

CAYO COSTA STATE PARK

UNIT MANAGEMENT PLAN

APPROVED

STATE OF FLORIDA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Division of Recreation and Parks

DECEMBER 9, 2005



Jeb Bush
Governor

Department of Environmental Protection

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Colleen Castille
Secretary

March 21, 2006

Ms. BryAnne White
Office of Park Planning
Division of Recreation and Parks
3900 Commonwealth Blvd.; M.S. 525
Tallahassee, Florida 32399

Re: Cayo Costa State Park

Lease #3462

Dear Ms. White:

On December 9, 2005, the Acquisition and Restoration Council recommended approval of the Cayo Costa State Park management plan. Therefore, the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, approved the management plan for the Cayo Costa State Park. Pursuant to Sections 253.034 and 259.032, Florida Statutes, and Chapter 18-2, Florida Administrative Code this plan's ten-year update will be due on December 9, 2015.

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,

Paula L. Allen
Office of Environmental Services
Division of State Lands
Department of Environmental Protection

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INTRODUCTION

Cayo Costa State Park is located in Lee County where it occupies portions of four islands: Cayo Costa and its satellite, Punta Blanca, portions of North Captiva and Bokeelia Island. Primary public access occurs on Cayo Costa Island located approximately nine miles west of Cape Coral on the mainland, separated by Matlacha Pass, Pine Island and Pine Island Sound. Gasparilla Island and the community of Boca Grande are located approximately one mile north across Boca Grande Pass. Access to Cayo Costa is by boat, traveling south either from Boca Grande or west from Pine Island. The Vicinity Map and Reference Map provide a geographic context for the park; delineate major roads, developed areas and significant land and water resources either within or nearby the park.

Currently the park contains approximately 2,656 acres. Acquisition of the park began on September 7, 1976 through the Environmentally Endangered Lands Bond Proceeds and has continued since then through the Preservation 2000 and Florida Forever Programs.

At Cayo Costa State Park, public outdoor recreation is the designated single use of the property (see Addendum 1). There are no legislative or executive directives that constrain the use of this property. The park is currently administered cooperatively with Stump Pass Beach, Don Pedro Island, Gasparilla Island and Charlotte Harbor Preserve State Parks.

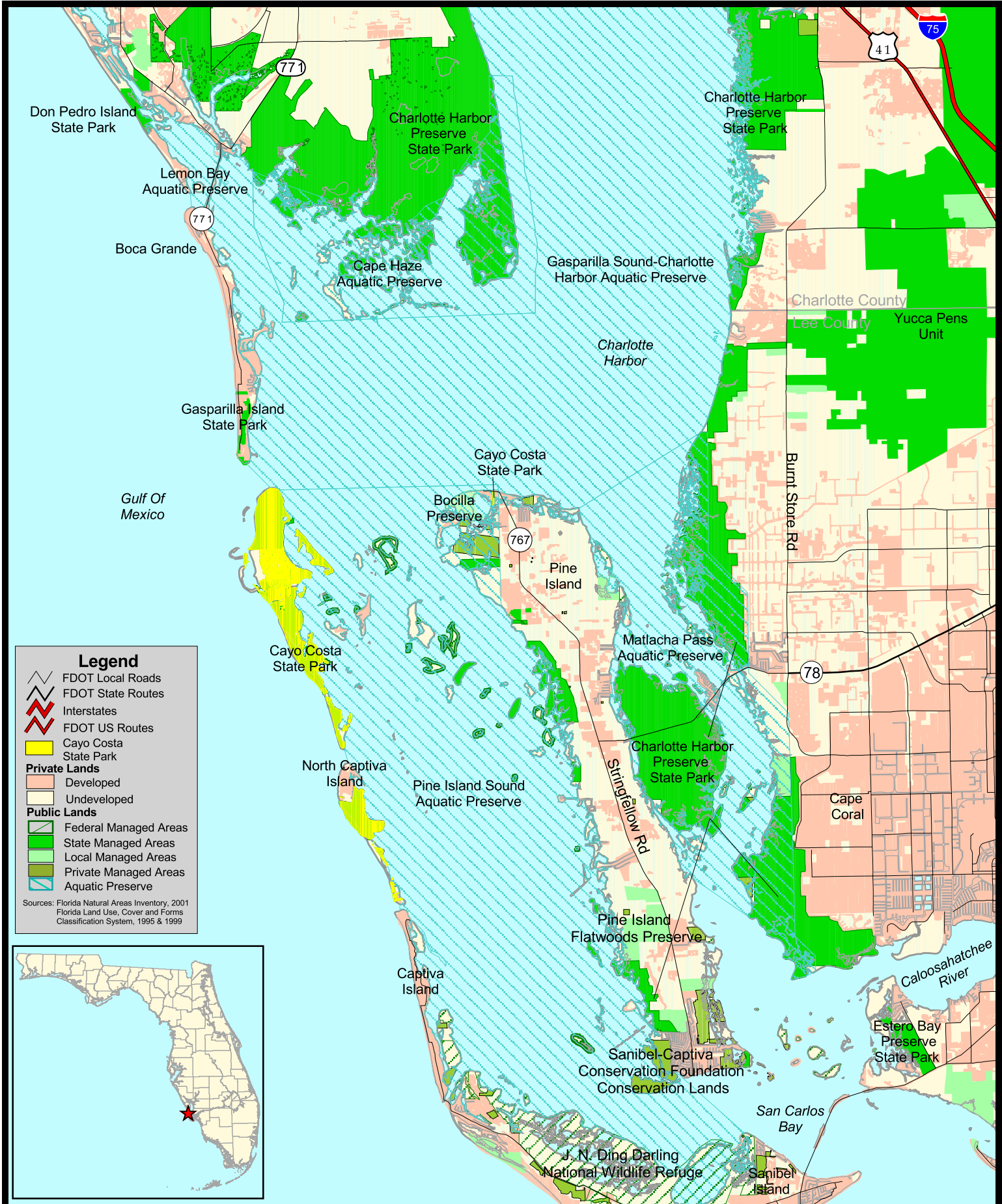
PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of Cayo Costa State Park as a unit of Florida's state park system. It identifies the objectives, criteria and standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the July 29, 1999, approved plan. All development and resource alteration encompassed 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.

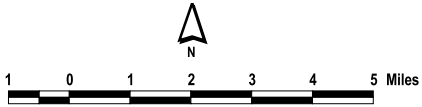
The plan consists of two interrelated components. Each component corresponds to a particular aspect of the administration of the park. The resource management component provides a detailed inventory and assessment of the natural and cultural resources of the park. Resource management problems and needs are identified, and specific management objectives are established for each resource type. This component provides guidance on the application of such measures as prescribed burning, exotic species removal, and restoration of natural conditions.

The land use component is the recreational resource allocation plan for the unit. Based on considerations such as access, population, and adjacent land uses, an optimum allocation of the physical space of the park is made, locating use areas and proposing types of facilities and volume of use to be provided.

In the development of this plan, the potential of the park to accommodate secondary management purposes ("multiple uses") was analyzed. These secondary purposes were considered within the context of the Division's statutory responsibilities and an analysis of the

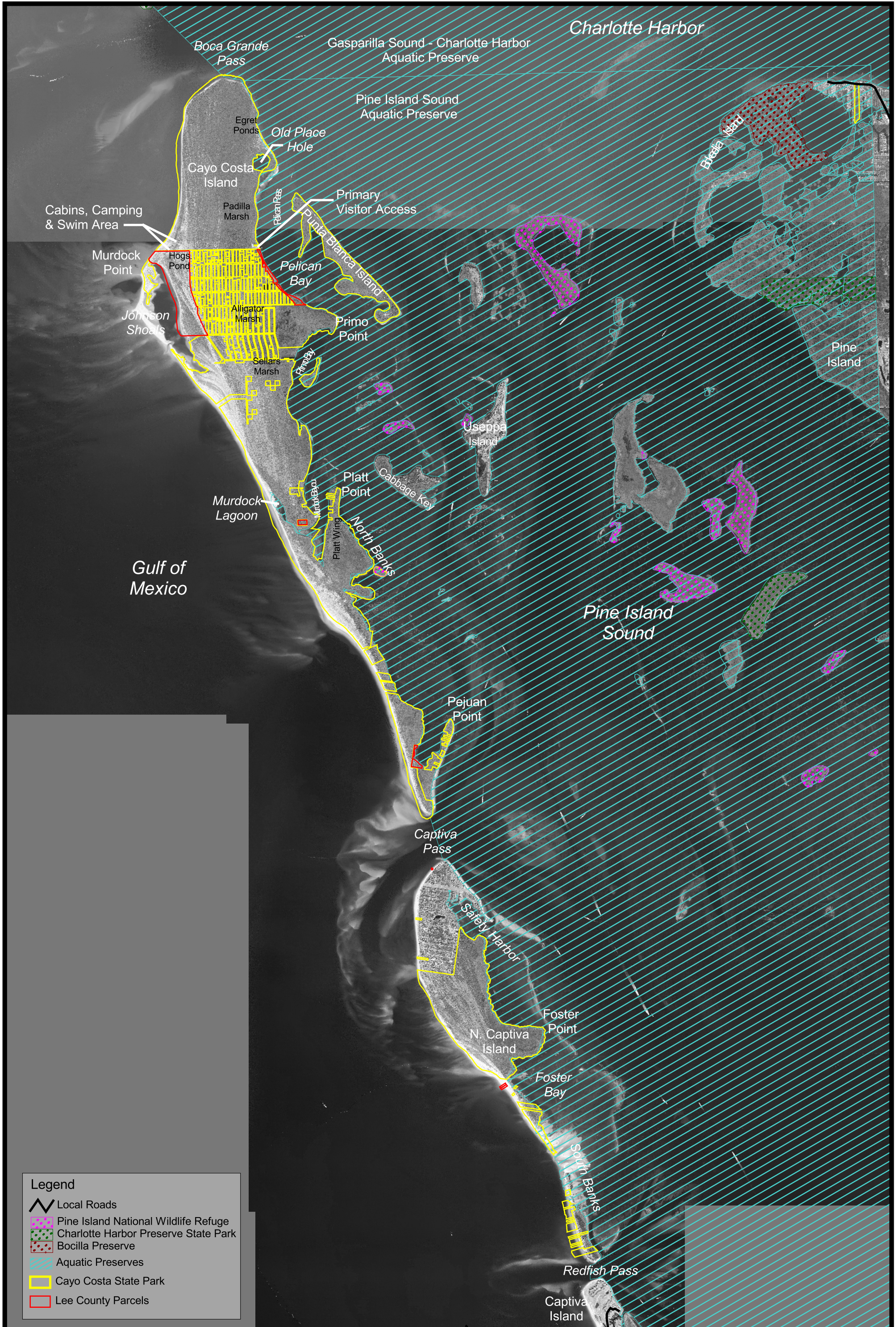


CAYO COSTA STATE PARK



Prepared by:
 Florida Department of Environmental Protection
 Division of Recreation and Parks
 Office of Park Planning

VICINITY MAP



Charlotte Harbor

Boca Grande Pass

Gasparilla Sound - Charlotte Harbor Aquatic Preserve

Pine Island Sound Aquatic Preserve

Egret Ponds
Old Place Hole

Cayo Costa Island

Padilla Marsh
Pelican Pass
Primary Visitor Access

Cabins, Camping & Swim Area

Murdock Point

Johnson Shoals

Hogs Pond

Alligator Marsh

Punta Blanca Island

Primo Point

Sellers Marsh

Murdock Lagoon

Platt Bay

Platt Point

Cabbage Key

Platt Wing

North Banks

Useppa Island

Betele Island

Pine Island

Gulf of Mexico

Pine Island Sound

Pejuan Point

Captiva Pass

Safety Harbor

Foster Point

N. Captiva Island

Foster Bay

South Banks

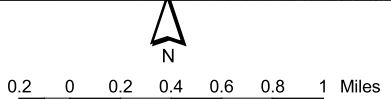
Redfish Pass

Captiva Island

Legend

-  Local Roads
-  Pine Island National Wildlife Refuge
-  Charlotte Harbor Preserve State Park
-  Bocilla Preserve
-  Aquatic Preserves
-  Cayo Costa State Park
-  Lee County Parcels

CAYO COSTA STATE PARK



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Florida Department of Environmental Protection
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REFERENCE MAP

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 or the management purposes of the park and should be discouraged.

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 unit was also analyzed. Decisions regarding this type of management (such as outsourcing, contracting with the private sector, use of volunteers, etc.) will be made on a case-by-case basis as necessity dictates.

MANAGEMENT PROGRAM OVERVIEW

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (Division) 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 Trustees have also granted management authority of certain sovereign submerged lands to the Division 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 impact public recreational uses. In cases where those sovereign submerged lands lie within the

boundaries of the Pine Island Sound Aquatic Preserve (see Vicinity Map), management activities will be coordinated with the Department's Office of Coastal and Aquatic Managed Areas (CAMA).

Many operating procedures are standard system wide and are set by policy. These procedures are outlined in the Division Operations Manual (OM) and cover such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, camping regulations, resource management, law enforcement, protection, safety and maintenance.

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

Park Goals and Objectives

The following park goals and objectives express the Division long-term intent in managing the state park. At the beginning of the process to update this management plan, the Division reviewed the goals and objectives of the previous plan to determine if they remain meaningful and practical and should be included in the updated plan. This process ensures that the goals and objectives for the park remain relevant over time.

Estimates are developed for the funding and staff resources needed to implement the management plan based on these goals, objectives and priority management activities. Funding priorities for all state park management and development activities are reviewed each year as part of the Division legislative budget process. The Division prepares an annual legislative budget request based on the priorities established for the entire state park system. The Division also aggressively pursues a wide range of other funds and staffing resources, such as grants, volunteers and partnerships with agencies, local governments and the private sector, for supplementing normal legislative appropriations to address unmet needs. The ability of the Division to implement the specific goals, objectives and priority actions identified in this plan will be determined by the availability of funding resources for these purposes.

Natural and Cultural Resources

Identify, preserve, protect and manage natural resources.

1. Control invasive exotic plant and animal species through appropriate methods.
 - A. Australian pines (*Casaurina equisetifolia*), Brazilian pepper (*Schinus terebinthifolius*), snake plant (*Sansevieria hyacinthoides*) and lead tree (*Leucaena leucocephala*) will continue to be the priority species for removal.
 - B. The units of priority will be, in declining order: Cayo Costa Island, Punta Blanca Island and North Captiva Island.
 - C. Prepare a monitoring and maintenance plan and regularly scheduled inspections of all parts of the park.
 - D. Continue and expand a trapping program and investigate additional measures that will eliminate feral hogs from Cayo Costa Island.
2. Establish and maintain prescribed fire program.
 - A. Continue prescribed burning at three designated sites on a three to five-year rotation.
3. Conduct a biological survey of newly acquired properties.
4. Continue to manage for and monitor marine turtles and nesting shorebirds on Cayo Costa

and North Captiva.

Identify, preserve, protect and manage cultural resources.

1. Seek funding for historical and archaeological research to understand the cultural past, improve interpretive programming and improve cultural resource management.
 - A. Conduct an archaeological survey to locate additional prehistoric and historic sites, recover additional information on already recorded sites, and document sites that are threatened or damaged.
 - B. Conduct archival research and oral history interviews on the islands' former occupants and historical uses.
2. Monitor cultural resources on a regular basis to document site condition, identify and evaluate threats, and modify cultural resource management practices as needed.
 - A. Compile a detailed, up-to-date description and condition assessment for each site to serve as a baseline for future comparison.
 - B. Conduct regular monitoring visits to each site and document its condition via written narrative and photography.
 1. Assess the condition of sites that were not visited during the 1998 or the 2003 Cultural Resource Management Evaluation, including Clark #1, Clark #2, Foster Bay Midden, Foster Bay Homestead, Padilla Cemetery and Burroughs Ranch.
 2. Monitor the condition of the heavily damaged Mark Pardo Shellworks frequently to evaluate continued feral hog activity in the area.
3. Establish and implement a routine maintenance program for the park's cultural resources, and conduct stabilization work or preservation treatment as needed.
 - A. Manage archaeological and historical sites in accordance with DHR policies, Division standards, BNCR guidelines (*Earthen Structures and Cemeteries, Gravesites and Graves*), state laws and rules, and Secretary of Interior standards.
 - B. Develop a written cultural resource management plan that specifies needed maintenance and monitoring tasks, and includes a schedule of activities.
 - C. Plan and execute remedial preservation treatment for the Mark Pardo Shellworks to prevent further destruction by feral hogs.
4. Take measures to avoid or minimize adverse impact to archaeological sites during ground-disturbing activity associated with routine park maintenance, natural resource management, preservation work, and development projects.
 - A. Consider cultural resource concerns and consult with cultural resource specialists early in a project's planning process.
 - B. Consult the DHR/DRP Compliance Review Matrix, submit a request for DHR comment if required, and complete all required archaeological monitoring.
5. Encourage park management and staff to attend and complete the Archaeological Resource Management Training, offered three times a year by DHR and FPS, and other preservation-related workshops and training offered periodically by FPS and the Florida Trust for Historic Preservation.

Recreation

Continue to provide quality resource based outdoor recreational and interpretive programs and facilities at the state park.

1. Provide opportunities for interpretation of natural and cultural resources through on and off-site programs, interpretive signage, displays and informational materials.
2. Maintain public access for saltwater beach recreation activities such as fishing, swimming and shelling.
3. Maintain a network of hiking trails that allow exploration of Cayo Costa Island.
4. Provide camping and primitive cabins to allow for extended stays at the park.

Seek funding to expand recreational and interpretive opportunities through the improvement of programs and the development and/or improvement of use areas and facilities, as outlined in this management plan.

1. Enhance the visitor experience on the park tram by improving the road, developing a tram-based interpretive tour and converting to alternative fuel vehicles.
2. Undertake a comprehensive redesign of the entrance area on Cayo Costa Island that improves visitor orientation, circulation, interpretation and the aesthetics of the area.
3. Improve access and reduce social trails to the beach.
4. Improve aesthetics and shade within camping and cabin area through native landscaping and additional shelters.
5. Reorganize tent camping area by relocating flood prone sites.
6. Upgrade restroom facilities in the camping and cabin area.

Enhance safe, environmentally responsible boating access to the park and within adjacent waters.

1. Conduct systematic monitoring of boat usage in Pelican Bay and the Gulf beach area to increase an understanding of boating use patterns, and identify management issues related to resource impacts and public access.
2. In coordination with local government and other appropriate public and private entities, develop recommendations for boat use in adjacent waters designed to protect coastal resources, public safety and enhance park operations.
3. Provide information to boaters via signage, printed materials and radio broadcast that encourage safe, responsible boating in nearshore waters.

Park Administration/Operations

Seek funding, staffing and partnerships to meet park operation and resource management needs.

1. Pursue acquisition of remaining out parcels through the DRP Acquisition and Inholdings Program and partnerships with local government and private conservation organizations.
2. Enhance personnel resources to address resource management, administration and visitor services/recreation needs.
3. Enhance ecotourism programs through partnerships and park concession operations.
4. Acquire additional equipment necessary to meet the management needs of the property.
5. Recruit and maintain volunteers to assist with management and interpretation of the park.
6. Conduct routine safety and maintenance inspections of facilities and public areas and correct deficiencies as needed. Assure compliance with state and federal safety guidelines.
7. Continue to improve universal access to park facilities in compliance with the Americans with Disabilities Act.
8. Provide staff with appropriate training opportunities in visitor services, resource management, park operations and interpretation.

Increase public awareness of the recreation opportunities and resource management needs of the park.

1. Monitor land and water use activities outside the park that may impact park resources or the visitor experience.
2. Stay informed regarding regional resource protection initiatives and regulatory changes.
3. Network with other land and water managing agencies to coordinate resource protection efforts.
4. Participate as guest speakers at civic association and other special interest group meetings.
5. Develop programs and partnerships with local schools and community organizations.
6. Collaborate with tourism development organizations to promote visitation to the park.

Management Coordination

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

The U.S. Fish and Wildlife Service (USFWS) staff at J. N. “Ding” Darling National Wildlife Refuge provides assistance with colonial waterbird monitoring. The Division participates in initiatives of the U.S. EPA National Estuary Program to promote protection of Charlotte Harbor. The Department of Agriculture and Consumer Services, Division of Forestry (DOF), assists Division staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC), assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within park boundaries. In addition, the FFWCC aids the Division with wildlife management programs, including the development and management of Watchable Wildlife programs. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Wetland Resources aid staff in planning and construction activities seaward of the Coastal Construction Line and the development of erosion control and beach renourishment projects when deemed appropriate. The DEP Bureau of Invasive Plant Management provides funding for invasive exotic plant removal projects.

Local government coordination and support is provided by Lee County through funding for tourism development, building code enforcement, public school programming and mosquito control. Park staff also coordinates resource and visitor management needs on adjacent county owned lands. Upper Captiva, Pine Island, Fort Myers Beach and Useppa fire departments assist with emergency services.

Sanibel-Captiva Conservation Foundation assists with sea turtle, and shorebird monitoring. The Barrier Island Parks Society (BIPS) provides funding, programming and volunteer support. Selby Gardens assists with plant identification and protection efforts. The Mote Marine Lab provides technical assistance in the area of fisheries and marine mammal protection. Randell Research Center assists with cultural resource education programs. Volunteers from a variety of local boat clubs help with coastal cleanup projects, and funding for supplies and educational programs.

Public Participation

The Division provided an opportunity for public input by conducting a public workshop and an advisory group meeting. A public workshop was held on December 15, 2004. The purpose of this meeting was to present this draft management plan to the public. A DEP Advisory Group meeting was held on December 16, 2004. The purpose of this meeting was to provide the Advisory Group members the opportunity to discuss this draft management plan.

Other Designations

Cayo Costa State Park is not within 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.

This unit is adjacent to the Pine Island Sound and Gasparilla Sound-Charlotte Harbor Aquatic Preserves which are designated under provision of the Florida Aquatic Preserve Act of 1975

(section 258.35, Florida Statutes). All waters within the unit 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 III waters by DEP.

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

The Division of Recreation and Parks has implemented resource management programs for preserving for all time the representative examples of natural and cultural resources of statewide significance under its administration. This component of the unit plan describes the natural and cultural resources of the park and identifies the methods that will be used to manage them. The stated management measures in this plan are consistent with the Department's overall mission in ecosystem management. Cited references are contained in Addendum 2.

The Division's philosophy of resource management is natural systems management. Primary emphasis is on restoring and maintaining, to the degree practicable, the natural processes that shape the structure, function and species composition of Florida's diverse natural communities as they occurred in the original domain. Single species management may be implemented when the recovery or persistence of a species is problematic provided it is compatible with natural systems management.

The management goal of cultural resources is to preserve sites and objects that represent all of Florida's cultural periods as well as significant historic events or persons. This goal may entail 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 is often affected by conditions and occurrences beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program (to assess resource conditions, evaluate management activities and refine management actions), review of local comprehensive plans and review of permit applications for park/ecosystem impacts.

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

Elevations on Cayo Costa Island vary over a 12.5-foot range, from two feet below mean sea level to about 10.5 feet above mean sea level. One pre-Columbian mound, Old Ware Mound, rises to about 16 feet above (msl). Topographic relief in Cayo Costa State Park was created by sediment deposited in successive ridges onto the seaward face of the island by the action of wind and waves. The most pronounced natural topographic features in the park are found on the seaward side, where the foredunes reach heights of between five and eight feet above msl. The older inland dunes level off to a gently undulating surface because of weathering. Elevations vary between two and six feet. The topography on the east side of the island is independent of this ridge-swale complex, being formed by either overwash fans or bayside sedimentation.

Geology

Cayo Costa and North Captiva Islands rest on a foundation of limestone. The upper layer of this limestone belongs to a Pleistocene series of sedimentary deposits called the Anastasia formation (conquinoid limestone, sand and clay). These two islands are part of a barrier chain including Gasparilla to the north, and Captiva and Sanibel to the south. They form a buffer for the Charlotte Harbor estuarine system, protecting it from the effects of storm-generated waves in the Gulf of Mexico.

In his book, *The Natural History of Cayo Costa (1977)*, Stanley Herwitz detailed the geomorphic history of the Charlotte Harbor barrier chain. About 5,000 years ago, the rate of rise in sea levels, caused by the melting of late Pleistocene glaciers, began to slow. It was at this time that the flooded mouths of the Myakka and Peace Rivers formed the Charlotte Harbor estuary. As the rising sea failed to offset the deposition of sediment, a spit began to extend southward from Cape Haze paralleling Pine Island. At this time, the waters of the Peace and Myakka Rivers flowed southward into San Carlos Bay. The spit may have been breached on occasion during this process, allowing the rivers to flow through the openings temporarily, but the volume of discharge and tidal movement was of such a low magnitude that longshore drift quickly sealed these temporary openings. It was not until Matlacha Pass began to fill with sediment and the southern portion of the spit (now known as Sanibel Island) began to recurve eastward into San Carlos Bay that discharge from the Myakka and Peace Rivers were forced to utilize the more northerly tidal inlets. This gave the barrier island chain a configuration resembling the present one.

Herwitz also made some interesting speculations and observations about the development history of Cayo Costa Island. For example, Cayo Costa is separated from Gasparilla Island to the north by Boca Grand Pass that, at a depth of 51 feet, is the major tidal channel serving Charlotte Harbor. However, the major pass was once located at the narrowest part of Cayo Costa, south of present day Platt Wing.

During a hurricane in the 1930s Johnson Shoals emerged to become, a prominent landform associated with Cayo Costa and subsequently had a noticeable effect on the shape of the island's shoreline. Originally, there was a single V-shaped shoal; it formed a barrier behind which a foreland grew out from Cayo Costa and almost connected with the shoal. In the 1940s however, a storm fragmented the shoal into three segments, exposing the shore of the island to wave action. The foreland lost over 100 feet by 1951.

From time to time, fingers of sand from the shoals approached the shore. These act as natural groins and obstruct the southward drift of sediments. As a result, much of Cayo Costa south of Johnson Shoals was subjected to severe erosion over a period of 40 years. Comparison of Cayo Costa's shorelines in 1958 and 1959 reveals that the entire sector of the island south of Murdock Lagoon was over 500 feet wider and much less concave than during the period of Johnson Shoals. Herwitz speculated that the next breaching of the island might occur at this narrow point south of Murdock Bayou, a location where several private dwellings have been built.

However, during the 1980s, Johnson Shoals disappeared, but a long, southward reaching spit emerged from the beach just south of where the rental cabins and campground are located. This spit has formed a large, semi-enclosed lagoon. However, at the time of this writing Johnson Shoals may be reemerging. Exposed sand is visible at low tide. If that happens, the Shoals may intercept sand drifting toward the south, thus reducing the spit.

One of the more interesting features of Cayo Costa's plant communities is an inland community of red mangroves. Although it originated in a saltwater lagoon-like environment, the mangrove community now fringes an inland body of fresh water. It has been isolated from its marine origins by the same processes that constantly change the shape of barrier islands.

Punta Blanca Island formed as a part of Cayo Costa as recently as 1868. It was connected to the "hook" of land enclosing the Old Place Hole. At this time, Old Pelican Pass was just a narrow channel separating Punta Blanca from Cayo Costa.

Soils

The islands consist mainly of undifferentiated sand, shell, marl and peat. Six soil types (see Soils Maps) have been identified in the 1984 *Soil Survey of Lee County, Florida* (Henderson). Addendum 3 contains a detailed map of soils in the unit and descriptions of the six soil types. There are no obvious erosion problems except those associated with the dynamics of a sandy coast. Management measures will continue to follow generally accepted best management practices to prevent soil erosion and conserve soil and water resources on site.

Minerals

There is no information available on minerals in Cayo Costa State Park. No mineral deposits of commercial value are known to exist in the park

Hydrology

When the ground is saturated, water rises above the surface in several elongated depressions where it remains until the dry season returns, whereupon it again subsides below ground.

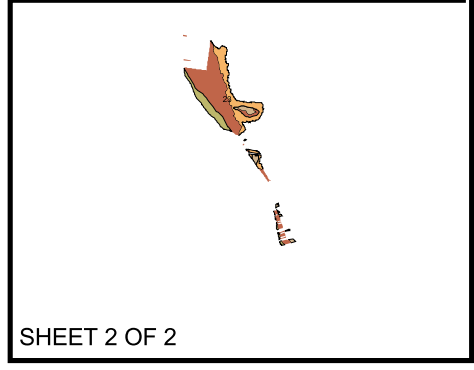
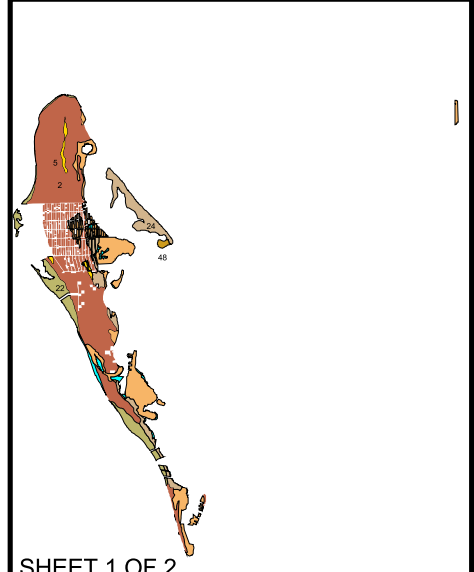
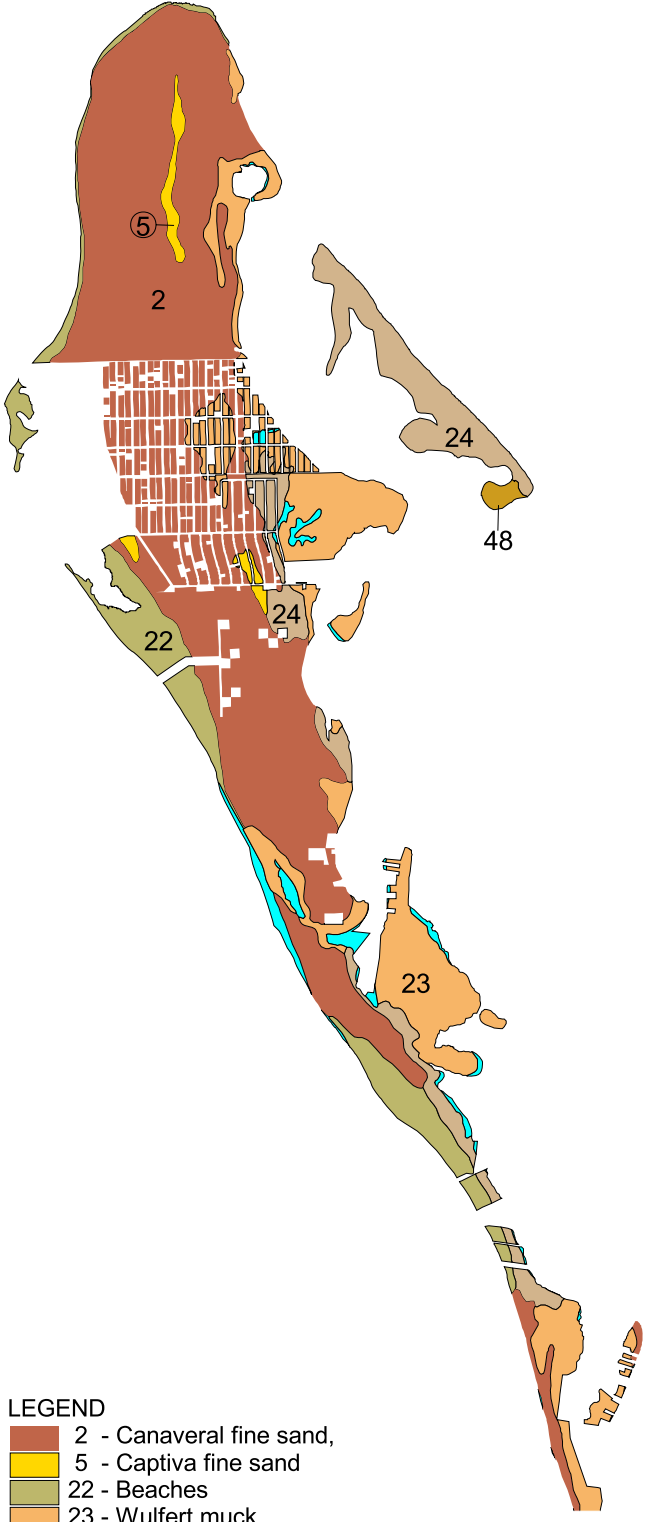
Due to the shallow water table and the lack of moving surface water systems, the drainage on Cayo Costa and North Captiva Islands is extremely poor. Precipitation saturates or is readily absorbed into the permeable substrate. Fresh water can only escape from the islands via the gradual processes of evapotranspiration and underground seepage. There are ten sites on Cayo Costa and two on North Captiva where surface water stands at least part of the year. All these are designated Class III waters by the Department of Environmental Protection except for Old Place Hole, Murdock's Lagoon and the Primo Point tidal pool complex that are connected to Pine Island Sound and designated as Class II waters.

