WACCASASSA BAY PRESERVE STATE PARK

UNIT MANAGEMENT PLAN

APPROVED

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

June 3, 2005

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
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Colleen Castille
Secretary

June 6, 2005

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

Re: Waccasassa Bay Preserve State Park Lease #2599

Dear Ms. White:

On June 3, 2005, the Acquisition and Restoration Council recommended approval of the Waccasassa Bay Preserve 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 Waccasassa Bay Preserve 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 **June 3, 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

Waccasassa Bay Preserve State Park is located in Levy County (see Vicinity Map) west of U.S. Highway 19 and south of State Road 24. Currently, there is limited public access to the park via land. Access to the park is primarily via water. The park contains 34,064 acres. For this plan, park acreage has been calculated based on the composition of natural communities, in addition to ruderal and developed areas. The vicinity map also reflects significant land and water resources existing near the park.

Waccasassa Bay Preserve State Park is located at the seaward fringe of Gulf Hammock, a once vast hardwood forest that originally covered almost 100,000 acres in the region between the Suwannee and Withlacoochee Rivers. Gulf Hammock consists mainly of wet lowlands whose characteristic natural community is hydric hammock. Waccasassa Bay Preserve State Park harbors some of the last remnants of intact Gulf Hammock; outside the preserve much of what was formerly hydric hammock is now pine plantation. Bordering the hydric hammock along the low energy coast of the Gulf of Mexico are vast expanses of tidal marsh. The tidal marsh is dissected by numerous tidal creeks and is dotted with isolated islands of hydric hammock inhabited by semi-tropical and temperate plant species.

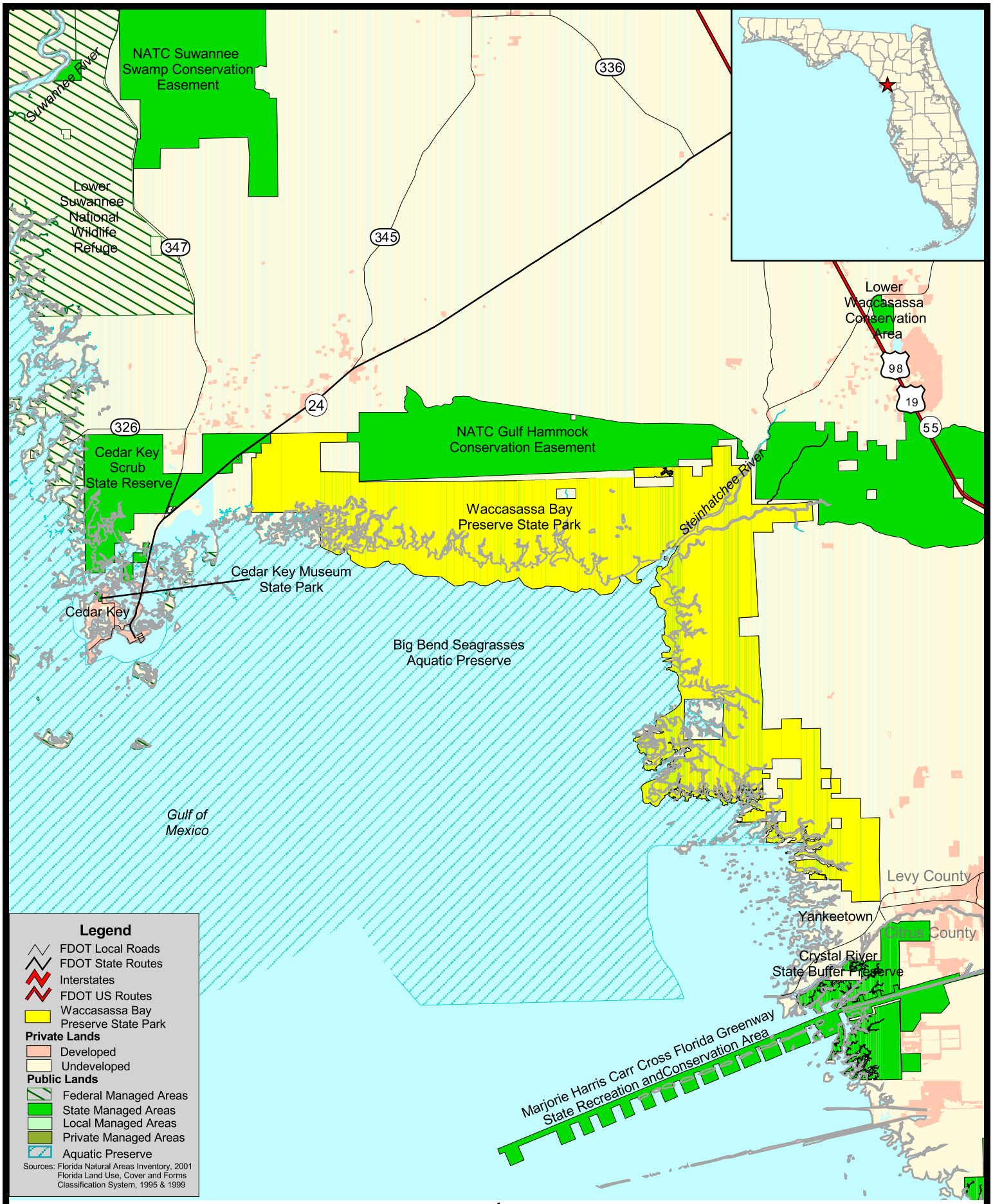
Waccasassa Bay Preserve State Park still offers sweeping vistas of natural landscapes uninterrupted by buildings, power lines and bridges. The preserve is home to numerous rare, threatened or endangered plant and animal species and commercially important marine species. The plentiful and varied cultural resources of the preserve range from prehistoric burial mounds and trash heaps to historic sites of the industries that formerly thrived in the area.

At Waccasassa Bay Preserve State Park, public outdoor recreation and conservation is the designated single use of the property. There are no legislative or executive directives that constrain the use of this property. The park was acquired on using funds/or donation (see Addendum 1).

PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of Waccasassa Bay Preserve 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 May 6, 1998 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



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

WACCASASSA BAY PRESERVE STATE PARK

VICINITY MAP

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 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 timber management for the purposes of natural community restoration could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. This compatible secondary management purpose is addressed in the Resource Management Component of the plan. 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 timber management for the purposes of natural community restoration would be appropriate at this park as an additional source of revenue for land management since it is compatible with the park's primary purpose of resource-based outdoor recreation and conservation.

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.

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

Park Goals and Objectives

The following park goals and objectives express the Division's 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 Resources

1. Coordinate with the Division of Forestry (DOF) and adjacent landowners to achieve early detection and rapid suppression of pine beetle infestations.

A. Aerial surveys provide the earliest detection of pine beetle infestations. Staff will coordinate with the DOF to verify aerial survey data using ground surveys based on GPS coordinates. Quick responses to infestations will be necessary to control the spread of the pine beetles. Where logging is not feasible due to environmental or other constraints, staff will implement alternative suppression measures as needed.

2. Restore the natural communities affected by pine beetle control measures.
   A. Staff will continue to develop and implement restoration plans for areas logged to control pine beetle infestations. Staff will periodically monitor the natural communities where less intensive measures were used to control pine beetles.
3. Restore the natural hydrology and water quality of areas damaged by artificial soil disturbances.
   A. In areas damaged by vehicles or heavy equipment, staff will implement projects to re-contour ruts to match the adjacent grade. Restoration of rut scars will be particularly important in areas where the scars run parallel to the normal direction of sheet flow and increase flow rates by channeling the flow. Restoration of scars that run perpendicular to the normal sheet flow will also be important, as these may intercept flow and redirect it to nearby tidal creeks.
   B. In places where logging roads and other access roads cross natural channels and now impede flows, either remove the roads outright or modify them to mitigate the disruption of natural drainage patterns. District 2 biologists have already developed plans and acquired a permit to accomplish these actions. Also, inspect the access road (GP Road) that leads into the recent acquisition in the northwest corner of the preserve to determine if existing culvert numbers and locations are adequate for maintenance of normal flow rates and patterns.
   C. Coordinate with the SRWMD in pursuing additional water quality monitoring for the Waccasassa River, Cow Creek and Tenmile Creek.
4. Re-establish an active prescribed burn program in the mesic flatwoods of the preserve.
   A. Burn the mesic flatwoods at a frequency appropriate for this community type, at least every 1-8 years as recommended by FNAI, but preferably as often as every 3-4 years. The objectives of the burn program will be to restore suitable habitat wildlife species and to prevent large numbers of off-site loblolly pines from becoming reestablished in areas that were clear-cut.
5. Control exotic species within the preserve.
   A. Continue to control cogongrass by treating with herbicides, using licensed contractors when appropriate. Monitor sites indefinitely and apply follow-up treatments as needed.
   B. Eradicate feral hogs within the preserve to the extent practicable. Hunting pressure from the adjacent wildlife management area and from the numerous inholdings within the preserve may help to limit the hog population. Continue to monitor damage from feral hogs to determine if additional control methods are necessary.
6. Pursue acquisition of parcels within the Optimum Boundary of the preserve, clarify boundary locations and improve boundary fencing.
   A. Encourage the Division to continue efforts to acquire parcels already on the Additions and Inholdings List for Waccasassa Bay Preserve State Park. Add other properties to the Optimum Boundary list as needed. The property that lies north of the preserve and south of Mainline Road from State Road 24 to the Waccasassa River will be considered for addition to the Additions and Inholdings list. This would create a buffer along the northern half of the preserve that would reduce impact to the water resources of the preserve. Acquisition of the Additions and Inholdings parcels would prevent environmental damage to the preserve associated with landowner accessing their inholding properties. Acquisition of these parcels would also protect water quality by preventing additional development of the inholdings, eliminating associated threats presented by the proliferation of septic systems in poorly drained areas. Lastly, acquisition of the Additions and Inholdings parcels would preserve the already established linkages among the natural areas of this remarkable region. It would greatly enhance the prospect that one day a continuous band of publicly owned natural areas

would extend north from Yankeetown all the way through the Big Bend region of the Gulf Coast. Unspoiled salt marshes that provide the last refuge for the endangered Florida salt marsh vole would receive protection.

B. Where feasible, survey boundaries of the preserve to clarify disputed property lines. Improve boundary fencing as needed. Continue to post areas where fencing is not possible, as on offshore islands, and identify them clearly as preserve property. Request assistance of the Park Patrol and other law enforcement agencies in enforcing Division regulations on preserve lands.

7. Pursue an increase in staffing for Waccasassa Bay Preserve State Park.

A. Aggressively pursue the assignment of additional staff to Waccasassa Bay Preserve State Park. Only adequate staffing will ensure the proper protection, preservation and interpretation of the natural and cultural resources of the preserve.

8. Contact institutions that may house animal or plant collections made within the preserve, retrieve pertinent records, and develop more complete species lists for the preserve. Improve the monitoring of listed plant and animal species.

A. Contact herbaria in the state universities of Florida to determine if any possess records of plants collected in the preserve that would supplement Abbott's (1998) list of vascular and non-vascular plant species for the preserve.

B. Contact institutions that may have records of macro-invertebrates collected within the preserve, and initiate development of a macro-invertebrate species list for the preserve.

C. Institute a program of periodic monitoring of listed species, to the extent feasible given staffing constraints. Use GPS technology to map known colonies of FNAI-designated plant species within the preserve. When possible, conduct post-burn surveys for gopher tortoises in zones containing mesic flatwoods.

9. Protect water resources within the preserve by actively supporting and participating in regional water management and conservation efforts.

A. In cooperation with the SRWMD, pursue funding for increased water quality and biological monitoring in the Waccasassa River and its springs, tributaries and estuaries, both within and outside the preserve.

B. Participate in regional water supply planning efforts, and closely monitor water use permit requests submitted to the SWFWMD and the SRWMD. For permit requests that may affect water resources within the preserve, provide The Division review and comments.

C. Request the SRWMD to set priorities for establishing minimum flows and levels (MFLs) for the Waccasassa River, and participate in the MFL establishment process.

<u>Cultural Resources</u>

1. Increase the frequency of patrols by preserve staff and law enforcement personnel.

A. Visit cultural sites regularly to determine the extent of the looting problem and to deter additional vandalism. Make it a priority to increase patrols at the more easily accessible sites. Request the assistance of Park Patrol and other law enforcement agencies as needed.

2. Increase monitoring of cultural resources and document changes observed.

A. Establish photo points and photograph certain sensitive cultural resource sites on a regular schedule. Periodic photography will allow comparison of future conditions with previous ones, and will enhance the monitoring of selected cultural sites.

B. Visit selected cultural resources on at least a semiannual basis. Add notes taken during site visits to the data collection kept for each resource.

C. Apply for grants to fund reassessments of endangered sites by qualified individuals, focusing on preservation of the sites, protection and mitigation of impacts from erosion and inundation.

3. Record additional cultural sites and survey areas of the preserve not covered by previous surveys.
   A. Record additional cultural resources as encountered and identified. Continue to work with the Division of Historical Resources to record new sites as they are encountered, and update existing records in the Florida Master Site File.
   B. Pursue grant funding for additional surveys within the preserve, targeting areas that were not included in previous archaeological surveys.

Recreational Goals

1. Continue to provide quality resource based outdoor recreational and interpretive programs and facilities at the state park.
   A. Maintain and promote boat, canoe and kayak access to the preserve via launch sites in Cedar Key and on the Waccasassa River.
2. Seek funding to expand recreational and interpretive opportunities through the improvement of programs and the development of new use areas and facilities, as outlined in this management plan.
   A. Develop pedestrian access trail into the preserve south of State Road 24 adjacent to Cedar Key Scrub State Reserve using existing all-weather road.
   B. Re-develop primitive canoe/kayak campsite on Waccasassa River and investigate potential for additional overnight primitive campsites for canoeists and kayakers.

Park Administration/Operations

1. Seek funding for two FTE positions to be shared with Cedar Key Scrub State Reserve.
   A. Add Park Biologist or Park Service Specialist with resource management specialization to meet basic responsibilities of listed species management and monitoring as well as prescribed burn planning and evaluation. Position should be shared with Cedar Key Scrub State reserve to assist with resource management activities in that unit as well.
   B. Add a Park Ranger position to assist with daily maintenance and management tasks, including fenceline patrol, and the management and creation of new public facilities and trail systems at Waccasassa Bay Preserve State Park.
2. Enhance park protection measures.
   A. Accomplish boundary fence repairs.
   B. Install additional fencing where needed.
   C. Pursue clarification of boundary locations.

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 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 aids staff in planning and the development of erosion control projects.

Emphasis is placed on protection of existing resources as well as the promotion of compatible outdoor recreational uses.

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 January 21, 2004. The purpose of this meeting was to present this draft management plan to the public. A DEP Advisory Group meeting was held on January 22, 2004. The purpose of this meeting was to provide the Advisory Group members the opportunity to discuss this draft management plan.

Other Designations

Waccasassa Bay Preserve 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. Waccasassa Bay Preserve State Park was designated as a National Natural Landmark in 1976. The park is a component of the Florida Greenways and Trails System.

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 II and III waters by DEP. This unit is adjacent to the Big Bend Seagrasses Aquatic Preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes).

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

The 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

Waccasassa Bay Preserve State Park is located in the Gulf Coastal Lowlands geomorphologic region. Characteristic of this region are the marine terraces that gradually transition from older terraces inland toward younger terraces along the coast. Specifically, the preserve occupies part of a landform known as the Gulf Coastal Swamps, a disjunct physiographic formation along parts of the peninsular coast where a scarcity of sand prevents beach formation (White 1970).

The topography of the preserve is generally flat. This flat character is disrupted only by stream channels, wetland depressions, and occasional knolls or mounds that may be of aboriginal origin. Elevations within the preserve range from slightly higher than ten feet above mean sea level to sea level. Five to ten foot elevations are present only in scattered locations, mainly at the south end of the preserve near Yankeetown, at several spots along the northern and northwest boundary of the preserve and on small islands of upland along the eastern boundary. The only known human disturbances of topographic features are unimproved roads and tramways and the activities, possibly aboriginal, that produced the mounds.

Geology

Regionally, in descending order, underlying deposits consist of the Pamlico Formation of

Pleistocene age; the Ocala Group, Avon Park Formation, Lake City Limestone and Oldsmar Limestone of Eocene age; and the Cedar Keys Formation of Paleocene age.

Surficial deposits in Waccasassa Bay Preserve State Park are considered part of the Pamlico Terrace. They consist of a thin layer of marine quartz sands and clayey sands that vary in thickness and are absent in some locations where limestone outcrops occur.

The Ocala Group of limestones, comprising three limestone deposits, is next in sequence. The Ocala Group may reach a thickness of 125 feet, but the average is 100 feet (Slabaugh et al. 1996). In descending order, deposits of the Ocala Group include the Crystal River Formation, the Williston Formation and the Inglis Formation. Outcrops of these formations are common in the preserve. Deposits are differentiated because of lithology and fossil content. The Crystal River Formation and upper portions of the Williston Formation are typically white to cream, abundantly fossiliferous, chalky limestones. The lower Williston and Inglis Formation are commonly alternating hard and soft, white, tan and gray, dolomitic and fossiliferous limestones.

Below the Ocala Group lies the Avon Park Formation, which is variable in lithology. It is commonly tan, buff and brown dolomite often interbedded with white, cream and yellow-gray limestone. The limestone commonly contains varying amounts of peat, lignite and plant remains. Some fossils are also present. The Avon Park Formation is commonly 150 feet thick, though it may be less, but it can also reach a thickness of 800 to 1,100 feet (Slabaugh et al. 1996).

In Levy County, Lake City Limestone is varied in composition. In general, the fossiliferous limestone is tan to cream, peat flecked, sometimes containing coquina, gypsum and dolomite. The formation measures between 575 and 900 feet thick.

Earliest of the Eocene deposits is the Oldsmar Limestone, pervasively dolomitized and having seams of chert and anhydrite. This formation varies from just under 400 feet to slightly over 550 feet in thickness.

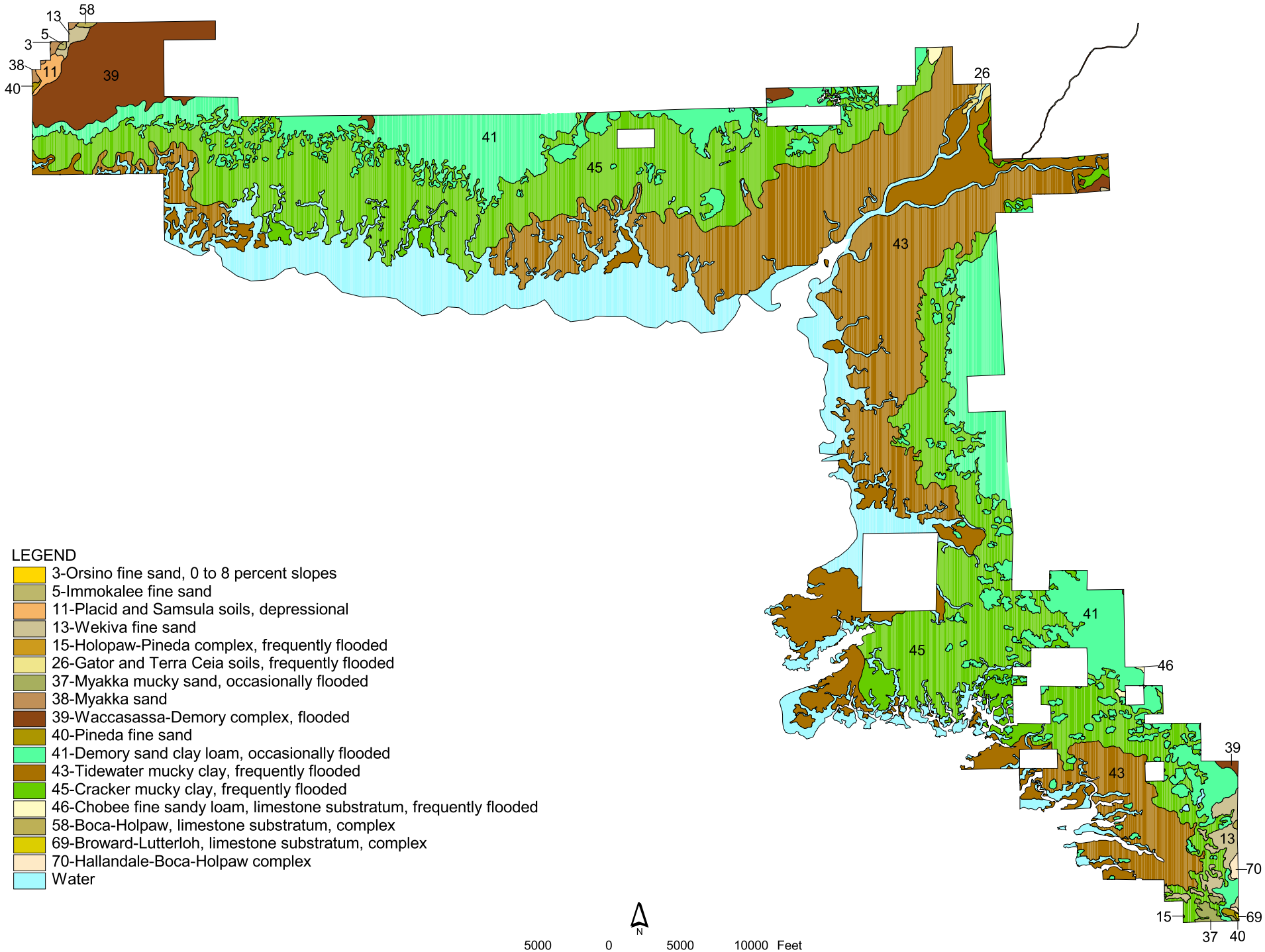
The Cedar Keys Formation is composed of interbedded tan to gray, often fossiliferous limestone and tan to brown, crystalline to chalky dolomite. Gypsum has impregnated large sections and may occur as thin lenses. The Cedar Keys Formation is some 600 feet thick (Chen 1965).

There are no known alterations of the geological formations of the preserve.

Soils

There are 13 soil types within Waccasassa Bay Preserve State Park (Slabaugh et al. 1996). See Addendum 3 for a list of these soils and complete soil descriptions (see Soils Map). Nearly all of these soils are wet; ranging from somewhat poorly drained to flooded, with the majority being frequently flooded. Many of the soils are shallow, having limestone bedrock near the surface, commonly within 6 to 80 inches of the surface. The shallowest soils occur on low islands in the tidal marsh where soils overlying limestone are commonly only 6 inches deep or less. In low hammocks, soils are commonly 11 - 18 inches deep. Deeper, mucky soils tend to be in wetland sloughs, along floodplains of creeks and rivers, and in some tidal marshes. Limited areas of better-drained soils occur in the northwest corner of the preserve adjacent to the Cedar Key Scrub State Reserve.

Some soil erosion may occur along creeks and rivers within the preserve because of boat wakes. Other recent soil disturbances have occurred during logging activities that were conducted to suppress a southern pine beetle outbreak. Past soil disturbances include agricultural and road



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Division of Recreation and Parks
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WACCASASSA BAY PRESERVE STATE PARK

SOILS MAP

building activities. Management activities will follow the most current generally accepted best management practices including silvicultural BMPs (FDACS 1993) to prevent soil erosion and conserve soil and water resources on site.

Minerals

Limestone from the Ocala Group is commonly mined for use in road construction (Rupert and Arthur 1990). Limestone quarries exist near the preserve. Whether any deposits of commercial value exist within the park is unknown.

Hydrology

The most prominent hydrologic feature of Waccasassa Bay Preserve State Park is the Waccasassa River, which roughly divides the preserve in two as it flows into the Gulf of Mexico. The Waccasassa River is a blackwater stream; high concentrations of tannins and organic acids give the water a dark appearance. The majority of the 556 square mile Waccasassa River watershed lies outside the preserve boundaries (Hornsby et al. 1999). The headwaters of the river are the Waccasassa flats, a mostly undeveloped mosaic of wetlands in parts of Gilchrist and Levy counties (Hand, Col and Grimson 1994). The primary source of water flowing in the Waccasassa River is local rainfall; however, springs also contribute to the flow. Levy County Blue Spring comprises the headwaters of the Little Waccasassa River. Several other springs including Wekiva Spring on a tributary of the Waccasassa, and numerous other small springs along the middle and lower reaches, contribute to water volume in the river as well. During periods of low rainfall, these springs become the primary source of river flow. Discharge from the Waccasassa River is variable and tidally influenced. For the period of record, the annual mean flow of the river is 283 cubic feet per second (cfs). The lowest daily mean flow is –2310 cfs (negative indicating a reversal of flow) recorded on August 31, 1985; the highest daily mean flow is 11400 cfs, recorded on September 12, 1964 (Franklin et al. 2001).

Water quality in the Waccasassa is generally fair to good (Hand, Col and Grimson 1994). The majority of the Waccasassa River within the preserve has been designated as an Outstanding Florida Water and is considered a Class II water body (open for shellfish harvesting, but often restricted). Water quality in the upper portion of the Waccasassa and in some of its tributaries, however, tends to be fair; these are Class III water bodies (shellfishing prohibited). Traditionally, the Outstanding Florida Water and Class II designations require somewhat stricter standards for water quality. The Suwannee River Water Management District (SRWMD) maintains a water quality and biological monitoring station on the Waccasassa River, at County Road 326, as part of its Surface Water Improvement and Management (SWIM) program. Based upon quarterly water quality monitoring since 1995, the SRWMD rates the water quality at that station as "good," (Hornsby et al. 1999). The DEP Northeast District once maintained a bioassessment station along the Waccasassa River at State Road 24.

Other surface water features include more than 40 named streams and numerous unnamed streams, located either partially or entirely within the preserve, and many ponds and small lakes. Most of the streams are blackwater streams whose water source is local rainfall. Some streams such as Kelly Creek and Spring Run, however, are fed by groundwater seepage and springs. The number of streams fed by springs is currently unknown. The majority of these waterways are Class II waters.

There are numerous solution features scattered throughout the preserve that are brackish in nature and support a brackish water flora. Very few of these ponds support a freshwater flora (Abbott 1998, Abbott and Judd 2000). Water sources for these ponds and lakes may include the Floridan aquifer, rainfall and tidal input from the Gulf of Mexico. A natural saltwater wedge

extends inland from the Gulf, intruding into the freshwater aquifers. The depth of the saline wedge ranges from zero at the coast to around 250 feet inland (Fernald and Patton 1984). It is possible that saltwater intrusion into the Floridan aquifer could contribute to the brackish nature of surface waters within the park, and this phenomenon may alter the water chemistry of freshwater ponds over time.

The Waccasassa Bay region is, in general, an area of discharge of the Floridan aquifer via groundwater seepage or springs. Groundwater resources at the preserve are generally in good condition. The Floridan aquifer lies at or near the ground surface, as evidenced by limestone outcrops occurring at or near the ground surface in the preserve and surrounding area. The aquifer is unconfined in this area, overlain by discontinuous and relatively thin soil deposits. The surficial aquifer is highly connected to the Floridan aquifer and surface waters may freely enter either of these aquifers. Thus, the potential for local groundwater pollution may be high. Perched water tables exist at depths from two to 25 feet and are manifest as systems such as lakes and cypress ponds.

