MANATEE SPRINGS STATE PARK

UNIT MANAGEMENT PLAN

APPROVED

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

September 1, 2004

Department of Environmental Protection

Jeb Bush
Governor

Marjorie Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000

Colleen M. Castille
Secretary

September 1, 2004

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

Re: Manatee Springs State ParkLease # 3634

Ms. White:

On August 20, 2004, the Acquisition and Restoration Council recommended approval of the Manatee Springs State Park management plan.

On September 1, 2004 the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, approved the management plan for Manatee Springs State Park. Pursuant to Section 253.034, Florida Statutes, and Chapter 18-2, Florida Administrative Code this plan's ten-year update will be due on September 1, 2014.

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. Please forward copies of all permits to this office upon issuance.

Sincerely,

Paula L. Allen

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

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INTRODUCTION

Manatee Springs State Park is located in Levy County, approximately five miles west of the city of Chiefland (see Vicinity Map). It is part of Suwannee Basin GeoPark, which also includes Fanning Springs State Park and Nature Coast Trail State Park. Access to Manatee Springs State Park is from State Road 320. The vicinity map also reflects significant land and water resources existing near the park.

Currently the park contains approximately 2,443 acres. For this plan, park acreage was calculated on the composition of natural communities, in addition to ruderal and developed areas. The park includes the Mead-Scott tract leased from the Suwannee River Water Management District (SRWMD). Acquisition began in 1949 through a line-item appropriation ("Old Money") for this specific project, and Manatee Spring became the first spring managed by the Florida Park Service.

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

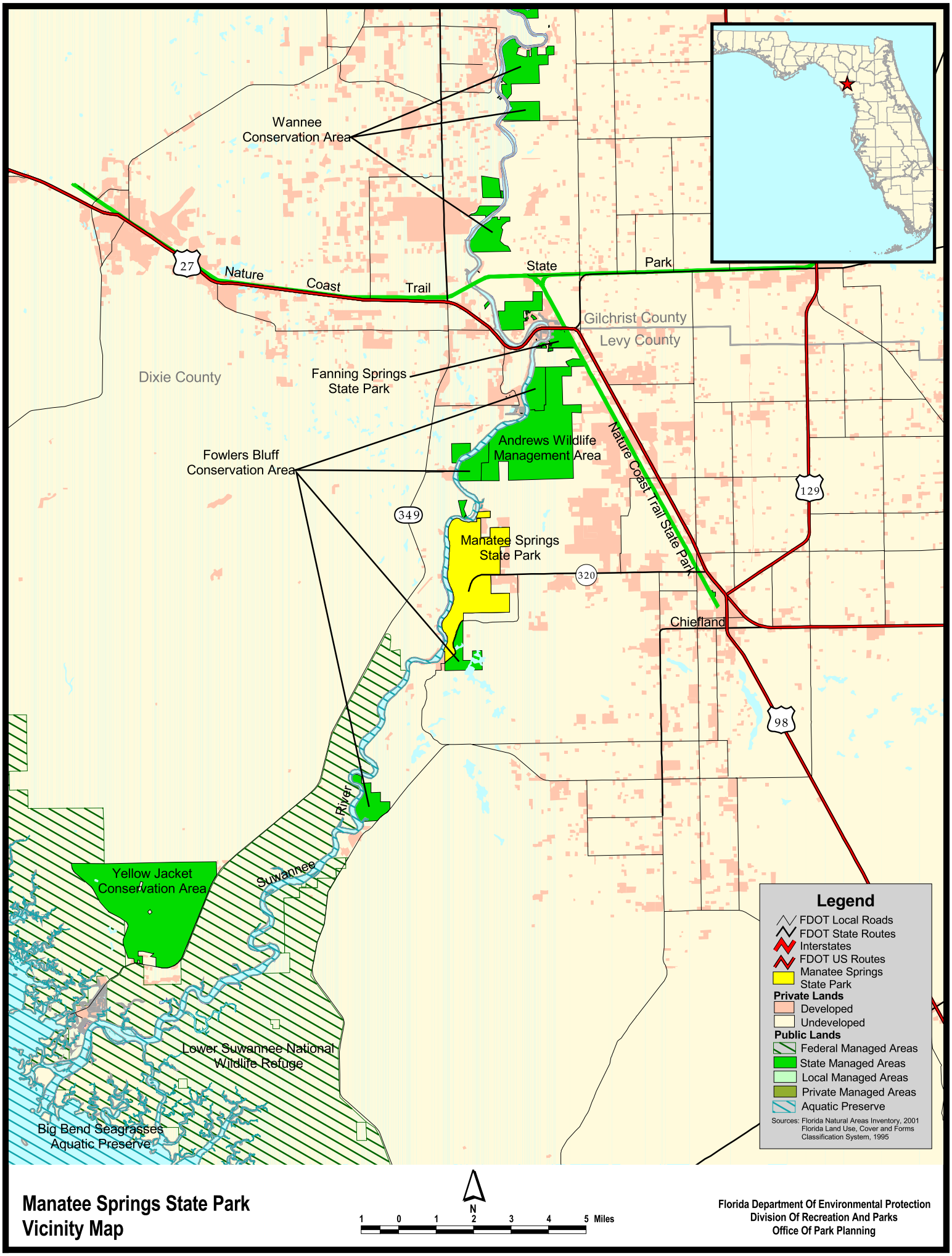
PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of Manatee Springs 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 February 23, 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 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 no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation.



Manatee Springs State Park
Vicinity Map

Florida Department Of Environmental Protection
Division Of Recreation And Parks
Office Of Park Planning

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.

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

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

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'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. Monitor outside development activities and provide comment as needed. Within the park, develop plans to retrofit or relocate existing park facilities that adversely impact the park's water resources.

- **A.** Request permitting agencies to notify Division staff of permit requests for activities that could adversely affect park resources. Communicate Division concerns for park resources to permitting agencies in a timely manner, and encourage statutory protection of the resources.
- **B.** Encourage the SRWMD to establish and implement minimum flows and levels for Manatee Springs and the lower Suwannee River.
- **C.** Support research that addresses the effectiveness of septic systems in karst environments. Determine whether septic systems in the park are affecting water quality in the caves or springs.
- **D.** Redesign and retrofit the Hickory Campground to attenuate and treat storm water runoff and erosion into the sinkholes that are hydraulically connected to the aquatic cave and headspring system. Also, redesign and relocate the campground septic system, to prevent water quality impacts in the cave and spring system. Alternatively, relocate the Hickory Campground and its restroom facilities, to a less sensitive area.
- **E.** Remove the closed boat ramp and unnecessary portions of the associated service road, and restore the impacted floodplain to the extent possible.
- **F.** Perform a bathymetric survey of the spring run, and determine the potential impacts of the sandbars.

2. Continue to monitor water quality and attempt to define the recharge area for the springs.

- **A.** Continue to monitor water quality in the park's wells and springs. Cooperate with the SRWMD to determine the extent of the recharge area for Manatee Springs and to identify direct connections between the Floridan aquifer and the ground surface in the recharge area.
- **B.** Work with scientists from other agencies to develop methods for correlating nitrate levels with changes in algal and plant communities. Continue to monitor plant cover and composition in the spring run.

3. Restore and protect spring-run stream and aquatic cave natural communities.

- **A.** Maintain the premise that total eradication of hydrilla is a principal objective in

restoration of the spring run. Continue to remove hydrilla manually. Employ other environmentally acceptable methods of eradication if necessary.

B. Conduct comprehensive baseline surveys of aquatic fauna, including fish, mollusks, snails and crustaceans.

C. Educate divers about adverse ecological impacts that may result from the intentional or unintentional defacing of cave walls, removal of artifacts or fossils, and molestation of cave biota. Develop rules for divers that would be more readily enforceable than existing rules and that would also govern divers' activities within the cave systems more effectively.

D. Research the adequacy of the existing carrying capacities for cave divers utilizing the main spring and Catfish Hotel, and revise the numbers as necessary. Design and implement a reservation system for divers that would ensure that carrying capacities are observed.

E. Continue to exclude motorboats from the spring and spring run year-round, and close the spring run to all motorized and non-motorized watercraft from December 1 through March 31. Install educational signs that acknowledge the importance of Manatee Springs as a refugium for the Gulf Coast manatee population.

4. Continue efforts to restore fire-dependent natural communities.

A. Continue prescribed burning of the sandhill, upland pine forest, scrubby flatwoods and depression marsh communities in the park under conditions conducive to achieving total restoration.

B. Remove non-fire adapted trees that have invaded the fire-type communities, utilizing methods such as mechanical and chemical treatment and prescribed burning. Replant longleaf pines in areas where they once dominated and where seed trees are currently sparse.

C. Continue to implement the restoration plan for the scrubby flatwoods within the Mead-Scott tract, which began with the removal of selected rows of slash pines, but still requires additional prescribed burning, removal of the windrows, replanting with longleaf pines, and the eventual removal of remaining off-site slash pines.

5. Continue to remove unnecessary roads, causeways, and borrow pits.

A. Restore borrow pits to the extent practicable by re-creating appropriate contours and replanting with native vegetation.

B. Identify and remove obsolete roads and firebreaks.

C. Remove, or redesign and retrofit, existing causeways through wetlands and river floodplains in order to restore a more natural sheet flow.

6. Identify and protect archaeological sites in the park.

A. Pursue funding for a phase I archaeological survey of the entire park and for a phase II survey of selected areas within the park, particularly those areas that are known archaeological sites and coincidentally experience high visitor use.

B. Investigate the feasibility of installing sand-filled Geoweb, or some other suitable structure or material, over the top of the probable archaeological site along the northern side of the spring run. The structure should be designed to protect the archaeological site from erosion and to prevent sediments from continually entering and degrading the spring run.

C. Regularly assess the condition of recorded and unrecorded cultural resources in the park. Use photo points to monitor the status of sites judged to be in poor condition.

D. Conduct ground disturbing activities in accordance with Department of State, Division of Historical Resources (DHR) policy.

E. Patrol cultural sites for vandalism and discourage the establishment of casual trails at the sites. Educate the public about the importance of preserving cultural sites, using

interpretive signs that include warnings against collecting artifacts in either terrestrial or aquatic environments.

F. Develop a written oral history for the park.

Recreational Goals

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

A. Pursue funding upgrades to assure that an appropriate level of cleanliness, corrective maintenance, visitor protection, resource management, and visitor service is attained in the park.

B. Assure that the park meets and complies with all applicable state and federal safety guidelines.

C. Continue to provide training to all staff to improve the level of visitor service programs.

8. 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. Pursue funding for upgrades to existing facilities to meet the Americans with Disabilities Act (ADA) standards for all buildings, campsites and other visitor use areas.

B. Pursue funding for upgrading existing facilities and for adding facilities consistent with the approved unit management plan.

Park Administration/Operations

9. Continue to support volunteer activities in the park and to develop partnerships.

A. Pursue development of a Citizen Support Organization to assist in fund-raising and to aid the park in meeting its goals and objectives.

B. Continue to recruit and train volunteers to supplement park staff and to assist the park in meeting its goals.

C. Pursue formation of a springs protection working group to encourage local public and private interests to develop regional strategies for protecting the water quality and flow of Manatee Springs.

D. Develop partnerships with local government and other organizations to promote common goals and share resources as appropriate.

10. Promote the park as a significant tourist destination both locally and nationally.

A. Continue to encourage tourism in the park through contacts with the media and writers' associations.

B. Continue to promote the park through association with local organizations.

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 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 December 11, 2003 and a DEP Advisory Group meeting was held on December 12, 2003. The purpose of these meetings was to present the plan to the public and to provide the advisory group members the opportunity to discuss the draft management plan.

Other Designations

Manatee Springs State Park was designated as a National Natural Landmark in 1971. Manatee Springs State Park is not within an Area of Critical State Concern as defined in section 380.05, Florida Statutes. Currently it is not under study for such designation. The park is a component of the Florida Greenways and Trails System. It is also designated as a site on the Great Florida Birding Trail by the FFWCC.

All waters within the unit have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302 Florida Administrative Code. Surface waters in this unit are also classified as Class III waters by DEP. 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.

Manatee Springs State Park was acquired primarily to protect a first magnitude artesian spring and its associated spring-run stream. The recreational attributes of the spring system, with its appealing natural setting, were already well known at the time of purchase. Recognition of the outstanding qualities of the other park resources quickly followed. William Bartram, who viewed the area in 1774, provided a written account of his observations, describing the spring in detail and noting the presence of the West Indian manatee. Today, Manatee Springs is an increasingly important manatee refuge, and its underwater cave system, one of the longest in North America, harbors several unusual invertebrate species.

Virtually every natural community in the park has been influenced to some degree by human activity, either directly or indirectly. To the extent possible, the Florida Park Service intends to restore these communities to their natural condition and to preserve them for future generations. Restoration will be accomplished using techniques such as prescribed burning, hardwood control, and exotic species removal. Preservation will be achieved through the wise management of human recreational activities.

Another of the park's noteworthy natural features is the Suwannee River, which forms the western boundary of the park. Recently designated an Outstanding Florida Water, the stream is renowned the world over for its idyllic scenery and its fascinating history.

The park also contains an abundance of significant cultural resources, including an extensive Weedon Island aboriginal site that was uncovered when the park was first developed. Other cultural features, both early and recent, include possible burial mounds, the remains of a moonshine still, and artifacts from the turpentine industry.

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

Manatee Springs State Park is located within the Gulf Coastal Lowlands, a physiographic division of the Northern Geomorphic Zone of Florida. Characteristic features of the Gulf Coastal Lowlands include Pleistocene epoch marine terraces of variable thickness, limestone exposures, and remarkable karst topography (Fernald and Purdum 1998).

Changes in elevation within Manatee Springs State Park are slight; slopes are generally gradual. Most of the topographic relief within the park is associated with the numerous features typical of karst terrain including springs, caves, lakes, and sinkholes (both flooded and dry). Elevations range from about 25 feet NGVD (National Geodetic Vertical Datum of 1929) on two knolls in the park to less than five feet NGVD in floodplain swamps along the Suwannee River.

Examples of alteration of the natural terrain exist throughout the park. Several former borrow sites are apparent along park roads and trails. Areas around the spring boil and along the upper part of the spring run have been developed to accommodate recreation. Over the years, several causeways were constructed across lowland areas to facilitate vehicular passage. One such causeway was located in the Mead-Scott tract, a southern extension of the park that is leased from the Suwannee River Water Management District (SRWMD). This causeway was removed in 1996 as part of a project to restore the natural floodway of the Suwannee River. The remaining causeways are necessary for public access or for park operations at this time. Some of these causeways may require additional culverts or low-water crossings to improve surface water conveyance.

Less obvious topographic disturbances in the park exist in the form of roads and firebreaks, fire plow scars, and spoil piles from past road maintenance. There are also dozens of relatively shallow ditches located in the floodplain swamp of the river. These ditches, oriented perpendicular to the river, extend linearly through a portion of the floodway and ultimately cut through the primary levee at the edge of the Suwannee River. The ditches may be by-products of the cypress logging that took place in Suwannee River swamps in the early twentieth century. In aerial photographs taken in 1940, the ditches are discernible as linear striations in the swampland. Apparently, felled trees were pulled to the river by oxen in the most direct line possible. Logs were then floated downstream for milling. Repeated use of the same pathways through the floodway would likely have scoured out linear ditches. Several of the ditches are deeper than can be explained satisfactorily by that interpretation, however. These ditches have low berms associated with them, perhaps indicating that they were deepened in an attempt to provide loggers with more permanent aquatic connections to the river channel.

Geology

Listed in descending order of age, regional underlying deposits include the Pamlico Terrace, Ocala Group, Avon Park Limestone, Lake City Limestone, Oldsmar Limestone, and Cedar Keys Limestone.

The Pamlico Terrace is the most diversified of the Pleistocene deposits that were laid down when sea levels fluctuated in response to successive glaciations. This deposit consists of irregular patches of sand or sandy clay alluvium, brackish-water clay or sand and marl; pasty, sandy, non-fossiliferous limestone presumed to be a bay deposit; and sandy, coquina marl and marly sand that is locally dolomitized. The thickness of the Pamlico Terrace varies with the degree of erosion to which it has been subjected.

Outcrops of the Ocala Group are visible about the main spring. Three limestone formations make up the group; from youngest to oldest, these are the Crystal River, Williston, and Inglis Formations.

The Crystal River Formation is typically white to cream in color and consists of a soft, massive, friable coquina set in a pasty calcite matrix. It may reach a thickness of 125 feet. The Williston Formation comprises two variations of a commonly silicified, fossiliferous marine limestone. One type is essentially a cream-colored coquina while the other is a cream to tan-colored, detrital limestone. This formation averages 30 feet in thickness. The Inglis Formation is a cream to tan, granular, rarely pasty, porous, very hard, massive, and shallow-water marine limestone having a plentiful fauna, in part a coquina. The base is dolomitized, the dolomite being tan to brown, highly porous but only slightly permeable. This formation averages 50 feet in thickness.

Below the Ocala Group lies the Avon Park Limestone, also of Eocene age. In Levy County, this limestone is variable in lithology. Three variations occur, all having a distinct fossiliferous fauna and a high content of lignitic and other carbonaceous plant residues. Any of them may be irregularly or completely dolomitized. One variation is a cream to brown, highly fossiliferous, fragmental to pasty, marine limestone that weathers to white and purple tints. Another is a cream to brown, very fossiliferous, pasty and fragmental, peat-flecked and seamed, marine limestone. The last is a tan to brown, thin-bedded and laminated, finely crystalline, marine dolomite, interbedded with layers of lignite and carbonaceous plant remains. The Avon Park Limestone can reach a thickness of at least 300 feet.

Below the Avon Park formation is Lake City Limestone. In Levy County, this deposit is varied in composition. In general, the formation consists of a tan to cream-colored, fragmental, often peat-flecked, granular and pasty limestone embedded with foraminifera, crystals of calcite and echinoid plates. Sometimes the limestone is a coquina. Gypsum may be present, so much so that fossils appear to be embedded in the mineral. Thin beds and seams of anhydrite and selenite may also be present. Dolomitization occurs in varying degrees. Finally, concentrated in the upper portions but found throughout, are pseudo-oolite beds; a brown to coffee-colored chert; an oftentimes silicaceous clay; and a brownish-gray, laminated, finely crystalline dolomite with carbonaceous and perhaps fossiliferous seams. This deposit measures from 575 to 900 feet in thickness.

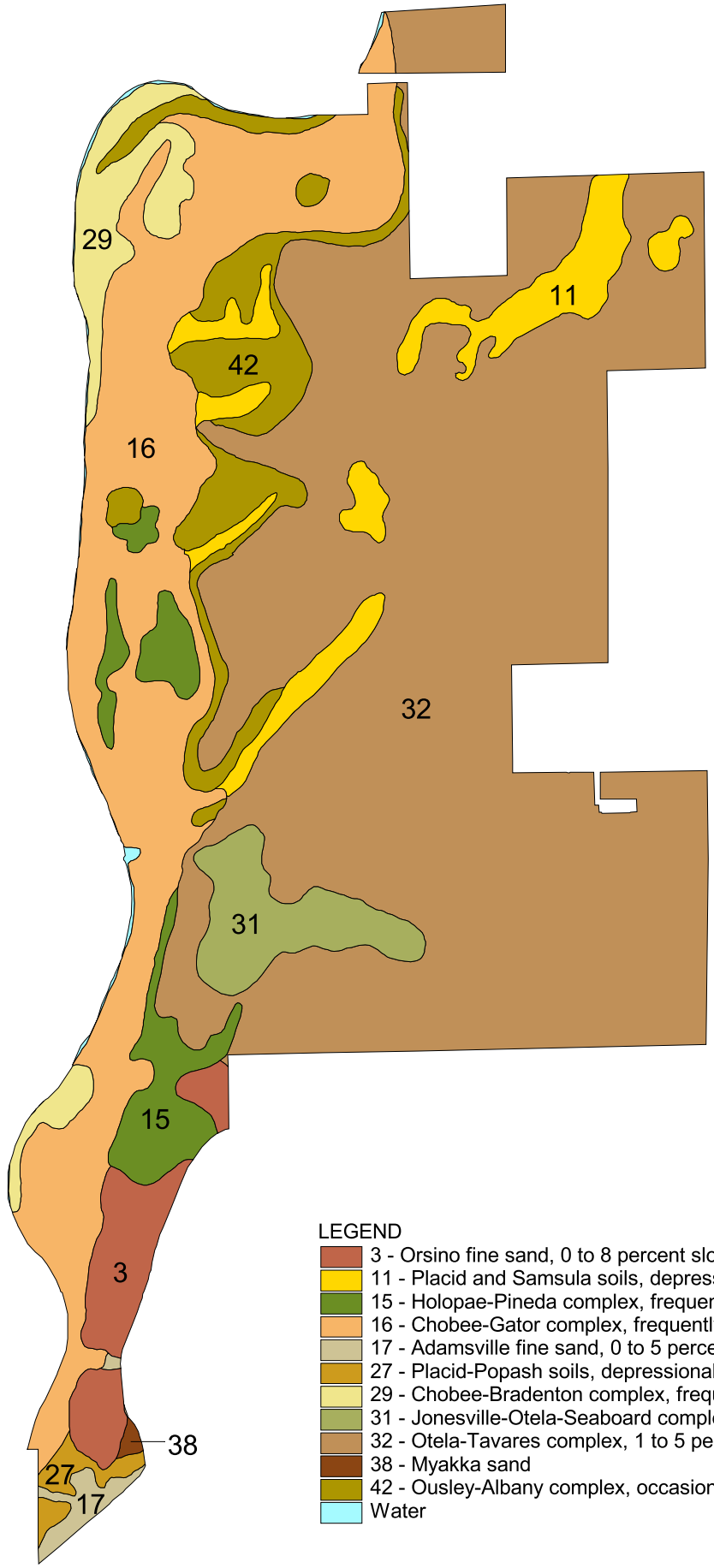
The deepest deposit of Eocene age is Oldsmar Limestone, a brown, porous, friable, granular limestone of calcite grains loosely embedded in a limestone paste and interbedded with brown, coarsely crystalline, sugary, porous dolomite having seams of white chert and anhydrite; coffee-colored chert; and finely crystalline, tan to brown dolomite. The base is commonly a brown, granular, porous, foraminiferous coquina in a soft limestone paste. This formation varies from just under 400 feet to slightly over 550 feet in thickness.