Since three of Cayo Costa Island's ten standing water bodies are connected with the estuarine system via tidal inlets, they cannot be considered as occurring within the confines of the island proper. The Old Place Hole, Murdock's Lagoon and the Primo Point tidal pool complex each have salinities nearly indistinguishable from those of Pine Island Sound. Primo Point differs, in that not all of its tidal pools are inundated year-round. Only exceptionally high tides are capable of flooding the more westerly sectors that are otherwise unvegetated salt barrens. This situation is also true of the Pejuan tidal pool.

Alligator Marsh, Sellar's Marsh and Hogs Pond are salt-free, and they represent the island's only natural, fresh surface waters. Beginning in early March, these sites are reduced to either a surface film of water or a soggy substrate. Alligator Marsh is the most extensive, covering approximately 18.2 acres during the summer. All three are simply low-lying zones of saturation in contact with the unconfined aquifer. Stanley Herwitz observed that the waters of Alligator Marsh shrank into localized pools during the dry winter of 1975-1976, yet assumed their characteristic dimensions during the following wet winter of 1976-1977, indicating a close correlation with rainfall.

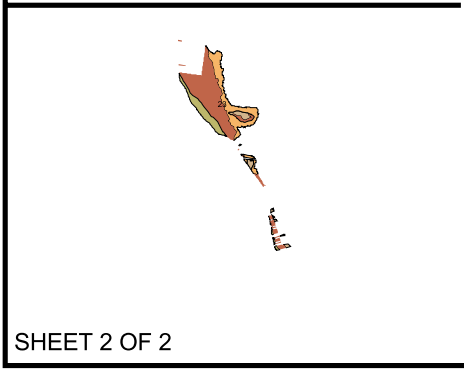
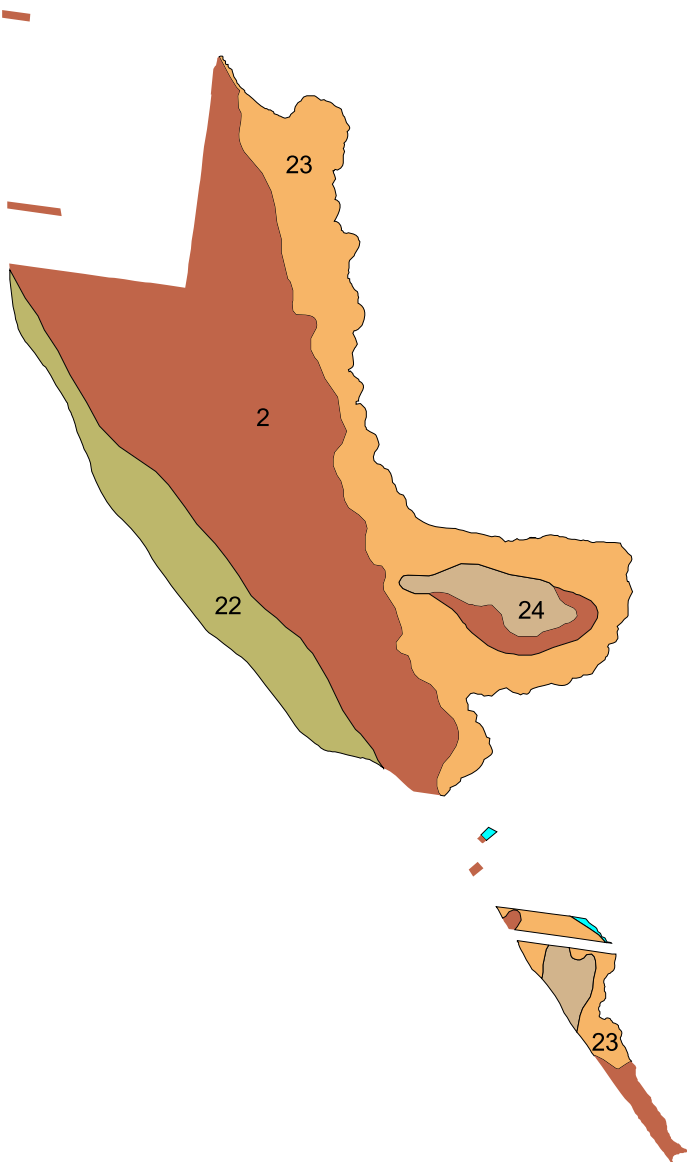
The inland mangrove pond, which lies to the immediate north of Alligator Marsh, exhibits a salinity gradient decreasing from north to south. While evidence is inconclusive, it seems likely that this is a result of either perched pocket of salts underlain by an impermeable matrix. Padilla Marsh exhibits this same characteristic. Separated from the bay by a strand of salt-intolerant vegetation, it dries up during the winter yet still manages to re-establish brackish conditions with each rainy season.

In the case of the two Egret Ponds, subterranean tidal seepage explains the relatively constant depths and salinities of the surface waters that seem unaffected by seasonal rainfall patterns. The

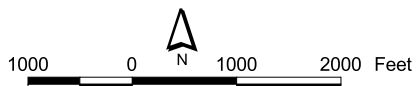
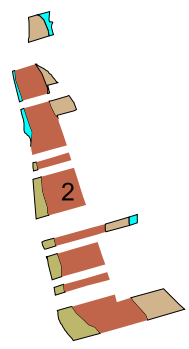


- LEGEND**
- 2 - Canaveral fine sand,
 - 5 - Captiva fine sand
 - 22 - Beaches
 - 23 - Wulfert muck
 - 24 - Kesson fine sand
 - 48 - St. Augustine sand
 - Water





- LEGEND**
- 2 - Canaveral fine sand,
 - 5 - Captiva fine sand
 - 22 - Beaches
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 - 48 - St. Augustine sand
 - Water



bayward pond is consistently more saline than the inland pond. Management will comply with best management practices to maintain or improve the existing water quality on site and will take measures to prevent soil erosion or other impacts to water resources.

Natural Communities

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (1990). 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 which are similar with respect to these factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, 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.

The park contains 11 distinct natural communities (see Natural Communities Map) in addition to ruderal areas. Park specific assessments of the existing natural communities are provided in the narrative below. A list of plants and animals occurring in the unit is contained in Addendum 4.

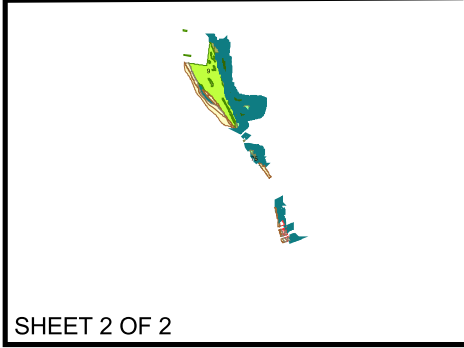
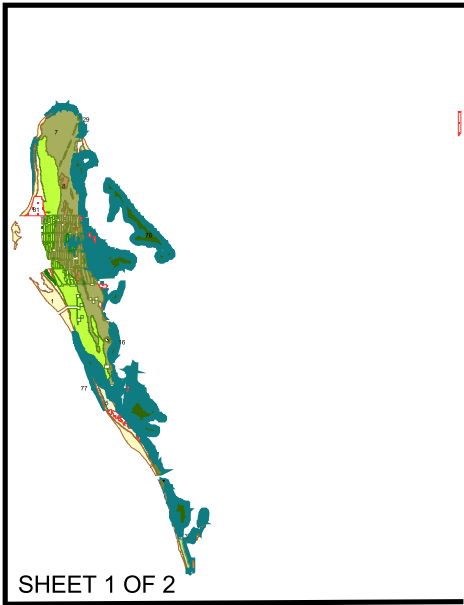
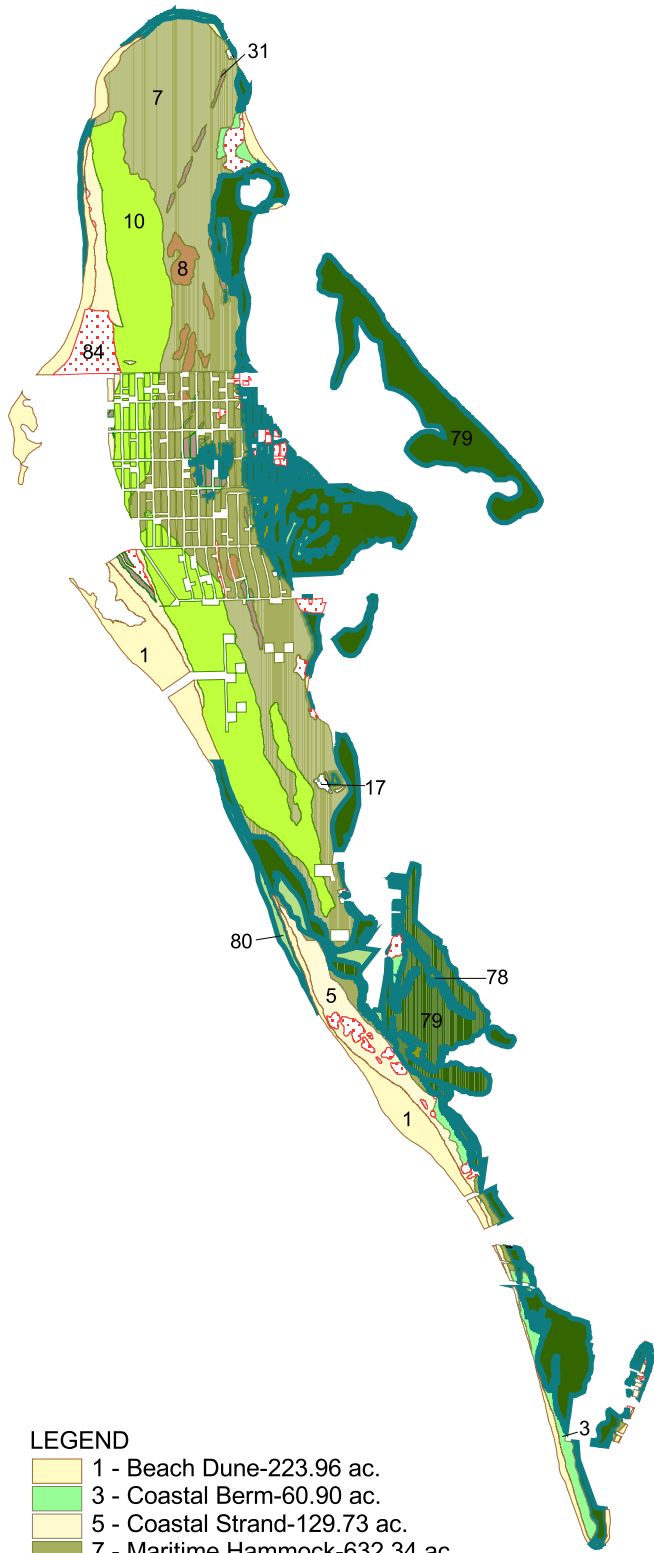
Beach dune. The dunes at Cayo Costa are not particularly high, reaching a maximum elevation of approximately eight feet above mean sea level. Comprised of wind-deposited foredune and wave-deposited upper beach, beach dune is sometimes transitional, sometimes ephemeral. Its halophyte vegetation may be replaced by other types as the accreting shore transforms into an island site, or the shore may erode, eliminating it altogether.

On Cayo Costa Island, this community can be found in two locations: the first occurs in several short, discontinuous stretches of the northern and northeastern part of the island formerly known as the Lee County Park. [This and several other geographical place names used in the natural community descriptions are from Herwitz (1977) and Morrill and Harvey (1980).] The second forms an extensive but narrow segment of the western shoreline beginning about one mile south of Murdock Point and running almost without interruption to the southern tip of the island. Marine tidal swamp is responsible for the discontinuity in beach dune here.

Beach dune also occurs on North Captiva Island in two general locations: on the western shoreline it occupies almost 4000 feet of the coast from the northern boundary of the park property, extending to just south of the region known as the Cuspate Forelands (Morrill and Harvey, 1980); the second site is in the slender, southern fingertip of the island, including the southwestern tip. In the narrowest part of the fingertip, beach dune extends across the island from the Pine Island Sound side to the Gulf side.

This community is characterized by the prevalence of pioneer species such as sea oats (*Uniola paniculata*), beach cordgrass (*Spartina bakeri*), bitter panicum (*Panicum amarum*), seashore paspalum (*Paspalum vaginatum*), beach elder (*Iva imbricata*), sea purslane (*Sesuvium portulacastrum*), ground cherry (*Physalis angustifolia*) and sea rocket (*Cakile lanceolata*). It is in excellent condition except where it has been invaded by Australian pines.

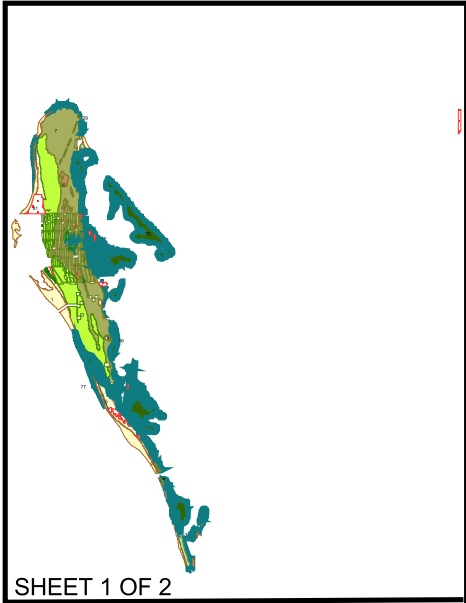
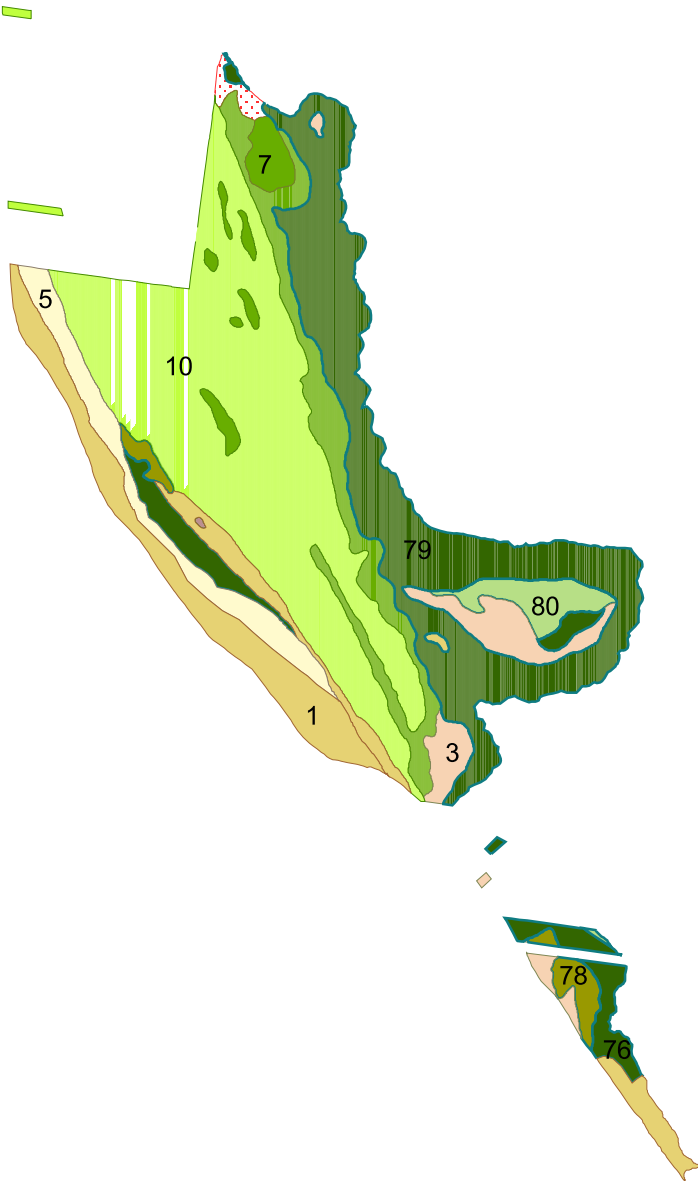
Coastal berm. This community at Cayo Costa State Park occurs interlaced with a more widespread community known as coastal grassland, and contains many of the same plant species. Together, these communities present a savannah-like appearance. Cabbage palms associated with a number of shrubs usually dominate the ridges of the coastal berm. Between the ridges on the coastal grassland, hairy gramma (*Bouteloua hirsuta*) is the dominant grass. This coastal



LEGEND

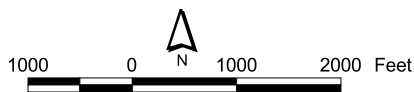
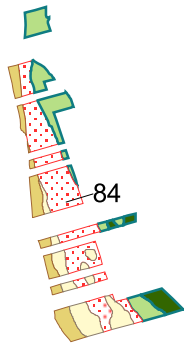
- 1 - Beach Dune-223.96 ac.
- 3 - Coastal Berm-60.90 ac.
- 5 - Coastal Strand-129.73 ac.
- 7 - Maritime Hammock-632.34 ac.
- 8 - Mesic Flatwoods-22.18 ac.
- 10 - Coastal Grasslands-486.06 ac.
- 17 - Shell Mound-2.84 ac.
- 31 - Depression Marsh-27.52 ac.
- 78 - Marine Tidal Marsh-38.90 ac.
- 79 - Marine Tidal Swamp-668.13 ac.
- 80 - Marine Unconsolidated Substrate-72.00 ac
- 84 - Ruderal-90.18 ac.





LEGEND

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berm/coastal grassland type association was probably originally restricted to a few barrier islands along the southwest coast of Florida, and Cayo Costa represents one of the few relatively undisturbed examples remaining. Most of the coastal berm in this park is in excellent condition. Some sites have been degraded by roads and the construction of homes.

Coastal strand. The coastal strand community at this park is typical in that, for the most part, it is an ecotonal community that generally lies between beach dunes and maritime hammock and may show some characteristics of the former. The difference is that, as mentioned elsewhere, a rather uncommon natural community known as coastal grassland is also a part of the adjoining ecological landscape.

Coarse sediments predominate in the substrate. Consequently, sea oats and beach elder are less abundant than in beach dunes.

The coastal strand community in this park is generally in excellent condition. Some small areas have been invaded by Australian pine. Removal of exotics is underway and should return this community to its original condition. Typical plants include Florida swamp privet (*Forestiera segregata*), cabbage palm (*Sabal palmetto*), saffron plum (*Sideroxylon celestrin*), coin vine (*Dalbergia ecastaphyllum*), Hercules' club (*Zanthoxylum clava-herculis*) and seaside croton (*Croton punctatus*) (also called Gulf croton), with the latter two being almost restricted to this habitat. Occasional individuals of earleaf greenbrier (*Smilax auriculata*), hairawn muhly (*Muhlenbergia capillaries*), golden creeper (*Ernodia littoralis*), necklace pod (*Sophora tomentosa*), hairy gramma grass and joewood (*Jacquina keyensis*) are present although they are suggestive of more inland communities. The joewood population at Cayo Costa State Park is at the northern end of its North American range. Although this species is not uncommon in the Florida Keys, its best-known mainland location is in Everglades National Park. It is rare elsewhere in Florida. Some beach dune plants like Spanish dagger (Spanish bayonet) (*Yucca aloifolia*), prickly pear (*Opuntia stricta*), and seaside primrose (*Ludwigia repens*) do well in this habitat.

Maritime hammock. In Cayo Costa State Park, the maritime hammock is the most extensive community on the islands. Here the successional trend from xerophytic shore to mesic upland habitat is well represented. Open sandy spaces are rare in this habitat. Humus build-up contributes to moisture retention, and a nearly complete canopy of cabbage palms and live oaks minimizes temperature fluctuations by reducing soil warming during the day and heat loss at night.

Although the better examples of this hammock are primarily woody in plant composition, including the suffrutescent coontie (*Zamia pumila*), the maritime hammock community here is home for a host of fern species including the scarce and unusual whisk fern (*Psilotum nudum*), marsh fern (*Thelypteris palustris*), shoestring fern (*Vittaria lineata*), resurrection fern (*Pleopeltis polypodiodes*) and bracken fern (*Pteridium aquilinum*). The moderate microclimate and progressive accumulation of nutrients over an extended period contribute to a magnitude of species diversity.

The maritime hammock has been subjected to occasional fires, particularly during early successional stages. These fires have returned bound-up inorganic matter to the soil in usable form, thereby aiding regrowth in the renourished substrate in a secondary pattern of succession and diversifying plant associations in the maritime hammock. Herwitz (1977) recognized the following four sub-associations: 1) cabbage palm aggregates in dense solid stands eliminating all

understory elements except strangler fig (*Ficus aurea*) and shoestring fern, which persist as epiphytes; 2) poorly shaded scrub-like vegetation consisting of live oak (*Quercus virginiana*) saplings and saw palmetto (*Serenoa repens*) which together become more numerous than the cabbage palms; 3) a purely herbaceous assemblage, featuring sparsely distributed plants of pineland pinweed (*Lechea sessiliflora*), axil flower (*Mecardonia acuminata*), purslane (*Sesuvium portulacastrum*) and heliotrope (*Heliotropium curassavicum*), situated among sandy spaces; and 4) clusters of 2 to 3 slash pines (*Pinus elliottii*) which produce enough pine needles to suppress the characteristic maritime hammock elements and create a modest open area hospitable to such grasses as coastal foxtail (*Setaria corrugata*) and hairawn muhly.

These variations within the maritime hammock are so minute that their patterns are unmappable. Therefore, the maritime hammock is seen as a single organic unit that will re-establish the same basic components, though often by circuitous routes, after disturbance.

This extensive community is generally in pristine to excellent condition in the park. Occasional roads mar limited portions, and native vegetation has succumbed to invasion by Brazilian pepper in other localized areas.

Mesic flatwoods. This community is confined to interior, discontinuous patches in the northern half of Cayo Costa Island. In fact, no slash pines have been found south of Murdock Lagoon. Since the flatwoods occur locally only within the maritime hammock, and always near a site of human disturbance, the flatwoods appear to be more related to human activities than to the island's physiography or successional pattern. Another more recent hypothesis based on tree-ring analysis is that mesic flatwoods formation correlates with the passage of hurricanes.

The mesic flatwoods at Cayo Costa State Park differ from the maritime hammock mainly in the decreased frequency of the woody species snowberry (*Chiococca alba*), randia (*Randia aculeata*), coral bean (*Erythrina herbacea*), lantana (*Lantana involucrata*), myrsine (*Rapanea punctata*), and tallowwood (*Ximenia americana*). The herbaceous groundcover is also significantly reduced, perhaps due to the weight of pine needles. Species able to tolerate these conditions include procession flower (*Polygala incarnata*), ground cherry (*Physalis angustifolia*), dollarleaf (*Rynchosia reniformis*), prickly pear (*Opuntia stricta*), and flatleaf flatsedge (*Cyperus planifolius*). Saw palmetto thrives under the cover of slash pine, forming mesic flatwoods characteristic of the nearby mainland. Why the mesic flatwoods habitat does not develop more fully as part of Cayo Costa's zonation sequence is a question that will require further research. This community is in excellent condition; and portions of it are in excellent condition. However, like some of the other communities on the islands, there are occasional roads and localized invasion of Brazilian pepper to be dealt with.

Coastal grassland. This community type has also been called an "overwash plain" and FNAI (1990) listed that name as a synonym of coastal grassland. Herwitz (1977) called it a savannah. Indeed one of the other synonyms which FNAI (1990) lists are "coastal savannah." At Cayo Costa, this community is savanna-like with open barren sand or a sparse to dense ground cover of grasses, prostrate vines, and other pioneer species that are adapted to harsh maritime conditions. As indicated above, this community intergrades with coastal berm and coastal strand in the park. Though rare in Florida, hairy gramma grass (*Bouteloua hirsuta*), is largely responsible for the savannah-like character of this community at the park. The coastal grassland at Cayo Costa State Park is located primarily on the wider parts of both Cayo Costa Island and North Captiva Island. Coastal grassland comprises the third largest natural community acreage in the park. Only maritime hammock and marine tidal swamp communities have more acreage.

Most of this community at Cayo Costa is in excellent condition. Limited areas have been degraded by roads and home building. These should be managed as outlined in the section of this plan dealing with restoration of disturbed or manipulated areas.

Shell mound. The shell mound community at Cayo Costa is in the form of middens left by pre-Columbian peoples. All of the shell mound sites in the park are on Cayo Costa Island. Old Ware Mound is composed of large shell fragments and reaches an elevation of about 15 feet. As it is not a “natural” community, shell mound is difficult to rate it in terms of its “original” condition. Besides a few grasses, this community supports mainly tropical hammock vegetation that is becoming increasingly rare outside of protected areas and it should be managed to safeguard this plant community. Rated in terms of its tropical hardwoods, it is in excellent condition except for very limited invasion by exotics. Considerable effort in 1998 has been devoted to the removal of the exotic, African bowstring hemp, at one of the sites.

Depression marsh. The examples of this community in the park differ from the typical FNAI natural community in both shape and origin. These linear (rather than circular) depression marshes were originally saline remnants of old coastal swale systems, but the continued leaching of salts from the substrates as the islands grew in width inevitably created more hydric conditions which promoted a transition to more freshwater plant species. Ultimately, the habitat became unfavorable for salt-tolerant plants and favorable for freshwater species. The transitional stage to freshwater conditions can be found in the unconsolidated substrate community immediately west of the salt barrens where freshwater elements are gradually usurping the area. Farther west across the islands, this community has become firmly established. This community at Cayo Costa State Park is in pristine condition.

Marine tidal marsh. This community is often associated with tidal flats and is normally the result of succession from that stage. The associations of salt-tolerant plants characterizing these areas of the islands arise in of one three ways:

Taking much the same form as the natural levee among mangroves, large quantities of sediment are deposited by storms crossing Pine Island Sound. Such deposits usually alter the substrate completely, killing the mangroves and eliminating the upper canopy. If the sediments are spread thin, contact with saline conditions is maintained and the low-growing, salt-tolerant plants invade the open area left populated by leafless trunks and branches of mangroves. This particular sequence has occurred on the interior of North Banks, Platt Wing and the northeast shore of Primo Point. (These geographical locations are mapped in Herwitz (1977), pg. 11.] In a few instances, exposure of the remnant mangrove trunks to unshaded conditions has led to the establishment of a variety of bromeliads, including wildpines (*Tillandsia balbisiana*), (*T. paucifolia*), (*T. flexuosa*), (*T. utriculata*), (*T. recurvata*), and (*T. usneoides*).

In certain Gulf side localities with poorly developed foredunes, swales are often flooded by waves to create saline conditions attractive to salt marsh species.

An inland tidal pool may lose connection with the tidal flow because of mangrove proliferation or bayside sedimentation. In the early stage of development, the area becomes increasingly saline as salts are concentrated by percolation and evaporation. Given sufficient quantities of rain, these salts are slowly diluted and leached from the soil, thereby making these “salt barrens” hospitable to vegetation. Since the low-growing plants are able to out-complete the mangroves, a salt marsh community follows. The salt marshes are dominated either by saltwort or sea oxeyes, except on the east side of Padilla Marsh where saltgrass (*Distichlis spicata*) and coastal dropseed

(*Sporobolus virginicus*) form what is generally termed a “salt meadow”.

Marine tidal swamp. The marine tidal swamp has the second largest natural community acreage after maritime hammock. Except for the upper, eastern part of North Captiva Island, most of the acreage of this community is on Cayo Costa and Punta Blanca. In fact, Punta Blanca is principally a mangrove island. Red mangroves are characteristic of the bayside land-water interface, and the edges of most of the island’s tidal channels and pools such as the Primo Point tidal pool complex and Murdock Lagoon. Since the bayside fringe of red mangroves (*Rhizophora mangle*) is usually in standing water, the island proper really begins with a sandy ridge deposited by daily tide and wave activity among the red mangrove’s prop roots. Inland from this slightly elevated “levee,” there is a mixed association of the three mangroves -- red, white (*Laguncularia racemosa*) and black (*Avicennia germinans*). Sometimes, on the natural levees and further inland on sandier substrates, buttonwood (*Conocarpus erectus*) and occasional individual of saltwort (*Batis maritima*), Christmas berry (*Lycium carolinianum*), or glasswort (*Salicornia virginica*) become established. Extensive solid stands of black mangroves in the area of North Banks and Pejuan Wing reflect increased saline conditions, indicating isolation from regular tidal flooding. The only part of the islands where the mangroves reach the Gulf is west of Murdock Lagoon. This odd situation is the result of secondary exposure, via erosion, and not an invasion of mangroves into the shoreline habitat. Most of this community remains in excellent condition. A small number of canals and spoil banks have degraded localized areas.

Marine unconsolidated substrate. This term actually describes two different natural communities, one mainly along the Gulf shore and the other on the bay side of the islands.

On the Gulf side of the island, the community is commonly called a beach [which is the first synonym listed by FNAI (1990) for this natural community type]. It is made up of unconsolidated and unstable grains of sand, having a configuration that changes seasonally and from year to year. As a habitat, it can be classified as three zones: sub tidal, intertidal, and supratidal, with sub tidal being the zone that is always submerged, intertidal being the zone between low tide and high tide, and supratidal is the zone between high tide and the beach dune community. Each zone is associated with a characteristic suite of organisms.

On the bay side of the islands, the community is commonly called a mudflat [another FNAI (1990) synonym]. These flats are above the surface of the water at low tide. They support numerous organisms that comprise a rich source of food for several species of birds. Both forms of marine unconsolidated substrate are in excellent condition.

Ruderal. This term is used to describe areas within the park that were previously or are presently impacted by invasive exotic plants species or other temporary impacts, such as dredge spoil. These are discrete areas and the main stand of Australian pines that once occupied the camping and tent area either were felled by the hurricanes or were removed as part of the cleanup effort. Small spoil areas at the bayside shop compound and adjacent to the two canals south of Pelican Bay were placed prior to 1965 and now support mature mangrove stands.

Designated Species

Designated species are those that are listed by the Florida Natural Areas Inventory (FNAI), U.S. Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FFWCC), and the Florida Department of Agriculture and Consumer Services (FDA) as endangered, threatened or of special concern. Addendum 5 contains a list of the designated species and their designated status for this park. Management measures will be addressed later in this plan.

Cayo Costa and North Captiva Islands contain no known species unique or endemic to the islands. A number of species however are listed as endangered, threatened or of special concern by one or more state or federal regulatory agencies

Special Natural Features

As indicated in the above sections, the entire park is an exceptional natural resource. Few barrier islands remain in Florida that has as little disturbance as those in the park. Of particular interest are the listed species, such as bald eagles, manatees and marine turtles. Also significant are the pre-Columbian mounds.

Cultural Resources

Evaluating the condition of cultural resources is accomplished using a three part evaluative scale, expressed as good, fair, and poor. These terms describe the present state of affairs, rather than comparing what exists against the ideal, a newly constructed component. 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 judgment is cause for concern. Poor describe 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 to reestablish physical stability.

According to the Florida Master Site File (FMSF), the present boundaries of Cayo Costa State Park partially or entirely encompass sixteen recorded cultural resources. Fourteen of these recorded sites lie on Cayo Costa Island and two lie on North Captiva Island; there are no recorded sites located on the park's holdings on Punta Blanca Island or Pine Island.

Prehistoric

Cayo Costa State Park contains six recorded prehistoric sites, five on Cayo Costa Island and one on North Captiva Island, including one large shell mound, one shell works and four shell middens. One of these sites, Mark Pardo Shellworks (8LL1606), was listed on the National Register of Historic Places (NRHP) in 1996. Very little is known about these sites or the prehistoric peoples that occupied these islands. All six sites were recorded based on surface inspection alone, and no additional investigation has been conducted. Consequently, the sites' dimensions, composition, cultural affiliation, and date of construction and use, remain largely unknown. Mark Pardo Shellworks is the exception, as it received scrutiny that is more intensive prior to its nomination to NRHP, resulting in a more detailed description of its components and an initial cultural period designation.