The hydric hammock natural community, which occurs inland from tidal marsh, has important effects on the hydrologic processes of these coastal lands. During periods of heavy rainfall the hydric hammock floods. Water travels through this community as sheet flow and eventually enters streams. Through the temporary storage of water, the hydric hammock likely affects water quality and functions to attenuate freshwater pulses into estuarine systems (Vince et al. 1989). These natural functions are disrupted by various land use practices, foremost among them being the drastic reduction in regional acreage of hydric hammock; much of Gulf Hammock has been converted to pine plantations. Past and present road building activities and facilitation of drainage as a part of silvicultural operations inside and outside the preserve may also affect natural hydrologic patterns. The channelization of surface waters by ditching and the impoundment of water by roads both probably contribute to the loss of natural functions of hydric hammocks. These land use practices, occurring mostly outside the preserve, are thus likely to affect the estuarine system inside the preserve.

Current threats to water quality in the preserve include additional development along the Waccasassa River and its tributaries; development to this point has been limited. However, a number of camps and permanent residences have been established along Tenmile Creek, a tributary of Cow Creek, within one mile of the preserve boundary. This development may be responsible for lowered water quality noted by Florida Marine Research Institute (FMRI) staff at the mouth of Cow Creek. In addition, past records indicate sediment loads in the Waccasassa River were recorded as high, possibly due to runoff from logging operations (Hand, Col and Grimson 1994; FDNR 1989). Recent logging operations in some of the preserve's mesic flatwoods and hydric hammock, for control of a southern pine beetle outbreak, likely altered natural hydrologic patterns. Ruts created by heavy equipment channeled surface waters and temporary roads built to accommodate logging trucks disrupted sheet flow.

Threats to water quantity in the natural systems of the preserve and surrounding areas are less easily projected and therefore difficult to define and minimize. Spring flows in both Blue Spring and Wekiva Spring are predicted to decrease by the year 2020 due to projected increases in groundwater withdrawals (Sepulveda 2002). The possible resultant impacts to the surfacewater systems to which these springs contribute remain undefined.

Natural Communities

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI) FNAI Descriptions. 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 12 distinct natural communities in addition to ruderal areas. Four of the estuarine natural communities: estuarine seagrass bed, estuarine mollusk reef, estuarine consolidated substrate and estuarine unconsolidated substrate are mapped as estuarine composite substrate since they are difficult to differentiate (see Natural Communities Map). 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.

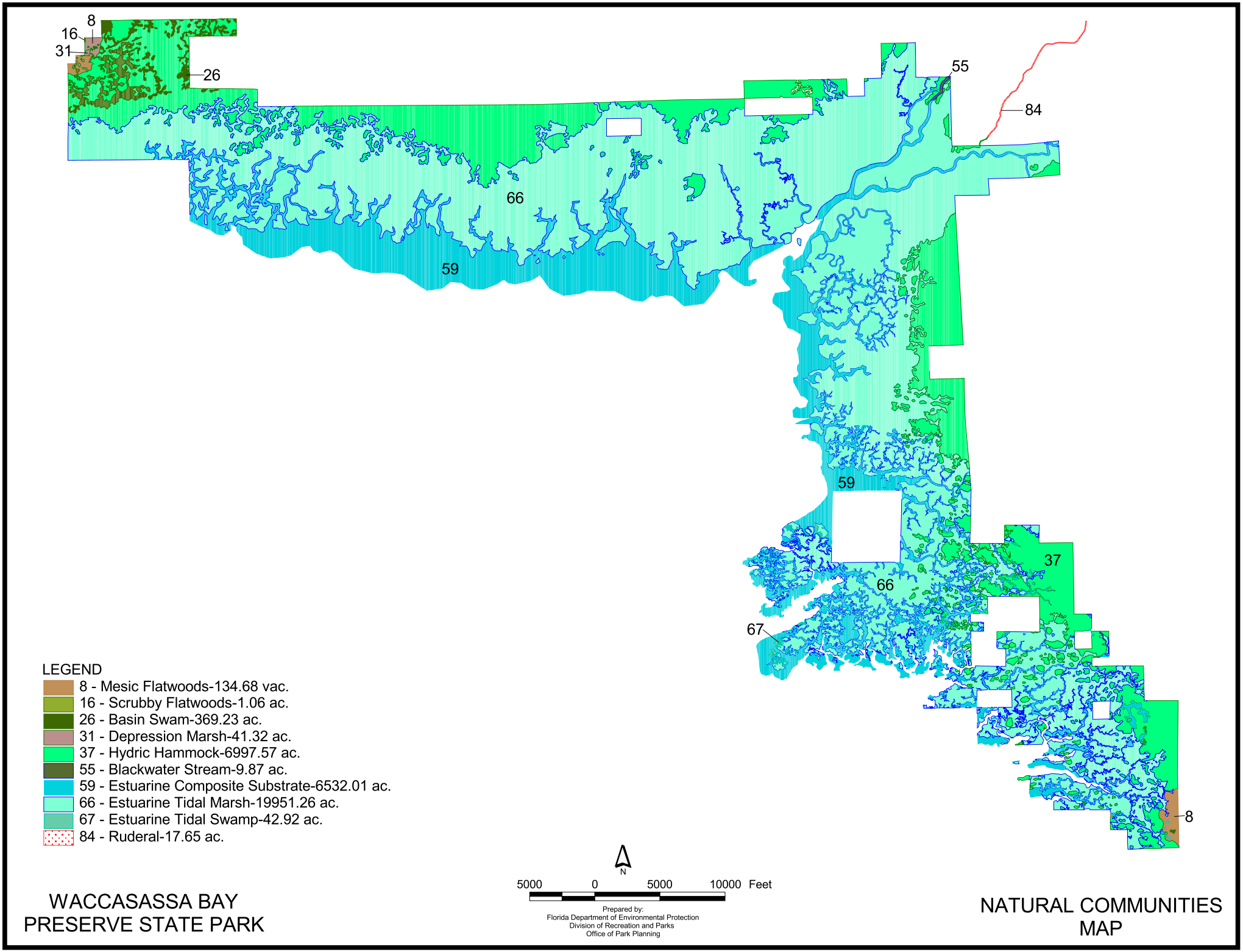
Mesic flatwoods. The flatwoods tend to occupy slightly higher elevations than the hydric hammock and tidal marsh. The mesic flatwoods at the southern end of the preserve are somewhat uncharacteristic in composition, possibly due to long-term fire exclusion, former timbering operations and the influence of sea level rise. Loblolly pine (*Pinus taeda*), cabbage palm (*Sabal palmetto*) and intermixed hydric hammock species occur along with slash pines (*Pinus elliottii*). The understory is dominated by shrubs, primarily saw palmetto (*Serenoa repens*) and yaupon holly (*Ilex vomitoria*). In scattered locales, there are remnant herbaceous species, and on some islands in the tidal marsh, certain scrub species have become established, possibly due to fire exclusion. Portions of the mesic flatwoods in the southern part of the park were logged in 1997 and 2000 to control outbreaks of southern pine beetles. Hydrologic patterns and water quality may have been affected by the logging as discussed above in the Hydrology section.

More typical mesic flatwoods occur in a new acquisition in the northwest portion of the preserve. Although much of this area was logged and planted with loblolly pines, the native shrub layer is relatively intact and remnant slash and longleaf pines (*Pinus palustris*) are common. Removal of offsite loblolly pines from these areas would help prevent or limit future outbreaks of southern pine beetles. Restoration of these areas will include logging of the offsite pines, replanting with longleaf pines, and regular burning. Several areas were more recently planted with slash pines. At some point in the future, the slash pines will be thinned and longleaf pines will be planted within the stand.

Remnant slash pines occur in several locations with the mesic flatwoods of the preserve. These older trees may retain some of the original characteristics of the slash pines along the gulf coast. Historically the south Florida slash pine, a variety or ecotype that more closely resembles the longleaf pine, may have extended into Levy County in the coastal flatwoods. These older slash pines will be preserved and protected during any thinning operations designed to remove planted slash pines.

In general, the majority of the mesic flatwoods of the preserve are in fair condition. This condition is expected to improve with removal of offsite pines and regular prescribed burning.

Scrubby flatwoods. A limited area of scrubby flatwoods occurs within the preserve along the boundary with the Cedar Key Scrub State Reserve. Although quite small, it is contiguous with larger areas of scrubby flatwoods within the adjacent reserve. Abbott (1998) describes some of the more xeric areas of mesic flatwoods that border tidal marshes in the southern flatwoods as



WACCASASSA BAY
PRESERVE STATE PARK

NATURAL COMMUNITIES
MAP

being similar to scrubby flatwoods. These areas have been mapped as mesic flatwoods since they are not probably true scrubby flatwoods.

Basin swamp. A large area of basin swamp occurs in the northwestern part of the preserve; it is dominated by cypress (*Taxodium distichum*) but also contains some hardwood species like red maple (*Acer rubrum*), black gum (*Nyssa sylvatica*) and ashes (*Fraxinus* spp). The basin swamp is intermingled with the hydric hammock. A few inches of elevation determines community type in this area. The understory of the basin swamp and hydric hammock is unusual in that it is dominated by needle palm (*Rhapidophyllum hystrix*). A small basin swamp located in the southern part of the preserve is dominated by cypress, sweetbay (*Magnolia virginiana*), and ash trees; it borders a deep tidal channel that is fringed with tidal marsh species. These areas are so small that they are unmapped. The basin swamps in the preserve are in good condition despite past logging activity. These systems are sensitive to changes in hydrologic patterns that could originate outside the preserve.

Depression marsh. The depression marshes are located within the mesic flatwoods in the northwest end of the preserve. These isolated wetlands are dominated by herbaceous rather than woody vegetation. Although there is some encroachment of woody vegetation, these marshes are in fairly good condition and are expected to improve as prescribed fires are introduced into the mesic flatwoods in the new acquisition.

Hydric hammock. The most extensive forested community in the preserve is hydric hammock. The hydric hammock is generally in good condition despite having been selectively logged in the past. Several episodes of logging dating from before the turn of the century have occurred, each time targeting a partially different group of species (Swindell 1949, Jennings 1951). Species diversity is relatively high, and there is a high diversity of species assemblages within the hydric hammock. Red cedar (*Juniperus virginiana*) and cabbage palm are usually important canopy members, but they are most dominant in areas close to the salt marsh. Species more characteristic of swamps and upland mixed forests often replace the red cedar and cabbage palm in the more inland portions of the hydric hammock. The presence of other species varies with the elevation, land use history, and distance from the salt marsh.

The make-up of this community is highly variable because the hydric hammock within the preserve once graded into upland mixed forest, swamps of various types and mesic flatwoods. The beginnings of the transition zones between these communities lie just within the preserve boundaries. In addition, many small islands of hydric hammock occur in the salt marsh. These were likely places of slightly higher elevation within the hydric hammock, which were isolated as sea levels rose. Community boundaries and species distributions within communities are dynamic and will continue to change over time with the influence of sea level rise and storms.

The many small, and sometimes large, rainwater depressions in the preserve constitute another variable component of the hydric hammock. These depressions have a longer hydroperiod and deeper water than is found in the surrounding hydric hammock; they occur because of breaks in the limestone bedrock near the surface. The freshwater pools can be ephemeral or permanent. The ponds are often brackish, probably because they are flooded by tidal surges. The vegetation characteristic of these ponds varies, often changing with time (Abbott 1998, Abbott and Judd 2000). Corkwood (*Leitneria floridana*) is common in some of the less dynamic, more permanent pools. Other species common in these pools include sawgrass (*Cladium jamaicense*) and Carolina willows (*Salix caroliniana*). The more ephemeral ponds often contain concentrations of herbaceous species that occur scattered throughout the surrounding hydric hammock. These

pools are too numerous to count or map; most of them are small and do not adequately fit any FNAI category.

Logging activities earlier in the century have affected the hydric hammock community in several ways. Loggers removed the most desirable timber trees, and with them the most desirable genes. Because of the selective logging (i.e., highgrading), the remaining forest is probably less genetically diverse than it once was. The genetic pool, in terms of quality of timber trees, may be inferior to what once existed in Gulf Hammock (Vince et al. 1989). Another consequence of former logging practices is that loblolly pine stands may be denser in some areas now than in the past. Recently, in some areas having dense populations of loblolly pine, southern pine beetles have infested large numbers of trees. Accessible infested areas were logged in 1997 and 2000 to control the spread of the beetle to adjacent lands. Because of the recent logging, hydrologic patterns and water quality were likely affected. Hydrologic patterns have also been altered by activities outside park boundaries including conversion of hydric hammock to pine plantation and past construction of roads and drainage systems.

Blackwater stream. The only blackwater stream in the preserve is the Waccasassa River. Water quality of the river is monitored periodically. Currently the stream appears to be in good condition. Potential threats to the river include mining and timbering that occur in the surrounding watersheds. These activities could eventually lead to degradation of the community by decreasing water quality and by altering natural hydrologic processes. Another problem is stream bank erosion caused by excessive boat wakes. Additional details about the Waccasassa River are provided in the *Hydrology* section above.

Estuarine composite substrate. Estuarine composite substrate is a combination of mineral, fauna and floral based estuarine natural communities including estuarine seagrass bed, estuarine mollusk reef, estuarine consolidated substrate and estuarine unconsolidated substrate. Due to the difficulties of mapping these subtidal and intertidal natural communities individually, they are lumped for mapping purposes as estuarine composite substrate, but are listed separately below to identify the types found within the preserve. Maintenance of this community type in a good condition is extremely important for wildlife such as sea turtles that use the Waccasassa Bay area as nursery grounds.

Estuarine seagrass bed. Seagrass beds occur at scattered locations within estuarine areas of the preserve. These areas have not yet been mapped individually so acreage figures are unavailable. As described above, seagrass bed acreage figures are included within the total for the estuarine composite substrate of the preserve. Large areas of sparse to dense seagrass beds occur southwest of the mouth of the Waccasassa River both within and outside the preserve.

Estuarine consolidated substrate. Small limestone outcrops are common along the streambeds and coastal shores of the preserve. These outcrops are important since shellfish, particularly oysters, often colonize them. The extent of this community within the preserve is unknown at this time. As mentioned above, areas of estuarine consolidated substrate are not mapped individually but are included as part of the estuarine composite substrate.

Estuarine mollusk reef. The mollusk reef is the only faunal-based estuarine system in the preserve. Oyster colonies form the bulk of this community. Their extent is unknown but they commonly occur as shoals in tidal creeks. Mollusk reef acreages are included within the total acreage for the estuarine composite substrate of the preserve.

The estuarine mollusk reefs in this part of the Gulf Coast are dominated by the American oyster, although other species of mollusks also occur on the reefs. In general, mollusk reefs are prone to impacts from water quality degradation. The mollusk reefs within the preserve boundary occur within Class II waters, but are often restricted from shellfish harvesting due to water quality concerns.

Estuarine unconsolidated substrate. Most of the tidal creeks within the preserve have mud bottoms and many have extensive supratidal mud flats that are important feeding areas for wading birds and shorebirds. Although some estuarine unconsolidated substrate may have limited amounts of sand deposition from adjacent uplands, much of this community along this low energy coastline is dominated by mud deposits.

Estuarine tidal marsh. Estuarine tidal marsh is the most extensive community in the preserve. Extensive stands of black needlerush and smooth cordgrass dominate the tidal marsh. Areas dominated by saltgrass and other herbs are common seaward of hydric hammock islands. Areas of bare limestone are also scattered throughout the tidal marsh of the preserve.

As with the other estuarine natural communities, tidal marshes are sensitive to runoff and pollution from adjacent uplands. According to Vince et al. (1989), the estuarine tidal marsh system is linked to adjacent upland areas by a band of hydric hammock that modifies the quantity, timing and quality of freshwater entering the marsh. Changes in any of these parameters can greatly modify the structure and productivity of the community receiving the freshwater flow. Reductions in tidal marsh salinity may negatively affect the function of the tidal marsh as a nursery for marine fish and invertebrate species.

Estuarine tidal swamp. Within the preserve, this community type occurs primarily south of Turtle Creek Bay. Cedar Key is the northern limit for this system on the Gulf Coast. Mangroves are common in Cedar Key but uncommon in areas further to the east to the Waccasassa River and south to Turtle Creek. Why this occurs is unknown, but the prevailing ocean currents may be responsible. While red mangrove (*Rhizophora mangle*) exists in the area, only black mangrove (*Avicennia germinans*) is known to grow within the preserve. Black mangrove may grow in relatively dense stands or as scattered individuals in tidal marsh. Hard freezes can damage black mangrove, so its dominance in the tidal marsh may vary with the severity of recent winters. Because of the wide range of densities and the dynamic, scattered nature of mangrove stands, this community type is included within the acreage totals for estuarine tidal marsh.

Ruderal. The northernmost ruderal area is the historic fiber factory site. This site contains a small, run-down wood-framed structure located in a pasture that is being invaded by loblolly pines. The other ruderal area in the preserve is an old homesite on a newly acquired property. Several exotic plant species are found at this old home site.

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.

Most of the designated animal species that occur within the preserve have populations that also range outside the preserve; however, the large, undisturbed expanses of the preserve likely serve

as important foraging areas for many of these species. It is probable that many of the reptiles and mammals that have smaller home ranges breed successfully within the preserve. As of 2002, four active bald eagle nests were recorded within the preserve by the FFWCC. An additional nest, last active in 1996 and currently of unknown status, is located within the preserve. Three others are mapped on private lands near the preserve. The status and location data were obtained from the FFWCC Eagle Nest Locator website (http://www.wildflorida.org/eagle/eaglenests/). The location data is considered accurate within 0.1 miles, so ground surveys would be required to confirm the location of the nests with respect to the preserve boundary. Both black bears and Florida panthers occurred historically within the preserve. By 1950, the black bear was nearly extirpated from the Gulf Hammock region, although panthers were reported frequently (Pearson 1951). Younker (2003) states that a black bear carcass was found on Stafford's Island in 1976.

The only record for the scrub jay in the preserve, made in the 1970s, was in the southern part. Historically, jays were known to occur near Yankeetown. The most recent sightings of scrub jays in this area were west of U.S. Highway 19, just south of the Withlacoochee River (Tom Mathews, pers.comm.). The gopher tortoise is also known to occur in the flatwoods at the south and northwest ends of the preserve. Indigo snakes have historically been relatively common in the Gulf Hammock region and occur within the preserve.

At least three species of sea turtles, the Atlantic ridley turtle, green turtle and the loggerhead turtle, use the seagrass beds and other estuarine and marine communities in the preserve. Waccasassa Bay serves as an important developmental habitat for sub-adults of these species (Carr 1995; Younker et al. 1992). There are also historical accounts of Atlantic ridley and green turtles hibernating in mud bottoms off Cedar Key and Waccasassa Bay (Carr 1995). The West Indian manatee also uses the estuarine communities of the preserve and the Waccasassa River.

One animal species found in tidal marsh similar to that which occurs in the preserve, but which has not been recorded to-date within the preserve, is the Florida salt marsh vole. This species is listed as endangered on both federal and state lists and is considered critically imperiled within Florida by FNAI. Both the USFWS and the FFWCC have attempted to locate the species within the preserve without success. At this time, the Florida salt marsh vole is known from only two locations along the Levy County coast near the Waccasassa Bay Preserve State Park.

Numerous listed plant species occur within the preserve. Two listed plants that are notably abundant in the preserve are corkwood (*Leitneria floridana*) and cedar elms (*Ulmus crassifolia*), both of which occur in hydric hammock. Several endangered plants in the preserve also occur in hydric hammock; these include Florida pinkroot (*Spigelia loganioides*), pinewood dainties (*Phyllanthus leibmannianus*), and crested coralroot (*Hexalectris spicata*).

Special Natural Features

The extensive outcrops of limestone in the preserve are a notable geologic feature. The flatness of the topography at the coast creates interesting opportunities for the study of effects of sea level rise. Sea level rise has shaped the boundaries of plant communities in the preserve over time and will continue to do so. Recent die-offs of cabbage palms on islands in the preserve have been attributed to sea level rise (Perry and Williams 1996). Climate change may accelerate sea level rise and the transformation of plant communities.

A unique botanical feature of the preserve is the number of plant species occurring either at the northern or southern limits of their ranges. In a recent floristic survey of Waccasassa Bay Preserve State Park 29 species were documented that occur at or near their contiguous southern limit in Florida. Likewise, 45 species were documented that occur at or near their contiguous

northern limit in Florida (Abbott 1998).

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 describes an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action to reestablish physical stability.

The cultural resources of Waccasassa Bay Preserve State Park are extensive. The Florida Master Site File (FMSF) lists 80 sites within the unit. Archaeological surveys conducted in the Gulf Hammock area resulted in testing and documentation of 80 archaeological sites within the preserve boundary (Jones and Borremans 1991, Jones 1993, Vojnovski et al, 2000). Addendum 6 contains a listing of the sites along with the most recent condition assessments. Additional sites were found outside the boundaries of the preserve. Sites are scattered across the preserve with concentrations in the northern section of the preserve and in the southern portion of the preserve, south of South Mangrove Point. There are fewer documented sites in the middle portion of the preserve, for example in Turtle Creek Bay and adjacent areas. This disparity may be due to differential survey efforts and the remote nature of these areas.

The vast majority of the recorded sites are shell middens; most of them are classified as eroding. In most cases, the erosion is due to natural processes such as tidal fluctuations, stream flow, storm surges and rain events. Undoubtedly, many of the sites that are now located on coastal islands or in tidal marsh were originally located in a more upland setting. Sea level rise has likely affected plant community distribution over time, pushing tidal marsh communities inland. Likewise, sea level rise and erosional processes have covered over or washed away many former aboriginal sites.

Other documented aboriginal sites include camps, lithic scatters, village/ habitation sites, and two burial mounds (Jones and Borremans 1991, Jones 1993, Vojnovski et al, 2000). Patterns of settlement are around sources of fresh water, i.e., creeks and freshwater ponds. The two burial sites that occur within the preserve were generally intact at the time of the archaeological survey but have since been impacted by looting. Both mounds were still considered to be in good condition when last assessed (Vojnovski et al, 2000). Spring Run Mound is located adjacent to the park boundary and may be especially vulnerable to looting.

In addition to prehistoric sites, there are numerous historical resources within the preserve. There are remnants of a salt works in the northern portion of the preserve that dates from the mid-to-late nineteenth century (Dickinson and Edwardson 1984). At the time of the report, the salt works was partially located in tidal marsh. Artifacts recorded include the remnants of two possible furnaces and two large kettles. Judging from the artifacts found, this salt works was probably not a large-scale operation but served as a local source of salt. A fiber factory also once existed in the preserve; it used palm fibers to make brooms and brushes.

Various other documented and undocumented historical resources occur scattered throughout the preserve. Documented resources include an old hearth, a moonshine still site, a cow pen, and a

territorial fort called Fort Three. Fort Three, which was once located at the mouth of the Waccasassa River, no longer exists due to natural erosion. Undocumented cultural resources include several possible wells (up to four known locations) scattered throughout the preserve. One such well is described in a report by Jones and Borremans (1991) as a rectangular well 1m x 0.75m. Two rock structures have been identified within the preserve; one resembles a small enclosure and the other is an extensive complex with no obvious shape. Stumps and tramways still exist as evidence of the extensive post-Civil War logging, which primarily targeted cedar, cypress and pine. A set of large wheels once used to skid lumber was recovered in the preserve; the wheels are presently stored in the maintenance area at Cedar Key Scrub State Reserve.

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.

Two stands dominated by planted loblolly pines in the northwest corner of the preserve have been evaluated for timber management (see Addendum 7). These sites were acquired since the last unit management plan revision. These areas are classified as mesic flatwoods, and loblolly pines are considered an offsite species. Remnant slash and longleaf pines occur within the stand and are common outside the planted areas. Restoration of these stands to mesic flatwoods will require removal of all loblolly pines, retention of slash and longleaf pines, and replanting with longleaf pines. One objective of the restoration project is to discourage future outbreaks of southern pine beetles within the preserve by removing offsite loblolly pines and reducing stress on the remaining longleaf and slash pines. Adjacent stands planted with younger slash pines may be considered for timber management in future management plan updates.

Additional Considerations

Southern Pine Beetles. Southern pine beetle infestations in the preserve have caused the mortality of large numbers of loblolly pines. Loss of these pines is unfortunate, but ecological impacts may not be as severe compared to other areas in the region. The majority of the forests in the preserve are not fire-maintained systems. Loblolly pines are a natural component of hydric hammock, but usually in lower densities than existed before the pine beetle outbreak. It is likely that the higher densities of loblolly were the result of previous disturbances such as logging and subsequent silviculture. In the flatwoods, the loblolly pines are considered to be offsite since they are not particularly fire-tolerant. The loss of loblolly pines is unlikely to have devastating long-term impacts on the ecological integrity of the preserve. The hydric hammock will undoubtedly regenerate itself, although some intervention may be required to prevent loblolly pines from again dominating the system. In the clear-cut areas of the mesic flatwoods, the loblolly pines that were removed as part of the pine beetle control measures will need to be replaced by naturally occurring fire-adapted pine species such as slash and longleaf pines.

Because of the large size and remote nature of the preserve, the only feasible way to detect southern pine beetle infestations is through aerial surveys. The Division of Forestry and neighboring industrial forestry companies often use these techniques. Because pine beetle infestations often spread rapidly, the sooner control measures are applied the better; affected areas are usually kept smaller in size and typically, there is less environmental damage. The motivation to control the southern pine beetle is largely to keep neighboring properties, where pines are of economic or aesthetic importance, from being infested. There are large, remote areas within the preserve that are inaccessible to conventional logging equipment (e.g., hydric hammock islands in tidal marsh and very wet hydric hammock areas). Such areas would be very expensive to log, or would sustain devastating environmental damage if logged. These factors should be considered when case-by-case decisions are made on the feasibility of logging to control pine beetle infestations.

Less invasive techniques, which are also slower, include felling infested trees with chainsaws and then spraying them with pesticides. These methods can be utilized when infestations are caught while they are still small. The less invasive techniques are sometimes required when infested areas are too wet to accommodate large machinery. For these reasons, the ability to mobilize control measures rapidly and to have a variety of control measures available is essential.

400-Foot Management Zone. The Trustees have also granted management authority of certain sovereign submerged lands to the Division. The management area includes a 400-foot zone from the edge of mean high water where the reserve 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. Areas exempted from this management agreement include those areas open for shellfish harvesting. Most of the estuarine waters adjacent to the preserve are designated as either “Conditionally Approved” or “Conditionally Restricted” for shellfish harvesting. Most of the Waccasassa River within the preserve has received a classification as “Prohibited” for shellfish harvesting.

Management Needs and Problems

Natural Resources

1. Infestations of southern pine beetles have occurred recently in the preserve and may continue to occur where loblolly pine densities are high.

- **A.** Much of the Gulf Hammock area adjacent to the preserve has been converted to loblolly pine plantations that provide an extensive food base for pine beetles. Many areas of the preserve have dense populations of old loblolly pines. In some areas, these loblolly pines appear to be the result of opportunistic colonization of logged-over areas of hydric hammock. In other areas, the pines were probably seeded into mesic flatwoods areas deliberately by previous landowners. Many of the pines within Waccasassa Bay Preserve State Park appear to be under stress. Stressing agents may include storms and salinity increases associated with sea level rise. Dense populations of stressed pines may be particularly susceptible to attack from the southern pine beetle. To date, southern pine beetles have infested over 500 acres within the preserve.

