



**FLORIDA DEPARTMENT OF  
ENVIRONMENTAL PROTECTION**

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TALLAHASSEE, FLORIDA 32399-3000

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SECRETARY

February 27, 2014

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

**Re: Avalon State Park – Lease # 3511**

Dear Ms. Carver:

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 Avalon State Park management plan. The next management plan update is due February 27, 2024.

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

Sincerely,

A handwritten signature in cursive script that reads "MS Gengenbach".

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



# **Avalon State Park**

**APPROVED  
Unit Management Plan**

**STATE OF FLORIDA  
DEPARTMENT OF ENVIRONMENTAL  
PROTECTION**

**Division of Recreation and Parks  
February 27, 2014**





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## **INTRODUCTION**

Avalon State Park is located in St. Lucie County about nine miles south of Vero Beach (see Vicinity Map). Access to the park is from a small parking area located along the east side of State Road A1A, which bisects the park (see Reference Map). The vicinity map also delineates the significant land and water resources near the park.

The State of Florida has acquired Avalon State Park to develop and manage the property for public outdoor recreation and related purposes. On December 12, 1985, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) obtained title to the initial property that became Avalon State Park. The initial purchase was funded through the Save Our Coast (SOC) program. Since then, the Trustees acquired additional parcels under the SOC and Conservation and Recreation Lands (CARL)/Preservation 2000 (P2000) programs and added them to Avalon State Park. Presently the park comprises approximately 657 acres.

The Trustees hold fee simple title to Avalon State Park and on July 15, 1987, the Trustees conveyed its management authority of Avalon State Park to the Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) under Lease No. 3511. The lease is for a period of 50 years, and it will expire on July 14, 2037. According to this lease agreement, the DRP will develop and manage the property for public outdoor recreation and related purposes.

At Avalon State Park, public outdoor recreation and conservation is the designated single use of the property. There are no legislative or executive directives that constrain the use of this property (see Addendum 1).

## **PURPOSE AND SIGNIFICANCE OF THE PARK**

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

The purpose of Avalon State Park is to provide natural areas and sandy beaches for wildlife sanctuary and resource-based outdoor recreation. Parklands protect a representative portion of Florida's original coastline for future generations and conserve important recreational assets that are vital to the state's tourist economy.

## **Park Significance**

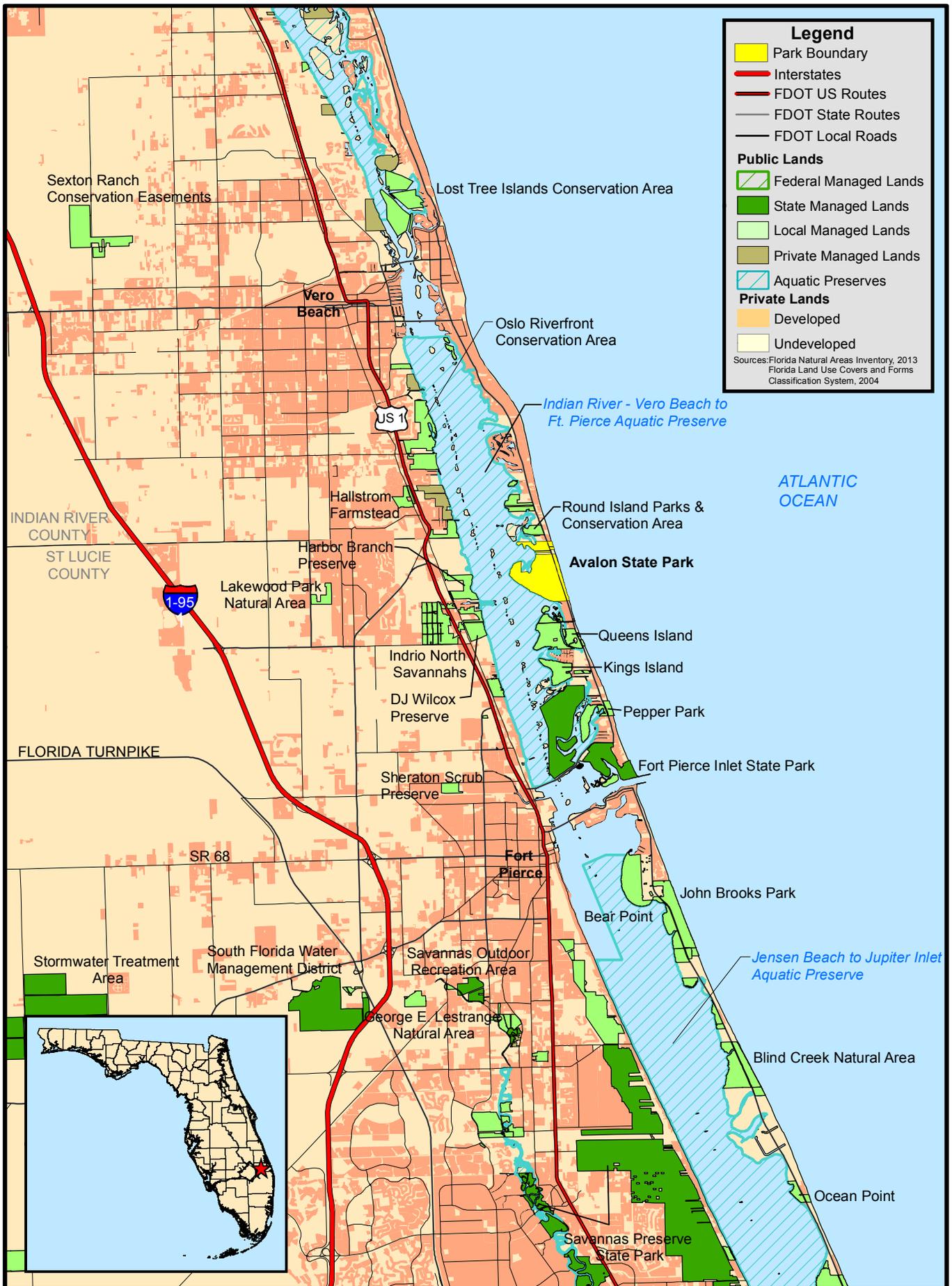
- Avalon State Park provides public beach access to nearly 1.3 miles of Atlantic shoreline that is enjoyed by nearly 170,000 Florida residents and visitors each year.
- The park protects from development nearly 16 acres of coastal strand and nearly 336 acres of maritime hammock, one of the largest continuous areas of this imperiled community in Florida.
- The park protects nearly 37 acres of beach dune community, which provides habitat for shorebirds and nesting area for three imperiled species of marine turtle, including green (*Chelonia mydas*), leatherback (*Dermochelys coriacea*) and loggerhead (*Caretta caretta*) turtles.
- The park protects nearly 260 acres of mangrove swamp that is hydrologically connected to the Indian River Lagoon, one of the most biologically diverse estuarine ecosystems in the United States, and provides habitat for a large number of pelicans and wading birds, including the endangered wood stork (*Mycteria americana*).

Avalon State Park is classified as a State Recreation Area in the DRP's unit classification system. In the management of a state recreation area, major emphasis is placed on maximizing the recreational potential of the unit. However, preservation of the park's natural and cultural resources remains important. Depletion of a resource by any recreational activity is not permitted. In order to realize the park's recreational potential, the development of appropriate park facilities is undertaken with the goal to provide facilities that are accessible, convenient and safe to support public recreational use or appreciation of the park's natural, aesthetic and educational attributes.

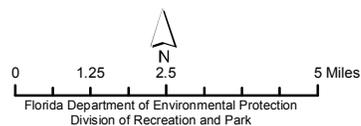
## **PURPOSE AND SCOPE OF THE PLAN**

This plan serves as the basic statement of policy and direction for the management of Avalon 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, and Chapter 18-2, Florida Administrative Code, and is intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the 2002 approved plan.

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

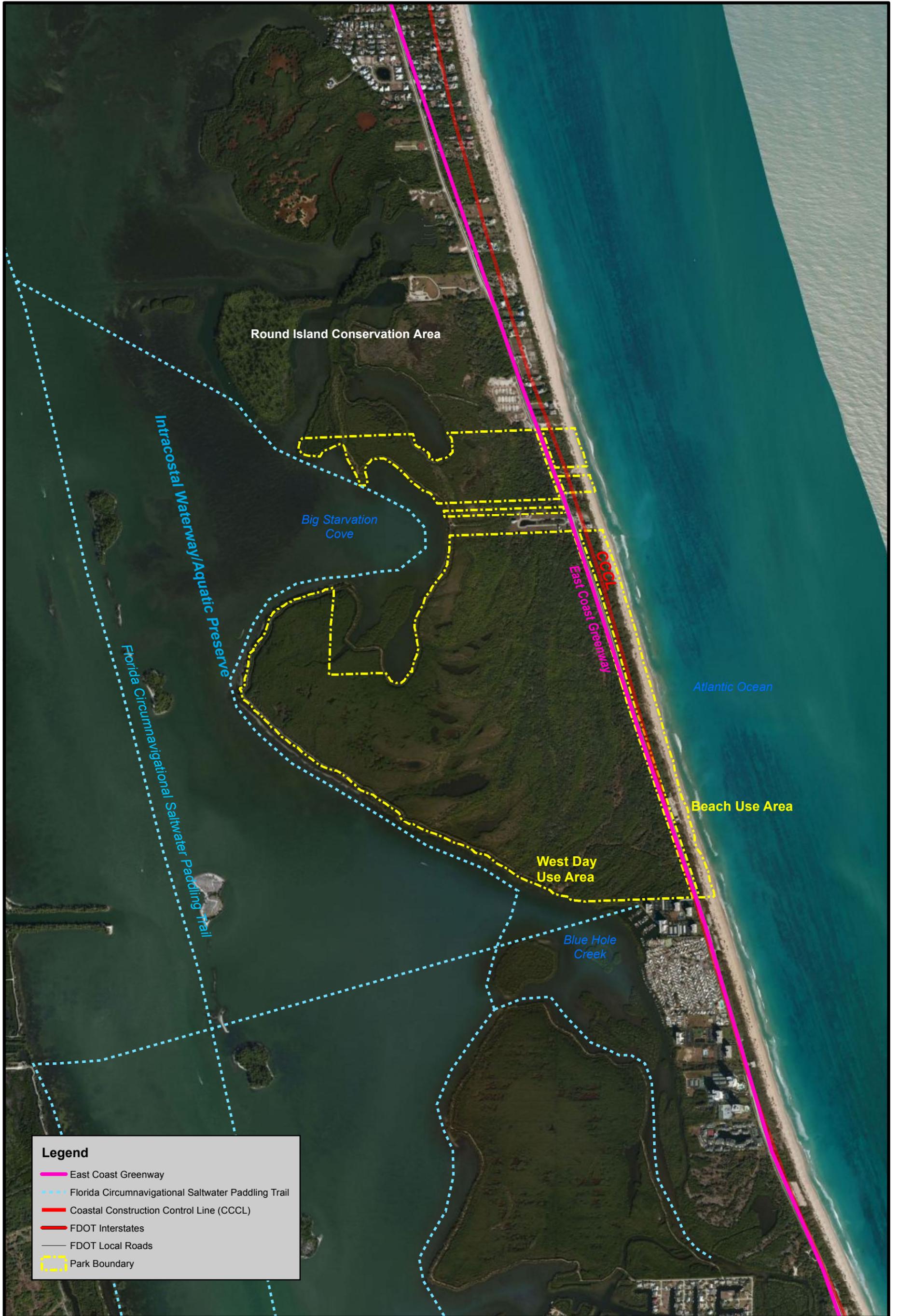


AVALON STATE PARK



VICINITY MAP





Round Island Conservation Area

Big Starvation Cove

Intracoastal Waterway/Aquatic Preserve

Florida Circumnavigational Saltwater Paddling Trail

Atlantic Ocean

Beach Use Area

West Day Use Area

Blue Hole Creek

CCCL  
East Coast Greenway

**Legend**

- East Coast Greenway
- - - Florida Circumnavigational Saltwater Paddling Trail
- Coastal Construction Control Line (CCCL)
- FDOT Interstates
- FDOT Local Roads
- Park Boundary

AVALON STATE PARK

  
 0 375 750 1,500 Feet  
Florida Department of Environmental Protection  
 Division of Recreation and Parks  
 Date of aerial: 2011

REFERENCE MAP



removal, imperiled species management, cultural resource management and restoration of natural conditions.

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

The Implementation Component consolidates the measurable objectives and actions for each of the park's management goals. An implementation schedule and cost estimates are included for each objective and action. Included in this table are (1) measures that will be used to evaluate 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. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes, and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

In the development of this plan, the potential of the park to accommodate secondary management purposes was analyzed. These secondary purposes were considered within the context of the DRP's statutory responsibilities and the resource needs and values of the park. This analysis considered the park natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this park, it was determined that no secondary purposes 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.

The use of private land managers to facilitate restoration and management of this park was also analyzed. Decisions regarding this type of management (such as

outsourcing, contracting with the private sector, use of volunteers, etc.) will be made on a case-by-case basis as necessity dictates.

## **MANAGEMENT PROGRAM OVERVIEW**

### **Management Authority and Responsibility**

In accordance with Chapter 258, Florida Statutes, and Chapter 62D-2, Florida Administrative Code, the 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 DRP's Operations Manual (OM) that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, public use regulations, resource management, law enforcement, protection, safety and maintenance.

### **Park Management Goals**

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

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

### **Management Coordination**

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

The Department of Agriculture and Consumer Services (DACS), 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 the DRP with wildlife management programs, including imperiled species management and Watchable Wildlife programs. The Florida Department of State (DOS), Division of Historical Resources (DHR) assists staff to ensure protection of archaeological and historical sites. The DEP Office of Coastal and Aquatic Managed Areas (CAMA) 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**

The DRP provided an opportunity for public input by conducting a public workshop and an Advisory Group Meeting to present the draft management plan to the public. These meetings were held on October 8 and 9, 2013, respectively. Meeting notices were published in the Florida Administrative Register, Volume 39, Number 190, September 30, 2013, 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**

Avalon State Park is not within and is not been designated as an Area of Critical State Concern as defined in Section 380.05, Florida Statutes. Currently it is not under study for such designation. The park is a component of the Florida Greenways and Trails System.

All waters within the park have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302, Florida Administrative Code. Surface waters in this unit are also classified as Class II waters by DEP. The park is adjacent to the Indian River Lagoon Aquatic Preserve 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.

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

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

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

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

<b>Management Zone</b>	<b>Acreage</b>	<b>Managed with Prescribed Fire</b>
AV-1	53.09	Yes
AV-2	32.20	No
AV-3	276.68	No
AV-4	4.33	No
AV-5	64.40	No
AV-6	217.62	No

## **RESOURCE DESCRIPTION AND ASSESSMENT**

### **Natural Resources**

#### **Topography**

Avalon State Park is located immediately adjacent to State Road A1A in St. Lucie County about nine miles south of Vero Beach. The physiographic land features of the site have been strongly influenced by various coastal and marine forces, as well as anthropogenic factors. Approximately ten percent of the park is located east of A1A and consists largely of Atlantic coast beach dune, coastal grassland and coastal strand. The primary dune in this area slopes gradually and rarely exceeds five feet in height above the unvegetated beachfront. A ten-foot contour line roughly defines the dune crest with the highest elevation at about 15 feet in the northeast part of the property. The flat-terraced interdune expanse is truncated on its western boundary by coastal strand and the filled area supporting A1A. This paved road surface supplies the highest unbroken topographic relief within the parcel. West of A1A, slopes gradually decline through disturbed roadside areas, coastal upland communities, and into tidal swamp. Elevations in this area run from approximately zero to five feet. Stabilized dikes/roads several feet in height above the surrounding tidal swamp ring the southern, western and northern sides of the parcel. The roads were present when the property was acquired by the state and have significantly altered estuarine hydraulic continuity within the parcel.

#### **Geology**

The geologic features underlying Avalon State Park are typical for this area of the southeast coast of Florida. The base rock is the Anastasia Formation. This feature is a coquinoid-quartz-limestone composite formed during the Pleistocene period. Pamlico Sand is found above the Anastasia rock; it is of more recent (late Pleistocene) origin. These two geologic features combined with the constant net movement of littoral zone sand from north to south have resulted in the current geomorphology of the barrier island on which the park is located. Other physical factors also affect the morphology of the area; these include hurricanes, lower intensity tropical storms and storms from the northeast

#### **Soils**

Soil types and soil morphologies are produced by forces of weather acting on parent material, accumulation of organic matter, and leaching of minerals. In general, undeveloped, well-drained sandy soils are found in this unit east of State Road A1A along the Atlantic coast (U.S. Department of Agriculture (USDA) 1980). Moderately well drained,



AVALON STATE PARK



MANAGEMENT ZONES MAP

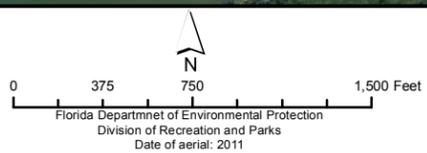




**Legend**

04	- Arents, 0-5 percent slopes
09	- Beaches
10	- Canaveral fine sand, 0 to 5 percent slopes
24	- Myakka fine sand
27	- Palm Beach fine sand, 0 to 5 percent slopes
35	- Kesson-Terra Ceia complex, tidal
46	- Mckee sandy clay loam, tidal
99	- Water

AVALON STATE PARK



SOILS MAP



poorly drained and saturated soils are found west of A1A (USDA 1980). See the soils map for soil associations that occur in the park. Addendum 4 contains detailed descriptions of these soil types (USDA 1980).

At this time, Avalon State Park has no major soil conservation issues. Earlier beach dune erosion due to years of unlawful operation of off-road vehicles (ORVs) as well as pedestrian trespass through sensitive areas is now minimal. There were several large beach dune "blowouts" on the property; these have been restored and are filling with native vegetation.

### **Minerals**

There are no known mineral deposits of commercial value located within this unit.