Located on coastal islands in Charlotte Harbor, Cayo Costa State Park's aboriginal cultural resources lie within the Caloosahatchee Region, as described in the "Archaeological Resources of Caloosahatchee Region" Multiple Properties NRHP Registration Form. This region, centered on the estuarine systems of Charlotte Harbor and encompassing Lee and Charlotte Counties, has supported human populations from the Paleo-Indian period (circa 11,500 B.C.) to the present. The majority of the region's recorded aboriginal sites are coastal shell middens that have been ascribed to the Caloosahatchee Culture, 500 B.C. to A.D. 1750. The Caloosahatchee and the historic period Calusa peoples are believed to have been large, sedentary, coastal-dwelling populations with complex societies that exploited the rich diversity of marine and estuarine resources. Interior sites are fewer, have received less archaeological attention and consequently are less well understood. Cayo Costa State Park's three types of recorded prehistoric sites

(midden, mound and shell work) fit the site type models for the Caloosahatchee Region as described by Austin (1987).

Old Ware Mound (8LL86): Shell mound and associated borrow pits, unknown cultural affiliation and temporal period, Cayo Costa Island. The mound is extensively vegetated by mature gumbo-limbo, cactus, agave, yucca and buttonwood. The site is difficult to locate, and not presently interpreted or incorporated into a park trail system. This site is presently in FAIR condition. The mound exhibits the predictable deterioration caused by slumping, erosion, weathering, animal activity, intrusive vegetation and pot hunting in the distant past.

Clark #1 (8LL702): Shell midden, unknown cultural affiliation and temporal period, Cayo Costa Island. The present condition of this site is unknown. The site was not visited during the 1998 or 2003 Cultural Resource Management Evaluations. The last documented condition assessment dates to 1983 when the site was recorded, at which time it was reported as relatively undisturbed.

Clark #2 (8LL703): Shell midden, unknown cultural affiliation and temporal period, Cayo Costa Island. The midden is approximately 1.5 meters deep. The present condition of this site is unknown. The site was not visited during the 1998 or 2003 Cultural Resource Management Evaluations. The last documented condition assessment dates to 1983 when the site was recorded, at which time it was reported as relatively undisturbed.

Clark #3 (8LL704): Shell midden, unknown cultural affiliation and temporal period, Cayo Costa Island. The site consists of several linear shell ridges that cover an estimated area of 2000 meters north south by 40 meters east- west. This prehistoric site lies underneath two historic town sites, the Padilla Settlement (8LL701) and Burrough's Ranch (8LL1494). The site is presently in FAIR condition. It is bisected by an old county road and infested with several exotic plant species, including periwinkle and lead tree. Park staff is presently targeting this area for exotic removal. Vehicular traffic, root intrusion and ground disturbance associated with exotic removal pose threats to the site.

Foster Bay Midden (8LL733): Shell midden, unknown cultural affiliation and temporal period, North Captiva Island. The midden covers an elongated area that stretches over several small, noncontiguous park holdings on North Captiva Island. The present condition of this site is unknown. The site was not visited during the 2003 Cultural RME site visit. The last documented condition assessment dates to 1987 when the site was recorded, at which time it was reported disturbed by trenching for underground utilities and erosion.

Mark Pardo Shellworks (8LL1606 NR): Shell works and midden, Caloosahatchee IIA – IV (A.D. 500 – 1500), Cayo Costa Island. The site is bounded by the high-tide mark to the west, south, and east, and new residential construction to the north. This site is composed of two distinct components –linear shell deposits that parallel the shoreline in and adjacent to the black mangrove forest, and black dirt shell midden just inland from the shell works. The shell deposits, which primarily contain large lightening whelk and some horse conch, range up to 1.5 meters above the ground and cover an estimated thirty acres. The midden contains rich black dirt indicative of a living area, and a variety of shells including oyster, clam, conch, and lightening whelk. Further research is needed to determine how the two different site components are related to each other –they may represent two different occupation periods and environmental episodes, or two different activity areas from the same occupation period. Hypotheses include that the shell works represent a protective seawall, or the remains of a shellfish harvesting and shell tool

production area. A third site component may exist beneath the submerged sediments in the black mangrove forest, an area that may have been occupied when sea levels were lower. The site was listed on the National Register of Historic Places in 1996 because of its outstanding preservation, abundance of ecofacts and artifacts, and potential to yield information about Paleo-environments and Caloosahatchee habitation sites on southwest Florida's barrier islands. According to the site's 1992 NRHP Registration Sheet, the site exhibited "outstanding integrity, and is one of the best preserved archeological sites in the region." The site is presently in POOR condition. Over the last decade, feral hogs rooting in and traveling through the area have caused extensive subsurface damage to the site's shell and midden deposits. Immediate action to curtail hog activity in the area is required to protect the site's remaining integrity. Erosion, exotic vegetation, vandalism and looting, and residential development on privately owned out-parcels just to the north also threaten the site.

Historic

Cayo Costa State Park contains ten recorded historic sites, nine on Cayo Costa Island and one on North Captiva Island, including two cemeteries, a homestead, remnants of two fishing villages, and three U.S. military and maritime-related sites. Six sites were recorded based on surface inspection alone, while three sites were identified during the underwater survey conducted by DHR archaeologists. None of the sites have been mapped or documented in detail, and very little archaeological testing has been done. While various historical documents, regional and local histories and oral history interviews provide a cultural context for these sites, specific site histories have yet to be compiled, and the sites' dimensions and composition have yet to be determined.

A number of different historic cultural groups inhabited and used Charlotte Harbor and its coastal islands, often simultaneously, attracted by ancestral ties, rich natural resources, deep-water passages and anchorages, isolation, and proximity to Cuba and the Caribbean. When the Spanish arrived in Charlotte Harbor in the 16th century, the area was occupied the native Calusa people until its remnant population departed from their homeland for Cuba in the mid-18th century. While Spain's colonial efforts were focused in northern La Florida and the Caribbean, Spaniards used Charlotte Harbor as an intermediary rendezvous point and trading conduit between its colonies. By the mid-18th century, Spaniards from Cuba and the Canary Islands began to establish fishing ranchos on the coastal islands, and by the 1830s so did European-Americans. The U.S. acquired Florida in 1821, and in 1848 shortly after statehood, the U.S. military declared the northern end of Cayo Costa Island and the southern end of nearby Gasparilla Island a military reservation. Rumored accounts that renegade Seminole Indians, armed runaway slaves, pirates, smugglers, and Confederate blockade-runners were occupants of Cayo Costa repeatedly drew the attention of the U.S. military. By the early 20th century, Cayo Costa Island hosted a quarantine station/marine hospital, three pilots' houses, a post office, a dock, and at least two fishing villages –the Spanish Padilla Settlement and Burrough's Ranch, both founded before the Civil War. As the result of modern developments such as new industries, improved transportation, increased real estate value, school redistricting, and state acquisition, much of Cayo Costa Island is now a state park, while numerous out parcels are being developed as privately owned retreats.

Pioneer Cemetery (8LL699): Historic cemetery, early 20th century, Cayo Costa Island. This site contains shell-bordered graves surrounded by a wooden fence. This site is presently in FAIR condition. The tombstones exhibit joint discoloration and deterioration caused by moisture, fungi and microorganisms. The 1999 Cultural Resource Management Evaluation report recommended masonry repair and graffiti removal; the extent of preservation work completed is unknown.

Quarantine Station (8LL700 A): Historic military site, early 20th century, Cayo Costa Island. This site is the former location of a U.S. military quarantine station and three ship pilohouses. The quarantine station was relocated to Cayo Costa Island from Gasparilla Island in 1904 and in operation until 1925. The site consists of masonry building material scattered over approximately two acres. A submerged brick concentration located by DHR archaeologists Dunbar and Gore in 1992 may be the remnants of the middle of the three pilohouses. This site is presently in POOR condition, exhibiting the predictable extreme deterioration given its location on a shoreline heavily impacted by boat wakes and the dynamic process of erosion and redeposition naturally experienced by barrier islands.

Pilot's Quarantine Station Dock (8LL700B): Historic structure, early 20th century, Cayo Costa Island. This site is the former location of a large dock associated with a U.S. military quarantine station, circa 1900-1925. The site consists of at least four submerged wooden dock pilings, approximately 12 to 14 inches in diameters, which extend from the shoreline into the deep-water channel. The present condition of this site is unknown. This submerged site was not observed during the 2003 Cultural Resource Management Evaluation site visit. The last documented condition assessment dates to 1992 when the site was recorded, at which time the wooden pilings were in a deteriorated condition due to erosion caused by bioturbation, marine organisms, and tidal activity.

Sand Dollar Wreck (8LL700C): Historic shipwreck, late 19th century, Cayo Costa Island. The submerged ship remains have been tentatively identified as a wrecked or scuttled large, wooden, barge-like vessel. The majority of the structure may still be intact and preserved beneath the sandy sediment. Diagnostic structural features suggest a ship construction date between 1870 and 1890 and a vessel size of approximately 51 feet long x 27 feet 8 inches wide. The present condition of this site is unknown. This submerged site was not observed during the 2003 Cultural Resource Management Evaluation site visit. The last documented condition assessment dates to 1992 when the site was recorded, at which time it was disturbed and threatened by erosion and unauthorized looting.

Scattered Historic Refuse (8LL700D): Historic refuse, late 18th – early 20th century, Cayo Costa Island. This site consists of submerged historic refuse scattered over approximately 1.5 acres, located near the Quarantine Station Dock and Sand Dollar Wreck. The majority of the artifacts are glass fragments that date to 1880 – 1920, and a small number of antebellum glass and iron objects and a concentration of bricks possibly associated with the 20th century ship pilohouses. The present condition of this site is unknown. This submerged site was not observed during the 2003 Cultural Resource Management Evaluation site visit. The last documented condition assessment dates to 1992 when the site was recorded, at which time it was disturbed by erosion and bioturbation and threatened by deterioration and vandalism.

Padilla Settlement (8LL701): Historic settlement, 19th century, Cayo Costa Island. This site is the former location of a Spanish fishing village that was founded by Tariva “Pappy” Padilla, previously of the Canary Islands, before the Civil War. The Padilla family and other Spanish fisher folk lived in wood plank and palmetto thatch houses on the northern end of the island until the U.S. military classified them as squatters and forced them to relocate to the middle of the island. The site consists of miscellaneous artifacts and structural remains, and overlies the prehistoric shell midden Clark #3 (8LL704). The site is presently in FAIR condition. It is bisected by an old county road and infested with several exotic plant species, including periwinkle and lead tree. Park staff is presently targeting this area for exotic removal. Vehicular traffic, root intrusion and ground disturbance associated with exotic removal pose threats to the

site.

Foster Bay Homestead (8LL734): Historic house site, early 20th century, North Captiva Island. This site consists of the structural remains of an early 20th century house and dock. The present condition of this site is unknown. The site was not visited during the 2003 Cultural RME site visit. The last documented condition assessment dates to 1987 when the site was recorded, at which time no threats but major disturbance to the site were reported.

Padilla Cemetery (8LL1493): Historic cemetery, late 19th- early 20th century, Cayo Costa Island. This cemetery is associated with the Padilla Settlement (8LL701). The site contains the graves of Tariva “Pappy” Padilla, his wife and at least one child, plus an estimated 30 Cuban fishermen who died in a 1910 hurricane. The site has two distinct ledges, is covered with limestone rocks and is vegetated by gumbo-limbo, cabbage palm, sea grape, stopper and century plant. The present condition of this site is unknown. The site was not visited during the 2003 Cultural RME site visit. The last documented condition assessment dates to 1992 when the site was recorded, at which time the site was reported as not disturbed but threatened by erosion and vandalism.

Burroughs Ranch (8LL1494): Historic town site, mid-19th century, Cayo Costa Island. This site is the former location of a fishing rancho established in 1859, depicted on a mid-19th century map as containing two medium and four small-sized buildings. The site measures approximately 85 meters north south by 40 meters east west, and lies on top of the prehistoric midden Clark #3 (8LL704). The present condition of this site is unknown. The site was not visited during the 2003 Cultural RME site visit. The last documented condition assessment dates to 1992 when the site was recorded, at which time the site was reported as not disturbed but threatened by vandalism.

No Name (8LL1413): Isolated find, unknown cultural affiliation or temporal period, Cayo Costa Island. A map from an unknown source, included in the Faulkner Mound (8LL87) site file, shows the location of a mound with impoundments near the recorded location of this site. The present condition of this site is unknown. The site was not visited during the 2003 Cultural RME site visit, and its condition was not reported when the site was recorded by a local informant in 1988.

RESOURCE MANAGEMENT PROGRAM

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 Division’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 early successional communities such as sand pine scrub and coastal strand.

During the development of this plan, an analysis was made regarding the feasibility of timber management activities for Cayo Costa State Park. It was then determined that the primary management objectives of the park could be met without conducting timber management

activities for this management plan cycle. Timber management will be reevaluated during the next revision of this management plan.

Additional Considerations

An additional special management consideration concerns the newly acquired acreages on North Captiva Island and Cayo Costa. The new acquisitions need biological surveys in order to assess the best management practices for these properties.

The hurricane season of 2004 was one of the worst ever recorded for this region. Hurricane Charley, a category four storm, made landfall on Cayo Costa just south of Murdock Bayou. Winds gusts in excess of 180mph and sustained winds of 145mph buffeted the island and adjacent areas during its advance. Areas to the south and east of the storm center sustained major wind damage, including toppled trees, damaged structures and major erosion. The southern half of Cayo Costa and North Captiva were overwashed by storm surge. The narrow beach at the center of North Captiva (described by Morrill and Harvey (1980) as Overwash Pass) was breached and a new pass approximately 800 feet wide was created. Although the storm surge was predicted to be much worse, the north half of Cayo Costa was spared extensive flooding, primarily because the dune system was in tact and not breached. Hurricanes Frances, Jeane and Ivan also contributed to erosion and some additional wind damage to the beach and shoreline vegetation.

In the storms' aftermath, native vegetation, wildlife and shoreline changes should be researched and monitored. It is anticipated that the loss of native vegetation may accelerate the advances of invasive, exotic plant species. Although it may be too soon to predict the long term impact to wildlife species, the 2004 data indicate that more than 50% of the marine turtle nests on Cayo Costa were lost and all were lost on North Captiva. Bald eagles and colonial water birds will also be impacted due to the loss of suitable nesting trees that were felled and/or stripped of their leaves. Mangroves and pine trees were especially hard hit and many are dying, post storm, because of desiccation, insect attacks and disease. Accelerated erosion will also impact future shorebird and marine turtle nesting.

Management Needs and Problems

Cayo Costa is a relatively large, relatively undisturbed barrier island. As such, it is a living laboratory for the study of barrier island dynamics and biodiversity. The broad resource management thrust is to protect and maintain this aspect of the island for scientific study and for education, in addition to its value as a base for outdoor recreation. The most fundamental impediment to this goal is the amount of privately owned land on the island available for the construction of homes, several of which have been built in recent years. More attention is now being given to acquiring these inholdings, but much remains to be done if Cayo Costa Island is not to be a partially developed state park. There are currently 23 residences on the island. Some property owners are apparently unwilling to sell at prices the state is willing to pay. Creative acquisition methods involving private conservation organizations may have to be explored. The greatest problem, and the greatest need, is acquiring the remaining inholdings.

The second problem and need is to eliminate exotic organism from park lands. Invasive, exotic plant species of greatest concern are Australian pines, Brazilian peppers, laurel figs (*Ficus microcarpa*), and beach napauka (*Scaevola taccada* var. *sericea*). Great strides have been made since the previous resource management component was promulgated in 1986. Eighty percent of Australian pines are gone and significant inroads in the Brazilian pepper infestation have been made. Continued progress at this rate of removal might eliminate these two species in the next five to ten years. The feral hog population on Cayo Costa Island should be eliminated. The

animals are highly destructive, damaging plant communities, foraging upon native plants and wildlife, including endangered and threatened species. They have also damaged several archaeological sites, as well as buildings and other infrastructure and present a serious health and safety issue for park staff and visitors. The Division will coordinate with the Florida Fish and Wildlife Conservation Commission, private trappers and researchers regarding intensive methods of removal.

Other resource management needs and problems involve monitoring and protecting manatees, bald eagles, marine turtles, shore birds and cultural sites. The oversight of marine turtles and shore birds is well in hand.

Erosion poses a threat to many of the archaeological sites located in Cayo Costa State Park. The terrestrial and submerged sites located along the northeastern edge of Cayo Costa Island are adversely impacted by receding shorelines, tidal activity, bioturbation and sediment deposition caused by boat wakes and the dynamic process of barrier island formation. Sites located elsewhere along Cayo Costa and North Captiva Islands' shoreline are also affected by daily tidal influxes and changing sea levels. The park's shell and earthen mound sites are gradually eroding from the effects of wind and water, uprooted trees, unauthorized digging, animal activity, and vegetation.

Vegetation poses a threat to the parks' shell and earthen structures in the form of intrusive root growth, tree falls and exotic infestation that can damage subsurface integrity and exacerbate erosion problems. Several of the known mounds now support unique tropical hardwood hammocks that should be safeguarded from invasion and spread of exotic species. In general, however, vegetation grows unchecked on these cultural sites. Vegetation also poses a threat to the masonry grave markers in the parks' cemeteries in the form of fungus and algae that discolor the stone, trap moisture, and provide an attractive environment for small organisms.

Feral hogs pose a serious threat to all subsurface archaeological resources on Cayo Costa Island. The ground disturbance caused by their hooves and rooting activity, particularly in the southern part of the island, can damage artifacts, provenience and stratigraphy at archaeological sites. Feral hogs have caused extensive damage to the National Register site Mark Pardo Shellworks.

Unauthorized human activity poses a threat to the park's cultural resources in the form of vandalism, artifact collecting, and digging. In the past, cemetery gravestones have been defaced by graffiti, mounds have been potholed and an illegal excavation discovered.

Management Objectives

The resources administered by the Division are divided into two principal categories: natural resources and cultural resources. The Division primary objective in natural resource management is to maintain and restore, to the extent possible, to the conditions that existed before the ecological disruptions caused by man. The objective for managing cultural resources is to protect these resources from human-related and natural threats. This will arrest deterioration and help preserve the cultural resources for future generations to enjoy.

The broad purpose of resource management at Cayo Costa State Park is to maintain the dynamic, undisturbed character of these barrier islands. To that end, completing the acquisition of private holdings is the single most important goal. Natural communities altered by man will be restored. Invasive exotic plants and feral hogs will be eliminated. Prescribed burning will be continued at appropriate sites. In addition, Cayo Costa Island has significant cultural resources that must be protected in perpetuity.

Management Measures for Natural Resources

Hydrology

Ground water. There is a freshwater lens below the surface of these islands, but its capability to supply water to facilities over a long term is unknown, as is its effect on the surface water systems.

Surface water. Bodies of surface water in the park are seasonal and essentially unaffected by human activities. They should remain that way.

Prescribed Burning

The objectives of prescribed burning are to create those conditions that are most natural for a particular community, and to maintain ecological diversity within the unit's natural communities. To meet these objectives, the park is partitioned into burn zones, and burn prescriptions are implemented for each zone. The park burn plan is updated annually to meet current conditions. All prescribed burns are conducted with authorization from the Department of Agriculture and Consumer Services, Division of Forestry (DOF). Wildfire suppression activities will be coordinated between the Division and the DOF.

On Cayo Costa Island, it has been suggested (Herwitz, 1977) that the one fire-type natural community--the mesic flatwoods-- is an artifact of human burning during historic time. Whatever the fact might be, management will maintain three mesic flatwoods sites by a program of periodic burning.

Designated Species Protection

The welfare of designated species is an important concern of the Division. In many cases, these species will benefit most from proper management of their natural communities. At times, however, additional management measures are needed because of the poor condition of some communities, or because of unusual circumstances that aggravate the particular problems of a species. The Division will consult and coordinate with appropriate federal, state and local agencies for management of designated species.

No special management measures are required except for the following species:

Loggerhead turtles. During the summer, park staff will take part in the statewide program for nesting sea turtles. This will involve patrolling each morning during the summer and recording nesting data. If raccoon predation on turtle nests becomes excessive, management will consider trapping or other methods of eliminating problem raccoons.

Bald eagles. The number of eagle nests in the park will vary over time. Eagle nests will be located and checked annually to record nesting results.

Nesting shore birds. Generally, nesting sites will be identified each year and protected against trespass by all appropriate measures. The park manager and district biologist will monitor and report nesting results annually.

Specifically, southeastern snowy plover, Wilson' plover, least tern and black skimmer seasonal nesting habitat shall be monitored and appropriate measures shall be taken to ensure the protection and maintenance of the nesting habitat for these species. Management activities will include installation of appropriate signs to prohibit access, and use of other measures such as

posts, high visibility string, tape, or line to prevent access to bird nesting areas before and throughout seasonal nesting activities, in accordance with Division Resource Management Procedures Numbers 3 and 13.

All of the above species and the piping plover also tend to congregate in certain locations and use them for resting. Resting areas shall be monitored to determine levels of disturbance. If major disturbances are occurring, similar actions may be taken to limit the disturbances. In addition to the above actions, park visitors will be informed about sensitive bird habitats through interpretative handouts and programs.

Finally, in order to operate an effective shorebird protection program, it is essential to control both feral and domestic hogs, cats and dogs in accordance with Division Resource Management Policy Number 1 and DEP Program Directive 930. Local pet ordinances shall be enforced and educational programs with nearby neighbors will be implemented.

West Indian manatees. Lee County is considered one of the most important counties for manatees on the west coast of Florida due to the large expanses of warm, shallow water that contains sea grass, the presence of warm water refugia, and ready access to freshwater resources. The largest number of animals is found in Lee County during the winter months. Over 300 manatees may be seen at the Florida Power and Light warm water outfall in the Orange River on the coldest days. While high numbers of manatees are found during the winter months, these slow moving mammals may be found in Lee County during all months of the year. Lee County waters also host a large number of manatees that travel south and north, to and from the waters of southern Collier County and the Everglades.

Manatees extensively use the sea grass beds, tidal creeks, canals and marine basins in Pine Island Sound, Matlacha Pass and San Carlos Bay. Manatee use in Pine Island Sound is generally concentrated in the southern half of the water body due to its proximity to the mouth of the Caloosahatchee River, Matlacha Pass and Estero Bay. However, animals may frequently move north along the bayside coasts of the barrier islands such as Sanibel, Captiva, Northern Captiva and Cayo Costa. Manatee “hot spots” in and around Cayo Costa State Park include Pelican Bay on Cayo Costa and Safety Harbor on Northern Captiva. During the past two summers, the park manager has observed six to eight manatees in the waters of Hook’s Canal where they can nearly always be found.

Lee County is presently working with the Florida Department of Environmental Protection (FDEP) to complete a comprehensive Manatee Protection Plan (MPP). In addition, both county and state governments have passed some basic manatee protection speed zone rules in portions of the county including the Caloosahatchee River. A more comprehensive rule is in development and includes slow speed zones from April 1st – November 15th in Pelican Bay (between Cayo Costa and Punta Blanca Islands) as well as within Safety Harbor on North Captiva Island. These speed zones reflect the need for manatee protection during the warmer months of the year when manatees are more likely to be found along the barrier island chain. The area around Cayo Costa State Park is unregulated from November 15th – April 1st since manatees are more commonly found in other portions of the county during the colder months. A manatee awareness sign has been erected at the park boat dock.

Exotic Species Control

Plants. Exotic species are those plants or animals that are not native to Florida, but were introduced because of human-related activities. Exotics have fewer natural enemies and may have a higher survival rate than do native species, as well. They may also harbor diseases or

parasites that significantly affect non-resistant native species. Consequently, it is the strategy of the Division to remove exotic species from native natural communities.

Australian pines commonly occur on the Gulf side foredunes, and in certain bayside areas. They have been nearly eliminated from Cayo Costa Island, but still require attention on Punta Blanca and North Captiva.

The displacement of native vegetation by Brazilian pepper is not as dramatic or as rapid as that by Australian pine, but it is more difficult and time-consuming to eliminate and may require follow-up treatment. Great progress in removal has been made since 1986, on Cayo Costa Island, but continued pressure over the next few years will be needed to eliminate existing plants.

Brazilian pepper is widely distributed throughout Cayo Costa's overwash plain, shell mound, maritime hammock and ruderal habitats.

There are other exotic plants on the islands. These do not pose any immediate threat to the native biota, but they should be eliminated as time permits. The plants are listed in Addendum 4. Some of these plants occur in ruderal areas. These may be preserved for interpretive purposes or used to establish base line data.

Animals. The only exotic animals that pose a problem in Cayo Costa State Park are feral hogs. They were reportedly released on Cayo Costa Island in the 1800s by resident Cuban fisherman who apparently utilized them as a food source. The hogs were eliminated from the island at some undetermined time. In the 1980s, however, hogs were reintroduced by personnel at the former Lee County Park and have multiplied rapidly, feeding on small vertebrates and roots, including leather fern and prickly pear. In past years, contract trappings have been used. More recently, park staff have deployed additional traps and in one year removed 200 animals. Additional measures should be evaluated with the aim of complete removal.

An important resource management objective will be the complete elimination of feral hogs from Cayo Costa Island.

Problem Species

Problem species are defined as native species whose habits create specific management problems or concerns. Occasionally, problem species are also a designated species, such as alligators. The Division will consult and coordinate with appropriate federal, state and local agencies for management of designated species that are considered a threat or problem.

Raccoons are the only problem species. Certain individuals living near the beach learn to dig up turtle eggs during the summer. The offending individual must then be trapped and removed from the park.

Management Measures for Cultural Resources

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. Approval from Department of State, Division of Historical Resources (DHR) must be obtained before taking any actions, such as development or site improvements that could affect or disturb the cultural resources on state lands (see Addendum 7).

Cayo Costa State Park's recorded cultural resources include fourteen archaeological sites and two historic cemeteries. The goal of cultural resource management in the park is to preserve and protect the remaining integrity of these cultural sites, as well as sites that have not yet been identified. Cultural resource management is best accomplished through a program of routine site maintenance and monitoring, interpretation, and stabilization work or other protective measures as needed. In some instances, such as feral hog eradication, tropical hammock protection, and exotic plant removal, cultural and natural resource management overlap and can be conducted in concert. Ideally, Cayo Costa State Park will develop a written cultural resource management plan that specifies in detail what maintenance, monitoring tasks are needed, and how frequently they should be performed, with provisions for adequate staff time and training in order to implement it. In the meanwhile, the park should conduct stewardship activities on a regular basis in compliance with Division of Recreation and Parks policies and guidelines, Florida Statutes Chapter 267 compliance requirements, and the Secretary of the Interior's standards and guidelines. The Bureau of Natural and Cultural Resources (BNCR) have issued guidelines to assist parks with preservation treatment of several types of cultural resources, and BNCR staff is available for consultation. All cultural resource management plans and actions should be documented and retained in permanent files.

The park's archaeological sites should be managed in situ, meaning that associated cultural artifacts, features, stratigraphy, landscape elements and their provenience should be preserved and protected in place. Park staff should monitor all of the park's archaeological sites on a regular basis in order to evaluate and document the condition of the site, identify actual and potential threats, and make needed maintenance adjustments or develop treatment plans. Site monitoring should consist of regular site visits, accompanied by written narrative and photographic documentation of the condition of the site. The frequency of monitoring visits will depend on the number and type of threats and the extent of their effect. Park staff should particularly visit and document the condition of those sites that were not visited during either the 1998 or 2003 Cultural Resource Management Evaluation site inspections, including Clark #1, Clark #2, Foster Bay Midden, Foster Bay Homestead, Padilla Cemetery, and Burroughs Ranch. Park staff should also document the damage caused by feral hogs to Mark Pardo Shellworks, and monitor its condition closely. Ideally, Cayo Costa State Park will compile a detailed, up-to-date description and condition assessment of each cultural resource to use as a baseline when evaluating the rapidity and seriousness of site deterioration.

All six of the park's recorded prehistoric sites are earthen structures, including shell and earthen mounds, shell middens, and linear shell features. Unchecked erosion and intrusive vegetation cause gradual site degradation that can seriously affect a site's integrity over the long run. The park should manage the earthen structures on a regular basis according to BNCR's guidelines *Earthen Structures*. Exotic removal in and around known sites should be conducted with minimal impact to the subsurface, and artifacts encountered during the process should be documented in narrative text and photographs. Feral hogs present an immediate and serious threat to the Mark Pardo Shellworks, and a potential threat to other sites located in the southern portion of Cayo Costa Island. Immediate measures should be taken to preserve the Mark Pardo Shellworks' remaining integrity, including continued eradication of feral hogs and consideration of protective fencing or some other form of site security, in consultation with cultural resource specialists.

The park's ten historic sites consist of two cemeteries and eight archaeological sites. The park should manage the cemeteries on a regular basis according to BNCR's guidelines *Cemeteries, Gravesites and Graves* to protect these burials and grave markers from the adverse impacts of

vegetation, animals, vandalism, and prescribed burns. The four sites located in or adjacent to the northeastern shoreline of Cayo Costa are seriously threatened by erosion and sediment redeposition. The adverse impact of these natural processes to the three submerged sites –Pilot’s Quarantine Station Dock, Sand Dollar Wreck and Scattered Historic Refuse, is difficult to determine and mitigate. The nearby land site Quarantine Station is partially inundated due to shoreline recession. Park staff should document site deterioration on a regular basis and make a deliberate decision on how to handle site preservation, versus inadvertently losing the site to erosion through inaction. Unmanaged vegetation can cause gradual site degradation to the two 19th century settlements and early 20th century homestead that can seriously impact site integrity over the long run. Park staff should remove exotics and other intrusive vegetation in and around these sites using methods that cause the least subsurface damage, and significant exotics associated with the historic sites should be identified and retained.

Park staff should conduct routine maintenance and operations, natural resource management, preservation work, and development/improvement projects in a manner that avoids or minimizes adverse impact to archaeological and historical sites. Prior to conducting ground-disturbing activity, park management must consult the DHR/DRP Compliance Review Matrix to determine whether DHR Request for Comment is required given the project’s nature. If the matrix indicates that the project should be submitted to DHR, or if there is uncertainty, the Project Manager should submit project documentation, including proposed location, extent and type of associated ground disturbance, to DHR as soon as possible in the planning process. If the matrix indicates that DHR Compliance Review is not required, Park Management must still determine whether a certified archaeological monitor is required to monitor the project. Compliance review and archaeological monitoring are critical components of cultural resource management in the park service. Follow through is just as critical. Archaeological monitors must document the results of the monitoring, consult with DHR as needed throughout the duration of the project and halt the project to protect archaeological resources if necessary. Park Management must ensure that all paperwork, including maps and monitoring results, is submitted to DHR and a copy forwarded to BNCR.

Research Needs

Natural Resources

Any research or other activity that involves the collection of plant or animal species on park property requires a collecting permit from the Department of Environmental Protection. Additional permits from the Florida Fish and Wildlife Conservation Commission, the Department of Agriculture and Consumer Services, or the U.S. Fish and Wildlife Service may also be required.

The relatively undisturbed condition of Cayo Costa State Park makes it an ideal site from which to conduct scientific research into the natural processes and phenomena characteristic of a barrier island ecosystem. The management policy on research will be to solicit and encourage only those forms of research that will aid the preservation and interpretation of the natural and cultural resources of the park. Emphasis will be placed on attracting researchers who will generate information useful in 1) making future management decisions; 2) making coastal zone management decisions; 3) developing public education programs; 4) identifying and monitoring the impact of recreational activities on the park’s natural resources; and 5) increasing knowledge of barrier island systems and barrier island phenomena in general.

Cultural Resources

Cayo Costa State Park has never been comprehensively surveyed for cultural resources. To date,

archaeological investigations of the islands' cultural resources have consisted almost exclusively of one-day site visits consisting of limited surface inspection and collection of surface artifacts from select areas. The majority of the park's recorded cultural resources have been documented at the Florida Master Site File (FMSF) based on the limited information recovered during these brief site visits. Dunbar and Gore's precursory underwater excavation off the northeastern tip of Cayo Costa Island in 1992 is the exception, resulting in the identification of three additional submerged site components associated with a previously recorded site, the Quarantine Station (8LL700A – D). All of these inspections were conducted or initiated by state or county governmental entities in response to an act of vandalism, a request for a shipwreck exploration contract, and cyclical county planning needs for cultural sensitivity data. The Division of Recreation and Park's involvement in cultural resource survey needs has primarily been limited to submitting plans for proposed park improvements to DHR for Compliance Review before commencement of the project.

