra.....	Eucinostomus harengulus	
Mojarra.....	Eucinostomus spp.....	
Goldspotted killifish	Floridichthys carpio.....	
Marsh killifish	Fundulus confluentus	
Gulf killifish	Fundulus grandis	
Mosquitofish	Gambusia holbrooki	
Yellowfin mojarra	Gerres cineres.....	
Darter goby.....	Gobionellus boleosoma.....	
Highfin goby	Gobionellus oceanicus	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Freshwater goby	<i>Gobionellus shufeldti</i>	
Naked goby.....	<i>Gobiosoma bosci</i>	
Code goby.....	<i>Gobiosoma robustum</i>	
Sailor's choice	<i>Haemulon parrai</i>	
Scaled sardine	<i>Harengula jaguana</i>	
Lined seahorse	<i>Hippocampus erectus</i>	
Northern halfbeak, new species	<i>Hyporhamphus meeki</i>	
Pinfish	<i>Lagodon rhomboides</i>	
Spot.....	<i>Leiostomus xanthurus</i>	
Rainwater killifish.....	<i>Lucania parva</i>	
Gray snapper.....	<i>Lutjanus griseus</i>	
Tarpon.....	<i>Megalops atlanticus</i>	
Silverside.....	<i>Menidia</i> spp.	
Southern kingfish.....	<i>Menticirrhus americanus</i>	
Green goby	<i>Microgobius thalassinus</i>	
Clown goby	<i>Microgobius gulosus</i>	
Atlantic croaker	<i>Micropogonias undulatus</i>	
Planehead filefish	<i>Monacanthus hispidus</i>	
Striped mullet.....	<i>Mugil cephalus</i>	
White mullet.....	<i>Mugil curema</i>	
Speckled worm eel	<i>Myrophis punctatus</i>	
Leather jacket	<i>Oligoplites saurus</i>	
Atlantic thread herring.....	<i>Opisthonema oglinum</i>	
Oyster toadfish	<i>Opsanus tau</i>	
Pigfish	<i>Orthopristis chrysoptera</i>	
Gulf flounder	<i>Paralichthys albigutta</i>	
Sailfin molly	<i>Poecilia latipinna</i>	
Black drum.....	<i>Pogonias cromis</i>	
Red drum.....	<i>Sciaenops ocellatus</i>	
Lookdown	<i>Selene vomer</i>	
Southern puffer	<i>Sphoeroides nephelus</i>	
Bandtail puffer	<i>Sphoeroides spengleri</i>	
Checkered puffer	<i>Sphoeroides testudineus</i>	
Great barracuda.....	<i>Sphyraena barracuda</i>	
Redfin needlefish	<i>Strongylura notata</i>	
Timucu	<i>Strongylura timucu</i>	
Chain pipefish.....	<i>Syngnathus louisianae</i>	
Gulf pipefish	<i>Syngnathus scovelli</i>	
Permit	<i>Trachinotus falcatus</i>	

AMPHIBIANS

Frogs and Toads

Southern toad	<i>Bufo terrestris</i>	
Pig frog.....	<i>Rana grylio</i>	

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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Southern leopard frog.....	Rana utriculata.....	
Cuban tree frog	Osteopilus septentrionalis*	

REPTILES

Crocodylians

American alligator	Alligator mississippiensis	MS,CD,IAP
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Turtles and tortoises

Loggerhead turtle	Caretta caretta.....	EUS
Green turtle	Chelonia mydas.....	EUS
Gopher tortoise.....	Gopherus polyphemus.....	ABF
Florida box turtle	Terrapene carolina bauri	

Lizards

Green anole	Anolis carolinensis	
Brown anole	Anolis sagrei*	
Six-lined racerunner	Cnemidophorus sexlineatus sexlineatus.....	
Southeastern five-lined skink ...	Eumeces inexpectatus.....	