The Cedar Keys Limestone, of Paleocene age, in this area is composed of interbedded tan to gray, granular, fragmental, 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 about 600 feet thick.

No remarkable alterations of the park's geological formations are known to have occurred in recent history.

Soils

There are 11 soil types present within the boundaries of Manatee Springs State Park (Slabaugh et al. 1996). These soil types range from well-drained, sandy soils in the uplands to poorly drained, mucky soils near the river (see Soils Map). See Addendum 3 for complete



MANATEE SPRINGS
STATE PARK

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

SOILS MAP

descriptions of these soils.

Major soil disturbances in the park that are attributable to past management practices include at least three borrow pits that once supplied materials for road construction and other purposes. Two of these borrow sites have since been re-contoured and replanted with native species. The other, Clay Pit, was abandoned and apparently reworked at some earlier date. Native vegetation is now becoming reestablished on the site.

Another type of soil disturbance, probably the result of historical logging activities, was the creation of ditches that extended from the river floodplain through the natural levee to the river (previously described in the Topography section). Past agricultural activities such as crop farming, turpentine production, and cattle ranching undoubtedly also caused soil disturbances in some areas of the park.

Present day sources of soil disturbance include firebreak maintenance, feral hog rooting, timber harvesting, facilities construction, and intensive public use. Erosion along the north and south shores of the main spring continues to occur because of recreational activities such as swimming and diving. Efforts to mitigate this erosion have been made over the past few years, however. Foot traffic is no longer permitted within the most impacted area on the south shore of the main spring. Here the soil has been stabilized with jute mesh to allow recovery of vegetation and to decrease erosion. In addition, the erosion at the children's swimming area on the north shore has been significantly reduced through the installation of terraces. A limited amount of erosion continues to occur there however; so additional control measures are needed. The bulkhead installed around the main spring to control erosion is being undermined at the southern and westernmost set of stairs. Displacement of sandy sediments at access points for swimmers is a common problem in parks that feature swimming areas in springs. Management activities at Manatee Springs will follow generally accepted best management practices to prevent soil erosion and conserve soil and water resources of the park.

Minerals

Although there is no known history of mining activity within the bounds of the present-day park, limestone mines have operated in the general vicinity of the park in the past. The nearest such mine, currently inactive, is located within one mile of the northeast boundary of the park. Mining for another mineral, limonite, also once occurred near Manatee Springs. Limonite is an iron ore that was used during the Civil War by the Confederacy in the manufacture of cannon.

Hydrology

The most prominent hydrologic features of Manatee Springs State Park are the Suwannee River and the spring system. The Suwannee River is the second largest river in Florida with respect to flow (Fernald and Purdum 1998). Manatee Spring is a first magnitude spring, contributing a mean discharge of approximately 180 cubic feet per second (cfs) to the overall flow of the river. In addition to the river and main spring, several smaller surface-water bodies exist within the park. Most of these are actually sinkhole lakes or ponds. The exception is Shacklefoot Pond, which is classified as a swamp lake.

Manatee Springs State Park is located within the lower basin of the Suwannee River, which flows from the Okefenokee Swamp approximately 235 miles southwesterly to the Gulf of

Mexico. Together, the upper and lower Suwannee River basins drain nearly 10,000 square miles in Florida and Georgia. The annual mean discharge of the Suwannee River into the Gulf of Mexico is approximately 10,500 cfs for the period of record, 1931-1999 (Franklin et al. 2000). The Suwannee River is designated an Outstanding Florida Water (OFW).

In 2001, the Governor’s Springs Initiative focused the attention of government and the private

sector on the need to protect springs on a regional level. Before that time, monitoring of flow, water quality and biology at Manatee Springs was sporadic and inconsistent. Funding from the 2001 initiative, and from the subsequent 2002 Springs Initiative, has supported research and work to protect springs. Spring stage and velocity are monitored continuously to determine spring flow rates, and water quality is monitored monthly. In addition to water quality and quantity monitoring, projects funded to date by the Springs Initiatives also include: recharge basin delineation, baseline biological surveys of spring fauna, semi-annual stream condition index (SCI) monitoring of the spring runs, establishing best management practices for land use in springs recharge areas, and providing public forums for education and outreach to improve the understanding of springs management. Preservation of Florida's springs requires protection of spring flows and water quality. Protection of these relies on the scientific data collected in the monitoring programs and studies funded by current and future Springs Initiatives.

In the Manatee Springs area the Floridan aquifer is unconfined. Consequently, springs and seeps along the Suwannee River discharge to the river, augmenting its flow. Groundwater percolation is the primary means of regional aquifer recharge under normal conditions. During flood stage, however, the cycle may be reversed and springs may act as insurgence points. Because Manatee Spring flows are normally very high however, it is uncommon for the direction of flow to reverse during river flood events.

Discharge from Manatee Springs has been measured sporadically since 1932 by several agencies. In 2001, the U.S. Geological Survey, in cooperation with the SRWMD and the Division, installed a continuous velocity recording station in the spring run. Daily stage and velocity data from this station are used to calculate daily discharge for the spring. Currently, monitoring at this station is funded through the Springs Initiative. The lowest flow recorded to date from Manatee Springs is 80 cfs, measured in June 2002. The highest flow on record is 268 cfs, measured in June 1998. For the period of record, the mean discharge volume for Manatee Springs is approximately 180 cfs. Sample discharge data are listed below (Rosenau et al. 1977, Hornsby and Ceryak 1998, EPA 2001).

Data Source	Date Recorded	Discharge (cfs)
USGS	03/14/32	149
USGS	12/17/42	218
USGS	07/24/46	137
USGS	04/27/56	110
USGS	11/18/60	238
USGS	05/28/63	145
USGS	04/19/72	220
USGS	07/31/73	203
USGS	01/18/85	209
DRP	09/27/90	140
DRP	01/09/91	144
SRWMD	06/25/97	142
SRWMD	06/08/98	268
USGS	06/11/02	80

In March 2001, the stream health of the Manatee Spring run was rated as impaired, based upon elevated nitrate levels and on the occurrence of macroinvertebrate and algal communities that were indicative of eutrophic waters (FDEP 2001). Recorded nitrate levels in

this and other springs in the region have generally increased since the 1940s (Hornsby and Ceryak 1998, EPA 2001). Nitrate concentration data for Manatee Springs are listed below (Hornsby and Ceryak 1998, Hornsby 2001).

Sample Date	NO_3-N (mg/L)
07/24/46	0.37
04/27/56	0.40
04/19/72	0.60
07/21/80	2.68
08/14/90	1.20
09/11/95	1.64
06/12/96	1.36
06/25/97	1.35
08/13/98	1.61
06/17/99	1.60
09/11/00	1.63
01/11/01	1.39

Elevated nitrate levels and a corresponding increase in growth of algae and aquatic weeds contribute to the degradation of overall water quality in the aquatic system of the lower Suwannee River. Therefore, potential contamination of groundwater within the recharge area of Manatee Springs is of great concern, both within the park and downstream. While the recharge area for the springs has not yet been defined, the large conduits that transmit most of the springs' flow apparently extend for miles to the southeast of the spring boil, and an undetermined distance to the northeast (Annette Long, pers.comm.). Direct, point-source contamination of Manatee Springs through these conduits is possible wherever sinkholes or other karst features exist that may form connections between the conduits and the ground surface.

The predominant land uses in the lower Suwannee River basin are silviculture and agriculture, although weekend and retirement homes are increasing in numbers within the river corridor. Because the Floridan aquifer is regionally unconfined, there is cause for concern regarding the effects of surrounding land uses on the quality of water in the springs and river. Recent public attention to water quality declines in Florida's springs and rivers has prompted state agencies to address possible anthropogenic causes for degradation, such as home and farm fertilizer use, septic systems, untreated storm water runoff, industrial discharge, and excessive groundwater withdrawals. The Governor's 2001 Springs Initiative provides funding to address these issues as they relate directly to springs.

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

Sandhill. At one time, the sandhill natural community probably covered a considerably greater extent of the higher elevations of the park than is apparent today. Before the property was acquired by the state, a long period of intensive anthropogenic disturbance occurred, followed by many years of fire suppression. These factors ultimately caused a blurring of the distinctions among the upland communities in the park.

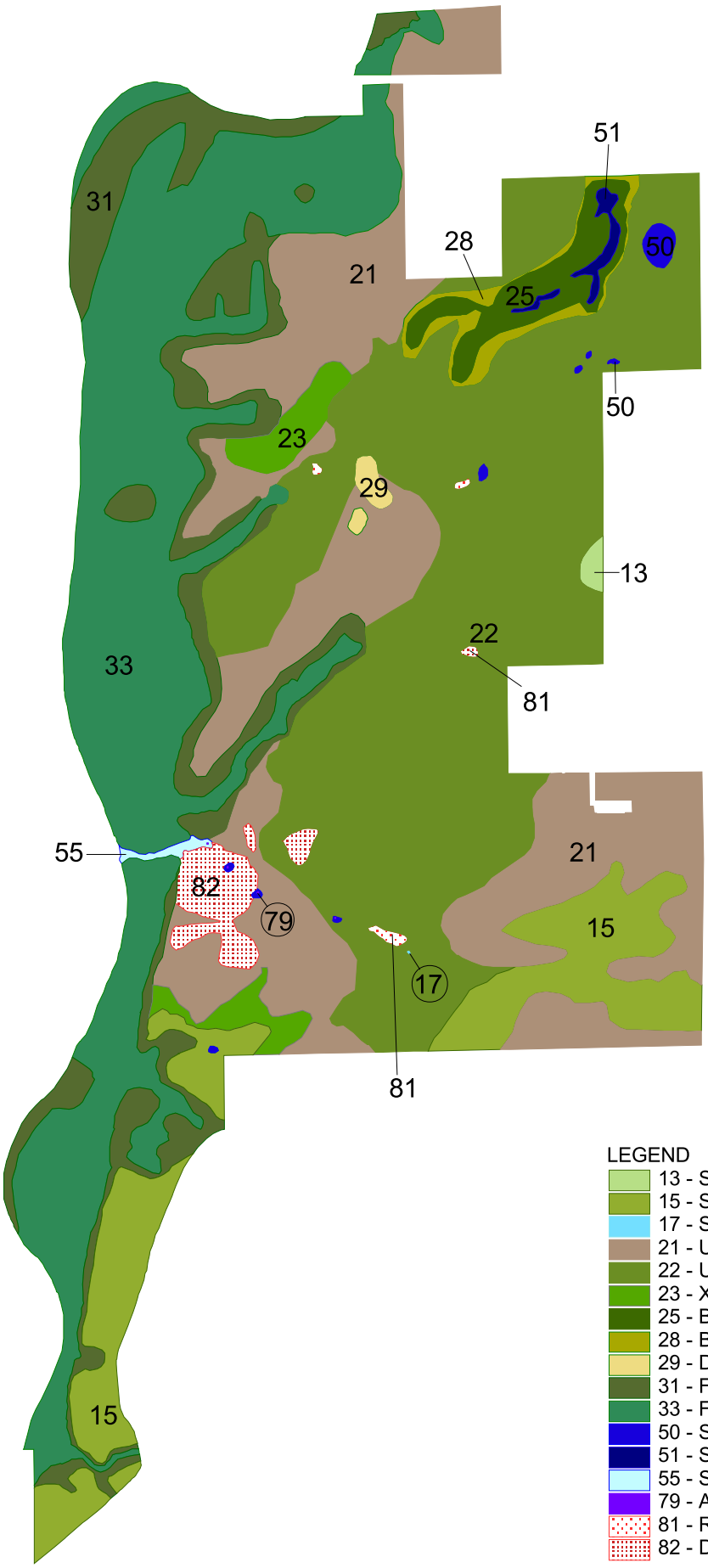
Stands of virgin longleaf pine were probably cut from the property by the early 1900s. The proximity of the longleaf stands to the Suwannee River, a major transportation corridor, likely led to their being harvested relatively early in the timber boom that decimated longleaf populations throughout the southeastern states. Agricultural practices that followed the timber harvests have hampered the recovery of natural sandhill areas. Aerial photographs from 1940 clearly show that most of the upland areas that normally would have contained longleaf pines no longer did so, indicating that they had been logged at some previous date. Several old fields of limited extent are also discernible adjacent to historical roads. Also apparent are multiple livestock trails that radiate through the uplands, particularly near Shacklefoot Pond. The present-day lack of native groundcover in many of the sandhill and upland pine forest areas of the park may be attributable, in part, to past livestock grazing.

Although longleaf pines still occur in the park, a reduced frequency of fire in more recent years, primarily due to drought, has allowed hardwood components of the community to become increasingly dominant. Management actions such as the reestablishment of a more natural fire regime with more frequent burns and continued emphasis on lightning-season burning, the removal of invasive offsite hardwoods, and the replanting of longleaf pines in appropriate areas should all help to promote some degree of recovery of this community. A complete restoration of the sandhills at the park, however, may require the planting of additional native plant species depending on the results of the initial restoration measures.

Scrubby flatwoods. The scrubby flatwoods community is found primarily in the southeast part of the park and within the Mead-Scott tract to the southwest. In many areas of the park, the boundaries between scrubby flatwoods and other upland communities such as sandhill, upland pine, and upland mixed forest may be difficult to distinguish. This is in part due to past fire suppression and other human impacts. Additional fieldwork will be necessary before a clearer definition of the boundaries of this and other fire-adapted communities is obtained. The provision of more specific, on-site information about local soils may also enable a more accurate delineation of communities.

Considerable progress has been made in restoring the scrubby flatwoods community in the southeast areas of the park, mainly through prescribed burning. There are still spots, however, where the so-called "scrub-oaks" attain tree-like dimensions. Once fire has reduced the sand live oak, myrtle oak and Chapman's oak to shrub height, the scrubby flatwoods will have regained a more natural appearance. Caution should be exercised in the application of prescribed fires in this community, however, due to the unnaturally high live-fuel loads in some areas. Extreme fire behavior in the scrubby flatwoods may cause loss of adult longleaf pines that remain in the overstory.

The scrubby flatwoods in the Mead-Scott tract were cleared and planted with slash pines at two separate times in the 1970s. Two small areas were cleared, windrowed, and bedded around 1970, while the majority of the tract was cleared and site-prepped in the same fashion



LEGEND

- 13 - Sandhill-4.15 ac.
- 15 - Scrubby Flatwoods-200.81 ac.
- 17 - Sinkhole-.07 ac.
- 21 - Upland Mixed Forest-486.24 ac.
- 22 - Upland Pine Forest-756.90 ac.
- 23 - Xeric Hammock-41.05 ac.
- 25 - Basin Swamp-45.25 ac.
- 28 - Bottomland Forest-23.57 ac.
- 29 - Depression Marsh-7.00 ac.
- 31 - Floodplain Forest-227.84 ac.
- 33 - Floodplain Swamp-594.23 ac.
- 50 - Sinkhole Lake-7.60 ac.
- 51 - Swamp Lake-6.78 ac.
- 55 - Spring-Run Stream-3.72 ac.
- 79 - Aquatic Cave-.04 ac.
- 81 - Ruderal-2.57 ac.
- 82 - Developed-35.01 ac.

N

1000 0 1000 2000 Feet

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

MANATEE SPRINGS STATE PARK

NATURAL COMMUNITIES MAP

in 1976-1977. In at least one area, several rows of eucalyptus trees were planted. Over most of the site, large windrows alternate with four or more rows of pines planted on raised beds.

Several unimproved roads pass through the uplands on the tract. Portions of these roads are located on the ecotone between the scrubby flatwoods and wetland communities. In these locations, the roads prevent the establishment of natural firebreaks between the uplands and the wetlands.

Numerous plant species native to scrubby flatwoods remain in the tract, primarily on the windrows and scattered among the planted pines. The sand live oak (*Quercus geminata*) is the most common scrub oak species remaining on the site. Other native scrubby flatwoods species that have survived include fetterbush (*Lyonia lucida*), crooked wood (*Lyonia ferruginea*), and lowbush blueberry (*Vaccinium darrowii*). Several invasive plant species have colonized the area as well. In general, this community is in poor condition. Restoration work by the SRWMD began with the removal of the rows of slash pines closest to the windrows, leaving at least two rows of pines between windrows to provide fuel for subsequent prescribed fires. Future restoration work will include periodic prescribed burning and the flattening of the windrows before replanting with longleaf pines. The last phase will include harvesting the remaining slash pines and replanting with additional longleaf pines.

Sinkhole and sinkhole lake. Sinkholes of various sizes and shapes occur throughout the park. The public is requested, for the most part, not to enter these features so that soil compaction, erosion, and plant destruction may be avoided. While most sinkholes within the park are relatively remote and hidden from view, those that are adjacent to hiking trails should be monitored for evidence of public use and consequent deterioration.

The only exceptions regarding public entry are the permanently flooded sinks known as Catfish Hotel and Friedman Sink, both of which are connected to the park's extensive aquatic cave system. Friedman Sink is remote and divers must request permission from park staff to enter it. Catfish Hotel is accessible to all divers and is subject to considerable use. The north sides of this sink experienced erosion in the past, before the installation of a flight of steps to facilitate access. A low fence has also been placed along the upper rim of the sink to restrict access from the picnic area.

One sizeable sinkhole lake, Graveyard Pond, is located in the northeast corner of the park. A few other, very small, water-bearing sinks also occur in the park. Feral hogs, by continually rooting along shorelines, contribute to erosion at these features, and are the primary negative impact.

Upland mixed forest. The upland mixed forest community has probably expanded within the park due to historical fire suppression in fire-dependant communities, although fire shadows do occur where this community could have been expected to develop naturally. The boundary between upland pine forest and upland mixed forest is usually indistinct, but historical impacts on the natural communities at Manatee Springs and the influences of aboriginal Floridians have blurred the distinction even further.

The park camping areas were constructed in upland mixed forest and are considered developed areas, although much of the natural overstory has been retained. The upland mixed forest is also susceptible to feral hog damage.

Upland pine forest. Upland pine forest often occurs as a broad transition zone between sandhills located on higher elevations and upland mixed forest or lowland communities located down slope. The upland pine forest community often shares plant species with the upland mixed forest and sandhill communities, making identification sometimes problematic.

The upland pine forest at Manatee Springs currently appears to be much more widespread than the sandhills, and historically it may have been the dominant natural community within the park.

Timbering long ago removed the virgin longleaf pines from the upland pine forest, as happened also in the sandhills and scrubby flatwoods. Although longleaf pines are still present, the absence of fire has permitted fire-intolerant hardwood species and loblolly pines to invade the community. Restoration of a natural fire regime, using primarily spring and summer burns, should help to reverse this trend in succession. As in the sandhills, past agricultural practices have heavily influenced the characteristics of the upland pine forest at the park. In many areas, the native groundcover plant diversity is very low, with certain indicator species such as wiregrass (*Aristida beyrichiana*) completely absent.

Additional fieldwork, along with more detailed site-specific information about soils, will be required before the complex of natural communities found in these impacted areas can be mapped with a greater degree of accuracy. It may be that much of what is currently labeled upland pine forest may actually be sandhill that has changed markedly due to past fire suppression and human disturbance.

In 2001, a southern pine beetle (spb) outbreak was discovered in the northeast corner of the park, within the Upland Pine Forest natural community. This infested area was dominated by mature loblolly pine, with isolated pockets of mature longleaf pine. Over 50 acres of loblolly pine were afflicted by the outbreak, while many of the mature longleaf pines were unharmed. A restricted spb clear cut was performed to control the outbreak and remove merchantable dead trees. Sixteen months later, the area was burned and longleaf pine seedlings were planted in the clear-cut zone. District staff continues to monitor seedling survival.

The clear-cut activities resulted in some soil disturbance, and possible damage to already sparse groundcover vegetation is a concern. Implementation of a restoration plan for the clear-cut zone will entail reestablishment of appropriate groundcover species.