Research can shed light on the nature and significance of a cultural resource, provide useful information for cultural resource management efforts, and help us reconstruct human history and activity in the area from the distant past to the present time. Because only limited archaeological survey, surface inspection, artifact collection, and historical research has been conducted of the parks' cultural resources, we have an incomplete understanding of the location of historic and prehistoric sites, and the dimensions, composition, features, cultural affiliation, type of use, and date of occupation of recorded sites. Consequently, it is not always clear what exactly the park is protecting and managing nor the best way to do that, and challenging to interpret local history to the public. The park should pursue funding and support for an archaeological survey to locate additional sites and collect more field data on recorded sites in order to increase our understanding of the past and provide sound cultural resource management recommendations. The park should also pursue funding and support for additional historical research to include archival review and oral history interviews.

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 contained in Addendum 6. Cost estimates for conducting priority management activities are based on the most cost effective methods and recommendations currently available (see Addendum 6).

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 of the Internal Improvement Trust Fund (board) are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032, the board of trustees, acting through the Department of Environmental Protection (department). The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required update of its management plan.

Cayo Costa State Park was subject to a land management review on June 29, 2005 (see Addendum 7). The review team made the following determinations:

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

LAND USE COMPONENT

INTRODUCTION

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

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management, through public workshops, and environmental groups. With this approach, the Division 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.

Cayo Costa State Park is located within Lee County in one of the fastest growing regions of the state. The islands that comprise the park are part of the chain of barrier islands separating the Charlotte Harbor, Pine Island Sound, and San Carlos Bay estuaries from the Gulf of Mexico. While isolation from the mainland helps to buffer the park from many of the negative impacts associated with urbanization, threats to park resources and the visitor experience increase along with growth in the area. The populations of Lee and the adjacent Charlotte County have grown 34 percent since 1990, and are projected to grow an additional twenty percent by 2010. As of 2002, 15 percent of residents in these counties were in the 0-14 age group, 31 percent in the 15-44 age group, 26 percent in the 45-64 age group, and 27 percent were aged 65 and over. This distribution reflects median ages in Lee (45.2) and Charlotte (54.3) that are much higher than the state as a whole (38.7) (Bureau of Economic and Business Research (BEBR), University of Florida, 2002). Over 1.2 million people reside within 50 miles of the park, which includes the cities of Sarasota, Arcadia, Venice, North Port, Punta Gorda, Cape Coral, Fort Myers, Sanibel and Naples (U.S. Department of Commerce, 2000). The nearest of these urban areas, Cape Coral, is located on the mainland about nine miles east.

Access to the park is by water only via private boat or concession operated tour boat. As of 2001, there were 62,711 registered pleasure boats in Lee and Charlotte County, an increase of nearly 40 percent since 1993-94 (Florida Department of Highway Safety and Motor Vehicles, 2001). Visitation at the park has shown a general upward trend over the last ten years, varying

from a low of 47,674 in 1995-96 to a high of 58,206 in 2000-01. Consistent with statewide tourism trends, visitation at the park appears to be recovering from a noticeable dip in 2001-02, with 54,745 visitors recorded in 2002-03. By Division estimates, these visitors contributed over 1.7 million dollars in direct economic impact to the region's economy (Florida Department of Environmental Protection, 2003). The park is the second least visited of the barrier island satellite parks and one of the lesser visited in the Division District 4. A lack of road access keeps visitation modest.

Existing Use of Adjacent Lands

An island location provides some buffering from land uses with the potential to impact park resources or the visitor experience. The effect of land and water uses on water quality in Charlotte Harbor and Pine Island Sound is of primary concern. Point and nonpoint sources of pollution from the mainland and inputs from pleasure craft and commercial vessels are all related to the pattern of development in the area. The proper handling of human waste by boaters using adjacent waters, particularly Pine Island Sound, is an important issue for the park.

The southern portion of Gasparilla Island includes the community of Boca Grande, which is well urbanized with a mixture of commercial and residential uses, and Gasparilla Island State Park. Pine Island is less intensively developed with much of the land maintained as rural and supporting low density residential uses and commercial nursery operations. However, the core of Pine Island has an urban character with medium density residential land uses concentrated at the north and south ends. Condominiums and single-family homes are located adjacent to the Bokeelia Island parcel. Sanibel Island and South Captiva Islands contain a significant amount of medium density residential development. Many smaller islands within Pine Island Sound are uninhabited mangrove features with the exception of Useppa Island that has been developed for residential purposes.

In addition to the state park, and Lee County owned parcels, several private residences, cottages and undeveloped subdivision lots occupy the remainder of Cayo Costa Island. The northern third of North Captiva Island is in private ownership, with many homes occupying this area.

A number of significant land and water resources exist near the park. They include Cape Haze, Gasparilla Sound-Charlotte Harbor, Matlacha Pass, Pine Island Sound and Estero Bay Aquatic Preserves, Stump Pass Beach, Don Pedro Island, Gasparilla Island, Charlotte Harbor Preserve and Estero Bay Preserve State Parks, and J. N. "Ding" Darling, Pine Island, and Matlacha Pass National Wildlife Refuges. These public lands contribute to the protection of area waters, provide important wildlife habitat and enhance resource-based recreation opportunities for visitors to Cayo Costa State Park.

Planned Use of Adjacent Lands

While the Charlotte Harbor area continues to grow, no significant changes in land use are anticipated on Gasparilla Island, Captiva or Sanibel as these areas are nearly built out. Storm events in 2004 severely impacted coastal communities, particularly areas with structures built prior to the strengthening of building codes after Hurricane Andrew. Post storm redevelopment in areas like Pine Island may result in a transition of land use patterns toward higher-end residential uses with a shift in the socioeconomic makeup of residents. It is also anticipated that the undeveloped lots on Cayo Costa Island and North Captiva will eventually be improved with private homes.

Unlike North Captiva, Cayo Costa still has quite a few vacant parcels among the remaining

private holdings. At the writing of this plan, approximately 23 of the 172 remaining private parcels on Cayo Costa Island contain single-family homes. Private residences on island outparcels can complicate resource management responsibilities (burning and exotic plant and animal control, for example), park operations and impact the visual landscape for park visitors. The number of individual landowners (+140) and skyrocketing coastal real estate prices have complicated the land acquisition process. While progress has been slow, 22 parcels have been acquired since the plan was last updated in 1999. The Division is actively pursuing willing sellers to acquire remaining vacant lots and supports a coordinated effort involving Lee County and conservation organizations to improve the success of the acquisition process in the future.

A related issue involves landowner access to private holdings on Cayo Costa Island. As landowners move forward with constructing homes the Division will be faced with requests for easements to their property. Private parcels are scattered between two platted subdivisions on the island. Future easements for road access have the potential to fragment the park further and impact natural resources. As the acquisition process moves forward, consideration will be given to pursuing abandonment of existing public right-of-ways, and consolidating potential access routes to maintain private access in a manner that minimizes resource impacts. In addition, a number of unauthorized boat docks have been constructed on an existing canal on Primo Bay that provides private landowner access. The Division, in coordination with Lee County, is pursuing clarification of ownership boundaries adjacent to the canal to address the issue of private boat dock construction in this area.

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.

Cayo Costa State Park represents the largest tract of publicly-owned land along the Charlotte Harbor chain of barrier islands. The park supports an assemblage of plants, animals and other features exemplifying natural conditions on these barrier islands. Cayo Costa and North Captiva are narrow elongated islands with low, rolling topographic profiles and irregular configurations. The north-south orientation of the islands parallels the mainland of Lee County. Punta Blanca Island is a small mangrove-dominated island on the bay side of Cayo Costa Island.

The state park contains areas of exceptional natural beauty. White sand beaches, open coastal grasslands and shady maritime hammocks create a visually stunning mix. The park contains approximately 10 miles of Gulf shoreline. The high-energy Gulf beach along Cayo Costa and North Captiva Islands is the most popular natural feature of the park and the focal point for many of the available recreational activities, such as swimming, fishing, sunbathing and shell collecting. Except for the north and south ends of Cayo Costa Island, where currents can be strong, and in areas where severe shoreline erosion has occurred, the Gulf beaches provides

safe swimming conditions. An overstory of cabbage palms and live oaks found in the park's maritime hammock provides a scenic contrast to the Gulf shore and can be explored on trails via foot or bike. Coastal grasslands are as beautiful as they are unique and allow sweeping vistas of the beach and Gulf waters. The numerous and diverse natural communities of the park are especially attractive to visitors who appreciate nature and solitude. Wildlife viewing opportunities are excellent and focus on the abundant bird life associated with barrier islands.

The majority of park visitors arrive by private boat and take advantage of the park's sheltered waters. Pelican Harbor, between Cayo Costa Island and Punta Blanca, provides a refuge during prevailing winds and is a popular anchorage for boaters.

The park contains 16 recorded cultural sites associated with Calusa mound building, Spanish fishing ranchos, a late 19th century quarantine station and an early 20th century fishing community. Park cultural sites, described in more detail in the Resource Management Component, present unique opportunities for interpretation to park visitors.

Assessment of Use

All legal boundaries, structures, facilities, roads and trails existing in the unit are delineated on the Base Map. Specific uses made of the unit are briefly described in the following sections.

Past Uses

Prior to acquisition by the state, the north end of Cayo Costa was managed as a public park by Lee County. Development has been limited to portions of the former county park, vacation home sites, fish camps, and a few dirt roads, canals and spoils banks. The remainder of the park is virtually undisturbed.

Recreational Uses

The northern end of Cayo Costa Island is the focus of recreational activity for park visitors. This area provides the public opportunities for beach access, tent camping, rental cabins, fishing, picnicking, swimming, boating, and nature study. A number of jeep trails crisscross the interior lands of Cayo Costa. Portions of these trails have been incorporated into the park's trail network.

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.

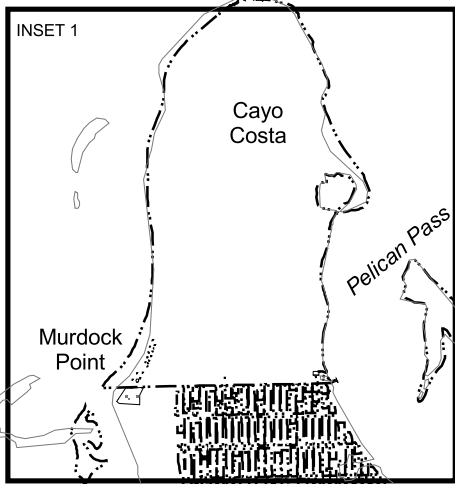
At Cayo Costa State Park, the beach dune, coastal berm, coastal strand, coastal grassland, maritime hammock, shell mound, depression marsh, marine tidal marsh, marine tidal swamp, marine unconsolidated substrate and known cultural resources have been designated as protected zones as delineated on the Conceptual Land Use Plan. Protected zones account for nearly 90 percent of total park acreage.

Existing Facilities

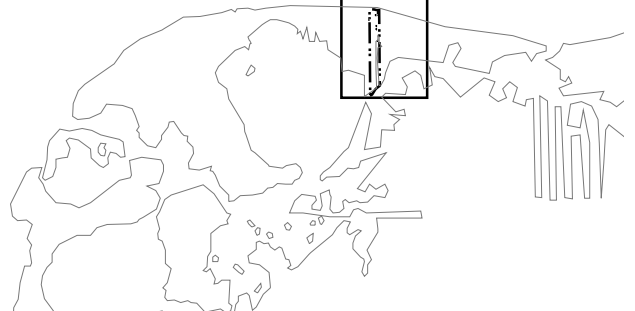
The primary public access point onto Cayo Costa Island is adjacent to Pelican Bay. This area contains public and service boat docks, restroom, combination office and visitor center and an

Boca Grande Pass

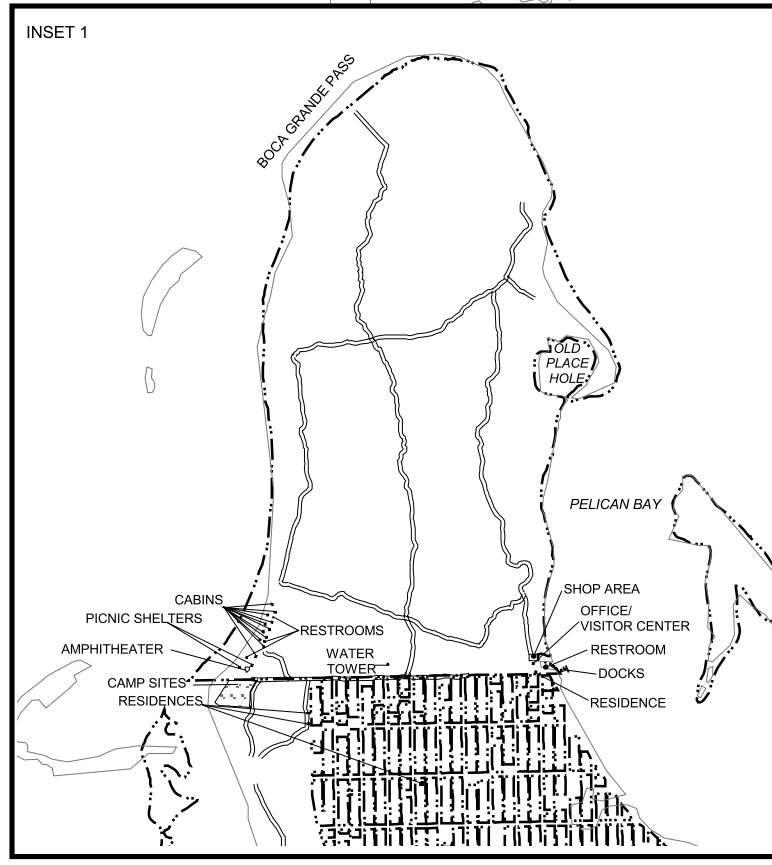
Charlotte Harbor



INSET 2

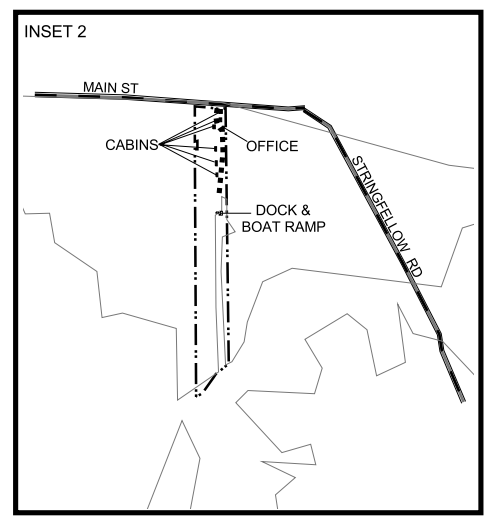


Pine Island Sound



Gulf of Mexico

Captiva Pass



South Bank

Redfish Pass

- LEGEND**
- Park Boundary
 - County Road
 - Park Road Unpaved
 - Shore Lines
 - Structures
 - Camp Sites
 - Marine Structures



Prepared by:
 Florida Department of Environmental Protection
 Division of Recreation and Parks
 Office of Park Planning

CAYO COSTA STATE PARK

BASE MAP

Assistant Park Manager's residence. The park shop area is located adjacent to this primary access point and includes a 3-bay and 2-bay pole barn, generator shed, and storage shed. A large diesel generator is located within the shop compound and provides electrical power to park facilities. A park operated tram route originates from this access area, and transports visitors approximately one mile to the western side fronting the Gulf of Mexico. Gulfside public facilities include 12 rustic cabins, three restroom facilities, two picnic shelters, amphitheater, and a tent camping area with 30 sites. Cayo Costa Island contains about five miles of trails for hiking and biking. Interpretive facilities include a series of interpretive panels at the Pelican Bay and Gulfside use areas that serve to orient visitors and provide information about barrier island natural resources. Fees are collected at two honor box stations located on the bay and Gulf sides of the island. Many park facilities, such as cabins and residences, were constructed during the 1960s, when the park was managed by Lee County and are showing signs of age. Water is provided by a well and septic systems handle wastewater. Three additional staff residences are located in the interior of Cayo Costa Island.

North Captiva Island and Punta Blanca Island contain no facilities.

Several structures are located on a small parcel on Bokeelia Island and include six rental cabins, and an office/laundry/storage building. The rental cabins are known as the Jug Creek Cottages and are operated by the park visitor service provider. A small boat dock and ramp are located at this site for use by visitors to the cottages. Vehicular access is available from Pine Island. This location is the only land base for the park and important for operational support as a disembarkation point for staff and supplies to the island.

A number of park facilities were damaged by Hurricane Charley in August of 2004 resulting in closure of the park for over 10 weeks. Many structures received significant damage, including the boat docks, residences and cabins on Cayo Costa and the cottages on Bokeelia Island. A waiting shelter at the dock, yurt and one restroom in the cabin area were destroyed and many Australian pines on the Gulf side were felled. At the time of the writing of this plan the Division was in the process of repairing and/or replacing recreational and support facilities damaged by the storm.

The following is a listing of existing park facilities:

Cayo Costa Island

Pelican Bay Use Area

- Public and service boat docks
- Honor box fee collection station
- Visitor center/park office
- Interpretive panels
- Assistant Park Manager residence
- Restroom
- Shop Compound
 - Pole barns (2)
 - Generator building
 - Storage building

Gulfside Use Area

- Primitive cabins (12)
- Tent camping area (30 sites)
- Day use restroom
- Cabin/camper restrooms (2)
- Amphitheatre
- Interpretive panels
- Medium picnic shelters (2)
- Honor box fee collection station
- Hiking and biking trails (7 miles)
- Staff residences (4)

Bokeelia Island

Cabins (6)
Office/laundry/storage
Boat dock and ramp
Unimproved parking (35-40 vehicles)

CONCEPTUAL LAND USE PLAN

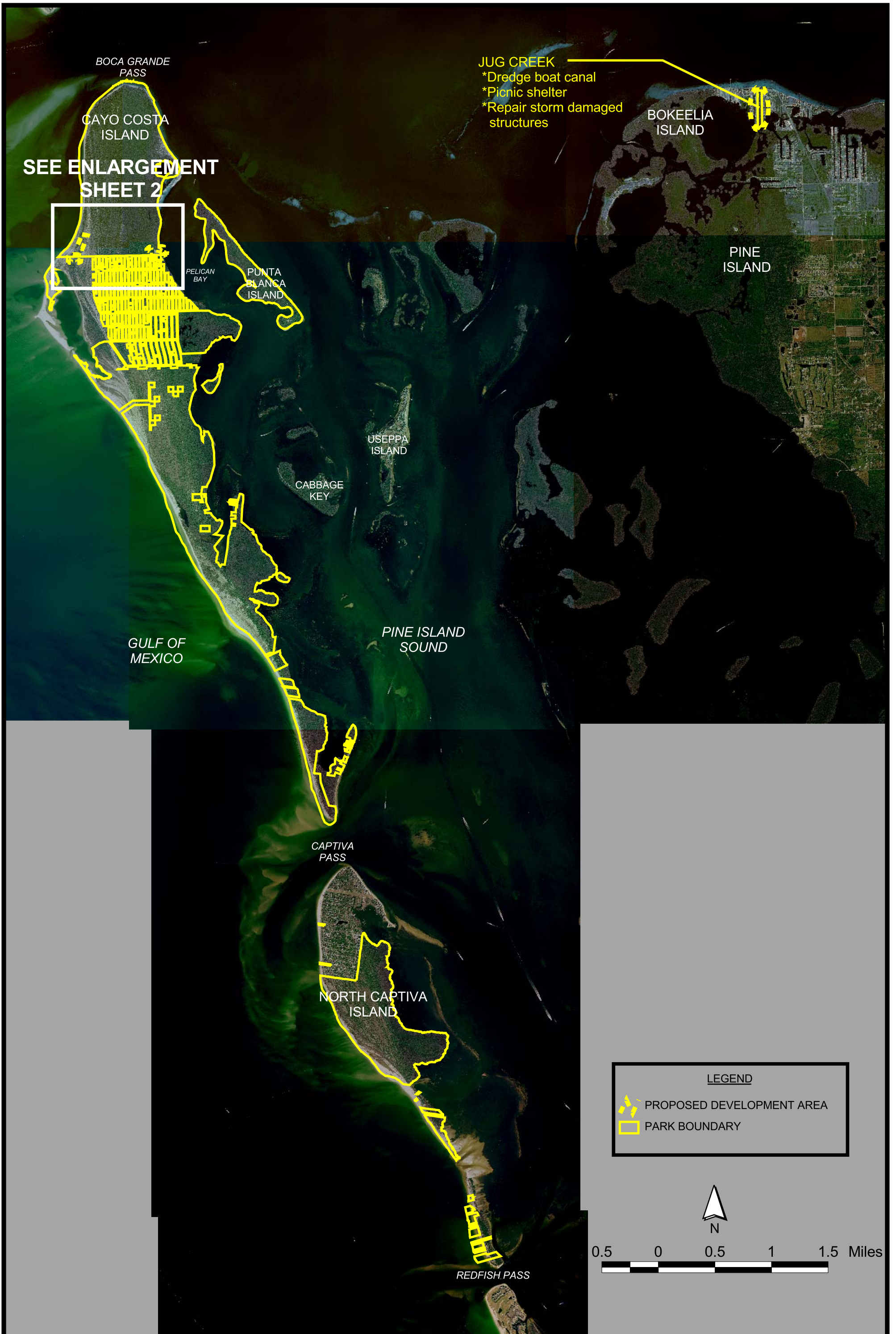
The following narrative represents the current conceptual land use proposal for this park. As new information is provided regarding the environment of the park, cultural resources, recreational use, and as new land is acquired, the conceptual land use plan may be amended to address the new conditions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

During the development of the unit management plan, the Division assesses potential impacts of proposed uses on the resources of the property. Uses that could result in unacceptable impacts are not included in the conceptual land use plan. Potential impacts are more thoroughly identified and assessed through the site planning process once funding is available for the development project. At that stage, design elements, such as sewage disposal and stormwater management, and design constraints, such as designated species or cultural site locations, are more thoroughly investigated. Advanced wastewater treatment or best available technology systems are applied for on-site sewage disposal. Stormwater management systems are designed to minimize impervious surfaces to the greatest extent feasible, and all facilities are designed and constructed using best management practices to avoid impacts and to mitigate those that cannot be avoided. Federal, state and local permit and regulatory requirements are met by the final design of the projects. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, the park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses and Proposed Facilities

As a state park, a balance is sought between maintaining and protecting natural and cultural resources and providing resource-based recreation. Maintaining the natural character of these barrier islands is important to the visitor experience, and should remain a priority for all future land use planning. The existing recreational activities at Cayo Costa State Park are appropriate and should be continued. Proposed improvements are targeted at repairing and/or replacing facilities damaged during recent storm events, enhancing visitor access, circulation, orientation and interpretation, and the separation of public use areas from maintenance and support facilities.

Pelican Bay Use Area. The existing layout of this area was influenced by the location of facilities when the state acquired the property from Lee County in 1984. Additional facilities were added to meet growing operational demands in a piecemeal fashion as funding became available. As a result, there is insufficient separation between recreation and support facilities with impacts to circulation and the visitor experience. Visitors arriving on the Pelican Bay side of Cayo Costa Island are met by the drone of the park's power generator and the visible presence of equipment and structures within the shop area. In addition, the mixing of recreation and support facilities is confusing to arriving visitors in search of information to orient themselves. A master plan is recommended to redesign the layout of all facilities in this area in an integrated, comprehensive fashion to improve circulation and the aesthetic



SEE ENLARGEMENT SHEET 2

JUG CREEK
 *Dredge boat canal
 *Picnic shelter
 *Repair storm damaged structures

GULF OF MEXICO

CABINS AREA
*Central bathhouse
*Repair/upgrade cabins
*Native landscaping

BEACH BOARDWALK






PELICAN BAY USE AREA IMPROVEMENTS
*Redesign layout of existing facilities
*Visitor center
*Dredge canal

STABILIZATION & DRAINAGE IMPROVEMENTS TO TRAM ROAD

PELICAN BAY

CAMPING AREA
*Native landscaping
*Medium picnic shelters (3)
*Reorganize sites
*Restroom

LEGEND

-  PROPOSED FACILITIES
-  PROPOSED DEVELOPMENT AREA
-  EXISTING TRAM ROAD
-  CAYO COSTA STATE PARK BOUNDARY
-  PROTECTED ZONES

CAYO COSTA STATE PARK



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Division of Recreation and Parks
Office of Park Planning

CONCEPTUAL
LAND USE PLAN
SHEET 2 OF 2

experience of visitors arriving to the island. The following elements will be addressed in the master plan:

- Relocation of shop facilities
- New visitor center
- Relocation of staff residence

The first priority is to relocate the shop facilities a sufficient distance north-northwest, to remove them from sight of arriving visitors and minimize the sound of the generator. Additional measures, such as improved muffling or physical sound barriers, should be considered to mitigate noise impacts. Existing facilities should be removed and new ones constructed, including a 3-bay shop, flammable storage building and generator shed. The lack of additional space within the surrounding ruderal area requires these facilities to be relocated a short distance into the adjacent maritime hammock community. Preference will be given to a site that provides sufficient noise and visual buffering and that minimizes natural community fragmentation and impacts to the maritime hammock.

The need exists to enhance interpretation of the park's natural and cultural resources and improve visitor orientation and contact. The existing visitor center shares a small portable trailer with the park office and is insufficient to meet the needs of the park. A new, modestly-sized visitor center is recommended as the primary visitor orientation point and the central hub of the park's interpretive program. The proposed visitor center is intended to accommodate a broad range of visitors from school groups to adults and should be centrally located, highly visible to the arriving public, and linked to the existing tram route. In addition to meeting the visitor information and interpretive needs of the park, it is also recommended that office and storage space be incorporated into the design of this facility. An information kiosk with a map of the island and locations of use areas and facilities is also recommended to be sited in the vicinity.

The existing residence is in need of replacement and should be relocated away from the center of the public area to make room for a visitor center. However, it is important for security reasons to maintain a residence in the vicinity. Relocating the residence to a location on the periphery would allow a staff presence to be maintained in this area yet remove a non-recreation related facility from the center of the park's primary public access area.

The recommended locations for these proposed improvements are based on preliminary site visits at the conceptual level of planning. The master planning process may reveal additional factors that influence the final siting of facilities. While proposed improvements are to take place within the geographic area previously discussed, flexibility in the final layout and design of facilities will be maintained to allow for adaptation to meet conditions revealed at a more detailed level of planning.

Park Tram. The park's tram route from the Pelican Bay access point to the camping and cabin area needs improving. Stabilization with an appropriate material and correcting drainage problems will reduce ongoing maintenance and allow for the potential use of an alternative type of tram vehicle. The existing diesel powered tram is loud, produces foul emissions and adds to the island's dependence on fossil fuel. To improve the tram experience it is recommended that diesel powered vehicles eventually be phased out and replaced with alternative fuel vehicles, if further investigations reveal cost effective and mechanically reliable alternatives exist. Consideration should also be given to expanding tram capacities to

reduce trips.

Boating Access. The canals that provide access to the service dock at Cayo Costa and the Jug Creek Cottages are proposed for dredging to improve access.

Gulfside Use Area. Two restrooms with outside showers used to serve cabin visitors and campers. One of these facilities was destroyed during Hurricane Charley. The remaining structure is old, presents constant maintenance challenges and does not meet ADA standards. A central bathhouse is recommended to replace existing restroom facilities that serve overnight visitors to the park. The bathhouse should be sited in a manner that is convenient to the cabin and camping area yet segregated from the existing day use restroom. A small restroom will be considered in the vicinity of the camping area if it is determined that a single bathhouse cannot adequately serve both areas.

To improve universal accessibility and discourage the blazing of social trails through the beach dune community, a boardwalk is proposed that would link the day use restroom, ADA cabin and tram shelter to the beach shoreline. It is recommended that an observation platform be designed into the boardwalk to enhance views of the Gulf shore.

A number of cabins were damaged from Hurricane Charley. A yurt in this area was destroyed. Existing cabins are recommended for repair and modest upgrades to improve the cabin experience. The yurt, while not ideally suited for the barrier island environment provided another non-camping option for visitors seeking overnight accommodations. It is recommended that the yurt be replaced with an additional primitive cabin or other structure to maintain capacity in this area.

Recent hurricanes also felled or badly damaged much of the Australian pines that provided shade for campers and cabin users. Remaining damaged trees pose safety concerns and should be removed. It is recommended that native vegetation be replanted in these areas to replace the loss of tree cover. To supplement native plantings, it is also proposed that up to three medium picnic shelters be constructed in the vicinity of the camping area.

The existing tent camping area is located, at least partially, within a low lying area that is susceptible to flooding and excessive biting insects. It is recommended that the layout of campsites be reorganized so that those sites most likely to be flooded are moved to adjacent areas of higher ground. If aesthetics flooding concerns, and convenience of beach access are not able to be adequately addressed by merely reorganizing sites in this area, future consideration should be given to finding another location for the camping area that is dry, near the beach and serviceable by the park tram.

Residence #4. This structure is located in the vicinity of existing occupied residences in the interior of Cayo Costa Island. It has recently been renovated and its septic system upgraded to meet local codes. Several options are being considered for its use, including housing for park staff, housing for volunteers and visiting researchers or as alternative overnight accommodation for the visiting public.

Water and Sewer Treatment. The park's existing well is shallow, and while no supply problems have been encountered to date, the capacity of this system to meet the long-term needs of the park should be evaluated. Septic systems in a barrier island environment require regular maintenance to function properly. Increasing levels of use and the challenges of

maintaining these systems without convenient road access to the mainland calls for research into the most appropriate wastewater treatment system for the park. Engineering surveys of current water and sewer systems are recommended to inform future decisions regarding park utilities.

Bokeelia Island. Several cottages experienced roof damage from Hurricane Charley and are being repaired. A medium picnic shelter with grills is recommended to be added in the vicinity of the Jug Creek cottages.

Facilities Development

Preliminary cost estimates for the following list of proposed facilities are provided in Addendum 6. These cost estimates are based on the most cost-effective construction standards available at this time. The preliminary estimates are provided to assist the Division in budgeting future park improvements, and may be revised as more information is collected through the planning and design processes.

Pelican Bay Use Area

Replace/relocate shop facilities
Replace/relocate visitor center
Replace/relocate staff residence

Park Tram

Stabilize tram road and improve drainage
Replace tram with alternative fuel vehicles

Boating Access

Dredge boat canals

Gulfside Use Area

Repair/upgrade existing cabins
Central bathhouse
Small restroom
Reorganize tent campsites
Beach boardwalk
Medium picnic shelters (3)
Native plantings

Bokeelia Island

Medium picnic shelter

Existing Use and Optimum 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 1).

The optimum 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 1.

Optimum Boundary

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

**Table 1
Existing Use And Optimum Carrying Capacity**

Activity/Facility	Existing Capacity		Proposed Additional Capacity		Estimated Optimum Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Visitor Center	6	24	54	240	60	240
Hiking	100	400			100	400
Camping	240	240			240	240
Cabins	78	78			78	78
Saltwater Beach Activities	400	800			400	800
TOTAL	818	1,518	54	240	878	1,758

As additional needs are identified through park use, development, research, and as adjacent land uses change on private properties, modification of the unit's optimum boundary may occur for the enhancement of natural and cultural resources, recreational values and management efficiency. At this time, no lands are considered surplus to the needs of the park.

Identification of lands on the optimum boundary map is solely for planning purposes and not for regulatory purposes. A property's identification on the optimum boundary map is not for use by any party or other government body to reduce or restrict the lawful right of private landowners. Identification on the map does not empower or require any government entity to impose additional or more restrictive environmental land use or zoning regulations. Identification is not to be used as the basis for permit denial or the imposition of permit conditions.

The optimum boundary for Cayo Costa State Park includes all remaining public and private lands on Cayo Costa Island, and remaining unimproved private parcels on the central and southern portions of North Captiva Island.