Snakes

Southern black racer	Coluber constrictor priapus	
Eastern indigo snake	Drymarchon corais couperi	MTC
Coachwhip snake	Masticophis flagellum.....	
Saltmarsh snake	Nerodia fasciata taeniata	SAM,MS

BIRDS

Pelicans

Brown Pelican	Pelecanus occidentalis	IAP, EUS
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Cormorants

Double-crested Cormorant	Phalacrocorax auritus.....	
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Darters

Anhinga	Anhinga anhinga	
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Bitterns and Herons

Great Egret	Ardea alba.....	
Great Blue Heron	Ardea herodias herodias	
Green Heron.....	Butorides virescens.....	
Little blue Heron	Egretta caerulea	SAM, MS, IAP, EUS
Reddish Egret.....	Egretta rufescens	SAM, MS, IAP, EUS

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Snowy Egret.....	<i>Egretta thula</i>	SAM, MS, IAP, EUS
Tricolored Heron	<i>Egretta tricolor</i>	SAM, MS, IAP, EUS
Black-crowned Night-heron	<i>Nycticorax nycticorax</i>	
Yellow-crowned Night-heron	<i>Nyctanassa violacea</i>	
Ibises and Spoonbills		
White Ibis	<i>Eudocimus albus</i>	SAM, MS, IAP, EUS
Storks		
Wood Stork.....	<i>Mycteria americana</i>	SAM, MS, IAP, EUS
Vultures		
Turkey Vulture.....	<i>Cathartes aura</i>	
Black Vulture	<i>Coragyps atratus</i>	
Ospreys		
Osprey	<i>Pandion haliaetus</i>	
Hawks, Eagles and Kites		
Cooper's Hawk.....	<i>Accipiter cooperii</i>	
Red-tailed Hawk	<i>Buteo jamaicensis</i>	
Red-shouldered Hawk.....	<i>Buteo lineatus</i>	
Bald Eagle	<i>Haliaeetus leucocephalus</i>	
Falcons		
Merlin	<i>Falco columbarius</i>	
Rails and Coots		
Common Moorhen.....	<i>Gallinula chloropus</i>	
Plovers		
Killdeer	<i>Charadrius vociferus</i>	
Snipes and Sandpipers		
Spotted Sandpiper	<i>Actitis macularius</i>	
Gulls and Terns		
Least Tern	<i>Sternula antillarum</i>	IAP, EUS
Royal Tern	<i>Thalasseus maximus</i>	
Doves		
Common Ground-Dove	<i>Columbina passerina</i>	
Mourning Dove	<i>Zenaida macroura</i>	
Eurasian Collared-Dove.....	<i>Streptopelia decaocto</i> *	

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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Goatsuckers

Chuck-will's-widow *Caprimulgus carolinensis*

Swifts

Chimney Swift *Chaetura pelagica*

Kingfishers

Belted Kingfisher *Megasceryle alcyon*

Woodpeckers

Pileated Woodpecker *Dryocopus pileatus*

Red-bellied Woodpecker *Melanerpes carolinus*

Downy Woodpecker *Picoides pubescens*

Flycatchers and Kingbirds

Great-crested Flycatcher *Myiarchus crinitus*

Eastern Phoebe *Sayornis phoebe*

Shrikes

Loggerhead Shrike *Lanius ludovicianus*

Vireos

White-eyed Vireo *Vireo griseus*

Red-eyed Vireo *Vireo olivaceus*

Jays and Crows

Fish Crow *Corvus ossifragus*

Blue Jay *Cyanocitta cristata*

Wrens

Carolina Wren *Thryothorus ludovicianus*

Thrashers

Northern Mockingbird *Mimus polyglottos*

Brown Thrasher *Toxostoma rufum*

Starlings

European Starling *Sturnus vulgaris**

Warblers

Yellow-rumped Warbler *Dendroica coronata*

Prairie Warbler *Dendroica discolor*

Yellow-throated Warbler *Dendroica dominica*

Cardinals, Tanagers, Grosbeaks, and Buntings

* Non-native Species

Indian River Lagoon Preserve State Park Plants and Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
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Northern Cardinal	Cardinalis cardinalis	
Painted Bunting	Passerina ciris	