Xeric hammock. Within the park, xeric hammock occurs in narrow, disjunct bands between communities and in isolated patches within other communities. This community is also difficult to map due to past impacts and fire suppression. Xeric hammock usually is an advanced stage of succession of sandhill, scrub, or scrubby flatwoods. This community has probably expanded beyond its natural extent at the park due to past fire suppression in the sandhills and scrubby flatwoods areas. Over the past two decades, natural fire regimes within adjacent fire-adapted communities have been restored. This should effectively halt the expansion of the xeric hammock and perhaps restore a more natural balance as fires are given the opportunity to creep into the edges of the hammock.

Basin swamp. This community largely occupies the depression known as Shacklefoot Pond. Although cypress is still the dominant tree species in the swamp, most of them were timbered early in this century, if not before. Large cypress stumps are still evident throughout this area.

Feral hogs are present and constitute a serious problem. Damage by feral hogs is the only major impact on this community.

Bottomland forest. The bottomland forest community interfaces with the basin swamp at Shacklefoot Pond. This community lacks mature trees, probably because of past logging activities. In addition, a causeway was once built across the north section of the community in order to accommodate a service road along the park boundary. The causeway is the only means of accessing that portion of the park, but it may impede natural sheet flow within the bottomland forest to some extent. In all wetland communities of the park, feral hogs represent

the primary threat.

Depression marsh. Small depression marshes occur within the upland pine forest and upland mixed forest communities of the park. Prescribed burning of the marshes under appropriate conditions should insure their continued existence by restricting hardwood encroachment.

Floodplain forest. This community occurs as a narrow band of lowland roughly paralleling the Suwannee River. Topographic relief determines the community's frequency of inundation, which forms the primary basis for distinguishing between floodplain forest and floodplain swamp.

Selective timbering likely occurred in the floodplain forest over the years, but little permanent damage is evident. Feral hogs forage in this forest, however, and must be controlled. In addition, a causeway crosses a narrow arm of the community northeast of the main spring. Serious consideration should be given to removing the causeway and re-contouring the area to allow resumption of natural sheet flow. If such an endeavor is deemed impractical due to the demands of park operations, then adequate alternatives may be the installation of additional culverts or construction of a low-water crossing in the causeway.

Before the state acquired the Mead-Scott tract, several acres of floodplain forest there were impacted by site preparation of adjacent uplands. In some areas, floodplain forest was also cleared and planted with slash pines. The slash pines within the floodplain forest have since been removed as part of the initial restoration work on the Mead-Scott tract.

Floodplain swamp. The floodplain swamp is found in a broad band adjacent to the river. Nearly all the large cypress trees were logged years ago. Over time, impacts from the logging activities have become somewhat obscured, but remnants visible today include numerous large cypress stumps and a series of low ditches that may have been created during logging operations. Additional information about these impacts is included in the Topography section of this plan. The floodplain swamp should eventually regain its original appearance as the second growth forest ages. Feral hogs are a constant threat and should be controlled by whatever means necessary.

Two earthen causeways that historically provided access to the Suwannee River also once affected the floodplain swamp within the Mead-Scott tract. In the early 1990s in cooperation with the SRWMD, the Division obtained a grant from the Pollution Recovery Trust Fund (PRTF), then completely removed the southern causeway and installed culverts in the northern causeway to restore a more natural sheet flow regime within the floodplain swamp. The northern causeway was retained to provide access to the Usher boat ramp located on the Mead-Scott tract.

Swamp lake. A small lake, Shacklefoot Pond, is located in the northeast part of the park just west of Graveyard Pond. No threats exist for this lake other than the feral hogs that regularly visit the shoreline and destroy both plants and animals with their foraging habits.

Blackwater stream (this community is not mapped). The park’s west boundary incorporates approximately three miles of the Suwannee River, a blackwater stream. Elevated nitrate levels were recently detected in stretches of the middle Suwannee River upstream from the park.

Hydrilla, a noxious exotic plant, is established in the riverbed at the mouth of the spring run. Fortunately, hydrilla does not flourish in the dark tannin-stained waters as well as it does in clearer water. The hydrilla in the river, however, is relatively difficult or maybe even impossible to eradicate completely, and it will always serve as a possible source of re-infestation of the spring-run.

Spring-run stream. A short spring run, around 1,250 feet in length, flows from Manatee Spring to the Suwannee River.

At times, the spring-run stream community has been impacted by the exotic plant hydrilla. This plant competes with native species for space and quickly colonizes substrate exposed during park visitors' recreational activities.

For many years, hydrilla has been removed manually from the spring run with the help of volunteers. Occasionally in the past, when the hydrilla growth became especially dense, mechanical removal using a floating harvester was also employed. In general, treatment with herbicides has proved ineffective, as the velocity of the spring flow is too great to allow sufficient contact time between the chemical and the hydrilla to have significant impact. When allowed to grow unchecked in the past, the hydrilla nearly occluded the spring run, thereby reducing the cross-sectional area of the flow and increasing the current velocity. Under these various conditions, the manatees that frequented this area were effectively excluded from use of the spring run.

Fortunately, several factors have contributed to the notable decline of hydrilla within the spring run over the past decade. Before 1989, a floating harvester was used periodically to reduce hydrilla levels, but the harvester also indiscriminately collected native plants and caused unwanted fragmentation of the hydrilla. Much more effective hydrilla control was achieved when the entire spring run was closed to motorized vessels in 1989, concurrent with the closing of the boat ramp located on the south side of the spring-run. With these actions, the amount of bottom scouring decreased, and the cutting of hydrilla stems and subsequent dispersal of fragments within the spring run decreased. What may have affected the hydrilla most, however, was that the Suwannee River remained at flood stage for several months in 1991, and the dark tannin-stained waters effectively shaded out the spring run during that period. When the floodwaters receded, the hydrilla infestation was greatly reduced. The hydrilla has still not regained its former prominence. Park staff and volunteers diligently monitor the spring run, and the hand removal of sprouts by volunteers has sufficed to control the small amount of hydrilla that remains.

Submerged aquatic vegetation (SAV) in the spring run varies spatially and temporally in composition and percent cover. In designated swimming areas, continual disturbance of sediments from visitor use hinders establishment and persistence of SAV. In shallower areas of the spring run, evidence of similar disturbance from canoeists is visible. These patterns of disturbance have been noted in other parks that feature major springs, and the potential for off-season recovery of SAV is being studied.

Continual grazing of SAV by aquatic fauna also affects the composition and percent cover. During colder months, manatees graze heavily upon all SAV they are able to reach. During the winter of 2000-2001, record numbers of manatees grazing in the spring and spring run contributed to a severe decline in SAV. Benthic algae have since become dominant in the spring run, presumably encouraged by elevated nitrate levels. The algae are dense and cover large areas, effectively shading out SAV. Causes for this evident shift in dominance of plant communities, and possible control methods for the algae, are being considered.

One source of lowered water quality in the spring run is storm water that enters the run from the old boat ramp located on its south side. Untreated runoff from the access road that serves the boat ramp is funneled directly into the spring run. Comprehensive restoration of the spring run should include the removal of concrete portions of the boat ramp and mitigation of the runoff from the access road.

The elevated nitrates that have been recorded in the discharge of Manatee Springs since the

1970s continue to arouse concern. Water quality issues such as this are addressed in the Hydrology section of this plan.

Large sand deposits exist in the spring run, probably because of erosion from the sand beach in the swimming area. The extent and movement of these sand bars is not known, however when water levels are extremely low, the sand bars may impede manatee access to the spring run.

Aquatic cave. This community is perhaps the most intriguing one at Manatee Springs. The actual total extent of this system is unknown, although over 26,000 feet of passages have been explored and mapped, establishing the system as one of the longest in North America (Annette Long, pers. comm.). There are four known points of entry, including Manatee Spring, Catfish Hotel, Sue Sink and Friedman Sink (see Base Map).

This system has endured a certain level of vandalism to date. Some graffiti are carved on the cavern wall within Manatee Spring and around the cavern entrance of Catfish Hotel. The cave system seems to be in fair to good condition, depending on the level of use it receives by cave and open-water SCUBA divers. However, it is difficult to monitor the condition of the caves adequately or to assess damage caused by divers. In general, narrower passages experience a higher level of damage, either from equipment scraping walls or from divers disturbing the substrate. Damage to the clay or silt layers, where they occur, may persist for long periods. It detracts from the natural beauty of the caves, and it may have unknown consequences for troglobites in the cave system.

Troglobitic species known to inhabit the Manatee Springs cave system include the light-fleeing cave crayfish (*Procambarus lucifugus*), the North Florida spider cave crayfish (*Troglocambarus maclanei*), and the Hobbs' cave amphipod (*Crangonyx hobbsi*).

Ruderal. Ruderal areas within the park include at least three abandoned borrow pits. Two of the pits have been re-contoured or filled, and attempts are being made to restore them to the appropriate type of natural community. Young loblolly pines are invading these disturbed areas and should be removed and replaced with longleaf pines where appropriate.

Developed. Developed areas within the park include the parking lots, bathhouse, rest rooms, campgrounds, picnic areas, support facilities and staff residences. Most of the developed areas are located near the spring.

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.

Perhaps the most significant designated species at Manatee Springs State Park is the spring's namesake, the West Indian manatee. Manatee sightings in the spring run and in nearby sections of the Suwannee River have steadily increased over the past decade. The increase is especially noticeable during the colder winter months when the mammals often utilize Manatee Springs as a warm water refugium and congregate either in the spring run or in the river at the mouth of the run. To protect manatees seeking refuge in the spring run, it is closed to all watercraft from December 1 to March 31.

Another designated species that occurs within the Suwannee River adjacent to Manatee Springs is the Gulf sturgeon, a federally threatened subspecies of the Atlantic sturgeon. At

certain times of the year, sturgeon is readily apparent in the park as they spontaneously leap from the water during their journey to and from spawning grounds in the upper Suwannee River.

The Manatee Springs cave system contains three designated invertebrate species, the light-fleeing cave crayfish, the North Florida spider cave crayfish, and the Hobbs' cave amphipod. While individual animals inhabiting the larger caves within the park may be subject to impacts from cave divers, these three species are probably also widespread within areas of the Floridan aquifer that are beyond the reach of normal cave exploration.

Additional designated animal species in the park include the gopher tortoise and Sherman's fox squirrel, both inhabitants of xeric fire-maintained uplands. These and other sandhill or upland pine forest species in the park have endured periods of fire suppression and extensive alteration of natural communities. According to anecdotal accounts, a population of scrub jays long ago occupied the scrubby flatwoods area south of the park drive (Younker 1991). No recent records of scrub jays in the park are known, although a remnant population does survive further south in Levy County, north of the Cedar Key Scrub State Reserve.

Special Natural Features

With an average flow of 117 million gallons of water per day, Manatee Spring is one of Florida's larger first magnitude springs. The main spring is approximately 30 feet deep and has a circumference of nearly 100 feet. The water temperature is approximately 72 degrees Fahrenheit year round. Because of the quality and volume of its flow and its appealing natural setting, the spring is designated a National Natural Landmark by the United States Department of the Interior (DOI).

The underwater cave system associated with Manatee Spring extends to the northeast and southeast of the main boil, reaching depths of 90 feet. Besides Manatee Spring, three sinkholes permit entry into the cave complex. The largest of these is Catfish Hotel, a sinkhole 40 feet deep and 125 feet in circumference. Somewhat farther away is Sue Sink and beyond it, Friedman Sink. In 1994, a world record dive was completed that covered a distance of 11,074 feet into the cave system, beginning at Friedman Sink (Jablonski 1995). To date, divers have mapped over 26,000 feet of passage in the Manatee Springs cave complex (Annette Long, pers. comm.).

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 Florida Master Site File (FMSF) lists seven sites within the park. Because it contains a first magnitude spring and because it borders the Suwannee River, an important transportation corridor and productive river, Manatee Springs State Park is likely to contain additional important historical and archaeological sites. However, no comprehensive cultural resource survey has been performed in the park, so the true extent of cultural resources there remains unknown.

Actual knowledge about the recorded sites is sparse also, particularly Lv85 and Lv86. Both of these sites are recorded as underwater refuse dumps in the site file, and both occur in sinks adjacent to the headspring. The conditions of these sites are unknown.

There are at least two potential burial mounds within the park. The eastern slope of one apparent burial mound, Lv112, has been disturbed by a bulldozer, thus its condition is rated fair to poor. Artifacts recovered after disturbance are from the Deptford and Weeden Island periods. Another mound, Lv139, requires testing to confirm its status as a burial mound. This mound has several shallow pits near the top indicating possible looting activities in the past, and the eastern edge has been superficially disturbed by heavy equipment. Its condition is fair.

At least two village sites may occur in the park. Site Lv32 is located near the headspring. Surface collection and an excavation performed in the1950s by Ripley Bullen indicate intermittent habitation for the last 1,800 years. Artifacts recovered are from several periods, Deptford, Swift Creek, Weeden Island, Fort Walton, and Seminole, however the most intensive period of habitation was the Weeden Island period (Bullen 1953). As with many sites located near springs that are utilized for recreational purposes, its condition has the potential to be compromised by recreational use and development of the area. Currently its condition is fair. The other village site, Lv33 (GV), is located near Clay Landing; however, its exact location is unknown and it may actually lie outside the park boundary near Old Clay Landing. When William Bartram visited the area in 1774, he described Seminoles living at a village called Talahasochte near what is now Clay Landing (Bartram 1928). The condition of Lv33 is unknown.

Another site, Lv37, is recorded as a prehistoric habitation, dense artifact scatter and historic road segment. This site contains artifacts indicating human occupation during the Archaic, Deptford and Weeden Island periods, and the historic period. Based upon current knowledge, most of this site is located outside park property, but a portion of it extends into an area of former pine plantation. It is likely that the upper strata of this site were disturbed during operations associated with the management of the pine plantation. Because most of this site lies outside of the park in a developed area, its condition is considered poor.

Unrecorded resources undoubtedly exist within the park, including a number of historic period farmsteads. Old-field vegetation is evident in numerous locations throughout the park, but little is known regarding exact locations or histories of potential historic period sites. Other evidence of past human activities includes a cut limerock trench thought to be part of an old mill site and debris thought to be part of an old moonshine still site. Scattered turpentine trees and cypress stumps occur throughout the park. Evidence of historical habitation around the headspring includes sherds of historical ceramic pottery recovered during the recent installation of a fence in the picnic area.

It should be noted that there are many other areas within the park identified as potential cultural sites (records, Bureau of Historic Preservation). These potential sites include the entire area around the head spring of Manatee, not just the area of excavation by Ripley Bullen. Artifacts recovered during the recent fence installation near the headspring give evidence that Lv32 may be larger than previously thought. A comprehensive cultural resources survey would undoubtedly reveal previously undiscovered cultural sites at Manatee Springs State Park.

Special Management Considerations

Timber Management Analysis

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

During the development of this plan, an analysis was made regarding the feasibility of timber management activities for this park. It was then determined that the primary management objectives of the unit could be met without conducting timber management activities for this management plan cycle. Timber management will be reevaluated during the next revision of this management plan.

Timber harvest for the control of southern pine beetle (spb) will continue to be used as necessary. Areas impacted by spb control activities will be restored according to guidelines provided by District biologists.

Additional Considerations

The Division has management authority over a 400-foot zone from the edge of mean high water along the Suwannee River where it passes through or alongside the park. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. Within this zone the park staff will enforce Division regulations. All wildlife within this zone, with the exception of fish, is protected from harvest, as stated in the Designated Species section, above. In addition, pre-cut timber harvesting (dead head logging) is prohibited within this zone.

Manatee Springs State Park contains two natural communities of special concern, the spring-run stream and the aquatic cave system. Both are relatively rare in the state, are sensitive to disturbance, and provide essential habitat for designated species. While it is relatively short in length, the spring run is increasingly important as a manatee refuge. Manatee sightings, both within the spring run and at its mouth, have increased in number as the hydrilla infestation has decreased. Warm water refugia are critical habitats for manatees during cooler weather and are relatively rare in the northern parts of Florida.

The best way to insure that manatees continue to utilize the spring run is to extend the exclusion of motorized vessels indefinitely. An additional measure, removal of the abandoned boat ramp, would promote the restoration of the spring-run natural community and would reduce stormwater runoff into the run. The exotic plant hydrilla continues to present a threat. To date, favorable climatic conditions and limited but active management have helped to minimize its spread. Complete eradication of the plant has not been achieved, however. As other environmentally acceptable methods of controlling hydrilla become known, District biologists will consider using them as well.

The uniqueness of the Manatee Springs cave system is described in the Natural Communities and Special Natural Features sections of this plan. At least three troglobitic invertebrates inhabit the aquatic cave system and adjacent areas within the Floridan aquifer. Two species are cave crayfish, namely the light-fleeing cave crayfish (*Procambarus lucifugus*) and the

North Florida spider cave crayfish (*Troglocambarus maclanei*). The Hobb's cave amphipod (*Crangonyx hobbsi*) also occurs within the Manatee Springs cave system. All of these species could be extirpated if water quality or rates of flow in the caves are altered.

More information on the status of these invertebrates and on the overall condition of the cave system will be needed before staff should consider recommending or implementing changes in protective measures, such as reducing carrying capacities for cave diving. Stations for photo points and for recording observations should be established within the accessible areas of the cave system to facilitate long-term monitoring of the condition of the caves.

Management Needs and Problems

1. Outside development and existing park facilities may negatively affect water resources within the park.
   - **A.** Limerock mining activities proposed for property adjacent to the park may adversely impact discharge, water quality, aquatic biota and recreational use of the cave system, spring and spring run.
   - **B.** Intensive, regional water withdrawals from the Floridan aquifer threaten spring flows and river levels. The USGS (2002) predicts a 16% reduction in flow from Manatee Springs by the year 2020 given projected water withdrawal demands. Minimum flows and levels have not been established for the springs or the river, leaving them vulnerable to competition for the area's limited water resources.
   - **C.** Some of the existing septic systems within the park are located in flood-prone or geologically sensitive areas, creating a potential threat to water quality in the spring and spring run.
   - **D.** Stormwater runoff from the unpaved campsites and access drive in the Hickory Campground flows directly into two sinkhole ponds that are connected via underwater caves to the main spring. The campsites that are located along the edges of the sinkhole ponds are susceptible to continual erosion and degradation from foot traffic and camping activities. In addition, the septic drain field for the campground restroom is located in proximity to the underwater cave system, posing a possible threat to water quality in the cave and spring systems.
   - **E.** Stormwater runoff from the closed boat ramp and associated service road contributes to erosion and poor water quality in the spring run.
   - **F.** Sand from the eroding beach has formed sand bars in the spring run, which may impede manatee access during low water levels.

2. Nitrate levels in the groundwater and spring discharge are elevated.
   - **A.** Nitrate levels detected in the spring discharge appear to be increasing from historic levels. While nitrate levels have remained within statutory limits (drinking water standards) in the park, wells nearby have become contaminated, at times causing local inhabitants to seek permission to draw potable water from park sources. Although evidence is not conclusive, the nitrate increases in the nearby wells were attributed to contamination from a former feedlot in the vicinity. Direct groundwater connections between Manatee Spring and the feedlot site are suspected.
   - **B.** Effects of elevated nitrates are observable in the spring run, however no scientific evidence exists to link the increasing nitrates with adverse impacts observed.

3. Spring-run and aquatic cave natural communities require restoration and protection.
   - **A.** The spring-run and aquatic cave systems are the most unique and fragile components of the park's natural resources. The spring run is chronically vulnerable to substantial takeover by the exotic plant, hydrilla. While hydrilla once dominated the run, its pervasiveness in recent years has greatly diminished. Recent disturbances of native vegetation in the spring run, however, may promote re-colonization by this undesirable exotic.

B. Inventories of aquatic fauna, which consist of limited recorded observations and outdated species lists, are inadequate.

C. Threats to the aquatic cave community include intentional and unintentional defacing of cave walls, removal of artifacts or fossils, and molestation of cave biota.

D. Manatee Springs is increasingly important as a refugium for the Gulf Coast population of manatees. Motorized vessels are not compatible with manatees, particularly in such close quarters. All watercraft in the spring run pose a threat to manatees during winter months, deterring them from the warm waters of the run, which results in exposure to hypothermic conditions in the river.

4. Upland fire-maintained natural communities are fire-suppressed.

A. Upland fire-maintained communities in the park, such as sandhill, upland pine forest, and scrubby flatwoods, have been adversely impacted by the long-time suppression of fire. Fire-influenced communities such as basin swamp and depression marsh may have also been affected by fire suppression. These communities have improved dramatically over the past decade because of the institution of a more active prescribed burning program and other management activities, however more restoration work is needed.

B. In the sandhills and upland pine forest, the longleaf pines have been replaced in dominance by oaks and other hardwoods. In addition, the loblolly pine, a species not considered indigenous to the upland pine forest, has supplanted the longleaf pine in some instances.

C. While some areas of scrubby flatwoods have not changed significantly in species composition, other portions now resemble xeric hammock. Within the Mead-Scott tract, nearly all the scrubby flatwoods were bedded and windrowed during site preparation for a slash pine plantation. This area is currently undergoing restoration.

5. Topographic alterations require restoration.

A. Restoration of several partially restored borrow pits, perhaps the most obvious topographic disturbances in the park, needs to be completed.