### **Hydrology**

Avalon State Park is located within the South Florida Water Management District. Drainage to the east is into the Atlantic Ocean. Drainage to the west through mangrove tidal swamp is into the Indian River Lagoon Aquatic Preserve. Stabilized dikes/roads, constructed for the purpose of mosquito control before the property was acquired by the state, run along the perimeter of swamp. These barriers have resulted in significant alteration of estuarine hydraulic continuity within the parcel. A breached area about 60 feet wide developed in the fall of 1981 as the result of a severe storm (J. David unpubl. data). This has restored an unknown amount of tidal exchange. The Division does not have any plans to close this breach and would like to have further hydrological studies take place in order to work jointly with St. Lucie County Mosquito control to implement the best management strategies for the hydrology in the park.

A number of mosquito control ditches run throughout the maritime hammock located west of A1A. These ditches alter the hydrology in both the area of estuarine tidal swamp to the west and create areas of estuarine tidal swamp within the maritime hammock. The mosquito ditches are currently active and flow levels are controlled by the mosquito control district of St. Lucie County. Due to the current active use of the mosquito control ditches, they cannot be filled in or plugged to restore a more natural hydrology within the parcel.

The Indian River Lagoon is a shallow estuary between the barrier island and the Florida mainland, extending from Volusia County south to Palm Beach County. Although construction of canals and sheet-flow surface runoff into Indian River have detrimentally altered both water quality and pulse quantity regimes, it still remains one of the most biologically diverse estuarine ecosystems in the United States. Currently, high levels of agricultural and residential area surface water runoff and their associated burdens of organic debris, nutrients, pesticide residuals, and other anthropogenic by-products all present problems for the estuary.

A thin freshwater lens underlies the uplands in the unit. This water is captured by percolation and retained from the approximately 52 inches of precipitation that the area receives annually.

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

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

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

### **BEACH DUNE**

**Desired future condition:** A coastal mound or ridge of unconsolidated sediments found along shorelines with high energy waves. Vegetation will consist of herbaceous dune forming grass species such as sea oats (*Uniola paniculata*) and sand cordgrass (*Spartina alterniflora*). Other typical species may include sea rocket (*Cakile* spp.), railroad vine (*Ipomea pes-caprae*), seashore paspalum (*Paspalum vaginatum*), beach morning glory (*Ipomea imperati*), and beach sunflower (*Helianthus debilis*, along the Atlantic coast). Occasionally shrubs such as seagrape (*Coccoloba uvifera*) may be scattered within the herbaceous vegetation.



**Legend**

- BD - Beach Dune 36.38 ac.
- CS - Coastal Strand 15.55 ac.
- MAH - Maritime Hammock 312.39 ac.
- MS - Mangrove Swamp 265.98 ac.
- CD - Canal/ditch 18.54 ac.
- DV - Developed 1.57 ac.
- RD - Road 7.28 ac.



**Description and assessment:** The beach dune is located exclusively in the eastern portion of the park, on the east side of State Road A1A. This community is located entirely within management zone AV-1. This community is considered to be in good condition. Previously the beach dune had been severely impacted by the unlawful operation of off-road vehicles and exotic plants. In August 1994, the most severely impacted areas were replanted with sea oats (*Uniola paniculata*), seagrape (*Coccoloba uvifera*), seashore elder (*Iva imbricata*) and bitter panicgrass (*Panicum amarum*). All of the Australian pines (*Casuarina equisetifolia*) also were removed from the backside of the primary dune and the interdune expanse. A parking lot that had been located in the beach dune community was removed in 2006. This area has been planted with native vegetation, and natural recruitment of surrounding vegetation has taken place. Both the restorative vegetation and the exotic plant removal projects were funded by the Pollution Recovery Trust Fund (PRTF). In March 2010, an exotic removal treatment was done of the entire beach dune. All woody species of exotic plants were removed, namely Brazilian pepper (*Schinus terebinthifolius*) and beach naupaka (*Scaevola taccada*). This project was funded by the United States Fish and Wildlife Service (USFWS) Coastal Program Grant. There remain scattered seedlings and saplings from the seed bank of the large woody plants that have been previously removed.

Despite these earlier problems, the unvegetated beachfront and primary dunes are still aesthetically pleasing and support most of the floral components expected to occur in this natural community type (see USDA 1984; Florida Sea Grant 1990; FNAI 2010). As also is typical for this type of habitat, nearshore sand and primary dune sand are extremely mobile. High-energy waves striking the shoreline, north to south littoral drift, and wind movement of dry sand along beachfront and dune profiles all contribute to this effect. The past construction of pedestrian dune crossovers and fencing should further protect this area from physical impacts and thereby promote natural accretion processes. The crossovers and fencing were funded by PRTF monies. There are some issues with public parking along state road A1A and crossing over the dune outside of the designated walkways. This has formed small trails impacting vegetation and causing minor erosion.

**General management measures:** As mentioned above, the beach dune is in good condition. The long-term maintenance of previous exotic removal projects will require periodic sweeps to remove any new seedlings or saplings present. Enforcement of individuals crossing over to the beach outside designated walkways should also occur. Installation of dune fencing may also help with this.

## **COASTAL STRAND**

**Desired future condition:** Characterized by stabilized, wind-deposited coastal dunes that are thickly vegetated with evergreen salt-tolerant shrubs. An ecotonal community generally lies between the beach dune and maritime hammock, scrub or tidal swamp. Coastal strand dunes contain deep, well-drained sands that are generally quite stable but become susceptible to severe damage if the vegetation is significantly disturbed. Temperate plant species dominate including saw palmetto (*Serenoa repens*), dwarfed cabbage palms (*Sabal palmetto*), tough bully (*Sideroxylon tenax*), yaupon, holly (*Ilex vomitoria*), Hercules' club (*Zanthoxylum clava-herculis*), and dwarfed, shrubby forms of red bay (*Persea borbonia*) and live oak (*Quercus virginiana*). South of Cape Canaveral, tropical species become more prevalent including seagrape (*Coccoloba uvifera*), swamp

privit (*Forestiera segregata*), myrsine (*Rapanea punctata*), buttonsage (*Lantana involcrata*), white indigoberry (*Randia aculeata*), snowberry (*Chiococca alba*) and numerous others. In either geographical range, smooth domed canopies develop as the taller vegetation is “pruned” by the windblown salt spray that kills the outer buds. This process is not as prevalent on the west coast of Florida or on the lee-side of islands due to prevailing easterly winds. Significant debate exists on the relative occurrence of natural fires compared to inland pyric communities. The DRP Fire Management Standard estimates that the appropriate fire return interval to be between four and 15 years. However, variability outside this range may occur based on site-specific conditions and management goals.

**Description and assessment:** The coastal strand is located exclusively on the eastern portion of the park, east of State Road A1A, in the area between A1A and the coastal dune. This community is located entirely within management zone AV-1. Historically the coastal strand extended further to the west but was truncated with the development of State Road A1A. This community is considered to be in good condition. Large infestations of Brazilian peeper had previously been present throughout the coastal strand. In March 2010, an exotic removal treatment was done of the entire coastal strand. All woody species of exotic plants were removed, namely Brazilian pepper (*Schinus terebinthifolius*) and carrotwood (*Cupaniopsis anacardioides*). This project was funded by the USFWS Coastal Program Grant. Exotic vegetation still exists in small patches of herbaceous plants, primarily guinea grass (*Panicum maximum*) and bowstring hemp (*Sansevieria hyacinthoides*). The native plant coin vine (*Dalbergia ecastaphyllum*) has spread throughout this community, primarily in areas where exotic plant removal has taken place. This native plant has begun to act invasively covering other native plant species when present.

**General management measures:** As mentioned above, the coastal strand is in good condition. The remaining small patches of herbaceous exotic vegetation should be removed. The long-term maintenance of previous exotic removal projects will require periodic sweeps to remove any new seedlings or saplings present. There are no current plans to conduct any prescribed fire activities in this area. Test fires may be conducted in the future to see how the ecosystem responds. Based on the results from these test fires further prescribed burning may take place in this community.

## **MARITIME HAMMOCK**

**Desired future condition:** A coastal evergreen hardwood forest occurring in narrow bands along stabilized coastal dunes. Canopy species will typically consist of live oak (*Quercus virginiana*), 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*), and/or wax myrtle (*Myrica cerifera*). Very sparse or absent herbaceous groundcover will exist.

**Description and assessment:** The stabilized habitat west of A1A is characterized by a maritime hammock community. This community comprises all of management zones AV-2 and AV-3, and the eastern portion of management zones AV-4 and AV-5. This area of Avalon State Park probably supports the greatest floral species diversity within the unit; warm-temperate species and tropical species co-dominate. A species list is included in

Addendum 5. This community is considered to be in fair condition due to impacts from altered hydrology and exotic plants. Mosquito ditches are present throughout the maritime hammock, allowing for tidal flow of water from the estuarine tidal swamp to the west. These ditches are currently active and are managed by the St. Lucie Mosquito Control District. The mosquito ditches allow for saltwater and plant species associated with mangrove swamp to be present in the maritime hammock. Dense areas of exotic plants, with heavy infestations of Brazilian pepper (*Schinus terebinthifolius*), are present in this community. The heaviest concentrations occur along the banks of the mosquito ditches where small spoil mounds are present from the creation of the ditches.

**General management measures:** Hydrological restoration of the maritime hammock would require the plugging and/or filling of the mosquito control ditches located throughout the community. The mosquito ditches are currently active and maintained by St. Lucie County Mosquito Control. As long as the mosquito ditches are actively being used no plugging or filling of the ditches can take place to restore the natural hydrology to the maritime hammock. Park staff has significantly reduced the infestation of exotic plants within this community. In 2010, a mechanical treatment of approximately ten acres of exotic plants took place, in 2012 an additional mechanical treatment to place of approximately eight acres. Approximately thirty-five acres of dense Brazilian pepper monoculture remain. In addition to removing exotic plants, this treatment also created access for park staff to treat additional areas within this community. Monitoring and treatment of exotic plants will continue for this community.

## **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 dominate 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 maritima*), 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, calcareous sands or 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 is the dominant natural community along the west side of the property that abuts the Indian River Lagoon estuary. This community comprises all of management zone AV-6 and the western portion of management zones AV-4 and AV-5. This community is considered to be in fair condition due to impacts from altered hydrology. Most of this community sits inside stabilized dikes/roads that run along the western edge of the community rising several feet in height, effectively impounding much of the area (Rey and Kain 1991). Consequently, it is difficult to determine how much of the community was actually mangrove swamp before barriers were constructed.

The mangrove swamp community in this area follows the typical zonation of red mangroves in the intertidal zone, black mangroves in the intermediate zone, and white mangroves and buttonwood in the highest elevations. A breached area in the road about 60 feet wide developed in 1981 as the result of a severe storm. This restored limited hydraulic continuity with the Indian River and more "normal" tidal exchange cycles and prisms for the wetland system. In general, the mangrove community in this area appears to be vigorous and biologically productive. However, primary productivity, nutrient cycling, and water quality of mangrove systems which have impaired tidal cycling are usually limited when compared to unimpaired systems. General ecology of South Florida mangrove communities may be reviewed in Odum et al. (1982).

**General management measures:** Restoration of this community would require the removal of the dikes/roads along the western edge of the mangrove swamp. This would return a normal tidal exchange cycle to the mangrove swamp and improve the water quality and nutrient cycling of this community. The mangrove swamp would also be fully reconnected to the Indian River Lagoon estuary allowing it to become fully utilized by a variety of plant and animal species present in the estuary. The breach that is currently in the impoundment berm does allow for some natural tidal exchange to occur. Currently there are no plans within the Division to repair this breach. The park will work with St. Lucie County Mosquito Control District to conduct further hydrological studies needed to identify how to best manage and restore this natural community.

### **Altered Landcover Types**

#### **CANAL/DITCH**

**Description and assessment:** Mosquito control ditches are present throughout the portion of the park west of State Road A1A in management zones AV-2, AV-3 AV-5 and AV-6. Both the mangrove swamp and maritime hammock communities have mosquito ditches within their boundaries. The mosquito ditches that run through the maritime hammock community are lined with mangrove and buttonwood trees due to the brackish nature of the water in the ditches. Large Brazilian pepper trees are also found along the edges of many of the ditches in the maritime hammock. Ditches throughout the mangrove swamp community create areas of open water due to their lower elevation when compared to the surrounding areas. The far west side of the property has a ditch that runs the entire length of the property. This ditch was created with the installation of the mosquito berm that separates the mangrove swamp and Indian River Lagoon. The ditch runs along this berm between the berm and the start of the mangrove swamp community. The breached area of the berm that was previously discussed allows for the transfer of water from the lagoon into this ditch.

**Desired future condition:** The ditches located in the maritime hammock will have exotic plant infestations removed along their edges. The ditches located in the mangrove swamp will have better connectivity to the surrounding lagoon to increase natural tidal flow and flushing of water.

**General management measures:** Staff will continue to conduct exotic plant removal along the ditches located in the maritime hammock. A hydrological assessment will take place to identify the best measures for further restoring a more natural tidal flow for the ditches located in the mangrove swamp community. The park will continue to work with St. Lucie County Mosquito Control to devise the best management measures for the mosquito ditches.

## **DEVELOPED AREAS**

**Description and assessment:** There is a stabilized parking area on the east side of State Road A1A in management zone AV-1. There is a stabilized parking area and observation tower on the west side of State Road A1A in management zone AV-2.

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

**General management measures:** Staff will continue to control invasive exotic plant species in developed areas of the park. Defensible space will be maintained around all structures in areas managed with prescribed fire or at risk of wildfires.

## **ROAD**

**Description and assessment:** The road runs along the western boundary of the park in management zones AV-3, AV-4, AV-5 and AV-6. This road is what comprises the mosquito control berm. The road is used by mosquito control to access the impoundment on the west side of the property. The road is unpaved and has native vegetation along its edges.

**General management measures:** Exotic plant maintenance will continue along road edges. St. Lucie County Mosquito Control will continue to maintain road and participate in exotic plant removal maintenance.

## **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), the Florida Fish and Wildlife Conservation Commission (FWC) or the Department of Agriculture and Consumer Services (DACCS) as endangered, threatened or of special concern.

Avalon State Park is an active participant in the statewide marine turtle-monitoring program. Three species of marine turtles -- loggerhead (*Caretta caretta*), green (*Chelonia mydas*) and leatherback (*Dermochelys coriacea*) -- use the relatively undeveloped portion of the beach within the park for nesting. The park serves as a state index and survey beach for nesting marine turtles. During the nesting season, park staff conducts daily surveys of the beach recording the previous night's activities including number of crawls, false crawls, species identification and number of nests. The data collected from the park are used by state and federal agencies to formulate policy on nesting marine turtles.

The population of nesting marine turtles is stable but tends to follow statewide trends. For example, if the population of nesting loggerhead turtles is in decline around the state, this trend is also reflected in the regional population nesting at the park. The major threats to nesting marine turtles, their nests and turtle hatchlings at Avalon are predation from natural and introduced predators and disorientation from artificial lighting. Currently the predation levels of sea turtle nests at Avalon fall below the 10% threshold. Any lighting that is currently in or will be added to the park will be "turtle-friendly" as recommended by the FWC Marine Turtle Lighting guidelines to avoid any disorientation issues.

The imperiled plant species found at Avalon are located in the beach dune and maritime hammock natural communities. Previously the plant species in the beach dune came under constant stress from illegal vehicle traffic and subsequent erosion along the beach. The vehicle traffic has been eliminated and the only current impact to these species comes from the occasional foot traffic that may occur outside of designated walkways and through the beach dune. The major threat to the imperiled plant species in the maritime hammock comes from exotic plant infestation reducing the amount of suitable habitat for these species. Ongoing exotic removal by both park staff and contractors continue to reduce this threat.

Many of the imperiled bird species are not residents of the park but have been observed using the natural resources of the park. The park will continue to implement a systems management approach that involves managing the resources as a complete ecosystem. This strategy will provide for the resources needed to assist in the recovery and stabilization of the imperiled bird species that use the park.

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

<b>Table 2: Imperiled Species Inventory</b>						
<b>Common and Scientific Name</b>	<b>Imperiled Species Status</b>				<b>Management Actions</b>	<b>Monitoring Level</b>
	<b>FWC</b>	<b>USFWS</b>	<b>FDACS</b>	<b>FNAI</b>		
<b>PLANTS</b>						
Sand-dune spurge <i>Chamaesyce cumulicola</i>			LE	G2, S2	10	Tier 1
Coastal vervain <i>Glandularia maritima</i>			LE	G1, S1	10	Tier 1 Tier 2
Simpson's stopper <i>Myrcianthes fragrans</i>			LT		2, 10	Tier 1 Tier2
Prickly-pear <i>Opuntia stricta</i>			LT		10	Tier 1
Beach-star <i>Remirea maritima</i>			LE		10	Tier 1
Inkberry <i>Scaevola plumieri</i>			LT		10	Tier 1
Common wild-pine <i>Tilandsia fasciculata</i>			LE		2, 10	Tier 1
<b>REPTILES</b>						
Loggerhead Sea Turtle <i>Caretta caretta</i>	LT	LT		G3, S3	3, 10, 13	Tier 4
Green Sea Turtle <i>Chelonia mydas</i>	LE	LE		G3, S2	3, 10, 13	Tier 4
Leatherback Sea Turtle <i>Dermochelys coriacea</i>	LE	LE		G2, S2	3, 10, 13	Tier 4
Gopher Tortoise <i>Gopherus polyphemus</i>	LT			G3, S3	1, 2, 10	Tier1
<b>BIRDS</b>						
Little Blue Heron <i>Egretta caerulea</i>	LS			G5, S4		Tier 1
Reddish Egret <i>Egretta rufescens</i>	LS			G4, S2		Tier 1
Snowy Egret <i>Egretta thula</i>	LS			G5, S3		Tier 1
Tricolored Heron <i>Egretta tricolor</i>	LS			G5, S4		Tier 1
White Ibis <i>Eudocimus albus</i>	LS			G5, S4		Tier 1
Merlin <i>Falco columbarius</i>				G5, S2		Tier 1

<b>Table 2: Imperiled Species Inventory</b>						
<b>Common and Scientific Name</b>	<b>Imperiled Species Status</b>				<b>Management Actions</b>	<b>Monitoring Level</b>
	<b>FWC</b>	<b>USFWS</b>	<b>FDACS</b>	<b>FNAI</b>		
American Oystercatcher <i>Haematopus palliatus</i>	LS			G5, S2		Tier 1
Wood Stork <i>Mycteria americana</i>	LE	LE		G4, S2		Tier 1
Brown Pelican <i>Pelecanus occidentalis</i>	LS			G4, S3		Tier 1
Roseate Spoonbill <i>Platalea ajaja</i>	LS			G5, S2		Tier 1
Black Skimmer <i>Rynchops niger</i>	LS			G5, S3		Tier 1
American Redstart <i>Setophaga ruticilla</i>				G5, S2		Tier 1
Least Tern <i>Sterna antillarum</i>	LT			G4, S3		Tier 1

**Management Actions:**

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

**Monitoring Level:**

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

- Tier 2.....** Targeted Presence/Absence: includes monitoring methods/activities that are specifically intended to document presence/absence of a particular species or suite of species.
- Tier 3.....** Population Estimate/Index: an approximation of the true population size or population index based on a widely accepted method of sampling.
- Tier 4.....** Population Census: A complete count of an entire population with demographic analysis, including mortality, reproduction, emigration, and immigration.
- Tier 5. ....** Other: may include habitat assessments for a particular species or suite of species or any other specific methods used as indicators to gather information about a particular species.