2. Natural communities affected by control measures for southern pine beetles require restoration.

- **A.** Measures to control southern pine beetles range from the felling/spraying of individual infested trees to the creation of large clear-cut zones. In 1997, the Division treated

approximately 320 acres of beetle-infested forest at Waccasassa Bay. On most of these acres, pines were cut under contract using conventional logging equipment, while in some areas pines were cut by hand and then sprayed with insecticide. Contract logging of additional areas took place in 2000 during a subsequent outbreak. The various control measures may affect plant communities differently. The less severe treatments, such as felling and spraying, may result in an immediate change in relative dominance of species. There may also be a change in vegetation structure due to the increased incidence of light. The long-term effects of the spraying are unknown. Staff conducted all pesticide spraying in the preserve under the supervision of a licensed pesticide applicator. Known effects of the clear cutting include soil disturbance, especially under wet conditions; major changes in vegetation structure; and possibly an alteration of species composition, even over the long term.

3. Human activities have altered the natural hydrology of the preserve, and water quality may have deteriorated.

- **A.** The hydric hammocks and wetlands within the preserve are vulnerable to damage from vehicles. Ruts produced by vehicles may readily become channels that intercept normal sheet flow in the hydric hammock and redirect the flow down roadways. Vehicular access to private inholdings by landowners, in particular, leads to uncontrolled and extensive environmental damage through the creation of ruts, channelization of water, soil compaction and removal of vegetation. As roads become impassable, private landowners create new ones parallel to the original routes thereby compounding the environmental damage.
- **B.** Although logging to control southern pine beetles has been limited to drier periods, the logging activities have had similar effects to those described above. Additional impacts include the creation of elevated roadways that may impede sheet flow or alter drainage ways. Each of the above activities may increase sediment loads in surface waters reaching tidal marshes, creeks and other wetlands.
- **C.** The Waccasassa River, Cow Creek and Tenmile Creek need additional water quality monitoring.

4. Fire exclusion has adversely affected the flatwoods community.

- **A.** Although there are certainly other factors involved, the lack of frequent fire is a major cause of the decline of the mesic flatwoods community within the preserve. Fire exclusion has encouraged the invasion of the mesic flatwoods by uncharacteristic hardwoods and by off-site pine species, leading to degradation of habitat preferred by species such as the gopher tortoise.

5. Exotic species occur within the preserve and need more intensive control measures.

- **A.** Efforts to control southern pine beetle outbreaks in the hydric hammock and mesic flatwoods through logging have introduced cogongrass into areas where it previously had not occurred. Removal of the tree canopy has stimulated the growth and spread of cogongrass at the southern end of the preserve.
- **B.** Feral hogs occur within the preserve and are difficult to control due to the presence of an adjacent wildlife management area and numerous inholdings within the preserve.

6. Private inholdings, disputed boundaries and inadequate fencing hinder efforts to protect natural and cultural resources.

- **A.** Access roads to private inholdings within the preserve pass through hydric hammock, tidal marsh, and other sensitive communities. Environmental damage of the nature described above often results when private vehicles use these roads. The development of septic systems on private parcels within the preserve may threaten water quality in preserve wetlands. Some of the inholdings represent large blocks of property that, if developed or cut over, would cause significant fragmentation of natural areas in the preserve.

B. Differences in legal surveys make the posting of accurate boundaries along certain inholdings properties almost impossible. Much of the northern and western boundary of the preserve is neither fenced nor posted; other fence lines need repairs. Patrol of some boundaries is extremely difficult due to their remoteness and generally wet condition. Unauthorized access to the preserve appears to be common in some areas. The DEP has documented problems such as illegal hunting, unauthorized vehicular access and even looting of archaeological sites within the preserve.

7. A severe staff shortage has hampered resource management efforts within Waccasassa Bay Preserve State Park.

A. Staffing for the preserve consists of a park manager and one park ranger, each of whom is also responsible for the management of Cedar Key Scrub State Reserve. These two people manage a combined total of 39,088 acres within the preserve and reserve. An additional responsibility of the park manager is the Cedar Key Museum State Park. A staff of two cannot provide the level of resource management or protection that such valuable natural areas deserve.

8. Additional plant and animal surveys to enable development of more complete species lists would benefit the preserve, as would closer monitoring of populations of listed species.

A. Although Abbott's (1998) vascular and non-vascular plant species lists for the preserve are quite comprehensive, records of additional non-vascular plants collected or documented within the preserve may exist in Florida herbaria or elsewhere.

B. The Division lacks records for macro-invertebrates collected within the preserve.

C. Monitoring of listed plant and animal species does not occur with sufficient frequency or regularity.

9. Activities occurring outside the boundaries of the preserve may affect water resources within the preserve.

A. Land use and management practices on lands beyond the boundaries of the preserve may degrade water quality in the Waccasassa River and its springs and tributaries, and thereby affect water quality within the preserve itself.

B. Water resources and water-dependent natural communities within the preserve require protection from excessive groundwater and surface water withdrawals for water supply in the region.

C. The SRWMD has not yet developed priorities for establishing minimum flows and levels (MFLs) for the Waccasassa River.

Cultural Resources

1. Cultural sites such as burial mounds require protection from vandalism.

A. Looting of burial mounds and other sites has been a problem in the past and may be ongoing. Patrolling these sites to determine the extent of the problem is difficult due to the remoteness of most of the sites.

2. Known cultural resources require increased monitoring.

A. Information is lacking on the current condition of cultural sites within the preserve. Park personnel do not visit or monitor many of the sites on a regular basis. Natural inundation and erosion endanger many of the sites.

3. Additional unrecorded cultural sites are likely to occur within the preserve.

A. Although archaeologists have already recorded many cultural sites within the preserve, it is highly likely that many others exist.

Management Objectives

The resources administered by the Division are divided into two principal categories: natural resources and cultural resources. The Division's 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.

Natural Resources

1. Coordinate with the Division of Forestry (DOF) and adjacent landowners to achieve early detection and rapid suppression of pine beetle infestations.

- **A.** Aerial surveys provide the earliest detection of pine beetle infestations. Staff will coordinate with the DOF to verify aerial survey data using ground surveys based on GPS coordinates. Quick responses to infestations will be necessary to control the spread of the pine beetles. Where logging is not feasible due to environmental or other constraints, staff will implement alternative suppression measures as needed.

2. Restore the natural communities affected by pine beetle control measures.

- **A.** Staff will continue to develop and implement restoration plans for areas logged to control pine beetle infestations. Staff will periodically monitor the natural communities where less intensive measures were used to control pine beetles.

3. Restore the natural hydrology and water quality of areas damaged by artificial soil disturbances.

- **A.** In areas damaged by vehicles or heavy equipment, staff will implement projects to re-contour ruts to match the adjacent grade. Restoration of rut scars will be particularly important in areas where the scars run parallel to the normal direction of sheet flow and increase flow rates by channeling the flow. Restoration of scars that run perpendicular to the normal sheet flow will also be important, as these may intercept flow and redirect it to nearby tidal creeks.
- **B.** In places where logging roads and other access roads cross natural channels and now impede flows, either remove the roads outright or modify them to mitigate the disruption of natural drainage patterns. District 2 biologists have already developed plans and acquired a permit to accomplish these actions. Also, inspect the access road (GP Road) that leads into the recent acquisition in the northwest corner of the preserve to determine if existing culvert numbers and locations are adequate for maintenance of normal flow rates and patterns.
- **C.** Coordinate with the SRWMD in pursuing additional water quality monitoring for the Waccasassa River, Cow Creek and Tenmile Creek.

4. Re-establish an active prescribed burn program in the mesic flatwoods of the preserve.

- **A.** Burn the mesic flatwoods at a frequency appropriate for this community type, at least every 1-8 years as recommended by FNAI, but preferably as often as every 3-4 years. The objectives of the burn program will be to restore suitable habitat wildlife species and to prevent large numbers of off-site loblolly pines from becoming reestablished in areas that were clear-cut.

5. Control exotic species within the preserve.

- **A.** Continue to control cogongrass by treating with herbicides, using licensed contractors when appropriate. Monitor sites indefinitely and apply follow-up treatments as needed.
- **B.** Eradicate feral hogs within the preserve to the extent practicable. Hunting pressure from the adjacent wildlife management area and from the numerous inholdings within the preserve may help to limit the hog population. Continue to monitor damage from feral hogs to determine if additional control methods are necessary.

6. Pursue acquisition of parcels within the Optimum Boundary of the preserve, clarify boundary locations and improve boundary fencing.

- **A.** Encourage the Division to continue efforts to acquire parcels already on the Additions and Inholdings List for Waccasassa Bay Preserve State Park. Add other properties to the Optimum Boundary list as needed. The property that lies north of the preserve and south

of Mainline Road from State Road 24 to the Waccasassa River will be considered for addition to the Additions and Inholdings list. This would create a buffer along the northern half of the preserve that would reduce impact to the water resources of the preserve. Acquisition of the Additions and Inholdings parcels would prevent environmental damage to the preserve associated with landowner accessing their inholding properties. Acquisition of these parcels would also protect water quality by preventing additional development of the inholdings, eliminating associated threats presented by the proliferation of septic systems in poorly drained areas. Lastly, acquisition of the Additions and Inholdings parcels would preserve the already established linkages among the natural areas of this remarkable region. It would greatly enhance the prospect that one day a continuous band of publicly owned natural areas would extend north from Yankeetown all the way through the Big Bend region of the Gulf Coast. Unspoiled salt marshes that provide the last refuge for the endangered Florida salt marsh vole would receive protection.

B. Where feasible, survey boundaries of the preserve to clarify disputed property lines. Improve boundary fencing as needed. Continue to post areas where fencing is not possible, as on offshore islands, and identify them clearly as preserve property. Request assistance of the Park Patrol and other law enforcement agencies in enforcing Division regulations on preserve lands.

7. Pursue an increase in staffing for Waccasassa Bay Preserve State Park.

A. Aggressively pursue the assignment of additional staff to Waccasassa Bay Preserve State Park. Only adequate staffing will ensure the proper protection, preservation and interpretation of the natural and cultural resources of the preserve.

8. Contact institutions that may house animal or plant collections made within the preserve, retrieve pertinent records, and develop more complete species lists for the preserve. Improve the monitoring of listed plant and animal species.

A. Contact herbaria in the state universities of Florida to determine if any possess records of plants collected in the preserve that would supplement Abbott's (1998) list of vascular and non-vascular plant species for the preserve.

B. Contact institutions that may have records of macro-invertebrates collected within the preserve, and initiate development of a macro-invertebrate species list for the preserve.

C. Institute a program of periodic monitoring of listed species, to the extent feasible given staffing constraints. Use GPS technology to map known colonies of FNAI-designated plant species within the preserve. When possible, conduct post-burn surveys for gopher tortoises in zones containing mesic flatwoods.

9. Protect water resources within the preserve by actively supporting and participating in regional water management and conservation efforts.

A. In cooperation with the SRWMD, pursue funding for increased water quality and biological monitoring in the Waccasassa River and its springs, tributaries and estuaries, both within and outside the preserve.

B. Participate in regional water supply planning efforts, and closely monitor water use permit requests submitted to the SWFWMD and the SRWMD. For permit requests that may affect water resources within the preserve, provide the Division review and comments.

C. Request the SRWMD to set priorities for establishing minimum flows and levels (MFLs) for the Waccasassa River, and participate in the MFL establishment process.

Cultural Resources

1. Increase the frequency of patrols by preserve staff and law enforcement personnel.

A. Visit cultural sites regularly to determine the extent of the looting problem and to deter additional vandalism. Make it a priority to increase patrols at the more easily accessible sites. Request the assistance of Park Patrol and other law enforcement agencies as needed.

2. Increase monitoring of cultural resources and document changes observed.
   A. Establish photo points and photograph certain sensitive cultural resource sites on a regular schedule. Periodic photography will allow comparison of future conditions with previous ones, and will enhance the monitoring of selected cultural sites.
   B. Visit selected cultural resources on at least a semiannual basis. Add notes taken during site visits to the data collection kept for each resource.
   C. Apply for grants to fund reassessments of endangered sites by qualified individuals, focusing on preservation of the sites, protection and mitigation of impacts from erosion and inundation.
3. Record additional cultural sites and survey areas of the preserve not covered by previous surveys.
   A. Record additional cultural resources as encountered and identified. Continue to work with the Division of Historical Resources to record new sites as they are encountered, and update existing records in the Florida Master Site File.
   B. Pursue grant funding for additional surveys within the preserve, targeting areas that were not included in previous archaeological surveys.

Management Measures for Natural Resources

Hydrology

Special attention will be given to repair of hydrologic damage as discussed above in Management Needs and Problems and Management Objectives.

Water quality in the blackwater streams, including the Waccasassa River, is generally considered good. Staff will continue to coordinate closely with agencies conducting water quality testing in the Waccasassa River to become aware of changes as they occur. In addition, staff will work with the appropriate agencies to establish additional water quality and biological monitoring upstream and downstream of the current monitoring stations. The data obtained from this monitoring will allow for more accurate assessments of hydrologic conditions both within and outside the preserve. With more comprehensive data, Division staff will be better equipped to contribute constructively to water resource preservation within the park.

Staff will pursue protection of water quantity within the park as well. Because the water flowing into, through and out of the preserve—the water the natural systems depend upon for ecological integrity—does not stop at the preserve boundaries, protection of the water resources requires a regional approach, and active participation of Division staff in regional land management and water supply planning. Long-term protection of the water resources will also depend upon the establishment of minimum flows and levels (MFLs) for the Waccasassa River, to ensure adequate quantities of good quality freshwater to support the natural systems of the park. Staff will continue to coordinate water conservation and protection issues with the appropriate water management districts and permitting agencies, providing Division review and comment as appropriate.

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.

The mesic flatwoods is the only fire-type community in the park. Its fire frequency is every one to eight years on average (FNAI 1990). Some of the areas that require burning are located within the corporate boundaries of the City of Yankeetown, whose ordinances prohibit open burning. Coordination with town officials will be required for completion of prescribed burning objectives. Much of the mesic flatwoods in the southern end of the preserve was heavily impacted by the Southern pine beetle outbreak and many offsite loblolly pines were removed along with the resident slash pines. Prescribed burns will be an integral part of the restoration of the clear-cut areas and will help prevent recolonization by loblolly pines. The mesic flatwoods in the new acquisition in the northwest corner of the preserve will also be managed with prescribed fire to facilitate restoration. During initial stages of restoration, winter or non-growing season fires may be used to reduce fuel loading while minimizing stress on pines. Ultimately, all mesic flatwoods zones will be burned during the lightning season.

Occasionally lightning fires occur under dry conditions in the hydric hammock community within the preserve. Most of these fires are slow creeping fires. If these fires require suppression, staff will attempt to extinguish these fires with hand tools or allow them to burn out to avoid damaging the hydric soils with heavy equipment. The park staff will coordinate and work with the local Division of Forestry staff regarding the development of a plan for addressing wildfire suppression within the park boundary. An element of the wildfire suppression plan may be an element regarding rehabilitation of fire lines and any other related impacts.

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.

Waccasassa Bay Preserve State Park is important to several listed species. Sea turtles and manatees apparently use the estuarine communities in the preserve. Coordination with the FFWCC Bureau of Protected Species Management and the U.S. Fish and Wildlife Service is essential for identification of threats to sea turtles and manatees and for the protection of resources vital to them. Consideration should be given to designating an off limits or a no wake, reduced speed limit zone within areas and during times that manatees are common. Activities (such as logging for southern pine beetle control) that may disturb the breeding of listed bird species such as the bald eagle will be prevented by following USFWS and FFWCC guidelines. An active prescribed burn program in the mesic flatwoods natural community will improve habitat for gopher tortoises and indigo snakes.

All populations of endangered plant species in the preserve will be identified and mapped to the extent possible. Many of these have already been located by Abbott (1998) and the GPS locations have been provided to the Division and incorporated into the Division GIS. Additional locations have been mapped by District office staff during past field surveys. Since the majority of these listed plants occur in hydric hammock, no specific management is needed for their persistence. Logging activities associated with southern pine beetle control measures should be carefully monitored to prevent important plant populations from being harmed. Staff will continue to work with staff from the University of Florida Herbarium and other institutions, as well as FNAI staff, to locate and monitor plant species of conservation interest.

Exotic Species Control

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.

Hydrilla and Brazilian pepper were formerly the two exotic plants of most concern in the preserve. An infestation of hydrilla was once recorded from Kelly Creek. On a recent visit to the site, no hydrilla was detected; however, the creek should be monitored on a yearly basis and if any infestation is noted, it should be treated immediately. Follow-up treatments should be scheduled as necessary. Brazilian pepper is the other exotic plant species that should be aggressively controlled. It occurs as rare individuals in the tidal marsh (Abbott 1998), and will likely occur in association with black mangrove. The only specimens known to occur in the preserve were seedlings growing where piles of wrack had washed up after a storm (Abbott 1998, Abbott and Judd 2000). This species will be difficult to find and eradicate as it has the potential to occur over a large, mostly inaccessible area.

Unfortunately, cogongrass has recently been discovered within the southern end of the preserve in the areas logged to control southern pine beetles. The infestations occur as many diffuse patches within the clear-cut areas. The origin of the infestation is not known. Propagules such as stem fragments or seeds may have been transported to the site on logging equipment or in fill brought in to stabilize logging roads. The Bureau of Invasive Plant Management provided grant funds to the Division for initial and follow up herbicide treatments of the cogongrass. Subsequent follow-up treatments are being done by Division staff. Unfortunately, additional patches of cogongrass continue to be discovered in these areas. These infestations are treated by staff, as they are located.

As this or other invasive exotics are discovered, they should be mapped, treated and monitored yearly. Follow-up treatments should be scheduled as necessary. Both mechanical and chemical treatments will be considered. All chemical treatments will be applied in accordance with herbicide labeling and federal regulations. Treatment of aquatic and invasive upland exotics will be coordinated with the FDEP Bureau of Invasive Plant Management. In a recent floristic survey, over 50 species of exotic plants were found within the preserve. Fortunately, most of these species occurred only along the right-of-way on Fiber Factory Road (Abbott 1998, Abbott and Judd 2000), which lies outside the main body of the preserve, and many are not typically invasive. The limited ruderal areas in the preserve often contain exotic species.

Non-native animals of concern include feral hogs and armadillos. Feral hog rooting is most extensive in hydric hammock north and west of the Waccasassa River. The feral hog disturbs the substrate, destroys plants, feeds heavily on acorns, nuts and small animals and competes extensively with native wildlife for food. Attempts will be made to reduce the numbers of this species through approved procedures. Hunting pressure from the surrounding wildlife management area and local hunt camps adjacent to the preserve or within inholdings in the preserve provide some level of control for feral hogs. Armadillos also impact soil and litter layers and may prey upon smaller native animals. Armadillos will be removed from the preserve whenever possible.

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.

With the exception of woody plants that have invaded communities because of fire exclusion, there are no problem species.

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 DHR Cultural Management Statement).

Actions that require permits or approval from DHR include development, site excavations or surveys, disturbances of sites or structures, disturbances of the substrate, and any other actions that may affect the integrity of the cultural resources. These actions could damage evidence that would someday be useful to researchers attempting to interpret the past.

All known sites, particularly burial sites, will be protected from vandalism to the extent possible. Routine patrols will be encouraged to deter looting. As previously undocumented cultural sites are discovered, they will be documented and submitted to the Florida Master Site File. Additional professional surveys of areas not covered by previous surveys will be encouraged.

Natural erosional processes are degrading many of the known aboriginal sites and many are being gradually inundated due to sea level rise. As discussed in previous archaeological surveys of the Gulf Hammock and Waccasassa Bay area, much of the information about aboriginal cultures will be lost as these sites erode and are destroyed (Jones and Borremans 1991, Jones 1993, Vojnovski et al 2000). Study of these sites should be encouraged, and advice from the Division of Historical Resources will be sought on appropriate actions to protect and/or salvage information from these sites. The Division of Historical Resources will also be consulted about possible actions to preserve any remaining artifacts at Salt Island. The Division will develop conceptual plans for preserving the site of the historical fiber factory.

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.

1. Research on the distribution and size of listed populations and the mapping of listed plant populations would aid in making management decisions.
2. A systematic inventory of animal species is needed.
3. Small community types such as the freshwater pools that occur in the hydric hammock should be mapped.
4. All spring-run streams should be identified, located and mapped.
5. Water quality and hydrology should be monitored in cooperation with other agencies.

6. Coastal islands should be examined closely to determine if the shell mound natural community exists in the preserve.
7. Studies on the effects of sea level rise in the preserve should continue.

Cultural Resources

1. Undocumented sites will be located, mapped and submitted to the Florida Master Site File. Funding for additional professional surveys will be pursued if necessary.
2. Research should be conducted on the origin and function of wells and rock structures in the preserve.
3. Long-time residents of the area should be interviewed to document the history of the Gulf Hammock area and to locate historical habitation sites.

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 8. Cost estimates for conducting priority management activities are based on the most cost effective methods and recommendations currently available (see Addendum 8).

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.

Waccasassa Bay Preserve State Park was subject to a land management review on February 2, 2004. 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.

Waccasassa Bay Preserve State Park is located within Levy County, about one mile northeast of Cedar Key in the west central part of the state. The populations of Levy and the adjacent Marion and Citrus Counties have grown 31 percent since 1990, and are projected to grow an additional 21 percent by 2010 (BEBR, University of Florida, 2000). As of 2000, 17 percent of residents in these counties were in the 0-14 age group, 32 percent in the 15-44 age group, 26 percent in the 45-64 age group, and 25 percent were aged 65 and over, which (reflects, is less than, more than, etc.) the state average for these groupings (BEBR, University of Florida, 2000). Nearly 420,000 people reside within 50 miles of the park, which includes the cities of Cedar Key, Dunnellon, Crystal River, Homosassa Springs and Chiefland (Census, 2000).

Waccasassa Bay Preserve State Park recorded 26,642 visitors in FY 2002-2003. This represents a net increase over the last five years. By DRP estimates, these visitors contributed $885,046 in direct economic impact and the equivalent of 17 jobs to the local economy (Florida Department of Environmental Protection, 2003).

Existing Use of Adjacent Lands

Waccasassa Bay Preserve State Park is situated on the Gulf of Mexico, in western Levy County. The preserve stretches from Yankeetown at the south, to near Cedar Key to the northwest. More than 100,000 acres of private timberland surrounds the preserve. Gulf Hammock Wildlife Management Area is east of the southern portion of the preserve. Cedar

Key Scrub State Reserve lies adjacent to the western preserve boundary. Much of the surrounding property has been used extensively for lumbering, grazing and hunting. A large number of hunt clubs surround the preserve. The Plum Creek Timber Company owns a large tract of land to the north of the preserve, much of which is being leased to hunt clubs. Significant amounts of private uplands in the region are being subdivided for residential development.

There are many resource-based recreation opportunities offered within a short distance of the preserve. Portions of the Lower Suwannee National Wildlife Refuge and the Cedar Keys National Wildlife Refuge lie immediately west of the preserve. Gulf Hammock Wildlife Management Area, Goethe State Forest and Cedar Key Museum State Park all lie within a short drive of the reserve as well. These public lands offer hiking, hunting, kayaking/canoeing, camping, horseback riding and environmental education opportunities. Two other camping areas, the Shell Mound campground and the Rainbow Country campground, are located within one mile of the preserve.

Planned Use of Adjacent Lands

It is expected that the private lands around the preserve will continue to be developed for residential uses as the population of the region continues to grow. Two residential developments, Cedar Key Plantation and Marsh Harbor, are under development just southwest and south respectively of the preserve boundary. These and any additional developments may affect water resources, prescribed burning capabilities and increase vehicular traffic on adjacent roads.

The majority of the lands surrounding Waccasassa Bay are classified as Natural Reservation. Under this classification, these lands “are designated for conservation purposes and are owned/operated by contractual agreement with, or managed by a federal, state, regional or local government or non-profit agency. Park facilities and services, agricultural/forestry uses and passive recreational activities and facilities that are compatible and complement conservation purposes of the area and are consistent with jurisdictional management plans shall be allowed in this category” (Levy County, 1999). Near the northeast boundary of the preserve, the lands are classified as Rural Low Density Agriculture Residential and Rural Low Density Forestry Residential. The maximum residential density in these lands is one unit per 10 acres with a minimum parcel size of 10 acres or one unit per 20 acres with a minimum parcel size of 20 acres respectively.

PROPERTY ANALYSIS

Effective planning requires a thorough understanding of the unit's natural and cultural resources. This section describes the resource characteristics and existing uses of the property. The unit's recreation resource elements are examined to identify the opportunities and constraints they present for recreational development. Past and present uses are assessed for their effects on the property, compatibility with the site, and relation to the unit's classification.

Recreation Resource Elements

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

Land Area

Waccasassa Bay State Preserve is one of the most remote areas in the state. The preserve has been designated as a National Natural Landmark, providing an extensive, undisturbed example of the coastal ecosystems that occur in northern Florida. There is currently limited public upland access to the site, and recreational uses are focused on the water resources of the preserve.

Water Area

The property encompasses an expansive stretch of salt marsh, dotted with picturesque wooded islands, interlaced by numerous tidal creeks. The extensive salt marshes and tidal creeks are breeding and nursery areas for hundreds of species of saltwater fish and shellfish. Waccasassa Bay has the distinction of containing one of the northernmost mangrove forests in Florida, providing essential habitat to large numbers of water birds that breed in the preserve. The Waccasassa River roughly divides the preserve in two as it drains into the Gulf of Mexico.

Natural Scenery

The horizon-to-horizon expanses of salt marsh are broken up with dense tree-islands of red cedar, cabbage palm and live oak. These hammock islands represent only a small remnant of the once vast Gulf Hammock. They are now protected as a reminder of the expansive hardwood forest that was once a feature of Florida's outstanding natural areas. The entire preserve is managed as a wilderness preserve in order to retain the primeval character of this undeveloped land.

Significant Wildlife Habitat

Many endangered and threatened species are found or have historically been found within the preserve's boundaries. As of 2002, four active bald eagle nests were recorded within the preserve by the FFWCC. At least three species of sea turtles, the Atlantic ridley turtle, green turtle and the loggerhead turtle, use the seagrass beds and other estuarine and marine communities in the preserve. Waccasassa Bay serves as an important developmental habitat for sub-adults of these species (Carr 1995; Younker et al. 1992). There are also historical accounts of Atlantic ridley and green turtles hibernating in mud bottoms off Cedar Key and Waccasassa Bay (Carr 1995). The West Indian manatee also uses the estuarine communities of the preserve and the Waccasassa River. Black bears, Florida panthers, scrub jays, gopher tortoises and indigo snakes have historically been found in the preserve and quite possibly can be found there today.

Numerous listed plant species also occur within the preserve. Two listed plants that are notably abundant in the preserve are corkwood (*Leitneria floridana*) and cedar elms (*Ulmus crassifolia*), both of which occur in hydric hammock. Several endangered plants in the preserve also occur in hydric hammock; these include Florida pinkroot (*Spigelia loganioides*), pinewood dainties (*Phyllanthus leibmannianus*), and crested coralroot (*Hexalectris spicata*).

Natural Features

The extensive limestone outcroppings in the preserve are a notable geologic feature. The flatness of the topography at the coast creates interesting opportunities for the study of effects of sea level rise. A unique botanical feature of the preserve is the number of plant species occurring either at the northern or southern limits of their ranges. In a 1998 floristic survey of Waccasassa Bay Preserve State Park, 29 species were documented that occur at or near their contiguous southern limit in Florida. Likewise, 45 species were documented that occur at or near their contiguous northern limit in Florida (Abbott 1998).