B. Obsolete roads and firebreaks are detrimental to natural community restoration and management.

C. Existing causeways through wetlands and river floodplains impede natural sheet flow.

6. Archaeological sites need clear identification and protection.

A. Unauthorized disturbance and possible looting of burial mounds have occurred in the past. Both of the underwater refuse sites are located in sinks that are used by divers, Catfish Hotel and Sue Sink. If divers remove artifacts from these sinks, they will compromise the integrity of the archaeological sites.

B. The entire area around the headspring is a zone of high probability for the presence of cultural resources. Erosion on the north side of the spring run presents a threat to this potential archaeological site. Previous efforts to mitigate the erosion, including the placement of sand over the top of the probable site, have caused sediments to continually enter and degrade the spring run.

C. The lack of complete information about cultural site locations may lead to inadvertent disturbance of archaeological sites in the course of park operations.

Management Objectives

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

1. Monitor outside development activities and provide comment as needed. Within the park, develop plans to retrofit or relocate existing park facilities that adversely impact the park's water resources.
   - **A.** Request permitting agencies to notify Division staff of permit requests for activities that could adversely affect park resources. Communicate Division concerns for park resources to permitting agencies in a timely manner, and encourage statutory protection of the resources.
   - **B.** Encourage the SRWMD to establish and implement minimum flows and levels for Manatee Springs and the lower Suwannee River.
   - **C.** Support research that addresses the effectiveness of septic systems in karst environments. Determine whether septic systems in the park are affecting water quality in the caves or springs.
   - **D.** Redesign and retrofit the Hickory Campground to attenuate and treat storm water runoff and erosion into the sinkholes that are hydraulically connected to the aquatic cave and headspring system. Also, redesign and relocate the campground septic system, to prevent water quality impacts in the cave and spring system. Alternatively, relocate the Hickory Campground and its restroom facilities, to a less sensitive area.
   - **E.** Remove the closed boat ramp and unnecessary portions of the associated service road, and restore the impacted floodplain to the extent possible.
   - **F.** Perform a bathymetric survey of the spring run, and determine the potential impacts of the sandbars.
2. Continue to monitor water quality and attempt to define the recharge area for the springs.
   - **A.** Continue to monitor water quality in the park's wells and springs. Cooperate with the SRWMD to determine the extent of the recharge area for Manatee Springs and to identify direct connections between the Floridan aquifer and the ground surface in the recharge area.
   - **B.** Work with scientists from other agencies to develop methods for correlating nitrate levels with changes in algal and plant communities. Continue to monitor plant cover and composition in the spring run.
3. Restore and protect spring-run stream and aquatic cave natural communities.
   - **A.** Maintain the premise that total eradication of hydrilla is a principal objective in restoration of the spring run. Continue to remove hydrilla manually. Employ other environmentally acceptable methods of eradication if necessary.
   - **B.** Conduct comprehensive baseline surveys of aquatic fauna, including fish, mollusks, snails and crustaceans.
   - **C.** Educate divers about adverse ecological impacts that may result from the intentional or unintentional defacing of cave walls, removal of artifacts or fossils, and molestation of cave biota. Develop rules for divers that would be more readily enforceable than existing rules and that would also govern divers' activities within the cave systems more effectively.
   - **D.** Research the adequacy of the existing carrying capacities for cave divers utilizing the main spring and Catfish Hotel, and revise the numbers as necessary. Design and implement a reservation system for divers that would ensure that carrying capacities are observed.
   - **E.** Continue to exclude motorboats from the spring and spring run year-round, and close the spring run to all motorized and non-motorized watercraft from December 1 through March 31. Install educational signs that acknowledge the importance of Manatee Springs as a refugium for the Gulf Coast manatee population.
4. Continue efforts to restore fire-dependent natural communities.

A. Continue prescribed burning of the sandhill, upland pine forest, scrubby flatwoods and depression marsh communities in the park under conditions conducive to achieving total restoration.

B. Remove non-fire adapted trees that have invaded the fire-type communities, utilizing methods such as mechanical and chemical treatment and prescribed burning. Replant longleaf pines in areas where they once dominated and where seed trees are currently sparse.

C. Continue to implement the restoration plan for the scrubby flatwoods within the Mead-Scott tract, which began with the removal of selected rows of slash pines, but still requires additional prescribed burning, removal of the windrows, replanting with longleaf pines, and the eventual removal of remaining off-site slash pines.

5. Continue to remove unnecessary roads, causeways, and borrow pits.

A. Restore borrow pits to the extent practicable by re-creating appropriate contours and replanting with native vegetation.

B. Identify and remove obsolete roads and firebreaks.

C. Remove, or redesign and retrofit, existing causeways through wetlands and river floodplains in order to restore a more natural sheet flow.

6. Identify and protect archaeological sites in the park.

A. Pursue funding for a phase I archaeological survey of the entire park and for a phase II survey of selected areas within the park, particularly those areas that are known archaeological sites and coincidentally experience high visitor use.

B. Investigate the feasibility of installing sand-filled Geoweb, or some other suitable structure or material, over the top of the probable archaeological site along the northern side of the spring run. The structure should be designed to protect the archaeological site from erosion and to prevent sediments from continually entering and degrading the spring run.

C. Regularly assess the condition of recorded and unrecorded cultural resources in the park. Use photo points to monitor the status of sites judged to be in poor condition.

D. Conduct ground disturbing activities in accordance with Department of State, Division of Historical Resources (DHR) policy.

E. Patrol cultural sites for vandalism and discourage the establishment of casual trails at the sites. Educate the public about the importance of preserving cultural sites, using interpretive signs that include warnings against collecting artifacts in either terrestrial or aquatic environments.

F. Develop a written oral history for the park.

Management Measures for Natural Resources

Hydrology

Historically, hydrological data collected for Manatee Springs included sporadic discharge measurements and water quality samplings by multiple agencies. In recent years, the SRWMD has collected bimonthly discharge and monthly water quality data. With funding from the Governor's 2001 and 2002 Springs Initiatives, discharge and water quality data will continue to be collected regularly through the end of Fiscal Year 2002-03. Sustaining the water quality and discharge monitoring programs in the future will depend upon a continuation of funding. This is a management priority because long-term management and protection of these resources will require continuous and consistent data collection.

Biological data for the springs, spring run, and cave system are remarkably sparse. Park staff and volunteers conduct daily surveys of manatees that frequent Manatee Spring and the spring run. Graduate students and researchers from other agencies provide limited species lists that pertain to their studies. District biologists monitor the spring run semi-annually for vegetation

composition and cover. In 2000 and 2001, the DEP's Bureau of Laboratories conducted semi-annual Stream Condition Index (SCI) monitoring in the spring run. In addition to scoring stream health, these assessments provide limited data on benthic invertebrates and dominant algal communities in the spring run. The information gleaned from all of these contributions, along with anecdotal information and wildlife observation records for the park, account for most of the species found on the park's plant and animal list. Baseline inventories of spring fauna, including fish, mussels, and crayfish, were completed in 2002 with funds from the Springs Initiative. Data collected from these inventories will provide the park with a more complete list of animal species occurring there.

In order to protect water quality and preserve the natural discharge rates of Manatee Spring, it is essential to define the groundwater recharge area of the spring. Once that area has been established, potential sources of aquifer pollution must be identified and proposed land use changes in the region must be scrutinized. Prevention of future water supply and water quality issues at the park may well depend upon the diligence of staff and the public in reviewing activities in the spring's recharge area that might significantly alter recharge rates or groundwater quality. Potential threats to the park's water resources from land use and development outside the park will increase as the surrounding areas continue to be developed. Staff review of permit requests to agencies such as the SRWMD will help in monitoring such threats. District biologists will address any proposed development that may cause adverse impacts to water resources within the park and will make appropriate comments pursuant to Chapter 120, Florida Statutes.

Residential wells adjacent to the park showed unacceptably high levels of nitrate contamination (>10 ppm) when tested in 1984. The nitrates were perceived to have originated from a cattle feedlot adjacent to the park's eastern boundary, possibly from runoff or percolation of fertilizers. Wells located within the park did not show high levels of nitrates when tested in 1984 and again in 1989. The spring boil, located approximately 1.5 miles from the feedlot, did not test high in nitrates either. The feedlot ceased operation in 1995 in response to concerns expressed by the Florida Department of Environmental Protection. Currently the former feedlot is utilized for intensive crop production, however limerock mining was recently proposed for the site. Potential impacts to park resources that might result from activation of a mine at this site are not clearly defined. The close proximity of the proposed mine to the park, the karst terrain, and the extensive cave and conduit system connected to Manatee Spring, are causes for concern. There is a high likelihood that subsurface connections exist between this site and the spring, and the prospect for negative impacts on the park should be thoroughly addressed before issuance of permits for any mining activities at this site.

Water quality threats to the spring and spring run from runoff within the park will be clearly defined and addressed. Currently, storm water runoff from impervious surfaces in the park is captured in swales and shallow ditches and routed both to and away from the spring, spring run and floodplain. The location of cultural resource sites in these areas presents a challenge to designing more effective storm-water treatment systems. Park management currently plants and encourages the growth of groundcover vegetation as a primary storm-water treatment method in areas of concentrated runoff. One source of runoff that cannot be attenuated or treated is the old boat ramp located on the south side of the spring run, just below the designated swimming area. Since two additional boat ramps exist at the park's north and south boundaries, and since boat traffic is prohibited in the spring run, this boat ramp should be removed and the area restored to decrease runoff.

Erosion regularly occurs in the swimming area, both on the north and on south banks of the

spring and spring run. Aquatic vegetation in this area is limited to places that are inaccessible to visitors. Foot traffic is minimized on the south side of the spring using bulkheads and access steps, however the rock substrate is exposed at access points because the shallow water depths allow visitors to stand and walk on the spring bottom. A shallow beach on the north side of the spring, utilized as a swimming area for children, was repeatedly refilled with beach sand before the 1990s. This area continues to erode and degrade the spring run. Efforts to stabilize the beach sand are compromised by a parallel commitment to protect the cultural resource site in the area. Restricting boat access in the spring and spring run, improving visitor access points to the water, and allowing natural vegetation to recover along the shoreline have helped to reduce human-induced bank erosion along the spring run. Division staff will continue to explore and implement measures to minimize erosion and visitor use impacts in high use areas.

Erosion is also a concern in the Hickory Campground area. The campground was designed and constructed long ago with little consideration given to treatment or attenuation of runoff. Runoff from the access drive and from many of the campsites carries sediments directly into two sinkhole ponds, which are hydraulically connected to the main spring. Park personnel have attempted to redirect runoff by building up the campsites, however the natural topography of the area and the proximity of the road and campsites to the sinkhole ponds make it impossible to control runoff effectively with these measures. Attenuation and treatment of runoff from the entire campground site, as well as adequate buffer protection of the sinkhole ponds, will be addressed. Redesign and reconstruction alternatives will be considered, including relocation of the campground and restoration of its current site.

Water quality in the spring system may also be adversely affected by existing septic systems within the park. Research is underway to evaluate the effectiveness of standard septic systems within a karst environment (Hooks 2001). Soil porosity and the conduits and fractures associated with areas of karst geology suggest that natural connections may exist between subsurface septic systems and the aquatic cave and spring systems. The implications of such connections if they exist are obviously negative. Two large septic systems are located in extremely close proximity to the spring and conduit system. The possible contamination of the springs from these septic systems will be addressed, and if they are found to have detrimental impacts, their removal will be prioritized.

A final area of concern is the hydrologic disruption resulting from historic land management activities. Natural sheet flow and overland flow have been disrupted in several areas of the park by the construction of fill roads that have inadequate surface water conveyance structures. These roads will be identified and removed if obsolete, or they will be redesigned and retrofitted to restore a more natural conveyance of surface waters.

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.

Four fire-dependent natural community types occur within the park: sandhill, upland pine forest, scrubby flatwoods, and depression marsh. Other natural communities may also be affected to some extent by fire, particularly when they border a fire-maintained community type.

In general, the upland communities are topographically segregated, with the sandhills occurring at higher elevations and the upland pine forest occurring at slightly lower elevations. The scrubby flatwoods community also often occurs at the lower elevations. The transition from one community type to another is usually quite gradual and indistinct, however. As a result, adjacent upland communities are often burned at the same time. Subtle differences in fire behavior factors such as fuel moisture, continuity, and composition determine which communities will carry fire on any given prescribed burn.

Zones 1 and 2 are located north of the park drive and are dominated by sandhill and upland pine forest. Scrubby flatwoods, upland pine forest, and sandhill are all found within Zone 3, located south of the park drive. Zone 5 is located within the Mead-Scott tract and the fire-maintained areas are primarily scrubby flatwoods. Zone 4 contains no fire-maintained areas and includes the spring-run and main spring.

The local park staff will coordinate with local Division of Forestry staff in development of a plan that addresses wildfire suppression within the park boundaries. The wildfire suppression plan may contain an element regarding rehabilitation of fire plow lines or other similar impacts of fire suppression.

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.

Currently no species-specific management program exists for the park; however, the need to manage the spring run properly to provide a refuge for manatees is noted in other sections of this plan. While manatees are protected by law wherever they are found, manatees seeking refuge within the park are afforded the added benefit of enforcement of manatee protection laws by park staff and volunteers. Harassment or inadvertent disturbance of manatees by park visitors is discouraged, and visitors are given the opportunity to learn about manatee protection through educational kiosks and informal discussions with park staff. The year-round prohibition of motorized boat traffic in the spring run adds another dimension of protection, preventing possible conflicts between boats and visiting manatees. Closure of the spring run to all watercraft from December 1 through March 31 provides manatees with unfettered access to one of the few warm water refugia on the lower Suwannee River.

In addition to the spring and spring run, the park has jurisdiction over sovereign submerged lands of the Suwannee River within 400 feet of the park boundary. This authority may be exercised to enforce park rules within that area to provide additional protection for manatees near the park boundary. Consideration should be given to designating a no-wake or reduced speed limit zone within this area for manatee protection.

Staff and volunteers currently record all manatee sightings within or adjacent to the park, tracking individual manatees using sketches or photographs of distinguishing markings. Collection and reporting of this information is coordinated with the USGS Sirenia Project, and the information is shared with FFWCC Bureau of Protected Species Management and the SRWMD. Division staff will work with the USFWS and FFWCC to assess the need for additional protective measures for manatees, such as seasonal restrictions for certain recreational uses.

To protect sensitive fauna, effective management of the cave systems must include regular

assessments of both natural and human impacts. Cave diving activities should be monitored to determine if there are any negative impacts on the cave fauna. The cave diving community should be educated about the vulnerability of cave fauna to human disturbance, whether deliberate or incidental. In addition, divers should be warned not to collect cave creatures for exhibition in aquaria. Any genuine effort to preserve the cave system and its inhabitants must include long-term protection of the sources of Manatee Springs. Protection of the recharge area for the springs is especially vital.

Another designated species, the Suwannee cooter, inhabits both the spring-run stream and blackwater river communities. As with the gopher tortoise, humans have often exploited the Suwannee cooter as a food source. Protection of these species from human exploitation is critical to their survival.

Designated species that occupy terrestrial portions of the park include the gopher tortoise and Sherman's fox squirrel. These species are gradually losing their natural habitat due to the region's history of fire suppression over the past sixty or more years. A continuation of the restoration of the fire-maintained communities within Manatee Springs State Park would greatly benefit these designated species, as well as many others. The scrubby flatwoods, believed to be occupied by a population of scrub jays, will be managed with prescribed fire to make the habitat suitable for scrub jays once again. Additional management strategies for scrub jays are anticipated in a forthcoming resource management evaluation for scrub jays at Manatee Springs.

Now, human activities do not appear to have affected designated plant species within the unit. However, populations of designated plants should be surveyed and mapped so that any future development in the park will avoid those sites. Proper natural systems management, including the use of prescribed fire and the maintenance of natural hydroperiods in wetland areas, should suffice to preserve these species.

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.

Relative to other parks in north Florida, Manatee Springs has few problems with exotic plants. Two aquatic weeds, hydrilla (*Hydrilla verticillata*) and water lettuce (*Pistia stratiotes*), have comprised the bulk of the exotics problems to date. Water lettuce is still present in two of the sinks near the headspring, although it is removed with volunteer labor on a yearly basis. These efforts, with the goal of eventual eradication, should continue. Hydrilla is not presently a major problem in the spring run (see *spring-run stream* in the *Natural Communities* section above). Due to unanticipated levels of manatee use of the spring run in the winter of 2000-2001, all aquatic vegetation, both native and exotic, has been denuded. District biologists and park staff are monitoring the recovery of vegetation in the run and will recommend appropriate action to prevent re-colonization of the run by hydrilla. Alligator weed (*Alternanthera philoxeroides*) is present, but not common or frequent in floodplain swamps (Gulledge 1999).

Upland invasive exotic plants are minimally present at Manatee Springs. One of the few remaining, upland invasive exotic plants documented within the park is paper mulberry (*Broussonetia papyifera*). Its distribution will be mapped and the population will be treated with herbicide as needed. A few mimosas (*Albizia julibrissin*) persist in the uplands, especially in the Springside-at-Manatee tract, a recent addition to the park. These will also be

treated. District biologists and park staff will continue to monitor the park for other invading exotics. A survey of the riverbanks for Japanese climbing fern (*Lygodium japonicum*) will be conducted, as it is a common noxious weed upstream on the Suwannee River.

Exotic animals found within the park include feral hogs and cats. Feral hogs cause significant damage to resources in many areas of the park. While their numbers vary from season to season, evidence of hogs is apparent throughout the park, and rooting by the hogs has undoubtedly caused problems for ground-nesting animals and forest floor dwellers, as well as for ferns and other plants in wetlands and along wetland edges. Feral hog control within the park follows Division guidelines. Recent public criticism of the feral hog removal program has prompted park and District staff to search for publicly acceptable ways to control hog populations. Hog removal will continue to be a management priority for the park.

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.

Since the park's swimming area encompasses the upper part of the spring run and the main spring, alligators occasionally invade the area. Permanently installed signs that provide information about alligators should suffice to warn the public of potential conflicts between alligators and visitors who are enjoying recreational activities in the park. Visitors who are canoeing on the spring run or adjacent areas of the Suwannee River may also interact with alligators. If a problem alligator is reported, Division guidelines are followed. If deemed necessary, the FFWCC is contacted and a request is made to have the individual problem animal relocated or removed.

Occasionally, gray squirrels that have become habituated to handouts from visitors become pests in the camping and picnic areas. To alleviate such problems when they occur, gray squirrels may be trapped in visitor use areas and then released in more remote areas. During campsite registrations and interpretive programs, visitors are informed about the importance of not feeding squirrels or other animals so that they do not become nuisances.

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.

Most of the known cultural resources within the park appear to be in fair condition, and given adequate protection, will remain so. The lack of adequate information about the location and extent of cultural sites in the park is a management concern. Inadvertent disturbance of cultural sites is probable if site locations and extents remain unknown.

Unfortunately, the headspring, the area of highest visitor use and greatest development, is also potentially one of the more significant archaeological sites in the park. Any future development near the headspring will need to be conducted with the minimum amount of soil

disturbance possible, especially in areas that have not previously been developed or disturbed. Likewise, the preservation of cultural resources in the park as a whole will be given a high priority when planning and implementing future enhancement of recreational facilities, resource management, interpretation, and protection.

Management staff will inspect each identified cultural resource site yearly to monitor changes and to record activities that may affect the resource. Notes and incident reports recorded for a site will be placed in the appropriate park resource file.

The park will continue to maintain files pertaining to recorded cultural resources. File organization will follow the guidelines developed by the Bureau of Natural and Cultural Resources. Information pertaining to cultural resources such as photographs, yearly condition assessments and FMSF. will be included in these files, which will be considered permanent resource management files and will not be scheduled for disposal.

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. Define the recharge area for Manatee Springs.
2. Identify connections between karst features located outside the park and conduits and springs found within the park.
3. Determine minimum flows and levels for Manatee Springs.
4. Assess the function and effectiveness of septic systems within the park.
5. Complete baseline inventories of flora and fauna in the spring and cave systems.
6. Locate and compile records of reptiles, amphibians and mammals collected within the park, and add these records to the park species lists.
7. Survey and record herpetofauna and mammal species which occur in the park.

Cultural Resources

1. Conduct a phase I archaeological survey of the entire park and a phase II survey of selected known sites in high-use areas of the park.
2. Identify and document historic period sites and the signatures of past land uses.

Resource Management Schedule

A priority schedule for conducting all management activities that is based on the purposes for which these lands were acquired, and to enhance the resource values, is contained in Addendum 6. Cost estimates for conducting priority management activities are based on the most cost effective methods and recommendations currently available (see Addendum 6).

Land Management Review

Section 259.036, Florida Statutes, established land management review teams to determine whether conservation, preservation, and recreation lands titled in the name of the Board of Trustees of the Internal Improvement Trust Fund (board) are being managed for the purposes for which they were acquired and in accordance with a land management plan adopted pursuant to s. 259.032, the board of trustees, acting through the Department of Environmental Protection (department). The managing agency shall consider the findings and recommendations of the land management review team in finalizing the required update of its management plan.