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

**Exotic and Nuisance Species**

Exotic species are plants or animals not native to Florida. Invasive exotic species are able to 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.

Exotic plant removal projects by park staff and contractual labor have greatly reduced the acres infested by exotic plants at Avalon. Since 2002, there has been 230 acres of exotics treated at Avalon. Exotic removal projects with contractual labor of the beach dune and coastal strand communities took place in 1994 and 2010, targeting the predominant exotic species in these areas: Brazilian pepper, beach naupaka and Australian pine. All 53 acres of management zone AV-1 have been cleared of woody exotic vegetation. These species are now in maintenance with periodic sweeps conducted by park and district staff to remove any new seedlings or saplings. Herbaceous exotic plant species still are present in management zone AV-1, but these are isolated to the western edge of the management zone along A1A and do not heavily impact the natural community.

The maritime hammock community is heavily infested with Brazilian pepper. Ongoing efforts by park staff and contractual labor have reduced the infested acres but much of the area is still in need of treatment. One of the major obstacles to exotic removal in this area is accessibility. Management roads exist only on the borders of this area and none exists on the western edge of the hammock. Mechanical removals in 2010 and 2012 did create some additional access but access to the western parts of the hammock remains an issue. The heaviest concentration of Brazilian pepper occurs along the edges of the mosquito control ditches. The mangrove swamp has no known exotic plant species.

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.

<b>Table 3: Inventory of FLEPPC Category I and II Exotic Plant Species</b>			
<b>Common and Scientific Name</b>	<b>FLEPPC Category</b>	<b>Distribution</b>	<b>Management Zone(s)</b>
<b>PLANTS</b>			
Woman's tongue <i>Albizia lebbek</i>	I	2	AV-2, AV-3, AV-5
Australian-pine <i>Casuarina equisetifolia</i>	I	2	AV-2
Carrotwood <i>Cupaniopsis anacardioides</i>	I	2	AV-3
Surinam Cherry <i>Eugenia uniflora</i>	I	2	AV-2, AV-5
Life plant <i>Kalanchoe pinnata</i>	II	2	AV-1
Lantana <i>Lantana camara</i>	I	2	AV-1
Guinea grass <i>Panicum maximum</i>	II	2	AV-1, AV-2, AV-3, AV-4, AV-5
Torpedo grass <i>Panicum repens</i>	I	3	AV-1, AV-3, AV-5
Castor bean <i>Ricinus communis</i>	II	1	AV-1
Bowstring hemp <i>Sansaviera hyacinthoides</i>	II	2	AV-1
Beach naupaka <i>Scaevola taccada</i>	I	2	AV-1, AV-2
Brazilian pepper <i>Schinus terebinthifolius</i>	I	2	AV-1, AV-2
		4	AV-3, AV-4, AV-5
Schefflera <i>Schefflera actinophylla</i>	I	2	AV-3

**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.

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

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

Raccoons occasionally raid sea turtle nests and prey on hatchlings on the beach. Monitoring of nest predation is noted during the daily nest counts. Supplemental feeding of raccoons by visitors can result in artificially high numbers and the spread of diseases. This activity is discouraged by educational brochures and posted signs prohibiting the feeding of wildlife. Proper disposal of discarded food items by visitors, especially along the beach, will help in alleviating this threat. When these species are observed on the beaches of the park, they are removed according to the protocols set forth in the DRP’s Operations Manual.

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

**Special Natural Features**

Avalon State Park is home to one of the largest continuous areas of maritime hammock in Florida. This natural community is listed by FNAI as being imperiled within the state. Continued restoration of this community will only increase its functionality and importance to the wide variety of species that utilize it. The beach dune should be mentioned in that it provides important undeveloped habitat for shore birds and excellent habitat for nesting sea turtles. Successful restoration of the mangrove swamp could provide one of the largest unimpounded mangrove swamps in the area.

**Cultural Resources**

This section addresses the cultural resources present in the park that may include archaeological sites, historic buildings and structures, cultural landscapes and collections. The Department of State (DOS) 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 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 (NRHP) involves the use of contexts as well as an evaluation of integrity of the site. A cultural resource's significance derives from its historical, architectural, ethnographic or archaeological context. Evaluation of cultural resources will result in a designation of NRL (National Register or National Landmark Listed or located in an NR district), NR (National Register eligible), NE (not evaluated) or NS (not significant) as indicated in the table at the end of this section.

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

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

## **Pre-Historic and Historic Archaeological Sites**

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

**Description:** The park contains two black earth and shell midden sites: Hurricane Oak Ridge and West Landing. Both of the sites are of the culture type Malabar I and Malabar II, covering the time period of ca. 750 B.C.-A.D. 1750. Hurricane Oak Ridge site (SL01639) has two components, A and B. The size of component A is 2,322 square meters, and component B is 50 x 150 feet. A survey of the site for the FMSF was conducted in March 2004. Test holes and a screen shovel were used to conduct the survey. The site is identified as serving for prehistoric habitation as a village or seasonal camp. Artifacts found include aboriginal ceramics, animal bone and unworked shell. The West Landing site (SL01685) is located just to the west of the Hurricane Oak Ridge site. The size of the site is 50 x 150 feet. A survey of the site for the FMSF was conducted in March 2004. Test holes and a screen shovel were used to conduct the survey. The site is identified as serving for prehistoric habitation and campsite. Artifacts found include aboriginal ceramics, animal bone and unworked shell.

A predictive model currently has not taken place at the park. A predictive model project will be taking place at the park in the near future. Based on a predictive model that took place in 2003 there is a high probability that additional archaeological sites are located within the park, based on its proximity to water accessible by canoe and being located on the leeward side of the dune ridge of a barrier island. These characteristics have shown a high level of probability for sites being present based on past surveys (Carr, 2004).

**Condition Assessment:** The Hurricane Oak Ridge Site (SL01639) is in fair condition. Currently the site has no impacts effecting its level of quality. The site was impacted during construction of the housing development that was built near the site. The portion of the site that is outside the park boundary was disturbed, most likely from heavy equipment, that removed outer layers of the soil covering the midden. The area of the site that is within the park boundary was only mildly impacted from the development with some mild erosion from wind and rain taking place over time after the initial soil disturbance took place at the edge of the site outside the park. There is no evidence of any looting that has taken place at this site. The West Landing site (SL01685) is in good condition. No land use disturbances have taken place here, and there is no evidence of looting.

**Level of Significance:** Avalon State Park Unit Management Plan addresses the status and expected conditions of resources located in Avalon State Park. Phase II archaeological testing revealed that intra-site patterning of cultural material at the site differentiated house sites from food preparation areas, enhancing our understanding of Malabar prehistory. Florida Master Site File (FMSF) has record of two archaeological sites in the park. The significance of each of the cultural resources located within this park is addressed separately in this overview. The sites must be monitored, any stabilization

issues addressed, and additional information or data relative to any sites submitted to the Division of Historical Resources (DHR)/FMSF.

Hurricane Oak Ridge (SL01639) is deemed Eligible for NRHP under Criterion D by the recorder and evaluated Potentially Eligible for NRHP by the State Historic Preservation Officer (SHPO). Both the recorder and SHPO consider West Landing (SL01685) Ineligible for NRHP.

**General management measures:** NR Listed or Eligible resources warrant higher profile monitoring and measures to stabilize and mitigate deterioration and disturbance, but all recorded sites will be located, visited and monitored regularly with necessary steps taken to conserve their integrity. Any clearing, grubbing or tree removal in the sites as well as any ground disturbance within 200 feet should be monitored (Carr, 2004). It is possible that these activities could uncover new sites or artifacts. Evidence of previously unrecorded sites will be documented and newly discovered sites will be recorded to DHR/FMSF standards. Boundaries of sites will be redefined as appropriate.

### **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:** There are no known or recorded historic structures in Avalon State Park. It should be noted that State Road A1A (SL01648), which runs through the park but is not on park property, is listed in the Florida Master Site File as a resource group.

### **Collections**

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

**Description:** Avalon State Park has no significant collection of artifacts.

**General management measures:** A Scope of Collections Statement has not been developed for the park. As the DRP Operations Manual requires that each park adopt a Scope of Collections Statement, such a statement needs to be developed as a for guide any future collections within Avalon 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.

<b>Table 4: Cultural Sites Listed in the Florida Master Site File</b>						
<b>Site Name and FMSF #</b>	<b>Culture/Period</b>	<b>Description</b>	<b>Significance</b>	<b>Condition</b>	<b>Treatment</b>	<b>Management Zone</b>
SL01639 Hurricane Oak Ridge	Pre-Historic	Archaeological Site	NR	F	P	AV-3
SL01685 West Landing	Pre-Historic	Archaeological Site	NS	G	P	AV-3

**Significance:**

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

**Condition**

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

**Recommended Treatment:**

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

**RESOURCE MANAGEMENT PROGRAM**

**Management Goals, Objectives and Actions**

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

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

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

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

## **Natural Resource Management**

### **Hydrological Management**

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

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

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

Park staff will continually monitor the hydrological function of park and assess the park's natural communities for future restoration needs, as needed. Hydrological restoration is currently difficult to conduct due to the active mosquito control ditches that are throughout the west side of the park. Park staff will continue to work cooperatively with

the St. Lucie County Mosquito Control District and will explore funding opportunities to further study the area's hydrology to identify best management practices for the park's hydrological resources, including natural resource management and mosquito control.

### **Natural Communities Management**

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

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

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

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

The only community located in Avalon State Park where prescribed fire may take place is the coastal strand in management zone AV-1. There is no recorded burn history for this area and the park currently does not have any plans to burn this area. The park may conduct test fires in the future to observe how the system responds and if future introduction of prescribed fire would be beneficial. Currently no fire breaks exist around the area. Fire breaks should be installed on the north and south coastal strand. These breaks would not be mechanically installed but would be made by staff using hand tools. No breaks will be necessary to the east, as the beach dune will act as a natural barrier, or to the west where State Road A1A would act as a barrier. The nature trails under development in the western portion of the park will also serve as fire breaks. Special care must be taken to avoid any impact to state road A1A on the western border of the coastal strand. Smoke management will be critical to ensuring a successful burn.

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

**Natural 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 communities' 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 maritime hammock and beach dune communities.

***Objective: Conduct habitat/natural community restoration activities on thirty-five acres of maritime hammock community.***

The maritime hammock contains approximately thirty-five acres of dense monocultures of Brazilian pepper. As these areas are being treated by park staff, restoration will also take place by mechanically removing dead and live exotic vegetation and replanting with native vegetation. Plants that are chosen to be planted in the exotic removal areas will be consistent with those that are found throughout the rest of the maritime hammock. Portions of the thirty-five acres may not need to be replanted if sufficient native vegetation is present to allow for natural recruitment. Approximately eighteen acres of dense Brazilian pepper have already been mechanically removed in 2010 and 2012. This area is currently being revegetated through plantings and natural recruitment. Maintenance and monitoring will need to periodically take place in order to remove any new exotic vegetation in these areas.

**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. Currently there are no natural community improvement projects planned at the park.

**Imperiled Species Management**

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

The DRP strives to maintain and restore viable populations of imperiled plant and animal species primarily by implementing effective management of natural systems. Single species management is appropriate in state parks when the maintenance, recovery or

restoration of a species or population is complicated due to constraints associated with long-term restoration efforts, unnaturally high mortality or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes, and should not imperil other native species or seriously compromise park values.

In the preparation of this management plan, DRP staff consulted with staff of the FWC's Imperiled Species Management or that agency's Regional Biologist and other appropriate federal, state and local agencies for assistance in developing imperiled animal species management objectives and actions. Likewise, for imperiled plant species, DRP staff consulted with FDACS. Data collected by the USFWS, FWC, FDACS and FNAI as part of their ongoing research and monitoring programs will be reviewed by park staff periodically to inform management of decisions that may have an impact on imperiled species at the park.

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

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

The beach dune area of the park represents habitat that may be used by the endangered beach mouse (*Peromyscus polionotus*). Currently, there are no records of any recent observations of the beach mouse at the park. A monitoring plan should be developed and implemented to confirm the presence/absence of this species. If the species is present, annual surveys should be conducted to document its population levels. DRP staff will continue to develop partnerships with other agencies and academic institutions to assist with the updates of inventory lists for additional imperiled species.

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

Avalon State Park is an active participant in the statewide marine turtle-monitoring program. Monitoring protocols have been established by FWC. Three species of marine turtles, loggerhead, green, and leatherbacks, use the beach for nesting. The park serves as a state index and survey beach for nesting marine turtles. During the nesting season, park staff conducts daily surveys of the beach recording the previous night's activities including number of crawls, false crawls, species identification and number of nests. In addition to the daily surveys, park staff also participates in the state's marine turtle stranding and salvage program that collects data on stranded, injured or dead marine

turtles. The data collected from the park are used by state and federal agencies to formulate policy on nesting marine turtles.

***Objective: Maintain predation levels of marine turtle nests at or below ten percent.***

Predation from natural and introduced animal species is one of the major threats to marine turtle nests and hatchlings. Raccoons and opossums are the primary predators in the park. Depredation is a part of the natural system and, to a certain extent, compensated by the high reproductive output of sea turtles. However, predators will sometimes become so proficient at finding and destroying nests that they may threaten all the nests on a beach. Resource managers may sometimes control predators such as raccoons by trapping and removing nuisance animals from the beach. Currently the predation levels of marine turtle nests at Avalon State Park are below ten percent. If predation exceeds the ten percent threshold, predator removal and/or the placement of additional protective screens or self-releasing cages over the nests will occur.

The predator removal program is an effective means of controlling nest depredation and is administered by the USDA. Another method for controlling mammalian predation without killing the predators is to place a self-releasing screen or cage over threatened nests. Park staff use a combination of flat screening and a predator removal program to maintain predation levels at or below the required ten percent that was established by the Florida Fish and Wildlife Conservation Commission (FWC). Raccoons are opportunistic predators that have adapted well to coexist in the urban developments throughout Florida. Scientific documentation indicates that certain behavior is learned. During the marine turtle nesting season, the population of raccoons prowling the beach increases. For these reasons, the screening does not always prevent nest depredation by raccoons, so it becomes necessary to remove the nuisance predator from the park.

***Objective: Continue to monitor and mitigate the level and intensity of artificial lighting from outside sources on the beach.***

Artificial lights on the nesting beach result in the disorientation of the turtle hatchlings following emergence from the nest cavity. The park will continue to work closely with FWC and adjacent property owners to address hatchling disorientation and further reduce the level and intensity of artificial lighting on the park's beaches.

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

Two plant species, Coastal vervain (*Glandularia maritima*) and Simpson's stopper (*Myrcianthes fragrans*), will be monitored and sightings will be documented. The exact locations of these plants within the park boundaries are unknown. These plants have previously been documented within the park (Johnson et al. 1993), and new surveys will be conducted to verify they are still present. Currently no monitoring plan exists for imperiled plant species at Avalon State Park. DRP staff will work to establish a monitoring plan, and this plan will be implemented by field staff. These plants may be present in the coastal strand community. Before any possible prescribed fire is conducted in the coastal strand, a survey will take place to mark any locations of imperiled plants and mitigate any harm to them that may occur from fire activity.

## **Exotic Species Management**

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

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

***Objective: Annually treat 12 infested acres of exotic plant species in the park.***

Park staff will conduct exotic removal treatment at the park for Category I and II invasive exotics, as well as exotic species identified that are currently not listed under the FLEPPC listing. The goal will be to treat exotic species that either have re-sprouted or have recruited into natural communities following previous exotic removal treatments in the beach dune and coastal strand areas. Initial treatment of the heavy infestations will continue in the maritime hammock, as well as continued maintenance of previous treatments within this community. All communities, including ruderal and developed, will be targeted. Continuous monitoring and maintenance activities to control re-growth and new infestations will be implemented by park staff. Vegetative surveys will continue to be conducted to ascertain the presence of new exotic species.

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

Control measures will focus on maintaining predation levels on marine turtle nests at or below those levels established by the FWC for State Index Nesting Beaches. Raccoons and opossums are the primary predators that will be removed from the beach under a program contacted by the USDA. The park occasionally has to remove feral or stray cats and dogs from the park. These animals should be turned over to the county animal control facility.