Old World Sparrows

House Sparrow	Passer domesticus*	
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MAMMALS

Didelphids

Virginia opossum	Didelphis virginiana	
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Lagomorphs

Domestic rabbit	Oryctolagus cuniculus*	
Marsh rabbit	Sylvilagus palustris	

Rodents

Eastern gray squirrel	Sciurus carolinensis	
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Carnivores

Domestic cat	Felis catus*	
Bobcat	Lynx rufus	
Raccoon	Procyon lotor	
Gray fox	Urocyon cinereoargenteus	

Sirens

Florida manatee	Trichechus manatus	EUS
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Cetaceans

Bottle-nosed dolphin	Tursiops truncatus	
Nine-banded armadillo	Dasyus novemcinctus*	

* Non-native Species

Addendum 6—Imperiled Species Ranking Definitions

Imperiled Species Ranking Definitions

The Nature Conservancy and the Natural Heritage Program Network (of which FNAI is a part) define an element as any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave or other ecological feature. An element occurrence (EO) is a single extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

Using a ranking system developed by The Nature Conservancy and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks to each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element occurrences, estimated abundance (number of individuals for species; area for natural communities), range, estimated adequately protected EOs, relative threat of destruction, and ecological fragility.

Federal and State status information is from the U.S. Fish and Wildlife Service; and the Florida Fish and Wildlife Conservation Commission (animals), and the Florida Department of Agriculture and Consumer Services (plants), respectively.

FNAL GLOBAL RANK DEFINITIONS

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or fabricated factor.
- G2 Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- G4 apparently secure globally (may be rare in parts of range)
- G5 demonstrably secure globally
- GH of historical occurrence throughout its range may be rediscovered (e.g., ivory-billed woodpecker)
- GX believed to be extinct throughout range
- GXC extirpated from the wild but still known from captivity or cultivation
- G#? Tentative rank (e.g., G2?)
- G#G# range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)

Imperiled Species Ranking Definitions

- G#Q..... rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
- G#T#Q..... same as above, but validity as subspecies or variety is questioned.
- GU due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G?..... Not yet ranked (temporary)
- S1..... Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- S2..... Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- S3..... Either very rare or local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- S4..... apparently secure in Florida (may be rare in parts of range)
- S5..... demonstrably secure in Florida
- SH of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX..... believed to be extinct throughout range
- SA..... accidental in Florida, i.e., not part of the established biota
- SE..... an exotic species established in Florida may be native elsewhere in North America
- SN regularly occurring but widely and unreliably distributed; sites for conservation hard to determine
- SU due to lack of information, no rank or range can be assigned (e.g., SUT2).
- S?..... Not yet ranked (temporary)
- N Not currently listed, nor currently being considered for listing, by state or federal agencies.

LEGAL STATUS

FEDERAL

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

- LE Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
- PE Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.

Imperiled Species Ranking Definitions

- PT Proposed for listing as Threatened Species.
- C Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A) Endangered due to similarity of appearance.
- T(S/A) Threatened due to similarity of appearance.
- EXPE, XE..... Experimental essential population. A species listed as experimental and essential.
- EXPN, XN.... Experimental non-essential population. A species listed as experimental and non-essential. Experimental, nonessential populations of endangered species are treated as threatened species on public land, for consultation purposes.

STATE

ANIMALS .. (Listed by the Florida Fish and Wildlife Conservation Commission - FWC)

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

Imperiled Species Ranking Definitions

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

LE Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.

LT Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.

Addendum 7—Cultural Information

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

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. General Discussion

Historic resources are both archaeological sites and historic structures. Per Chapter 267, Florida Statutes, *'Historic property' or 'historic resource' means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.'*

B. Agency Responsibilities

Per State Policy relative to historic properties, state agencies of the executive branch must allow the Division of Historical Resources (Division) the opportunity to comment on any undertakings, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the project, permit, grant, etc.

State agencies shall preserve the historic resources which are owned or controlled by the agency.