GASPARILLA SOUND-CHARLOTTE HARBOR AQUATIC PRESERVE

CHARLOTTE HARBOR

CAYO COSTA STATE PARK

Singlelow Rd

CAYO COSTA STATE PARK

CAPTIVA PASS

PINE ISLAND SOUND



GULF OF MEXICO

PINE ISLAND SOUND AQUATIC PRESERVE



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 Florida Department of Environmental Protection
 Division of Recreation and Parks
 Office of Park Planning

LEGEND

-  Park Boundary
-  Optimum Boundary

CAYO COSTA STATE PARK

OPTIMUM BOUNDARY MAP

Addendum 1—Acquisition History

Cayo Costa State Park

Acquisition History

Purpose of Acquisition

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) acquired Cayo Costa State Park to develop, operate and maintain the property for outdoor recreational, park, conservation, historic, and related purposes.

Sequence of Acquisition

On September 7, 1976, the State of Florida obtained title to the property that later became Cayo Costa State Park. The property was purchased with EEL Bond Proceeds. In 1984 and 1986, the Trustees conveyed management authority of Cayo Costa State Park to the Department of Environmental Protection, Division of Recreation and Parks (Division) under the two leases.

Since the establishment of Cayo Costa State Park in 1976, the State of Florida has acquired additional parcels and incorporated them into Cayo Costa State Park. The acquisitions were funded under CARL/P2000, Carl Mega multi-parcels and through donation...

Title Interest

The Trustees hold fee simple title of Cayo Costa State Park.

Lease Agreements

On June 21, 1984, the Trustees leased a portion of Cayo Costa State Park to three state agencies, the Division of Recreation and Parks (Division), Florida Fish and Wildlife Conservation Commission, and the Department of State, Division of Historical Resources) under Management Agreement #745-9005, which later changed to Lease No. 3569. On February 25, 1986, the Trustees leased the remaining part of the park to the Division under Lease No. 3426. This lease is for a period of fifty (50) years, and will expire on February 24, 2036. On October 23, 2000, the Trustees cancelled Lease No. 3569 and amended the lands previous managed under this lease to Lease No. 3426.

According to Lease No. 3426, the Division manages Cayo Costa State Park for the development, conservation and protection of natural and cultural resources and to use the property for resource-based public outdoor recreation compatible with the conservation and protection of resources.

Special Conditions On Use

Cayo Costa 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.

Cayo Costa State Park

Acquisition History

Outstanding Reservations

Following is a listing of outstanding rights, reservations and encumbrances that apply to Cayo Costa State Park.

Instrument: Easement
Instrument Holder: Trustees
Beginning Date: November 1, 2000
Ending Date: Forever
Outstanding Rights, Uses, Etc.: The easement allows the Florida Power and Light Company to construct, operate and maintain overhead and underground electric utility facilities on a portion of Cayo Costa State Park.

Instrument: Warranty Deeds (Amendment No. 17)
Instrument Holder: Several grantors
Beginning Date: Different deed dates
Ending Date: Forever
Outstanding Rights, Uses, Etc.: About sixty-one (61) deeds are subject to easements for ingress, egress, and boat docking purposes and about fifty-seven (57) deeds are subject to easements for road and utility purposes and mineral reservations.

Instrument: Warranty Deed
Instrument Holder: William R. Hamilton
Beginning Date: March 26, 1999
Ending Date: Forever
Outstanding Rights, Uses, Etc.: The deed is subject to Declaration of Covenants and Restrictions recorded in O.R. book 958, page 246, and a roadway easement recorded in O.R. book 958, page 246-248.

Instrument: Warranty Deed
Instrument Holder: Ralph Kaplan and Terrel Kaplan
Beginning Date: August 3, 1989
Ending Date: Forever
Outstanding Rights, Uses, Etc.: The deed is subject to easements for roadway and ingress and egress purposes, and to United States of America for use and navigation of any portion of property.

Cayo Costa State Park

Acquisition History

Instrument: Warranty Deed
Instrument Holder: United States of America
Beginning Date: May 28, 1985
Ending Date: Forever
Outstanding Rights, Uses, Etc.: According to the deed, if the subject lands are not used for park purposes, title will revert to the United States of America.

Instrument: Warranty Deed
Instrument Holder: Maxwell R. and Carol L. Sellars
Beginning Date: December 13, 1984
Ending Date: Forever
Outstanding Rights, Uses, Etc.: The deed is subject to the reservation of the life estate to the instrument holder for ingress and egress purposes.

Instrument: County Deed
Instrument Holder: Lee County
Beginning Date: August 22, 1984
Ending Date: Forever
Outstanding Rights, Uses, Etc.: The deed is subject to reservations and restrictions contained in three patents from the United States of America.

Instrument: Easement
Instrument Holder: Trustees
Beginning Date: January 27, 1983
Ending Date: For a period of 50 years.
Outstanding Rights, Uses, Etc.: The easement allows the Lee County Electric Cooperative, Inc. to construct, install, operate and maintain an electrical transmission line on a portion of Cayo Costa State Park.

Instrument: Warranty Deed
Instrument Holder: A.W. D. and Frances A. Harris
Beginning Date: December 16, 1982
Ending Date: Forever
Outstanding Rights, Uses, Etc.: The deed is subject to certain restrictions and an easement for public utility purposes.

Cayo Costa State Park

Acquisition History

Cayo Costa State Park

Advisory Group List

The Honorable John E. Albion
Lee County Board of
County Commissioners
P.O. Box 398
Fort Myers, Florida 33902

Rick Joyce, Director
Department of Community Development
Division of Environmental Sciences
P.O. Box 398
Fort Myers, Florida 33902-0398

Roger Clark, Land Stewardship Manager
Lee County Parks and Recreation
3410 Palm Beach Blvd.
Fort Myers, Florida 33916

Roy Edenfield, Chairman
Lee County Soil & Water Conservation
District
4100 Center Point Drive
Fort Myers, FL 33916

Chuck Listowski
West Coast Inland Navigation District
P.O. Box 1845
Venice, Florida 34284

Reggie Norman, Park Manager
Cayo Costa State Park
P.O. Box 1150
Boca Grande, Florida 33921

Heather Stafford, Manager
Charlotte Harbor and Estero Bay Aquatic
Preserves
12301 Burnt Store Road
Punta Gorda, Florida 33955

Jim Isaacs, Senior Forester
Florida Division of Forestry
10941 Palm Beach Blvd
Ft. Myers, FL 33905

Joe Bozzo, District Biologist
Florida Fish and Wildlife Conservation
Commission
566 Commercial Blvd.
Naples, Florida 34104

Margaret Nanney
2104 53rd Avenue East
Bradenton, Florida 34203

JoAnn Luce, Chair
Alligator Amblers Chapter
Florida Trail Association
8901 Cascades Isle Blvd.
Estero, Florida 33928

Captain Doug Stewart
P.O. Box 1604
Boca Grande, Florida 33921

Walter Meanwell, President
Barrier Islands Park Society
P.O. Box 637
Boca Grande, Florida 33921

Louise Shaw
Upper Captiva Wildlife Foundation, Inc.
P.O. Box 503
Pineland, Florida 33945

Nicole Ryan, Environmental Policy
Manager
The Conservancy of Southwest Florida
1450 Merrihue Drive
Naples, Florida 34102

Vince McGrath, President
Audubon Society of Southwest Florida
12115 Hibiscus Drive
Fort Myers, Florida 33908

Cayo Costa State Park
Advisory Group List

Cayo Costa State Park
Advisory Group Staff Report

The Advisory Group appointed to review the proposed land management plan for Cayo Costa State Park met in the Amory Memorial Chapel at Gasparilla Island State Park on December 16, 2004.

The Honorable John E. Albion, John Yarborough, Roland Ottolini, Roy Edenfield, Chuck Listowski, JoAnn Luce, Louise Shaw, Nicole Ryan, Reggie Norman and Vince McGrath did not attend. All other appointed Advisory Group members were present. Rick Joyce and Roger Clark represented Lee County, and Heather Stafford represented Charlotte Harbor and Estero Bay Aquatic Preserves. Robert Neal (Lee County), Johnny Bryson (DOF), Michael Weston (DOF), Kathleen Rohrer (Barrier Islands Parks Society, Inc.) and Elizabeth Donley (Charlotte Harbor National Estuary Program) also attended the meeting. Attending staff included Ken Alvarez, Annette Nielsen, John Aspiolea and Michael Kinnison.

Summary of Advisory Group Comments

Margi Nanney (private landowner) discussed the need for increased patrols of park property to address security and resource protection given the remote nature of much of the park and a boundary configuration that makes it difficult for visitors to know when they are on park property. She emphasized the need for the state to be more aggressive in acquiring remaining private parcels and indicated that existing property owners may be willing to consider life estates that would eventually transfer ownership to the state. She discussed the need for sustained efforts to manage exotic plants and recommended seeking assistance from outside organizations to bolster the park's exotic plant removal program. Annette Nielsen discussed progress in removing exotics, particularly Brazilian pepper, and indicated that much of the park is in a maintenance phase. Michael Kinnison stated that Australian pines were recently cleared from the camping and cabin area.

Doug Stewart (boat captain) raised the issue of unauthorized boat charters mooring at the boat basin and how this behavior may affect other non-permitted charter operators that have an occasional need to drop visitors along the park shoreline. Ms. Nielsen explained that a permit system is used to control the numbers of charter boats accessing the park for public safety and security reasons, and that one vendor has an exclusive use permit that grants first right of refusal for providing a variety of services at the park. Mr. Stewart also indicated that there is a problem with boats operating close to the Gulf shoreline, which disturbs fish, shorebirds and is a threat to public safety. He recommended designating an idle speed zone that would be marked with buoys. Roger Clark responded that this would require a change to the Lee County ordinances, and suggested that any consideration of speed zones should also consider Boca Grande. Ken Alvarez stated that the Division of Recreation and Parks was successful in dealing with similar problems at Honeymoon Island State Park by establishing internal combustion engine exclusion zones.

Robert Neal (Lee County) would like to see improved coordination between the park, county and local law enforcement. He noted that the previous discussion of regulating boating traffic was a good example of the need for improved coordination. He closed by expressing support for the proposed improvements on the Pelican Bay side of the park.

Kathleen Rohrer (Barrier Islands Park Society, Inc. - BIPS) explained that the role of the citizen support organization is to help fund improvements needed at a park. She indicated that BIPS is

Cayo Costa State Park
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expanding its focus to include Cayo Costa State Park and is having success at increasing volunteer participation. She asked Division staff with help identifying priority projects to fund, which may include technical consulting work and acquisition projects.

Walter Meanwell (BIPS) stated that the organization was willing to step forward with significant funding to meet repair needs from the hurricane season if they were reimbursable. He expressed concern about permanent damage to the island's mangroves from Hurricane Charley and asked what would become of the fishing shanties that were damaged. County staff responded that rebuilding would be contingent on obtaining appropriate building permits and landowner authorization.

Heather Stafford (Charlotte Harbor Aquatic Preserve) identified the need for consistency in references to the disjunct parcel on Pine Island. She suggested mentioning the overlapping management authority between the Aquatic Preserve boundary and the Division's 400-foot shoreline management zone in the plan. She suggested goal 1.C may overstate staff ability to control exotic plants and asked if the plan included a prioritized list for acquisition. Mr. Kinnison responded that all remaining parcels were considered high priorities for acquisition. She asked for clarification on colonial waterbird monitoring at the park. Division staff indicated that this work was conducted by existing staff. Ms. Stafford suggested revising the Soils section so that text references to soil erosion were discussed more clearly and located elsewhere in the plan. Ms. Nielsen added that she would be addressing various other discrepancies in the Resource Management Component and updating the Natural Communities Map. Ms. Stafford asked to have the plan includes the number of existing boat slips and to label the proposed shelter on Punta Blanca Island on the Conceptual Land Use Plan Map. She recommended restricting the Punta Blanca site to non-motorized vessels only. Mr. Stewart opposed this recommendation since he did not feel the site was unique or unduly sensitive. Ms. Nielsen commented that boating groups have suggested that the park manage the submerged lands in Pelican Bay to manage boating activity in this area.

Joe Bozzo (Fish and Wildlife Conservation Commission) asked about the inclusion of panthers and bears on the plan's designated species list. Division staff indicated that the wrong list was included in the plan and would be replaced. He discussed the challenge of managing exotic plants and supported park efforts to control them.

Roger Clark (Lee County) noted that an action plan was needed in the management plan that identifies timetables for accomplishing management tasks and standards to measure progress. He recommended including a historical overview in the plan that would provide a historic context and resource for interpretive purposes. He suggested the plan include more explanation of the challenges facing acquisition of remaining private land holdings. He stated that the Division of State Lands has not taken advantage of Lee County offers to provide funding and staffing assistance to facilitate the acquisition process, and suggested that the state's land acquisition process was not working. He discussed the need for a more creative approach that considers collaborating with non-governmental conservation organizations and even condemnation. He closed by recommending a reevaluation of resource management costs listed in the plan.

Michael Weston (Division of Forestry - DOF) suggested adding a timber management statement to the plan since replanting may be necessary after hurricane impacts or fire.

Cayo Costa State Park
Advisory Group Staff Report

Johnny Bryson (DOF) discussed the DOF island strike team's role in fire suppression in coastal environments. He stated that DOF was willing to provide assistance with prescribed burning at the park and suggested the federal excess equipment program may be a source for needed fire management equipment.

Rick Joyce (Lee County) stated that the plan was deficient in not discussing the issue of providing access to private landholdings on Cayo Costa Island. He discussed the need to address unauthorized docks along the canal that provides private access and provided an example of unauthorized use of a dock to facilitate home construction. Mr. Kinnison responded that a survey is needed to determine ownership in this area and jurisdictional authority. Mr. Joyce discussed the challenge of controlling upland access to private lots and explained how existing jeep trails cross private and public property. He indicated that one landowner had unsuccessfully requested permission from the county to use the tram road to move equipment and supplies for home construction. He stated that the county is researching the law related to this issue and will be developing a policy to guide the development review process on the island. Mr. Clark explained that Lee County owns over one hundred acres on Cayo Costa and would be interested conveying the property to the state to be managed as part of the park.

Elizabeth Donley recommended acknowledging the Barrier Island Parks Society, Inc. in the plan and their role at the park. She also requested a statement that established carrying capacities would be maintained.

Comments Submitted in Writing

Louise Shaw (Upper Captiva Wildlife Foundation, Inc.) commented that the plan makes little mention of Hurricane Charley impacts, and particularly noted the washover on Upper Captiva Island. She suggested the plan discuss the approximately 1-mile long sandbar that is signed and protected as a shorebird resting and nesting area on Upper Captiva. She discussed the Foundation's involvement with annual sea turtle monitoring and the weekly recording and removal of trash along the shoreline. She closed by suggesting the park would benefit more from additional staff than new facilities.

Chuck Listowski (West Coast Inland Navigation District) noted that while the park and adjacent waters accommodate many boats pursuing a variety of recreational interests, the plan is primarily focused on uplands. He requested addressing the issue of offshore anchoring and suggested consulting Dale Adams, Department of Environmental Protection liaison, to discuss cruising vessels and island recreation opportunities.

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Staff Recommendations

Staff recommends approval of the proposed management plan for Cayo Costa State Park as presented with the following comments and revisions.

Recreational Facilities/Access

- The concept of a rest shelter on Punta Blanca Island will be removed from the plan. It is not considered practical to restrict the facility from use by motorized boats and staff has concerns that it will also encourage overnight use of the area. The existence of facilities on Cayo Costa Island minimizes the need for additional facilities on adjacent lands. Canoeists and kayakers will still be able to access the island for day use.

Regulating Boating in Adjacent Waters

- Text will be added to the plan that discusses issues related to boating activity in adjacent waters of the park, particularly within Pelican Bay.
- It is recommended that boating activity be monitored systematically along the Gulf shoreline and Pelican Bay during this planning cycle, and management recommendations developed, in coordination with Lee County and the Pine Island Sound Aquatic Preserve, aimed at protecting shoreline and near-shore resources as well as public health and safety.

Action Plan

- The current plan format is considered sufficient in providing the direction needed to guide management decisions at the park while providing flexibility to allow for adaptive approach to management that can respond to changing conditions and new knowledge and information over the plan's next cycle. However, the Division recognizes the advantage of the detail provided by an action plan and is addressing the issue as part of a process aimed at revising state park management plan content.

Historic Context

- The current text discussion of the history of the park is considered sufficient for the purposes of the management plan. Detailed discussions of the historical context are considered more appropriately addressed in documents specifically developed for interpretive purposes.

Cost Estimates

- Budget estimates will be reevaluated so that they provide a reasonable approximation of the costs of meeting the management demands of the park.

Land Acquisition

- Text will be added to the plan that discusses the unique challenges facing acquisition of remaining private land holdings.
- The Division will pursue management of existing County owned property on Cayo Costa Island considered important for the management needs of the park.
- The Division will encourage an expanded effort to acquire remaining private island holdings that includes the participation of Lee County and conservation organizations.

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Access to Private Land Holdings

- Text will be added to the plan that discusses the issue of access to private landholdings on Cayo Costa Island.
- The Division supports increased coordination with Lee County to manage private access to Cayo Costa that minimizes impacts to public resources. The Division is currently seeking clarification of ownership boundaries of lands surrounding the canal off Primo Bay that provides private landholder access to Cayo Costa Island. This coordination will also consider the consolidation of existing platted public right-of-ways as progress is made on the acquisition of private landholdings

Timber Management

- During the current plan update, it was determined that timber management activities were not necessary for the upcoming management plan cycle. Future plan updates will reconsider the need for timber management at the park.

Carrying Capacity

- Existing carrying capacity figures will be reevaluated to ensure they reflect levels of use that are deemed acceptable for resource protection and maintaining a quality visitor experience. Park staff manages public access consistent with established capacities as is feasible in an island environment. No additional statement regarding maintaining capacity levels is considered necessary. Future plan updates may call for expanded recreational opportunities which may require a revision in carrying capacity.

Hurricane Impacts

- A brief discussion of impacts to park resources from the 2004 hurricane season will be included in the plan.

Shorebird Resting/Nesting on Upper Captiva

- Text will be added to the Resource Management Component that discusses shorebird resting/nesting habitat on Upper Captiva.

Management Coordination of Sovereign Submerged Lands

- Text will be added to the Management Authority and Responsibility section that identifies the need to coordinate management with the Aquatic Preserve where management jurisdictions overlap within the 400-foot zone extending from the park shoreline.

Editorial Revisions

- Issues identified by the Advisory Group related to text, mapping and Addenda irregularities will be addressed.

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Addendum 2—References Cited

Cayo Costa State Park

References Cited

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- Herwitz, Stanley. 1977. The natural history of Cayo-Costa Island. New College Environmental Studies Program, Publication No. 14. Sarasota, FL. 118 pp.
- Johnson, A.F. and J.W. Muller. 1993. An assessment of Florida's remaining coastal upland natural communities: Southwest Florida. Florida Natural Areas Inventory, Tallahassee, FL.
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- Morrill, Sandy and Judson Harvey. 1980. An environmental assessment of North Captiva Island. New College Environmental Studies Program, Publication No. 23. Sarasota, Florida. 91 pp. + 4 plates.
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- Walker, K.J. and B.E. Maffick. 1996. National Register of Historic Places Nomination. Florida Department of State, Division of Historical Resources.

Cayo Costa State Park

References Cited

Addendum 3—Soil Descriptions

Cayo Costa State Park

Soil Descriptions

(2) Canaveral fine sand - This is a nearly level, moderately well drained and somewhat poorly drained soil on low ridges. Slopes are smooth to slightly convex and range from 0 to 2 percent.

Typically, the surface layer is black and dark gray fine sand mixed with shell fragments and is about 15 inches thick. The underlying layers are light brownish gray and light gray fine sand mixed with shell fragments to a depth of 80 inches or more.

Included with this soil are small areas of Captiva and Kesson soils. Included soils generally make up less than 10 percent of any mapped areas.

In most years, under natural conditions, this soil has a water table depth of 18 to 40 inches for 2 to 6 months. The water table recedes to a depth of more than 40 inches during February through July. The available water capacity is very low. Natural fertility is low. Permeability is very rapid. Natural vegetation consists of cabbage palm, seagrape, wild coffee, and an understory of vines and weeds.

(5) Captiva fine sand - This is nearly level, poorly drained soil in sloughs. Slopes are smooth to concave and range from 0 to 1 percent.

Typically, the surface layer is black fine sand about 6 inches thick. The underlying layers are fine sand mixed with shell fragments to a depth of 80 inches or more. The upper 9 inches is pale brown with light gray streaks, the next 11 inches is light gray with many pale brown mottles, the next 4 inches is light gray with about 30 percent multicolored shell fragments, and the lower 50 inches is light gray.

Included with this soil in mapping are small areas of Canaveral and Kesson soils. Also included are scattered areas of Captiva fine sand that is ponded and soils that are similar to Captiva soils but have more than 35 percent multicolored shell fragments larger than 2 millimeters between depths of 10 and 40 inches. Included soils make up about 5 to 10 percent of any mapped area.

In most years, under natural conditions, this soil has a water table within a depth of 10 inches for 1 to 2 months. The water table is at a depth of 10 to 40 inches for 10 months during most years. In some years, the soils is covered by standing water for several days.

The available water capacity is low. Permeability is very rapid.

Natural vegetation consists of cabbage palm, Brazilian pepper, sand cordgrass, leatherleaf fern, and waxmyrtle.

(22) Beaches - Beaches consist of narrow strips of nearly level, mixed sand and shell fragments along the Gulf of Mexico. These areas are covered with saltwater at daily high tides.

The areas are subject to movement by the wind and tide and are bare of vegetation in most places. The only vegetation is salt-tolerant plants. Beaches are geographically associated with Canaveral soils.

Cayo Costa State Park

Soil Descriptions

Beaches are used intensively for recreation during the entire year. Homes, condominiums, beach cottages, and motels have been built on the fringes of beaches in many places.

(23) Wulfert Muck - This is a nearly level, very poorly drained soil in broad tidal swamps. Slopes are smooth and range from 0 to 1 percent.

Typically, the surface layer is muck that is dark reddish brown to a depth of 12 inches and dark brown to a depth of 36 inches. Beneath the muck is gray fine sand with light gray streaks and about 10 percent shell fragments.

Included with this soil in mapping, and making up about 15 percent of the mapping unit, are small areas of Kesson soils and soils similar to Wulfert soils, but with limestone at a depth of 20 to 40 inches.

The water table fluctuates with the tide. Areas are subject to tidal flooding.

The available water capacity is high in the organic horizons and low in the horizons below. Natural fertility is medium. Permeability is rapid.

Natural vegetation consists of American mangrove, black mangrove, and needlegrass.

(24) Kesson fine sand - This is a nearly level, very poorly drained soil in broad tidal swamps. Areas are subject to tidal flooding. Slopes are smooth and range from 0 to 1 percent.

Typically, the surface layer is about 6 inches of sand that contains shell fragments. The underlying layers are fine sand that contain shell fragments, and they extend to a depth of 80 inches or more. The upper 4 inches is pale brown, the next 3 inches is light brown, the next 25 inches is light gray with dark gray streaks, and the lower 42 inches is white.

Included with this soil in mapping are areas of Captiva and Wulfert soils and soils that have organic surface layers. Also included are soils that have loamy material throughout. Included soils make up about 10 to 15 percent of any mapped area.

The water table fluctuates with the tide. The available water capacity is low. Natural fertility is low. Permeability is moderately rapid or rapid.

Natural vegetation consists of black mangrove, batis, oxeye daisy, and American mangrove.