## **Special Management Considerations**

### **Timber Management Analysis**

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

A timber management analysis was not conducted for this park since its total acreage is below the 1,000-acre threshold established by statute. Timber management will be re-evaluated during the next revision of this management plan.

## **Coastal/Beach Management**

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

Avalon State Park has 1.3 miles of beach within the park. Erosion is not an issue along the beach within the park. No prior beach renourishment projects have taken place, and there are none planned. There are three imperiled species of marine turtles that use the beach for nesting. The park serves as a state index and survey beach for nesting marine turtles. Park staff conducts daily surveys during nesting season and these data are used by state and federal agencies to implement sea turtle protocols. Off-road vehicle use in the past was along the beach and dune community. This activity has subsided but continued monitoring and enforcement is needed to ensure these activities do not begin again. There are minor issues with public parking along State Road A1A outside of the designated parking area and crossing over to the beach. Trails have been formed from this activity, impacting vegetation and causing some erosion along the beach dune. Enforcement of these no parking areas should curb this activity. Public access to the beach is at designated walkways leading to the beach from the parking area.

The Trustees have granted management authority of certain sovereign submerged lands to the DRP under Management Agreement MA 68-086 (as amended January 19, 1988). Management of Avalon State Park includes certain management activities within the buffer zone of sovereign submerged land along the entire beach, beginning at the mean high water or ordinary high water line, or from the edge of emergent vegetation and extending waterward for 400 feet. This area comprises the marine unconsolidated substrates of the park. The submerged resources within the buffer zone significantly increase the species diversity within the park and offers additional recreational opportunities for park visitors. Visitors are able to access this community either from the beach or from a boat. Management actions occurring within the buffer zone include patrolling for boats and watercraft too close to the park's beaches, removal of trash, litter, and other debris, public safety activities, and resource inventories and monitoring.

## **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. 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. The most recent arthropod control plan for Avalon State Park was approved in December 2008.

### **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.

### **Cultural Resource Management**

Cultural resources are individually unique, and collectively, very challenging for the public land manager whose goal is to preserve and protect them in perpetuity. The DRP is implementing the following goals, objectives and actions, as funding becomes available, to preserve the cultural resources found in Avalon 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 FDOS, Division of Historical Resources (DHR) for review and comment prior to undertaking the proposed project. Recommendations may include, but are not limited to concurrence with the project as submitted, pre-testing of the project site by a certified archaeological monitor, cultural resource assessment survey by a qualified professional archaeologist, modifications to the proposed project to avoid or mitigate potential adverse effect. In addition, any demolition or substantial alteration to any historic structure or resource must be submitted to the DHR for consultation and the DRP must demonstrate that there is no feasible alternative to removal and must provide a strategy for documentation or salvage of the resource. Florida law further requires that the DRP consider the reuse of historic buildings in the park in lieu of new construction and must undertake a cost comparison of new development versus rehabilitation of a building before electing to construct a new or replacement building. This comparison must be accomplished with the assistance of the DHR.

#### ***Objective: Assess and evaluate two of two recorded cultural resources in the park.***

Both cultural sites located in Avalon State Park were previously evaluated in March 2004. Since then development has occurred just north of the park boundary adjacent to where the sites are located. The current condition of these sites should be surveyed and evaluated to assess their condition post development. Special consideration should be given to the Hurricane Oak Ridge Site, as it is eligible for addition to the National Register.

Preservation of these sites should also be a priority. Looting and further development near the park boundary are the major threats to the sites.

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

Evaluations conducted in March 2004 need to be updated in the FMSF for both cultural sites. Management should develop and implement a routine monitoring program that enables personnel to report on the location and condition of the recorded the parks' prehistoric and historic cultural resources. Any additional artifacts found should be recorded and updated in the FMSF as needed. Efforts should be made to conduct oral history interviews and/or compile administrative history for the park and surrounding areas to help further guide cultural management decisions. A Scope of Collections will need to be developed and updated for any current collections or for any new collections the park may acquire.

Predictive modeling is needed to determine if there is a need for further archeological survey. This model provides for high, medium and low areas of probability for the occurrence of pre-historic sites. The park has never had a Phase I survey taken place within its boundaries. The model will provide guidance for future development as well as the need for future Phase I archaeological surveys.

***Objective: Bring one of two recorded cultural resources into good condition.***

The West Landing site is currently in good condition and presently does not need any restoration. Efforts should be made to preserve this site and continue to keep in in good condition. The condition of the Hurricane Oak Ridge site is fair due to the adjacent development that has occurred. This site needs to be further evaluated as to what is needed to bring it in to good condition. Stabilization and long-term preservation of this site should be the end goal. A cyclical maintenance plan should be developed and implemented to help guide the park with needed preservation of its sites. Park staff should develop and implement a regular monitoring schedule for both cultural resource sites. Any future activities near these sites by park staff particularly ground disturbance shall be conducted in accordance with DHR guidelines and monitored by appropriately trained personnel.

### **Resource Management Schedule**

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

### **Land Management Review**

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation and recreation lands titled in the name of the Board of Trustees are being managed for the purposes for which they were acquired and in accordance with their approved land management plans. The DRP considered recommendations of the land management review team and updated this plan accordingly. Avalon State Park has not been subject a land management review.

## **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, and through public workshops and environmental groups. With this approach, the DRP's 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.

Avalon State Park is located in St. Lucie County on North Hutchinson Island, a barrier island bounded on the east by the Atlantic Ocean and on the west by the Indian River Lagoon/Intracoastal Waterway. The park is approximately one-quarter mile south of the Indian River County line, four miles north of the City of Fort Pierce and five miles south of the City of Vero Beach. More than 550,000 people live within 30 miles of the park (U.S. Census 2010).

The population of St. Lucie and Indian River counties is diverse in terms of demographic characteristics. According to U.S. Census data (2011), approximately one-third of residents in these counties identify as black,

Hispanic or Latino or another minority group. Almost half (44%) of residents can be described as youth or seniors (U.S. Census 2011). The two counties differ economically, as Indian River County ranked seventh statewide in per capita personal income at \$50,977, while St. Lucie County ranked 36th statewide at \$30,768 (below the statewide average of \$39,636) (U.S. Bureau of Economic Analysis 2012).

The park is located in the Central East Vacation Region, which includes Volusia, Brevard, Indian River, St. Lucie, Martin and Okeechobee counties (Visit Florida 2011). According to the 2011 Florida Visitor Survey, eight percent of domestic visitors to Florida visited this region. Of the estimated 6 million domestic visitors who came to this region in 2011, approximately 90 percent traveled for leisure. Visiting the beach/waterfront and shopping were the most popular activities for those visitors to the region. Summer was the most popular season for visitors, but visitation was generally spread throughout the year. Most visitors traveled by air (71 percent), reporting an average stay of 4.2 nights and spending an average of \$105 per person per day (Visit Florida 2011).

There are considerable publicly-owned resource-based recreation opportunities in proximity to the park. Fort Pierce Inlet State Park, located 2.5 miles to the south, provides beach activities, shoreline fishing, scuba diving, picnicking, primitive group camping and hiking and walking trails, along with opportunities for wildlife viewing, paddling and interpretive activities. The Florida Circumnavigational Saltwater Paddling Trail, or the CT, spans 1,515 miles along Florida's coast, from Pensacola to Fort Clinch. Segment 21, a 47-mile link from Fort Pierce Inlet State Park to Front Street Park in Melbourne, runs through the Indian River Lagoon (an Aquatic Preserve) adjacent to Avalon State Park. A portion of the East Coast Greenway, a developing 3,000-mile trail system that way links all the major cities of the eastern seaboard between Canada and Key West, runs through the park along SR A1A.

On Hutchinson Island, the Kings Island and Queens Island Preserves (once the site of a Native American fishing camp), Wildcat Cove Preserve and Pepper Park, all managed by St. Lucie County, offer beach activities, hiking, picnicking and paddling. South of Fort Pierce Inlet State Park, John Brooks Park and Bear Point Sanctuary feature beachfront areas and wetland preserve that provide seashore fishing, picnicking, paddling access, hiking and kayak rentals. To the north of the park, Indian River County's Round Island Riverside and Beach Parks and Round Island South Conservation Area provide hiking, wildlife viewing, picnicking, beach activities and boating and paddling access.

Several preserves managed by St. Lucie County (in coordination with St. Lucie County Mosquito Control) are located on the mainland west of the park. Harbor Branch Preserve, D.J. Wilcox Preserve, Indrio Savannahs Preserve and Sheraton Scrub Preserve, all acquired in part or in full through the Florida Communities Trust, provide resource preservation and passive outdoor recreation, including hiking, fishing, paddling, and nature study. Nearby Lakewood Park Regional

Park also provides hiking trails, and Savannas Outdoor Recreation Area offers a variety of outdoor activities, including camping.

### **Existing Use of Adjacent Lands**

Adjacent land uses surrounding the park are mostly medium to high density residential. Intermixed with the northern non-contiguous parcels of the park, there are several approved residential developments that have not been completely built-out as well as still several undeveloped individual parcels. Immediately south of the park, lands on the islands are developed with high-rise residential structures and mobile homes. Florida Atlantic University's Harbor Branch Oceanographic Institute is located directly across the Indian River Lagoon from the park.

The 200-foot right-of-way and two-lane paved section of State Road A1A bisects the park. The Florida Department of Transportation recently completed a resurfacing project that added sidewalks, new guardrail, concrete bench pads, ditch pavement and slope protection in some areas.

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

St. Lucie and Indian River counties were relatively rural communities that have experienced rapid population growth over the last 30 years. From 1980 to 2010, the population of the two counties almost tripled. Growth in the area slowed somewhat during the economic downturn of the late 2000s, and business and real estate growth is projected to increase over the timeframe of this plan. Although the surrounding area is expected to grow by approximately 70% by 2040 (BEBR 2012), the existing pattern of residential development is not anticipated to change. Currently, St. Lucie County has designated lands adjacent to the park as Residential Urban (RU) (up to 5 dwelling units (du)/acre) to the north and Residential High (up to 15 du/acre) to the south (St. Lucie County 2010). Across the Indian River County line to the north, adjacent lands are designated Conservation-1 (0 du/acre), Conservation-2 (1 du/40 acres), Recreation and Low-Density Residential-1 (up to 3 du/acre) (Indian River County 2010). A review of proposed comprehensive plan amendments in St. Lucie and Indian River counties showed no substantial development projects impacting the park.

Within St. Lucie County, the zoning classification for the areas immediately adjacent to the park (both north and south) is Hutchinson Island Residential District (HIRD). This purpose of the HIRD zoning category is to provide for a residential environment on Hutchinson Island that 1) is respectful of the natural resources and value of the barrier islands and 2) can be supported by available public and private services. The standards outlined in the land development code for this category ensure that growth and development is clustered away from environmentally sensitive lands and is limited to the more tolerant upland portions of Hutchinson Island (St. Lucie County 2012).

The Treasure Coast Regional Planning Council and both St. Lucie and Indian River counties are committed to maintaining a healthy, sustainable natural

environment in the area (TCRPC 2012). Nonetheless, additional residential or commercial development near the park could produce adverse impacts such as changes in surface and groundwater quality and increased traffic. It will be important for DRP staff to participate in the review of all Comprehensive Plan amendments, proposed zoning changes and development plans that may impact the park in the future.

## **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**

Avalon State Park contains approximately 660 acres and is one of the last large stands of undeveloped land in this area. State Road A1A divides the park property into eastern and western portions. Each portion of the park features different natural communities and provides opportunities for various resource-based recreational activities.

Four natural communities are represented at the park, providing diverse wildlife habitat and wide-ranging natural experiences for park visitors. Two natural communities -- mangrove swamp and maritime hammock -- are represented in the western portion of the park. They provide an ideal setting for the park's shared use trails, wildlife observation and nature study. The natural communities in the eastern portion of the park -- beach dune and coastal strand -- provide the setting for the beach use areas and picnicking facilities. The beach dune community at Avalon State Park has undergone extensive restoration since 1994 and is currently in good condition.

#### **Water Area**

The park provides access to two substantial bodies of water: the Indian River Lagoon, one of the most important estuarine systems in the United States, and the Atlantic Ocean. Both provide significant opportunities for saltwater recreation, providing opportunities for swimming, fishing, paddling and other activities. A stabilized dike was constructed around the property west of SR

A1A, impounding the tidal swamp for mosquito control purposes. A 60-foot wide portion of the dike was breached during a storm, restoring some tidal exchange.

### **Shoreline**

Avalon State Park has approximately six thousand lineal feet of high-energy Atlantic shoreline, providing opportunities for swimming, fishing, and other beach activities. There are submerged hazards along part of the Atlantic shoreline, constructed by the military for training purposes during World War II. Much of the western shoreline consists of dense mangrove vegetation. This area primarily provides opportunities for wildlife viewing and observation as well as paddling access to the Indian River Lagoon.

### **Natural Scenery**

The park's beaches provide visitors with an unobstructed view of the horizon over the Atlantic Ocean. An observation platform in the western portion of the property provides views of the Indian River Lagoon. The western section provides high-quality maritime hammock with opportunities for hiking and primitive camping.

### **Significant Habitat**

The mangroves provide an important habitat for fish, invertebrates, and a variety of bird species such as Roseate spoonbill, wood stork, least tern and several egrets. The Atlantic shoreline is an important nesting site for sea turtles. It is hoped that as the dune system continues to recover from past disturbances, it may provide suitable habitat for endangered beach mice.

### **Natural Features**

Avalon State Park is home to one of the largest continuous areas of maritime hammock in Florida. This natural community is listed by FNAI as being imperiled within the state. Continued restoration of this community will only increase its functionality and importance to the wide variety of species that utilize it.

### **Archaeological and Historical Features**

There are two archaeological sites located partially within the park along the northern park boundary. These sites served as prehistoric habitation and campsites and include artifacts from the Malabar (I and II) period. However, these sites are inaccessible and not suitable for interpretation.

## **Assessment of Use**

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

### **Past Uses**

The park was named Avalon in honor of the Navy soldiers who trained here during World War II in preparation for the invasion of Normandy. The Navy

used Avalon and the surrounding area to hone the skills of their landing craft crews and to develop their newest type of soldier, the Frogmen, who would later become the Navy SEALs. The submerged hazards along a portion of the Atlantic shoreline were constructed at that time.

### **Future Land Use and Zoning**

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

The park is identified as Conservation – Public (CPUB) on the Future Land Use Map in the St. Lucie County Comprehensive Plan. Areas designated as Conservation-Public are those lands which exhibit unique environmental characteristics and are owned by federal, state, regional, or local public agencies. They are intended solely for preservation and/or recreational use. No residential or commercial development may occur other than that typically related to park service and security functions (St. Lucie County 2010).

The park also falls under the St. Lucie County zoning designations and is zoned HIRD and Institutional. The County intended to rezone these properties to Conservation - Public (CPUB) in 2004; however, the changes never took effect due to defects in the supporting documentation. The County is currently working to correct this issue and rezone the properties to CPUB. The CPUB category is consistent with the Future Land Use category and was established to provide an environment suitable for the protection, preservation or enhancement of public lands in the community (St. Lucie County 2012). The CPUB designation allows cultural activities consistent with the environmental, history, and/or archaeological values of the site and public conservation areas with related recreational uses. There are no expected conflicts between the CPUB Future Land Use or zoning designations and typical state park land uses.

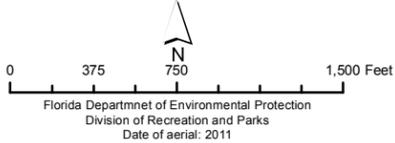
### **Current Recreational Use and Visitor Programs**

Resource-based outdoor recreation in Florida continually increases in popularity. The growth of Florida's resident and tourist populations brings increasing pressure for access that is more widespread and for denser levels of public use in the natural areas available to the public. Consequently, one of the greatest challenges for public land management today is the balancing of reasonable levels of public access with the need to preserve and enhance the natural and cultural resources of the protected landscapes.

The focus of the existing recreational activities at Avalon State Park is the Atlantic shoreline, providing opportunities for swimming, fishing, surfing and other beach activities. The park provides a parking area with dune crossovers on the narrow strip of land between the highway and the dunes east of SR A1A. Hiking, bicycling, picnicking and wildlife viewing are available in the area of the park west of SR A1A. The park's busiest season is from Thanksgiving through



AVALON STATE PARK



BASEMAP



May, and parking at the beach use area often reaches capacity during those months. The park offers interpretive and educational programming to educate the public on the park's resources as well as the history of the area. An interpretive kiosk at the picnic area provides park information and education.

Avalon State Park recorded 169,156 visitors in FY 2011/2012. By DRP estimates, the FY 2011/2012 visitors contributed \$7,443,479 million in direct economic impact and the equivalent of 149 jobs to the local economy (Florida Department of Environmental Protection 2012).

### **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 Avalon State Park, mangrove swamp, maritime hammock, coastal strand and beach dune have been designated as protected zones as delineated on the Conceptual Land Use Plan map.

## **Existing Facilities**

### **Recreation Facilities**

The park's recreational facilities are contained in two primary use areas: the main beach day use area and the trailhead use area. The main beach day use area is located east of SR A1A in the southern portion of the park. This area features picnic pavilions, dune crossovers and interpretive signage. The western portion of the park provides trails and a small day use area. The shared use trail is accessed at the gate on the west side of SR A1A and leads to the west day use area, which also includes a picnic shelter, accessible parking and an observation tower. The shared use trail continues past the day use area along the mosquito dike.

### **Support Facilities**

The park's support facilities include parking, restrooms and honor box in the beach use area and parking in the west day use area. The park currently has no shop or residence area.

In 2004, Hurricanes Frances and Jeanne hit Avalon State Park just three weeks apart. The ocean surge completely devastated the northern section of the park, destroying the paved parking area and the facilities at that location. An inventory of the park's recreational and support facilities is included below.