Manatee Springs State Park was subject to a land management review on February 4, 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, were in compliance 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 the park's interaction with other facilities.

Manatee Springs State Park is located within Levy County, about six miles west of Chiefland in the north central part of the state. The populations Levy and the adjacent Dixie, Gilchrist, Alachua, Marion, and Citrus counties have grown 32 percent since 1990, and are projected to grow an additional 22 percent by 2010 (BEBR, University of Florida, 2000). As of 2000, 18 percent of residents in these counties were in the 0-14 age group, 40 percent in the 15-44 age group, 23 percent in the 45-64 age group, and 19 percent were aged 65 and over, which reflects the state average for these groupings (BEBR, University of Florida, 2001). Nearly 650,000 people reside within 50 miles of the park, which includes the cities of Chiefland, Cross City, Gainesville, Crystal River, Williston, and Ocala (Census, 2000).

Manatee Springs State Park recorded 129,149 visitors in FY 2002-2003. Park visitation has been stable over the last five years. By DRP estimates, these visitors contributed $4,790,659 in direct economic impact and the equivalent of 96 jobs to the local economy (Florida Department of Environmental Protection, 2003).

Existing Use of Adjacent Lands

Manatee Springs State Park is located in Levy County, west of the city of Chiefland. Entrance to the park is from State Road 320 or by boat from the Suwannee River. Most of the adjacent property to Manatee Springs State Park consists of low-density residential development. A Golf Course and Country Club and a trailer park are located directly east of the state park entrance. The Suwannee River forms the western boundary of the park.

Significant recreational opportunities exist along the Suwannee River corridor north and south of the park. Public lands including the Nature Coast Trail State Park, Andrews Wildlife Management Area, Fanning Springs State Park, and the Lower Suwannee National Wildlife Refuge exist within a short driving distance of Fanning Springs. Camping, hiking, swimming, picnicking, bicycling and hunting are the main recreational pursuits on these public lands. On the west, the park is defined by the Suwannee River, which is heavily used for recreational boating, fishing and personal watercraft. The SRWMD owns several tracts of land along the river including the Mead-Scott tract that is leased by the Division. With Manatee Springs acting as a destination along the Suwannee River Wilderness Trail, an increase in recreation on the river as well as in the park is expected.

Planned Use of Adjacent Lands

It is anticipated that residential development around the park will continue in response to population growth in the area. The land surrounding Manatee Springs State Park is zoned as rural low-density agriculture residential that limits housing to one dwelling unit per 10 acres (Levy County Comprehensive Plan, 1999). Manatee Springs itself is zoned as a natural reservation. Potential impacts from future development include declines in local surface and subsurface water quality, an increase in local traffic and loss of any remnant natural areas that are not in public ownership.

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

Within Manatee Springs State Park’s 2,443 acres exist an array of Florida’s native natural communities. These natural communities include bottomland forest, floodplain forest, floodplain swamp and sinkholes. These communities are particularly sensitive to recreation activities. The sinkhole community is an excellent feature for interpretation, but the steep slopes associated with this community must be protected from inappropriate use. The majority of the present development in the park is concentrated in areas around Manatee Springs, occupied by upland mixed forest and xeric hammock. These areas provide scenic, shady locations for numerous recreational activities.

Water Area

The two most important water features of the unit are Manatee Springs, a first magnitude spring, and the Suwannee River. Recreational activities are centered on the developed swimming area in the spring, boating, and fishing activities along the spring run and the Suwannee River. SCUBA diving is permitted in both the main springs and Catfish Hotel, a wet sinkhole. A boardwalk along the 1,250 linear foot spring run provides user access through the floodplain area to the edge of the Suwannee River.

Shoreline

The total shoreline of Manatee Springs Run totals 2,500 linear feet, and is not considered a main recreational resource for the park. The shoreline of the Suwannee River included in the unit boundary totals another 18,200 linear feet and is primarily accessed by boat, canoe or kayak.

Natural Scenery

Manatee Springs, the spring run and the Suwannee River are the primary visual resources of the park. The boardwalk along the spring run provides access to the run and the river as well as the adjacent floodplain swamp for nature study and scenery appreciation. The upland mixed forest and xeric hammock communities that house the existing recreational development also provide scenic attractions.

Significant Wildlife Habitat

The waters of this unit are an important resource for the endangered West Indian Manatee. The upland communities are critical for the various species identified in the resource component of this plan.

Natural Features

The outstanding natural features of the park are the main spring, the adjacent sinkholes, and an underground cavern system. Interpretation of this area's karst topography is an important aspect of the visitors' experience at the park. Based on the quality and volume of its flow and its aesthetic qualities, the spring has been designated a National Natural Landmark by the United States Department of the Interior (DOI).

Archaeological and Historical Features

The Florida Master Site File (FMSF) lists seven sites within the park. Because it contains a first magnitude spring and borders the Suwannee River, an important transportation corridor and productive river, Manatee Springs State Park is likely to contain additional important historical and archaeological sites. However, no comprehensive cultural resource survey has been performed in the park, so the true extent of cultural resources there remains unknown.

Assessment of Use

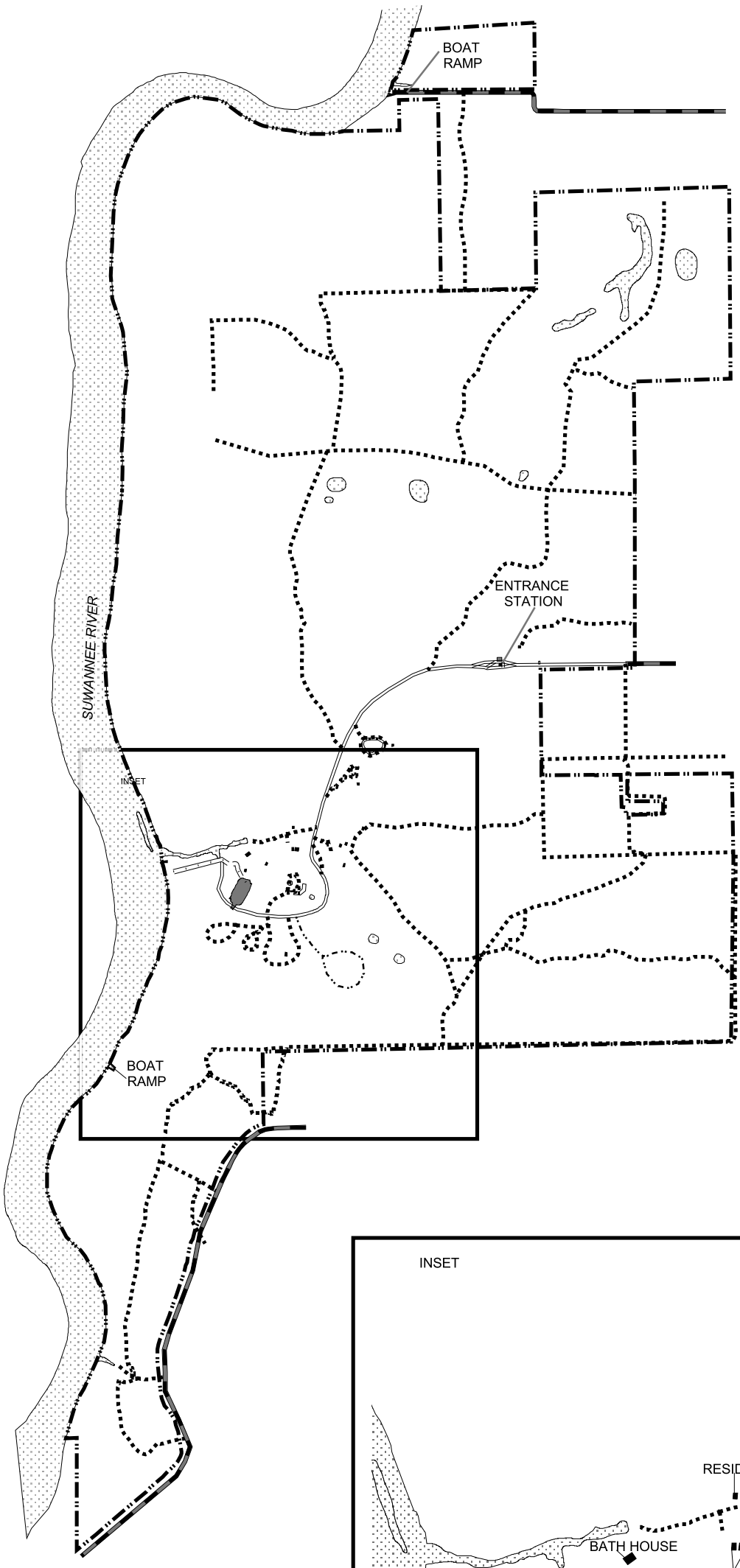
All legal boundaries, significant natural features, structures, facilities, roads, trails and easements existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

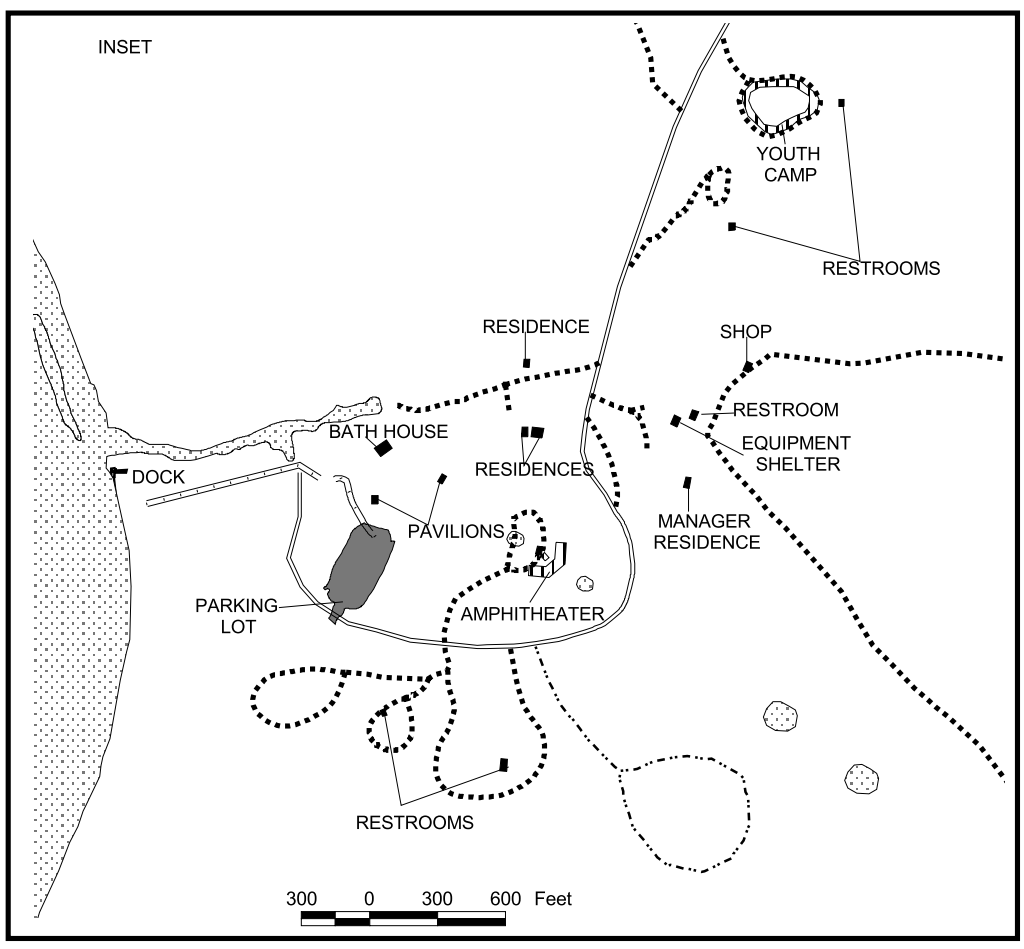
Past Uses

The land surrounding Manatee Springs has long been utilized as a major natural and cultural resource. The springs, spring run and surrounding forest were utilized by the area's prehistoric Indian population as hunting and fishing resource. William Bartram's visit indicates that the spring run has been an attraction to travelers in the area since Florida's earliest European visitors arrived. Evidences of past human activities and historic features include a possible old mill site as well as an old moonshine still site. Scattered turpentine trees and cypress stumps remind us of the timbering industry that once thrived along the banks of the Suwannee. It is also notable that a commercial fisherman once lived above the main spring and evidence of this, such as two fig trees purportedly planted by him, remain today. Following the timbering and fishing eras, much of the land surrounding Manatee Springs was in private ownership and, prior to the state's acquisition of the park in the 1940s, it was used as a private hunt camp.

Recreational Uses

The recreational activities available at this unit include swimming, fishing, camping, diving, canoeing, hiking, bicycling and nature study. A small boat ramp is available on the





LEGEND
- Park Boundary
- Walkways
- Hiking Trail
- County Road
- Park Road Paved
- Park Road Unpaved
- Sate Road
- Structures
- Special Use Areas
- Parking Lots
- Water Bodies
- Marine Structures

1000 0 N 1000 2000 Feet

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

MANATEE SPRINGS STATE PARK

BASE MAP

Mead-Scott tract (Usher boat ramp), which is managed by the state park, and a second boat ramp (Clay Landing boat ramp) on an easement at the north end of the park is managed by Levy County. Within the Manatee Springs run, motorized boating is prohibited at all times and all watercraft is prohibited during the winter months (December through end of March) for manatee protection.

Other Uses

The boat ramp located within the northern part of the park is located on an easement from the Trustees to Levy County, and managed by the County.

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 Manatee Springs State Park, all wetland communities, including the spring run stream and the sinkhole communities, scrubby flatwoods, sandhill and upland pine communities have been designated as protected zones as delineated on the Natural Communities Map.

Existing Facilities

Recreation Facilities

Picnic shelters (2)
Camping area (92 sites)
Primitive youth camps (2)
Canoe launch
Concession building
Floating dock
Hiking/Bicycling trails (8.5 miles)
Hiking/Nature trail (0.6 miles)
Boardwalk
Amphitheater
Boat ramps and shelter (2)

Support Facilities

Residences (3)
Ranger station
Shop complex
Restrooms
Bathhouses (3)
Headsprings parking area (166 spaces)
Trailhead (10 spaces)
Volunteer camping sites (5)

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 (CLUP)}. 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.

SUWANNEE RIVER

PARK ENTRANCE STATION & OFFICE

RV PULLOFF AREA

SEE ENLARGEMENT

USHER BOAT RAMP ROAD IMPROVEMENTS

LEGEND

- Proposed Road
- Protected Zone
- Proposed Facilities
- Proposed Camping Area
- Camping Area
- Road Reconfiguration
- Park Office
- Entrance Station
- Park Boundary

MANATEE SPRINGS STATE PARK
CONCEPTUAL LAND USE PLAN
SHEET 1 OF 2

N

2000 0 2000 Feet

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

HEADSPRINGS IMPROVEMENTS

* CANOE/KAYAK LAUNCH
* BOAT RAMP REMOVAL
* ROAD RECONFIGURATION
* SIDEWALK ADDITION
* LANDSCAPING & RESTORATION

CONCESSION BUILDING REMOVAL

PICNIC AREA

CONCESSION BUILDING RECONSTRUCTION

PARKING LOT

HICKORY CAMPING LOOP RENOVATIONS

* SITE RECONFIGURATION
* BATHHOUSE RENOVATIONS

MAGNOLIA CAMPING LOOP ADDITION

LEGEND

- Boardwalk
- Proposed Facilities
- Camping Area
- Road Reconfiguration
- Protected Zone
- Proposed Camping Area
- Dock
- Park Boundary

MANATEE SPRINGS STATE PARK
CONCEPTUAL LAND USE PLAN
SHEET 2 OF 2

400 0 N 400 Feet

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

Stormwater management systems are designed to minimize impervious surfaces to the greatest extent feasible, and all facilities are designed and constructed using best management practices to avoid impacts and to mitigate those that cannot be avoided. Federal, state and local permit and regulatory requirements are met by the final design of the projects. This includes the design of all new park facilities consistent with the universal access requirements of the Americans with Disabilities Act (ADA). After new facilities are constructed, the park staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses and Proposed Facilities

Manatee Springs State Park has been a provider of recreational opportunities in the north central region of Florida since the 1940s. As Florida's first springs state park, the mission of Manatee Springs State Park has revolved around the provision of recreation as well as the protection of the springs system. Recreation has been and is largely based around the spring and the Suwannee River. It includes activities such as swimming, hiking, nature observation, diving, camping, and picnicking, all of which should be continued. While recreation continues to flourish, Manatee Springs has become increasingly important as a manatee refuge and as such, measures to protect the spring and other natural resources at the park have become more important and necessary. Many of the changes to this park are recommended because of the increased importance of natural resources conservation at Manatee Springs State Park.

Recreation Facilities

Concession building reconstruction. The old concession building is insufficient, outdated, located in the floodplain, and is in an area where there is a lot of erosion near the headsprings. It is proposed that the building be torn down and a new one constructed. The new concession building should be located near the north end of the parking lot. It is envisioned that the new one should be of a cracker style and measure approximately 1500 square feet. The building should include a small kitchen and gift shop, an interpretive area and a bathhouse. A cultural resources survey should be conducted prior to construction. The site of the old concession building should be replanted with native vegetation.

Canoe/kayak launch. The former springs boat ramp has been used as a canoe launch for several years. It is recommended that the concrete from the launch be removed and that the road leading to the launch be rerouted in order to stop the flow of stormwater into the spring. A canoe/kayak launch should be constructed in the area just to the northeast of the current ramp. Restoring the adjacent spring shoreline and roadbed to its natural state is recommended. Parking and a circular drop-off area should be located south of the current area as shown on the CLUP.

Hickory camping loop renovation. The Hickory camping area is in need of renovation because its location, near two sinkhole ponds that are hydraulically connected to the main spring, has caused much erosion and runoff into the spring system. Attempts have been made in the past to minimize the erosion and runoff; however, these attempts have had little impact. It is recommended that the number of sites within the area be reduced from 23 sites to 10 and that these sites be located as far away from the sinkhole ponds as possible (Note: the total number of campsites in the park will actually be increased by 2 when viewed with the Magnolia camping loop addition). The bathhouse also is in need of major renovations in order to bring it up to current Division standards. The current septic drain field is located in proximity to the spring's main conduit and the underwater cave system, which poses a potential threat to water quality in the cave and spring systems. To remedy this, money has already been allocated by the Division for the relocation of the drainfield across the main park road where it will be positioned to receive the wastewater

from both the Hickory loop as well as the proposed Magnolia loop addition. Ultimately, all septic systems within the park should be connected to a public water treatment facility as soon as possible after such a facility becomes available. It is also proposed that this camping area, upon the addition of a third Magnolia camping area loop, be converted to a group camp.

Magnolia camping loop addition. A 15 site modern camping loop should be constructed in the area between the current camping loops as shown on the CLUP. This new camping loop should be constructed mainly for the use of RVs, with a combination of pull-thru and back-in sites of varying size. A new bathhouse should be constructed to accommodate campers. Sites towards the back of the Magnolia One camping area should be converted to a tent or pop-up only area because of the smaller size of the sites and the low level of tree clearance. The bathhouses in the two older loops also need to be renovated to meet current Division standards.

Interpretive exhibit upgrades. Interpretation is a major focus of the Florida State Park system. Upgraded interpretive panels and information are needed at sites near the headsprings, along the boardwalk and on the floating dock, in the camping areas, and along various trails within the park. A statement for interpretation has been developed for the park and should be used for this purpose. Some suggested themes for interpretation include the spring system, manatees, rare and endangered species, Leave-no-trace outdoor ethics, karst topography, upland and riverine ecosystems, the Timucuan village site, burial mounds, Native American culture, and commercial fishing.

Support Facilities

Swim area deck repairs. The concrete decking around the swim area is cracking and in need of repair.

Springs boat ramp road reconfiguration. The former springs boat ramp needs to be removed and the road leading to it needs to be reconfigured so that stormwater runoff no longer flows directly into the spring run. As mentioned previously, the area where the ramp is currently should be restored. The road needs to be reconstructed and should contain a circular drop-off and temporary parking area as shown in the CLUP. The parking area should be large enough for 2-4 cars. The area where the current roadbed lies should be replanted and a sidewalk should be constructed that links the drop off with the beach, canoe/kayak launch, and the spring run boardwalk.

Picnic area landscape improvements. The picnic area is suffering from severe erosion. This erosion could affect water quality in the spring system due to the area's proximity to headsprings. Native plants and grasses should be planted in this area to help reverse this trend.

Entrance road RV pull-off area. A five-seven site RV pull-off area needs to be constructed near the park entrance station to help facilitate the flow of traffic into the park.

Usher boat ramp road improvements. The road leading to the Usher boat ramp is in poor condition and too narrow to permit safe passage of boat traffic to and from the ramp. It should be improved and widened where possible. The Division should coordinate with the Suwannee River Water Management District on these improvements.

Facilities Development

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

is collected through the planning and design processes.