Archaeological and Historical Features

The cultural and historical resources of Waccasassa Bay Preserve State Park are extensive. The Florida Master Site File (FMSF) lists 80 sites within the unit. The vast majority of the recorded sites are shell middens; most of them are classified as eroding. In most cases, the erosion is due to natural processes such as tidal fluctuations, stream flow, storm surges and rain events. Other documented aboriginal sites include camps, lithic scatters, village/ habitation sites, and two burial mounds (Jones and Borremans 1991, Jones 1993, Vojnovski et al, 2000). In addition to prehistoric sites, there are numerous historical resources within the preserve. There are remnants of a salt works in the northern portion of the preserve that dates from the mid-to-late nineteenth century (Dickinson and Edwardson 1984). Various other documented and undocumented historical resources occur scattered throughout the preserve. Documented resources include an old hearth, a moonshine still site, a cow pen, and a territorial fort called Fort Three. Fort Three, which was once located at the mouth of the Waccasassa River, no longer exists due to natural erosion. Undocumented cultural resources include several possible wells (up to four known locations) scattered throughout the preserve.

Assessment of Use

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

Past Uses

The uplands within the preserve were used for timber production, hunting and cattle grazing before acquisition by the state.

Recreational Uses

The current recreational activities are associated with the water resources of the preserve. Fishing in the Waccasassa River and the numerous tidal creeks is the primary recreational pursuit at the unit. Boaters and anglers in the preserve have an opportunity to experience a large segment of unspoiled Florida wilderness. The shallow waters of the preserve are ideal for canoeing and kayaking. The preserve also offers excellent opportunities for nature study and wildlife observation.

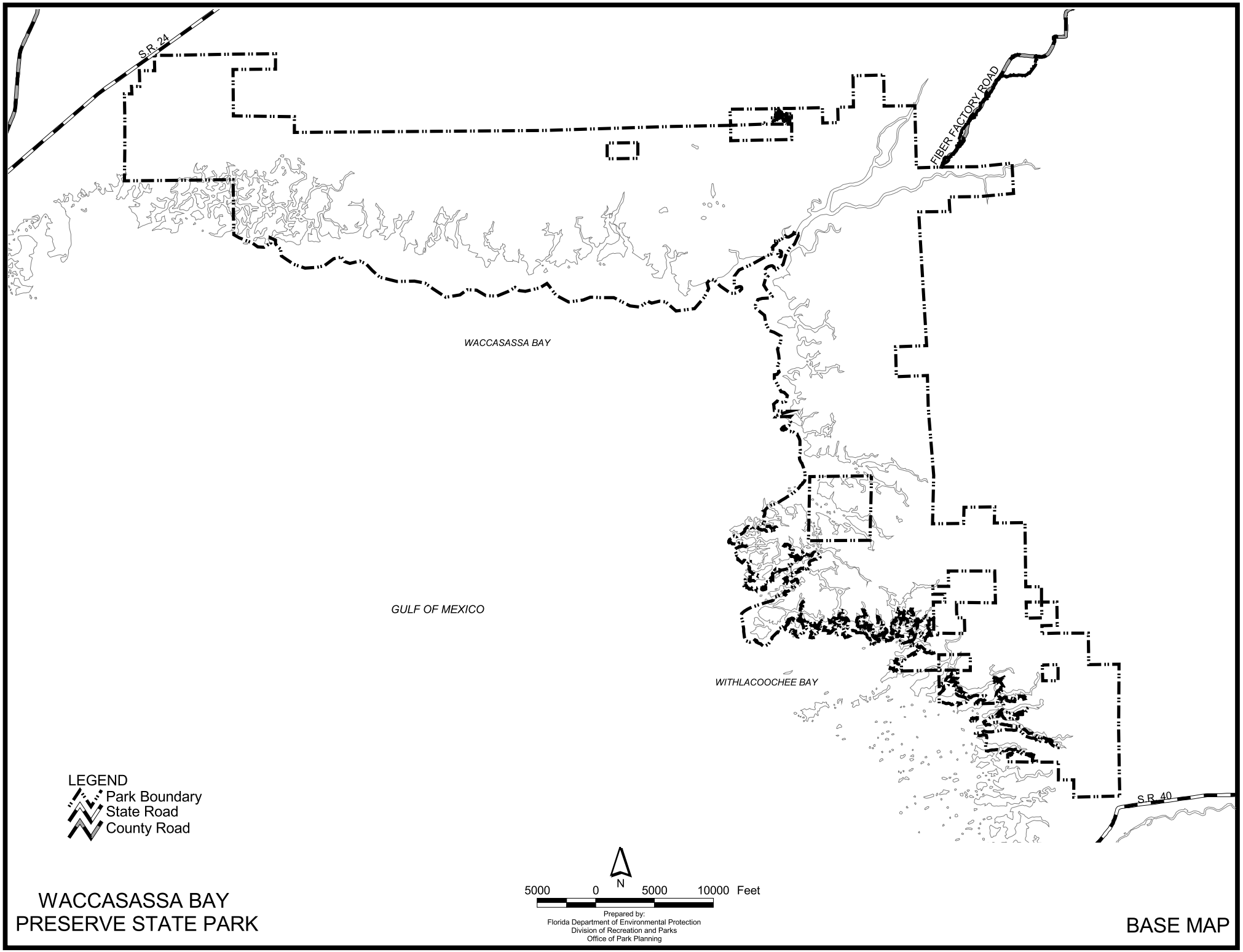
Other Uses

The nearly pristine condition of the property makes it an ideal site to study natural ecosystems. Researchers from the University of Florida have conducted various studies within the preserve.

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 Waccasassa Bay Preserve State Park, the entire site has been designated as a protected zones as delineated on the Conceptual Land Use Plan due to the sensitivity of the natural resources.



WACCASASSA BAY
PRESERVE STATE PARK

BASE MAP

Existing Facilities

Recreation Facilities. Existing facilities at the preserve are extremely limited due to the lack of suitable uplands. Most of the recreation occurring at Waccasassa Bay is based around boating, canoeing/kayaking or fishing. Public access to the preserve is mainly available via boat ramps located in Cedar Key, Yankeetown, at the Shell Mound boat ramp on CR326 north of Cedar Key Scrub State Reserve, and at the Levy County boat ramp in Gulf Hammock on the Waccasassa River. However, the preserve also contains a trail of approximately one mile in length. Trailhead parking is located on the Cedar Key Scrub State Reserve property just off State Road 24. One primitive campsite is available within the preserve's boundaries. The campsite is accessible only by boat and is located on an island in the Waccasassa River.

Support Facilities. Support facilities for the preserve are located just off State Road 24, within the boundary of Cedar Key Scrub State Reserve. They include two ranger residences, a shop building and an office.

The following is a listing of existing facilities at Waccasassa Bay Preserve State Park.

Recreation Facilities
Trail (1 mile)
Primitive Campsite (1)

Support Facilities (on Cedar Key Scrub State Reserve property)
Ranger residences (2)
Shop building
Office building

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.

PROPOSED TRAILHEAD

TRAIL

PROPOSED PRIMITIVE CAMPSITE (HALL CREEK)

PROPOSED PRIMITIVE CAMPSITE (KELLY CREEK)

WACCASASSA RIVER PRIMITIVE CAMPSITE

PROPOSED PRIMITIVE CAMPSITE (TURTLE CREEK)

Waccasassa Reefs

Turtle Creek Point

Old RR grade

Tenmile

Run

Creek

LEGEND

- Existing Facilities
- Trail
- New Facilities
- Park Boundary

WACCASASSA BAY PRESERVE STATE PARK

9500 N 0 9500 Feet

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

CONCEPTUAL LAND USE PLAN

Potential Uses and Proposed Facilities

As a preserve, the primary emphasis is placed on protection of the resources of the site. Potential recreational uses should be primarily low-impact, and must be compatible with resource preservation objectives. The existing low-level boating and fishing activities in the preserve are appropriate and should continue. Preserving the wilderness quality of the unit will continue to be an important factor in future land use planning.

Recreation Facilities

Primitive campsites. Three primitive camping areas should be developed on three of the islands (Hall Creek, Kelly Creek and Turtle Creek) in Waccasassa Bay. The areas should be large enough for up to eight visitors at one time and should consist of a designated tent area, a fire ring and a picnic table. The areas should be designated as pack-it-in, pack-it-out areas only.

Interpretive exhibits. Interpretation is a major focus of the Florida State Park system. Interpretive displays and exhibits are needed throughout the preserve including at each trailhead and at designated points along the trail. Potential interpretive themes for Waccasassa Bay Preserve State Park include rare and endangered species, the natural and cultural history of the Cedar Key region, native American history, wetlands and estuarine ecology, and Leave-No-Trace ethics.

Support Facilities

Office. As suggested in the Cedar Key Scrub State Reserve management plan update, a new office building is needed to act as a center for administration of Cedar Key Scrub, Waccasassa Bay State Preserve and the Cedar Key Museum. The current park office is old and too small for the park's current needs. The new building should be large enough to house two offices and meeting space. It is proposed that it be located in the footprint of the old park office building on the Cedar Key Scrub State Reserve site (See Cedar Key Scrub State Reserve plan for additional information).

Trailhead. A trailhead should be developed near the park office for access to the trail. This facility should feature parking for up to 10 vehicles, a composting restroom, an interpretive kiosk and a medium picnic shelter.

Facilities Development

Preliminary cost estimates for the following list of proposed facilities are provided in Addendum 8 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.

Recreation Facilities

Picnic tables and grills	Medium picnic shelter
Interpretive displays	Stabilized tent sites (2)

Support Facilities

Trailhead parking (10 vehicles)	Composting restroom

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.

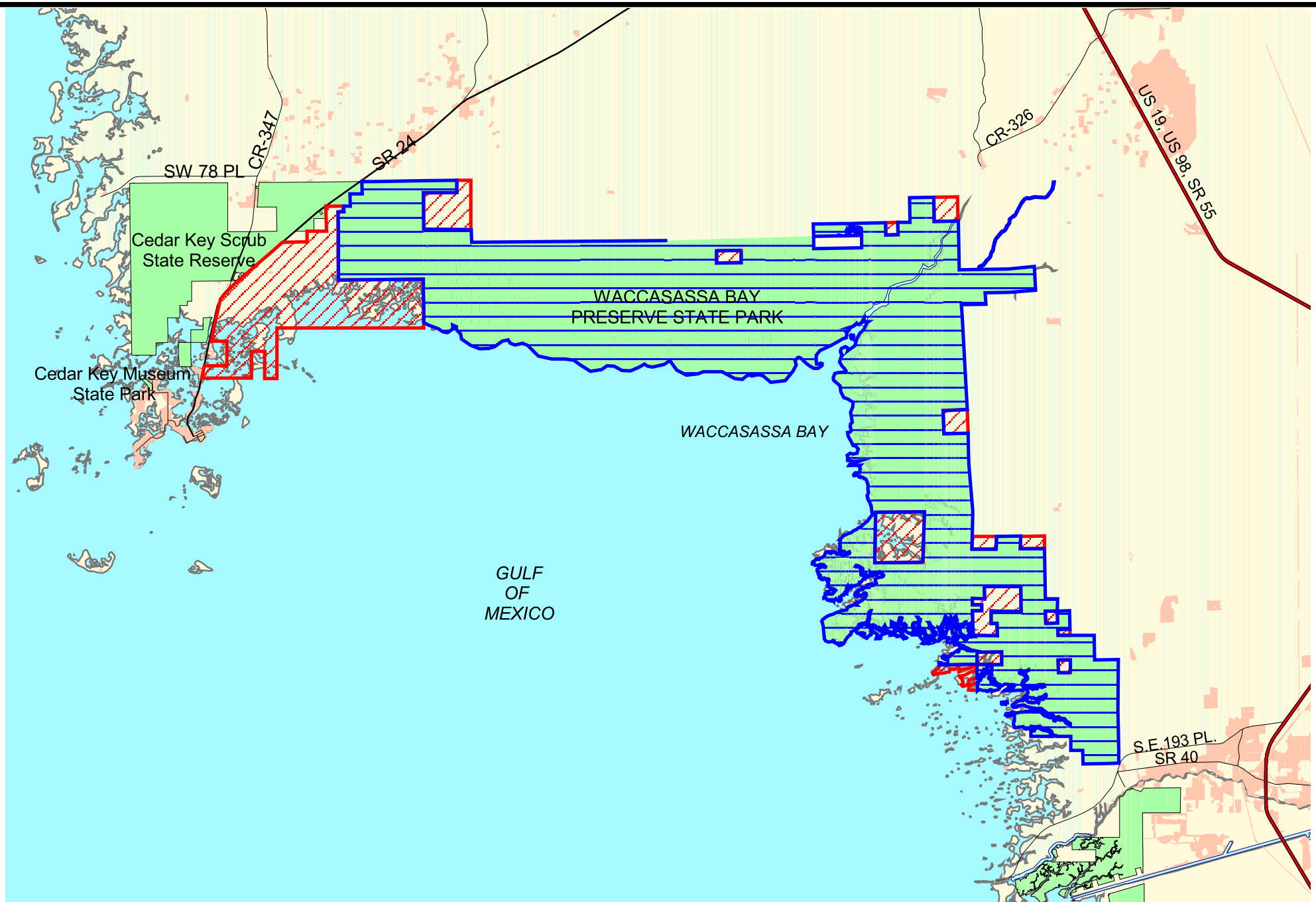
Existing Use And Optimum Carrying Capacity

	Existing Capacity		Proposed Additional Capacity		Estimated Optimum Capacity	
Activity/Facility	**One Time**	**Daily**	**One Time**	**Daily**	**One Time**	**Daily**
Trails	20	80			20	80
Picnicking			24	48	24	48
Camping	8	8	24	24	32	32
Boating and Fishing	60	120			60	120
TOTAL	**88**	**208**	**48**	**72**	**136**	**280**

Optimum Boundary

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. 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. At this time, no lands are considered surplus to the needs of the park.

Undeveloped lands around the unit have been identified as desirable for acquisition. The acquisition of these lands will add desirable natural resources, and will enhance the unit’s boundaries for management purposes. Acquisition of these lands will provide opportunities for expanded public recreational use, and will help to maintain an adequate buffer from future private development.



WACCASASSA BAY
PRESERVE STATE PARK

N

9000 0 9000 18000 Feet

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

LEGEND
Park Boundary
Optimum Boundary

OPTIMUM BOUNDARY MAP

Addendum 1—Acquisition History

Purpose and Sequence of Acquisition

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) acquired Waccasassa Bay Preserve State Park to manage the property in such a way as to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

On December 10, 1971, the Trustees purchased a 25,825.70-acre property constituting the initial area of Waccasassa Bay Preserve State Park. The purchase was funded under LATF and LWCF programs. Since this initial purchase, the State has acquired several parcels under P2000/A&I program, the CARL program and by a donation and added them to Waccasassa Bay Preserve State Park.

Title Interest

The Trustees hold fee simple title of **Waccasassa Bay Preserve State Park**.

Management Authority

On April 6, 1972, the Trustees leased Waccasassa Bay Preserve State Park to the Division of Recreation and Parks (Division) under Lease No. 2599. The lease is for a period of ninety-nine (99) years, which will expire on April 5, 2071.

According to Lease Agreement, the Division manages Waccasassa Bay Preserve State Park only for the development, conservation and protection of natural and cultural resources, and for resource-based public outdoor recreation compatible with the conservation and protection of the property.

Waccasassa Bay Preserve State Park designated single-use to provide resource-based public outdoor recreation and other related uses. Uses such as water resource development projects, water supply projects, storm-water management projects, and linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this unit management plan) are not consistent with this management plan or the management purposes of the park

Outstanding Reservations

Following is a listing of outstanding rights, reservations, and encumbrances that apply to Waccasassa Bay Preserve State Park.

Instrument: .....Limited Warranty Deed
Instrument Holder: .....North American Timber Corp.
Beginning Date: .....June 14, 2000
Ending Date: .....No specific date is given
Outstanding Rights, Uses, Etc.: .....The deed is subject to ½ interests in and to the oil, gas, sulfur, salt, and uranium in a certain deed from Robinson Land and Lumber Company of Alabama, Inc. as recorded in Deed Book 98, page 18.

Instrument: .....Limited Warranty Deed
Instrument Holder: .....Georgia-Pacific Corporation
Beginning Date: .....November 1, 1999
Ending Date: .....No specific date is given
Outstanding Rights, Uses, Etc.: .....The deed is subject to ½ interests in and to the oil, gas, sulphur, salt, and uranium in a certain deed from Robinson Land and Lumber Company of Alabama, Inc. as recorded in Deed Book 98, page 18.

Instrument: ..... Easement
Instrument Holder: ..... John F. Yearty
Beginning Date: ..... December 12, 1978
Ending Date: ..... Perpetual
Outstanding Rights, Uses, Etc.: ..... The easement is subject to a right-of-way easement to Georgia-Pacific Corporation for the movement of forest management equipment as recorded in O.R. Book 135, page 130 in official records of Levy County.

Instrument: ..... Indenture
Instrument Holder: ..... Georgia–Pacific Corporation
Beginning Date: ..... December 10, 1971
Ending Date: ..... Forever
Outstanding Rights, Uses, Etc.: ..... The deed is subject to an indenture from Robinson Land & Lumber Company of Alabama, Inc., as recorded in Deed Book 98, page 18; and a ½ interest in and to oil, gas, sulfur, salt and uranium conveyed by Robinson Land & Lumber Company of Alabama, Inc., to Patty H. Paterson as recorded in Deed Book 99, page 580.

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The Advisory Group appointed to review the proposed land management plans for Cedar Key Scrub State Reserve and Waccasassa Bay Preserve State Park was held at the Cedar Key Museum State Park, on January 22, 2004. Mr. Danny Stevens, Ms. Desiree Mills, Mr. Charlie Houder, Mr. Ken Daniels, Ms. Elizabeth Van Mierop, Mr. Rob Crane, Ms. Linda Pollini, and Mr. Greg Galpin did not attend. Mr. Dave Wilson represented Ms. Ann Sharkey, Ms. Sue Colson represented Mr. Ken Daniels, Ms. Kathy Winborn represented Mr. Danny Stevens, Mr. Mike Mitchell represented Mr. Ken Litzenberger, and Mr. DeWitt Watson represented Mr. Don West. All other appointed Advisory Group members were present. Attending staff were Mr. Jeff DiMaggio, Mr. Dan Pearson, Ms. KC Bloom, and Mr. Charles Neese. Ms. Helen Pankratz-Koehler, Mr. Mike Crews, and Ms. Margy VanLandingham attended as interested citizens.

Ms. Bloom began the meeting by explaining the purpose of the advisory group and reviewing the meeting agenda. She also provided a brief overview of the Division's planning process and summarized public comments received during the previous evening's public workshop and written comments submitted by non-attending members of the Advisory Group. She then asked each member of the advisory group to express his or her comments on the plan.

Summary Of Advisory Group Comments

Ms. Sue Colson, in representing her views based upon her representation of the city of Cedar Key and as a member of the Cedar Key Aquaculture Association Board, stated that she would split her comments into two parts. First, as a representative of the city of Cedar Key, **Ms. Colson** stated that she had concerns regarding our information particularly on page 16 of the plan. She continued that in terms of storm water management, the city of Cedar Key has applied over $900,000 toward some of the problems. The city has eradicated the use of septic tanks and has started a storm water retention program using storm scepters. There is also a pump out station on the county dock and the county is working on maintaining the water quality of the region. As a representative of the Aquaculture Association, **Ms. Colson** stressed that the Scrub and Waccasassa are vital in maintaining the region's water quality. She expressed concern with the projected numbers of canoists/kayakers in the plans because of the potential for their using the land within Waccasassa Bay for bathroom activities and the potential water quality problems associated with them. She stressed the importance of interpretation and education for our park visitors so that they develop an awareness of the importance of good water quality to the clam industry and region. **Ms. Colson** suggested that any canoe/kayak trails and trips be managed based on a reservation system to help track the number of users within the area. She provided that the parks are doing a great job in terms of burning and restoring scrub jay habitat. **Ms. Colson** expressed disappointment in the state's land acquisition programs. She stated that as a former Water Management District board member, she was involved in numerous state acquisitions but that the current appraisal system does not work in that it doesn't allow for any flexibility. She expressed disappointment that the state has not yet found a way to purchase the Thompson tract.

Mr. Vic Doig stated that **Ms. Colson** made some excellent points about flaws in the state system. He continued that the highest priority for Cedar Key Scrub and Waccasassa should be the addition of more staff. He stated that while Jeff is doing a great job as manager, having 2 staff members actively managing the two properties is not enough**. Mr. Doig** would like to see the properties continue to focus on habitat management and protection. The scrub jay population is in need of help and if the reserve can keep restoring its habitat that would be a positive thing. The state also needs to work at protecting more of the scrub jay habitat in this area through acquisition, easements and any other available means. He also stated that he thinks that the plans are strong but could incorporate more information about projects related to non-game species such as minks.

Mr. DeWitt Watson provided that in terms of forestry, the plans entail several things DOF would be willing to be a part of including burning and maintaining fire breaks. He commended the parks on their burning over the last few years. **Mr. Watson** stated that forestry would be glad to help the parks in anyway. **Mr. DiMaggio** thanked **Mr. Watson** for the Division of Forestry's help.

Mr. Dave Wilson stated his support for the park plans. As president of the Levy County Horse Club, Mr.

Wilson expressed his support for increasing the number of equestrian trails in the Scrub. He provided that equestrians spend significant amounts of money in local areas when they go on trail rides. Mr. Wilson stated that the Horse Club would be happy to assist the Division in the development of more equestrian trails. He also suggested that the parking areas at the trailheads be increased to provide better access for horse trailers. Mr. DiMaggio stated that the Division was looking at developing pull-through parking areas at the trailheads and would be happy to accept any help in the development of additional trails.

Mr. George Griffin stated that he thought the plans were thorough and well-focused. He felt that **Ms. Colson** also made some excellent points. He also stated that he didn't notice the salt marsh vole on the species list for Waccasassa. **Mr. Pearson** explained that the vole has not been found in the park's boundary, even though it has been spotted in the vicinity. **Mr. Mitchell** added that they have identified some possible vole habitat at the Lower Suwannee National Wildlife Refuge and are currently studying it.

Mr. Terry Dumont stated that the Water Management District could help us with water quality data in the region, especially on the NATC Gulf Hammock Conservation Easement on the north end of Waccasassa. He described some of his work with the Plum Creek Timber Company on easements up the Waccasassa River and on Otter Creek. **Ms. Bloom** thanked **Mr. Dumont** for sharing his information.

Mr. Mike Mitchell, as the representative for **Mr. Ken Litzenberger**, stated **that Mr. Litzenberger** was in favor of the two plans. He stated that the parks are doing some very positive things in terms of restoration especially given the limited staffing.

Mr. Brack Barker stated that his company, Wild Florida Adventures, is Leave-No-Trace (LNT) certified and practices LNT techniques throughout their travels. He provided that he would like to see the proposed campsites in the Waccasassa plan be included in a paddling trail like the Big Bend paddling trail that is being developed by the Fish & Wildlife Conservation Commission. He also suggested that the Division adopt LNT ethics for use at the campsites.

Mr. Lannie Cardona provided that he would like to see the Division work with the county to get the US Department of the Interior to transfer the lease on a 460 acre property that is within Waccasassa's boundary from the county to the state. He stated that the county does not have the capabilities to manage it as well as the state could. **Mr. Cardona** asked how the Division gets its visitation and economic impact data. **Mr. DiMaggio** explained how he measures the visitation levels at the parks and **Ms. Bloom** discussed the process for developing the economic impact data. **Mr. Cardona** then stated that the Division should proceed with increasing the amount of interpretation available at the parks because of its value to the park visitor/tourists. He believes that the Division should work with FWCC to develop a new paddling trail in the region and include the proposed Waccasassa campsites within the trail. **Mr. Cardona** expressed his support for the parks and discussed their importance to the water quality of the region.

Ms. Kathy Winburn stated that she supports the park plans. She expressed concerns that the plans don't discuss the current status of properties listed as optimum boundary**. Ms. Bloom** explained the optimum boundary/land acquisition process and discussed the various funds involved in the purchase of state lands.

Summary Of Public Comments

Ms. Helen Pankratz-Koehler stated that, as a member of the Levy County Tourism Development Council Board, she recognized the importance of nature-based tourism and how tourism is a mixed-blessing to a county that has been designated rural by the legislature. She continued that the parks, national wildlife refuge and state forest are important features which will help make Levy County a destination. **Ms. Pankrantz-Koehler** remarked that she was glad to see the Division looking at increasing the number of equestrian trails in the Scrub and stated that she, along with the Levy County Horse Club, would be happy to help the park develop the trails. She gave a CD focusing on equestrian issues (from the equestrian conference in Gainseville) to **Ms. Bloom** for her information and use in planning. **Ms. Pankrantz-Koehler** stated that she would like to see additional stabilized parking at the trailheads as well as for better tracking of the economic impacts of equestrians on the parks and in the local economies. **Ms. Bloom** thanked **Ms. Pankrantz-Koehler** for her information.

Ms. Margy Van Landingham stated that as a member of the Friends of Cedar Key Environmental

Group, she would like to see the area potentially designated as an Area of Critical Concern for the state. She believes that because the area has such a fragile environment and is not already highly developed, the designation could help the county retain its rural nature while opening additional state resources to the area. **Ms. Van Landingham** supports the state's efforts in habitat management and restoration. She stated her support for the acquisition of optimum boundary lands around the park and reserve.

Mr. Mike Crews had no comment.

The meeting was then adjourned.

Staff Recommendation

A number of excellent discussions took place during the Advisory Group meeting. With minor revisions, staff recommends approval of the management plan as submitted.

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Addendum 3—Soils Descriptions

(3) Orsino fine sand, 0 to 8 percent slopes - This moderately well drained, very deep, nearly level to gently rolling soil is on dunes and ridges. Individual areas are generally circular or elongated and range from 2 to nearly 750 acres in size.

Typically, the surface layer is gray fine sand about 4 inches thick. The subsurface layer is fine sand. It is very pale brown to a depth of about 8 inches and white to a depth of 13 inches. The subsoil is fine sand. It is brownish yellow to a depth of about 48 inches, light yellowish brown to a depth of 58 inches, and brownish yellow to a depth of 70 inches. The underlying material to a depth of 80 inches or more is white fine sand.

On 95 percent of the acreage mapped as Orsino fine sand, 0 to 8 percent slopes, Orsino and similar soils make up about 88 to 100 percent of the mapped areas. Dissimilar soils make up less than about 12 percent of the mapped areas.

Included in mapping are soils that are similar to the Orsino soil but do not have a leached subsurface layer; have a surface layer that is made up dominantly of shell fragments; have limestone bedrock below a depth of 60 inches; have a dark, organically stained subsoil; have a seasonal high water table at a depth of 20 to 42 inches; or do not have a seasonal high water table within a depth of 60 inches.

Dissimilar soils t hat are included with Orsino soil in mapping occur as small areas of Immokalee, Myakka, Otela, Placid, Pompano, Popash, Samsula, Smyrna, and Sparr soils and soils that have limestone bedrock within a depth of 60 inches. Placid, Popash, and Samsula soils are in depressions. Immokalee, Myakka, Pompano, Smyrna, and Sparr soils are in the slightly lower landscape positions. Otela soils are in positions on the landscape similar to those of the Orsino soil. They have a loamy subsoil at a depth of 40 to 80 inches.

In most years the seasonal high water table is at a depth of 48 to 60 inches in the Orsino soil for 1 to 6 months. Permeability is very rapid. Available water capacity is very low.