**Main Beach Use Area**

Small picnic shelter (4)  
 Dune crossover (2)  
 Restroom  
 Paved parking (44 vehicles)  
 Honor box  
 Interpretive exhibits (3)

**West Day Use Area**

Observation platform  
 Small picnic shelter  
 Accessible parking  
 Shared use trail (1.7 miles)

**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, the 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 improved activities and programs are also recommended and discussed below.

***Objective: Maintain the park's current recreational carrying capacity of 1,490 users per day.***

The park will continue to provide the current range of recreational day use opportunities. Hiking, off-road bicycling, picnicking, nature study, swimming, fishing, surfing and other beach activities are popular activities for park patrons.

***Objective: Expand the park's recreational carrying capacity by 431 users per day.***

Expanded parking at the main beach use area and the addition of a north beach use area will expand opportunities for swimming and other beach activities. In addition, completion new nature trails on the west side of SR A1A along with a pedestrian crossing, trailhead, and bridge will expand and enhance recreational opportunities for hiking and bicycling. A new primitive camping area and canoe/kayak launch in the western portion of the park will add recreational camping opportunities and increase paddling opportunities.

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

Two in-person, ranger-led activities are currently offered at the park upon request of park visitors. A history walk is designed to inform visitors about the unique history of Avalon State Park as a U.S. Navy SEAL training location. A dune ecology walk provides interpretive and educational information about the park's issues and resources. Both of these walks provide the public with valuable information that educates visitors about dune preservation and restoration within the park. The walks also educate visitors about park ecology, park history and "lethal litter."

Self-guided interpretive signs and kiosks educate visitors about invasive plants, seashells, rip tide currents and other issues. Publications available at the park cover an array of themes, including sea turtles, mangroves, sea grasses, trails and park activities.

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

The park will develop four new programs to designed to inform visitors of the need to sustain the existing habitat conditions for the colonial waterbirds and other wildlife. The programs will also teach visitors about appropriate wildlife viewing behavior and techniques. Visitor education will be provided in person and through interpretive displays and kiosks at the use areas, trail entrance and along the trails.

New activities will consist of ranger-led programs, scheduled quarterly and also offered upon request. These programs will include sea turtle walks during the summer months, a beach walk that provides information on the wrack line and how it affects the environment and plants (yearly in the fall), hikes on the park trails providing information about the mosquito dikes, maritime hammock and mangroves and kayak tours in Indian River Lagoon. The park will also work with residents of neighborhoods adjacent to the park to provide education.

Interpretive signage will also identify behaviors that are encouraged in the park, while discouraging perennial problem activities, such as littering. Interpretive information will also provide information about park activities, including hiking and bicycling. Up to six interpretive panels and three interpretive kiosks are proposed. Where possible, signs will be consolidated to decrease intrusions into park vistas.

## **Proposed Facilities**

### **Capital Facilities and Infrastructure**

**Goal: Develop and maintain the capital facilities and infrastructure necessary to implement the recommendations of the management plan.**

The proposed development concept for the park is two-fold. It includes improvements to existing use areas that will enhance the visitor experience and increase access to recreational opportunities. In addition, new facilities are proposed that will add recreational activities that are compatible with those currently offered at the park.

The existing facilities of this state park are appropriate to the natural and cultural resources contained in the park and should be maintained. New construction, as discussed further below, is recommended to improve the quality and safety of the recreational opportunities, to improve the protection of park resources and to streamline the efficiency of park operations. As recommended by the FWC Marine Turtle Lighting guidelines, all exterior lighting for current and proposed facilities will utilize "turtle-friendly" lighting. The following is a summary of improved and new facilities needed to implement the conceptual land use plan for Avalon 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 two existing facilities and one-half mile 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 the DRP). The following discussion of other recommended improvements and repairs are organized by use area within the park.

**Main Beach Use Area:**

Expansion of the parking area is recommended to provide additional parking for beach users as well as visitors wishing to access the trails in the western portion of the park. Up to 50 parking spaces, a beach access path/dune crossover, small bathhouse and interpretive kiosk should be added to the north end of the use area to accommodate visitor needs. Provision of RV parking spaces will be considered in the design of the parking lot. Future concession services should be provided using mobile units and could include recreational equipment rentals, snack foods, beverages and various sundry items. The mobile concession should be located adjacent to a bathhouse to facilitate access to utilities. The park will identify a designated swimming area.

**Avalon West Day Use Area:**

The west day use area should be enhanced to provide additional visitor access to the park's extensive maritime hammock and Indian River Lagoon. A shoreline canoe/kayak launch is recommended to expand recreational paddling opportunities and provide access to the Indian River Lagoon. The launch should be designed to provide universal access. If DRP staff observes unacceptable impacts to resources or the visitor experience, limiting public access to guided tours (by rangers, volunteers, or certified outfitters) will be considered to reduce such impacts.

A small picnic shelter, accessible parking, kiosk and an observation platform are already located in this area. The kiosk should provide maps of existing paddling trails, safety information and other interpretive information to enhance the visitor experience. A composting restroom and honor box should also be provided. Accessibility improvements should be made in the day use area to enhance access between the observation platform/access ramp, accessible parking space, picnic pavilion and composting toilet. The mosquito dike should continue to be used as a shared use trail. An observation platform and kiosk are recommended for the end of the dike trail, providing views of the interior wetlands and the Indian River Lagoon.

**Roadway Improvements:**

The park roadway that leads to the west day use area, proposed support facilities and primitive camping area needs to be stabilized, allowing park visitors and staff to easily access the west day use area, dike trail and canoe/kayak launch.

***Objective: Construct five new facilities and 1.3 miles of trail.***

**Pedestrian Crossings/Trail Connections:**

Users of the East Coast Greenway and the park's shared use trails will need to cross SR A1A to safely travel between the trails and the park's beach use area and facilities. To increase visitor safety, a pedestrian crossing proposed on SR

A1A that would allow park visitors to safely cross the roadway and provide a connection to the park's shared use trail network. The crossing should be enhanced with appropriate additional pedestrian treatments such as signing, traffic calming, signalization or other countermeasures that increase safety and compliance.

### **Maritime Hammock Trail and Trailhead:**

Nature trails are currently under development in the western portion of the park to provide access to the maritime hammock and the edge of the tidal swamp west of SR A1A. A bridge or low-water crossing over the low/wet area of the trail is recommended to provide a complete connection for trail users and allow the trail to be opened for use by park visitors. The bridge/crossing should be designed for use by ATV park maintenance vehicles. Two observation platforms and three interpretive kiosks are proposed at various points along the trail to enhance the visitor experience and provide views of the maritime hammock. A trailhead is proposed on the west side of A1A to provide visitor access to the nature trails. The trailhead would feature an accessible parking space and three additional parking spaces, honor box, bicycle parking and an interpretive kiosk. A portion of the trail, from the trailhead to the first observation platform, should be universally accessible.

### **North Beach Use Area:**

A new beach access day use area is proposed at the location of the former northern beach access area. This day use area will include paved parking for up to 27 vehicles, two small picnic pavilions with tables and grills, a small restroom facility and dune walkover. An entrance gate and honor box are also proposed to provide security and collect entrance fees. Bicycle parking (4 spaces) will also be provided, and provision of RV parking spaces will be considered. A stabilized dune walkover will be provided, and an interpretive kiosk will provide information about the park and its resources as well as safety information. A swimming area will be designated.

### **Primitive Camping Area:**

A primitive camping area serving groups of up to 30 persons is proposed in the western portion of the park north of the park road and west of the proposed support area. A composting toilet and potable water connection are recommended for this camping area, which would provide primitive overnight accommodations in an area with few camping opportunities. Access to this area will be limited to registered campers, and a small parking area will be provided at the edge of the site. A primitive campsite should also be located near the canoe/kayak launch to provide camping access for paddlers on the Florida Circumnavigational Saltwater Paddling Trail. At a minimum, the primitive campsite should provide room for up to two tents and a fire ring.





## Shop Facilities:

The addition of shop facilities to Avalon State Park would provide better access to the park's resources and recreation facilities for management, oversight and visitor services and eliminate the need for all equipment and staff to be located at Fort Pierce Inlet State Park. The support area is recommended on the north side of the park road just west of SR A1A and would include a staff residence, two volunteer campsites, and a one-bay shop. Utility connections would be required for this site to be suitable as a shop area.

## Facilities Development

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

### Main Beach Use Area

Expanded parking area (50 spaces)  
Small restroom  
Interpretive kiosk  
Mobile concession  
Dune crossover

### North Beach Use Area

Small picnic pavilion (2)  
Grill (4)  
Small restroom  
Interpretive kiosk  
Entrance gate & honor box  
Dune crossover  
Paved parking (27 spaces)  
Bicycle parking (4 spaces)

### Maritime Hammock Trailhead

Nature trail (1.3 miles with .2 mile for universal access)  
Parking (4 spaces)  
Bridge or low-water crossing (40 linear feet)  
Interpretive kiosk (3)  
Interpretive signage (3)

Observation platform (2)  
Honor box  
Bicycle parking (4 spaces)

### Avalon West Day Use Area

Composting restroom  
Canoe/kayak launch  
Observation platform  
Accessibility improvements  
Honor box

### Primitive Camping Area

Up to 30 persons  
Composting restroom  
Potable water

### Support Area

Pole barn (1-bay)  
Residence  
Volunteer site (2)  
Utility connections

### Parkwide

Park road improvement (0.5 miles)  
Interpretive signage (5)  
Pedestrian crossing  
Primitive campsite (paddle-in)

## 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).

**Table 5. Recreational Carrying Capacity**

<b>Activity/Facility</b>	<b>Existing Capacity*</b>		<b>Proposed Additional Capacity</b>		<b>Future Capacity</b>	
	<b>One Time</b>	<b>Daily</b>	<b>One Time</b>	<b>Daily</b>	<b>One Time</b>	<b>Daily</b>
<b>Beach Use</b>	622	1,178	371	703	993	1,881
<b>Shoreline Fishing</b>	70	139			70	139
<b>Paddling</b>	53	105			53	105
<b>Trails</b>						
Shared Use Trail	17	68			17	68
Nature Trail			26	104	26	104
<b>Primitive Camping</b>			34	34	34	34
<b>TOTAL</b>	<b>762</b>	<b>1,490</b>	<b>431</b>	<b>841</b>	<b>1,193</b>	<b>2,331</b>

\*Existing capacity has been revised from approved plan to better follow DRP carrying capacity guidelines.

The recreational carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in Table 6.

## **Optimum Boundary**

The optimum boundary map reflects lands that have been identified as desirable for direct management by the 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. 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. At this time, no lands are considered surplus to the needs of the park.

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.

Ten parcels, totaling 82 acres, are identified within the optimum boundary. One parcel is an inholding in the western portion of the park bounded by park property and the Indian River Lagoon. Other parcels included in the optimum boundary are located in the northern area of the park and on both sides of A1A. Acquisition of these parcels would provide opportunities to expand recreational opportunities and allow park staff to manage these areas as part of the larger park property through continued exotic species management, natural resource protection and restoration, and monitoring of visitor activities and impacts within the park.

In addition, this plan recommends that the park boundary (and leased area) be extended off the west side to include an additional 25 feet into the Indian River Lagoon. Extending the park boundary would give the DRP the authority to manage and protect the park's natural communities, including the listed species that occur there (including but not limited to mangroves), in accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, for the purposes of visitor safety and resource protection.



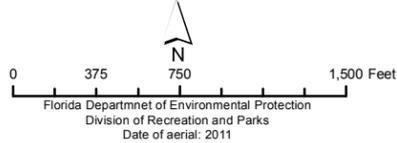


Atlantic Ocean

**Legend**

- Park Boundary
- Optimum Boundary

AVALON 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 Avalon State Park in 2002, 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**

- The Park is one of 33 beach indexing sites in the state that provides data for researchers worldwide as it relates to sea turtle survival, contributing to the preservation of these unique species.
- District and park staff developed and secured funding for the removal of exotic plants from the park.
- Restoration of the southern park facilities due to hurricane damage.
- An honor box has been installed to collect park entrance fees.

#### **Resource Management**

##### **Natural Resources**

- Beach and dune restoration project after hurricane damage.
- 1.5 miles of firebreaks have been added to be used for trails at a future date.
- 75 acres of exotic plants have been removed.

##### **Cultural Resources**

- The park offers a history walk on the park's history as a Navy SEAL training location.

#### **Recreation and Visitor Services**

- The park maintains partnerships with local schools and governments to educate and share information for the overall understanding and protection of the resources.
- The park is listed as a site on the Great Florida Birding Trail.
- Several interpretive programs are offered year around to educate the public on the resource as well as the history of the area.

## **Park Facilities**

- The park has removed the Northern facilities and replaced the Southern structures that were damaged by hurricanes that occurred in 2004.
- The park has made many modifications to facilities to enhance compliance with the Americans with Disabilities Act (ADA), thus increasing accessibility of park's facilities and use areas.

## **MANAGEMENT PLAN IMPLEMENTATION**

This management plan is written for a timeframe of ten years, as required by Section 253.034 Florida Statutes. The Ten-Year Implementation Schedule and Cost Estimates (Table 7) summarizes the management goals, objectives and actions that are recommended for implementation over this period, and beyond. Measures are identified for assessing progress toward completing each objective and action. A time frame for completing each objective and action is provided. Preliminary cost estimates for each action are provided and the estimated total costs to complete each objective are computed. Finally, all costs are consolidated under the following five standard land management categories: Resource Management, Administration and Support, Capital Improvements, Recreation Visitor Services and Law Enforcement.

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

Statewide priorities for all aspects of land management are evaluated each year as part of the process for developing the DRP's annual legislative budget requests. When preparing these annual requests, the DRP considers the needs and priorities of the entire state park system and the projected availability of funding from all sources during the upcoming fiscal year. In addition to annual legislative appropriations, the DRP pursues supplemental sources of funds and staff resources wherever possible, including grants, volunteers and partnerships with other entities. The DRP's ability to accomplish the specific actions identified in the plan will be determined largely by the availability of funds and staff for these purposes, which may vary from year to year. Consequently, the target schedules and estimated costs identified in Table 6 may need to be adjusted during the ten-year management planning cycle.

**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	\$110,000
Objective B	Expand administrative support as new lands are acquired, new facilities are developed, or as other needs arise.	Administrative support expanded	C	\$60,000
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	ST	\$20,000
Action 1	Conduct/obtain assessment of hydrological needs in the park.	Assessment conducted	ST	\$19,000
Action 2	Continue cooperation with St. Lucie County Mosquito Control regarding hydrological restoration of inactive mosquito ditches.	Cooperation ongoing	C	\$1,000
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 35 acres of maritime hammock community.	# Acres restored or with restoration underway	LT	\$88,000
Action 1	Develop/update site specific restoration plan	Plan developed/updated	ST	\$3,000
Action 2	Implement restoration plan	# Acres with restoration underway	LT	\$85,000

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



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

<b>Goal IV: Maintain, improve or restore imperiled species populations and habitats in the park.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Develop/update baseline imperiled species occurrence inventory lists for plants and animals, as needed.</b>	List developed/updated	C	\$6,000
<b>Objective B</b>	<b>Monitor and document 3 selected imperiled animal species in the park.</b>	# Species monitored	C	\$16,000
Action 1	Conintue to implement FWC monitoring protocols for 3 imperiled animal species including loggerhead, green and leatherback marine turtles.	# Species monitored	C	\$16,000
<b>Objective C</b>	<b>Maintain predation levels of marine turtle nests at or below ten percent.</b>	# Species monitored	C	\$3,000
<b>Objective D</b>	<b>Continue to monitor and mitigate the level and intensity of artificial lighting from outside sources on the beach.</b>	# Species monitored	C	\$2,000
<b>Objective E</b>	<b>Monitor and document 2 selected imperiled plant species in the park.</b>	# Species monitored	C	\$19,000
Action 1	Develop monitoring protocols for 2 selected imperiled plant species including coastal vervain and Simpson's stopper.	# Protocols developed	ST	\$2,000
Action 2	Implement monitoring protocols for 2 including those listed in Action 1 above.	# Species monitored	C	\$17,000
<b>Goal V: Remove exotic and invasive plants and animals from the park and conduct needed maintenance-control.</b>		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Annually treat 12 acres of exotic plant species in the park.</b>	# Acres treated	C	\$31,000
Action 1	Annually develop/update exotic plant management work plan.	Plan developed/updated	C	\$16,000
Action 2	Implement annual work plan by treating 12 acres in park, annually, and continuing maintenance and follow-up treatments, as needed.	Plan implemented	C	\$15,000
<b>Objective B</b>	<b>Implement control measures on 2 exotic and nuisance animal species in the park.</b>	# Species for which control measures implemented	C	\$2,000

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



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

<b>Goal VI: Protect, preserve and maintain the cultural resources of the park.</b>				
		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Assess and evaluate 2 of 2 recorded cultural resources in the park.</b>	Documentation complete	LT	<b>\$1,000</b>
Action 1	Complete 2 assessments/evaluations of archaeological sites. Prioritize preservation and stabilization projects.	Assessments complete	LT, ST	\$1,000
<b>Objective B</b>	<b>Compile reliable documentation for all recorded historic and archaeological sites.</b>	Documentation complete	LT	<b>\$16,000</b>
Action 1	Ensure all known sites are recorded or updated in the Florida Master Site File.	# Sites recorded or updated	ST	\$1,000
Action 2	Complete a predictive model for high, medium and low probability of locating archaeological sites within the park.	Probability Map completed	ST	\$7,000
Action 3	Develop and adopt a Scope of Collections Statement.	Document completed	ST	\$2,000
Action 4	Conduct oral history interviews.	Interviews complete	LT	\$2,000
Action 5	Compile a park administrative history.	Report completed	ST	\$4,000
<b>Objective C</b>	<b>Bring 1 of 2 recorded cultural resources into good condition.</b>	# Sites in good condition	LT	<b>\$1,500</b>
Action 1	Design and implement regular monitoring programs for 1 cultural sites	# Sites monitored	C	\$500
Action 2	Create and implement a cyclical maintenance program for each cultural resource.	Programs implemented	C	\$1,000
<b>Goal VII: Provide public access and recreational opportunities in the park.</b>				
		<b>Measure</b>	<b>Planning Period</b>	<b>Estimated Manpower and Expense Cost* (10-years)</b>
<b>Objective A</b>	<b>Maintain the park's current recreational carrying capacity of 1,490 users per day.</b>	# Recreation/visitor	C	<b>\$265,000</b>
<b>Objective B</b>	<b>Expand the park's recreational carrying capacity by 841 users per day.</b>	# Recreation/visitor	LT	<b>\$150,000</b>
<b>Objective C</b>	<b>Continue to provide the current repertoire of 4 interpretive, educational and recreational programs on a regular basis, as identified in the Land Use Component.</b>	# Interpretive/education programs	C	<b>\$4,000</b>
<b>Objective D</b>	<b>Develop 4 new interpretive, educational and recreational programs, as identified in the Land Use Component.</b>	# Interpretive/education programs	LT	<b>\$10,000</b>

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UFN = currently unfunded need



**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 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	\$265,000
Objective B	Continue to implement the park's transition plan to ensure facilities are accessible in accordance with the American with Disabilities Act of 1990.	Plan implemented	LT	\$5,000
Objective C	Improve and/or repair 2 existing facilities and one-half mile of road as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	UFN	\$600,000
Objective D	Construct 4 new facilities and 1.4 miles of trail as identified in the Land Use Component.	# Facilities/Miles of Trail/Miles of Road	UFN	\$1,300,000
Objective E	Expand maintenance activities as existing facilities are improved and new facilities are developed.	Facilities maintained	C	\$150,000
<b>Summary of Estimated Costs</b>				
<b>Management Categories</b>				<b>Total Estimated Manpower and Expense Cost* (10-years)</b>
Resource Management				\$205,500
Administration and Support				\$170,000
Capital Improvements				\$1,905,000
Recreation Visitor Services				\$844,000
Law Enforcement Activities**			**Law enforcement activities in Florida State Parks are conducted by the FWC Division of Law Enforcement and by local law enforcement agencies.	