Concession building (1500 sq feet)
Canoe/kayak launch
Hickory camping loop renovation
Magnolia camping loop addition/renovation
Interpretive exhibits/signs
Boat ramp road reconfiguration
Medium bathhouse
Swim area deck repairs
Picnic area landscape improvements
Concession building removal
RV pull-off area (5-7 sites)
Stabilized road and parking
Landscaping
Bathhouse renovations
Road improvements/widening

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.

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						
Hiking	60	240			60	240
Bicycling	40	160			40	160
Equestrian						
Picnicking/Swimmin	800	1,600			800	1,600
Boating						
Canoe/kayaking	20	40			20	40
Camping						
Standard	376	376	8	8	384	384
Youth Camp	60	60			60	60
Diving						
SCUBA Diving	18	36			18	36
Cave Diving	12	24			12	24
TOTAL	**1,386**	**2,536**	**8**	**8**	**1,394**	**2,544**

Note: The fishing facilities are assumed to serve the same recreational user base as the picnic area, therefore, no carrying capacity is determined for them.

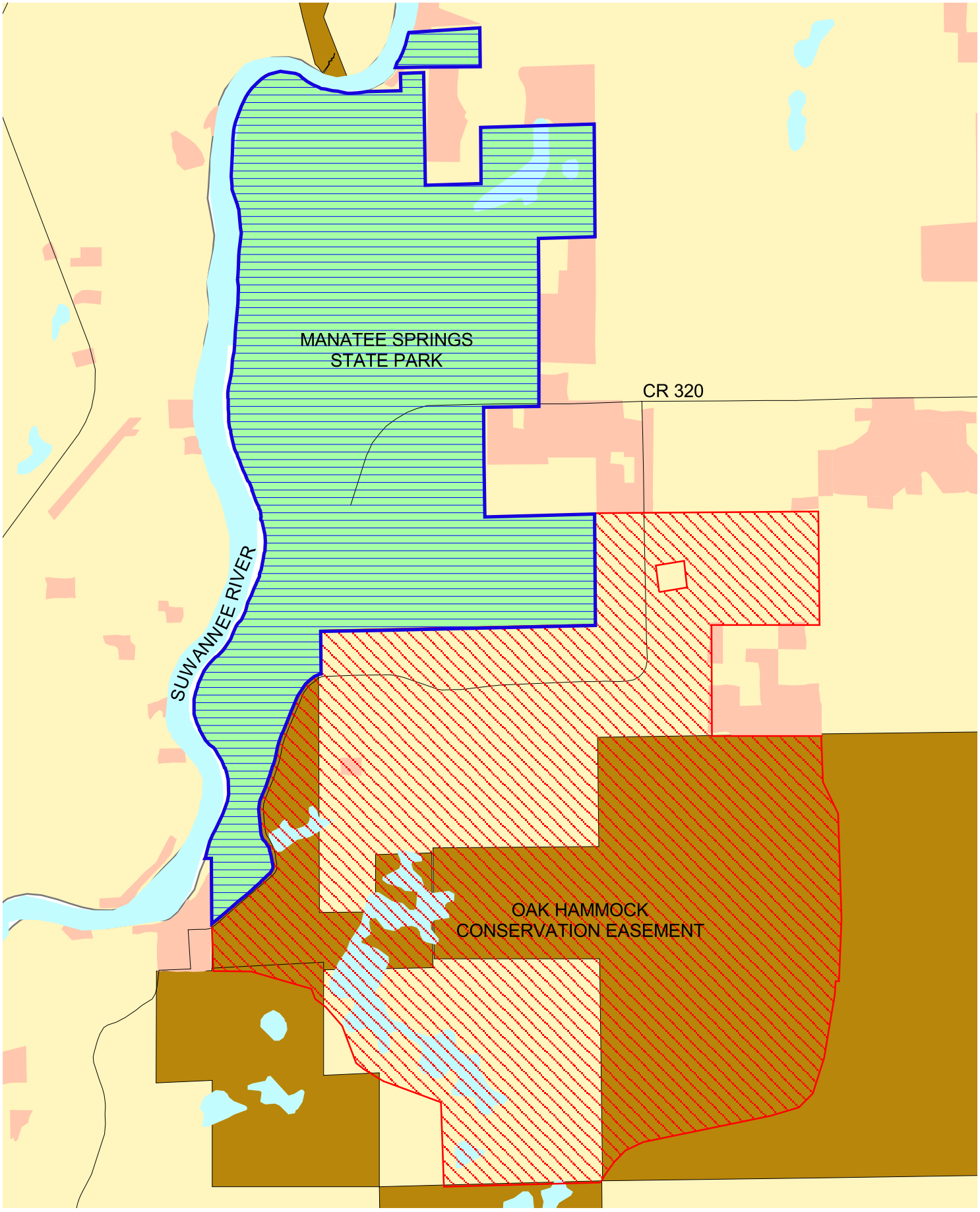
Optimum Boundary

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.

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

Approximately 3,900 acres south and east of the park are recommended for addition to the park to enhance management and conserve desirable resources. A known conduit runs from the headspring in the park onto the recommended lands. These lands also contain wetlands that are suspected to be a recharge area affecting the spring. At this time, no lands are considered surplus to the needs of the park.



MANATEE SPRINGS
STATE PARK

2000 0 N 2000 4000 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 and Advisory Group Information

Purpose and Sequence of Acquisition

The State of Florida acquired Manatee Springs State Park to develop, operate, and maintain the property for outdoor recreation, park, conservation, historic, and related purposes. On January 6, 1949, the State of Florida obtained title the property that constituted the initial area of Manatee Springs State Park. The property was purchased with "Old Money." Since this initial purchase, the State has acquired several additional parcels, through LATF and P2000/A&I programs, and added them to Manatee Springs State Park.

Lease Agreement

January 23, 1968, the Board of Trustees of the Internal Improvement Trust Fund (Trustees) conveyed management authority of the park to the Florida Department of Environmental Protection, Division of Recreation and Parks under Lease No. 2324 for a period of ninety-nine (99) years. In 1988, the Trustees assigned a new lease number, Lease No. 3634, to Manatee Springs State Park without making any changes to the terms and conditions of Lease No. 2324. The new lease expires on January 23, 2067. According to the Trustees lease, the Division manages Manatee Springs State Park only for the development, conservation and protection of natural and cultural resources of the park and for resource-based public outdoor recreation compatible with the conservation and protection of the property.

Title Interest

The Trustees hold fee simple title of Manatee Springs State Park.

Special Conditions On Use

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

Outstanding Reservations

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

Instrument:	Well Monitoring License Agreement
Instrument Holder:	Trustees .
Beginning Date:	January 18, 2002
Ending Date:	10 years from the effective date of the agreement
Outstanding Rights, Uses, Etc.:	The Suwannee River Water Management District will utilize a portion of Manatee Springs State Park to locate, construct, install and operate scientific equipment to conduct water quality and quantity monitoring.

Instrument:	Easement
Instrument Holder:	DRP
Beginning Date:	April 30, 1975
Ending Date:	Coterminous with the term of Lease No. 3634
Outstanding Rights, Uses, Etc.:	The Board of County Commissioners for Levy County will use a portion of Manatee Springs State Park for road right-of-way purposes.

Manatee Springs State Park

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Manatee Springs State Park

Advisory Group Staff Report

The Advisory Group appointed to review the proposed land management plan for Manatee Springs State Park was held at the Capital City Bank conference room, 2012 N. Young Blvd., in Chiefland on December 12, 2003. Mr. Danny Stevens, Ms. Desiree Mills, Mr. Charlie Houder, Mr. George Griffin, Ms. Elizabeth Van Mierop, Mr. Layne Redman, and Mr. Carlton Pierce did not attend. Ms. Annette Long represented both Mr. Svenn Lindskold and Ms. Kathy Cantwell while Mr. Vic Doig represented Mr. Neal Eichholze. All other appointed Advisory Group members were present. Attending staff were Sally Lieb, Susanna Hetrick, and K.C. Bloom.

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. Annette Long stated that her comments were much the same as those she expressed at the public workshop the previous night. She expressed concerns about the cave divers inadvertently effecting the sensitive cave environment and that the Cave Diving section of the National Speleological Society is working on some signage to address these concerns. She also stated that the cave divers and The Nature Conservancy may partner together to buy some of the more sensitive optimum boundary parcels that are located above the spring conduit. **Ms. Long** stated that both **Mr. Lindskold** and **Ms. Cantwell** were happy with the plan and applauded the park's efforts to deal with both the drainfields and the campground issues as they relate to the proximity to the sinkholes.

Mr. Don West discussed the value of using low water crossings vs. culverts when fixing the park roads. He suggested that it might be valuable to thin the loblolly stands to prevent future southern pine beetle infestations.

Mr. Vic Doig provided that the park was doing a great job in trying to protect the water quality of the springs. He suggested that more be done about the algae problem in the spring run but also stated that some of the problem is based outside the park and is beyond the scope of the Park Service**. Mr. Doig** stated that the manatee protected zone that has been placed on the river is a great improvement for the protection of the manatees. He felt that the species and plant list were excellent but that the herp and mammal lists could be increased. He suggested contracting with a university to get some of the inventory done. **Mr. Doig** also felt that a continued emphasis on burning was important as well. He stated that DEP is part of the Prescribed Fire Working Group so help is available to the park. **Ms. Hetrick** provided an overview of the some of the problems related to the spring system. She described the steps that it took to implement the manatee protection zone as well as stated that the park is working on catching up on its burning back-log. **Ms. Lieb** responded that the park will be in touch with the working group for additional burning help.

Ms. Lynetta Griner asked what was being done regarding the feral hogs at the park**. Ms. Lieb** replied that the park was attempting to hire a good contractor to help assist with their removal. She also stated that the park removed approximately 40 hogs last year alone. **Ms. Griner** also stated that Usher boat ramp is not located on the base map. **Ms. Bloom** responded that it would be included in the next version of the plan. **Ms. Griner** expressed concerns that the access road to that boat ramp is in poor condition and too narrow. **Ms. Lieb** explained that the boat ramp is

on property that the park leases from the Suwannee River Water Management District (SRWMD) and that any solution would require cooperation from the two agencies. **Ms. Griner** replied that she had talked with officials with the SRWMD and they said that they would look into it. She continued that the Clay Landing boat ramp, on the park's northern boundary, has already been improved and that the park should try to promote it more through various medium and better signage.

Mr. Ed Smith expressed support for the plan and stated that he supported adding on to the plant and animal lists. He stated that the park staff was doing a great job and that eventually the city would like the park to link to its sewer system.

Mr. Lannie Cardona stated that the plan was very well developed. He continued that once something was done to improve the Usher boat ramp, the County could help with some signage. **Mr. Cardona** stated that the county would like to work with the park in terms of regional promotion.

Mr. Mark Long provided that he supported the plan as well as the statements given in the advisory group. He thinks there are a lot of positive improvements being made at the park.

The meeting was then adjourned.

Staff Recommendation

A number of excellent discussions took place during the Advisory Group meeting. With minor revisions, including the recommended improvements to Usher boat ramp, staff recommends approval of the management plan as submitted.

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Addendum 3—Soils Descriptions

(2) Tavares fine sand, 1 to 5 percent slopes - These Tavares soils are moderately well drained and very deep occurring on sandy uplands. These nearly level to gently sloping soils have very dark grayish brown fine sands in surface layers extending to a depth of about 7 inches. The underlying fine sand is brown to a depth of 41 inches, pale brown to 58 inches and white to 80 inches.

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

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

(15) Holopaw-Pineda complex, frequently flooded - This complex consists of poorly drained, very deep Holopaw and Pineda soils. These nearly level, frequently flooded soils are on the floodplains of rivers and creeks. Typically, the surface layer of the Holopaw soil is very dark gray fine sand, and is about 3 inches thick. The subsurface layer extends to a depth of about 60 inches. It is light brownish gray fine sand to a depth of about 50 inches, and a pale brown fine sand below that. The subsoil layer extends from a depth of 60 inches to beyond a depth of 80 inches. It is gray sandy clay loam. Typically, the surface layer of the Pineda soil is black fine sand, and is about 4 inches thick. The subsoil layer is brown fine sand and extends to a depth of about 14 inches. The underlying material extends to a depth of about 35 inches. It is light gray fine sand to a depth of about 28 inches, and white fine sand below that. A loamy subsoil layer extends from a depth of 35 inches to a depth of about 52 inches. It is light gray fine sandy loam. The underlying material extends to a depth beyond 80 inches. It is gray fine sand.

(16) Chobee-Gator complex, frequently flooded - This complex consists of very poorly drained, very deep Chobee and Gator soils. These nearly level, frequently flooded soils are on floodplains of rivers and creeks. Typically, the surface layer of the Chobee soil extends to a depth of about 19 inches. It is dark brown muck in the upper 3 inches, and very dark gray fine sandy loam below that. The subsoil is dark gray sandy clay loam, and extends to a depth of about 42 inches. The underlying material is gray loamy fine sand, and extends to beyond a depth of 80 inches. Typically, the surface layer of the Gator soil is black muck, and extends to a depth of about 26 inches. The underlying material extends beyond a depth of 80 inches.

It is very dark gray fine sandy loam to a depth of about 40 inches, gray sandy clay loam to depth of about 52 inches, and light gray fine sand below that.

(17) Adamsville fine sand, 0 to 5 percent slopes - This soil type is somewhat poorly drained and very deep occurring on low ridges and knolls. The surface layer of these nearly level to gently sloping soils are dark gray fine sand, extending to a depth of about 14 inches. The underlying material is fine sand extending to a depth of 80 inches. These sands are grayish brown to a depth of 32 inches, pale brown to a depth of 43 inches, light gray to 70 inches, and white below.

(27) Placid and Popash soils, depressional - This unit consists of very poorly drained, very deep Placid and Popash soils. These nearly level, ponded soils are on depressions that are within areas of flatwoods or on marsh prairies. Typically, the surface layer of the Placid soil is black fine sand, and is about 22 inches thick. The underlying material extends beyond a depth of 80 inches. It is dark gray fine sand in the upper 16 inches, and light brownish gray fine sand below that. Typically, the surface layer of the Popash soil is very dark gray fine sand, and is about 12 inches thick. The subsurface layer extends to a depth of about 45 inches. It is a mixture of dark grayish brown and grayish brown fine sand to a depth of about 20 inches, grayish brown fine sand to a depth of about 30 inches, and light brownish gray fine sand below that. The subsoil extends from a depth of about 45 inches to beyond 80 inches. It is dark gray sandy clay loam.

(29) Chobee-Bradenton complex, frequently flooded - This complex consists of very poorly drained, very deep Chobee soils, and poorly drained, very deep Bradenton soils. These nearly level, frequently flooded soils are on floodplains of rivers and creeks. Typically, the surface layer of the Chobee soil extends to a depth of about 11 inches. It is black fine sandy loam in the upper 7 inches, and very dark gray fine sandy loam below. The subsoil layer extends to a depth of 48 inches. It is dark gray sandy clay loam with common pockets of soft calcium carbonate accumulations in the upper 26 inches, and gray sandy clay loam below that. The underlying material is greenish gray fine sandy loam to a depth of about 72 inches, and dark gray fine sand below. Typically, the surface layer of Bradenton soil is black fine sand, and is about 4 inches thick. The subsurface layer is light brownish gray fine sand extending to a depth of about 9 inches. The subsoil layer extends to a depth of about 28 inches. It is dark grayish brown sandy clay loam in the upper 9 inches, and grayish brown fine sandy loam below that. The underlying material extends from a depth of about 28 inches to beyond a depth of 80 inches. It is white calcareous fine sandy loam to a depth of about 32 inches, strong brown loamy fine sand to a depth of about 48 inches, and light gray fine sand below that.

(31) Jonesville-Otela-Seaboard complex, 1 to 5 percent slopes - These moderately to well drained soils vary in depth from shallow Seaboard soils to moderately deep Jonesville soils to very deep Otela soils. All of these soils are nearly level to gently sloping and occur on karst uplands. Typically, the surface layer of the Jonesville soil is gray fine sand, and is about 5 inches thick. The subsurface layer extends to a depth of 27 inches and is pale brown fine sand in the upper 9 inches and very pale brown fine sand below that. The brownish yellow sandy clay loam subsoil extends to the limestone bedrock at 35 inches. The Otela soil has a surface layer of grayish brown fine sand to a depth of 4 inches. The subsurface layer is light gray fine sand to about 22 inches, brownish yellow fine sand to about 40 inches, very pale brown fine

sand to about 50 inches and brownish yellow fine sand to about 58 inches. Otela subsoil is a yellowish brown sandy clay loam that extends to the limestone bedrock at about 66 inches. The surface layer of the Seaboard soil is dark grayish brown fine sand extending to a depth of 8 inches. The underlying material is a pale brown fine sand extending to limestone bedrock at about 17 inches.

(32) Otela-Tavares complex, 1 to 5 percent slopes - This unit consists of moderately well-drained, very deep Otela and Tavares soils. These nearly level to gently sloping soils are on karst uplands. Typically, the surface layer of the Otela soil is dark gray fine sand, and is about 8 inches thick. The subsurface layer extends to a depth of about 68 inches. It is grayish brown fine sand to a depth of about 18 inches, light brownish gray fine sand to a depth of about 30 inches, very pale brown fine sand to a depth of about 35 inches, white fine sand to a depth of about 41 inches, and very pale brown fine sand below that. The subsoil layer extends from a depth of 68 inches to beyond a depth of 80 inches. It is light yellowish brown fine sandy loam in the upper 10 inches, and gray fine sandy loam below that. Typically, the surface layer of the Tavares soil is dark grayish brown fine sand, and is about 9 inches thick. The underlying material is fine sand and extends to beyond a depth of 80 inches. It is grayish brown to a depth of about 18 inches, pale brown to a depth of about 38 inches, very pale brown to a depth of about 48 inches, and white below that.

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

(42)Ousley-Albany complex, occasionally flooded - This unit consists of somewhat poorly drained, very deep Ousley and Albany soils. These nearly level, occasionally flooded soils are on slightly elevated knolls and ridges on flood plains. Typically, the surface layer of the Ousley soil extends to a depth of about 12 inches. It is gray fine sand in the upper 4 inches, and light gray fine sand below that. The underlying material is fine sand and extends to beyond a depth of 80 inches. It is dark brown to a depth of about 18 inches, yellowish brown to a depth of about 28 inches, light yellowish brown to a depth of about 38 inches, pale brown to a depth of about 65 inches, and light gray below that. Typically, the surface layer of the Albany soil is light brownish gray fine sand and extends to a depth of about 6 inches. The subsurface layer is brown fine sand to a depth of about 15 inches, and light yellowish brown fine sand to a depth of about 50 inches. The subsoil layer extends from a depth of 50 inches, to beyond a depth of 80 inches. It is yellowish brown sandy clay loam in the upper 15 inches, and light gray sandy clay loam below that.