Addendum 4—Plant And Animal List

Cayo Costa State Park

Plants

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for designated species)
Rosary pea *	<i>Abrus precatorius</i>	
Giant leather fern	<i>Acrostichum danaeifolium</i>	
Seminole false foxglove	<i>Agalinis filifolia</i>	
Saltmarsh false foxglove	<i>Agalinis maritima</i>	
False sisal	<i>Agave decipiens</i>	
Sisal *	<i>Agave sisalana</i>	
Golden-trumpet *	<i>Allamanda cathartica</i>	
Yellow chaff-flower	<i>Alternanthera flavescens</i>	
Alligator-weed	<i>Alternanthera philoxeroides</i>	
Southern amaranth	<i>Amaranthus australis</i>	
Florida amaranth	<i>Amaranthus floridanus</i>	
Common ragweed	<i>Ambrosia artemisiifolia</i>	
Coastal ragweed	<i>Ambrosia hispida</i>	
Toothcups	<i>Ammannia latifolia</i>	
Bushy bluestem	<i>Andropogon glomeratus</i> var. <i>pumilus</i>	
Broomsedge	<i>Andropogon virginicus</i>	
Island marlberry	<i>Ardisia escallonioides</i>	
Tall threeawn	<i>Aristida patula</i>	
Arrowfeather	<i>Aristida purpurascens</i>	
Feay's milkweed	<i>Asclepias feayi</i>	
Whorled milkweed	<i>Asclepias verticillata</i>	
Sprenger's asparagus-fern *	<i>Asparagus aethiopicus</i>	
Common asparagus-fern *	<i>Asparagus setaceus</i>	
Sand atriplex	<i>Atriplex cristata</i>	
Black mangrove	<i>Avicennia germinans</i>	
Saltwater false willow	<i>Baccharis angustifolia</i>	
Saltbush	<i>Baccharis halimifolia</i>	
Coastal water-hyssop	<i>Bacopa monnieri</i>	
Saltwort	<i>Batis maritima</i>	
Orchid-tree *	<i>Bauhinia variegata</i>	
Beggar-ticks	<i>Bidens alba</i> var. <i>radiata</i>	
Toothed mid-sorus fern	<i>Blechnum serrulatum</i>	
Silverhead	<i>Blutaparon vermiculare</i>	
Red spiderling	<i>Boerhavia diffusa</i>	
Sea daisies; sea oxeye	<i>Borrichia frutescens</i>	
Hairy grama	<i>Bouteloua hirsuta</i>	
American blueheart	<i>Buchnera americana</i>	
Watergrass *	<i>Bulbostylis barbata</i>	
Gumbo-limbo	<i>Bursera simaruba</i>	
Gray nicker	<i>Caesalpinia bonduc</i>	
Coastal searocket	<i>Cakile lanceolata</i>	
American beautyberry	<i>Callicarpa americana</i>	
Seaside bean	<i>Canavalia rosea</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Jamaica caper-tree	<i>Capparis cynophallophora</i>	
Goatweed	<i>Capraria biflora</i>	
Tabasco pepper	<i>Capsicum frutescens</i>	
Papaya *	<i>Carica papaya</i>	
Natal-plum	<i>Carissa macrocarpa</i>	
Love vine	<i>Cassytha filiformis</i>	
Australian-pine *	<i>Casuarina equisetifolia</i>	
Madagascar periwinkle *	<i>Catharanthus roseus</i>	
West Indian cock's comb	<i>Celosia nitida</i>	7
Spiny hackberry	<i>Celtis ehrenbergiana</i>	7
Slender sandspur	<i>Cenchrus gracillimus</i>	
Coast sandspur	<i>Cenchrus incertus</i>	
Spurred butterfly-pea	<i>Centrosema virginianum</i>	
Night-flowering Jessamine *	<i>Cestrum nocturnum</i>	
Partridge pea	<i>Chamaecrista fasciculata</i>	
Wild sensitive-plant	<i>Chamaecrista nictitans var. aspera</i>	
Blodgett's sandmat	<i>Chamaesyce blodgettii</i>	
Dixie sandmat	<i>Chamaesyce bombensis</i>	
Coastal dune sandmat	<i>Chamaesyce cumulicola</i>	1
Pill-pod sandmat	<i>Chamaesyce hirta</i>	
Tropical sandmat	<i>Chamaesyce hypericifolia</i>	
Hyssop-leaf sandmat	<i>Chamaesyce hyssopifolia</i>	
Spotted sandmat	<i>Chamaesyce maculata</i>	
Coastal-beach sandmat	<i>Chamaesyce mesembrianthemifolia</i>	
Snowberry	<i>Chiococca alba</i>	
Coco-plum	<i>Chrysobalanus icaco</i>	
Coastal plain goldenaster	<i>Chrysopsis scabrella</i>	
Yellow thistle	<i>Cirsium horridulum</i>	
Key lime *	<i>Citrus Xaurantifolia</i>	
Sour orange; grapefruit *	<i>Citrus Xaurantium</i>	
Sawgrass	<i>Cladium jamaicense</i>	
Tread-softly	<i>Cnidocolus stimulosus</i>	
Seagrape	<i>Coccoloba uvifera</i>	
Coconut palm *	<i>Cocos nucifera</i>	
Erect day-flower	<i>Commelina erecta</i>	
Buttonwood	<i>Conocarpus erectus</i>	
Dwarf horseweed	<i>Conyza canadensis var. pusilla</i>	
Leavenworth's tickseed	<i>Coreopsis leavenworthii</i>	
String-lily	<i>Crinum americanum</i>	
Shakeshake *	<i>Crotalaria incana</i>	
Low rattlebox	<i>Crotalaria pumila</i>	
Rabbit-bells	<i>Crotalaria rotundifolia</i>	
Tropical croton	<i>Croton glandulosus var. floridanus</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Seaside croton	<i>Croton punctatus</i>	
Palay rubber vine *	<i>Cryptostegia grandiflora</i>	
Marsh parsley *	<i>Cyclosporum leptophyllum</i>	
Gulf coast swallow-wort	<i>Cynanchum angustifolium</i>	
Leafless swallow-wort	<i>Cynanchum scoparium</i>	
Bermudagrass *	<i>Cynodon dactylon</i>	
Poorland flatsedge	<i>Cyperus compressus</i>	
Baldwin's flatsedge	<i>Cyperus croceus</i>	
Umbrellasedge *	<i>Cyperus involucratus</i>	
Alabama swamp flatsedge	<i>Cyperus ligularis</i>	
Flat-leaf flatsedge	<i>Cyperus planifolius</i>	
Many-spike flatsedge	<i>Cyperus polystachyos</i>	
Pine-barren flatsedge	<i>Cyperus retrorsus</i>	
Four-angle flatsedge	<i>Cyperus tetragonus</i>	
Crowfootgrass *	<i>Dactyloctenium aegyptium</i>	
Coin-vine	<i>Dalbergia ecastaphyllum</i>	
Whitetassels	<i>Dalea carnea</i>	
Feay's prairie-clover	<i>Dalea feayi</i>	
Small smooth-leaf tick-trefoil	<i>Desmodium marilandicum</i>	
Dixie tick-trefoil *	<i>Desmodium tortuosum</i>	
Needleleaf witchgrass	<i>Dichantherium aciculare</i>	
Cypress witchgrass	<i>Dichantherium dichotomum</i>	
Hemlock witchgrass	<i>Dichantherium portoricense</i>	
Rough-hair witchgrass	<i>Dichantherium strigosum</i>	
Shaggy crabgrass	<i>Digitaria villosa</i>	
Saltgrass	<i>Distichlis spicata</i>	
Varnish leaf	<i>Dodonaea viscosa</i>	
West Indian chickweed	<i>Drymaria cordata</i>	
Goosegrass *	<i>Eleusine indica</i>	
Tampa butterfly orchid	<i>Encyclia tampensis</i>	7
Gophertail lovegrass	<i>Eragrostis ciliaris</i>	
Sanibel Island lovegrass	<i>Eragrostis pectinacea var. tracyi</i>	5
Fireweed	<i>Erechtites hieracifolius</i>	
Oakleaf fleabane	<i>Erigeron quercifolius</i>	
Golden beach creeper	<i>Ernodea littoralis</i>	
Southeastern coralbean	<i>Erythrina herbacea</i>	
White stopper	<i>Eugenia axillaris</i>	
Spanish stopper	<i>Eugenia foetida</i>	
Surinam cherry *	<i>Eugenia uniflora</i>	
Dogfennel	<i>Eupatorium capillifolium</i>	
False-fennel	<i>Eupatorium leptophyllum</i>	
Semaphore eupatorium	<i>Eupatorium mikanioides</i>	
Saltmarsh fingergrass	<i>Eustachys glauca</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Pinewoods fingergrass	<i>Eustachys petraea</i>	
Creeping morning-glory	<i>Evolvulus alsinoides</i>	
Florida strangler fig	<i>Ficus aurea</i>	
Indian laurel; Cuban laurel *	<i>Ficus microcarpa</i>	
Carolina fimbry	<i>Fimbristylis caroliniana</i>	
Hurricanegrass	<i>Fimbristylis cymosa</i>	
Marsh fimbry	<i>Fimbristylis spadicea</i>	
Florida yellowtops	<i>Flaveria floridana</i>	
Narrowleaf yellowtops	<i>Flaveria linearis</i>	
Florida privet	<i>Forestiera segregata</i>	
Downy milk-pea	<i>Galactia volubilis</i>	
Coastal bedstraw	<i>Galium hispidulum</i>	
Spoon-leaf purple everlasting	<i>Gamochaeta purpurea</i>	
Southern gaura	<i>Gaura angustifolia</i>	
Seven-year apple	<i>Genipa clusiifolia</i>	
Round-fruit hedge-hyssop	<i>Gratiola virginiana</i>	
Silk-oak *	<i>Grevillea robusta</i>	
Prickly-apple cactus	<i>Harrisia aboriginum</i>	3, 7
Pine-barren frostweed	<i>Helianthemum corymbosum</i>	
West coast dune sunflower	<i>Helianthus debilis subsp. vestitus</i>	
Scorpion-tail	<i>Heliotropium angiospermum</i>	
Seaside heliotrope	<i>Heliotropium curassavicum</i>	
Pineland heliotrope	<i>Heliotropium polyphyllum</i>	
Bladder mallow	<i>Herissantia crispa</i>	
Camphorweed	<i>Heterotheca subaxillaris</i>	
Hibiscus *	<i>Hibiscus rosa-sinensis</i>	
Coastal plain hawkweed	<i>Hieracium megacephalon</i>	
Round-leaf bluet	<i>Houstonia procumbens</i>	
Many-flower marsh pennywort	<i>Hydrocotyle umbellata</i>	
Night-blooming cereus *	<i>Hylocereus undatus</i>	
Broad-leaf spider-lily	<i>Hymenocallis latifolia</i>	
Moonflower	<i>Ipomoea alba</i>	
Ocean-blue morning-glory	<i>Ipomoea indica var. acuminata</i>	
Railroad-vine	<i>Ipomoea pes-caprae subsp. brasiliensis</i>	
Glade morning-glory	<i>Ipomoea sagittata</i>	
Beach morning-glory	<i>Ipomoea violacea</i>	
Juba's bush	<i>Iresine diffusa</i>	
Big-leaf marsh-elder	<i>Iva frutescens</i>	
Beach-elder	<i>Iva imbricata</i>	
Ixora *	<i>Ixora coccinea</i>	
Joewood	<i>Jacquinia keyensis</i>	5, 7, 9
Arabian jasmine *	<i>Jasminum sambac</i>	
Chandelier plant *	<i>Kalanchoe delagoensis</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Life plant *	<i>Kalanchoe pinnata</i>	
Saltmarsh mallow	<i>Kosteletzkya virginica</i>	
White mangrove	<i>Laguncularia racemosa</i>	
Shrub verbena *	<i>Lantana camara</i>	
Button-sage	<i>Lantana involucrata</i>	
Florida tribisee	<i>Lasiacis divaricata</i>	
Pineland pinweed	<i>Lechea sessiliflora</i>	
Poorman's-pepper	<i>Lepidium virginicum</i>	
White leadtree *	<i>Leucaena leucocephala</i>	
Gopher-apple	<i>Licania michauxii</i>	
Carolina sea-lavender	<i>Limonium carolinianum</i>	
Small-fruit primrose-willow	<i>Ludwigia microcarpa</i>	
Creeping primrose-willow	<i>Ludwigia repens</i>	
Christmasberry	<i>Lycium carolinianum</i>	
Tomato *	<i>Lycopersicon esculentum</i>	
Galse mallow	<i>Malvastrum corchorifolium</i>	
Texas wax-mallow	<i>Malvaviscus penduliflorus</i>	
Mango *	<i>Mangifera indica</i>	
Florida mayten	<i>Maytenus phyllanthoides</i>	5
Axil-flower	<i>Mecardonia acuminata</i>	
Snow squarestem	<i>Melanthera nivea</i>	
Chocolate-weed	<i>Melochia corchorifolia</i>	
Creeping cucumber	<i>Melothria pendula</i>	
Alamo vine *	<i>Merremia dissecta</i>	
Climbing hempvine	<i>Mikania scandens</i>	
Wild balsam-apple *	<i>Momordica charantia</i>	
Horsemint	<i>Monarda punctata</i>	
Hairgrass	<i>Muhlenbergia capillaris</i>	
Wax myrtle	<i>Myrica cerifera</i>	
Narrow sword fern;		
Tuberous sword fern *	<i>Nephrolepis cordifolia</i>	
Tropical puff	<i>Neptunia pubescens</i>	
Oleander *	<i>Nerium oleander</i>	
Monk orchid *	<i>Oeceoclades maculata</i>	
Seaside evening-primrose	<i>Oenothera humifusa</i>	
Clustered bluet	<i>Oldenlandia uniflora</i>	
Prickly-pear cactus	<i>Opuntia humifusa</i>	
Erect prickly-pear cactus	<i>Opuntia stricta</i>	1, 9
Butterweed	<i>Packera glabella</i>	
Beachgrass	<i>Panicum amarum</i>	
Beaked panicum	<i>Panicum anceps</i>	
Hog millet *	<i>Panicum miliaceum</i>	
Switchgrass	<i>Panicum virgatum</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Florida pellitory-of-the-wall	<i>Parietaria floridana</i>	
Virginia creeper	<i>Parthenocissus quinquefolia</i>	
Blue paspalum	<i>Paspalum caespitosum</i>	
Bahiagrass *	<i>Paspalum notatum</i>	
Thin paspalum	<i>Paspalum setaceum</i>	
Seashore paspalum	<i>Paspalum vaginatum</i>	
Corky-stemmed passionflower	<i>Passiflora suberosa</i>	
Lemongrass	<i>Pectis glaucescens</i>	
Spreading lemongrass	<i>Pectis prostrata</i>	
Jacob's-ladder	<i>Pedilanthus tithymaloides subsp. smallii</i>	
Red bay	<i>Persea borbonia var. borbonia</i>	
Garlic guinea-hen weed	<i>Petiveria alliacea</i>	
Golden polypody	<i>Phlebodium aureum</i>	
Senegal date palm *	<i>Phoenix reclinata</i>	
Carpetweed	<i>Phyla nodiflora</i>	
Drummond's leaf-flower	<i>Phyllanthus abnormis</i>	
Coastal ground-cherry	<i>Physalis angustifolia</i>	
Starry-hair ground-cherry	<i>Physalis walteri</i>	
Pokeberry	<i>Phytolacca americana</i>	
Slash pine	<i>Pinus elliottii</i>	
Devil's-claws	<i>Pisonia aculeata</i>	
Cat's-claw	<i>Pithecellobium unguis-cati</i>	
Resurrection fern	<i>Pleopeltis polypodioides var. michauxiana</i>	
Shrubby camphorweed	<i>Pluchea odorata</i>	
Rosy camphorweed	<i>Pluchea rosea</i>	
Wild poinsettia	<i>Poinsettia cyathophora</i>	
Boykin's milkwort	<i>Polygala boykinii</i>	
Showy milkwort	<i>Polygala grandiflora</i>	
Procession flower	<i>Polygala incarnata</i>	
Swamp smartweed	<i>Polygonum hydropiperoides</i>	
Rustweed	<i>Polypremum procumbens</i>	
Purslane	<i>Portulaca oleracea</i>	
Pink purslane	<i>Portulaca pilosa</i>	
Red-stem purslane	<i>Portulaca rubricaulis</i>	
Sweet everlasting	<i>Pseudognaphalium obtusifolium</i>	
Guava *	<i>Psidium guajava</i>	
Whisk fern	<i>Psilotum nudum</i>	
Wild coffee	<i>Psychotria nervosa</i>	
Bracken	<i>Pteridium aquilinum var. caudatum</i>	
Coastal blackroot; rabbit-tobacco	<i>Pterocaulon pycnostachyum</i>	
Hairline mock bishop's-weed	<i>Ptilimnium capillaceum</i>	
Live oak	<i>Quercus virginiana</i>	
White indigo-berry	<i>Randia aculeata</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Myrsine	<i>Rapanea punctata</i>	
Red mangrove	<i>Rhizophora mangle</i>	
Red Natalgrass *	<i>Rhynchelytrum repens</i>	
Michaux's snout-bean	<i>Rhynchosia michauxii</i>	
Dollarleaf	<i>Rhynchosia reniformis</i>	
Star rush	<i>Rhynchospora colorata</i>	
Gray's beaksedge	<i>Rhynchospora grayi</i>	
Southern beaksedge	<i>Rhynchospora microcarpa</i>	
Bloodberry	<i>Rivina humilis</i>	
Widgeon-grass	<i>Ruppia maritima</i>	
Cabbage palm	<i>Sabal palmetto</i>	
Bull-tongue arrowhead	<i>Sagittaria lancifolia</i>	
Carolina willow	<i>Salix caroliniana</i>	
Tropical sage	<i>Salvia coccinea</i>	
Water pimpernel	<i>Samolus ebracteatus</i>	
Pineland pimpernel	<i>Samolus valerandi subsp. parviflorus</i>	
African bowstring hemp *	<i>Sansevieria hyacinthoides</i>	
Perennial glasswort; Virginia glasswort	<i>Salicornia perennis</i>	
White vine	<i>Sarcostemma clausum</i>	
Inkberry	<i>Scaevola plumieri</i>	1, 5, 9
Beach naupka *	<i>Scaevola taccada var. sericea</i>	
Australian umbrella tree *	<i>Schefflera actinophylla</i>	
Brazilian pepper *	<i>Schinus terebinthifolius</i>	
Tall nutgrass	<i>Scleria triglomerata</i>	
Sweetbroom; licorice-weed	<i>Scoparia dulcis</i>	
Princess-of-the-night *	<i>Selenicereus pteranthus</i>	
Saw palmetto	<i>Serenoa repens</i>	
Shoreline sea-purslane	<i>Sesuvium portulacastrum</i>	
Coastal foxtail	<i>Setaria corrugata</i>	
Coral foxtail	<i>Setaria macrosperma</i>	
Knotroot foxtail	<i>Setaria parviflora</i>	
Broomweed	<i>Sida acuta</i>	
Elliott's fanpetal	<i>Sida elliotii</i>	
Saffron-plum	<i>Sideroxylon celastrinum</i>	
False mastic	<i>Sideroxylon foetidissimum</i>	
Narrow-leaf blue-eyed grass	<i>Sisyrinchium angustifolium</i>	
Ear-leaf greenbrier	<i>Smilax auriculata</i>	
Common nightshade	<i>Solanum americanum</i>	
Black nightshade	<i>Solanum chenopodioides</i>	
Chapman's goldenrod	<i>Solidago odora var. chapmanii</i>	
Seaside goldenrod	<i>Solidago sempervirens</i>	
Spiny leaved cow-thistle *	<i>Sonchus asper</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	Scientific Name	Primary Habitat Codes (for designated species)
Common sow-thistle *	<i>Sonchus oleraceus</i>	
Yellow necklace pod *	<i>Sophora tomentosa</i> var. <i>occidentalis</i>	
Yellow necklace pod	<i>Sophora tomentosa</i> var. <i>truncata</i>	
Sand cordgrass	<i>Spartina bakeri</i>	
Saltmeadow cordgrass	<i>Spartina patens</i>	
Prostrate false buttonweed	<i>Spermacoce prostrata</i>	
Coral dropseed	<i>Sporobolus domingensis</i>	
Smutgrass *	<i>Sporobolus indicus</i>	
Smutgrass *	<i>Sporobolus indicus</i> var. <i>pyramidalis</i>	
Seashore dropseed	<i>Sporobolus virginicus</i>	
Blue porterweed	<i>Stachytarpheta jamaicensis</i>	
Diamond-flowers	<i>Stenaria nigricans</i>	
St. Augustinegrass *	<i>Stenotaphrum secundatum</i>	
Sea blite	<i>Suaeda linearis</i>	
Bay-cedar	<i>Suriana maritima</i>	
Annual saltmarsh aster	<i>Symphotrichum subulatum</i>	
Cape honeysuckle *	<i>Tecoma capensis</i>	
Widespread maiden fern	<i>Thelypteris kunthii</i>	
Marsh fern	<i>Thelypteris palustris</i> var. <i>pubescens</i>	
Portia tree *	<i>Thespesia populnea</i>	
Blackeyed susan *	<i>Thunbergia alata</i>	
Medusahead air plant	<i>Tillandsia balbisiana</i>	5, 7
Giant air plant	<i>Tillandsia fasciculata</i> var. <i>densispica</i>	
Twisted air plant	<i>Tillandsia flexuosa</i>	5, 7
Wild pine	<i>Tillandsia paucifolia</i>	
Small ball-moss	<i>Tillandsia recurvata</i>	
Southern needleleaf air plant	<i>Tillandsia setacea</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Spreading air plant	<i>Tillandsia utriculata</i>	5, 7
Eastern poison ivy	<i>Toxicodendron radicans</i>	
Forked bluecurls	<i>Trichostema dichotomum</i>	
Coat buttons *	<i>Tridax procumbens</i>	
Purple sandgrass	<i>Triplasis purpurea</i>	
Eastern gamagrass	<i>Tripsacum dactyloides</i>	
Southern cattail	<i>Typha domingensis</i>	
Sea oats	<i>Uniola paniculata</i>	
White crownbeard	<i>Verbesina virginica</i>	
Giant ironweed	<i>Vernonia gigantea</i>	
four-leaf vetch	<i>Vicia acutifolia</i>	
Piedmont cow-pea	<i>Vigna luteola</i>	
Summer grape	<i>Vitis aestivalis</i>	
Southern fox grape	<i>Vitis rotundifolia</i>	
Shoestring fern	<i>Vittaria lineata</i>	

* Non-native Species

Cayo Costa State Park

Plants

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for designated species)
Basora prieta	<i>Waltheria indica</i>	
Washington palm *	<i>Washingtonia robusta</i>	
Virginia chain fern	<i>Woodwardia virginica</i>	
Tallowwood; Hog-plum	<i>Ximenia americana</i>	
Elliott's yellow-eyed grass	<i>Xyris elliotii</i>	
Spanish dagger	<i>Yucca aloifolia</i>	
Coontie	<i>Zamia pumila</i>	8
Hercules-club	<i>Zanthoxylum clava-herculis</i>	
Wild lime	<i>Zanthoxylum fagara</i>	

Cayo Costa State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
FISH		
Nurse shark	<i>Ginglymostoma cirratum</i>	77
Bull shark	<i>Carcharhinus leucas</i>	77
Blacktip shark	<i>Carcharhinus limbatus</i>	77
Sandbar shark	<i>Carcharhinus plumbeus</i>	77
Bonnethead shark	<i>Sphyrna tiburo</i>	77
Southern stingray	<i>Dasyatis americana</i>	77
Spotted eagle ray	<i>Aetobatis narinari</i>	77
Ladyfish	<i>Elops saurus</i>	77
Tarpon	<i>Megalops atlantica</i>	77
Common snook	<i>Centropomus undecimalis</i>	77
Trumpet fish	<i>Aulostomus maculatus</i>	77
Goliath grouper	<i>Epinephelus itajara</i>	77
Gag grouper	<i>Mycteroperca microlepis</i>	77
Cobia	<i>Rachycentron canadum</i>	77
Blue runner	<i>Caranx crysos</i>	77
Jack crevalle	<i>Caranx hippos</i>	77
Florida pompano	<i>Trachinotus carolinus</i>	77
Gray snapper	<i>Lutjanus griseus</i>	77
White grunt	<i>Haemulon plumieri</i>	77
Pinfish	<i>Lagodon rhomboides</i>	77
Sheepshead	<i>Lagodon rhomboides</i>	77
Spotted seatrout	<i>Cynoscion nebulosus</i>	77
Black drum	<i>Pogonias cromis</i>	77
Red drum	<i>Sciaenops ocellatus</i>	77
Striped mullet	<i>Mugil cephalus</i>	77
Spanish mackerel	<i>Scomberomorus maculatus</i>	77
Gulf flounder	<i>Paralichthys albigutta</i>	77
Puffer	<i>Sphoeroides nephelus</i>	77
AMPHIBIANS		
Southern leopard frog	<i>Rana sphenoccephala</i>	29
Eastern narrowmouth toad	<i>Gastrophryne carolinensis</i>	29
Cuban treefrog*	<i>Osteopilus septentrionalis</i>	81
Squirrel treefrog	<i>Hyla squirella</i>	7, 29
REPTILES		
American alligator	<i>Alligator mississippiensis</i>	7, 29, 77, 81
Common snapping turtle	<i>Chelydra serpentina serpentina</i>	29
Box turtle	<i>Terrapene carolina</i>	7
Ornate diamondback terrapin	<i>Malaclemys terrapin macrospilota</i>	76
Florida cooter	<i>Pseudemys floridana floridana</i>	77

* Non-native Species

Cayo Costa State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Gopher tortoise	<i>Gopherus polyphemus</i>	3, 5, 9
Atlantic green turtle	<i>Chelonia mydas</i>	77
Atlantic loggerhead	<i>Caretta caretta</i>	77
Atlantic ridley	<i>Lepidochelys kempii</i>	77
Green anole	<i>Anolis carolinensis carolinensis</i>	7
Six-lined racerunner	<i>Cnemidophorus sexlineatus sexlineatus</i>	5
Ground skink	<i>Scincella lateralis</i>	16
Mangrove water snake	<i>Nerodia fasciata compressicauda</i>	76
Peninsula ribbon snake	<i>Thamnophis sauritus sackeni</i>	82
Southern black racer	<i>Coluber constrictor priapus</i>	7, 8, 82
Eastern coachwhip	<i>Masticophis flagellum flagellum</i>	5,8
Eastern indigo snake	<i>Drymarchon corais couperi</i>	5
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>	5, 8, 81
Scarlet kingsnake	<i>Lampropeltis triangulum elapsoides</i>	7
Eastern diamondback rattlesnake	<i>Crotalus adamanteus</i>	5,9

BIRDS

Common loon	<i>Gavia immer</i>	77
Horned grebe	<i>Podiceps auritus</i>	77
Sooty shearwater	<i>Puffinus griseus</i>	OF
American white pelican	<i>Pelecanus erythrorhynchos</i>	77, OF
Eastern brown pelican	<i>Pelecanus occidentalis carolinensis</i>	76, OF
Northern gannet	<i>Sula bassanus</i>	77
Red-footed booby	<i>Sula sula</i>	77
Double-crested cormorant	<i>Phalacrocorax auritus</i>	77
Anhinga	<i>Anhinga anhinga</i>	OF
Magnificent frigatebird	<i>Fregata magnificens</i>	OF
Great blue heron	<i>Ardea herodias</i>	77
Green heron	<i>Butorides virescens</i>	76
Cattle egret	<i>Bubulcus ibis</i>	OF
Little blue heron	<i>Egretta caerulea</i>	77
Reddish egret	<i>Egretta rufescens</i>	77
Great egret	<i>Ardea alba</i>	77
Snowy egret	<i>Egretta thula</i>	77, 29
Tricolored heron	<i>Egretta tricolor</i>	77
Black-crowned night heron	<i>Nycticorax nycticorax</i>	76
Yellow-crowned night heron	<i>Nyctanassa violacea</i>	76
Wood stork	<i>Mycteria americana</i>	OF
Glossy ibis	<i>Plegadis falcinellus</i>	77, OF
White ibis	<i>Eudocimus albus</i>	77
Roseate spoonbill	<i>Ajaia ajaja</i>	77

* Non-native Species

Cayo Costa State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Mottled duck	<i>Anas fulvigula</i>	OF
Blue-winged teal	<i>Anas discors</i>	29
Canvasback	<i>Aythya valisineria</i>	77
Lesser scaup	<i>Aythya affinis</i>	77
Ruddy duck	<i>Oxyura jamaicensis</i>	77
Red-breasted merganser	<i>Mergus serrator</i>	77
Turkey vulture	<i>Cathartes aura</i>	OF
Black vulture	<i>Coragyps atratus</i>	OF
Swallow-tailed kite	<i>Elanoides forficatus</i>	OF
Sharp-shinned hawk	<i>Accipiter striatus</i>	OF
Cooper's hawk	<i>Accipiter cooperii</i>	OF
Red-tailed hawk	<i>Buteo jamaicensis</i>	8
Red-shouldered hawk	<i>Buteo lineatus</i>	5, 7, 81
Broad-winged hawk	<i>Buteo platypterus</i>	7
Short-tailed hawk	<i>Buteo brachyurus</i>	81
Southern bald eagle	<i>Haliaeetus leucocephalus</i>	1, 8
Northern harrier	<i>Circus cyaneus</i>	OF
Osprey	<i>Pandion haliaetus</i>	8, 76, OF
Peregrine falcon	<i>Falco peregrinus tundrius</i>	1, OF
Merlin	<i>Falco columbarius</i>	OF
American kestrel	<i>Falco sparverius</i>	1, 5, OF
Northern bobwhite	<i>Colinus virginianus</i>	8
Sora	<i>Porzana carolina</i>	29
Clapper rail	<i>Rallus longirostris</i>	29
Purple gallinule	<i>Porphyryla martinica</i>	77
Common moorhen	<i>Gallinula chloropus</i>	29
American coot	<i>Fulica americana</i>	29, 77
American oystercatcher	<i>Haematopus palliatus</i>	1
Semipalmated plover	<i>Charadrius semipalmatus</i>	1
Piping plover	<i>Charadrius melodus</i>	77
Southeastern snowy plover	<i>Charadrius alexandrinus tenuirostris</i>	1
Wilson's plover	<i>Charadrius wilsonia</i>	1
Killdeer	<i>Charadrius vociferus</i>	77
Black-bellied plover	<i>Pluvialis squatarola</i>	77
Ruddy turnstone	<i>Arenaria interpres</i>	77
Common snipe	<i>Gallinago gallinago</i>	29
Long-billed curlew	<i>Numenius americanus</i>	77, OF
Whimbrel	<i>Numenius phaeopus</i>	77
Spotted sandpiper	<i>Actitis macularia</i>	77
Greater yellowlegs	<i>Tringa melanoleuca</i>	77
Lesser yellowlegs	<i>Tringa flavipes</i>	77
Willet	<i>Catoptrophorus semipalmatus</i>	77
Red knot	<i>Calidris canutus</i>	77

* Non-native Species

Cayo Costa State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Pectoral sandpiper	<i>Calidris melanotos</i>	77
Dunlin	<i>Calidris alpina</i>	77
Semipalmated sandpiper	<i>Calidris pusilla</i>	77
Western sandpiper	<i>Calidris mauri</i>	77
Sanderling	<i>Calidris alba</i>	77
Stilt sandpiper	<i>Calidris himantopus</i>	77
Short-billed dowitcher	<i>Limnodromus griseus</i>	77
Long-billed dowitcher	<i>Limnodromus scolopaceus</i>	77
Marbled godwit	<i>Limosa fedoa</i>	77
Red-necked phalarope	<i>Phalaropus lobatus</i>	77
American avocet	<i>Recurvirostra americana</i>	77
Black-necked stilt	<i>Himantopus mexicanus</i>	77
Great black-backed gull	<i>Larus marinus</i>	77
Herring gull	<i>Larus argentatus</i>	77, OF
Ring-billed gull	<i>Larus delawarensis</i>	77, OF
Laughing gull	<i>Larus atricilla</i>	77, OF
Bonaparte's gull	<i>Larus philadelphia</i>	OF
Gull-billed tern	<i>Sterna nilotica</i>	OF
Forster's tern	<i>Sterna forsteri</i>	77
Common tern	<i>Sterna hirundo</i>	77
Bridled tern	<i>Sterna anaethetus</i>	OF
Least tern	<i>Sterna antillarum</i>	1
Royal tern	<i>Sterna maxima</i>	77
Sandwich tern	<i>Sterna sandvicensis</i>	77
Caspian tern	<i>Sterna caspia</i>	77
Black tern	<i>Chlidonias niger</i>	77
Black skimmer	<i>Rynchops niger</i>	1,77
Mourning dove	<i>Zenaida macroura</i>	MTC
Eurasian collared dove*	<i>Streptopelia decaocto</i>	81
Common ground-dove	<i>Columbina passerina</i>	5
Budgerigar*	<i>Melopsittacus undulatus</i>	81
Mangrove cuckoo	<i>Coccyzus minor</i>	76
Yellow-billed cuckoo	<i>Coccyzus americanus</i>	7
Barn owl	<i>Tyto alba</i>	7, 82
Eastern screech-owl	<i>Otus asio</i>	7
Great horned owl	<i>Bubo virginianus</i>	5, 8
Florida burrowing owl	<i>Athene cunicularia floridana</i>	5
Barred owl	<i>Strix varia</i>	7
Chuck-will's-widow	<i>Caprimulgus carolinensis</i>	7
Common nighthawk	<i>Chordeiles minor</i>	OF
Chimney swift	<i>Chaetura pelagica</i>	OF
Ruby-throated hummingbird	<i>Archilochus colubris</i>	OF
Belted kingfisher	<i>Ceryle alcyon</i>	OF

* Non-native Species

Cayo Costa State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Northern flicker	<i>Colaptes auratus</i>	76
Pileated woodpecker	<i>Dryocopus pileatus</i>	7,8
Red-bellied woodpecker	<i>Melanerpes carolinus</i>	5, 81
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>	7
Downy woodpecker	<i>Picoides pubescens</i>	81
Gray kingbird	<i>Tyrannus dominicensis</i>	76
Scissor-tailed flycatcher	<i>Tyrannus forficatus</i>	5
Great crested flycatcher	<i>Myiarchus crinitus</i>	8
Eastern phoebe	<i>Sayornis phoebe</i>	8
Eastern wood-pewee	<i>Contopus virens</i>	7
Tree swallow	<i>Tachycineta bicolor</i>	OF
Bank swallow	<i>Riparia riparia</i>	OF
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>	OF
Barn swallow	<i>Hirundo rustica</i>	OF
Purple martin	<i>Progne subis</i>	OF
Blue jay	<i>Cyanocitta cristata</i>	8
American crow	<i>Corvus brachyrhynchos</i>	MYC
Fish crow	<i>Corvus ossifragus</i>	MTC
House wren	<i>Troglodytes aedon</i>	7, 8
Carolina wren	<i>Thryothorus ludovicianus</i>	7, 8
Marsh wren	<i>Cistothorus palustris</i>	29
Sedge wren	<i>Cistothorus platensis</i>	29
Northern mockingbird	<i>Mimus polyglottos</i>	5, 81
Gray catbird	<i>Dumetella carolinensis</i>	7
Brown thrasher	<i>Toxostoma rufum</i>	7, 8
Wood thrush	<i>Hylocichla mustelina</i>	7
Hermit thrush	<i>Catharus guttatus</i>	7
Swainson's thrush	<i>Catharus ustulatus</i>	7
Gray-cheeked thrush	<i>Catharus minimus</i>	7
Veery	<i>Catharus fuscescens</i>	7
Blue-gray gnatcatcher	<i>Polioptila caerulea</i>	7, 8
Ruby-crowned kinglet	<i>Regulus calendula</i>	7, 8
Cedar waxwing	<i>Bombycilla cedrorum</i>	8
Loggerhead shrike	<i>Lanius ludovicianus</i>	5, 9
European starling*	<i>Sturnus vulgaris</i>	81
White-eyed vireo	<i>Vireo griseus</i>	7, 8
Yellow-throated vireo	<i>Vireo flavifrons</i>	7
Blue-headed vireo	<i>Vireo solitarius</i>	8
Black-whiskered vireo	<i>Vireo altiloquus</i>	7, 81
Black and white warbler	<i>Mniotilta varia</i>	7
Prothonotary warbler	<i>Protonotaria citrea</i>	7
Swainson's warbler	<i>Limnothlypis swainsonii</i>	7
Worm-eating warbler	<i>Helmitheros vermivorus</i>	7

* Non-native Species

Cayo Costa State Park

Animals

Common Name	Scientific Name	Primary Habitat Codes (for all species)
Orange-crowned warbler	<i>Vermivora celata</i>	7
Northern parula	<i>Parula americana</i>	7, 8
Yellow warbler	<i>Dendroica petechia</i>	7
Magnolia warbler	<i>Dendroica magnolia</i>	7
Cape May warbler	<i>Dendroica tigrina</i>	7
Black-throated blue warbler	<i>Dendroica caerulescens</i>	7
Yellow-rumped warbler	<i>Dendroica coronata</i>	7, 8
Black-throated green warbler	<i>Dendroica virens</i>	7
Yellow-throated warbler	<i>Dendroica dominica</i>	7
Blackpoll warbler	<i>Dendroica striata</i>	7
Prairie warbler	<i>Dendroica discolor</i>	8
Palm warbler	<i>Dendroica palmarum</i>	8
Ovenbird	<i>Seiurus aurocapillus</i>	7
Northern waterthrush	<i>Seiurus noveboracensis</i>	7
Louisiana waterthrush	<i>Seiurus motacilla</i>	7
Common yellowthroat	<i>Geothlypis trichas</i>	8
Hooded warbler	<i>Wilsonia citrina</i>	7
American redstart	<i>Setophaga ruticilla ruticilla</i>	7
Bobolink	<i>Dolichonyx oryzivorus</i>	81
Red-winged blackbird	<i>Agelaius phoeniceus</i>	29
Orchard oriole	<i>Icterus spurius</i>	7, 81
Baltimore oriole	<i>Icterus galbula</i>	7, 81
Scarlet tanager	<i>Piranga olivacea</i>	8, 81
Summer tanager	<i>Piranga rubra</i>	7
Northern cardinal	<i>Cardinalis cardinalis</i>	8
Rose-breasted grosbeak	<i>Pheucticus ludovicianus</i>	81
Indigo bunting	<i>Passerina cyanea</i>	7, 81
Painted bunting	<i>Passerina ciris</i>	7, 81
Eastern towhee	<i>Pipilo erythrophthalmus</i>	1, 5
Swamp sparrow	<i>Melospiza georgiana</i>	29
Pine siskin	<i>Carduelis pinus</i>	3, 81
American goldfinch	<i>Carduelis tristis</i>	81

MAMMALS

Virginia opossum	<i>Didelphis virginiana</i>	MTC
Marsh rabbit	<i>Sylvilagus palustris</i>	29
Gray squirrel	<i>Sciurus carolinensis</i>	7, 8
Hispid cotton rat	<i>Sigmodon hispidus</i>	7
Black rat*	<i>Rattus rattus</i>	MTC
Raccoon	<i>Procyon lotor</i>	MTC
River otter	<i>Lutra canadensis</i>	29, 77
Bobcat	<i>Felis rufus</i>	5, 7

* Non-native Species

Cayo Costa State Park

Animals

Common Name	<i>Scientific Name</i>	Primary Habitat Codes (for all species)
West Indian manatee	<i>Trichechus manatus</i>	77
Atlantic bottle-nosed dolphin	<i>Tursiops truncatus</i>	77
Feral hog	<i>Sus scrofa</i>	7, 8, 81

Habitat Codes

TERRESTRIAL

1. Beach Dune
2. Bluff
3. Coastal Berm
4. Coastal Rock Barren
5. Coastal Strand
6. Dry Prairie
7. Maritime Hammock
8. Mesic Flatwoods
9. Coastal Grasslands
10. Pine Rockland
11. Prairie Hammock
12. Rockland Hammock
13. Sandhill
14. Scrub
15. Scrubby Flatwoods
16. Shell Mound
17. Sinkhole
18. Slope Forest
19. Upland Glade
20. Upland Hardwood Forest
21. Upland Mixed Forest
22. Upland Pine Forest
23. Xeric Hammock

PALUSTRINE

24. Basin Marsh
25. Basin Swamp
26. Baygall
27. Bog
28. Bottomland Forest
29. Depression Marsh
30. Dome
31. Floodplain Forest
32. Floodplain Marsh
33. Floodplain Swamp
34. Freshwater Tidal Swamp
35. Hydric Hammock
36. Marl Prairie
37. Seepage Slope
38. Slough
39. Strand Swamp
40. Swale
41. Wet Flatwoods
42. Wet Prairie

LACUSTRINE

43. Clastic Upland Lake
44. Coastal Dune Lake
45. Coastal Rockland Lake
46. Flatwood/Prairie Lake
47. Marsh Lake
48. River Floodplain Lake

LACUSTRINE—Continued

49. Sandhill Upland Lake
50. Sinkhole Lake
51. Swamp Lake

RIVERINE

52. Alluvial Stream
53. Blackwater Stream
54. Seepage Stream
55. Spring-Run Stream

ESTUARINE

56. Estuarine Composite Substrate
57. Estuarine Consolidated Substrate
58. Estuarine Coral Reef
59. Estuarine Grass Bed
60. Estuarine Mollusk Reef
61. Estuarine Octocoral Bed
62. Estuarine Sponge Bed
63. Estuarine Tidal Marsh
64. Estuarine Tidal Swamp
65. Estuarine Unconsolidated Substrate
66. Estuarine Worm Reef

MARINE

67. Marine Algal Bed
68. Marine Composite Substrate
69. Marine Consolidated Substrate
70. Marine Coral Reef
71. Marine Grass Bed
72. Marine Mollusk Reef
73. Marine Octocoral Bed
74. Marine Sponge Bed
75. Marine Tidal Marsh
76. Marine Tidal Swamp
77. Marine Unconsolidated Substrate
78. Marine Worm Reef

SUBTERRANEAN

79. Aquatic Cave
80. Terrestrial Cave

MISCELLANEOUS

81. Ruderal
82. Developed

MTC Many Types Of Communities

OF Overflying

Habitat Codes

Addendum 5—Designated Species List

Rank Explanations For FNAI Global Rank, FNAI State Rank, Federal Status and State Status

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 man-made 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 and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
G4	=	apparently secure globally (may be rare in parts of range)
G5	=	demonstrably secure globally
GH	=	of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
GX	=	believed to be extinct throughout range
GXC	=	extirpated from the wild but still known from captivity or cultivation
G#?	=	tentative rank (e.g., G2?)
G#G#	=	range of rank; insufficient data to assign specific global rank (e.g., G2G3)
G#T#	=	rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
G#Q	=	rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
G#T#Q	=	same as above, but validity as subspecies or variety is questioned.
GU	=	due to lack of information, no rank or range can be assigned (e.g., GUT2).
G?	=	not yet ranked (temporary)
S1	=	Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2	=	Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3	=	Either very rare and 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)

LEGAL STATUS

N = Not currently listed,nor currently being considered for listing,by state or federal agencies.