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



## **Addendum 1—Acquisition History**



## **Avalon State Park Acquisition History**

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### **Purpose of Acquisition**

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) has acquired Avalon State Park to develop, operate, and maintain the property for a public outdoor recreational, conservation and related purposes.

### **Sequence of Acquisition**

On December 12, 1985, the Trustees purchased a 152.8-acre property in St. Lucie County, Florida, that constituted the initial area of Avalon State Park. The Trustees purchased the property from Avalon Joint Venture for \$10,880,000. This purchase was funded under the Save Our Coast (SOC) program. Since this initial purchase, the Trustees have acquired several parcels under the Conservation and Recreation Lands (CARL) program, the Preservation 2000/Additions and Inholdings (P2000/A&I) program and through a donation, adding them to Avalon State Park. The current area of the park is approximately 660 acres.

On July 15, 1987, the Trustees conveyed its management authority of Avalon State Park to the Department of Environmental Protection (DEP), Division of Recreation and Parks (DRP) under Lease No. 3511. This 50-year lease will expire on July 14, 2037. According to this lease agreement, the DRP will develop and manage the property for public outdoor recreation and related purposes.

### **Title Interest**

The Trustees hold fee simple title interest in Avalon State Park.

### **Lease Agreement**

On July 15, 1987, the Trustees leased Avalon State Park to the State of Florida Department of Natural Resources, predecessor in interest to the State of Florida Department of Environmental Protection, Division of Recreation and Parks (DRP), under Lease No. 3511. This lease is for a term of fifty (50) years, and it will expire on July 14, 2037.

According to Lease No. 3511, the DRP manages Avalon State Park for public outdoor recreation and related purposes.

### **Special Condition on Use**

Avalon 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, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park.

## Avalon State Park Acquisition History

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



## **Avalon State Park Advisory Group Members**

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### **Local Government Representatives**

The Honorable Tod Mowery, Chair  
St. Lucie County Board of  
County Commissioners  
2300 Virginia Avenue  
Fort Pierce, Florida 34982

The Honorable Linda Hudson, Mayor  
City of Fort Pierce  
City Hall  
100 N. US 1  
P.O. Box 1480  
Fort Pierce, Florida 34954

### **Agency Representatives**

Mr. Steve Eibl, Park Manager  
Avalon and Ft. Pierce Inlet State Parks  
905 Shorewinds Drive  
Fort Pierce, Florida 34949-1549

Mr. John Marshall, Region 5  
Other Public Lands Forester  
Florida Forest Service,  
5458 N Highway 17  
Deleon Springs, Florida 32130

Mr. Ricardo Zambrano  
Regional Biologist  
Florida Fish and Wildlife Conservation  
Commission  
8535 Northlake Boulevard  
West Palm Beach, Florida 33412

Mr. Brian Sharpe, Aquatic Preserve  
Manager  
Indian River-Vero Beach to Ft. Pierce  
Aquatic Preserve  
3300 Lewis Street  
Fort Pierce, Florida 34981

Mr. James David, Director  
St. Lucie County Mosquito Control  
District  
3150 Will Fee Road  
Fort Pierce, Florida 34982

Mr. Philip C. Gates, Jr., Chair

St. Lucie Soil and Water  
Conservation District  
8400 Picos Road, Suite 202  
Fort Pierce, Florida 34945

### **Tourist Development Council Representative**

The Honorable Chris Dzadoovsky, Chair  
St. Lucie Tourist Development Council  
2300 Virginia Avenue  
Fort Pierce, Florida 34982

### **Environmental and Conservation Representatives**

Mr. Ed Bowes, President  
St. Lucie Audubon Society  
3182 SW Watson Ct.  
Port St. Lucie, Florida 34953

Mr. Andy Brady, President  
The Conservation Alliance  
P.O. Box 12515  
Fort Pierce, Florida 34979-2515

### **Recreational User Representatives**

Ms. Cheryl Williams, Director  
Eastern Surfing Association  
Treasure Coast Florida District  
1590 3rd Court  
Vero Beach, Florida 32960

Ms. Bridget Kean, Chair  
Florida Trail Association  
Tropical Trekkers Chapter  
P.O. Box 423  
Palm City, Florida 34992

### **Adjacent Landowners**

Ms. Dalelyne Siwik, President  
Ocean Harbour Condo Association  
5167 N. Highway A1A  
Fort Pierce, Florida 34949

## Avalon State Park Advisory Group Members

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## **Avalon State Park Advisory Group Report**

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The Advisory Group meeting to review the proposed land management plan for Avalon State Park was held at the Ocean Harbour North Condominium Clubhouse on Wednesday, October 9, 2013, at 9:00 AM.

Joe deBree, III, represented John Marshall. David Heuberger represented Brian Sharpe. Judy Gersony represented Ed Bowes. Mark Haryslak represented Cheryl Williams. Philip Gates, Jr. and Andy Brady were not in attendance. Bridget Kean did not attend but sent in written comments by email. All other appointed Advisory Group members were present. Attending staff were Steve Eibl, Lisa Phillips, Art Yerian, Ernie Cowan, Andy Flanner and Jennifer Carver.

Ms. Carver began the meeting by explaining the purpose of the Advisory Group and reviewing the meeting agenda. Ms. Carver summarized public comments received during the previous evening's public workshop. Ms. Carver then asked each member of the Advisory Group to express his or her comments on the draft plan.

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

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**Commissioner Tod Mowery** (St. Lucie County) stated that his comments related to mosquito control and deferred his time to James David.

**James David** (St. Lucie County Mosquito Control District (MCD)) stated that the mosquito impoundment was constructed in 1966 and was breached during a storm in 1980. Mr. David stated there have been numerous studies conducted on the impoundment and surrounding area (including ongoing studies by the Smithsonian marine station in the northern area of the impoundment). Mr. David pointed out that St. Lucie County contributed a portion of its Save Our Coast funding to help purchase Avalon State Park. Mr. David stated that the MCD would like to close the 40-foot wide breach in the impoundment as they have done at other locations in the area, such as Queens Island. He stated that the MCD is not able to manage the dike system properly and that mosquitos and sand flies are a problem in the western portion of park bounded by the impoundment. The MCD would like to be able to reintroduce management to this system and use new technologies the MCD has developed with DEP in the southern portion of St. Lucie County. Mr. David stated that restoring the breach flow dynamics (through repairing the breach) and installing 20 or more culverts would allow the dikes to function as intended. He also stated that the MCD has maintained the dike for many years, including removing exotics and mowing, and they would like to be able to manage the impoundment. Mr. David pointed out that hydrology in the southeast corner of the impoundment could be improved with berm and culverts. This would improve shoreline flushing and enhance connectivity under the southern portion of the dike, reducing mosquito production. The MCD currently treats along that roadway and ditches by hand, but this would not be necessary if the area were flushing properly. The MCD uses mosquito magnets along the road and park boundary and also traps mosquitos. Mr. David stated there are grants available to construct the suggested culverts and the MCD can facilitate the permitting process. The MCD's goal is to see enhancement of circulation. He stated the MCD supports the study of the impoundment proposed in the management plan. He encouraged the acquisition the remaining portion of the

## Avalon State Park Advisory Group Report

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peninsula to allow better management. Mr. David stated that the MCD would be glad to manage entire western portion of property for public access and improved management for mosquito control. The MCD has managed other areas and has received grants from many agencies for recreational and management improvements. Mr. David pointed out several corrections that could be made on the natural communities map to provide additional detail. He strongly recommended that the DRP develop a long-term strategy for sea level rise, including tracking sea level rise and conducting studies. He indicated that there are a number of factors contributing to poor water quality in the estuary and suggested several data sources for monitoring data. Mr. David also provided additional comments by email prior to the meeting (see Summary of Written Comments below).

**Mayor Linda Hudson** (City of Fort Pierce) agreed with the comments made by the MCD. She stated that the park is not within the City, but she agrees with the DRP's plan to try to make the park visitor-friendly without harming the ecosystem.

**Ricardo Zambrano** (Florida Fish and Wildlife Conservation Commission (FWC)) stated that FWC may provide additional comments regarding sea turtles separately. Mr. Zambrano stated that he is a voting member of the mosquito control subcommittee and asked if aerial or truck adulticiding was occurring in the park. Staff indicated that the Arthropod Control Plan for the park did not allow adulticiding and that the plan text will be revised to reflect the current Arthropod Control Plan. Mr. Zambrano suggested that the text on page 38 under natural communities improvement include mention of beach mice. He inquired if the park has conducted surveys for beach mice or seen any signs of beach mice and suggested that the monitoring for beach mice be added to page 30. He also inquired what impact would the proposed new and expanded parking lots would have on the beach mouse habitat.

**Mark Haryslak** (Eastern Surfing Association) inquired whether the park was being considered for closure. He asked if the proposed expansion of the park was viable, especially on the west side, considering the current water quality issues. Mr. Haryslak stated his concern that people might not be interested in visiting the park. He stated that the Surfing Association hopes that through surfing, kids will learn about the ocean, the parks, and Florida's resources. He indicated that if the parking were expanded sufficiently, including RV parking, the park could be used for surfing contests. Mr. Haryslak also inquired about the source of water at Avalon and suggested recycling water, solar power, etc., be considered.

**Joe deBree III** (Department of Agriculture and Consumer Services, Florida Forest Service (FFS)) stated that the improvements to the parking areas could eliminate costly repair/maintenance costs from poorly developed parking areas. He suggested that DRP consider options for placing parking on the west side of A1A as well. Mr. deBree encouraged development of a fire management plan for the park that addresses increasing manmade areas, conducting prescribed burning, and utilizing fire breaks. He indicated that the FFS supports the proposed plan for the park.

## Avalon State Park Advisory Group Report

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DRP staff indicated that the coastal strand is considered a burn community with a fire return interval of 5-15 years, and while DRP has no set plan to burn, a test may be conducted.

**Dalelyne Siwik** (Ocean Harbour Condo Association) stated that she is fortunate to live right next door to Avalon and that the biggest concern of the property owners she represents is the selling of park lands. The residents don't want any park land sold. She stated the Association is in favor of increasing parking at the park, as some visitors park in the Ocean Harbour lot to reach the park's beach area. She indicated that mosquitos are a problem and that she feels that if we want to increase tourism and promote the park as a great hiking area, the mosquitos need to be controlled. Ms. Siwik stated that residents don't hike in the park because of the mosquitos and fear of disease. She asked how projects are prioritized and when that occurs. She recommended that improvements to the beach areas be first priority if funding is available. She indicated that the Association has purchased land across A1A adjacent to the park, extending the undeveloped beach areas. The Association is interested in preservation and would like to be able to use the western portion of Avalon for more functions.

**Judy Gersony** (St. Lucie Audubon Society) asked about the establishment of new firebreaks mentioned in the plan and when they would be established. DRP staff clarified that the park is planning to install additional trails that can also act as firebreaks. She inquired if there has been an updated survey of plants in the park (especially the western portion). Ms. Gersony has personally observed several species in the park that are not included on the plant list. She noted that *Glandularia* had not been observed since 1993 in the coastal strand and was concerned that any burning in that natural community would destroy *Glandularia* if it were present. She asked if the *Glandularia* would be protected or moved under such circumstances. Staff also encouraged Ms. Gersony and other members of Audubon and the Native Plant Society to provide their observations to the park manager to assist with updating the plant lists. Park staff update the lists based on their own observations and information from other observers. Staff also indicated that some species could be reemerging where exotic species removal has been conducted. Ms. Gersony asked if there were nesting shore birds in the beach dune as stated on page 30. She inquired about the best surface for a dune walkover (coquina or boardwalk). DRP staff indicated that coquina may have several advantages in this location. Ms. Gersony pointed out that the beach area structures were damaged in 2004. She inquired if a survey for imperiled species would be conducted prior to any of the proposed development to avoid impacts. DRP staff indicated that surveys are conducted prior to burns and construction projects. Ms. Gersony provided additional comments by email (see Summary of Written Comments below).

**Commissioner Chris Dzadovsky** (St. Lucie County Tourism Development Council (TDC)) provided a number of comments from the perspective of the TDC and County staff. He stated that ecotourism is a multibillion dollar industry in St. Lucie County, and they are very concerned with saving the Indian River Lagoon. The TDC works closely with Ft. Pierce Authentic Tours to promote outdoor activities. He

## Avalon State Park Advisory Group Report

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stated that he is deeply concerned that portions of Avalon State Park were on the initial surplus lands list, because St. Lucie County did invest its money to help purchase some of the property. To avoid impacts to the imperiled dune system, he suggested moving parking lots to the west side of A1A and installing pedestrian crossings or underpasses. From tourism side, the TDC is undertaking public-private partnerships with high-end RV resorts, and he suggested RV camping may be a good source of revenue and tourism for the park (He also indicated that Ft. Pierce Inlet may be a better location). Commissioner Dzadovsky suggested the following items/changes to the plan: eliminate the eastern row of parking in the existing lot to reduce impacts; use a more stabilized dune crossover such as mat, /stone; use green building technologies such as paver blocks to minimize stormwater (page 58); include the park as a destination/hub on the East Coast Greenway with information about bicycling/trail opportunities and the ecosystem; follow St. Lucie County's sea turtle lighting requirements; provide lifeguards to increase safety; add a boardwalk over the gap in the dike trail to extend the shared use trail; add a fishing pier on the lagoon; construct taller observation decks and/or trim vegetation at west day use area; provide additional educational opportunities such as a self-guided interpretive trail; construct narrow trails to improve the hiking experience; increase tidal flow in the dike system with culverts; add a phasing plan identifying funding priorities; clarify the number of campsites and how parking would be handled in the primitive camping area; and include consistent information in the plan about the history of the park's name. Commissioner Dzadovsky mentioned that the Transportation Planning Organization has just updated the bicycle and pedestrian plan. The County's Environmental Resources staff suggested that surveys for beach mice be conducted and improvements be modified as necessary during implementation. Commissioner Dzadovsky also provided a written copy of his comments.

**David Heuberger** (Indian River Lagoon Aquatic Preserves) stated that most of his issues have been addressed. He indicated that public use is a concern. He indicated that where the breach in the mosquito impoundment is located, a delta/salt marsh formed that may be used for a research site. Research has shown that it may be more effective to plant salt marsh to establish a mangrove system rather than planting mangroves. He requested that the DRP keep the Aquatic Preserves informed if any changes in management are planned.

### **Summary of Written Comments**

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**James David** (St. Lucie County Mosquito Control District (MCD)) provided written comments to DRP staff prior to the meeting. Mr. David provided several fact corrections regarding water levels and tidal exchange. Mr. David suggested that the Natural Communities map be revised to show the perimeter ditch and breach in the impoundment. He does not support removal of any dikes and indicates that circulation would be improved with the installation of culverts. He points out that the AV-5 management zone is being managed with pumps and a modified Rotational Impoundment Management Plan. Mr. David indicates that there is an Arthropod Control Plan for the park. He suggests that a monitoring program be established to evaluate the impacts of sea level rise. Mr. David recommends that

## Avalon State Park Advisory Group Report

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the AV-6 management zone by transferred to the local mosquito control district for management. Mr. David also provided additional written comments following the meeting. He pointed out that the MCD has been able to implement an Coastal Ecosystem Restoration Management approach that integrates upland and wetland management, and creates opportunities for public health, education, research and recreational use. He stated that transferring the management of the park's western area to the MCD and St. Lucie County would result in faster implementation of the resource management and public access enhancements. Copies of the comments are attached.

**Commissioner Chris Dzado** (St. Lucie County Tourism Development Council (TDC)) provided a written copy of the comments he made during the meeting to provide additional detail. The comments are attached.

**Judy Gersony** (St. Lucie Audubon Society) provided written comments to DRP staff in addition to the comments she made at the meeting. Ms. Gersony's written comments identified several minor corrections that were needed. A copy of the comments is attached.