Addendum 4—Plant And Animal List

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	LICHENS	
	Bulbothrix confoederata	
	Cladina evansii	
	Cladina subtenus	
	Cladonia peziziformis	
	Heterodermia echinata	
	Heterodermia obscurata	
	Parmotrema gardneri	
	Parmotrema hypoleucinum	
	Parmotrema michauxianum	
	Parmotrema perforatum	
	Parmotrema rampodense	
	Parmotrema rigidum	
	Physcia tribacoides	
	Rimelia reticulata	
	Usnea baileyii	
	Usnea dimorpha	
	Usnea strigosa	
	FUNGI	
	Amanita sp.	
Grisette	*Amanita vaginata*	
Ringless honey mushroom	*Armillariella tabescens*	
Bolete	*Boletus rubellus*	
Small chanterele	*Cantharellus minor*	
	Cantharellus sp.	
Cort	*Cortinarius sp.*	
Fragrant chanterele	*Craterellus odoratus*	
Orange jelly	*Dacrymyces palmatus*	
	Gymnopolis croceoluteus	
	Gymnopolis liquiritiae	
	Entoloma sp.	
Polypore	*Fomitopsis durescens*	
Laccaria	*Laccaria sp.*	
Burnt sugar milky	*Lactarius aquifluus*	
Corrugated cap milky	*Lactarius corrugus*	
Voluminous latex milky	*Lactarius volemis*	
Lentinus	*Lentinus crinitus*	
	Leucocoprinus fragilissimus	
Polypore	*Polyporus sp.*	
Coral	*Ramaria gracilis*	
Purplebloom russula	*Russula mariae*	
False turkeytail	*Stereum ostrea*	
Turkeytail	*Trametes cubensis*	
Turkeytail	*Trametes ectypus*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Turkeytail	*Trametes versicolor*	
Turkeytail	*Tremella fuciformis*	
	PTERIDOPHYTES	
Ebony spleenwort	*Asplenium platyneuron*	
Royal fern	*Osmunda regalis*	31
Resurrection fern	*Polypodium polypodioides*	
Eastern bracken fern	*Pteridium aquilinum*	
Golden polypody	*Phlebodium aureum*	
Wood fern	*Thelypteris sp.*	
Netted chain fern	*Woodwardia areolata*	
Water spangles	*Salvinia minima*	
	GYMNOSPERMS	
Southern red cedar	*Juniperus virginiana*	
Slash pine	*Pinus elliottii*	
Spruce Pine	*Pinus glabra*	
Longleaf pine	*Pinus palustris*	
Loblolly pine	*Pinus taeda*	
Bald cypress	*Taxodium distichum*	
Coontie	*Zamia floridana*	13, 15
	ANGIOSPERMS	
Monocots		
Ticklegrass	*Agrostis hyemalis*	
Bushy bluestem	*Andropogon glomeratus var. pumilus*	
Bluestem	*Andropogon longiberbis*	
Splitbeard bluestem	*Andropogon ternarius*	
Broomsedge bluestem	*Andropogon virginicus var. decipiens*	
Broomsedge bluestem	*Andropogon virginicus*	
Nodding nixie	*Apteria aphylla*	
Tall threeawn	*Aristida patula*	
Arrowfeather	*Aristida purpurascens*	
Virginia snakeroot	*Aristolochia serpentaria*	
Common carpetgrass	*Axonopus affinis*	
Big carpetgrass	*Axonopus furcatus*	
Capillary hairsedge	*Bulbostylis ciliatifolia*	
Bluethread	*Burmannia biflora*	
Sandywoods sedge	*Carex dasycarpa*	
Sedge	*Carex festucacea*	
Limestone meadow sedge	*Carex granularis*	
Long's sedge	*Carex longii*	
Sandspur	*Cenchrus echinatus*	
Slender sandbur	*Cenchrus gracillimus*	
Coastal sandbur	*Cenchrus incertus*	

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Longleaf woodoats	*Chasmanthium laxum*	
Florida jointtail grass	*Coelorachis tuberculosa*	29
Dayflower	*Commelina communis* *	
Whitemouth dayflower	*Commelina erecta*	
String lily	*Crinum americanum*	
Bermuda grass	*Cynodon dactylon* *	
Baldwin's flat sedge	*Cyperus croceus*	
Swamp flatsedge	*Cyperus distinctus*	
Wiry flatsedge	*Cyperus filiculmus*	
Yellow flatsedge	*Cyperus flavescens*	
Epiphytic flatsedge	*Cyperus lanceolatus* *	
Plukenet's flatsedge	*Cyperus plukenetti*	
Manyspike flatsedge	*Cyperus polystachyos*	
Pinebarren flatsedge	*Cyperus retrorsus*	
Nutgrass	*Cyperus rotundus* *	
Strawcolored flatsedge	*Cyperus strigosus*	
Fourangle flatsedge	*Cyperus tetragonus*	
Crowfoot grass	*Dactyloctenium aegyptium* *	
Needleleaf witchgrass	*Dichanthelium aciculare*	
Tapered witchgrass	*Dichanthelium acuminatum*	
Variable witchgrass	*Dichanthelium commutatum*	
Cypress witchgrass	*Dichanthelium dichotomum*	
Cypress witchgrass	*Dichanthelium ensifolium*	
Heller's witchgrass	*Dichanthelium oligosanthes*	
Eggleaf witchgrass	*Dichanthelium ovale*	
Hemlock witchgrass	*Dichanthelium portoricense*	
Roughhair witchgrass	*Dichanthelium strigosum*	
Southern crabgrass	*Digitaria ciliaris*	
Blanket crabgrass	*Digitaria serotina*	
Violet crabgrass	*Digitaria violascens*	
Upright burhead	*Echinodorus berteroi*	
Dwarf burhead	*Echinodorus tenellus*	
Roadgrass	*Eleocharis baldwinii*	
Sand spikerush	*Eleocharis montevidensis*	
Sprouting spikerush	*Eleocharis vivipara*	
Indian goosegrass	*Eleusine indica*	
Greenfly orchid	*Epidendrum conopseum*	31
Elliott's lovegrass	*Eragrostis elliottii*	
Coastal lovegrass	*Eragrostis virginica*	
Centipede grass	*Eremochloa ophiuroides* *	
Fourspike	*Eustachys neglecta*	
Pinewoods fingergrass	*Eustachys petraea*	
Bearded skeleton grass	*Gymnopogon ambiguus*	
Hydrilla	*Hydrilla verticillata* *	
Yellow stargrass	*Hypoxis curtissii*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Forked rush	*Juncus dichotomus*	
Grassleaf rush	*Juncus marginatus*	
Needlepod rush	*Juncus scirpoide*s	
Path rush	*Juncus tenuis*	
Looseflower waterwillow	*Justicia ovata*	
Fragrant spikesedge	*Kyllinga odorata*	
Whitehead bogbutton	*Lachnocaulon anceps*	
Cardinalflower	*Lobelia cardinalis*	33
Italian ryegrass	*Lolium perenne*	
Little duckweed	*Lemna obscura*	
Frog's bit	*Limnobium spongia*	
Southern naiad	*Najas guadalupensis*	
Woods grass	*Oplismenus hirtellus subsp. setarius*	
Beaked panicum	*Panicum anceps*	
Redtop panicum	*Panicum rigidulum*	
Bluejoint panicum	*Panicum tenerum*	
Bahia grass	*Paspalum notatum* *	
Brownseed paspalum	*Paspalum plicatulum*	
Early paspalum	*Paspalum praecox*	
Water paspalum	*Paspalum repens*	
Thin paspalum	*Paspalum setaceum*	
Blackseed needlegrass	*Piptochaetium avenaceum*	
Water lettuce	*Pistia stratiotes* *	
Annual bluegrass	*Poa annua**	
Pickerelweed	*Pontederia cordata*	
Starrush whitetop	*Rhynchospora colorata*	
Beakrush	*Rhynchospora corniculata*	
Narrowfruit horned beaksedge	*Rhynchospora inundata*	
Sandyfield beaksedge	*Rhynchospora megalogarpa*	
Southern beaksedge	*Rhynchospora microcarpa*	
Plumed beaksedge	*Rhynchospora plumosa*	
European watercress	*Rorippa nasurtium-aquaticum*	
Carolina wild petunia	*Ruelia caroliniensis*	
Dwarf palmetto	*Sabal minor*	
Cabbage palm	*Sabal palmetto*	
Silver plumegrass	*Saccharum alopecuroides*	
Narrow plumegrass	*Saccharum baldwinii*	
Sugarcane plumegrass	*Saccharum giganteum*	
American cupscale	*Sacciolepis striata*	
Slender arrowhead	*Sagittaria graminea*	
Springtape	*Sagittaria kurziana*	
Netted nutrush	*Scleria reticularis*	
Tall nutgrass	*Scleria triglomerata*	
Cultivated rye	*Secale cereale*	
Saw palmetto	*Serenoa repens*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Yellow bristlegrass	*Setaria parviflora*	
Narrowleaf blue-eyed grass	*Sisyrinchium angustifolium*	
Nash's blue-eyed grass	*Sisyrinchium nashii*	
Annual blue-eyed grass	*Sisyrinchium rosulatum*	
Earleaf greenbriar	*Smilax auriculata*	
Catbrier	*Smilax bona-nox*	
Sawbrier	*Smilax glauca*	
Sarsaparilla vine	*Smilax pumila*	
Jackson vine	*Smilax smallii*	
Slender Indian grass	*Sorghastrum elliottii*	
Prairie wedgescale	*Sphenopholis obtusata*	
Dotted duckweed	*Spirodela punctata*	
Smutgrass	*Sporobolus indicus* *	
St. Augustine grass	*Stenotaphrum secundatum*	
Bartram's airplant	*Tillandsia bartramii*	
Ballmoss	*Tillandsia recurvata*	
Spanish moss	*Tillandsia usneoides*	
Purpletop	*Tridens flavus*	
Venus's looking glass	*Triodanis perfoliata*	
Eelgrass	*Vallisneria americana*	
Squirreltail fescue	*Vulpia elliotea*	
Brazilian watermeal	*Wolffia brasiliensis*	
Florida mudmidget	*Wolffiella gladiata*	
Richard's yellow-eyed grass	*Xyris jupicai**	
Tall yellow-eyed grass	*Xyris platylepis*	
Spanish bayonet	*Yucca aloifolia*	
Adam's needle	*Yucca filamentosa*	
Dicots		
Slender threeseed mercury	*Acalypha gracilens*	
Florida maple	*Acer saccharum*	
Southern red maple	*Acer rubrum*	
Opposite-leaf spotflower	*Acmella oppositifolia*	
Red buckeye	*Aesculus pavia*	
Hammock thoroughwort	*Ageratina jucunda*	
Alligator weed	*Alternathera philoxeroides* *	
Common ragweed	*Ambrosia artemisiifolia*	
False indigobush	*Amorpha fruticosa*	
Lusterspike indigobush	*Amorpha herbacea*	
Pepper vine	*Ampelopsis arborea*	
Eastern bluestar	*Amsonia tabernaemontana*	
Indianhemp	*Apocynum cannabinum*	
Devil's walking stick	*Aralia spinosa*	
Thymeleaf sandwort	*Arenaria serpyllifolia* *	
Pinewoods milkweed	*Asclepias humistrata*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Milkweed	*Asclepias perennis*	
Butterfly weed	*Asclepias tuberosa*	
Slimleaf pawpaw	*Asimina angustifolia*	
Smallfruited pawpaw	*Asimina parviflora*	
Dwarf pawpaw	*Asimina pygmaea*	
Silvery aster	*Aster concolor*	
Bushy aster	*Aster dumosus*	
Groundsel tree	*Baccharis halimifolia*	
Herb-of-grace	*Bacopa monnieri*	
Yellow buttons	*Balduina angustifolia*	
White wild indigo	*Baptisia alba*	
Pineland wild indigo	*Baptisia lecontii*	
Twining screwstem	*Bartonia paniculata*	
Rattan vine	*Berchemia scandens*	
River birch	*Betula nigra*	
Beggarticks	*Bidens alba*	
Crossvine	*Bignonia capreolata*	
False nettle	*Boehmeria cylindrica*	
Watershield	*Brasenia schreberi*	
Paper mulberry	*Broussonetia papyrifera**	
Fanwort	*Cabomba caroliniana*	
American beautyberry	*Callicarpa americana*	
Trumpetvine	*Campsis radicans*	
American hornbeam	*Carpinus caroliniana*	
Water hickory	*Carya aquatica*	
Pignut hickory	*Carya glabra*	
Mockernut hickory	*Carya alba*	
Sugarberry	*Celtis laevigata*	
Coinwort	*Centella asiatica*	
Spurred butterfly pea	*Centrosema virginianum*	
Buttonbush	*Cephalanthus occidentalis*	
Coontail	*Ceratophyllum demersum*	
Partidge pea	*Chamaecrista fasciculata*	
Spotted sandmat	*Chamaesyce maculata*	
Prostrate sandmat	*Chamaesyce prostrata*	
Mexican tea	*Chenopodium ambrosioides* *	
Cottony goldenaster	*Chrysopsis gossypina*	
Water hemlock	*Cicuta maculata*	
Yellow thistle	*Cirsium horridulum*	
Atlantic pigeonwings	*Clitoria mariana*	
Tread softly	*Cnidoscolus stimulosus*	
Blue mist flower	*Conoclinium coelestinum*	
Squawroot	*Conopholis americana*	
Canadian horseweed	*Conyza canadensis*	
Leavenworth's tickseed	*Coreopsis leavenworthii*	

*** Non-native Species**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Roughleaf dogwood	*Cornus asperifolia*	
Swamp dogwood	*Cornus foemina*	
May haw	*Crataegus aestivalis*	
Cockspur haw	*Crataegus crus-galli*	
Parsley haw	*Crataegus marshallii*	
Yellowleaf hawthorne	*Crataegus michauxii*	
Dwarf thorn	*Crataegus uniflora*	
Slender scratchdaisy	*Croptilon divaricatum*	
Lanceleaf crotalaria	*Crotalaria lanceolata**	
Rabbitbells	*Crotolaria rotundifolia*	
Vente conmigocroton	*Croton glandulosus*	
Pineland croton	*Croton linearis*	
Michaux's croton	*Croton michauxii*	
Croton	*Croton trinitatis*	
Rushfoil	*Crotonopsis linearis*	
Compact dodder	*Cuscuta compacta*	
Marsh parsley	*Cyclospermum leptophyllum**	
Titi	*Cyrilla racemiflora*	
Summer farewell	*Dalea pinnata*	
Hoary ticktrefoil	*Desmodium canescens*	
Panicledleaf ticktrefoil	*Desmodium paniculatum*	
Threeflower ticktreefoil	*Desmodium triflorum*	
Florida balm	*Diceranda densiflora*	
Carolina ponysfoot	*Dichondra caroliniensis*	
Poor joe	*Diodia teres*	
Buttonweed	*Diodia virginiana*	
Common persimmon	*Diospyros virginiana*	
Drymary	*Drymaria cordata*	
Water hyacinth	*Eichnornia crassipes* *	
Florida elephant's foot	*Elephantopus elatus*	
Smooth elephant's foot	*Elephantopus nudatus*	
Elephant's foot	*Elephantopus tomentosum*	
American burnweed	*Erechtites hieracifolia*	
Oakleaf fleabane	*Erigeron quercifolius*	
Prairie fleabane	*Erigeron strigosis*	
Dogtongue wild buckwheat	*Eriogonum tomentosum*	
Cherokee bean	*Erythrina herbacea*	
White thoroughwort	*Eupatorium album*	
Dog fennel	*Eupatorium capillifolium*	
Yankeeweed	*Eupatorium compositifolium*	
Roundleaf thoroughwort	*Eupatorium rotundifolium*	
Late boneset	*Eupatorium serotinum*	
Common fig	*Ficus carica* *	
Ageratum	*Fleischmannia incarnata*	
White ash	*Fraxinus americana*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Carolina ash	*Fraxinus caroliniana*	
Cottonweed	*Froelichia floridana*	
Prostrate milkpea	*Galactia regularis*	
Downy milkpea	*Galactia volubilis*	
Coastal bedstraw	*Galium hispidulum*	
Stiff marsh bedstraw	*Galium tinctorium*	
Dwarf huckleberry	*Gaylussacia frondosa*	
Yellow jessamine	*Gelsemium sempervirens*	
Water locust	*Gleditsia aquatica*	
Sweet everlasting	*Gnaphalium obtusifolium*	
Pennsylvania everlasting	*Gnaphalium pensylvanicum*	
Spoonleaf purple everlasting	*Gnaphalium purpureum*	
Roundfruit hedge hyssop	*Gratiola virginiana*	
Southern beeblossom	*Gaura angustifolia*	
Carolina silverbell	*Halesia carolina*	
Diamondflower	*Hedyotis boscii*	
Old World diamondflower	*Hedyotis corymbosa* *	
Innocence	*Hedyotis procumbens*	
Cluster diamondflower	*Hedyotis uniflora*	
Carolina frostweed	*Helianthemum carolinianum*	
Camphorweed	*Heterotheca subaxillaris*	
Queen devil	*Hieracium gronovii*	
Swamp pennywort	*Hydrocotyle verticillata*	
St. Peter's-wort	*Hypericum crux-andraea*	
St. John's-wort	*Hypericum galioides*	
St. Andrew's cross	*Hypericum hypericoides*	
Dwarf St. John's-wort	*Hypericum mutilum*	
Tropical bushmint	*Hyptis mutabilis* *	
Carolina holly	*Ilex ambigua*	
Large gallberry	*Ilex coriacea*	
Possum haw	*Ilex decidua*	
American holly	*Ilex opaca*	
Yaupon holly	*Ilex vomitoria*	
Carolina indigo	*Indigofera caroliniana*	
Hairy indigo	*Indigofera hirsuta* *	
Virginia willow	*Itea virginica*	
Narrowleaved elder	*Iva microcephla*	
Justicia	*Justicia ovata*	
Virginia dwarf dandelion	*Krigia virginica*	
Grassleaf lettuce	*Lactuca graminifolia*	
Lantana	*Lantana camara**	
Thymeleaf pinweed	*Lechea minor*	
Lion's ear	*Leonitis nepetefolia**	
Virginia pepperweed	*Lepidium virginicum*	
Hairy lespedeza	*Lespedeza hirta*	

*** Non-native Species**

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Tall lespedeza	*Lespedeza stuevei*	
Pinkscale gayfeather	*Liatris elegans*	
Grassleaf gayfeather	*Liatris graminifolia*	
Lopsided blazingstar	*Liatris pauciflora*	
Shortleaf gayfeather	*Liatris tenuifolia*	
Gopher apple	*Licania michauxii*	
Canada toadflax	*Linaria canadensis*	
Appalachicola toadflax	*Linaria floridana*	
Sweetgum	*Liquidambar styraciflua*	
Cardinal flower	*Lobelia cardinalis*	
Downy lobelia	*Lobelia puberula*	
Creeping primrose willow	*Ludwigia repens*	
Rusty staggerbush	*Lyonia ferruginea*	
Coastal plain staggerbush	*Lyonia fruticosa*	
Southern magnolia	*Magnolia grandiflora*	
Florida milkvine	*Matelea floridana*	21,22
Anglepod	*Matelea gonocarpos*	
Axil flower	*Mecardonia acuminata*	
Black medick	*Medicago lupulina*	
Snow squarestem	*Melanthera nivea*	
Shade mudflower	*Micranthemum umbrosum*	
Brown's savory	*Micromeria brownei*	
Climbing hempvine	*Mikania scandens*	
Sensitive brier	*Mimosa quadrivalvis var. angustata*	
Partridgeberry	*Mitchella repens*	
Lax hornpod	*Mitreola petiolata*	
Spotted beebalm	*Monarda punctata*	
Wax myrtle	*Myrica cerifera*	
Spatterdock	*Nuphar advena*	
Water tupelo	*Nyssa aquatica*	
Swamp tupelo	*Nyssa sylvatica var. biflora*	
Black tupelo	*Nyssa sylvatica*	
Cutleaf evening primrose	*Oenothera laciniata*	
Prickly pear cactus	*Opuntia humifusa*	
Wild olive	*Osmanthus americanus*	
Hophornbeam	*Ostrya virginiana*	
Yellow woodsorrel	*Oxalis corniculata*	
Coastal plain palafox	*Palafoxia integrifolia*	
American nailwort	*Paronychia americana*	
Baldwin's nailwort	*Paronychia baldwinii*	
Sand squares	*Paronychia rugelii*	
Virginia creeper	*Parthenocissus quinquefolia*	
Purple passionflower	*Passiflora incarnata*	
Yellow passionflower	*Passiflora lutea*	
Pentodon	*Pentodon pentandrus*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Redbay	*Persea borbonia*	
Swampbay	*Persea palustris*	
Oak mistletoe	*Phoradendron leucarpum*	
Mistletoe	*Phoradendron serotinum*	
Turkey tangle fogfruit	*Phyla nodiflora*	
Carolina leafflower	*Phyllanthus caroliniensis*	
Chamber bitter	*Phyllanthus urinaria* *	
Pokeweed	*Phytolacca americana*	
Pitted stripeseed	*Piriqueta caroliniana*	
Narrowleaf silkgrass	*Pityopsis graminifolia*	
Waterelm	*Planera aquatica*	
Common plantain	*Plantago major**	
Showy milkwort	*Polygala grandiflora*	
Dense flower knotweed	*Polygonum densiflorum*	
Dotted smartweed	*Polygonum punctatum*	
Smartweed	*Polygonum setaceum*	
Rustweed	*Polypremum procumbens*	
Marsh mermaidweed	*Proserpinaca palustris*	
Carolina laurel cherry	*Prunus caroliniana*	
Black cherry	*Prunus serotina*	
Flatwoods plum	*Prunus umbellata*	
Wafer ash	*Ptelea trifoliata*	
Blackroot	*Pterocaulon pycnostachyum*	
Mock bishop's weed	*Ptilimnium capillaceum*	
Florida mountain mint	*Pycnanthemum floridanum*	
Carolina desertchickory	*Pyrrhopappus carolinianus*	
Chapman's oak	*Quercus chapmanii*	
Southern red oak	*Quercus falcata*	
Sand live oak	*Quercus geminata*	
Bluejack oak	*Quercus incana*	
Diamondleaf oak	*Quercus laurifolia*	
Overcup oak	*Quercus lyrata*	
Sand post oak	*Quercus margaretta*	
Swamp chestnut oak	*Quercus michauxii*	
Myrtle oak	*Quercus myrtifolia*	
Water oak	*Quercus nigra*	
Willow oak	*Quercus phellos*	
Running oak	*Quercus pumila*	
Bluff oak	*Quercus sinuata*	
Live oak	*Quercus virginiana*	
Carolina buckthorn	*Rhamnus caroliniana*	
West Indian meadowbeauty	*Rhexia cubensis*	
Pale meadowbeauty	*Rhexia mariana*	
Winged sumac	*Rhus copallinum*	
Doubleform snoutbean	*Rhynchosia difformis*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Michaux's snoutbean	*Rhynchosia michauxii*	
Tropical Mexican clover	*Richardia brasiliensis**	
Florida pusley	*Richardia scabra**	
European watercress	*Rorippa nasturtium-aquaticum**	
Sawtooth blackberry	*Rubus argutus*	
Sand blackberry	*Rubus cuneifolius*	
Southern dewberry	*Rubus trivialis*	
Wild petunia	*Ruellia caroliniensis*	
Heartwing dock	*Rumex hastatulus*	
Coastal rosegentian	*Sabatia calycina*	
Coastal plain willow	*Salix caroliniana*	
Florida willow	*Salix floridana*	31, 33
Lyreleaf sage	*Salvia lyrata*	
Pineland pimpernel	*Samolus valerandi ssp. parviflorus*	
Canadian black snakeroot	*Sanicula canadensis*	
Lizard's tail	*Saururus cernuus*	
Helmet skullcap	*Scutellaria integrifolia*	
Butterweed	*Senecio glabellus*	
Wild sensitive plant	*Senna ligustrina*	
Maryland wild sensitive plant	*Senna marilandica*	
Coffeeweed	*Senna obtusifolia*	
Hemlock waterparsnip	*Sium suave*	
Broomweed	*Sida acuta* *	
Cuban jute	*Sida rhombifolia*	
Gum bully	*Sideroxylon lanuginosum*	
Florida bully	*Sideroxylon reclinatum*	
Chapman's goldenrod	*Solidago odora var. chapmanii*	
Bristly scaleseed	*Spermolepsis divaricata*	
Scaleseed	*Spermolepis echinata*	
Pineland scalypink	*Stipulicida setacea*	
Queen's delight	*Stillingia sylvatica*	
Wildbean	*Strophostyles umbellata*	
Coastalplain dawnflower	*Stylisma patens*	
Storax	*Styrax americanus*	
Sweetleaf	*Symplocos tinctoria*	
Scurf hoarypea	*Tephrosia chrysophylla*	
Florida hoary pea	*Tephrosia florida*	
Hoary pea	*Tephrosia hispidula*	
Wood sage	*Teucrium canadense*	
Carolina basswood	*Tilia americana var. caroliniana*	
Poison ivy	*Toxicodendron radicans*	
Greater Marsh St. John's-Wort	*Triadenum walteri*	
Forked bluecurls	*Trichostema dichotomum*	
White clover	*Trifolium repens* *	
Three-birds pogonia	*Triphora trianthophora*	