(5) Immokalee fine sand - This poorly drained, very deep, nearly level soil is on flatwoods. Individual areas are generally irregular in shape and range from 2 to nearly 1,700 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 9 inches thick. The subsurface layer is fine sand. It is gray to a depth of about 16 inches and light gray to a depth of 38 inches. The subsoil is very dark grayish brown, organically coated fine sand to a depth of about 43 inches and dark brown fine sand to a depth of 80 inches or more.

On 95 percent of the acreage mapped as Immokalee fine sand, Immokalee and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up lass then 9 percent. On 5 percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas.

Included in mapping are soils that are similar to the Immokalee soil but have and organically stained subsoil that is within a depth of 30 inches or below a depth of 50 inches, do not have an organically stained subsoil, have a limestone bedrock below a depth of 60 inches, have a loamy subsoil below a depth of 40 inches, or have a sandy texture in the surface layer.

Dissimilar soils that are included with the Immokalee soil in mapping occur as small areas of Adamsville, Cassia, Hicoria, Janney, Pineda, Placid, Pomello, Popash, and Zolfo soils and soils that have limestone bedrock within a depth of 60 inches. Adamsville, Cassia, Pomello, and Zolfo soils are in the slightly higher landscape positions. Pineda and Janney soils are in positions on the landscape similar to those of the Immokalee soil. Hicoria, Placid, and Popash soils are in depressions. Pineda soils do not have and organically stained subsoil. They have a loamy subsoil within a depth of 40 inches. Janney soils have limestone bedrock within a depth of 40 inches.

In most years, the seasonal high water table is at a depth of 6 to 18 inches in the Immokalee soils

for 1 to 4 months. The water table may recede to a depth of about 60 inches during droughty periods. Permeability is moderate. Available water capacity is low.

(11) Placid and Samsula soils, depressional – These very poorly drained, very deep, nearly level soils are in depressions on flatwoods. They are ponded. Individual areas are generally oval or irregular in shape and range from 2 to nearly 2,000 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer of the Placid soil is black muck to a depth of about 3 inches and very dark gray fine sand to a depth of 14 inches. The underlying material is light gray fine sand to a depth of about 24 inches, brown fine sand to a depth of 45 inches, and very pale brown fine sand to a depth of 80 inches.

Typically, the surface layer of the Samsula soil is dark brown muck to a depth of about 6 inches and black muck to a depth of 47 inches. The underlying material is grayish brown fine sand to a depth of about 62 inches and light brownish gray fine sand to a depth of 80 inches or more.

Some of the areas of the map unit are made up of Placid and similar soils, some are made up of Samsula and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. Areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On 95 percent of the acreage mapped as Placid and Samsula soils, depressional, Placid, Samsula, and similar soils make up about 88 to 100 percent of the map unit. Dissimilar soils make up more than 12 percent of the mapped areas.

Included in mapping are soils that are similar to the Placid soils but have an organic surface layer that is less than 3 inches thick; have a dark, organically coated subsoil or a loamy subsoil below a depth of 20 inches; do not have a dark surface layer as much as 10 inches in thickness; or have bedrock between depth of 40 and 80 inches. Also included are soils that are similar to the Samsula soil but have a loamy layer or a dark, organically coated, sandy layer below the organic surface layer; have an organic surface layer that is more than 51 inches thick or less than 16 inches thick; have a loamy material underlying the organic surface layer; are more alkaline in the surface layer; or have bedrock between depths of 40 and 80 inches.

Dissimilar soils that are included with the Placid and Samsula soils in mapping occur as small areas of Chobee, Holopaw, Myakka, Pineda, Pomona, Pompano, and Smyrna soils and soils that have bedrock at a depth of 20 to 40 inches. Chobee soils are in positions on the landscape similar to those of the Placid and Samsula soils. Holopaw, Myakka, Pineda, Pomona, Pompano, and Smyrna soils are in the slightly higher landscape positions. Chobee soils are loamy throughout.

During most years the seasonal high water table is above the surface in the Placid and Samsula soils fore more than 6 months and is within a depth of 12 inches during the rest of the year. Permeability is rapid in both soils. Available water capacity is low in the Placid soil and high in the Samsula soil.

(13) Wekiva fine sand - This poorly drained, shallow to moderately deep, nearly level soil is on low ridges. Individual areas are generally irregular in shape and range from 2 to more than 10,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer, to a depth of about 9 inches is grayish brown fine sand. The subsoil, to a depth of about 18 inches, is yellowish brown sandy clay loam. Below this is limestone bedrock.

On 90 percent of the acreage mapped as Wekiva fine sand, Wekiva and similar soils make up about 75 to 100 percent of the mapped areas. Dissimilar soils make up less than 25 percent. On 10 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping are soils that are similar to the Wekiva soil but do not have a sandy surface

layer that is 7 or more inches thick, have limestone bedrock below a depth of 30 inches or at a depth of 4 to 9 inches, do not have a loamy subsoil, or have a loamy subsoil at a depth of 20 to 40 inches.

Dissimilar soils that are included with the Wekiva soil in mapping occur as small areas of Aripeka, Bradenton, Chobee, Hicoria, Holopaw, Matmon, Moriah, and Pineda soils and soils that have limestone bedrock within a depth of 4 inches. Aripeka, Matmon, and Moriah soils are in the slightly higher landscape positions, Bradenton, Holopaw, and Pineda soils are in positions on the landscape similar to those of the Wekiva soil. Chobee soils are in the lower landscape positions, and Hicoria soils are in depressions. Bradenton, Holopaw, and Pineda soils do not have limestone bedrock within a depth of 40 inches and do not have a loamy subsoil within a depth of 20 inches.

In most years the seasonal high water table is within a depth of 12 inches in the Wekiva soil for 2 to 6 months. It is above the surface for 1 to 2 weeks following heavy rains. The water table recedes into crevices and solution holes in the bedrock during droughty periods. Permeability is moderately slow. Available water capacity is very low.

(15) Holopaw-Pineda complex, frequently flooded - These poorly drained, very deep, nearly level soils on flood plains along rivers and creeks. They are frequently flooded. Individual areas are generally elongated and range from 3 to nearly 300 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Holopaw soil is very dark gray fine sand about 3 inches thick. The subsurface layer is light brownish gray fine sand to a depth of about 50 inches and pale brown fine sand to a depth of 60 inches. The subsoil is gray sandy clay loam to a depth of 80 inches or more.

Typically, the surface layer of the Pineda soil is black fine sand about 4 inches thick. The upper part of the subsoil is brown fine sand to a depth of about 14 inches. The underlying material is light gray fine sand to a depth of about 28 and white fine sand to a depth of 35 inches. The lower part of the subsoil is light gray fine sandy loam to a depth of about 52 inches. The underlying material is gray fine sand to a depth of 80 inches or more.

Generally, the mapped areas average about 55 percent Holopaw and similar soils and 29 percent Pineda soils and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Holopaw and Pineda soils and of the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreage mapped as Holopaw-Pineda complex, frequently flooded, Holopaw, Pineda, and similar soils make up about 76 to 93 percent of the mapped areas. Dissimilar soils make up about 7 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Holopaw soil but do not have a loamy subsoil within a depth of 80 inches, have a dark surface layer that is more than 7 inches thick, or have a subsurface layer that has colors in shades of yellowish brown. Also included are sols that are similar to the Pineda soil bur do not have a sandy subsoil that is more than 4 inches thick, do not have sandy pockets and intrusions in the upper 2 to 10 inches of the loamy subsoil, or have a dark surface layer that is more than 10 inches thick. Also included are soils that are similar to the Pineda and Holopaw soils but have bedrock or layers of shell fragments below a depth of 60 to 80 inches or have a surface layer of muck, loamy sand, or sandy loam that is more than 3 inches thick.

Dissimilar soils that are included with the Holopaw and Pineda soils in mapping occur as small areas of Albany, Bradenton, Chobee, Gator, Ousley, and Tera Ceia soils and soils that have limestone bedrock within a depth of 60 inches. Bradenton and Chobee soils are in positions on the landscape similar to those of Holopaw and Pineda soils. Albany and Ousley soils are in the slightly higher landscape positions. Gator and Terra Ceia soils are in the lower landscape positions.

Bradenton soils have a loamy subsoil within a depth of 20 inches. Chobee soils are loamy throughout.

In most years, the seasonal high water table is within a depth of 12 inches in the Holopaw and Pineda soils for 2 to 6 months, but it can receded to a depth of about 60 inches during droughty periods. Areas of this map unit are flooded by adjacent rivers or creeks for periods of 1 to 4 months during most years. Permeability is moderate in the Holopaw soils and slow or very slow in the Pineda soil. Available water capacity is low in both soils.

(26) Gator and Terra Ceia soils, frequently flooded – These very poorly drained, very deep nearly level soils are on flood plains along rivers and creeks. They are frequently flooded. Individual areas are generally elongated and range from 2 to nearly 4,000 acres in size. Slopes are 0 to1 percent.

Typically, the surface layer of the Gator soil is very dark brown muck about 38 inches thick. The underlying material is gray fine sandy loam to a depth of 80 inches or more.

Typically the surface layer of the Terra Ceia soil is a mixture of black and very dark grayish brown muck to a depth of about 37 inches and black muck to a depth of 80 inches or more.

Some areas of the map unit are made up of Gator and similar soils, some are made up of Terra Ceia and similar soils, and some are made up of both soils. The relative proportion of the combinations of the soils varies. Areas of the individual soils are large enough to map separately, but because of present and predicted use they were mapped as one unit.

On 80 percent of the acreage mapped as Gator and Terra Ceia soils, frequently flooded, Gator, Terra Ceia, and similar soils make up about 76 to 100 percent of the mapped areas. Dissimilar soils make up less than 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Gator soils, but have a sandy layer that is more than 12 inches thick underlying the organic surface layer or have and organic surface layer that is less than 16 inches thick. Also included are soils that are similar to the Gator and Terra Ceia soils but have bedrock below a depth of 40 inches or are extremely acid in the surface layer.

Dissimilar soils that are included with the Gator and Terra Ceia soils in mapping occur as small areas of Bradenton, Chobee, Hicoria, Holopaw, Pineda, Placid, and Popash soils and soils that have bedrock within a depth of 40 inches. Hicoria, Placid, and Popash soils are in positions on the landscape similar to those of Gator and Terra Ceia soils. Bradenton, Chobee, Holopaw, and Pineda sols are in the slightly higher landscape positions. Hicoria, Placid, and Popash soils are sandy to a depth of 20 inches or more and do not have a thick, organic surface layer.

Throughout the year the seasonal high water table is within a depth of 6 inches in the Gator and Terra Ceia soils. Areas of this map unit are flooded by adjacent rivers are creeks for periods of 1 to 6 months during most years. Permeability is moderate in the Gator soil and rapid in the Terra Ceia soil. Available water capacity is very high in both soils.

(37) Myakka mucky sand, occasionally flooded - This poorly drained, very deep nearly level soil is on the flatwoods are adjacent to the tidal marsh or the floodplain of the Suwannee River. It is occasionally flooded. Individual areas are generally long and narrow and range from 3 to nearly 500 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is black muck to a depth of about 2 inches and a very dark gray mucky sand to a depth of 10 inches. The subsurface layer is gray sand to a depth of about 21 inches. The subsoil is very dark gray sand to a depth of about 40 inches and very dark grayish brown sand to a depth of 80 inches or more.

On most of the acreage mapped as Myakka mucky sand, occasionally flooded, Myakka and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Myakka soils but have a surface layer of fine sand or sand that is more than 3 inches thick; have an organic layer at the surface that is more than 3 inches thick; do not have a dark, organically coated subsoil; have a loamy subsoil at a depth of 40 to 80 inches; have a dark organically coated subsoil that is within a depth of 20 inches or at a depth of 30 to 80 inches; or have a dark surface layer that is more than 8 inches thick.

Dissimilar soils that are included with the Myakka soil in mapping occur as small areas of Adamsville, Bradenton, Pineda, Placid, Popash, Pomello, Samsula, and Zolfo soils and soils that have a bedrock at a depth of 40 to 60 inches. Bradenton and Pineda soils are in positions on the landscape similar to those of the Myakka soil. Adamsville, Pomello, and Zolfo soils are in the slightly higher landscape positions. Placid, Popash and Samsula soils are in the lower landscape positions. Bradenton and Pineda soils do not have and organically stained subsoil and have a loamy subsoil within a depth of 40 inches.

The seasonal high water table is within a depth of 12 inches in the Myakka soil for more than 6 months during most years. Areas of this map unit are flooded by storm-driven tides or by the Suwannee River for periods of 2 to 7 days during some years. Permeability is moderate or moderately rapid. Available water capacity is moderate.

(39) Waccasassa-Demory complex, flooded – These poorly drained, shallow or very shallow, nearly level soils are on low ridges. They are rarely flooded and occasionally flooded. Individual areas are generally irregular in shape and range from 2 to more than 10,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Waccasassa soil is very dark grayish brown sandy clay loam about 2 inches thick. The subsoil is dark yellowish brown sandy clay loam to a depth of about 12 inches. Limestone bedrock is at a depth of about 12 inches.

Typically, the surface layer of the Demory soil is very dark brown sandy clay loam to a depth of about 6 inches. The underlying material is dark yellowish brown sandy clay loam, and extends to a depth of about 11 inches. Limestone bedrock is at a depth of about 11 inches.

Generally, the mapped areas average about 53 percent Waccasassa and similar soils and 37 percent Demory and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Waccasassa and Demory soils and of the similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Waccasassa-Demory complex, flooded, Waccasassa, Demory, and similar soils make up about 81 to 99 percent of the mapped areas. Dissimilar soils make up about 1 to 19 percent. ON 5 percent of the acreage, the dissimilar soils make up more than 19 percent of the mapped areas.

Included in mapping are soils that are similar to the Waccasassa and Demory soils but have a surface layer of fine sand, loamy fine sand, fine sandy loam, or muck that is more than 3 inches thick; have more than 5 percent gravel in the surface layer; are sandy throughout; or have bedrock within a depth of 4 inches.

Dissimilar soils that are included with the Waccasassa and Demory soils in mapping occur as small areas of Aripeka, Boca, Bradenton, Chobee, Hicoria, Matmon, and Pineda soils and rock outcrop. Aripeka and Matmon soils are in the slightly higher landscape positions. Boca, Bradenton, and Pineda soils are in positions on the landscape similar to those of the Waccasassa and Demory soils. Chobee and Hicoria soils are in the lower landscape positions. Boca and Pineda soils are sandy to a depth of 20 inches or more and do not have bedrock within a depth of 20 inches. Bradenton soils

do not have bedrock within a depth of 40 inches.

The seasonal high water table is within a depth of 12 inches in the Waccasassa and Demory soils for 2 to 6 months ins most years. During dry periods it is within crevices and solution holes in the bedrock. Areas of this map unit are flooded by adjacent creeks for periods of 2 to 7 days during some years. Permeability is moderately slow in both soils. Available water capacity is very slow in both soils.

(40) Pineda fine sand - This poorly drained, very deep nearly level soil is on sloughs on flatwoods. Individual areas are generally irregular in shape and range from 3 to nearly 350 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer is dark gray fine sand to a depth of about 18 inches. The subsoil is brown fine sand to a depth of about 32 inches, dark grayish brown fine sandy loam to a depth of 55 inches, and greenish gray sandy clay loam to a depth of 80 inches or more.

On 80 percent of the acreage mapped as Pineda fine sand, Pineda and similar soils make up about 76 to 86 percent of the mapped areas. Dissimilar soils make up about 14 to 24 percent. On 20 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Pineda soils but have and organically coated subsoil more than 2 inches thick that overlies the loamy subsoil, do not have a sandy subsoil, have bedrock at a depth of 60 to 80 inches, do not have sandy intrusions in the upper 2 to 10 inches of the loamy subsoil, or have a dark surface layer that is more than 10 inches thick.

Dissimilar soils that are included with the Pineda soil in mapping occur as small areas of Chobee, Hicoria, Myakka, Placid, Pompano, Popash, and Smyrna soils and soils that have a bedrock at a depth of 40 to 60 inches. Myakka, Pompano, and Smyrna soils are in positions on the landscape similar to those of the Pineda soil. Chobee, Hicoria, Placid, and Popash soils are in the lower landscape positions. Myakka, Pompano, and Smyrna soils are sandy to a depth of 80 inches or more. Myakka and Smyrna soils have an organically coated subsoil.

In most years the seasonal high water table is within a depth of 12 inches in the Pineda soil for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is slow or very slow. Available water capacity is low.

(41) Demory sandy clay loam, occasionally flooded - This poorly drained, nearly level, shallow to very shallow is on low ridges adjacent to or surrounded by areas of tidal marsh. It is occasionally flooded. Individual areas are generally irregular in shape and range from 2 to nearly 3,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface is covered with several inches of undecomposed leaf litter. The surface layer is black muck about 3 inches thick. Below this is very dark grayish brown sandy clay loam about 4 inches thick. The underlying material is dark grayish brown sandy clay loam about 2 inches thick. Limestone bedrock is at a depth of 9 inches.

On 95 percent of the acreage mapped as Demory sandy clay loam, occasionally flooded, Demory and similar soils make up about 78 to96 percent of the mapped areas. Dissimilar soils make up about 4 to 22 percent. On 5 percent of the acreage, the dissimilar soils make up more than22 percent of the mapped areas.

Included in mapping are soils that are similar to the Demory soil but do not have a dark surface layer; have a surface layer of fine sand, loamy fine sand, fine sandy loam, or muck that is more than 3 inches thick; have more than 5 percent gravel in the surface layer; have bedrock within a depth of 4 inches; or are sandy throughout.

Dissimilar soils that are included with the Demory soil in mapping occur as small areas of Aripeka, Boca, Bradenton, Chobee, Cracker, and Matmon soils and rock outcrop. Chobee and Cracker soils are in the slightly lower landscape positions. Boca and Bradenton soils are in the positions on the landscape similar to those of the Demory soil. Aripeka and Matmon soils are in the slightly higher landscape positions. Boca and Bradenton soils do not have bedrock within a depth of 20 inches. Boca soils area sandy to a depth of 20 inches or more.

The seasonal high water table is within a depth of 12 inches for 2 to 6 months in most years. During dry periods it is within crevices and solution holes in the bedrock. Areas of this map unit are flooded by adjacent creeks or by storm-driven tides for periods of 2 to 7 days during some years. Permeability is moderately slow. Available water capacity is very low.

(43) Tidewater mucky clay, frequently flooded - This very poorly drained, deep and very deep, nearly level soil is in tidal marsh. It is frequently flooded. Individual areas are generally irregular in shape and range from 4 to nearly 6,700 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is very dark brown mucky clay to a depth of about 10 inches, black silty clay to a depth of abut 24 inches, and black sandy clay loam to a depth of 40 inches. The underlying material is a mixture of black and very dark grayish brown loamy fine sand to a depth of about 76 inches. Limestone bedrock is at a depth of 76 inches.

On 95 percent of the acreage mapped as Tidewater mucky clay, frequently flooded, Tidewater and similar soils make up about 91 to 100 percent of the mapped areas. Dissimilar soils make up less than 9 percent. On 5 percent of the acreage, the dissimilar soils make up more than 9 percent of the mapped areas. Included in mapping are soils that are similar to the Tidewater soil but have a surface layer of much that is 4 to 51 inches thick' have a surface layer of fine sandy loam, sandy clay loam, or sandy clay that is more than 3 inches thick; do not have dark surface layer as much as 10 inches in thickness; have sandy materials at a depth of 20 to 40 inches; have bedrock at a depth of 30 to 40 inches; or do not have sulfidic materials within a depth of 20 inches.

Dissimilar soils that are included with the Tidewater soil in mapping occur as small areas of Boca, Cracker, Demory, Immokalee, Myakka, Wekiva, Wulfert, and Zolfo soils and soils that have bedrock at a depth of 20 to 30 inches, have sandy materials within a depth of 20 inches, or have an organic surface layer that is more than 51 inches thick. Cracker and Wulfert soils are in positions on the landscape similar to those of the Tidewater soil. Boca, Demory, Immokalee, Myakka, Wekiva, and Zolfo soils are in the slightly higher landscape position. Cracker soils have limestone bedrock within a depth of 20 inches. Wulfert soils have an organic surface layer that is more than 16 inches thick.

The seasonal high water table is within a depth of 12 inches in the Tidewater soil throughout the year. Areas of this map unit are flooded daily by high tides. Permeability is moderately slow. Available water capacity is low.

(45) Cracker mucky clay, frequently flooded - This very poorly drained, shallow or very shallow, nearly level soil is in areas of tidal marsh. IT is frequently flooded. Individual areas are generally irregular in shape and range from 9 to nearly 5,900 acres in size. Slopes are 0 to 1 percent.

Typically, the surface layer is black mucky clay to a depth of about 4 inches and very dark gray sandy clay loam to a depth of 12 inches. Limestone bedrock is at a depth of about 12 inches.

On 90 percent of the acreage mapped as Cracker mucky clay, frequently flooded, Cracker and similar soils make up about 76 to92 percent of the mapped areas. Dissimilar soils make up about 8 to 24 percent. On 10 percent of the acreage, the dissimilar soils make up more than 24 percent of the mapped areas.

Included in mapping are soils that are similar to the Cracker soil but have a surface layer of muck,

fine sandy loam, sandy clay loam, or sandy clay that is more than 3 inches thick; are sandy throughout; or have bedrock at a depth of 20 to 30 inches or within a depth of 6 inches.

Dissimilar soils that are included with the Cracker soil in mapping occur as small areas of Boca, Demory, Tidewater, Wekiva, and Wulfert soils and areas of soils that have bedrock at a depth of 20 to 30 inches. Also included are small areas of rock outcrop. Tidewater and Wulfert soils are in positions on the landscape similar to those of the Cracker soil. Boca, Demory, and Wekiva soils are in the slightly higher landscaper positions. Tidewater and Wulfert soils do not have bedrock within a depth 40 inches. Wulfert soils have an organic surface layer that is more than 16 inches thick.

The seasonal high water table is within a depth of 12 inches in the Cracker soil thought the year. Areas of this map unit are flooded daily by high tides. Permeability is moderate. Available water capacity is very low.

(46) Chobee fine sandy loam, limestone substratum, frequently flooded - This very poorly drained, deep or very deep, nearly level soil is on flood plains. It is frequently flooded. Individual areas are generally irregular in shape and range from 3 to nearly 3,500 acres in size.

Typically, the surface layer is very dark brown muck to depth of about 3 inches and very dark brown fine sandy loam to a depth of 11 inches. The subsoil is very dark grayish brown sandy clay loam to a depth of about 21 inches, light brownish gray sandy clay loam to a depth of 28 inches, dark greenish gray sandy clay loam to a depth of 54 inches, and a mixture of greenish gray and light greenish gray sandy clay loam to a depth of 68 inches. Limestone bedrock is at a depth of about 68 inches.

On most of the acreage mapped as Chobee fine sandy loam, limestone substratum, frequently flooded, Chobee and similar soils make up more than 85 percent of the mapped areas. Dissimilar soils make up less than 15 percent.

Included in mapping are soils that are similar to the Chobee soil but do not have bedrock within a depth of 80 inches, have bedrock at a depth of 20 t o 40 inches, do not have a dark surface layer as much as 10 inches in thickness, have an organic surface layer that is 4 to 16 inches thick, have and average content of clay in the upper 20 inches of the subsoil that is more than 35 percent, or have a surface layer of fine sand, loamy fine sand, or sandy clay loam that is 4 to 20 inches thick.

Dissimilar soils that are included with the Chobee soil in mapping occur as small areas of Boca, Bradenton, Demory, Gator, Hicoria, Pineda, Popash, Waccasassa, and Wekiva soils. Also included are soils that are in positions on the landscape similar to those of the Chobee soil but have bedrock within a depth of 20 inches. Gator, Hicoria, and Popash soils are in positions on the landscape similar to those of the Chobee soil. Boca, Bradenton, Demory, Pineda, Waccasassa, and Wekiva soils are in the higher landscape positions. Gator soils have and organic surface layer that is more than 16 inches thick. Hicoria and Popash soils are sandy to a depth of 20 inches or more.

The seasonal high water table is at or above the surface in the Chobee soil for more than 6 months during most years. Areas of this map unit are flooded by adjacent rivers or creeks for periods of more than 6 months during most years. Permeability is slow. Available water capacity is moderate.

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

Typically, the surface layer of the Boca soil is black fine sand about 5 inches thick. The subsurface layer is light gray fine sand to a depth of about 15 inches, light brownish gray fine sand to a depth of 25 inches, and brown fine sand to a depth of 29 inches. The subsoil is olive brown sandy clay loam to a depth of about 37 inches. Limestone bedrock is at a depth of about 37 inches.

Typically, the surface layer of the Holopaw soil is black fine sand about 5 inches thick. The subsurface layer is a mixture of gray and dark grayish brown fine sand to a depth of about 20 inches, light brownish gray fine sand to a depth of 35 inches, pale brown fine sand to a depth of 41 inches, and a mixture of grayish brown and very dark grayish brown fine sand to a depth of 43 inches. The subsoil is dark gray sandy clay loam to a depth of about 48 inches and gray fine sandy loam to a depth of 65 inches. Limestone bedrock is at a depth of about 65 inches.

On 95 percent of the acreage mapped as Boca-Holopaw, limestone substratum, complex, Boca, Holopaw, and similar soils make up about 83 to 98 percent of the mapped areas. Dissimilar soils make up about 2 to 17 percent. On 5 percent of the acreage, the dissimilar soils make up ore than 17 percent of the mapped areas.

Included in mapping are soils that are similar to the Coca soils but do not have bedrock within a depth of 40 inches, have and organically stained layer that over lies the subsoil or the bedrock, have a loamy subsoil within a depth of 20 inches, do not have a loamy subsoil, or have a surface layer that is more than 9 inches thick. Also included are soils that are similar to the Holopaw soil but do not have bedrock within a depth of 80 inches; have a dark, organically stained layer that is more than 2 inches thick overlying the loamy subsoil; do not have a loamy subsoil; or have a dark surface layer that is more than 7 inches thick.

Dissimilar soils that are included with the Boca and Holopaw soils in mapping occur as small areas of Aripeka, Bradenton, Chobee, Hallandale, Hicoria, Matmon, Placid, Popash, and Waccasassa soils. Aripeka and Matmon soils are in the slightly higher landscape positions. Bradenton, Hallandale, and Waccasassa soils are in positions on the landscape similar to those of the Boca and Holopaw soils. Chobee, Hicoria, Placid, and Popash soils are in the lower landscape positions. Bradenton and Waccasassa soils have a loamy subsoil within a depth of 20 inches. Hallandale and Waccasassa soils have limestone bedrock within a depth of 20 inches.

In most years the seasonal high water table is within a depth of 12 inches in the Boca and Holopaw soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains or can recede to a depth of about 60 inches during droughty periods. Permeability is moderate in the Boca soil and moderately slow or moderate in the Holopaw soil. Available water capacity is very low in the Boca soil and moderate in the Holopaw soil.

(69) Broward-Lutterloh, limestone substratum, complex - This map unit consists of a moderately deep Broward soil and a very deep Lutterloh soil. These somewhat poorly drained nearly level soils are on low ridges. Individual areas are generally irregular in shape and range from 2 to nearly 2,000 acres in size. Slopes range from 0 to 2 percent.

Typically, the surface layer of the Broward soil is dark gray fine sand about 6 inches thick. The underlying material is a mixture of light yellowish brown and brownish yellow fine sand to a depth of 10 inches and yellowish brown fine sand to a depth of 25 inches. Limestone bedrock is at a depth of about 25 inches.