Regarding proposed demolition or substantial alterations of historic properties, consultation with the Division must occur, and alternatives to demolition must be considered.

State agencies must consult with Division to establish a program to location, inventory and evaluate all historic properties under ownership or controlled by the agency.

C. Statutory Authority

Statutory Authority and more in depth information can be found at: <http://www.flheritage.com/preservation/compliance/guidelines.cfm>

D. Management Implementation

Even though the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual. Specific information regarding individual projects must be submitted to the Division for review and recommendations.

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

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. Recommendations may include, but are not limited to: approval of the project as submitted, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions, exterior alteration, or related new construction regarding historic structures must also be submitted to the Division of Historical Resources for review and comment by the Division's architects. Projects involving structures fifty years of age or older, must be submitted to this agency for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant. These must be evaluated on a case by case basis.

Adverse impacts to significant sites, either archaeological sites or historic buildings, must be avoided. Furthermore, managers of state property should make preparations for locating and evaluating historic resources, both archaeological sites and historic structures.

E. Minimum Review Documentation Requirements

In order to have a proposed project reviewed by the Division, certain information must be submitted for comments and recommendations. The minimum review documentation requirements can be found at:

http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf .

* * *

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

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

Phone: (850) 245-6425

Toll Free: (800) 847-7278

Fax: (850) 245-6435

Eligibility Criteria for National Register of Historic Places

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

- 1) Districts, sites, buildings, structures, and objects may be considered to have significance in American history, architecture, archaeology, engineering, and/or culture if they possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:
 - a) are associated with events that have made a significant contribution to the broad patterns of our history; and/or
 - b) are associated with the lives of persons significant in our past; and/or
 - c) embody the distinctive characteristics of type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; and/or
 - d) have yielded, or may be likely to yield, information important in prehistory or history.

- 2) Ordinarily cemeteries, birthplaces, or graves of historical figures; properties owned by religious institutions or used for religious purposes; structures that have been moved from their original locations; reconstructed historic buildings; properties primarily commemorative in nature; and properties that have achieved significance within the past 50 years shall not be considered eligible for the *National Register*. However, such properties will qualify if they are integral parts of districts that do meet the criteria or if they fall within the following categories:
 - a) a religious property deriving its primary significance from architectural or artistic distinction or historical importance; or
 - b) a building or structure removed from its original location but which is significant primarily for architectural value, or which is the surviving structure most importantly associated with a historic person or event; or
 - c) a birthplace or grave of an historical figure of outstanding importance if there is no appropriate site or building directly associated with his productive life; or
 - d) a cemetery which derives its primary significance from graves of persons of transcendent importance, from age, distinctive design features, or association with historic events; or

Eligibility Criteria for National Register of Historic Places

- e) a reconstructed building, when it is accurately executed in a suitable environment and presented in a dignified manner as part of a restoration master plan, and no other building or structure with the same association has survived; or a property primarily commemorative in intent, if design, age, tradition, or symbolic value has invested it with its own exceptional significance; or
- f) a property achieving significance within the past 50 years, if it is of exceptional importance.

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

Restoration is defined as the act or process of accurately depicting the form, features, and character of a property as it appeared at a particular period of time by means of the removal of features from other periods in its history and reconstruction of missing features from the restoration period. The limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a restoration project.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations and additions while preserving those portions or features that convey its historical, cultural or architectural values.

Stabilization is defined as the act or process of applying measures designed to reestablish a weather resistant enclosure and the structural stability of an unsafe or deteriorated property while maintaining the essential form as it exists at present.

Preservation is defined as the act or process of applying measures necessary to sustain the existing form, integrity and materials of an historic property. Work, including preliminary measures to protect and stabilize the property, generally focuses upon the ongoing maintenance and repair of historic materials and features rather than extensive replacement and new construction. New exterior additions are not within the scope of this treatment; however, the limited and sensitive upgrading of mechanical, electrical and plumbing systems and other code-required work to make properties functional is appropriate within a preservation project.

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