**Bridget Kean** (Florida Trail Association, Tropical Trekkers) was not able to attend the meeting. She provided comments by email. She stated that the FTA supports the continued development of the park for hiking, bird watching, resource management and paddling. She felt that the acquisition of additional lands would enhance the park. A copy of the comments is attached.

**Karen Schanzle** (Florida Fish and Wildlife Conservation Commission) provided comments from the marine turtle subsection of FWC as indicated by Mr. Zambrano. Ms. Schanzle provided specific comments regarding the objective for monitoring imperiled animal species. She suggested that park staff use sub-meter GPS units during nesting survey and that disorientation and Obstructed Nesting Attempt reports be completed as appropriate. A copy of the comments is attached.

### Staff Recommendations

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The staff recommends approval of the proposed management plans for Avalon State Park as presented, with the following significant changes:

- Incorporate text regarding the presence of beach mouse habitat and the need to monitor for beach mice.
- Modify the discussion of arthropod control in the park to indicate the approved plan.
- Modify the text regarding prescribed fire to indicate that a test may be conducted for the coastal strand, and clarify that the park's trails also serve as firebreaks.
- Incorporate language regarding the use of turtle-friendly lighting in the park.
- Clarify the use of the primitive camping area and access to the west day use area.
- Review Addendum 5 (Plant and Animal List) and modify as appropriate to include species observed in the park.

## **Avalon State Park Advisory Group Report**

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The MCD has suggested that the breach in the dike should be repaired to maximize the MCD's ability to control water levels and mosquito control measures in the western portion of the park (west of SR A1A). The Division does not plan to repair the breach at this time. The plan text will be modified to reflect that the Division will continue to work cooperatively with the MCD and will explore funding opportunities to further study the area's hydrology to identify recommendations for managing the natural resources and mosquito control.

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

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

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

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

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

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### **Addendum 3—References Cited**



## Avalon State Park References Cited

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## Avalon State Park References Cited

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## **Addendum 4—Soils Descriptions**



## Avalon State Park Soils Descriptions

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**(9) Beaches** - This map unit consists of nearly level to sloping, narrow strips of tide- and surf-washed sandy material and shell fragments along the shoreline of the Atlantic Ocean. It commonly is a mixture of moderately alkaline sandy material and fine shell fragments.

The beaches are less than 100 to 300 feet wide. As much as half of the beach area may be flooded daily during high tides, and all of it can be flooded by storm tides. Most of the beaches have a uniform gentle slope that extends to the edge of the water, although the shape and gradient of the slope can change with every storm.

This map unit generally supports no vegetation, although some clumps of sea oats, railroad vine, and other salt-tolerant plants are near some of the inland edges.

Depth to the water table varies considerably, commonly ranging from 0 to 6 feet, depending on distance from the shore, elevation of the beach, and the tides.

This map unit can be used only as recreational areas and wildlife habitat. Severe erosion is often a problem during severe storms. Because they have great esthetic value, the beaches are an important part of the coastline.

No capability classification is assigned.

**(10) Canaveral sand** - This very deep, nearly level or gently sloping, moderately well drained soil is on low, dunelike ridges. Individual areas are long and narrow and range from 10 to 200 acres in size. Slopes are dominantly less than 3 percent but range to 5 percent.

On 95 percent of the acreage mapped as Canaveral sand, Canaveral and similar soils make up 99 to 100 percent of the mapped areas.

Typically, the surface layer is dark grayish brown sand about 4 inches thick. About 10 percent of this layer is sand-sized shell fragments. The next 46 inches is pale brown sand in which the content of sand-sized shell fragments is about 20 percent. The lower 30 inches is gray sand in which the content of sand-sized shell fragments is about 25 percent.

Included in mapping are soils that are similar to Canaveral sand, but are better drained.

Dissimilar soils that are included with this soil in mapping occur as small areas of poorly drained soils that have a black surface layer. These soils make up about 1 percent of the map unit.

During most years the water table in the Canaveral soil is at a depth of 24 to 36 inches for 2 to 4 months and is at a depth of 36 to 60 inches for the rest of the year. It is at a depth of 12 to 24 inches after periods of heavy rainfall. Permeability is very rapid.

## Avalon State Park Soils Descriptions

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The natural vegetation consists of sand live oak, cabbage-palm, and scattered saw palmetto. Exotic tree species, including Brazilian pepper, have become established in some areas.

This soil is not suited to cultivated crops or improved pasture. A low available water capacity and low natural fertility severely reduce the variety of grasses that can be grown on the soil. This soil is poorly suited to the production of citrus, mangos, and avocados. The suitability for these crops is fair, however, if intensive management measures, including irrigation and regular applications of fertilizer, are applied. A close-growing crop between the trees helps to control soil blowing.

This soil is not used as rangeland or forest land. It is in the South Florida Coastal Strand ecological plant community.

This soil is severely limited as a site for buildings, sanitary facilities, and recreational development because of the wetness. Extensive water-control measures and large amounts of suitable fill material are needed to overcome this limitation. The sandy surface layer should be stabilized in areas used for recreational purposes. Water-control measures are needed. Sealing or lining trench sanitary landfills and sewage lagoons with impervious soil material helps to prevent seepage. The sides of shallow excavations should be shored. Because of the droughtiness of the soil, native plants should be selected for landscaping.

The capability subclass is VIs.

**(24) Myakka fine sand** -consists of deep and very deep, poorly to very poorly drained soils formed in sandy marine deposits. These soils are on flatwoods, high tidal areas, flood plains, depressions, and gently sloping to sloping barrier islands. They have rapid permeability in the A horizon and moderate or moderately rapid permeability in the Bh horizon. Slopes range from 0 to 8 percent.

Myakka soils occur on nearly level high tidal, flatwoods, flood plains, and depressional areas and gently sloping to sloping barrier islands with gradients of 0 to 8 percent. The soil formed in sandy marine deposits. Rainfall averages about 50 to 60 inches annually

Myakka soils are poorly to very poorly drained. They have slow internal drainage and slow to ponded runoff. Permeability is rapid in the A and E horizons and moderate or moderately rapid in the Bh horizon. The water table is at depths of less than 18 inches for 1 to 4 months duration in most years and recedes to depths of more than 40 inches during very dry seasons. Depressional areas are covered with standing water for periods of 6 to 9 months or more in most years.

Most areas are used for commercial forest production or native range. Large areas with adequate water control measures are used for citrus, improved pasture, and truck crops. Native vegetation includes slash pines with an undergrowth of sawpalmetto, running oak, inkberry, waxmyrtle, huckleberry, chalky bluestem, pineland threeawn, and scattered fetterbush.

## Avalon State Park Soils Descriptions

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**(27) Palm Beach fine sand** -consists of very deep, well to excessively drained, very rapidly permeable soils on dune-like ridges that are generally parallel to the coast. They formed in thick deposits of sand and shell fragments. Near the type location, the mean annual temperature is about 72 degrees F., and the mean annual precipitation is about 60 inches. Slopes range from 0 to 17 percent.

Reaction is slightly alkaline or moderately alkaline throughout. All horizons effervesce weakly to strongly with dilute HCl. Stratified layers of sand and shells or shell fragments occur throughout the soil. This soil is dry for as long as 50 consecutive days in most years.

Most areas are in native vegetation or is developed urban land. A few small areas are cleared and used for growing citrus. Native vegetation consists of cabbage palm, running oak, sawpalmetto, common seagrape, seaots, bays, and oaks.

**(35)Kesson, terra ceia complex, tidal** - consists of deep, very poorly drained, rapid to moderately rapid permeable soils that formed in thick marine deposits of sand and shell fragments in tidal swamps and marshes along the Gulf Coast of Peninsular Florida. Slopes range from 0 to 1 percent.

Sulfur content is more than 0.75 percent within depths of 20 inches. The calcium carbonate equivalent is more than three times the sulfur content for some portion. Reaction ranges from mildly alkaline to strongly alkaline and the soil is calcareous. It does not become extremely acid when dry. Texture is sand or fine sand throughout. Kesson soils are very poorly drained. Runoff is slow. Permeability is moderately rapid to rapid. Under natural conditions, the soil is flooded during normal high tides.

Kesson soils are in tidal swamps and marshes along the Gulf Coast in Peninsular Florida. Slopes are less than 1 percent. The soils formed in thick deposits of sand and shell fragments. Near the type location, the mean annual precipitation is about 55 inches and the mean annual temperature is about 73 degrees F.

Kesson soils are used mainly for wildlife habitat. Native vegetation is black mangrove, oxeye daisy, batis, and scattered American mangrove.

**(46)Mckee sandy clay loam, tidal** - consists of very poorly drained, very slowly permeable soils that formed in loamy or clayey tidal deposits. They occur on nearly level mangrove islands and swamps. Slopes are less than one percent.

These soils are continuously saturated with saline water. Soil salinity is greater than 16 mmhos/cm to a depth of 60 inches, and ranges from 8 to 16 mmhos/cm below 60 inches. The n value of all mineral horizons to a depth of 40 inches or more is greater than 1.0, and ranges from 0.7 to 1.0 at depths of more than 40 inches. Reaction ranges from neutral to moderately alkaline throughout. The mineral layers within the 10- to 40-inch control section have a clay content of 35 to 59 percent. Mckee soils are very poorly drained. Permeability is very slow in the upper part of

## Avalon State Park Soils Descriptions

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the C horizon and moderate in the A and lower part of the C horizon. They are continuously saturated. Fluctuating tides overwash the surface twice daily.

Mckee soils are in mangrove islands and tidal swamps, at or near sea level. These soils formed in unconsolidated loamy or clayey tidal deposits. Slopes range from 0 to 0.5 percent. Near the type location, the mean annual rainfall is about 55 inches, and the mean annual temperature is about 74 degrees F.

Wetland wildlife habitat, sport and commercial finfish and shellfish and crustacean spawning grounds, and neutral erosion control during tropical storms. Also, where accessible by elevated road or levee, these areas are well suited to beekeeping for mangrove honey production. Vegetation is red, black and white mangrove, with some areas of saltwort, glasswort, seashore saltgrass, and seashore paspalum.

## **Addendum 5—Plant and Animal List**



## Avalon State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Rosary pea*	<i>Abrus precatorius</i>	
Giant leather fern	<i>Acrostichum danaeifolium</i>	
Chaff flower	<i>Alternanthera ramosissima</i>	
Woman's tongue*	<i>Albizia lebbeck</i>	
Common ragweed	<i>Ambrosia artemisiifolia</i>	
Torchwood	<i>Amyris elemifera</i>	
Marlberry	<i>Ardisia escallonioides</i>	
Black mangrove	<i>Avicennia germinans</i>	
Saltbush	<i>Baccharis angustifolia</i>	
Saltbush	<i>Baccharis halimifolia</i>	
Saltwort	<i>Batis maritima</i>	
Spanish needles	<i>Bidens alba</i>	
Swamp Fern	<i>Blechnum serrulatum</i>	
Sea oxeye	<i>Borrichia frutescens</i>	
Tough bumelia	<i>Bumelia tenax</i>	
Gumbo limbo	<i>Bursera simaruba</i>	
Nickerbean	<i>Caesalpinia bonduc</i>	
Sea rocket	<i>Cakile lanceolata</i>	
Beauty berry	<i>Callicarpa americana</i>	
Partridge-pea	<i>Cassia chamaecrista</i>	
Australian pine*	<i>Casuarina litorea</i>	
Southern sandspur	<i>Cenchrus echinatus</i>	
Madagascar periwinkle*	<i>Catharanthus roseus</i>	
Dune sandspur	<i>Cenchrus tribuloides</i>	
Sand-dune spurge	<i>Chamaesyce cumulicola</i>	BD
Lamb's-quarters*	<i>Chenopodium album</i>	
Mexican tea*	<i>Chenopodium ambrosioides</i>	
Snowberry	<i>Chiococca alba</i>	
Seagrape	<i>Coccoloba uvifera</i>	
Day flower	<i>Commelina erecta var. angustifolia</i>	
Buttonwood	<i>Conocarpus erecta</i>	
Horseweed	<i>Conyza canadensis</i>	
Smooth rattlebox*	<i>Crotalaria pallida var. obovata</i>	
Beach tea	<i>Croton punctatus</i>	
Carrotwood*	<i>Cupaniopsis anacardioides</i>	
Coin vine	<i>Dalbergia ecastophyllum</i>	
Saltgrass	<i>Distichlis spicata</i>	
Tall elephants foot	<i>Elephantopus elatus</i>	
Butterfly orchid	<i>Encyclia tampensis</i>	
Coral bean	<i>Erythrina herbacea</i>	
White stopper	<i>Eugenia axillaris</i>	
Spanish stopper	<i>Eugenia foetida</i>	
Surinam cherry*	<i>Eugenia uniflora</i>	
Dog fennel	<i>Eupatorium serotinum</i>	

\* Non-native Species

## Avalon State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Strangler fig .....	<i>Ficus aurea</i>	
Yellowtop .....	<i>Flaveria linearis</i>	
Florida privet .....	<i>Forestiera segregata</i>	
Milk pea .....	<i>Galactia volubilis</i>	
Coastal mock vervain .....	<i>Glandularia maritima</i> .....	CS
Blolly .....	<i>Guapira discolor</i>	
Southern guara .....	<i>Guara angustifolia</i>	
Shoal grass.....	<i>Halodule wrightii</i>	
Paddle grass .....	<i>Halophila decipiens</i>	
Beach sunflower .....	<i>Helianthus debilis</i>	
Scorpion-tail .....	<i>Heliotropium angiospermum</i>	
Seaside heliotrope .....	<i>Heliotropium curassavicum</i>	
Camphor weed .....	<i>Heterotheca subaxillaris</i>	
Largeleaf marsh pennywort.....	<i>Hydrocotyle bonariensis</i>	
Spider lily .....	<i>Hymenocallis latifolia</i>	
Morning-glory .....	<i>Ipomoea indica</i>	
Railroad-vine .....	<i>Ipomea pes-caprae</i>	
Beach morning-glory.....	<i>Ipomoea stolonifera</i>	
Bloodleaf.....	<i>Iresine diffusa</i>	
Beach elder .....	<i>Iva imbricata</i>	
Black ironwood.....	<i>Krugiodendron ferreum</i>	
White mangrove.....	<i>Laguncularia racemosa</i>	
Pepper grass.....	<i>Lepidium virginicum</i>	
Gopher apple .....	<i>Licania michauxii</i>	
Sea lavender.....	<i>Limonium carolinianum</i>	
Creeping Charlie.....	<i>Lippia nodiflora</i>	
Lobelia .....	<i>Lobelia homophylla</i>	
Poorman's-patch .....	<i>Mentzelia floridana</i>	
Hemp vine.....	<i>Mikania cordifolia</i>	
Horsemint .....	<i>Monarda punctata</i>	
Balsam apple* .....	<i>Momordica charnatia</i>	
Mulberry.....	<i>Morus rubra</i>	
Wax myrtle.....	<i>Myrica cerifera</i>	
Simpson's stopper.....	<i>Myrcianthes fragans</i> .....	MAH
Prickly pear.....	<i>Opuntia stricta</i> .....	CS
Bitter panicum .....	<i>Panicum amarum</i>	
Guinea grass* .....	<i>Panicum maximum</i>	
Torpedo grass*.....	<i>Panicum repens</i>	
Virginia creeper .....	<i>Parthenocissus quinquefolia</i>	
Passion flower .....	<i>Passiflora suberosa</i>	
Red bay .....	<i>Persea bornonia</i>	
Golden polypody.....	<i>Phlebodium aureum</i>	
Drummond's leafflower.....	<i>Phyllanthus abnormis</i>	
Ground cherry.....	<i>Physalis viscosa</i>	

\* Non-native Species

## Avalon State Park Plants

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Pokeberry.....	<i>Phytolacca americana</i>	
Camphorweed.....	<i>Pluchea odorata</i>	
Painted leaf.....	<i>Poinsettia cyathophora</i>	
Resurrection fern.....	<i>Polypodium polypodioides</i>	
Pink purslane.....	<i>Portulaca pilosa</i>	
Guava*.....	<i>Psidium guajava</i>	
Bracken feren.....	<i>Pteridium aquilinum</i>	
Live oak.....	<i>Quercus virginiana</i>	
Wild coffee.....	<i>Psychotria nervosa</i>	
Myrsine.....	<i>Rapanea punctata</i>	
Beach star.....	<i>Remirea maritime</i> .....	BD
Red mangrove.....	<i>Rhizophora mangle</i>	
Sumac.....	<i>Rhus copallina</i>	
Castorbean*.....	<i>Ricinus communis</i>	
Rouge berry.....	<i>Rivina humilis</i>	
Cabbage palm.....	<i>Sabal palmetto</i>	
Glasswort.....	<i>Salicornia bigelowii</i>	
Glasswort.....	<i>Salicornia virginica</i>	
Saltwort.....	<i>Salsola kali</i>	
Bowstring hemp*.....	<i>Sansevieria hyacinthoides</i>	
Inkberry.....	<i>Scaevola plumieri</i> .....	BD
Beach naupaka*.....	<i>Scaevola taccada</i>	
Brazilian pepper*.....	<i>Schinus terebinthifolius</i>	
Saw palmetto.....	<i>Serenoa repens</i>	
Sea purslane.....	<i>Sesuvium portulacastrum</i>	
Common wire weed.....	<i>Sida ulmifolia</i>	
Giant foxtail grass.....	<i>Setaria magna</i>	
Knotroot grass.....	<i>Setaria parvifloa</i>	
Greenbrier.....	<i>Smilax auriculata</i>	
Smooth cordgrass.....	<i>Spartina alternifolia</i>	
Potato tree.....	<i>Solanum erianthum</i>	
Saltmeadow cordgrass.....	<i>Spartina patens</i>	
Creeping oxeye.....	<i>Sphagneticola trilobata</i>	
Sea blite.....	<i>Suaeda linearis</i>	
Common wild pine.....	<i>Tillandsia fasciculata</i> .....	MAH
Ball moss.....	<i>Tillandsia recurvata</i>	
Spanish moss.....	<i>Tillandsia usneoides</i>	
Poison ivy.....	<i>Toxicodendron radicans</i>	
Blue curls.....	<i>Trichostema dichotomum</i>	
Sea oats.....	<i>Uniola paniculata</i>	
Frostweed.....	<i>Verbesina virginica</i>	
Cow pea.....	<i>Vigna luteola</i>	
Southern fox grape.....	<i>Vitis munsoniana</i>	
Calusa grape.....	<i>Vitis shuttleworthii</i>	