Typically, the surface layer of the Lutterloh soil is dark gray fine sand about 9 inches thick. The subsurface layer is light gray fine sand to a depth of about 35 inches and brown fine sand to a depth of 53 inches. The subsoil layer is light brownish gray fine sandy loam and extends to a depth 61 inches. Limestone bedrock is at a depth of about 61 inches.

Generally, the mapped areas average about 57 percent Broward and similar soils and 35 percent Lutterloh and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Broward and Lutterloh soils and of similar soils are fairly consistent in most mapped areas.

On 95 percent of the acreage mapped as Broward-Lutterloh, limestone substratum, complex, Broward, Lutterloh, and similar soils make up about 87 to 98 percent of the mapped areas.

Dissimilar soils make up about 2 to 13 percent. On 5 percent of the acreage, the dissimilar soils make up more than 13 percent of the mapped areas.

Included in mapping are sols that are similar to the Broward soil but have bedrock at a depth of 12 to 20 inches, have a loamy or organically stained subsoil that over lies the bedrock, or have bedrock at a depth of 40 to 60 inches. Also included are soils that are similar to the Lutterloh soils but are sandy to a depth of 80 inches or more, have a dark surface layer that is more than 9 inches thick, or have bedrock at a depth of 40 to 60 inches.

Dissimilar soils that are included with the Broward and Lutterloh soils in mapping occur as small areas of Boca, Bushnell, Hallandale, Hicoria, Holopaw, Placid, Pompano, Popash, Orsino, and Otela soils. Also included are soils that are in positions on the landscape similar to those of Broward and Lutterloh soils but have a bedrock within a depth of 12 inches. Bushnell soils are in positions on the landscape similar to those of the Broward and Lutterloh soils. Orsino and Otela soils are in the slightly higher landscape positions. Boca, Hallandale, Holopaw, and Pompano soils are in the slightly lower landscape positions. Hicoria, Placid, and Popash soils are in depressions. Bushnell soils have a clayey subsoil within a depth of 20 inches.

The seasonal high water table is at a depth of 18 to 30 inches in the Broward and Lutterloh soils for 2 to 6 months during most years. Permeability is rapid in the Broward soil and moderate in the Lutterloh soil. Available water capacity is very low in both soils.

(70) Hallandale-Boca-Holopaw complex - This map unit consists shallow or very shallow Hallandale soil, a moderately deep Boca soil, and a very deep Holopaw soils. These poorly drained, nearly level soils are on low ridges and flatwoods.

Typically, the surface layer of the Hallandale soil is light gray fine sand about 4 inches thick. The subsurface layer is white fine sand to a depth of about 12 inches. The subsoil is very pale brown fine sand to a depth of 19 inches. Limestone bedrock is at a depth of about 19 inches.

Typically, the surface layer of the Boca soil is dark gray fine sand about 4 inches thick. The subsurface layer is white fine sand to a depth of about 10 inches and very pale brown fine sand to a depth of 21 inches. The subsoil is light brownish gray sandy clay loam to a depth of about 25 inches. Limestone bedrock is at a depth of 25 inches.

Typically, the surface layer of the Holopaw soil is very dark gray fine sand about 4 inches thick. The subsurface layer is light gray fine sand to a depth of about 28 inches and very pale brown fine sand to a depth of 52 inches. The subsoil layer is gray sandy clay loam to a depth of 80 inches or more.

Generally, the mapped areas average about 35 percent Hallandale and similar soils, 28 percent Boca and similar soils, and 27 percent Holopaw and similar soils. The components of this map unit are so intermingled that it is not practical to map them separately at the scale used in mapping. However, the proportions of the Hallandale, Boca, and Holopaw soils and the similar soils are fairly consistent in most mapped areas.

On 80 percent of the acreages mapped as Hallandale-Boca-Holopaw complex, Hallandale, Boca, Holopaw and similar soils make up about 75 to 100percent of the mapped areas. Dissimilar soils make up less than 25 percent. On 20 percent of the acreage, the dissimilar soils make up more than 25 percent of the mapped areas.

Included in mapping areas soils that are similar to the Hallandale soils but have a continuous, loamy subsoil that overlies the bedrock; have a dark surface layer that is more than 7 inches thick; or have bedrock within a depth of 4 inches. Also included are soils that area similar to the Boca soil but do not have a loamy subsoil at least 4 inches thick, have a loamy subsoil within a depth of 20 inches; or have bedrock at a depth of 40 to 80 inches. Also included are soils that are similar to the Holopaw sol but have bedrock at a depth of 40 to 80 inches, have a dark surface layer that is more

than 7 inches thick, or do not have a loamy subsoil within a depth of 80 inches. Also included are soils that are similar to the Hallandale, Boca, and Holopaw soils but have a dark, organically stained subsoil that is more than 2 inches thick.

Dissimilar soils that are included with the Hallandale, Boca, and Holopaw soils in mapping occur as small areas of Adamsville, Broward, Hicoria, Lutterloh, Moriah, Placid, Popash, and Seaboard soils. Also included are small areas of rock outcrop. Hicoria Placid, and Popash soils are in depressions. Adamsville, Broward, Lutterloh, Moriah, and Seaboard soils are in the slightly higher landscape positions.

In most years the seasonal high water table is within a depth of 12 inches in the Hallandale, Boca, and Holopaw soils for 2 to 6 months, but it can be above the surface for 1 to 2 weeks following heavy rains of can recede to a depth of about 60 inches during droughty periods. Permeability is rapid in the Hallandale soil, moderate in the Boca soil, and moderately slow or moderate in the Holopaw soil. Available water capacity is very low in the Hallandale and Boca soils and Low in the Holopaw soil.

Addendum 4—Plant And Animal List

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	MOSSES	
	Amblystegium varuim	
	Anomodon attenuatus	
	Anomodon rostratus	
	Barbula agraria	
	Barbula cancellata	
	Bryohaplocladium microphyllum	
	Bryum pseudocapillare	
	Cryphaea glomerata	
	Cyrto-hypnum minutulum	
	Ditrichum pallidum	
	Entodon macropodus	
	Entodon seductrix	
	Fissidens cristatus	
	Fissidens taxifolius	
	Forsstroemia trichomitria	
	Homolotheciella subcapillata	
	Isopterygium tenerum	
	Leucobryum albidum	
	Leucodon julaceus	
	Octoblepharum albidum	
	Papillaria nigrescens	
	Rhynchostegium serrulatum	
	Schlothemia rugifolia	
	Schwetshkeopsis fabronia	
Meadow spikemoss	*Selaginella apoda*	
	Sematophyllum adnatum	
	Syrrhopodon incompletus	
	Syrrhopodon texanus	
	Thelia hirtella	
	Thuidium delicatulum	
	MACROLICHENS	
	Bulbothrix isidiza	
	Canoparmelia cryptochlorophaea	
	Cladina subtenuis	
	Cladonia grayi	
	Cladonia leporina	
	Cladonia peziziformis	
	Cladonia ramulosa	
	Cladonia ravenelii	
	Dirinaria applanata	
	Heterodermia speciosa	
	Hyperphyscia syncolla	
	Leptogium austroamericanum	
	Leptogium azureum	
	Leptogiumchloromelum	
	Leptogium cyanescens	

* Non-native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	Leptogium marginellum	
	Leptogium phyllocarpum	
	Leptogium stipitatum	
	Lobaria ravenelii	
	Parmotrema hypoleucinum	
	Parmotrema perforatum	
	Parmotrema rigidum	
	Parmotrematinctorum	
	Parmotrema ultralucens	
	Physcia atrostriata	
	Physcia neogaea	
	Pseudoparmelia sphaerospora	
	Puntelia rudecta	
	Pyxine caesiopruinosa	
	Ramalina complanata	
	Ramalina fastigiata	
	Ramalina usnea	
	Ramalina willeyi	
	Rimelia reticulata	
	Rimelia subisidiosa	
	Usnea baileyi	
	Usnea mutabilis	
	Usnea perplectata	
	Usnea rubicunda	
	Usnea strigosa	
	Usnea trichodea	
	LIVERWORTS	
	Aneura pinguis	
	Ceratolejeunea laetefusca	
	Cheilolejeunea clausa	
	Cheilolejeunea rigidula	
	Cololejeunea cardiocarpa	
	Frullania cobrensis	
	Frullania eboracensis	
	Frullania kunzei	
	Frullania obcordata	
	Frullania squarrosa	
	Lejeunea cladogyna	
	Lejeunea flava	
	Lejeunea laetivirens	
	Leucolejeunea unciloba	
	Marchantia domingensis	
	Mastigolejeunea auriculata	
	Microlejeunea ulicina spp. *bullata*	
	Odontoschisma prostratum	
	Pallavicinia lyellii	
	Plagiochila dubia	
	Radula australis	
	Riccia fluitans	

* **Non-native Species**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	Riccardia latifrons	
	Riccardia multifida	
	Ricciocarpus natans	
	Sphaercarpos sp.	
	CHAROPHYTES	
	Chara zeylanica	
	Nitella capillata	
	PTERIDOPHYTES	
Giant leatherfern	*Acrostichum danaeifolium*	
Ebony spleenwort	*Asplenium platyneuron*	
Southern grapefern	*Botrychium biternatum*	
Southern woodfern	*Dryopteris ludoviciana*	
Japanese climbing fern *	*Lygodium japonicum*	
Cinnamon fern	*Osmunda cinnomomea*	25
Golden polypody	*Phlebodium aureum*	
Resurrection fern	*Pleopeltis polypodioides*	
Chinese ladder brake *	*Pteris vittata*	
Hairy maidenfern	*Thelypteris hispidula*	
Southern shield fern	*Thelypteris kunthii*	
Harper's maidenfern	*Thelypteris ovata*	
Marsh fern	*Thelypteris palustris*	
Shoestring fern	*Vittaria lineata*	
Virginia chainfern	*Woodwardia virginica*	
	GYMNOSPERMS	
Red cedar	*Juniperus virginiana*	
Slash pine	*Pinus elliottii*	
Loblolly pine	*Pinus taeda*	
Bald cypress	*Taxodium distichum*	
Coontie	*Zamia pumila*	35
	ANGIOSPERMS	
Monocots		
Purple bluestem	*Andropogon glomeratus* var. *glaucopsis*	
Bluestem	*Andropogon glomeratus* var. *pumilis*	
Elliott's bluestem	*Andropogon gyrans* var. *stenophyllus*	
Hairy bluestem	*Andropogon longiberbis*	
Broomgrass	*Andropogon virginicus* var. *virginicus*	
Jack-in-the-pulpit	*Arisaema triphyllum*	
Tall threeawn	*Aristida patula*	
Arrowfeather threeawn	*Aristida purpurascens*	
Bottlebrush threeawn	*Aristida spiciformis*	
Wiregrass	*Aristida beyrichiana*	
Switchcane	*Arundinaria gigantea*	
Common carpetgrass	*Axonopus fissfolius*	
Big carpetgrass	*Axonopus furcatus*	
Pitted beardgrass	*Bothriochloa ischaenum* var. *songarica*	
Ware's haresedge	*Bulbostylis stenophylla*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Bandana-of-the-Everglades	*Canna flaccida*	
Broadwing sedge	*Carex alata*	
Eastern woodland sedge	*Carex blanda*	
Chapman's sedge	*Carex chapmanni*	35
Cherokee sedge	*Carex cherokeensis*	
Longhair sedge	*Carex comosa*	
Hammock sedge	*Carex fissa*	
Gholson's sedge	*Carex gholsonii*	
Godfrey's sedge	*Carex godfreyi*	
Shoreline sedge	*Carex hylaninolepis*	
False hopsedge	*Carex lupuliformis*	
Peninsula sedge	*Carex paeninsulae*	
Florida hammock sedge	*Carex vexans*	
Southern sandbur	*Cenchrus echinatus*	
Coastal sandbur	*Cenchrus incertus*	
Big sandbur	*Cenchrus myosuroides*	
Slender woodoats	*Chasmanthium laxum*	
Longleaf chasmanthium	*Chasmanthium sessiliflorum*	
Shiny woodoats	*Chasmanthium nitidum*	
Sawgrass	*Cladium jamaicense*	
Common dayflower *	*Commelina diffusa*	
Whitemouth dayflower	*Commelina erecta*	
String lily	*Crinum americanum*	
Bermudagrass *	*Cynodon dactylon*	
Poorland flatsedge	*Cyperus compressus*	
Baldwin's flatsedge	*Cyperus croceus*	
Swamp flatsedge	*Cyperus distinctus*	
Yellow nutgrass *	*Cyperus esculentus*	
Yellow flatsedge	*Cyperus flavescens*	
Haspan flatsedge	*Cyperus haspan*	
Swamp flatsedge	*Cyperus ligularis*	
Fragrant flatsedge	*Cyperus odoratus*	
Flatleaf flatsedge	*Cyperus planifolius*	
Manyspike sedge	*Cyperus polystachyos*	
Pinebarren flatsedge	*Cyperus retrorsus*	
Nutgrass *	*Cyperus rotundus*	
Strawcolored flatsedge	*Cyperus strigosus*	
Tropical flatsedge	*Cyperus surinamensis*	
Fourangle flatsedge	*Cyperus tetragonus*	
Green flatsedge	*Cyperus virens*	
Needleleaf witchgrass	*Dichanthelium aciculare*	
Deertongue panicum	*Dichanthelium clandestinum*	
Variable witchgrass	*Dichanthelium commutatum*	
Cypress witchgrass	*Dichanthelium dichotomum*	
Witchgrass	*Dicanthelium ensifolium*	
Erectleaf witchgrass	*Dichanthelium erectifolium*	
Openflower witchgrass	*Dicanthelium laxiflorum*	
Hemlock witchgrass	*Dicanthelium portoricense*	
Southern crabgrass	*Digitaria ciliaris*	
Slender crabgrass *	*Digitaria filiformis* var. *filiformis*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Saltgrass	*Distichlis spicata*	
Jungle rice *	*Echinochloa colona*	
Barnyardgrass *	*Echinochloa crus-galli*	
Coast cockspur	*Echinochloa walteri*	
Upright burrhead	*Echinodorus berteroi*	
White spikerush	*Eleocharis albida*	
Purple spikerush	*Eleocharis atropurpurea*	
Roadgrass	*Eleocharis baldwinii*	
Gulf coast spikerush	*Eleocharis cellulosa*	
Yellow spikerush	*Eleocharis flavescens*	
Canada spikerush	*Eleocharis geniculata*	
Wand spikerush	*Eleocharis montevidensis*	
Indian goosegrass *	*Eleusine indica*	
Virginia wildrye	*Elymus virginicus*	
Greenfly orchid	*Epidendrum conopseum*	25, 35
Elliot's lovegrass	*Eragrostis elliottii*	
Bigtop lovegrass	*Eragrostis hirsuta*	
Coastal lovegrass	*Eragrostis virginica*	
Centipedegrass *	*Eremochloa ophiuroides*	
Sugarcane plumegrass	*Erianthus giganteus*	
Michaux's cupgrass	*Eriochloa michauxii*	
Saltmarsh fingergrass	*Eustachys glauca*	
Pinewoods fingergrass	*Eustachys petraea*	
Slender fimbry	*Fimbristylis autumnalis*	
Carolina fimbry	*Fimbristylis caroliniana*	
Forked fimbry	*Fimbristylis dichotoma*	
Marsh fimbry	*Fimbristylis spadicea*	
Hairy fimbry	*Fimbristylis puberula*	
Saltmarsh umbrellasedge	*Fuirena breviseta*	
Southern umbrellasedge	*Fuirena scirpoidea*	
Toothpetal false reinorchid	*Habenaria floribunda*	
Spikecrested coralroot	*Hexalectris spicata*	35
Hydrilla *	*Hydrilla verticillata*	
Yellow stargrass	*Hypoxis curtissii*	
Fringed yellow stargrass	*Hypoxis juncea*	
Prairie iris	*Iris hexagona*	
Leathery rush	*Juncus coriaceus*	
Forked rush	*Juncus dichotomus*	
Shorerush	*Juncus marginatus*	
Bighead rush	*Juncus megacephalus*	
Manyhead rush	*Juncus polycephalus*	
Needlegrass rush	*Juncus roemerianus*	
Needlepod rush	*Juncus scirpoides*	
Path rush	*Juncus tenuis*	
Shortleaf spikesedge	*Kyllinga brevifolia*	
Low spikesedge *	*Kyllinga pumila*	
Southern cutgrass	*Leersia hexandra*	
Whitegrass	*Leersia virginica*	
Obscure duckweed	*Lemna obscura*	
Bearded sprangletop	*Leptochloa fascicularis*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Florida addersmouth orchid	*Malaxis spicata*	
Two-flower melicgrass	*Melica mutica*	
Shoregrass	*Monanthochloe littoralis*	
Gulf hairawn	*Muhlenbergia capillaris*	
Nakedstem dewflower *	*Murdannia nudiflora*	
Hollyleaf naiad	*Najas marina*	
Crowpoison	*Nothoscordum bivalve*	
Woodsgrass	*Oplismenus hirtellus* ssp. *setarius*	
Beaked panicum	*Panicum anceps*	
Fall panicgrass	*Panicum dichotomiflorum*	
Torpedograss *	*Panicum repens*	
Redtop panicum	*Panicum rigidulum*	
Switchgrass	*Panicum virgatum*	
Blue paspalum	*Paspalum caespitosum*	
Dallisgrass *	*Paspalum dilatatum*	
Florida paspalum	*Paspalum floridanum*	
Rustyseed paspalum *	*Paspalum langei*	
Bahia grass *	*Paspalum notatum*	
Water paspalum	*Paspalum repens*	
Thin paspalum	*Paspalum setaceum*	
Vaseygrass *	*Paspalum urvillei*	
Seashore paspalum	*Paspalum vaginatum*	
Green arrow arum	*Peltandra virginica*	
Savannah panicum	*Phanopyrum gymnocarpon*	
Annual bluegrass *	*Poa annua*	
Rabbitsfootgrass *	*Polypogon monspeliensis*	
Sago pondweed	*Potamogeton pectinatus*	
Needle palm	*Rhapidophyllum hystrix*	35
Anglestem beaksedge	*Rhynchospora caduca*	
Starrush whitetops	*Rhynchospora colorata*	
Shortbristle horned beakrush	*Rhynchospora corniculata*	
Fascicled beaksedge	*Rhynchospora fascicularis*	
Sandyfield beaksedge	*Rhynchospora megalocarpa*	
Southern beaksedge	*Rhynchospora microcarpa*	
Millet beaksedge	*Rhynchospora miliacea*	
Mingled beaksedge	*Rhynchospora mixta*	
Widgeongrass	*Ruppia maritima*	
Bluestem palmetto	*Sabal minor*	
Cabbage palm	*Sabal palmetto*	
Grassy arrowhead	*Sagittaria graminea*	
Bluetongue arrowhead	*Sagittaria lancifolia*	
Awlleaf arrowhead	*Sagittaria subulata*	
Little bluestem	*Schizachyrium scoparium*	
California bulrush	*Scirpus californicus*	
Pendulous bulrush	*Scirpus lineatus*	
Saltmarsh bulrush	*Scirpus robustus*	
Softstem bulrush	*Scirpus tabernaemontani*	
Littlehead nutrush	*Scleria oligantha*	
Tall nutgrass	*Scleria triglomerata*	
Low nutrush	*Scleria verticillata*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Cultivated rye *	*Secale cereale*	
Saw palmetto	*Serenoa repens*	
Coral foxtail	*Setaria macrosperma*	
Knotroot foxtail	*Setaria parviflora*	
Narrowleaf blueyed grass	*Sisyrinchium atlanticum*	
Annual blueeyed grass *	*Sisyrinchium rosulatum*	
Earleaf greenbrier	*Smilax auriculata*	
Catbrier	*Smilax bona-nox*	
Sawbrier	*Smilax glauca*	
Bamboo vine	*Smilax laurifolia*	
Wild sarsaparilla	*Smilax pumila*	
Lanceleaf greenbrier	*Smilax smallii*	
Greenbrier	*Smilax tamnoides*	
Slender Indiangrass	*Sorghastrum elliotti*	
Saltmarsh cordgrass	*Spartina alterniflora*	
Sand cordgrass	*Spartina bakeri*	
Marshhay cordgrass	*Spartina patens*	
Gulf cordgrass	*Spartina spartinae*	
Prairie wedgescale	*Sphenopholis obtusata*	
Smutgrass *	*Sporobolus indicus*	
Seashore dropseed	*Sporobolus virginicus*	
St. Augustinegrass	*Stenotaphrum secumdatum*	
Alligator flag	*Thalia geniculata*	
Bartram's airplant	*Tillandsia bartramii*	
Ballmoss	*Tillandsia recurvata*	
Southern needleleaf	*Tillandsia setacea*	
Spanish moss	*Tillandsia usneoides*	
Tall purpletop	*Tridens flavus*	
Arrowgrass	*Triglochin striata*	
Eastern gammagrass	*Tripsacum dactyloides*	
Southern cattail	*Typha domingensis*	
Shortleaf yelloweyed grass	*Xyris brevifolia*	
Carolina yelloweyed grass	*Xyris caroliniana*	
Spanish bayonet	*Yucca aloifolia*	
Redmargin lily	*Zephyranthes simpsonii*	35
Dicots		
Mauve	*Abutilon hulseanum*	
Slender threeseed mercury	*Acalypha gracilens*	
Red maple	*Acer rubrum*	
Florida maple	*Acer saccharum* var. *floridanum*	
Button-of-gold	*Acmella oppositifolia* var. *repens*	
Red buckeye	*Aesculus pavia*	
Seaside gerardia	*Agalinis maritima*	
Slenderleaf false foxglove	*Agalinis tenuifolia*	
Small-leaf thoroughwort	*Ageratina jucunda*	
Silktree *	*Albizia julibrissin*	
Southern amaranth	*Amaranthus australis*	
Spiny amaranth *	*Amaranthus spinosus*	
Common ragweed	*Ambrosia artemisiifolia*	
Pink ammannia	*Ammannia latifolia*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
False indigo	*Amorpha fruticosa*	
Pepper vine	*Ampelopsis arborea*	
Eastern bluestar	*Amsonia tabernaemontana*	
Chaffweed	*Anagallis minima*	
Devil's walkingstick	*Aralia spinosa*	
Spreading sandwort	*Arenaria lanuginosa*	
Thymeleaf sandwort *	*Arenaria serpyllifolia*	
Swamp milkweed	*Asclepias incarnata*	
Fewflower milkweed	*Asclepias lanceolata*	
Milkweed	*Asclepias perennis*	
Narrowleaf pawpaw	*Asimina longifolia*	
Climbing aster	*Aster carolinianus*	
Bushy aster	*Aster dumosus*	
Annual marshaster	*Aster subulatus*	
Perennial saltmarshaster	*Aster tenuifolius*	
White-topped aster	*Aster tortifolius*	
Crested saltbush	*Atriplex cristata*	
Black mangrove	*Avicennia germinans*	
Falsewillow	*Baccharis angustifolia*	
Groundsel tree	*Baccharis glomeruliflora*	
Groundsel bush	*Baccharis halimifolia*	
Smooth water-hyssop	*Bacopa monnieri*	
Saltwort	*Batis maritima*	
Tarflower	*Bejaria racemosa*	
Rattan vine	*Berchemia scandens*	
Florida greeneyes	*Berlandiera subacaulis*	
Beggarticks	*Bidens alba*	
Spanish needles	*Bidens bipinnata*	
Smallfruit beggarticks	*Bidens mitis*	
Cross vine	*Bignonia capreolata*	
Samphire	*Blutaparon vermiculare*	
Red spiderling	*Boerhavia diffusa*	
False nettle	*Boehmeria cylindrica*	
Doll's daisy	*Boltonia diffusa*	
Sea oxeye	*Borrichia frutescens*	
American bluehearts	*Buchnera americana*	
Coastal searocket	*Cakile lanceolata*	
American beautyberry	*Callicarpa americana*	
Florida bellflower	*Campanula floridana*	
Trumpet vine	*Campsis radicans*	
Bittercress	*Cardamine bulbosa*	
Pennsylvania bittercress	*Cardamine pensylvanica*	
Vanilla plant	*Carphephorus ordoratissimus*	
American hornbeam	*Carpinus caroliniana*	
Water hickory	*Carya aquatica*	
Pignut hickory	*Carya glabra*	
Sugarberry	*Celtis laevigata*	
Coinwort	*Centella asiatica*	
Spurred butterfly pea	*Centrosema virginianum*	
Buttonbush	*Cephalanthus occidentalis*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Mouseear chickweed *	*Cerastium glomeratum*	
Prickly hornwort	*Ceratophyllum echinatum*	
Redbud	*Cercis canadensis*	
Partridge pea	*Chamaechrista fasciculata*	
Sensitive pea	*Chamaechrista nictitans*	
Limestone sandmat	*Chamaesyce blodgettii*	
Hyssopleaf sandmat	*Chamaesyce hyssopifolia*	
Spotted sandmat	*Chamaesyce maculata*	
Coastal beach sandmat	*Chamaesyce mesembrianthemifolia*	
Pitseed goosefoot	*Chenopodium berlandieri*	
Snowberry	*Chiococca alba*	
Spotted water hemlock	*Cicuta maculata*	
Purple thistle	*Cirsium horridulum*	
Nuttall's thistle	*Cirsium nuttallii*	
Sweet orange *	*Citrus aurantium*	
Oldman's beard	*Clematis catesbyana*	
Swamp leatherflower	*Clematis crispa*	
Carolina moonseed	*Cocculus carolinus*	
Narrowleaf paleseed *	*Conobea multifida*	
Blue mistflower	*Cononclinium coelestinum*	
Asthmaweed *	*Conyza bonariensis*	
Horseweed	*Conyza canadensis*	
Common tickseed	*Coreopsis leavenworthii*	
Roughleaf dogwood	*Cornus asperifolia*	
Swamp dogwood	*Cornus foemina*	
Lesser swinecress *	*Coronopus didymus*	
Smallflower fumewort	*Corydalis micrantha*	
Crataegus aestivalis	*Crataegus aestivalis*	
Rabbitbells	*Crotalaria rotundifolia*	
Showy rattlebox	*Crotalaria spectabilis*	
Colombian waxweed	*Cuphea carthagenensis*	
Marsh parsley *	*Cyclospermum leptophyllum*	
Coastal cynanchum	*Cynanchum angustifolium*	
Leafless cynanchum	*Cynanchum scoparium*	
Whitetassels	*Dalea carnea*	
Swamp loosestrife	*Decodon verticillatus*	
Climbing hydrangea	*Decumaria barbara*	
Western tansymustard	*Descurainea pinnata*	
Wild tantan *	*Desmanthus virgatus*	
Dillenius' ticktrefoil	*Desmodium glabellum*	
Zarzabacoa comun *	*Desmodium incanum*	
Maryland tickclover	*Desmodium marilandicum*	
Panicledleaf ticktrefoil	*Desmodium paniculatum*	
Dixie ticktrefoil *	*Desmodium tortuosum*	
Threeflower ticktrefoil *	*Desmodium triflorum*	
Ponyfoot	*Dichondra carolinensis*	
Branched foldwing	*Dicliptera brachiata*	
Buttonweed	*Diodia virginiana*	
Florida yam	*Dioscorea floridana*	
Persimmon	*Diospyros virginiana*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Twinflower	*Dyschoriste humistrata*	
Oblongleaf twinflower	*Dyschoriste oblongifolia*	
False daisy	*Eclipta prostrata*	
Elephant's-foot	*Elephantopus carolinianus*	
Tall elephant's foot	*Elephantopus elatus*	
Carolina elephant's foot	*Elephantopus nudatus*	
Carolina scalystem	*Elytraria caroliniensis*	
American burnweed	*Erechtites hieracifolia*	
Oakleaf fleabane	*Erigeron quercifolius*	
Prairie fleabane	*Erigeron strigosus*	
Early whitetop fleabane	*Erigeron vernus*	
Baldwin's eryngo	*Eryngium baldwinii*	
Cherokee bean	*Erythrina herbacea*	
White stopper	*Eugenia axillaris*	
American strawberrybush	*Euonymus americanus*	
White thoroughwort	*Eupatorium album*	
Dog fennel	*Eupatorium capillifolium*	
Semaphore eupatorium	*Eupatorium mikanioides*	
Mohr's thoroughwort	*Eupatorium mohrii*	
Common boneset	*Eupatorium perfoliatum*	
False hoarhound	*Eupatorium rotundifolium*	
Lateflowering boneset	*Eupatorium serotinum*	
Wood spurge	*Euphorbia commutata*	35
Catchfly prairie gentian	*Eustoma exaltatum*	
Slender goldenrod	*Euthamia caroliniana*	
Silverdwarf morningglory	*Evolvulus sericeus*	
Narrowleaf yellowtops	*Flaveria linearis*	
Pink thoroughwort	*Fleischmannia incarnata*	
Upland swampprivet	*Forestiera ligustrina*	
Florida swampprivet	*Forestiera segregata*	
White ash	*Fraxinus americana*	
Carolina ash	*Fraxinus caroliniana*	
Green ash	*Fraxinus pennsylvanica*	
Elliot's milkpea	*Galactia elliottii*	
Downy milkpea	*Galactia volubilis*	
Coastal bedstraw	*Galium hispidulum*	
Hairy bedstraw	*Galium pilosum*	
Stiff marsh bedstraw	*Galium tinctorium*	
Pennsylvania everlasting	*Gamochaeta pensylvanica*	
Southern beeblossum	*Gaura angustifolia*	
Blue huckleberry	*Gaylussacia frondosa* var. *tomentosa*	
Yellow jessamine	*Gelsemium sempervirens*	
Carolina cranesbill	*Geranium carolinianum*	
Water locust	*Gleditsia aquatica*	
Honey locust	*Gleditsia triacanthos*	
Rough hedge hyssop	*Gratiola hispida*	
Flattop mille graines *	*Hedyotis corymbosa*	
Innocence	*Hedyotis procumbens*	
Swamp sunflower	*Helianthus angustifolius*	
Cucumberleaf	*Helianthus debilis*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Stiff sunflower	*Helianthus radula*	
Seaside heliotrope	*Heliotropium curassavicum*	
Camphorweed	*Heterotheca subaxillaris*	
Scarlet rosemallow	*Hibiscus coccineus*	
Swamp rosemallow	*Hibiscus grandiflorus*	
Marsh pennywort	*Hydrocotyle umbellata*	
Whorled pennywort	*Hydrocotyle verticillata*	
Roundpod St. John's-wort	*Hypericum cistifolium*	
St. Andrew's-cross	*Hypericum hypericoides*	
Fourpetal St. John's-wort	*Hypericum tetrapetalum*	
Bushmint	*Hyptis alata*	
Tropical bushmint *	*Hyptis mutabilis*	
Dahoon holly	*Ilex cassine*	
Gallberry	*Ilex glabra*	
Yaupon holly	*Ilex vomitoria*	
Cogongrass *	*Imperata cylindrica*	
Tievine	*Ipomoea cordatotriloba*	
Ivyleafed morningglory *	*Ipomoea hederacea*	
Whitestar	*Ipomoea lacunosa*	
Largeroot morningglory *	*Ipomoea macrorhiza*	
Man-of-the-earth	*Ipomoea pandurata*	
Railroad vine	*Ipomoea pes-caprae*	
Saltmarsh morningglory	*Ipomoea sagittata*	
Bloodleaf	*Iresine diffusa*	
Marsh elder	*Iva frutescens*	
Piedmont marshelder	*Iva microcephala*	
Seashore mallow	*Kosteletzkya virginica*	
Japanese clover *	*Kummerowia striata*	
Wild lettuce	*Lactuca canadensis*	
Woodland lettuce	*Lactuca floridana*	
Henbit deadnettle *	*Lamium amplexicaule*	
Lantana *	*Lantana camara*	
Hairy pinweed	*Lechea mucronata*	
Corkwood	*Leitneria floridana*	25
Virginia pepperweed	*Lepidium virginicum*	
Narrowleaf lespedeza	*Lespedeza angustifolia*	
Hairy bushclover	*Lespedeza hirta*	
Slender blazing star	*Liatris gracilis*	
Grassleaf blazing star	*Liatris graminifolia*	
Shortleaf blazing star	*Liatris tenuifolia*	
Sea lavender	*Limonium carolinianum*	
Canada toadflax	*Linaria canadensis*	
Malaysian false pimpernel *	*Lindernia crustacea*	
Stiff yellow flax	*Linum medium*	
Fogfruit	*Lippia nodiflora*	
Sweetgum	*Liquidambar styraciflua*	
Tuberous gromwell	*Lithospermum tuberosum*	
Cardinal flower	*Lobelia cardinalis*	25
Bay lobelia	*Lobelia feayana*	
Glade lobelia	*Lobelia glandulosa*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Coral honeysuckle	*Lonicera sempervirens*	
Seaside primrosewillow	*Ludwigia maritima*	
Smallfruit primrosewillow	*Ludwigia microcarpa*	
Creeping primrosewillow	*Ludwigia repens*	
Christmasberry	*Lycium carolinianum*	
Crookedwood	*Lyonia ferruginea*	
Coastalplain staggerbush	*Lyonia fruticosa*	
Fetterbush	*Lyonia lucida*	
Winged loosestrife	*Lythrum alatum*	
Saltmarsh loosestrife	*Lythrum lineare*	
Southern magnolia	*Magnolia grandiflora*	
Sweetbay	*Magnolia virginiana*	
Anglepod	*Matelea gonocarpos*	35
Florida mayten	*Maytenus phyllanthoides*	35
Axilflower	*Mecardonia acuminata*	
Black medick *	*Medicago lupulina*	
Snow squarestem	*Melanthera nivea*	
White sweetclover *	*Melilotus albus*	
Indian sweetclover *	*Melilotus indicus*	
Chocolateweed *	*Melochia corchorifolia*	
Creeping cucumber	*Melothria pendula*	
Hairy hempvine	*Mikania cordifolia*	
Climbing hempvine	*Mikania scandens*	
Partridge berry	*Mitchella repens*	
Tropical girdlepod *	*Mitracarpus hirtus*	
Stalked miterwort	*Mitreola petiolata*	
Swamp miterwort	*Mitreola sessilifolia*	
Carolina bristlemallow	*Modiola caroliniana*	
Spotted beebalm	*Monarda punctata*	
Red mulberry	*Morus rubra*	
Wax myrtle	*Myrica cerifera*	
Twoleaf watermilfoil	*Myriophyllum pinnatum*	
Tropical puff	*Neptunia pubescens*	
Royalblue	*Nymphaea elegans*	
American white waterlily	*Nymphaea odorata*	
Swamp tupelo	*Nyssa sylvatica* var. *biflora*	
Cutleaf evening primrose	*Oenothera laciniata*	
Erect pricklypear	*Opuntia stricta*	8, 35, 81
Wild olive	*Osmanthus americana*	
Eastern hophornbeam	*Ostrya virginiana*	
Common yellow woodsorrel	*Oxalis corniculata*	
Water cowbane	*Oxypolis filiformis*	
Virginia creeper	*Parthenocissus quinquefolia*	
Passionflower	*Passiflora lutea*	
Corkystem passionflower	*Passiflora suberosa*	
Spearleaf swampmallow *	*Pavonia hastata*	
Manyflower beardtongue	*Penstemon multiflorus*	
Redbay	*Persea borbonia*	
Swampbay	*Persea palustris*	
Thicket bean	*Phaseolus smilacifolius*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Oak mistletoe	*Phoradendron leucarpum*	
Red chokeberry	*Photina pyrifolia*	
Fogfruit	*Phyla nodiflora*	
Carolina phyllanthus	*Phyllanthus carolinensis*	
Pinewood dainties	*Phyllanthus liebmannianus* ssp. *platylepis*	35
Chamber bitter *	*Phyllanthus urinaria*	
Groundcherry	*Physalis walteri*	
Pokeweed	*Phytolacca americana*	
Small-flowered butterwort	*Pinguicula pumila*	
Pitted stripeseed	*Piriqueta cistoides* subsp. *caroliniana*	
Common plantain *	*Plantago major*	
Virginia plantain	*Plantago virginica*	
Longleaf camphorweed	*Pluchea longifolia*	
Sweetscent	*Pluchea odorata*	
Rosy camphorweed	*Pluchea rosea*	
Paintedleaf	*Poinsettia cyathophora*	
Boykin's milkwort	*Polygala boykinii*	
Showy polygala	*Polygala grandiflora*	
Procession flower	*Polygala incarnata*	
Candyroot	*Polygala nana*	
Mild waterpepper	*Polygonum hydropiperoides*	
Dotted smartweed	*Polygonum punctatum*	
Leafcup	*Polymnia uvedalia*	
Rustweed	*Polypremum procumbens*	
Paraguayan purslane *	*Portulaca amilis*	
Marsh mermaidweed	*Proserpinaca palustris*	
Combleaf mermaidweed	*Proserpinaca pectinata*	
American plum	*Prunus americana*	
Black cherry	*Prunus serotina*	
Flatwoods plum	*Prunus umbellata*	
Wild coffee	*Psychotria nervosa*	
Waferash	*Ptelea trifoliata*	
Bracken fern	*Pteridium aquilinum*	
Blackroot	*Pterocaulon pycnostaschyum*	
Bishopsweed	*Ptilimnium capillaceum*	
Carolina desertchickory	*Pyrrhopappus carolinianus*	
Chapman's oak	*Quercus chapmanii*	
Sand live oak	*Quercus geminata*	
Laurel oak	*Quercus laurifolia*	
Swamp chestnut oak	*Quercus michauxii*	
Myrtle oak	*Quercus myrtifolia*	
Water oak	*Quercus nigra*	
Running oak	*Quercus pumila*	
Shumard oak	*Quercus shumardii*	
Live oak	*Quercus virginiana*	
Myrsine	*Rapanea punctata*	
Wild radish *	*Raphanus raphanistrum*	
Camphor daisy	*Rayjacksonia phyllocephala*	
Winged sumac	*Rhus copallinum*	
Michaux's snoutbean	*Rhynchosia michauxii*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Least snoutbean	*Rhynchosia minima*	
Tropical Mexican clover *	*Richardia brasiliensis*	
Southern marsh yellowcress	*Rorippa teres*	
Swamp rose	*Rosa palustris*	
Sawtooth blackberry	*Rubus argutus*	
Sand blackberry	*Rubus cuneifolius*	
Southern dewberry	*Rubus trivialis*	
Blackeyed Susan	*Rudbeckia hirta*	
Cutleaf coneflower	*Rudbeckia laciniata*	
Pinnate-lobed coneflower	*Rudbeckia trilobata* var. *pinnatiloba*	35
Wild petunia	*Ruellia carolinensis*	
Swamp dock	*Rumex verticillatus*	
Coastal rosegentian	*Sabatia calycina*	
Rose-of-Plymouth	*Sabatia stellaris*	
Climbing buckthorn	*Sageretia minutiflora*	
Annual glasswort	*Salicornia bigelovii*	
Perennial glasswort	*Salicornia perennis*	
Carolina willow	*Salix caroliniana*	
Tropical sage	*Salvia coccinea*	
Lyreleaf sage	*Salvia lyrata*	
American elder	*Sambucus canadensis*	
Water pimpernel	*Samolus ebracteatus*	
Pineland pimpernel	*Samolus valerandi*	
Snakeroot	*Sanicula canadensis*	
Soapberry	*Sapindus saponaria*	
Lizardtail	*Saururus cernuus*	
Brazilian pepper *	*Schinus terebinthifolius*	
Sweetbroom	*Scoparia dulcis*	
Carpenter's square	*Scrophularia marilandica*	
Florida scrub skullcap	*Scutellaria arenicola*	
Rough skullcap	*Scutellaria integrifolia*	
Yellow top	*Senecio glabellus*	
Maryland wild sensitiveplant	*Senna marilandica*	
Coffeeweed *	*Senna obtusifolia*	
Danglepod	*Sesbania herbacea*	
Bladderpod	*Sesbania vesicaria*	
Sea purslane	*Sesuvium portulacastrum*	
Cuban jute	*Sida rhombifolia*	
Prickly fanpetals *	*Sida spinosa*	
Saffron plum	*Sideroxylon celastrinum*	
Gum bully	*Sideroxylon lanuginosum*	
Florida bully	*Sideroxylon reclinatum*	
Tough bully	*Sideroxylon tenax*	
Starry rosinweed	*Silphium astericus*	
Horsenettle	*Solanum carolinense*	
Black nightshade	*Solanum chenopodioides*	
Pinebarren goldenrod	*Solidago fistulosa*	
Chapman's goldenrod	*Solidago odora* var. *chapmanii*	
Wrinkle leaf goldenrod	*Solidago rugosa*	
Seaside goldenrod	*Solidago sempervirens*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Smooth goldenrod	*Solidago stricta*	
Twistedleaf goldenrod	*Solidago tortifolia*	
Spiny sowthistle *	*Sonchus asper*	
Largeleaf buttonweed	*Spermacoce assurgens*	
Slender buttonweed *	*Spermacoce prostrata*	
Creeping oxeye *	*Sphagneticola trilobata*	
Pinkroot	*Spigelia loganioides*	35
Common chickweed *	*Stellaria media*	
American snowbell	*Styrax americana*	
Sea blite	*Suaeda linearis*	
Coralberry	*Symphoricarpos orbiculatus*	
New Zealand spinach *	*Tetragonia tetragonioides*	
Canadian germander	*Teucrium canadense*	
Carolina basswood	*Tilia americana*	
Poison ivy	*Toxicodendron radicans*	
Whitenymph	*Trepocarpus aethusae*	
Forked bluecurls	*Trichostema dichotomum*	
Field clover *	*Trifolium campestre*	
Clasping Venus's lookingglass	*Triodanis perfoliata*	
Winged elm	*Ulmus alata*	
American elm	*Ulmus americana*	
Cedar elm	*Ulmus crassifolia*	
Heartleaf nettle	*Urtica chamaedryoides*	
Leafy bladderwort	*Utricularia foliosa*	
Tree sparkleberry	*Vaccinium arboreum*	
Lowbush blueberry	*Vaccinium darrowii*	
Shiny blueberry	*Vaccinium myrsinites*	
Deerberry	*Vaccinium stamineum*	
Brazilian vervain *	*Verbena brasiliensis*	
Harsh vervain	*Verbena scabra*	
Frostweed	*Verbesina virginica*	
Ironweed	*Vernonia gigantea*	
Asian ironweed *	*Vernonia cinerea*	
Corn speedwell *	*Veronica arvensis*	
Neckweed	*Veronica peregrina*	
Southern arrow-wood	*Viburnum dentatum*	
Walter viburnum	*Viburnum obovatum*	
Vetch	*Vicia acutifolia*	
Florida vetch	*Vicia floridana*	
Common vetch *	*Vicia sativa*	
Early blue violet	*Viola palmata*	
Common blue violet	*Viola sororia*	
Walter's violet	*Viola walterii*	
Summer grape	*Vitis aestivalis*	
Florida grape	*Vitis cinerea*	
Muscadine grape	*Vitis rotundifolia*	
Frost grape	*Vitis vulpina*	
Common cocklebur	*Xanthium strumarium*	
Hog plum	*Ximenia americana*	
Oriental false hawksbeard *	*Youngia japonica*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Hercules' club	*Zanthoxylum clava-herculis*	
Wild lime	*Zanthoxylum fagara*	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
	FISH	
Lined sole	*Achirus lineatus*	56
Orange filefish	*Aluterus schoepfi*	56
White catfish	*Ameiurus catus*	56
Fringed pipefish	*Anarchopterus criniger*	56
Broad-striped anchovy	*Anchoa hepsetus*	56
Bay anchovy	*Anchoa mitchilli*	56
Sheepshead	*Archosargus probatocephalus*	53, 56
Hardhead catfish	*Arius felis*	53, 56
Southern stargazer	*Astroscopus y-graecum*	56
Gafftopsail catfish	*Bagre marinus*	56
Silver perch	*Bairdiella chrysoura*	56
Frillfin goby	*Bathygobius soporator*	56
Gulf menhaden	*Brevoortia patronus*	56
Grass porgy	*Calamus arctifrons*	56
Crevalle Jack	*Caranx hippos*	56
Blacktip shark	*Carcharhinus limbatus*	56
Atlantic spadefish	*Chaetodipterus faber*	56
Florida blenny	*Chasmodes saburrae*	56
Striped burrfish	*Chilomycterus schoepfi*	56
Atlantic bumper	*Chloroscombrus chrysurus*	56
Sand seatrout	*Cynoscion arenarius*	56
Spotted seatrout	*Cynoscion nebulosus*	56
Sheepshead minnow	*Cyprinodon variegatus*	56
Atlantic stingray	*Dasyatis sabina*	56
Bluntnose stingray	*Dasyatis say*	56
Round scad	*Decapterus punctatus*	56
Sand perch	*Diplectrum formosum*	56
Spottail pinfish	*Diplodus holbrooki*	56
Gizzard shad	*Dorosoma cepedianum*	56
Threadfin shad	*Dorosoma petenense*	56
Sharksucker	*Echeneis naucrates*	56
Ladyfish	*Elops saurus*	56
Redfin pickerel	*Esox americanus*	56
Chain pickerel	*Esox niger*	56
Swamp darter	*Etheostoma fusiforme*	56
Fringed flounder	*Etropus crossotus*	56
Smallmouth flounder	*Etropus microstomus*	56
Jenny mojarra	*Eucinostomus gula*	56
Tidewater mojarra	*Eucinostomus harengulus*	56
Goldspotted killifish	*Floridichthys carpio*	56
Golden topminnow	*Fundulus chrysotus*	56
Marsh killifish	*Fundulus confluentus*	56
Gulf killifish	*Fundulus grandis*	56
Striped killifish	*Fundulus majalis*	56
Seminole killifish	*Fundulus seminolis*	56
Eastern mosquitofish	*Gambusia holbrooki*	56
Skilletfish	*Gobiesox strumosus*	56
Darter goby	*Gobionellus boleosoma*	56
Naked goby	*Gobiosoma bosc*	56