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

- LE = Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species that is in danger of extinction throughout all or a significant portion of its range.
- PE = Proposed for addition to the List of Endangered and Threatened Wildlife and Plants as Endangered Species.
- LT = Listed as Threatened Species. Defined as any species that is likely to become an endangered species within the near future throughout all or a significant portion of its range.
- PT = Proposed for listing as Threatened Species.
- C = Candidate Species for addition to the list of Endangered and Threatened Wildlife and Plants. Defined as those species for which the USFWS currently has on file sufficient information on biological vulnerability and threats to support proposing to list the species as endangered or threatened.
- E(S/A) = Endangered due to similarity of appearance.
- T(S/A) = Threatened due to similarity of appearance.

STATE

Animals (Listed by the Florida Fish and Wildlife Conservation Commission - FFWCC)

- LE = Listed as Endangered Species by the FFWCC. 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 FFWCC. 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 as a consequence is destined or very likely to become an endangered species within the foreseeable future.
- LS = Listed as Species of Special Concern by the FFWCC. 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 which,in the foreseeable 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.
- CE = Commercially Exploited

Cayo Costa State Park

Designated Species

Plants

Common Name/ Scientific Name	<u>Designated Species Status</u>		
	FDA	USFWS	FNAI
West Indian cock's comb <i>Celosia nitida</i>	LE		
Spiny hackberry <i>Celtis ehrenbergiana</i>	LE		G4/S1
Coastal dune sandmat <i>Chamaesyce cumulicola</i>	LE		G2/S2
Butterfly orchid <i>Encyclia tampensis</i>	CE		
Sanibel lovegrass <i>Eragrostis tracyi</i>	LE		G2/S2
Prickly-apple cactus <i>Harrisia aboriginum</i>	LE	MC	G1/S1
Joewood <i>Jacquinia keyensis</i>	LT		G4/S3
Florida mayten <i>Maytenus phyllanthoides</i>	LT		
Shell mound prickly pear cactus <i>Opuntia stricta</i>	LT		
Inkberry <i>Scaveola plumieri</i>	LT		
Medusahead air plant <i>Tillandsia balbiana</i>	LT		
Twisted air plant <i>Tillandsia flexuosa</i>	LT		G5/S3
Spreading air plant <i>Tillandsia utriculata</i>	LE		
Coontie <i>Zamia pumila</i>	CE		

Cayo Costa State Park

Designated Species

Animals

Common Name/ Scientific Name	<u>Designated Species Status</u>		
	FFWCC	USFWS	FNAI
AMPHIBIANS			
Florida gopher frog <i>Rana capito</i>	LS		G3G4,S3
REPTILES			
American alligator <i>Alligator mississippiensis</i>	LS	LT(S/A)	G5,S4
Atlantic ridley Gopher tortoise <i>Gopherus polyphemus</i>	LS		G3,S3
Atlantic ridley <i>Lepidochelys kempii</i>	LE	LE	G1, S1
Atlantic green turtle <i>Chelonia mydas</i>	LE	LE	G3,S2
Atlantic loggerhead <i>Caretta caretta</i>	LT	LT	G3,S3
Eastern indigo snake <i>Drymarchon corais cooperi</i>	LT	LT	G4T3,S3
Eastern diamondback rattlesnake <i>Crotalus adamanteus</i>			G5,S3
BIRDS			
Eastern brown pelican <i>Pelecanus occidentalis</i>	LS		G4,S3
Magnificent frigatebird <i>Fregata magnificens</i>			G5,S1
Great white heron <i>Ardea herodias</i>			G5T2,S2
Little blue heron <i>Egretta caerulea</i>	LS		G5,S4
Reddish egret <i>Egretta rufescens</i>	LS		G4,S2
Great egret <i>Ardea alba</i>			G5,S4
Snowy egret <i>Egretta thula</i>	LS		G5,S3
Tricolored heron <i>Egretta tricolor</i>	LS		G5,S4
Black-crowned night heron <i>Nycticorax nycticorax</i>			G5,S3

Cayo Costa State Park

Designated Species

Animals

Common Name/ Scientific Name	<u>Designated Species Status</u>		
	FFWCC	USFWS	FNAI
Yellow-crowned night heron <i>Nyctanassa violacea</i>			G5,S3
Least bittern <i>Ixobrychus exilis</i>			G5,S4
Wood stork <i>Mycteria americana</i>	LE	LE	G4,S2
Glossy ibis <i>Plegadis falcinellus</i>			G5,S3
White ibis <i>Eudocimus albus</i>	LS		G5,S4
Roseate spoonbill <i>Ajaia ajaja</i>	LS		G5,S2
Snail kite <i>Rostrhamus sociabilis</i>	LE	LE	G4G5T2,S2
Cooper's hawk <i>Accipiter cooperii</i>			G5,S3
Short-tailed hawk <i>Buteo brachyurus</i>			G4G5,S1
Southern bald eagle <i>Haliaeetus leucocephalus</i>	LT	LT	G4,S3
Osprey <i>Pandion haliaetus</i>			G5,S3S4
Crested caracara <i>Caracara cheriway</i>	LT	LT	G5,S2
Peregrine falcon <i>Falco peregrinus</i>	LE		G4,S2
Merlin <i>Falco columbarius</i>			G5,S2
Southeastern American kestrel <i>Falco sparverius</i>	LT		G5T4,S3
Florida sandhill crane <i>Grus canadensis</i>	LT		G5T2T3,S2S3
Limpkin <i>Aramus guarauna</i>	LS		G5,S3
American oystercatcher <i>Haematopus palliatus</i>	LS		G5,S2
American avocet <i>Recurvirostra americana</i>			G5,S2
Least tern <i>Sterna antillarum</i>	LT		G4,S3
Royal tern <i>Sterna maxima</i>			G5,S3

Cayo Costa State Park

Designated Species

Animals

Common Name/ Scientific Name	<u>Designated Species Status</u>		
	FFWCC	USFWS	FNAI
Sandwich tern <i>Sterna sandvicensis</i>			G5,S2
Caspian tern <i>Sterna caspia</i>			G5,S2
Black skimmer <i>Rynchops niger</i>	LS		G5,S3
Piping plover <i>Charadrius melodus</i>	LT	LT	G3,S2
Wislons' plover <i>Charadrius wilsonii</i>	LT	LT	G5,S2
Southeastern snowy plover <i>Charadrius alexandrinus tenuirostris</i>	LT	LT	G4,S1
White-crowned pigeon <i>Columba leucocephala</i>	LT		G3,S3
Florida burrowing owl <i>Athene cunicularia</i>	LS		G4T3,S3
Southern hairy woodpecker <i>Picoides villosus</i>			G5,S3
Red-cockaded woodpecker <i>Picoides borealis</i>	LT	LE	G3,S2
Florida scrub-jay <i>Aphelocoma coerulescens</i>	LT	LT	G2,S2
White-breasted nuthatch <i>Sitta carolinensis</i>			G5,S2
Worm-eating warbler <i>Helmitheros vermivorus</i>			G5,S1
American redstart <i>Setophaga ruticilla</i>			G5,S2
Florida grasshopper sparrow <i>Ammodramus savannarum</i>	LE	LE	G5T1,S1
Bachman's sparrow <i>Aimophila aestivalis</i>			G3,S3

MAMMALS

Sherman's fox squirrel <i>Sciurus niger shermani</i>	LS		G5T3,S3
Round-tailed muskrat <i>Neofiber alleni</i>			G3,S3
Florida black bear <i>Ursus americanus floridanus</i>	LT		G5T2,S2
Florida long-tailed weasel <i>Mustela frenata peninsulæ</i>			G5T3,S3

Cayo Costa State Park

Designated Species

Animals

Common Name/ <i>Scientific Name</i>	<u>Designated Species Status</u>		
	FFWCC	USFWS	FNAI
Florida Panther <i>Puma concolor coryi</i>	LE	LE	G5T1,S1
West Indian manatee <i>Trichechus manatus</i>	LE	LE	G2,S2

Cayo Costa State Park

Designated Species

Animals

**Common Name/
*Scientific Name***

Designated Species Status

FFWCC

USFWS

FNAI

Addendum 6—Priority Schedule And Cost Estimates

Cayo Costa State Park
Priority Schedule And Cost Estimates

Estimates are developed for the funding and staff resources needed to implement the management plan based on goals, objectives and priority management activities. Funding priorities for all state park management and development activities are reviewed each year as part of the Division's legislative budget process. The Division prepares an annual legislative budget request based on the priorities established for the entire state park system. The Division also aggressively pursues a wide range of other funds and staffing resources, such as grants, volunteers, and partnerships with agencies, local governments and the private sector for supplementing normal legislative appropriations to address unmet needs. The ability of the Division to implement the specific goals, objectives and priority actions identified in this plan will be determined by the availability of funding resources for these purposes.

Resource Management

1. Exotic removal and maintenance completed over five years.

Estimated Cost: Contracted cost, including manpower, herbicide and travel is \$950/ac for removal and maintenance of Brazilian pepper and Australian pine in an island situation. There are approximately 900 acres on Cayo Costa, 15 acres on Punta Blanca, 100 acres at North Captiva and 4 acres at Jug Creek (Cayo landbase property), a total of 1019 acres in need of initial treatment or maintenance.

Subtotal: \$968,050.00

2. Prescribed burns over ten years.

Estimated Cost: Prescribed burning is based on approximately 85 acres divided into three zones. The cost of burning includes man-hours and the operation of equipment. Approximately 5 individuals are needed to burn, averaging \$15.77/hour, 10 hours per burn, 1 burns per year = \$788.00/yr plus operational costs and equipment needs of a brush truck, brown tree cutter, prep, fuel costs and post-burn evaluation.

Subtotal: \$85,500.00

3. Protection of shorebird nesting and monitoring over ten years:

Estimated Cost: A park ranger should patrol the site daily during the week and twice daily during weekends and holidays. Allowing 2 hours per day at \$15.77/hour = \$220.78/wk for 20 weeks = \$4,415.60/yr
Signs, barriers, educational displays and fuel would cost \$2000/yr.

Subtotal: \$64,156.00

4. Monitor sea turtle nesting over ten years:

Estimated Cost: A park ranger will need to survey the beach daily during sea turtle nesting

* **Categories of the uniform cost accounting system not reflected in this addendum, have no schedule or cost associated with them.**

Cayo Costa State Park
Priority Schedule And Cost Estimates

season (May through October). At \$15.77/hr, 17.5 hrs/wk for 26 wks = \$7175.35/yr. Signs, screening, educational displays and materials and fuel would cost \$2500/yr.

Subtotal: \$96,754.00

5. Control of feral hogs over ten years:

Estimated cost: A park ranger will monitor contractor removal of feral hogs. Rangers will also remove hogs as necessary. Supplies needed: wire traps and 22 caliber rim fire shells and other supplies at \$3000.00/yr. One ranger \$15.77/hr, 1 hour/day times 7 days per week times 52 wks = \$5740.28/yr.

Subtotal: \$87,403.00

6. Monitoring of cultural resources over ten years:

Estimated cost: A park ranger will patrol the cultural resources sites \$15.77/hr x 10 hrs/wk x 52 wks.

Subtotal: \$82,004.00

7. Compile a detailed, up-to-date description and condition assessment of the park's cultural resources within 1-3 years:

Estimated cost: One ranger @ \$15.77/hr. x 40 hours X 6 months.

Subtotal: \$15,139

8. Develop a written cultural resource management plan within 1-3 years

Estimated cost: Park and BNCR staff time @ \$17/hr. x 40 hrs. X 2 months.

Subtotal: \$5,440.00

Total Cost: \$1,404,446.00

Administration

1. Additional personnel resources to meet general administrative duties. Annually recurring over 10 years:

Estimated Cost: Approximately 40 hrs./week x 52 wks. x 10 yrs. @ \$13/hr.

Total Cost: \$270,400.00

* Categories of the uniform cost accounting system not reflected in this addendum, have no schedule or cost associated with them.

Cayo Costa State Park
Priority Schedule And Cost Estimates

Visitor Service—Recreation

- 1. Additional personnel resources to meet park programming and routine maintenance, cleaning and other non-administrative duties. Annually recurring over 10 years:**

Estimated Cost: Approximately 54 hrs./week x 52 wks. x 10 yrs. @ \$13/hr.

Total Cost: **\$365,040.00**

*** Categories of the uniform cost accounting system not reflected in this addendum, have no schedule or cost associated with them.**

**Cayo Costa State Park
Priority Schedule And Cost Estimates**

Capital Improvements

Development Area or Facilities	Estimated Cost
Boating Access	\$273,750.00
Bokeelia Island	\$45,000.00
Gulfside Use Area	\$604,000.00
Park Tram	\$175,000.00
Pelican Bay Use Area	\$773,750.00
Support Facilities	\$31,250.00

Total with contingency **\$2,283,300.00**

NOTE: These preliminary cost estimates, based on Divisions standards, do not include costs for site-specific elements not evident at the conceptual level of planning. Additional costs should be investigated before finalizing budget estimates. All items fall in the new facility construction category © of the uniform cost accounting system required by ch. 259.037 F.S.

Addendum 7—Additional Information

FNAI Descriptions

DHR Cultural Management Statement

And

Land Management Review Report—June 29, 2005 LMR

Descriptions Of Natural Communities Developed By FNAI

This summary presents the hierarchical classification and brief descriptions of 82 Natural Communities developed by Florida Natural Areas Inventory and identified as collectively constituting the original, natural biological associations of Florida.

A Natural Community is defined as a distinct and recurring assemblage of populations of plants, animals, fungi and microorganisms naturally associated with each other and their physical environment. For more complete descriptions, see Guide to the Natural Communities of Florida, available from Florida Department of Natural Resources.

The levels of the hierarchy are:

Natural Community Category - defined by hydrology and vegetation.

Natural Community Groups - defined by landform, substrate, and vegetation.

Natural Community Type - defined by landform and substrate; soil moisture condition; climate; fire; and characteristic vegetation.

TERRESTRIAL COMMUNITIES

XERIC UPLANDS
COASTAL UPLANDS
MESIC UPLANDS
ROCKLANDS
MESIC FLATLANDS

PALUSTRINE COMMUNITIES

WET FLATLANDS
SEEPAGE WETLANDS
FLOODPLAIN WETLANDS
BASIN WETLANDS

LACUSTRINE COMMUNITIES

RIVERINE COMMUNITIES

SUBTERRANEAN COMMUNITIES

MARINE/ESTUARINE COMMUNITIES

Definitions of Terms Used in Natural Community Descriptions

TERRESTRIAL - Upland habitats dominated by plants which are not adapted to anaerobic soil conditions imposed by saturation or inundation for more than 10% of the growing season.

XERIC UPLANDS - very dry, deep, well-drained hills of sand with xeric-adapted vegetation.

Sandhill - upland with deep sand substrate; xeric; temperate; frequent fire (2-5 years); longleaf pine and/or turkey oak with wiregrass understory.

Scrub - old dune with deep fine sand substrate; xeric; temperate or subtropical; occasional or rare fire (20 - 80 years); sand pine and/or scrub oaks and/or rosemary and lichens.

Xeric Hammock - upland with deep sand substrate; xeric-mesic; temperate or subtropical; rare or no fire; live oak and/or sand live oak and/or laurel oak and/or other oaks, sparkleberry, saw palmetto.

COASTAL UPLANDS - substrate and vegetation influenced primarily by such coastal (maritime) processes as erosion, deposition, salt spray, and storms.

Beach Dune - active coastal dune with sand substrate; xeric; temperate or subtropical; occasional or rare fire; sea oats and/or mixed salt-spray tolerant grasses and herbs.

Coastal Berm - old bar or storm debris with sand/shell substrate; xeric-mesic; subtropical or temperate; rare or no fire; buttonwood, mangroves, and/or mixed halophytic herbs and/or shrubs and trees.

Coastal Grassland - coastal flatland with sand substrate; xeric-mesic; subtropical or temperate;

Descriptions Of Natural Communities Developed By FNAI

occasional fire; grasses, herbs, and shrubs with or without slash pine and/or cabbage palm.

Coastal Rock Barren - flatland with exposed limestone substrate; xeric; subtropical; no fire; algae, mixed halophytic herbs and grasses, and/or cacti and stunted shrubs and trees.

Coastal Strand - stabilized coastal dune with sand substrate; xeric; subtropical or temperate; occasional or rare fire; dense saw palmetto and/or seagrape and/or mixed stunted shrubs, yucca, and cacti.

Maritime Hammock - stabilized coastal dune with sand substrate; xeric-mesic; subtropical or temperate; rare or no fire; mixed hardwoods and/or live oak.

Shell Mound - Indian midden with shell substrate; xeric-mesic; subtropical or temperate; rare or no fire; mixed hardwoods.

MESIC UPLANDS - dry to moist hills of sand with varying amounts of clay, silt or organic material; diverse mixture of broadleaved and needleleaved temperate woody species.

Bluff - steep slope with rock, sand, and/or clay substrate; hydric-xeric; temperate; sparse grasses, herbs and shrubs.

Slope Forest - steep slope on bluff or in sheltered ravine; sand/clay substrate; mesic-hydric; temperate; rare or no fire; magnolia, beech, spruce pine, Shumard oak, Florida maple, mixed hardwoods.

Upland Glade - upland with calcareous rock and/or clay substrate; hydric-xeric; temperate; sparse mixed grasses and herbs with occasional stunted trees and shrubs, e.g., eastern red cedar.

Upland Hardwood Forest - upland with sand/clay and/or calcareous substrate; mesic; temperate; rare or no fire; spruce pine, magnolia, beech, pignut hickory, white oak, and mixed hardwoods.

Upland Mixed Forest - upland with sand/clay substrate; mesic; temperate; rare or no fire; loblolly pine and/or shortleaf pine and/or laurel oak and/or magnolia and spruce pine and/or mixed hardwoods.

Upland Pine Forest - upland with sand/clay substrate; mesic-xeric; temperate; frequent or occasional fire; longleaf pine and/or loblolly pine and/or shortleaf pine, southern red oak, wiregrass.

ROCKLANDS - low, generally flat limestone outcrops with tropical vegetation; or limestone exposed through karst activities with tropical or temperate vegetation.

Pine Rockland - flatland with exposed limestone substrate; mesic-xeric; subtropical; frequent fire; south Florida slash pine, palms and/or hardwoods, and mixed grasses and herbs.

Rockland Hammock - flatland with limestone substrate; mesic; subtropical; rare or no fire; mixed tropical hardwoods, often with live oak.

Sinkhole - karst feature with steep limestone walls; mesic-hydric; subtropical or temperate; no fire; ferns, herbs, shrubs, and hardwoods.

MESIC FLATLANDS - flat, moderately well-drained sandy substrates with admixture of organic material, often with a hard pan.

Dry Prairie - flatland with sand substrate; mesic-xeric; subtropical or temperate; annual or frequent fire; wiregrass, saw palmetto, and mixed grasses and herbs.

Mesic Flatwoods - flatland with sand substrate; mesic; subtropical or temperate; frequent fire; slash pine and/or longleaf pine with saw palmetto, gallberry and/or wiregrass or cutthroat grass understory.

Prairie Hammock - flatland with sand/organic soil over marl or limestone substrate; mesic; subtropical; occasional or rare fire; live oak and/or cabbage palm.

Descriptions Of Natural Communities Developed By FNAI

Scrubby Flatwoods - flatland with sand substrate; xeric-mesic; subtropical or temperate; occasional fire; longleaf pine or slash pine with scrub oaks and wiregrass understory.

PALUSTRINE - Wetlands dominated by plants adapted to anaerobic substrate conditions imposed by substrate saturation or inundation during 10% or more of the growing season. Includes non-tidal wetlands; tidal wetlands with ocean derived salinities less than 0.5 ppt and dominance by salt-intolerant species; small (less than 8 ha), shallow (less than 2 m deep at low water) water bodies without wave-formed or bedrock shoreline; and inland brackish or saline wetlands.

WET FLATLANDS - flat, poorly drained sand, marl or limestone substrates.

Hydric Hammock - lowland with sand/clay/organic soil, often over limestone; mesic-hydric; subtropical or temperate; rare or no fire; water oak, cabbage palm, red cedar, red maple, bays, hackberry, hornbeam, blackgum, needle palm, and mixed hardwoods.

Marl Prairie - flatland with marl over limestone substrate; seasonally inundated; tropical; frequent to no fire; sawgrass, spikerush, and/or mixed grasses, sometimes with dwarf cypress.

Wet Flatwoods - flatland with sand substrate; seasonally inundated; subtropical or temperate; frequent fire; vegetation characterized by slash pine or pond pine and/or cabbage palm with mixed grasses and herbs.

Wet Prairie - flatland with sand substrate; seasonally inundated; subtropical or temperate; annual or frequent fire; maidencane, beakrush, spikerush, wiregrass, pitcher plants, St. John's wort, mixed herbs.

SEEPAGE WETLANDS - sloped or flat sands or peat with high moisture levels maintained by downslope seepage; wetland and mesic woody and/or herbaceous vegetation.

Baygall - wetland with peat substrate at base of slope; maintained by downslope seepage, usually saturated and occasionally inundated; subtropical or temperate; rare or no fire; bays and/or dahoon holly and/or red maple and/or mixed hardwoods.

Seepage Slope - wetland on or at base of slope with organic/sand substrate; maintained by downslope seepage, usually saturated but rarely inundated; subtropical or temperate; frequent or occasional fire; sphagnum moss, mixed grasses and herbs or mixed hydrophytic shrubs.

FLOODPLAIN WETLANDS - flat, alluvial sand or peat substrates associated with flowing water courses and subjected to flooding but not permanent inundation; wetland or mesic woody and herbaceous vegetation.

Bottomland Forest - flatland with sand/clay/organic substrate; occasionally inundated; temperate; rare or no fire; water oak, red maple, beech, magnolia, tuliptree, sweetgum, bays, cabbage palm, and mixed hardwoods.

Floodplain Forest - floodplain with alluvial substrate of sand, silt, clay or organic soil; seasonally inundated; temperate; rare or no fire; diamondleaf oak, overcup oak, water oak, swamp chestnut oak, blue palmetto, cane, and mixed hardwoods.

Floodplain Marsh - floodplain with organic/sand/alluvial substrate; seasonally inundated; subtropical; frequent or occasional fire; maidencane, pickerelweed, sagittaria spp., buttonbush, and mixed emergents.

Floodplain Swamp - floodplain with organic/alluvial substrate; usually inundated; subtropical or temperate; rare or no fire; vegetation characterized by cypress, tupelo, black gum, and/or pop ash.

Freshwater Tidal Swamp - river mouth wetland, organic soil with extensive root mat; inundated with freshwater in response to tidal cycles; rare or no fire; cypress, bays, cabbage palm, gums and/or cedars.

Descriptions Of Natural Communities Developed By FNAI

Slough - broad, shallow channel with peat over mineral substrate; seasonally inundated, flowing water; subtropical; occasional or rare fire; pop ash and/or pond apple or water lily.

Strand Swamp - broad, shallow channel with peat over mineral substrate; seasonally inundated, flowing water; subtropical; occasional or rare fire; cypress and/or willow.

Swale - broad, shallow channel with sand/peat substrate; seasonally inundated, flowing water; subtropical or temperate; frequent or occasional fire; sawgrass, maidencane, pickerelweed, and/or mixed emergents.

BASIN WETLANDS - shallow, closed basin with outlet usually only in time of high water; peat or sand substrate, usually inundated; wetland woody and/or herbaceous vegetation.

Basin Marsh - large basin with peat substrate; seasonally inundated; temperate or subtropical; frequent fire; sawgrass and/or cattail and/or buttonbush and/or mixed emergents.

Basin Swamp - large basin with peat substrate; seasonally inundated, still water; subtropical or temperate; occasional or rare fire; vegetation characterized by cypress, blackgum, bays and/or mixed hardwoods.

Bog - wetland on deep peat substrate; moisture held by sphagnum mosses, soil usually saturated, occasionally inundated; subtropical or temperate; rare fire; sphagnum moss and titi and/or bays and/or dahoon holly, and/or mixed hydrophytic shrubs.

Coastal Interdunal Swale - long narrow depression wetlands in sand/peat-sand substrate; seasonally inundated, fresh to brackish, still water; temperate; rare fire; graminoids and mixed wetland forbs.

Depression Marsh - small rounded depression in sand substrate with peat accumulating toward center; seasonally inundated, still water; subtropical or temperate; frequent or occasional fire; maidencane, fire flag, pickerelweed, and mixed emergents, may be in concentric bands.

Dome Swamp - rounded depression in sand/limestone substrate with peat accumulating toward center; seasonally inundated, still water; subtropical or temperate; occasional or rare fire; cypress, blackgum, or bays, often tallest in center.

LACUSTRINE - Non-flowing wetlands of natural depressions lacking persistent emergent vegetation except around the perimeter.

Clastic Upland Lake - generally irregular basin in clay uplands; predominantly with inflows, frequently without surface outflow; clay or organic substrate; colored, acidic, soft water with low mineral content (sodium, chloride, sulfate); oligo-mesotrophic to eutrophic.

Coastal Dune Lake - basin or lagoon influenced by recent coastal processes; predominantly sand substrate with some organic matter; salinity variable among and within lakes, and subject to saltwater intrusion and storm surges; slightly acidic, hard water with high mineral content (sodium, chloride).

Coastal Rockland Lake - shallow basin influence by recent coastal processes; predominantly barren oolitic or Miami limestone substrate; salinity variable among and within lakes, and subject to saltwater intrusion, storm surges and evaporation (because of shallowness); slightly alkaline, hard water with high mineral content (sodium, chloride).

Flatwoods/Prairie Lake - generally shallow basin in flatlands with high water table; frequently with a broad littoral zone; still water or flow-through; sand or peat substrate; variable water chemistry, but characteristically colored to clear, acidic to slightly alkaline, soft to moderately hard water with moderate mineral content (sodium, chloride, sulfate); oligo-mesotrophic to eutrophic.

Marsh lake - generally shallow, open water area within wide expanses of freshwater marsh; still water

Descriptions Of Natural Communities Developed By FNAI

or flow-through; peat, sand or clay substrate; occurs in most physiographic regions; variable water chemistry, but characteristically highly colored, acidic, soft water with moderate mineral content (sodium, chloride, sulfate); oligo-mesotrophic to eutrophic.

River Floodplain Lake - meander scar, backwater, or larger flow-through body within major river floodplains; sand, alluvial or organic substrate; colored, alkaline or slightly acidic, hard or moderately hard water with high mineral content (sulfate, sodium, chloride, calcium, magnesium); mesotrophic to eutrophic.

Sandhill Upland Lake - generally rounded solution depression in deep sandy uplands or sandy uplands shallowly underlain by limestone; predominantly without surface inflows/outflows; typically sand substrate with organic accumulations toward middle; clear, acidic moderately soft water with varying mineral content; ultra-oligotrophic to mesotrophic.

Sinkhole Lake - typically deep, funnel-shaped depression in limestone base; occurs in most physiographic regions; predominantly without surface inflows/outflows, but frequently with connection to the aquifer; clear, alkaline, hard water with high mineral content (calcium, bicarbonate, magnesium).

Swamp Lake - generally shallow, open water area within basin swamps; still water or flow-through; peat, sand or clay substrate; occurs in most physiographic regions; variable water chemistry, but characteristically highly colored, acidic, soft water with moderate mineral content (sodium, chloride, sulfate); oligo-mesotrophic to eutrophic.

RIVERINE - Natural, flowing waters from their source to the downstream limits of tidal influence and bounded by channel banks.

Alluvial Stream - lower perennial or intermittent/seasonal watercourse characterized by turbid water with suspended silt, clay, sand and small gravel; generally with a distinct, sediment-derived (alluvial) floodplain and a sandy, elevated natural levee just inland from the bank.

Blackwater Stream - perennial or intermittent/seasonal watercourse characterized by tea-colored water with a high content of particulate and dissolved organic matter derived from drainage through swamps and marshes; generally lacking an alluvial floodplain.

Seepage Stream - upper perennial or intermittent/seasonal watercourse characterized by clear to lightly colored water derived from shallow groundwater seepage.

Spring-run Stream - perennial watercourse with deep aquifer headwaters and characterized by clear water, circumneutral pH and, frequently, a solid limestone bottom.

SUBTERRANEAN - Twilight, middle and deep zones of natural chambers overlain by the earth's crust and characterized by climatic stability and assemblages of troglonecic, troglophilic, and troglotic organisms.

Aquatic Cave - cavernicolous area permanently or periodically submerged; often characterized by troglotic crustaceans and salamanders; includes high energy systems which receive large quantities of organic detritus and low energy systems.

Terrestrial Cave - cavernicolous area lacking standing water; often characterized by bats, such as *Myotis* spp., and other terrestrial vertebrates and invertebrates; includes interstitial areas above standing water such as fissures in the ceiling of caves.

MARINE/ESTUARINE (The distinction between the Marine and Estuarine Natural Communities is often subtle, and the natural communities types found under these two community categories have the same

Descriptions Of Natural Communities Developed By FNAI

descriptions. For these reasons they have been grouped together.) - Subtidal, intertidal and supratidal zones of the sea, landward to the point at which seawater becomes significantly diluted with freshwater inflow from the land.

Consolidated Substrate - expansive subtidal, intertidal and supratidal area composed primarily of nonliving compacted or coherent and relatively hard, naturally formed mass of mineral matter (e.g., coquina limerock and relic reefs); octocorals, sponges, stony corals, nondrift macrophytic algae, blue-green mat-forming algae and seagrasses sparse, if present.

Unconsolidated Substrate - expansive subtidal, intertidal and supratidal area composed primarily of loose mineral matter (e.g., coralgall, gravel, marl, mud, sand and shell); octocorals, sponges, stony corals, nondrift macrophytic algae, blue-green mat-forming algae and seagrasses sparse, if present.

Octocoral Bed - expansive subtidal area occupied primarily by living sessile organisms of the Class Anthozoa, Subclass Octocorallia (e.g., soft corals, horny corals, sea fans, sea whips, and sea pens); sponges, stony corals, nondrift macrophytic algae and seagrasses sparse, if present.

Sponge Bed - expansive subtidal area occupied primarily by living sessile organisms of the Phylum Porifera (e.g., sheepswool sponge, Florida loggerhead sponge and branching candle sponge); octocorals, stony corals, nondrift macrophytic algae and seagrasses sparse, if present.