\* Non-native Species

**Avalon State Park Plants**

<b>Common Name</b>	<b>Scientific Name</b>	<b>Primary Habitat Codes (for imperiled species)</b>
Shoestring fern .....	<i>Vittaria lineata</i>	
Spanish bayonet.....	<i>Yucca aloifolia</i>	
Hercules club .....	<i>Zanthoxylum clava-herculis</i>	
Wild lime .....	<i>Zanthoxylum fagara</i>	

\* Non-native Species

## Avalon State Park Animals

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

Southern Toad .....	Bufo terrestris .....	MAH
Green Tree Frog .....	Hyla cinerea .....	MAH

### REPTILES

Green Anole.....	Anolis carolinensis.....	BD, CS, MAH
Loggerhead .....	Caretta caretta .....	BD
Green Turtle .....	Chelonia mydas .....	BD
Six-lined Racerunner.....	Cnemidophorus sexlineatus.....	BD, CS
Southern Black Racer.....	Coluber constrictor priapus.....	CS, MAH
Leatherback.....	Dermochelys coriacea.....	BD
Southern Ring-necked Snake....	Diadophis punctatus punctatus .....	MAH
Red Rat Snake .....	Elaphe guttata guttata.....	CS, MAH
Southeastern Five-Lined .....	Eumeces inexpectatus .....	CS, MAH
Skink Gopher Tortoise .....	Gopherus polyphemus .....	BD, CS
Florida East Coast Terrapin .....	Malaclemys terrapin tequesta .....	MS
Eastern Coachwhip .....	Masticophis flagellum flagellum.....	BD, CS, MAH
Rough Green Snake .....	Ophiodrys aestivus.....	MAH
Ground Skink.....	Scincella lateralis .....	CS, MAH
Dusky Pigmy Rattlesnake.....	Sistrurus miliarius barbouri .....	MAH
Florida Box Turtle .....	Terrapene carolina bauri .....	MAH
Eastern Garter Snake.....	Thamnophis sirtalis sirtalis .....	CS, MAH

### INSECTS

Saltmarsh mosquito .....	Aedes taeniorhynchus.....	MAH, MS
Black and yellow argiope .....	Argiope auranti.....	MTC
spider		
Honey bee* .....	Apis mellifera* .....	CS, DV
Florida carpenter ant.....	Camponotus floridanus .....	MTC
Common green darner.....	Anax junius.....	CS, DV
Deer fly .....	Chrysops vittatus .....	MAH, MS
No-see-ums .....	Cullicoides sp .....	MAH, MS
Spiny orb-weaver .....	Gasteracantha cancriformis .....	MTC
Antlion.....	Myrmeleon sp.....	CS, DV
Golden silk spider .....	Nephila clavipes.....	MTC
Red imported fire ant * .....	Solenopsis invicta .....	MTC

### BIRDS

Spotted Sandpiper .....	Actitis macularia .....	BD
Red-winged Blackbird.....	Agelaius phoeniceus .....	MTC

\* Non-native Species

## Avalon State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Wood Duck .....	<i>Aix sponsa</i> .....	MS
Roseate Spoonbill .....	<i>Ajaia ajaja</i> .....	MS
Mottled Duck.....	<i>Anas fulvigula</i> .....	MS
Pintail .....	<i>Anas acuta</i> .....	MS
Blue-winged Teal.....	<i>Anas discors</i> .....	MS
Mallard.....	<i>Anas platyrhynchos</i> .....	MS
Black Duck .....	<i>Anas rubripes</i> .....	MS
American Wigeon.....	<i>Anas americana</i> .....	MS
Gadwall.....	<i>Anas strepera</i> .....	MS
Anhinga .....	<i>Anhinga anhinga</i> .....	MS
Great Egret.....	<i>Ardea alba</i> .....	MS
Great Blue Heron.....	<i>Ardea herodias</i> .....	MS
Ruddy Turnstone.....	<i>Arenaria interpres</i> .....	BD
Ring-necked Duck.....	<i>Aythya collaris</i> .....	MS
Lesser Scaup .....	<i>Aythya affinis</i> .....	ECBS, EOB
Great Horned Owl.....	<i>Bubo virginianus</i> .....	BD, CS, MAH
Cattle Egret .....	<i>Bubulcus ibis</i> .....	MTC
Red-shouldered Hawk .....	<i>Buteo lineatus</i> .....	BD, CS, MAH
Red-tailed Hawk .....	<i>Buteo jamaicensis</i> .....	BD, CS, MAH
Green-back Heron .....	<i>Butorides virescens</i> .....	MS
Sanderling.....	<i>Calidris alba</i> .....	BD
Dunlin.....	<i>Calidris alpina</i> .....	BD
Red Knot.....	<i>Calidris canutus</i> .....	BD
Western Sandpiper .....	<i>Calidris mauri</i> .....	BD
Least Sandpiper .....	<i>Calidris minutilla</i> .....	BD
Chuck-Will's Widow.....	<i>Caprimulgus carolinensis</i> .....	MTC
Whip-poor-will.....	<i>Caprimulgus vociferus</i> .....	MTC
Cardinal .....	<i>Cardinalis cardinalis</i> .....	MTC
Turkey Vulture .....	<i>Cathartes aura</i> .....	MTC
Willet.....	<i>Catoptrophorus semipalmatus</i> .....	BD
Red-bellied Woodpecker .....	<i>Centurus carolinus</i> .....	MTC
Chimney.....	<i>Chaetura pelagica</i> .....	BD
Semipalmated Plover .....	<i>Charadrius semipalmatus</i> .....	BD
Killdeer .....	<i>Charadrius vociferus</i> .....	BD
Wilson's Plover.....	<i>Charadrius wilsonia</i> .....	BD
Common Nighthawk.....	<i>Chordeiles minor</i> .....	MTC
Northern Harrier.....	<i>Circus cyaneus</i> .....	BD, MS
Yellow-billed Cuckoo .....	<i>Coccyzus americanus</i> .....	MTC
Common Flicker .....	<i>Colaptes auratus</i> .....	MTC
Bobwhite Quail.....	<i>Colinus virginianus</i> .....	MTC
Ground Dove .....	<i>Columbina passerina</i> .....	MTC
Black Vulture .....	<i>Coragyps atratus</i> .....	MTC
Fish Crow .....	<i>Corvus ossifragus</i> .....	MTC
Blue Jay .....	<i>Cyanocitta cristata</i> .....	MTC

\* Non-native Species

## Avalon State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Northern Parula.....	<i>Setophaga americana</i> .....	MTC
Yellow-rumped Warbler.....	<i>Setophaga coronata</i> .....	MTC
Prairie Warbler.....	<i>Setophaga discolor</i> .....	MTC
Yellow-throated Warbler.....	<i>Setophaga dominica</i> .....	MTC
Palm Warbler.....	<i>Setophaga palmarum</i> .....	MTC
Pine Warbler.....	<i>Setophaga pinus</i> .....	MTC
Downy Woodpecker.....	<i>Dendrocopus pubescens</i> .....	MTC
Pileated Woodpecker.....	<i>Dryocopus pileatus</i> .....	MTC
Gray Catbird.....	<i>Dumetella carolinensis</i> .....	MTC
Little Blue Heron.....	<i>Egretta caerulea</i> .....	MS
Snowy Egret.....	<i>Egretta thula</i> .....	MS
Tricolored Heron.....	<i>Egretta tricolor</i> .....	MS
Reddish Egret.....	<i>Egretta rufescens</i> .....	MS
White Ibis.....	<i>Eudocimus albus</i> .....	MS
Merlin.....	<i>Falco columbarius</i> .....	BD
American Kestrel.....	<i>Falco sparverius</i> .....	BD
American Coot.....	<i>Fulica americana</i> .....	MS
Magnificent Frigatebird.....	<i>Fregata magnificens</i> .....	MS
Common Loon.....	<i>Gavia immer</i> .....	MS
Red-throated Loon.....	<i>Gavia stellata</i> .....	MS
Common Yellowthroat.....	<i>Geothlypis trichas</i> .....	MTC
American Oystercatcher.....	<i>Haematopus palliatus</i> .....	BD
Black-necked Stilt.....	<i>Himantopus mexicanus</i> .....	BD
Barn Swallow.....	<i>Hirundo rustica</i> .....	BD
Tree Swallow.....	<i>Iridoprocne bicolor</i> .....	BD
Loggerhead Shrike.....	<i>Lanius ludovicianus</i> .....	MTC
Herring Gull.....	<i>Larus argentatus</i> .....	BD
Laughing Gull.....	<i>Larus atricilla</i> .....	BD
Ring-billed Gull.....	<i>Larus delawarensis</i> .....	BD
Greater Black-backed Gull.....	<i>Larus marinus</i> .....	BD
Short-billed Dowitcher.....	<i>Limnodromus griseus</i> .....	BD
Belted Kingfisher.....	<i>Megaceryle alcyon</i> .....	MS
Song Sparrow.....	<i>Melospiza melodia</i> .....	MTC
Red-breasted Merganser.....	<i>Mergus serrator</i> .....	ECBS, EOB
Mockingbird.....	<i>Mimus polyglottos</i> .....	MTC
Black-and-white Warbler.....	<i>Mniotilta varia</i> .....	MTC
Northern Gannet.....	<i>Morus bassanus</i> .....	MS
Wood Stork.....	<i>Mycteria americana</i> .....	MS
Great Crested Flycatcher.....	<i>Myiarchus crinitus</i> .....	MTC
Yellow-crowned Night Heron.....	<i>Nyctanassa violacea</i> .....	MS
Black-crowned Night Heron.....	<i>Nycticorax nycticorax</i> .....	MS
Screech Owl.....	<i>Otus asio</i> .....	BD
Osprey.....	<i>Pandion haliaetus</i> .....	MS
Savannah Sparrow.....	<i>Passerculus sandwichensis</i> .....	MTC

\* Non-native Species

## Avalon State Park Animals

Common Name	Scientific Name	Primary Habitat Codes (for imperiled species)
Brown Pelican .....	<i>Pelecanus occidentalis</i> .....	MS
Double-crested Cormorant .....	<i>Phalacrocorax auritus</i> .....	MS
Hairy Woodpecker .....	<i>Picoides villosus</i> .....	MTC
Summer Tanager.....	<i>Piranga rubra</i> .....	MTC
Black-bellied Plover.....	<i>Pluvialis squatarola</i> .....	BD
Pied-billed Grebe .....	<i>Podilymbus podiceps</i> .....	MS
Blue-gray Gnatcatcher.....	<i>Polioptila caerulea</i> .....	MTC
Sora .....	<i>Porzana carolina</i> .....	MS
Purple Martin .....	<i>Progne subis</i> .....	BD
Common Grackle.....	<i>Quiscalus quiscula</i> .....	MTC
Clapper Rail .....	<i>Rallus longirostris</i> .....	MS
Black Skimmer.....	<i>Rynchops niger</i> .....	BD
Eastern Phoebe .....	<i>Sayornis phoebe</i> .....	MTC
American Redstart .....	<i>Setophaya ruticilla</i> .....	MTC
Yellow-bellied Sapsucker.....	<i>Sphyrapicus varius</i> .....	MTC
Least Tern .....	<i>Sterna antillarum</i> .....	BD
Forster's Tern.....	<i>Sterna forsteri</i> .....	BD
Royal Tern.....	<i>Sterna maxima</i> .....	BD
Sandwich Tern .....	<i>Sterna sandvicensis</i> .....	BD
Barred Owl .....	<i>Strix varia</i> .....	BD, CS, MAH
Brown Booby .....	<i>Sula leucogaster</i> .....	MS
Carolina Wren .....	<i>Thryothorus ludovicianus</i> .....	MTC
Brown Thrasher.....	<i>Toxostoma rufum</i> .....	MTC
Greater Yellowlegs.....	<i>Tringa melanoleuca</i> .....	BD, MS
Lesser Yellowlegs.....	<i>Tringa flavipes</i> .....	BD, MS
House Wren .....	<i>Troglodytes aedon</i> .....	MTC
American Robin .....	<i>Turdus migratorius</i> .....	MTC
Eastern Kingbird.....	<i>Tyrannus tyrannus</i> .....	MTC
White-eyed Vireo.....	<i>Vireo griseus</i> .....	MTC
Solitary Vireo .....	<i>Vireo solitarius</i> .....	MTC
Mourning Dove.....	<i>Zenaida macroura</i> .....	BD

### MAMMALS

Opossum.....	<i>Didelphis marsupialis</i> .....	BD, CS, MAH
Bobcat .....	<i>Lynx rufus</i> .....	BD, CS, MAH
Cotton Mouse.....	<i>Peromyscus gossypinus</i> .....	BD, CS
Raccoon .....	<i>Procyon lotor</i> .....	BD, CS, MAH, MS
Eastern Mole.....	<i>Scalopus aquaticus</i> .....	CS, MAH
Gray Squirrel .....	<i>Sciurus carolinensis</i> .....	CS, MAH
Cotton Rat.....	<i>Sigmodon hispidus</i> .....	BD, CS, MAH
Eastern Cottontail.....	<i>Sylvilagus floridanus</i> .....	BD, CS, MAH
Marsh Rabbit.....	<i>Sylvilagus palustris</i> .....	BD, CS, MAH, MS
Gray Fox .....	<i>Urocyon cinereoargenteus</i> .....	BD, CS, MAH

## Natural Community Abbreviations for Habitat

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### TERRESTRIAL

Beach Dune .....	BD
Coastal Berm .....	CB
Coastal Grassland .....	CG
Coastal Strand .....	CS
Dry Prairie .....	DP
Keys Cactus Barren.....	KCB
Limestone Outcrop.....	LO
Maritime Hammock.....	MAH
Mesic Flatwoods .....	MF
Mesic Hammock .....	MEH
Pine Rockland .....	PR
Rockland Hammock .....	RH
Sandhill.....	SH
Scrub.....	SC
Scrubby Flatwoods.....	SCF
Shell Mound.....	SHM
Sinkhole.....	SK
Slope Forest .....	SPF
Upland Glade .....	UG
Upland Hardwood Forest.....	UHF
Upland Mixed Woodland.....	UMW
Upland Pine .....	UP
Wet Flatwoods .....	WF
Xeric Hammock .....	XH

### PALUSTRINE

Alluvial Forest .....	AF
Basin Marsh .....	BM
Basin Swamp .....	BS
Baygall.....	BG
Bottomland Forest .....	BF
Coastal Interdunal Swale .....	CIS
Depression Marsh .....	DM
Dome Swamp .....	DS
Floodplain Marsh .....	FM
Floodplain Swamp.....	FS
Glades Marsh .....	GM
Hydric Hammock .....	HH
Keys Tidal Rock Barren.....	KTRB
Mangrove Swamp .....	MS
Marl Prairie .....	MP
Salt Marsh.....	SAM
Seepage Slope .....	SSL
Shrub Bog .....	SHB
Slough .....	SLO
Slough Marsh.....	SLM

## Natural Community Abbreviations for Habitat

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Strand Swamp ..... STS  
Wet Prairie ..... WP

### LACUSTRINE

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

### RIVERINE

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

### SUBTERRANEAN

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

### ESTUARINE

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

## Natural Community Abbreviations for Habitat

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### MARINE

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

### ALTERED LANDCOVER TYPES

Abandoned field .....	ABF
Abandoned pasture .....	ABP
Agriculture.....	AG
Canal/ditch .....	CD
Clearcut pine plantation.....	CPP
Clearing .....	CL
Developed .....	DV
Impoundment/artificial pond .....	IAP
Invasive exotic monoculture.....	IEM
Pasture - improved .....	PI
Pasture - semi-improved .....	PSI
Pine plantation .....	PP
Road.....	RD
Spoil area .....	SA
Successional hardwood forest.....	SHF
Utility corridor .....	UC

### MISCELLANEOUS

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

## **Natural Community Abbreviations for Habitat**

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



## **Imperiled Species Ranking Definitions**

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

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

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

### **FNAI 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)
- 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)

## **Imperiled Species Ranking Definitions**

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

### **LEGAL STATUS**

#### **FEDERAL**

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

- LE ..... Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
- PE ..... Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT ..... Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.
- PT ..... Proposed for listing as Threatened Species.
- C ..... Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological

## **Imperiled Species Ranking Definitions**

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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.

### **STATE**

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

LE ..... Listed as Endangered Species by the FWC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.

LT ..... 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.

LS ..... Listed as Species of Special Concern by the FWC. Defined as a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance or substantial human exploitation that, in the near future, may result in its becoming a threatened species?

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

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

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

## Imperiled Species Ranking Definitions

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## **Addendum 7—Cultural Information**



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

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

### **A. General Discussion**

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

### **B. Agency Responsibilities**

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

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

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

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

### **C. Statutory Authority**

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

### **D. Management Implementation**

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

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

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

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

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

**E. Minimum Review Documentation Requirements**

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

[http://www.flheritage.com/preservation/compliance/docs/minimum\\_review\\_documentation\\_requirements.pdf](http://www.flheritage.com/preservation/compliance/docs/minimum_review_documentation_requirements.pdf) .

\* \* \*

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

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

Phone: (850) 245-6425

Toll Free: (800) 847-7278

Fax: (850) 245-6435

## **Eligibility Criteria for National Register of Historic Places**

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

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

## Eligibility Criteria for National Register of Historic Places

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- 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

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

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

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

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

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

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