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Twoscale goby	*Gobiosoma longipala*	56
Code goby	*Gobiosoma robustum*	56
Smooth butterfly ray	*Gymnura micrura*	56
White grunt	*Haemulon plumieri*	56
Scaled sardine	*Harengula jaguana*	56
Buntnose jack	*Hemicaranx amblyrhynchus*	56
Least killifish	*Heterandria formosa*	56
Lined seahorse	*Hippocampus erectus*	56
Dwarf seahorse	*Hippocampus zosterae*	56
Crested blenny	*Hypleurochilus geminatus*	56
Halfbeak	*Hyporhamphus unifasciatus*	56
Feather blenny	*Hypsoblennius hentz*	56
Scrawled cowfish	*Lactophrys quadricornis*	56
Buffalo trunkfish	*Lactophyrs trigonus*	56
Pinfish	*Lagodon rhomboides*	53, 56
Spot	*Leiostomus xanthurus*	53, 56
Longnose gar	*Lepisosteus osseus*	56
Florida gar	*Lepisosteus platyrhincus*	56
Dollar sunfish	*Lepomis marginatus*	56
Redear sunfish	*Lepomis microlophus*	56
Spotted sunfish	*Lepomis punctatus*	56
Bluefin killifish	*Lucania goodei*	*56*
Rainwater killifish	*Lucania parva*	56
Gray snapper	*Lutjanus griseus*	56
Lane snapper	*Lutjanus synagris*	56
Rough silverside	*Membras martinica*	56
Inland silverside	*Menidia beryllina*	53, 56
Tidewater silverside	*Menidia peninsulae*	56
Southern kingcroaker	*Menticirrhus americanus*	56
Northern kingcroaker	*Menticirrhus saxatalis*	56
Green goby	*Microgobius thalassinus*	56
Fringed filefish	*Monacanthus ciliatus*	56
Planehead filefish	*Monacanthus hispidus*	56
Striped mullet	*Mugil cephalus*	56
White mullet	*Mugil curema*	56
Gag	*Myctoperca microlepis*	56
Speckled worm eel	*Myrophis punctatus*	56
Golden shiner	*Notemigonus crysoleucas*	56
Coastal shiner	*Notropis petersoni*	56
Polka-dot batfish	*Ogcocephalus radiatus*	56
Leatherjacket	*Oligoplites saurus*	56
Shrimp eel	*Ophichthus gomesi*	56
Crested cusk-eel	*Ophidion welshi*	56
Atlantic thread herring	*Opisthonema oglinum*	56
Gulf toadfish	*Opsanus beta*	56
Pigfish	*Orthopristis chrysoptera*	56
Seaweed blenny	*Parablennius marmoreus*	56
Gulf flounder	*Paralichthys albigutta*	56
Harvestfish	*Peprilus alepidotus*	56
Poecilia hybrid *	*Poecilia* sp.	

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Black drum	*Pogonias cromis*	56
Bluefish	*Pomatomus saltatrix*	56
Leopard searobin	*Prionotus scitulus*	56
Bighead searobin	*Prionotus tribulus*	56
Cownose ray	*Rhinoptera bonasus*	56
Round sardinella	*Sardinella aurita*	56
Red drum	*Sciaenops ocellatus*	56
Spanish mackerel	*Scomberomorus maculatus*	56
Barbfish	*Scorpaena brasiliensis*	56
Lookdown	*Selene vomer*	56
Southern puffer	*Sphoeroides nephelus*	56
Bandtail puffer	*Sphoeroides spengleri*	56
Northern sennet	*Sphyraena borealis*	56
Bonnethead shark	*Sphyrna tiburo*	56
Checkered blenny	*Starksia ocellata*	56
Atlantic needlefish	*Strongylura marina*	56
Redfin needlefish	*Strongylura notata*	56
Blackcheek tonguefish	*Symphurus plagiusa*	56
Dusky pipefish	*Syngnathus floridae*	56
Chain pipefish	*Syngnathus louisianae*	56
Sargassum pipefish	*Syngnathus pelagicus*	56
Gulf pipefish	*Syngnathus scovelli*	56
Inshore lizardfish	*Synodus foetens*	56
Florida pompano	*Trachinotus carolinus*	56
Permit	*Trachinotus falcatus*	56
Hogchoker	*Trinectes maculatus*	53, 56
Houndfish	*Tylosorus crocodilus*	56
	AMPHIBIANS	
Salamanders		
Two-toed amphiuma	*Amphiuma means*	25
Lesser siren	*Siren intermedia*	25
Frogs & Toads		
Southern toad	*Bufo t. terrestris*	35
Green treefrog	*Hyla cinerea*	35
Cope's gray treefrog	*Hyla chrysoscelis*	35
Southern chorus frog	*Pseudacris nigrita*	8
Bullfrog	*Rana catesbeiana*	25
Southern leopard frog	*Rana sphenocephala*	25
	REPTILES	
Crocodilians		
American alligator	*Alligator mississippiensis*	53
Turtles		
Loggerhead sea turtle	*Caretta caretta*	56
Green turtle	*Chelonia mydas*	56
Gopher tortoise	*Gopherus polyphemus*	8
Striped mud turtle	*Kinosternon bauri*	35
Eastern mud turtle	*Kinosternon s. subrubrum*	35
Kemp's ridley turtle	*Lepidochelys kempii*	56

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Diamondback terrapin	*Malaclemys terrapin*	63
Florida box turtle	*Terrapene carolina bauri*	35
Lizards		
Green anole	*Anolis carolinensis*	35
Ground skink	*Scincella laterale*	35
Snakes		
Eastern cottonmouth	*Agkistrodon piscivorus*	35
Southern black racer	*Coluber constrictor priapus*	35
Eastern diamondback rattlesnake	*Crotalus adamanteus*	8
Eastern indigo snake	*Drymarchon corais couperi*	35
Gulf Hammock rat snake	*Elaphe obsoleta williamsi*	35
Eastern kingsnake	*Lampropeltis getula*	35
Gulf salt marsh snake	*Nerodia clarkii clarkii*	63
Banded water snake	*Nerodia fasciata*	53
Dusky pygmy rattlesnake	*Sistrurus miliarius barbouri*	35
Blue-striped ribbon snake	*Thamnophis sauritus nitae*	35
Blue-striped garter snake	*Thamnophis sirtalis similis*	35

BIRDS

Loons		
Common Loon	*Gavia immer*	63
Grebes		
Horned Grebe	*Podiceps auritus*	63
Pied-billed Grebe	*Podilymbus podiceps*	63
Pelicans		
American White Pelican	*Pelecanus erythrorhynchos*	63
Brown Pelican	*Pelecanus occidentalis*	63
Cormorants		
Double-crested Cormorant	*Phalacrocorax auritus*	63
Darters		
Anhinga	*Anhinga anhinga*	63
Herons & Bitterns		
Great Blue Heron	*Ardea herodias*	63
American Bittern	*Botaurus lentiginosus*	63
Cattle Egret	*Bubulcus ibis*	63
Green-backed Heron	*Butorides striatus*	63
Great Egret	*Casmerodius albus*	63
Little Blue Heron	*Egretta caerulea*	63
Snowy Egret	*Egretta thula*	63
Tri-colored Heron	*Egretta tricolor*	63
Black-crowned Night Heron	*Nycticorax nyctocorax*	63
Yellow-crowned Night Heron	*Nycticorax violaceus*	63
Storks		
Wood Stork	*Mycteria americana*	63
Ibis & Spoonbills		
White Ibis	*Eudocimus albus*	63
Ducks & Geese		
Wood Duck	*Aix sponsa*	63
American Wigeon	*Anas americana*	63
Northern Shoveler	*Anas clypeata*	63

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Green-winged Teal	*Anas crecca*	63
Blue-winged Teal	*Anas discors*	63
Mallard	*Anas platyrhynchos*	63
Lesser Scaup	*Aythya arrinis*	63
Canvasback	*Aythya valisineria*	63
Bufflehead	*Bucephala albeola*	63
Hooded Merganser	*Lophodytes cucullatus*	63
Red-breasted Merganser	*Mergus serrator*	63
Vultures		
Turkey Vulture	*Cathartes aura*	35
Black Vulture	*Coragyps atratus*	35
Hawks, Eagles & Kites		
Cooper's Hawk	*Accipiter cooperii*	35
Sharp-shinned Hawk	*Accipiter striatus*	35
Red-tailed Hawk	*Buteo jamaicensis*	35
Red-shouldered Hawk	*Buteo lineatus*	35
Northern Harrier	*Circus cyaneus*	63
American Swallow-tailed Kite	*Elanoides forficatus*	35
Bald Eagle	*Haliaeetus leucocephalus*	63
Ospreys		
Osprey	*Pandion haliaetus*	63
Falcons		
American Kestrel	*Falco sparverius*	63
Quails, Turkeys & Pheasants		
Wild Turkey	*Meleagris gallopavo*	35
Rails, Gallinules & Coots		
American Coot	*Fulica americana*	63
Common Moorhen	*Gallinula chloropus*	63
Clapper Rail	*Rallus longirostris*	63
Plovers & Lapwings		
Semi-palmated Plover	*Charadrius semipalmatus*	63
Black-bellied Plover	*Pluvialis squatarola*	63
Oystercatchers		
American Oystercatcher	*Haematopus palliatus*	63
Snipes & Sandpipers		
Dunlin	*Calidris alpina*	63
Western Sandpiper	*Calidris mauri*	63
Least Sandpiper	*Calidris minutilla*	63
Semi-palmated Sandpiper	*Calidris pusilla*	63
Willet	*Catoptrophorus semipalmatus*	63
Common Snipe	*Gallinago gallinago*	63
Short-billed Dowitcher	*Limnodromus griseus*	63
Whimbrel	*Numenius phaeopus*	63
Lesser Yellowlegs	*Tringa flavipes*	63
Greater Yellowlegs	*Tringa melanotos*	63
Spotted Sandpiper	*Tringa solitaria*	63
Gulls & Terns		
Laughing Gull	*Larus atricilla*	63
Herring Gull	*Larus argentatus*	63
Ring-billed Gull	*Larus delawarensis*	63