Coral Reef - expansive subtidal area with elevational gradient or relief and occupied primarily by living sessile organisms of the Class Hydrozoa (e.g., fire corals and hydrocorals) and Class Anthozoa, Subclass Zoantharia (e.g., stony corals and black corals); includes deepwater bank reefs, fringing barrier reefs, outer bank reefs and patch reefs, some of which may contain distinct zones of assorted macrophytes, octocorals, & sponges.

Mollusk Reef - substantial subtidal or intertidal area with relief from concentrations of sessile organisms of the Phylum Mollusca, Class Bivalvia (e.g., molluscs, oysters, & worm shells); octocorals, sponges, stony corals, macrophytic algae and seagrasses sparse, if present.

Worm Reef - substantial subtidal or intertidal area with relief from concentrations of sessile, tubicolous organisms of the Phylum Annelida, Class Polychaeta (e.g., chaetopterids and sabellarids); octocorals, sponges, stony corals, macrophytic algae and seagrasses sparse, if present.

Algal Bed - expansive subtidal, intertidal or supratidal area, occupied primarily by attached thallophytic or mat-forming prokaryotic algae (e.g., halimeda, blue-green algae); octocorals, sponges, stony corals and seagrasses sparse, if present.

Grass Bed - expansive subtidal or intertidal area, occupied primarily by rooted vascular macrophytes, (e.g., shoal grass, halophila, widgeon grass, manatee grass and turtle grass); may include various epiphytes and epifauna; octocorals, sponges, stony corals, and attached macrophytic algae sparse, if present.

Composite Substrate - expansive subtidal, intertidal, or supratidal area, occupied primarily by Natural Community elements from more than one Natural Community category (e.g., Grass Bed and Algal Bed species; Octocoral and Algal Bed species); includes both patchy and evenly distributed occurrences.

Tidal Marsh - expansive intertidal or supratidal area occupied primarily by rooted, emergent vascular macrophytes (e.g., cord grass, needlerush, saw grass, saltwort, saltgrass and glasswort); may include various epiphytes and epifauna.

Tidal Swamp - expansive intertidal and supratidal area occupied primarily by woody vascular macrophytes (e.g., black mangrove, buttonwood, red mangrove, and white mangrove); may include various epiphytes and epifauna.

DEFINITIONS OF TERMS Terrestrial and Palustrine Natural Communities

Descriptions Of Natural Communities Developed By FNAI

Physiography

Upland - high area in region with significant topographic relief; generally undulating

Lowland - low area in region with or without significant topographic relief; generally flat to gently sloping

Flatland - generally level area in region without significant topographic relief; flat to gently sloping

Basin - large, relatively level lowland with slopes confined to the perimeter or isolated interior locations

Depression - small depression with sloping sides, deepest in center and progressively shallower towards the perimeter

Floodplain - lowland adjacent to a stream; topography influenced by recent fluvial processes

Bottomland - lowland not on active floodplain; sand/clay/organic substrate

Hydrology

occasionally inundated - surface water present only after heavy rains and/or during flood stages

seasonally inundated - surface water present during wet season and flood periods

usually inundated - surface water present except during droughts

Climatic Affinity of the Flora

tropical - community generally occurs in practically frost-free areas

subtropical - community generally occurs in areas that experience occasional frost, but where freezing temperatures are not frequent enough to cause true winter dormancy

temperate - community generally occurs in areas that freeze often enough that vegetation goes into winter dormancy

Fire

annual fire - burns about every 1-2 years

frequent fire - burns about every 3-7 years

occasional fire - burns about every 8-25 years

rare fire - burns about every 26-100 years

no fire - community develops only when site goes more than 100 years without burning

Descriptions Of Natural Communities Developed By FNAI

LATIN NAMES OF PLANTS MENTIONED IN NATURAL COMMUNITY DESCRIPTIONS

anise - *Illicium floridanum*
bays:
swamp bay - *Persea palustris*
gordonia - *Gordonia lasianthus*
sweetbay - *Magnolia virginiana*
beakrush - *Rhynchospora* spp.
beech - *Fagus grandifolia*
blackgum - *Nyssa biflora*
blue palmetto - *Sabal minor*
bluestem - *Andropogon* spp.
buttonbush - *Cephalanthus occidentalis*
cabbage palm - *Sabal palmetto*
cacti - *Opuntia* and *Harrisia* spp.,
predominantly *stricta* and *pentagonus*
cane - *Arundinaria gigantea* or *A. tecta*
cattail - *Typha* spp.
cedars:
red cedar - *Juniperus silicicola*
white cedar - *Chamaecyparis thyoides* or
C. henryi
cladonia - *Cladonia* spp.
cypress - *Taxodium distichum*
dahoon holly - *Ilex cassine*
diamondleaf oak - *Quercus laurifolia*
fire flag - *Thalia geniculata*
Florida maple - *Acer barbatum*
gallberry - *Ilex glabra*
gums:
tupelo - *Nyssa aquatica*
blackgum - *Nyssa biflora*
Ogeechee gum - *Nyssa ogeche*
hackberry - *Celtis laevigata*
hornbeam - *Carpinus caroliniana*
laurel oak - *Quercus hemisphaerica*
live oak - *Quercus virginiana*
loblolly pine - *Pinus taeda*
longleaf pine - *Pinus palustris*
magnolia - *Magnolia grandiflora*
maidencane - *Panicum hemitomon*
needle palm - *Rhapidophyllum hystrix*
overcup oak - *Quercus lyrata*
pickerel weed - *Pontederia cordata* or *P. lanceolata*
pignut hickory - *Carya glabra*
pop ash - *Fraxinus caroliniana*
pond apple - *Annona glabra*
pond pine - *Pinus serotina*
pyramid magnolia - *Magnolia pyramidata*
railroad vine - *Ipomoea pes-caprae*
red cedar - *Juniperus silicicola*
red maple - *Acer rubrum*
red oak - *Quercus falcata*
rosemary - *Ceratiola ericoides*
sagittaria - *Sagittaria lancifolia*
sand pine - *Pinus clausa*
saw palmetto - *Serenoa repens*
sawgrass - *Cladium jamaicensis*
scrub oaks - *Quercus geminata*, *Q. chapmanii*, *Q. myrtifolia*, *Q. inopina*
sea oats - *Uniola paniculata*
seagrape - *Coccoloba uvifera*
shortleaf pine - *Pinus echinata*
Shumard oak - *Quercus shumardii*
slash pine - *Pinus elliotii*
sphagnum moss - *Sphagnum* spp.
spikerush - *Eleocharis* spp.
spruce pine - *Pinus glabra*
St. John's wort - *Hypericum* spp.
swamp chestnut oak - *Quercus prinus*
sweetgum - *Liquidambar styraciflua*
titi - *Cyrilla racemiflora*, and *Cliftonia monophylla*
tuliptree - *Liriodendron tulipifera*
tupelo - *Nyssa aquatica*
turkey oak - *Quercus laevis*
water oak - *Quercus nigra*
waterlily - *Nymphaea odorata*
white cedar - *Chamaecyparis thyoides*
white oak - *Quercus alba*
willow - *Salix caroliniana*
yucca - *Yucca aloifolia*

**Management Procedures For
Archaeological And Historical Sites And Properties
On State -- Owned Or Controlled Lands
(Revised August, 1995)**

A. GENERAL DISCUSSION

Archaeological and historic sites are defined collectively in 267.021(3), F.S., as "historic properties" or "historic resources." They have several essential characteristics that must be recognized in a management program.

First of all, they are a finite and non-renewable resource. Once destroyed, presently existing resources, including buildings, other structures, shipwreck remains, archaeological sites and other objects of antiquity, cannot be renewed or revived. Today, sites in the State of Florida are being destroyed by all kinds of land development, inappropriate land management practices, erosion, looting, and to a minor extent even by well-intentioned professional scientific research (e.g., archaeological excavation). Measures must be taken to ensure that some of these resources will be preserved for future study and appreciation.

Secondly, sites are unique because individually they represent the tangible remains of events that occurred at a specific time and place.

Thirdly, while sites uniquely reflect localized events, these events and the origin of particular sites are related to conditions and events in other times and places. Sites can be understood properly only in relation to their natural surroundings and the activities of inhabitants of other sites. Managers must be aware of this "systemic" character of historic and archaeological sites. Also, it should be recognized that archaeological sites are time capsules for more than cultural history; they preserve traces of past biotic communities, climate, and other elements of the environment that may be of interest to other scientific disciplines.

Finally, the significance of sites, particularly archaeological ones, derives not only from the individual artifacts within them, but equally from the spatial arrangement of those artifacts in both horizontal and vertical planes. When archaeologists excavate, they recover, not merely objects, but also a record of the positions of these objects in relation to one another and their containing matrix (e.g., soil strata). Much information is sacrificed if the so-called "context" of archaeological objects is destroyed or not recovered, and this is what archaeologists are most concerned about when a site is threatened with destruction or damage. The artifacts themselves can be recovered even after a site is heavily disturbed, but the context -- the vertical and horizontal relationships -- cannot. Historic structures also contain a wealth of cultural (socio-economic) data that can be lost if historically sensitive maintenance, restoration or rehabilitation procedures are not implemented, or if they are demolished or extensively altered without appropriate documentation. Lastly, it should not be forgotten that historic structures often have associated potentially significant historic archaeological features that must be considered in land management decisions.

B. STATUTORY AUTHORITY

Chapter 253, Florida Statutes ("State Lands") directs the preparation of "single-use" or "multiple-use" land management plans for all state-owned lands and state-owned sovereignty submerged lands. In this document, 253.034(4), F.S., specifically requires that "all management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing agency plans to identify, locate, protect and preserve, or otherwise use fragile non-renewable resources, such as archaeological and historic sites, as well as other fragile resources..."

Chapter 267, Florida Statutes is the primary historic preservation authority of the state. The importance of protecting and interpreting archaeological and historic sites is recognized in 267.061(1)(a), F.S.:The rich and unique heritage of historic properties in this state, representing more than 10,000 years of human presence, is an important legacy to be valued and conserved for present and future generations. The destruction of these nonrenewable historic resources will engender a significant loss to the state's quality of life, economy, and cultural environment. It is therefore declared to be state policy to:

1. Provide leadership in the preservation of the state's historic resources; [and]

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2. Administer state-owned or state-controlled historic resources in a spirit of stewardship and trusteeship;...

Responsibilities of the Division of Historical Resources in the Department of State pursuant to 267.061(3), F.S., include the following:

1. Cooperate with federal and state agencies, local Governments, and private organizations and individuals to direct and conduct a comprehensive statewide survey of historic resources and to maintain an inventory of such responses.
2. Develop a comprehensive statewide historic preservation plan.
3. Identify and nominate eligible properties to the National Register of Historic Places and otherwise administer applications for listing properties in the National Register of Historic Places.
4. Cooperate with federal and state agencies, local governments, and organizations and individuals to ensure that historic resources are taken into consideration at all levels of planning and development.
5. Advise and assist, as appropriate, federal and state agencies and local governments in carrying out their historic preservation responsibilities and programs.
6. Carry out on behalf of the state the programs of the National Historic Preservation Act of 1966, as amended, and to establish, maintain, and administer a state historic preservation program meeting the requirements of an approved program and fulfilling the responsibilities of state historic preservation programs as provided in subsection 101(b) of that act.
7. Take such other actions necessary or appropriate to locate, acquire, protect, preserve, operate, interpret, and promote the location, acquisition, protection, preservation, operation, and interpretation of historic resources to foster an appreciation of Florida history and culture. Prior to the acquisition, preservation, interpretation, or operation of a historic property by a state agency, the Division shall be provided a reasonable opportunity to review and comment on the proposed undertaking and shall determine that there exists historic authenticity and a feasible means of providing for the preservation, interpretation and operation of such property.
8. Establish professional standards for the preservation, exclusive of acquisition, of historic resources in state ownership or control.
9. Establish guidelines for state agency responsibilities under subsection (2).

Responsibilities of other state agencies of the executive branch, pursuant to 267.061(2), F.S., include:

1. Each state agency of the executive branch having direct or indirect jurisdiction over a proposed state or state-assisted undertaking shall, in accordance with state policy and prior to the approval of expenditure of any state funds on the undertaking, consider the effect of the undertaking on any historic property that is included in, or eligible for inclusion in, the National Register of Historic Places. Each such agency shall afford the division a reasonable opportunity to comment with regard to such an undertaking.
2. Each state agency of the executive branch shall initiate measures in consultation with the division to assure that where, as a result of state action or assistance carried out by such agency, a historic property is to be demolished or substantially altered in a way that adversely affects the character, form, integrity, or other qualities that contribute to [the] historical, architectural, or archaeological value of the property, timely steps are taken to determine that no feasible and prudent alternative to the proposed demolition or alteration exists, and, where no such alternative is determined to exist, to assure that timely steps are taken either to avoid or mitigate the adverse effects, or to undertake an appropriate archaeological salvage excavation or other recovery action to document the property as it existed prior to demolition or alteration.
3. In consultation with the division [of Historical Resources], each state agency of the executive branch shall establish a program to locate, inventory, and evaluate all historic properties under the agency's ownership or control that appear to qualify for the National Register. Each such agency shall exercise caution to assure that any such historic property is not inadvertently transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly.
4. Each state agency of the executive branch shall assume responsibility for the preservation of historic

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resources that are owned or controlled by such agency. Prior to acquiring, constructing, or leasing buildings for the purpose of carrying out agency responsibilities, the agency shall use, to the maximum extent feasible, historic properties available to the agency. Each agency shall undertake, consistent with preservation of such properties, the mission of the agency, and the professional standards established pursuant to paragraph (3)(k), any preservation actions necessary to carry out the intent of this paragraph.

5. Each state agency of the executive branch, in seeking to acquire additional space through new construction or lease, shall give preference to the acquisition or use of historic properties when such acquisition or use is determined to be feasible and prudent compared with available alternatives. The acquisition or use of historic properties is considered feasible and prudent if the cost of purchase or lease, the cost of rehabilitation, remodeling, or altering the building to meet compliance standards and the agency's needs, and the projected costs of maintaining the building and providing utilities and other services is less than or equal to the same costs for available alternatives. The agency shall request the division to assist in determining if the acquisition or use of a historic property is feasible and prudent. Within 60 days after making a determination that additional space is needed, the agency shall request the division to assist in identifying buildings within the appropriate geographic area that are historic properties suitable for acquisition or lease by the agency, whether or not such properties are in need of repair, alteration, or addition.
6. Consistent with the agency's mission and authority, all state agencies of the executive branch shall carry out agency programs and projects, including those under which any state assistance is provided, in a manner which is generally sensitive to the preservation of historic properties and shall give consideration to programs and projects which will further the purposes of this section.

Section 267.12 authorizes the Division to establish procedures for the granting of research permits for archaeological and historic site survey or excavation on state-owned or controlled lands, while Section 267.13 establishes penalties for the conduct of such work without first obtaining written permission from the Division of Historical Resources. The Rules of the Department of State, Division of Historical Resources, for research permits for archaeological sites of significance are contained in Chapter 1A-32, F.A.C.

Another Florida Statute affecting land management decisions is Chapter 872, F.S. Section 872.02, F.S., pertains to marked grave sites, regardless of age. Many state-owned properties contain old family and other cemeteries with tombstones, crypts, etc. Section 872.05, F.S., pertains to unmarked human burial sites, including prehistoric and historic Indian burial sites. Unauthorized disturbance of both marked and unmarked human burial site is a felony.

C. MANAGEMENT POLICY

The choice of a management policy for archaeological and historic sites within state-owned or controlled land obviously depends upon a detailed evaluation of the characteristics and conditions of the individual sites and groups of sites within those tracts. This includes an interpretation of the significance (or potential significance) of these sites, in terms of social and political factors, as well as environmental factors. Furthermore, for historic structures architectural significance must be considered, as well as any associated historic landscapes.

Sites on privately owned lands are especially vulnerable to destruction, since often times the economic incentives for preservation are low compared to other uses of the land areas involved. Hence, sites in public ownership have a magnified importance, since they are the ones with the best chance of survival over the long run. This is particularly true of sites that are state-owned or controlled, where the basis of management is to provide for land uses that are minimally destructive of resource values.

It should be noted that while many archaeological and historical sites are already recorded within state--owned or controlled--lands, the majority of the uplands areas and nearly all of the inundated areas have not been surveyed to locate and assess the significance of such resources. The known sites are, thus,

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only an incomplete sample of the actual resources - i.e., the number, density, distribution, age, character and condition of archaeological and historic sites - on these tracts. Unfortunately, the lack of specific knowledge of the actual resources prevents formulation of any sort of detailed management or use plan involving decisions about the relative historic value of individual sites. For this reason, a generalized policy of conservation is recommended until the resources have been better addressed.

The generalized management policy recommended by the Division of Historical Resources includes the following:

1. State land managers shall coordinate all planned activities involving known archaeological or historic sites or potential site areas closely with the Division of Historical Resources in order to prevent any kind of disturbance to significant archaeological or historic sites that may exist on the tract. Under 267.061(1)(b), F.S., the Division of Historical Resources is vested with title to archaeological and historic resources abandoned on state lands and is responsible for administration and protection of such resources. The Division will cooperate with the land manager in the management of these resources. Furthermore, provisions of 267.061(2) and 267.13, F.S., combined with those in 267.061(3) and 253.034(4), F.S., require that other managing (or permitting) agencies coordinate their plans with the Division of Historical Resources at a sufficiently early stage to preclude inadvertent damage or destruction to known or potentially occurring, presently unknown archaeological and historic sites. The provisions pertaining to human burial sites must also be followed by state land managers when such remains are known or suspected to be present (see 872.02 and 872.05, F.S., and 1A-44, F.A.C.)
2. Since the actual resources are so poorly known, the potential impact of the managing agency's activities on historic archaeological sites may not be immediately apparent. Special field survey for such sites may be required to identify the potential endangerment as a result of particular management or permitting activities. The Division may perform surveys, as its resources permit, to aid the planning of other state agencies in their management activities, but outside archaeological consultants may have to be retained by the managing agency. This would be especially necessary in the cases of activities contemplating ground disturbance over large areas and unexpected occurrences. It should be noted, however, that in most instances Division staff's knowledge of known and expected site distribution is such that actual field surveys may not be necessary, and the project may be reviewed by submitting a project location map (preferably a 7.5 minute U.S.G.S. Quadrangle map or portion thereof) and project descriptive data, including detailed construction plans. To avoid delays, Division staff should be contacted to discuss specific project documentation review needs.
3. In the case of known significant sites, which may be affected by proposed project activities, the managing agency will generally be expected to alter proposed management or development plans, as necessary, or else make special provisions to minimize or mitigate damage to such sites.
4. If in the course of management activities, or as a result of development or the permitting of dredge activities (see 403.918(2)(6)a, F.S.), it is determined that valuable historic or archaeological sites will be damaged or destroyed, the Division reserves the right, pursuant to 267.061(1)(b), F.S., to require salvage measures to mitigate the destructive impact of such activities to such sites. Such salvage measures would be accomplished before the Division would grant permission for destruction of the affected site areas. The funding needed to implement salvage measures would be the responsibility of the managing agency planning the site destructive activity. Mitigation of historic structures at a minimum involves the preparation of measured drawings and documentary photographs. Mitigation of archaeological resources involves the excavation, analysis and reporting of the project findings and must be planned to occur sufficiently in advance to avoid project construction delays. If these services are to be contracted by the state agency, the selected consultant will need to obtain an Archaeological Research Permit from the Division of Historical Resources, Bureau of Archaeological Research (see 267.12, F.S. and Rules 1A-32 and 1A-46 F.A.C.).
5. For the near future, excavation of non-endangered (i.e., sites not being lost to erosion or development) archaeological site is discouraged. There are many endangered sites in Florida (on

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both private and public lands) in need of excavation because of the threat of development or other factors. Those within state-owned or controlled lands should be left undisturbed for the present - with particular attention devoted to preventing site looting by "treasure hunters". On the other hand, the archaeological and historic survey of these tracts is encouraged in order to build an inventory of the resources present, and to assess their scientific research potential and historic or architectural significance.

6. The cooperation of land managers in reporting sites to the Division that their field personnel may discover is encouraged. The Division will help inform field personnel from other resource managing agencies about the characteristics and appearance of sites. The Division has initiated a cultural resource management training program to help accomplish this. Upon request the Division will also provide to other agencies archaeological and historical summaries of the known and potentially occurring resources so that information may be incorporated into management plans and public awareness programs (See Management Implementation).
7. Any discovery of instances of looting or unauthorized destruction of sites must be reported to the agent for the Board of Trustees of the Internal Improvement Trust Fund and the Division so that appropriate action may be initiated. When human burial sites are involved, the provisions of 872.02 and 872.05, F. S. and Rule 1A-44, F.A.C., as applicable, must also be followed. Any state agent with law enforcement authority observing individuals or groups clearly and incontrovertibly vandalizing, looting or destroying archaeological or historic sites within state-owned or controlled lands without demonstrable permission from the Division will make arrests and detain those individuals or groups under the provisions of 267.13, 901.15, and 901.21, F.S., and related statutory authority pertaining to such illegal activities on state-owned or controlled lands. County Sheriffs' officers are urged to assist in efforts to stop and/or prevent site looting and destruction.

In addition to the above management policy for archaeological and historic sites on state-owned land, special attention shall be given to those properties listed in the National Register of Historic Places and other significant buildings. The Division recommends that the Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings (Revised 1990) be followed for such sites.

The following general standards apply to all treatments undertaken on historically significant properties.

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.
2. The historic character of a property shall be retained and preserved. The removal of historic materials or alterations of features and spaces that characterize a property shall be avoided.
3. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.
4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.
5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.
6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, or pictorial evidence.
7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.
8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.
9. New additions, exterior alterations, or related new construction shall not destroy materials that

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characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired. (see Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings [Revised 1990]).

Divisions of Historical Resources staff are available for technical assistance for any of the above listed topics. It is encouraged that such assistance be sought as early as possible in the project planning.

D. MANAGEMENT IMPLEMENTATION

As noted earlier, 253.034(4), F.S., states that "all management plans, whether for single-use or multiple-use properties, shall specifically describe how the managing agency plans to identify, locate, protect and preserve, or otherwise use fragile non-renewable resources, such as archaeological and historic sites..." The following guidelines should help to fulfill that requirement.

1. All land managing agencies should contact the Division and send U.S.G.S. 7.5 minute quadrangle maps outlining the boundaries of their various properties.
2. The Division will in turn identify site locations on those maps and provide descriptions for known archaeological and historical sites to the managing agency.
3. Further, the Division may also identify on the maps areas of high archaeological and historic site location probability within the subject tract. These are only probability zones, and sites may be found outside of these areas. Therefore, actual ground inspections of project areas may still be necessary.
4. The Division will send archaeological field recording forms and historic structure field recording forms to representatives of the agency to facilitate the recording of information on such resources.
5. Land managers will update information on recorded sites and properties.
6. Land managers will supply the Division with new information as it becomes available on previously unrecorded sites that their staff locate. The following details the kind of information the Division wishes to obtain for any new sites or structures that the land managers may report:

A. Historic Sites

- (1) Type of structure (dwelling, church, factory, etc.).
- (2) Known or estimated age or construction date for each structure and addition.
- (3) Location of building (identify location on a map of the property, and building placement, i.e., detached, row, etc.).
- (4) General Characteristics: (include photographs if possible) overall shape of plan (rectangle, "L" "T" "H" "U", etc.); number of stories; number of vertical divisions of bays; construction materials (brick, frame, stone, etc.); wall finish (kind of bond, coursing, shingle, etc.); roof shape.
- (5) Specific features including location, number and appearance of:
 - (a) Important decorative elements;
 - (b) Interior features contributing to the character of the building;
 - (c) Number, type, and location of outbuildings, as well as date(s) of construction;
 - (d) Notation if property has been moved;
 - (e) Notation of known alterations to building.

B. Archaeological Sites

- (1) Site location (written narrative and mapped location).
- (2) Cultural affiliation and period.
- (3) Site type (midden, burial mound, artifact scatter, building rubble, etc.).

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- (4) Threats to site (deterioration, vandalism, etc.).
- (5) Site size (acreage, square meters, etc.).
- (6) Artifacts observed on ground surface (pottery, bone, glass, etc.).
- (7) Description of surrounding environment.
- 7. No land disturbing activities should be undertaken in areas of known archaeological or historic sites or areas of high site probability without prior review by the Division early in the project planning.
- 8. Ground disturbing activities may proceed elsewhere but land managers should stop disturbance in the immediate vicinity of artifact finds and notifies the Division if previously unknown archaeological or historic remains are uncovered. The provisions of Chapter 872, F.S., must be followed when human remains are encountered.
- 9. Excavation and collection of archaeological and historic sites on state lands without a permit from the Division are a violation of state law and shall be reported to a law enforcement officer. The use of metal detectors to search for historic artifacts shall be prohibited on state lands except when authorized in a 1A-32, F.A.C., research permit from the Division.
- 10. Interpretation and visitation which will increase public understanding and enjoyment of archaeological and historic sites without site destruction or vandalism is strongly encouraged.
- 11. Development of interpretive programs including trails, signage, kiosks, and exhibits is encouraged and should be coordinated with the Division.
- 12. Artifacts found or collected on state lands are by law the property of the Division. Land managers shall contact the Division whenever such material is found so that arrangements may be made for recording and conservation. This material, if taken to Tallahassee, can be returned for public display on a long term loan.

E. ADMINISTERING AGENCY

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

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

Contact Person:

Susan M. Harp
Historic Preservation Planner
Telephone (850) 245-6333
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Land Management Review of Cayo Costa State Park—June 29, 2005

Management Review Team Members

Agency Represented	Team member Appointed	Team member In attendance
DOF	Bill Korn	Bill Korn
DRP	Andrea Bishop	Andrea Bishop
FWC	Steve Shattler	Steve Shattler
Private Land Manager(KSC)	Jack Tanner	Jack Tanner
Conservation Org. (TNC)	Ed Freeman	
DEP	Kelly Kramer	Kelly Kramer
Lee County	Bob Repenning	Bob Repenning
Observer (FNAI)	Carolyn Kindell	Carolyn Kindell
Observer (GNP)	Aaron Deslatte	Aaron Deslatte

Process for Implementing Regional Management Review Teams

Legislative Intent and Guidance:

Chapter 259.036, F. S. was enacted in 1997 to determine whether conservation, preservation, and recreation lands owned by the state Board of Trustees of the Internal Improvement Trust Fund (Board) are being managed properly. It directs the Department of Environmental Protection (DEP) to establish land management review teams to evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions, and archaeological features. The teams also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan. If a land management plan has not been adopted, the review shall consider the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices are in compliance with the management policy statement and management prospectus for that property. If the land management review team determines that reviewed lands are not being managed for the purposes for which they were acquired or in compliance with the adopted land management plan, management policy statement, or management prospectus, DEP shall provide the review findings to the Board, and the managing agency must report to the Board its reasons for managing the lands as it has. A report of the review team findings are given to the managing agency under review, the Acquisition and Restoration Council, and the Governor and Cabinet.

Review Site

The management review of Cayo Costa State Park considered approximately 2,445 acres in Lee County that are managed by the Division of Recreation and Parks (DRP). The team evaluated the extent to which current management actions are sufficient, whether the land is being managed for the purpose for which it was acquired, and whether actual management practices, including public access, are in compliance with the management plan. The Division of State Lands approved the management plan on July 29, 1999, and the management plan update is due on July 29, 2009.

Review Team Determination

Is the land being managed for the purpose for which it was acquired? All team members agreed that Cayo Costa State Park is being managed for the purpose for which it was acquired.

Are actual management practices, including public access, in compliance with the management plan? All team members agreed that management practices, including public access, are in compliance with the management plan.

Commendations to the Managing Agency

The following commendations resulted from a discussion and vote of review team members.

1. The team commends the manager and staff for their outstanding invasive plant and animal removal program on the island.
2. The team commends the manager and staff for their exceptional resource management program results despite the hurricanes and staff limitations.

Exceptional Management Actions

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

Exceptional Management Actions:

- Excellent management of the following natural communities: beach dunes, coastal berm, coastal strand, maritime hammock, mesic flatwoods, coastal grasslands, depression swamp, marine tidal marsh, and unconsolidated substrate.
- Excellent protection and preservation of cultural resources.
- Excellent prescribed fire program including.
- Excellent restoration efforts at the Borough's Ranch area.
- Excellent management of invasive, non-native plant species.
- In the area of hydrologic/geologic function excellent management of surface water quality and ditch restoration efforts.
- Excellent public access from the water, recreational opportunities, and environmental outreach/education.

Recommendations and Checklist Findings

The management plan must include responses to the recommendations and checklist items that are identified below.

Recommendations

The following recommendations resulted from a discussion and vote of review team members.

1. The team recommends that the plan clearly identify Lee County ownerships on the islands and the management arrangements between the DRP and the County to manage these areas.

Manager's Response: Agree

2. The team recommends that the DRP increase monitoring of shore birds and gopher tortoises possibly using volunteers.

Manager's Response: Agree for shorebirds. The need for increased monitoring of gopher tortoises will have to be evaluated.

3. The team recommends that the DRP evaluate and improve the existing septic systems on the island.

Manager's Response: See response under Checklist Finding #9.

4. The team recommends that the DRP evaluate and monitor post fire impacts on the current burn zones to determine fire need and frequency.

Manager's Response: Agree.

5. The team recommends that the DRP make it a priority to fund archeological survey work on the island due to erosion and other means that may disturb the sites.

Manager's Response: Agree. This has been addressed in the draft revised Unit Management Plan, Park Goals and Objectives, first goal for cultural resource preservation, protection and management.

6. The team recommends that the DRP coordinate with the County on well permits and on monitoring ground and surface water on the island, to protect the quantity and quality of the potable water on the island.

Manager's Response: Neither Lee County nor the South Florida Water Management District (SFWMD) have a permit requirement for private wells. Nor do they have a monitoring plan for ground water on the island. Some potable water testing is conducted by the park and the County. DRP will discuss ground water monitoring with the SFWMD.

7. The team recommends that the DRP make it a high priority to acquire the inholdings on the island possibly by getting the Cayo Costa project reinstated onto the Florida Forever acquisition list.

Manager's Response: The remaining outparcels are currently being purchased through the Florida Forever program since Cayo Costa is considered a substantially complete project.

Checklist Findings

The following items received low scores on the review team checklist that indicated that management actions, in the field, were insufficient (f) or that the issue was not sufficiently addressed in the management plan (p).

1. Discussion in the management plan by community type, of the desired burn prescription including area, frequency and quality of the burns.(p)

Manager's Response: These will be addressed in the annual burn plan for the park, in accord with the general discussion of prescribed burning in the draft revised Unit Management Plan, Management Measures for Natural Resources.

2. Discussion in the management plan of the ongoing restoration of the Borough's Ranch.(p)(f)

Manager's Response: Agree, the Borough's and other sites are discussed in the revision.

3. Discussion in the management plan of the need to improve roads and install culverts.(p)(f)

Manager's Response: This is addressed in the Land Use Component of the revised plan.

4. Discussion in management plan of the need to monitor surface and ground water quality and quantity.(p)(f)

Manager's Response: See Response to Recommendation #6 above. After evaluation of the need for monitoring, discussion could be added to the plan.

5. Discussion in management plan of the need for surveys of the inholdings on both islands, and signage, gates and fencing at North Captiva.(p)(f)

Manager's Response: Agree. Fencing, gates and signage are being replaced on North Captiva.

6. Discussion in management plan of the need for additional law enforcement.(p)

Manager's Response: Agree.

7. Discussion in management plan of management complications resulting from expanding development on the island.(p)(f)

Manager's Response: Agree. This is included in the revised plan.

8. Discussion in management plan for management of alterations to cultural resources sites.(f)

Manager's Response: Agree, and addressed in the revised plan.

9. Discussion in management plan of the need for more and better sanitary facilities.(f)

Manager's Response: This issue has already been addressed in the revised plan, Land Use Component.

10. Discussion in management plan of the need for more buildings, equipment, staff and funding for this park.(f)

Manager's Response: Regarding buildings: State Park land use plans are developed by professional planning staff through a public process and are approved by the Acquisition and Restoration Council. It is beyond the scope of the review team's responsibilities to plan facilities or development on state lands.

Regarding staff: If it is determined that additional staff are needed at the time of the next unit management plan revision, it will be included in the plan. However, no new staff can be assigned to this or any other park unit unless they are appropriated by the Legislature or reassigned from other units. Additional staff is needed by a majority of parks statewide which is why we regularly seek positions, volunteers, and partners. Funding is determined annually by the Florida Legislature.