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Bonaparte's Gull	*Larus philadelphia*	63
Forster's Tern	*Sterna forsteri*	63
Royal Tern	*Sterna maxima*	63
Black Skimmer	*Rynchops niger*	63
Doves & Pigeons		
Mourning Dove	*Zenaida macroura*	35
Cuckoos		
Yellow-billed Cuckoo	*Coccyzus americanus*	35
Owls		
Screech Owl	*Otus asio*	35
Barred Owl	*Styrix varia*	35
Common Barn Owl	*Tyto alba*	35
Nightjars		
Chuck-will's-widow	*Caprimulgus vociferus*	35
Hummingbirds		
Ruby-throated Hummingbird	*Archilochus colubris*	Throughout
Kingfishers		
Belted Kingfisher	*Ceryle alcyon*	63
Woodpeckers		
Northern Flicker	*Colaptes auratus*	35
Pileated Woodpecker	*Dryocopus pileatus*	35
Red-bellied Woodpecker	*Melanerpes carolinus*	35
Downy Woodpecker	*Picoides pubescens*	35
Yellow-bellied Sapsucker	*Sphyrapicus varius*	35
Flycatchers		
Eastern Phoebe	*Sayornis phoebe*	35
Swallows		
Barn Swallow	*Hirando rustica*	63
Tree Swallow	*Tachycineta bicolor*	63
Jays & Crows		
Scrub Jay	*Aphelocoma coerulescens*	8
American Crow	*Corvus brachyrhynchos*	35
Fish Crow	*Corvus ossifragus*	35
Blue Jay	*Cuanocitta cristata*	35
Titmice		
Tufted Titmouse	*Parus bicolor*	35
Wrens		
Marian's Marsh Wren	*Cistothorus palustris marianae*	63
Carolina Wren	*Thuyothorus ludovicianus*	35
Thrashers		
Gray Catbird	*Dumetella carolinensis*	35
Mockingbird	*Mimus polyglottos*	35
Brown Thrasher	*Toxostoma rufum*	35
Thrushes, Kinglets & Veery		
Blue-gray Gnatcatcher	*Polioptila caerulea*	35
Ruby-crowned Kinglet	*Regulus calindula*	35
American Robin	*Turdus migratorius*	35
Shrikes		
Loggerhead Shrike	*Lanius ludovivianus*	8
Vireos		

*** Non-native Species**

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
White-eyed Vireo	*Vireo griseus*	35
Red-eyed Vireo	*Vireo olivaceus*	35
Solitary Vireo	*Vireo solitarius*	35
Warblers, Blackbirds and Thrushes		
Red-winged Blackbird	*Agelaius phoeniceus*	35
Yellow-rumped Warbler	*Dendroica cotonata*	35
Yellow-throated Warbler	*Dendroica dominica*	35
Magnolia Warbler	*Dendroica magnolia*	35
Palm Warbler	*Dendroica palmarum*	35
Yellow Warbler	*Dendroica petechia*	35
Pine Warbler	*Dendroica pinus*	8
Common Yellow-throat	*Geothlypis trichas*	63
Brown-headed Cowbird *	*Molothrus ater*	MTC
Black-and-white Warbler	*Mniotilta varia*	35
Northern Parula	*Parula americana*	35
Common Grackle	*Quiscalus quiscula*	63
Northern Waterthrush	*Seiurus noveboracensis*	63
Grosbeaks, Sparrows & Buntings		
Scott's Seaside Sparrow	*Ammodramus maritimus peninsulae*	63
Cardinal	*Cardinalis cardinalis*	35
	MAMMALS	
Insectivores		
Least shrew	*Cryptotis parva*	35
Eastern mole	*Scalopus aquaticus*	35
Bats		
Southeastern bat	*Myotis austroriparius*	MTC
Seminole bat	*Lasiurus seminolus*	35
Eastern big-eared bat	*Plecotus rafinesquei*	35
Marsupials		
Virginia opossum	*Didelphis virginana*	35
Edentates		
Armadillo *	*Dasypus novemcinctus*	35
Lagomorphs		
Eastern cottontail	*Sylvilaqus floridanus*	8
Marsh rabbit	*Sylvilaqus palustris*	63
Rodents		
Southern flying squirrel	*Glaucomys volans*	35
Eastern woodrat	*Neotoma floridana*	35
Golden mouse	*Ochrotomys nuttalli*	35
Rice rat	*Oryzomys palustris*	35
Cotton mouse	*Permyscus gossypinus*	8
Gray squirrel	*Sciurus carolinensis*	35
Cotton rat	*Sigmodon hispidus*	8
Mustelids		
Striped skunk	*Mephitis mephitis*	35
Southeastern weasel	*Mustela frenata olivacea*	35

*** Non-native Species**

Waccasassa Bay Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Gulf salt marsh mink	*Mustela vison halilimnetes*	63
Carnivores		
River otter	*Lutra canadensis*	53
Bobcat	*Lynx rufus*	35
Raccoon	*Procyon lotor*	35
Florida panther	*Puma concolor coryi*	35
Gray fox	*Urocyon cinereoargenteus*	35
Black bear	*Ursus americanus*	35
Artiodactyls		
White-tailed deer	*Odocoileus virginianus*	35
Feral pig *	*Sus scrofa*	35
Sirens		
Manatee	*Trichechus manatus*	56

*** Non-native Species**

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

Lacustrine

46 Flatwood/Prairie Lake
47 Marsh Lake
48 River Floodplain Lake
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 Terrestral Cave

Miscellaneous

81 Ruderal
82 Developed

MTC Many Types Of Communities

OF Overflying

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)

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

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.

Waccasassa Bay Preserve State Park

Designated Species

Plants

Common Name/ ***Scientific Name***	**Designated Species Status** FDA	USFWS	FNAI
Chapman's sedge			
Carex chapmanni	LE		G3, S3
Greenfly orchid			
Epidendrum canopseum	CE		
Wood spurge			
Euphorbia commutata	LE		G5, S2
Crested coralroot			
Hexalectris spicata	LE		
Corkwood			
Leitneria floridana	LT		G3, S3
Cardinal flower			
Lobelia cardinalis	LT		
Anglepod			
Matelea gonocarpos	LT		
Florida mayten			
Maytenus phyllanthoides	LT		
Erect prickly-pear			
Opuntia stricta	LT		
Cinnamon fern			
Osmunda cinnamomea	CE		
Pinewood dainties			
Phyllanthus leibmannianus ssp. *platylepis*	LE	MC	G4T2, S2
Needle palm			
Rhapidophyllum hystrix	CE		
Pinnate-lobed coneflower			
Rudbeckia trilobata var. *pinnatiloba*	LE	MC	G5T3, S2
Florida pinkroot			
Spigelia loganioides	LE		G2, S2
Coontie			
Zamia pumila	CE		
Redmargin lily			
Zephyranthes simpsonii	LT		G2G3, S2S3

Waccasassa Bay Preserve State Park

Designated Species

Animals

Common Name/ *Scientific Name*	**Designated Species Status** FFWCC	USFWS	FNAI
FISH			
Suwannee bass *Micropterus notius*	LS		G3, S3
REPTILES			
American alligator *Alligator mississippiensis*	LS	T(S/A)	G5, S4
Loggerhead *Caretta caretta*	LT	LT	G3, S3
Green turtle *Chelonia mydas*	LE	LE	G3,S2
Eastern diamondback rattlesnake *Crotalus adamanteus*			G4, S3
Eastern indigo snake *Drymarchon corais cooperi*	LT	LT	G4T3, S3
Gopher tortoise *Gopherus polyphemus*	LS		G3, S3
Kemp's ridley *Lepidochelys kempii*	LE	LE	G1, S1
Gulf salt marsh snake *Nerodia clarkii clarkii*			G4T3, S3?
BIRDS			
Cooper's Hawk *Accipiter cooperii*			G5, S3
Scott's Seaside Sparrow *Ammodramus maritimus peninsulae*	LS		G4T3, S3
Florida Scrub Jay *Aphelocoma coerulescens*	LT	LT	G2, S2
Great Egret *Ardea alba*			G5, S4
Marian's Marsh Wren *Cistothorus palustris marianae*	LS		G5T3, S3
Little Blue Heron *Egretta caerulea*	LS		G5, S4
Snowy Egret *Egretta thula*	LS		G5, S3
Tricolored Heron *Egretta tricolor*	LS		G5, S4
Swallow-tailed Kite *Elanoides forficatus*			G5, S2
White Ibis *Eudocimus albus*	LS		G5, S4
American Oystercatcher *Haematopus palliatus*	LS		G5, S2
Bald Eagle *Haliaeetus leucocephalus*	LT	LT	G4, S3
Wood Stork			

Waccasassa Bay Preserve State Park

Designated Species

Animals

Common Name/ ***Scientific Name***	**Designated Species Status**		
	FFWCC	**USFWS**	**FNAI**
Mycteria americana	LE	LE	G4, S2
Osprey			
Pandion haliaetus			G5, S3S4
Brown Pelican			
Pelecanus occidentalis	LS		G4, S3
Black Skimmer			
Rynchops niger	LS		G5, S3
Royal Tern			
Sterna maxima			G5,S3
MAMMALS			
Southeastern weasel			
Mustela frenata olivacea			G5T4, S3?
Gulf salt marsh mink			
Mustela vison halilimnetes			G5T3, S3
Southeastern bat			
Myotis austroriparius			G4, S3
Florida panther			
Puma concolor coryi	LE	LE	G5T1, S1
Manatee			
Trichechus manatus	LE	LE	G2, S2
Florida black bear			
Ursus americanus floridanus	LT		G5T2, S2

Addendum 6—Florida Master Site File List Of Cultural Sites

FMSF #	Site Name	Site Type	Culture Period	Site Condition
LV00034	Lone Cedar Island	Shell Midden	Deptford/Weeden Island	Eroded
LV00047	North Bank, Mouth of Waccasassa River	Midden?	Unknown	Unknown
LV00048	Mouth of Rocky Creek	Shell Midden	Unknown	Destroyed
LV00049	Rocky Creek I	Shell Midden	Unknown	Destroyed
LV00050	Rocky Creek II	Shell Midden	Unknown	Destroyed
LV00052	Waccasassa 1	Unknown	Unknown	Unknown
LV00082	Old Hudson Place	Shell Midden	Unknown	Damaged
LV00083	Old Watson Place	Shell Midden	Woodland	Damaged
LV00133	Salt Works at Salt Island	Salt works	Mid-1800's	Damaged
LV00298	Rocky Run Island	Shell Midden	Woodland	Fair
LV00299	Rocky Run II	Shell Midden	Woodland	Fair
LV00300	Primitive Camp II	Shell Midden	Deptford/Weeden Island	Eroding
LV00301	Primitive Camp	Shell Midden	Weeden Island	Eroding
LV00302	Mud Creek	Shell Midden	Woodland	Eroding
LV00303	Cow Creek	Shell Midden	Unknown	Eroding
LV00304	WAC Site	Shell Midden	Weeden Island	Eroding
LV00305	Tange Shell Midden	Shell Midden	Weeden Island	Good
LV00306	McCord Site	Shell Midden	Woodland	Good
LV00307	Leaning Oak Site	Shell Midden	Weeden Island/Safety Harbor	Fair
LV00308	Gator Mound	Burial Mound	Weeden Island	Good/Looted
LV00309	Shell Scatter	Shell Midden	Woodland	Good
LV00310	Cowpen Site	Shell Midden	Woodland	Fair
LV00311	Kelly Creek I	Camp	Unknown	Poor
LV00312	Kelly Creek II	Camp	Weeden Island	Poor
LV00313	Kelly Creek III	Camp	Unknown	Poor
LV00314	Kelly Creek IV	Shell Midden	Unknown	Poor
LV00315	Kelly Creek V	Shell Midden	Unknown	Poor
LV00316	Kelly Creek VI	Shell Midden	Woodland	Poor
LV00317	Transect 5	Camp	Woodland	Fair
LV00318	Leaning Oak II	Camp	Woodland	Fair
LV00319	Square Well	Shell Midden	Woodland	Fair
LV00320	Square Well Road II	Shell Midden	Woodland	Good
LV00322	Barn at Loop Road	Structure	Unknown	Fair
LV00323	Hearth Kelly Creek	Hearth	Unknown	Poor
LV00324	Rocky Run Still	Still	Early 1900's	Poor
LV00325	The Cowpens	Cow Pens	Early 1900's	Fair
LV00435	Gnat Island	Shell Midden	Woodland	Eroding
LV00436	Sandfly Point A	Shell Midden	St. Johns/Weeden Island	Eroding

FMSF #	Site Name	Site Type	Culture Period	Site Condition
LV00034	Lone Cedar Island	Shell Midden	Deptford/Weeden Island	Eroded
LV00437	Little Gnat Island	Shell Midden	Woodland	Eroding
LV00438	Demory Stub	Shell Midden	Woodland	Eroding
LV00439	Thousand Point A	Lithic Scatter	Aboriginal Unspecified	N/A
LV00440	Thousand Point B	Shell Midden	Woodland	Good
LV00441	Thousand Point C	Shell Midden	Woodland	Good
LV00442	Clothesline Island	Shell Midden	Woodland	Good/Fair
LV00443	Bee Island	Shell Midden/Building Remains	Woodland/American Post-1821	Eroding
LV00444	Sandfly Point C	Shell Midden	Woodland	Eroding
LV00445	Sherd Island	Shell Midden	Woodland	Eroding
LV00446	Gnat Island II	Shell Midden	Woodland	Eroding
LV00447	Snake Eyes Point	Shell Midden	Woodland	Eroding
LV00448	Fawn Island	Shell Midden	Woodland	Eroding
LV00449	Dragonfly Isle	Shell Midden	Norwood/Woodland	Eroding
LV00450	Demory Tip	Shell Midden	Woodland	Eroding
LV00451	Pitiful Island	Shell Midden	Woodland	Eroding
LV00452	Plentiful Island	Shell Midden	Weeden Island	Eroding
LV00454	Lowes Bay 1	Shell Midden	Woodland	Eroding
LV00455	Lowes Bay 2	Shell Midden	Weeden Island	Eroding
LV00456	Lowes Bay 4	Shell Midden	Woodland	Eroded
LV00457	Sandfly Point B	Shell Midden	Woodland	Eroding
LV00458	Confusion Point	Shell Midden	Deptford/Seminole	Eroding
LV00459	Four Cedar Island	Shell Midden	Archaic/Woodland	Eroding
LV00460	Hospitality Island	Shell Midden	Woodland	Eroding
LV00461	Blue Ball Island	Shell Midden	Woodland	Eroding
LV00462	Sandfly Island	Shell Midden	Weeden Island	Eroding
LV00463	Shotgun Island	Shell Midden	Woodland	Eroding
LV00466	House Site	Shell Midden	Woodland	Eroding
LV00467	Opus P	Village/Habitation	Archaic/Weeden Island	Good
LV00468	Crackerville	Village/Habitation	Weeden Island	Disturbed
LV00469	Spring Run Mound	Burial Mound	Early Weeden Island	Good, Minor Looting
LV00470	Thousand Mile Creek	Shell Midden	Woodland	Eroded
LV00471	Old Fiber Factory	Historic	19th-20th Century	Eroded
LV00472	South Point	Shell Midden	Archaic	Eroded, Inundated
LV00473	South Beach	Shell Midden	Unknown	Eroded, Inundated
LV00474	Trout Creek	Shell Midden	Unknown	Eroded
LV00475	Sheephead Creek	Shell Midden	Woodland/Historic	Eroded
LV00476	Thousand Island	Lithic Scatter	Unknown	Good
LV00477	Jones Island	Shell Midden	Woodland	Eroded
LV00529	Spring Run Hammock	Probable Historic Homestead/Square Well	Late 19th-Early 20th Century	Good

FMSF #	Site Name	Site Type	Culture Period	Site Condition
LV00034	Lone Cedar Island	Shell Midden	Deptford/Weeden Island	Eroded
LV00532	Turtle Creek North	Artifact Scatter	Probable Weeden Island	Unknown
LV00540	Potlid Pinellas	Midden	Weeden Island	Unknown
LV00542	Turtle Creek Well	Historic Square Well	Late 19th-Early 20th Century	Good

Table taken from:

Vojnovski, P. K., Newman, C., Swann, B. and J. Lammers. 2000 Archaeological Investigations within the Waccasassa Bay State Preserve, Levy County, Florida. C.A.R.L. Archaeological Survey, Florida Bureau of Archaeological Research.31 pp. +appendix.

Addendum 7—Timber Management Analysis

The timber assessment required by Chapters 253 and 259, Florida Statutes, was conducted by Allison Mead**.**

Statement of management goals

The management goal of Waccasassa Bay Preserve State Park in the following stands is to enhance the mesic flatwoods communities, to restore the park-like stands of longleaf and slash pines with a relatively open understory containing scattered woody plant species and saw palmetto, and to promote a groundcover dominated by native grasses and forbs. Protection of cultural resources and other natural communities within the park remains a priority. All stands to be harvested will be subjected to a compliance review with the Department of State, Division of Historical Resources to minimize impacts to known or unknown cultural resources.

In these stands longleaf and slash pine growth and regeneration will be favored. Timber harvesting will selectively remove offsite loblolly pines and offsite hardwoods to progress towards the long-term goal of restoring a longleaf and slash pine mesic flatwoods community with old growth characteristics.

Stands 1 and 2

Stand description. Stands 1 and 2 are loblolly pine plantations that are approximately 12 acres and 6 acres in size respectively. These stands consist of planted loblolly pines interspersed with an occasional longleaf or slash pine. Loblolly pines were planted at 519 trees per acre. The only apparent silvicultural treatment to these stands was a third row thinning. Most trees are sawtimber sized, with some chip-n-saw and pulpwood sized trees. Native groundcovers, woody shrubs, and saw palmetto remain on site.

Table 1. Stand 1 and 2 Information

Site	Dominant Pine Species	# Acres	Average Height	Average DBH	Est. Value per Acre	Est. Total Value
Stand 1	Loblolly	12	65 ft.	9 inches	$3,029	$36,343
Stand 2	Loblolly	6	65 or 55 ft.	8 inches	$1,993	$11,960
					TOTAL	$48,303

Stand history. These stands once belonged to Georgia-Pacific (AKA The Timber Company), and it is not know how long they have been in forest production. These stands seem to have minimal ground disturbance, and seem to have never been bedded or windrowed.

Cultural resources in or near the stand. The only known cultural resource in the vicinity of stands 1 and 2 is the former rail bed associated with the the Florida Railroad which once ran from Cedar Key to Fernandina on the Atlantic Coast under the control of David Levy Yulee. The railroad began operations in March of 1861; rail service to Cedar Key continued until around 1932. The abandoned rail bed lies southeast of SR 24.

Wetlands in or near the stand. These stands contain seasonal wetlands and logging should take place in the dry season.

Access to the stand. Access to the stands is via existing park service roads.

Management recommendations. It is recommended that all of the loblolly pines be removed in a complete harvest. This operation should leave any longleaf or slash pines that would normally be found on this site. These stands should be burned one year after thinning and then hand planted with longleaf pine tublings.

Prepared by: Allison Mead

Addendum 8—Priority Schedule And Cost Estimates

Waccasassa Bay Preserve 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.

Natural Resources

1. Develop restoration plans and initiate restoration of areas affected by southern pine beetle control measures. 0-5 years. **Estimated Cost: $10,000.**
2. Restore the natural hydrology and water quality of areas damaged by artificial soil disturbance. 0-10 years. **Estimated Cost: $35,000.**
3. Increase prescribed burning in mesic flatwoods . 0-10 years. **Estimated Cost: $30,000.**
4. Control exotic plant species within the preserve. Conduct follow-up treatments of exotics subsequent to their initial treatment via contract. Continue to monitor the preserve for new infestations of exotic plants. Map and treat infestations as needed. 0-10 years. **Estimated Cost: $40,000.**
5. Improve the management of natural and cultural resources in the parks by pursuing an additional position, either park biologist or park service specialist with resource management specialization. Position should be shared with Cedar Key Scrub State Reserve to assist with resource management activities in that unit as well. 2-10 years**.** **Estimated Cost: $320,000.**
6. Add a position to assist with daily maintenance and management tasks, including fenceline patrol, and the management and creation of new public facilities and trail systems at Waccasassa Bay Preserve State Park. Position should be shared with Cedar Key Scrub State Reserve to assist with management and operations in that unit as well. 2-10 years. **Estimated Cost: $240,000.**
7. Continue to monitor designated species within the park. Includes continued mapping of rare plant species, and monitoring of other designated species. Implement protective measures as needed. 0-10 years. **Estimated Cost: $20,000.**
8. Enhance resource protection by securing boundaries of the parks. Includes survey of the park boundaries and fencing where needed. 0-10 years. **Estimated Cost: $250,000.**

Cultural Resources

1. Increase monitoring of cultural resources and document changes through routine visits and photopoints. 0-10 years. **Estimated Cost: $10,000.**
2. Record additional cultural sites and pursue funding for surveys of areas of the preserve not covered by previous surveys. 0-10 years. **Estimated Cost: $40,000.**

TOTAL ESTIMATED COST: $995,000.

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

Waccasassa Bay Preserve State Park
Priority Schedule And Cost Estimates

Development Area or Facilities		**Cost**
1.	Recreation Facilities	$38,500.00
2.	Support Facilities	22,500.00
	Total w/contingency	**$73,200.00**

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.

FNAI Descriptions

DHR Cultural Management Statement

2004 Land Management Review

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; 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.

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.

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 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 trogloxenic, troglophilic, and troglobitic organisms.

Aquatic Cave - cavernicolous area permanently or periodically submerged; often characterized by troglobitic 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. 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., coralgal, 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 spares, 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

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

LATIN NAMES OF PLANTS MENTIONED IN NATURAL COMMUNITY DESCRIPTIONS

anise - *Illicium floridanum*
bays:
  swamp bay -*Persea palustris*
  gordonia -*Gordonia lasianthus*
  sweetbay -*Magnolia virgiana*
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 elliottii*
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 tulipfera*
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*

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]
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 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, 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 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 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.).
(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. <u>ADMINISTERING AGENCY</u>

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
Suncom 205-6333
FAX (850) 245-6437

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

Land Management Review of Waccasassa Bay State Preserve

(Lease No. 2599), February 2, 2004

Prepared by Division of State Lands Staff

William Howell, OMC Manager
Joseph Duncan, Administrative Assistant

For

State Park Review Team

Final June 28, 2004

Land Manager:	DRP
Area:	32,492
County:	Levy
Mngt. Plan Revised:	05/06/1998
Mngt. Plan Update Due:	05/06 2008

Management Review Team Members

Agency Represented	Team member Appointed	Team member In attendance
DOF	Bill Korn	Butch Mallot
DEP	Don Jensen	Don Jensen
DRP	Anne Barkdoll	Dan Pierce
County	Kathy Winburn	
FWCC	Vic Doig	Vic Doig
Conservation Org.	Carolyn Kindell	Carolyn Kindell

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 findings are given to the managing agency under review, the Acquisition and Restoration Council, and to the Division of State Lands. Also, DEP shall report the annual review findings of its land management review teams to the Board no later than the second board meeting in October of each year.

Review Site

The management review of Waccasassa Bay Preserve State Park considered approximately 32,492 acres in Levy 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 DRP management plan was approved on May 06, 1998, and the management plan update is due on May 06, 2008.

Review Team Determination

1. Is the land being managed for the purpose for which it was acquired?

All team members agreed that Waccasassa Bay Preserve State Park is being managed for the purpose for which it was acquired.

2. Are actual management practices, including public access, in compliance with the management plan?

All team members agreed that actual management practices, including public access, were in compliance with the management plan for this site.

Commendations to the Managing Agency

The Team commends the manager for his partnership skills, including helping and getting help from other parks and managing agencies in the area, sharing equipment, and jointly conducting prescribed burns.

Exceptional Management Actions

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

1. Management and protection of the Basin Swamp, Hydric hammock, Blackwater Stream, Estuarine sea grass bed, estuarine tidal marsh, estuarine tidal swamp, estuarine mollusk reef, estuarine composite substrate and the estuarine consolidated substrate communities.
2. Protection and preservation of listed plants and animals.
3. Protection, survey and preservation of cultural sites.
4. Excellent roads and restoration of ditches.
5. Excellent monitoring of surface and groundwater quality and quantity.

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 DRP obtain, or make sure a legal easement is in existence, for the management access to the various parts of the preserve.

Manager's Response: Agree. The Division will work with DSL to determine the need for additional easements for management access.

2. The team recommends that DRP coordinate with the Division of State Lands and the

General Counsels Office to resolve the boundary issues with private property owners within and adjacent to the Preserve.

Manager's Response: Agree. The Division will continue working with DSL and the GCO to resolve boundary issues with private property owners.

Checklist findings

The following items received low scores on the review team checklist which indicates that management actions, in the field, were insufficient (f) or that the issue was not sufficiently addressed in the management plan (p). These items need to be further addressed in the management plan update.

1. Discussion in the management plan of problems associated with the accurate survey of the property boundary (f), and gates/fencing (f).

Manager's Response: Agree. The management plan update will address survey needs and fencing needs. Discrepancies in the original surveys in this area of the state make this a complex issue that is not easily solved. The remote nature of the preserve makes it difficult to maintain boundary fencing and access gates.

2. Discussion in the management plan of the need for additional law enforcement presence (f).

Manager's Response: Agree. The management plan update will address law enforcement needs. However, the Division does not control allocation of law enforcement, and must request additional assistance through the Division of Law Enforcement or from a local law enforcement agency.

3. Discussion in the management plan of the problems associated with expanding development (f) and hunt clubs (p),(f).

Manager's Response: Agree. The management plan update will address development issues and other adjacent land uses that could seriously impact resources of the park. Although we have no control over adjacent land uses, staff will make every reasonable effort to ensure that park resources are protected. Staff will recommend actions be taken by the appropriate regulatory agencies to ensure that there will not be any material impacts on park resources as a result of adjacent land uses or zoning.

4. Discussion in the management plan of the need for additional interpretive facilities/signs (f).

Manager's Response: Agree. The management plan update will address the need for additional interpretive facilities and signs in the Conceptual Land Use Plan. Interpretive facilities will be developed as land-based public access is developed.

5. Discussion in the management plan of the need for additional buildings (f), staff (f) and funding (f).

Manager's Response: Disagree on 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.

Agree on staff (assuming land management staff are the concern). 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.

Agree on funding (assuming land management issues are the concern). The updated unit management plan will address land management funding needs. However, Division funding is determined annually by the Florida Legislature and funds are allocated to the 150+ state parks according to priority needs. All state parks would benefit from additional funding.