*** Non-native Species**

Manatee Springs State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Winged elm	*Ulmus alata*	
American elm	*Ulmus americana*	
Cedar elm	*Ulmus crassifolia*	31
Leafy badderwort	*Utricularia foliosa*	
Sparkleberry	*Vaccinium arboreum*	
Highbush blueberry	*Vaccinium corymbosum*	
Darrow's blueberry	*Vaccinium darrowii*	
Shiny blueberry	*Vaccinium mysinites*	
Deerberry	*Vaccinium stamineum*	
Tall ironweed	*Vernonia angustifolia*	
Neckweed	*Veronica peregrina*	
Walter viburnum	*Viburnum obovatum*	
Florida vetch	*Vicia floridana*	
Early blue violet	*Viola palmata*	
Common blue violet	*Viola sororia*	
Prostrate blue violet	*Viola walteri*	
Summer grape	*Vitis aestivalis*	
Muscadine grape	*Vitis rotundifolia*	
Hercules' club	*Zanthoxylum clava-herculis*	

*** Non-native Species**

Manatee Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
	INVERTEBRATES	
Arthropods		
Hobb's cave amphipod	*Crangonyx hobbsi*	79
Light-fleeing cave crayfish	*Procambarus lucifugus*	79
North Florida spider cave crayfish	*Troglocambarus maclanei*	79
Mussels		
Asiatic clam	*Corbicula fluminea**	53, 55
Variable spike	*Elliptio icteriana*	53, 55
Iridescent lilliput	*Toxolasma paulus*	53, 55
Downy rainbow	*Villosa villosa*	53, 55
	FISHES	
Gulf sturgeon	*Acipenser oxyrinchus desotoi*	
Alabama shad	*Alosa alabamae*	53, 55
Spotted bullhead	*Ameiurus serracanthus*	53, 55
Bowfin	*Amia calva*	53, 55
American eel	*Anquilla rostrata*	53, 55
Pirate perch	*Aphredoderus sayanus*	53, 55
Okefenokee pygmy sunfish	*Elassoma okefenokee*	53, 55
Banded pygmy sunfish	*Elassoma zonatum*	53, 55
Bluespotted sunfish	*Enneacanthus gloriosus*	53, 55
Lake chubsucker	*Erimyzon sucetta*	53, 55
Redfin pickerel	*Esox americanus*	53, 55
Chain pickerel	*Esox niger*	53, 55
Brown darter	*Etheostoma edwini*	53, 55
Swamp darter	*Etheostoma fusiforme*	53, 55
Seminole killifish	*Fundulus seminolis*	53, 55
Eastern mosquitofish	*Gambusia affinis holbrooki*	53, 55
Mosquito fish	*Heterandria formosa*	53, 55
White catfish	*Ictalurus catus*	53, 55
Brown bullhead	*Ictalurus nebulosus*	53, 55
Yellow catfish	*Ictalurus natalis*	53, 55
Channel catfish	*Ictalurus punctatus*	53, 55
Florida gar	*Lepisosteus platyrhincus*	53, 55
Longnose gar	*Lepisosteus ossens*	53, 55
Redbreast sunfish	*Lepomis auritus*	53, 55
Warmouth	*Lepomis gulosus*	53, 55
Bluegill	*Lepomis macrochirus*	53, 55
Shellcracker	*Lepomis microlophus*	53, 55
Stumpknocker	*Lepomis punctatus*	53, 55
Bluefin killifish	*Lucania goodei*	53, 55
Suwannee Bass	*Micropterus notius*	53, 55
Florida largemouth bass	*Micropterus salmoides floridanus*	53, 55
Spotter sucker	*Minytrema melanops*	53, 55

*** Non-native Species**

Manatee Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Striped mullet	*Mugil cephalus*	53, 55
Golden shiner	*Notemigonus crysoleucas*	53, 55
Redeye chub	*Notropis harperi*	53, 55
Tailight shiner	*Notropis maculatus*	53, 55
Coastal shiner	*Notropis petersoni*	53, 55
Tadpole madtom	*Noturus gyrinus*	53, 55
Sailfin molly	*Poecilia latipinna*	53, 55
Speckled perch	*Pomoxis nigromaculatus*	53, 55
Atlantic needlefish	*Strongylura marina*	53, 55
Hogchoker	*Trinectes maculatus*	53, 55
	AMPHIBIANS	
Salamanders		
Mole salamander	*Ambystoma talpoideum*	21
Peninsula newt	*Notophthalmus viridescens*	51
Frogs and Toads		
Southern toad	*Bufo terrestris*	21
Greenhouse frog	*Eleutherodactylus planirostris* *	Throughout
Gray treefrog	*Hyla chrysoscelis*	21, 31
Spring peeper	*Pseudacris crucifer*	21 , 31
Southern leopard frog	*Rana sphenocephala*	25, 51
Eastern spadefoot	*Scaphiopus holbrooki*	22
	REPTILES	
Crocodiles		
Alligator	*Alligator mississippiensis*	53 55
Turtles		
Florida snapping turtle	*Chelydra serpentina osceola*	51
Gopher tortoise	*Gopherus polyphemus*	22
Striped mud turtle	*Kinosternon baurii*	25
Florida mud turtle	*Kinosternon subrubrum*	25, 31
Alligator snapping turtle	*Macroclemys temminckii*	53
Suwannee cooter	*Pseudemys concinna suwanniensis*	53
Florida red-belly turtle	*Pseudemys nelsoni*	53
Stinkpot	*Sternotherus odoratus*	55
Florida softshell	*Apalone ferox*	29
Lizards		
Carolina anole	*Anolis carolinensis*	Throughout
Six-lined racerunner	*Cnemidophorus sexlineatus*	15
Southeastern five-lined skink	*Eumeces inexpectatus*	22
Broad-head skink	*Eumeces laticeps*	21
Southern fence lizard	*Sceloporus undulatus*	23
Ground skink	*Scincella lateralis*	21

*** Non-native Species**

Manatee Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Snakes		
Cottonmouth	*Agkistrodon piscivorus*	33
Southern black racer	*Coluber constrictor priapus*	31
Eastern diamondback rattlesnake	*Crotalus adamanteus*	Throughout
Eastern indigo snake	*Drymarchon corais couperi*	23
Corn snake	*Elaphe guttata*	23
Rat snake	*Elaphe obsoleta*	21
Eastern hognose snake	*Heterodon platyrhinos*	22
Southern hognose snake	*Heterodon simus*	23
Red-bellied water snake	*Nerodia erythrogaster*	55
Florida banded water snake	*Nerodia fasciata pictiventris*	53
Brown water snake	*Nerodia taxispilota*	55
Florida crowned snake	*Tantilla relicta*	23
Eastern garter snake	*Thamnophis sirtalis*	31
	BIRDS	
Pied-billed grebe	*Podilymbus podiceps*	51
American white pelican	*Pelecanus erythrorhynchos*	53
Double-crested cormorant	*Phalacrocorax auritus*	53
Anhinga	*Anhinga anhinga*	53
Great blue heron	*Ardea herodias*	53, 55
Green-backed heron	*BuLtorides striatus*	53, 55
Cattle egret	*Bubulcus ibis*	81, 82
Great egret	*Casmerodius albus*	53
Little blue heron	*Egretta caerulea*	53
Snowy egret	*Egretta thula*	55
Tricolor heron	*Egretta tricolor*	53
Yellow-crowned night heron	*Nyctanassa violaceus*	53
Black-crowned night heron	*Nycticorax nycticorax*	53
Wood stork	*Mycteria americana*	29
White ibis	*Eudocimus albus*	33
Wood duck	*Aix sponsa*	51
Lesser scaup	*Aythya affinis*	53
Ring-necked duck	*Aythya collaris*	51
Canada goose	*Branta canadensis*	51
Hooded merganser	*Bucephala albeola*	53
Turkey vulture	*Cathartes aura*	Throughout
Black vulture	*Coragyps atratus*	Throughout
Red-tailed hawk	*Buteo famaicensis*	22
Red-shouldered hawk	*Buteo lineatus*	33
Broad-winged hawk	*Buteo palypterus*	21
Northern harrier	*Circus cyaneus*	29
Bald eagle	*Haliaeetus leucocephalus*	53
Mississippi kite	*Ictinia mississipiensis*	Throughout
Swallow-tailed kite	*Elanoides forficatus*	53

*** Non-native Species**

Manatee Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Osprey	*Pandion haliaetus*	53
Northern bobwhite	*Colinus virginianus*	22, 23
Wild turkey	*Meleagris gallopavo*	21
American coot	*Fulica americana*	51
Common moorhen	*Gallinula chloropus*	51
Purple gallinule	*Porphyrula martinica*	51
Limpkin	*Aramus guarauna*	53
Spotted sandpiper	*Catoptrophorus semipalmatus*	53
Common snipe	*Gallinago gallinago*	29
American woodcock	*Scolopax minor*	28
Rock dove	*Columba livia* *	82
Ground dove	*Columbina passerina*	23
Mourning dove	*Zenaida macroura*	Throughout
Yellow-billed cuckoo	*Coccyzus americanus*	21
Great Horned owl	*Bubo virginianus*	22
Screech owl	*Otus asio*	21
Barred owl	*Styrix varia*	33
Chuck-will's-widow	*Caprimulgus carolinensis*	23
Whip-poor-will	*Caprimulgus vociferus*	23
Common nighthawk	*Chordeiles minor*	23
Chimney swift	*Chaetura pelagica*	Throughout
Ruby-throated hummingbird	*Arichilochus colubris*	21
Belted kingfisher	*Ceryle alcyon*	53
Northern flicker	*Colaptes auratus*	22
Pileated woodpecker	*Dryocopus pileatus*	21
Red-bellied woodpecker	*Melanerpes erythrocephalus*	Throughout
Red-headed woodpecker	*Melanerpes carolinus*	22
Yellow-bellied sapsucker	*Sphyrapicus varius*	21
Hairy woodpecker	*Picoides villosus*	22
Downy woodpecker	*Picoides pubescens*	Throughout
Acadian flycatcher	*Empidonax flaviventris*	31
Eastern phoebe	*Sayornis phoebe*	22
Eastern kingbird	*Tyrannus tyrannus*	23
Gray kingbird	*Tyrannus dominicensis*	81, 82
Barn swallow	*Hirundo rustica*	53
Bank swallow	*Riparia riparia*	53
Tree swallow	*Tachycineta bicolor*	53
Florida scrub jay	*Aphelocoma coerulescens*	15
American crow	*Corvus brachyrhynchos*	Throughout
Fish crow	*Corvus ossifragus*	Throughout
Blue jay	*Cyanocitta cristata*	Throughout
Tufted titmouse	*Parus bicolor*	Throughout
Carolina chickadee	*Parus carolinensis*	Throughout
Carolina wren	*Thryothorus ludovicianus*	Throughout
House wren	*Troglodytes aedon*	Throughout

*** Non-native Species**

Manatee Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Gray catbird	*Dumetella carolinensis*	21
Northern mockingbird	*Mimus polyglottos*	81, 82
Brown thrasher	*Toxostoma rufus*	81, 82
Veery	*Catharus fuscescens*	21
Hermit thrush	*Catharus guttatus*	21
Swainson's thrush	*Catharus ustulatus*	21
Eastern bluebird	*Sialia sialis*	23
Blue-gray gnatcatcher	*Polioptila caerulea*	Throughout
Ruby-crowned kinglet	*Regulus calendula*	Throughout
Golden-crowned kinglet	*Regulus satrapa*	22
American robin	*Turdus migratorius*	Throughout
Cedar waxwing	*Bombycilla cedrorum*	Throughout
Loggerhead shrike	*Lanius ludovicianus*	23
Yellow-throated vireo	*Vireo flavifrons*	22
White-eyed vireo	*Vireo griseus*	Throughout
Red-eyed vireo	*Vireo olivaceus*	21
Solitary vireo	*Vireo solitarius*	21
Red-winged blackbird	*Agelaius phoeniceus*	25
Black-throated blue warbler	*Dendroica caerulescens*	21
Yellow-rumped warbler	*Dendroica coronata*	Throughout
Prairie warbler	*Dendroica discolor*	22
Yellow-throated warbler	*Dendroica dominica*	22
Blackburnian warbler	*Dendroica fusca*	22
Magnolia warbler	*Dendroica magnolia*	21
Palm warbler	*Dendroica palmarum*	22
Yellow warbler	*Dendroica petechia*	22
Pine warbler	*Dendroica pinus*	22
Blackpoll warbler	*Dendroica striata*	22
Cape May warbler	*Dendroica tigrina*	22
Rusty blackbird	*Euphagus carolinus*	25
Worm-eating warbler	*Helmitherous vermimorous*	21
Brown-headed cowbird	*Molothrus ater*	23
Black-and-white warbler	*Mniotilta varia*	Throughout
Northern parula	*Parula americana*	Throughout
Summer tanager	*Piranga rubra*	22
Prothonotary warbler	*Protonotaria citrea*	33
Common grackle	*Quiscalus major*	Throughout
Ovenbird	*Seiurus aurocapillus*	21
Louisiana waterthrush	*Seiurus motacilla*	33
Northern waterthrush	*Seiurus noveboracensis*	33
American redstart	*Setophaga ruticilla*	21
Eastern meadowlark	*Sturnella magna*	81, 82
Starling	*Sturnus vulgaris* *	81, 82
Orange-crowned warbler	*Vermivroa celata*	22
Golden-winged warbler	*Vermivroa chrysoptra*	21

*** Non-native Species**

Manatee Springs State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Tennessee warbler	*Vermivroa peregrina*	21
Hooded warbler	*Wilsonia citrina*	31
American goldfinch	*Cardeulis tristis*	Throughout
Northern cardinal	*Cardinalis cardinalis*	Throughout
Rose-breasted grosbeak	*Pheucticus ludovicianus*	21
Indigo bunting	*Passerina cyanea*	22
House sparrow	*Passer domesticus* *	81, 82
Rufous-sided towhee	*Pipilo erythrophthalmus*	15
Chipping sparrow	*Spizella passerina*	23
White-crowned sparrow	*Zonotrichia albicollis*	22
White-throated sparrow	*Zonotrichia leucophrys*	21
	MAMMALS	
Opossum	*Didelphis marsupialis*	Throughout
Armadillo	*Dasypus novemcinctus* *	Throughout
Eastern cottontail	*Sylvilagus floridanus*	Throughout
Beaver	*Castor canadensis*	53
Southern flying squirrel	*Glaucomys volans*	Throughout
Southeastern pocket gopher	*Geomys pinetis*	23, 22
Golden mouse	*Peromyscus nuttalli*	21
Gray squirrel	*Sciurus carolinensis*	Throughout
Sherman's Fox squirrel	*Sciurus niger shermani*	23, 22
Eastern mole	*Scalopus aquaticus*	22
River otter	*Lutra canadensis*	53, 55
Bobcat	*Lynx rufus*	Throughout
Gray fox	*Procyon cinereoargenteus*	22
Raccoon	*Procyon lotor*	Throughout
West Indian manatee	*Trichechus manatus*	55
White-tailed deer	*Odocoileus virginianus*	Throughout
Feral pig	*Sus scrofa* *	31

* **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
46. Flatwood/Prairie Lake
47. Marsh Lake

LACUSTRINE—Continued

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

Manatee Springs State Park

Designated Species

Plants

Common Name/ *Scientific Name*	**Designated Species Status** FDA	USFWS	FNAI
Florida jointtail grass			
Coelorachis tuberculosa	LT		G3, S3
Greenfly Orchid			
Epidendrum canopseum	CE		
Cardinal flower			
Lobelia cardinalis	T		
Florida milkvine			
Matelia floridana	LE		G3, S1
Royal Fern			
Osmunda regalis	CE		
Florida mountainmint			
Pycnathemum floridanum	LT		G3, S3
Cedar Elm			
Ulmus crassifolia			G5, S1
Coontie			
Zamia pumila	CE		

Manatee Springs State Park

Designated Species

Plants

Common Name/ *Scientific Name*	**Designated Species Status** FDA	USFWS	FNAI
FISH			
Gulf Sturgeon *Acipenser oxyrinchus desotoi*	SSC	T	G3T2, S2
Spotted Bullhead *Ameiurus serracanthus*			G3, S3
Suwannee Bass *Micropterus notius*	SSC		G2G3, S2S3

Manatee Springs State Park

Designated Species

Animals

Common Name/ *Scientific Name*	**Designated Species Status** FFWCC	USFWS	FNAI
	REPTILES		
American Alligator *Alligator mississippiensis*	SSC	T(S/A)	G5, S4
Eastern Diamondback Rattlesnake *Crotalus adamanteus*			G4, S3
Eastern Indigo Snake *Drymarchon corais couperi*	T	T	G4T3, S3
Gopher Tortoise *Gopherus polyphemus*	SSC		G3, S3
Alligator Snapping Turtle *Macroclemys temminckii*	SSC		G3G4, S3
Suwannee Cooter *Pseudemys concinna suwanniensis*	SSC		G5T3, S3
	BIRDS		
Florida Scrub Jay *Aphelocoma coerulescens*	T	T	G3, S3
Limpkin *Aramus guarauna*	SSC		G5, S3
Northern harrier *Circus cyaneus*			
Little blue heron *Egretta caerulea*	SSC		G5, S4
Snowy egret *Egretta thula*	SSC		G5, S4
Tricolor heron *Egretta tricolor*	SSC		G5,S4
Swallow-tailed Kite *Elanoides forficatus*			G5, S2
White ibis *Eudocimus albus*	SSC		G5, S4
Bald eagle *Haliaeetus leucocephalus*	T	T	G4,S3
Worm-eating Warbler *Helmitherous vermimorous*	E		G5,S1
Wood stork *Mycteria americana*		E	G4,S2
Yellow-crowned night heron *Nyctanassa violacea*			G5,S3?
Black-crowned night heron *Nycticorax nycticorax*			G5,S3?
Osprey			

Manatee Springs State Park

Designated Species

Animals

Common Name/ *Scientific Name*	**Designated Species Status** FFWCC	USFWS	FNAI
Pandion haliaetus			G5,S3S4
Hairy Woodpecker *Picoides villosus*			G5, S3?
Louisiana Waterthrush *Seiurus motacilla*			G5, S3
American Redstart *Setophaga ruticilla*			G5,S3
MAMMALS			
Sherman's Fox Squirrel *Sciurus niger shermani*	SSC		G5T3,S2
River otter *Lutra canadensis*			
West Indian manatee *Trichechus manatus*	E	E	G2, S2
INVERTEBRATES			
Hobbs' Cave Amphipod *Crangonyx hobbsi*			G2G3, S2S3
Light-fleeing Cave Crayfish *Procambarus lucifugus*			G2G3, S2S3
North Florida Spider Cave Crayfish *Troglocambarus maclanei*			G2G3, S2

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.

Addendum 6—Priority Schedule And Cost Estimates

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

RESOURCE MANAGEMENT

1. Continue to monitor water quality in the park's wells and springs, in cooperation with the SRWMD and other agencies. 0-10 years. **Estimated Cost: $50,000** ($5,000 annually for 10 years).
2. Continue efforts to define the recharge area for the springs, in cooperation with the SRWMD. 0-10 years. **Estimated Cost: $50,000.**
3. Conduct baseline biotic inventories and visitor-impact studies of the aquatic cave system. 0-10 years. **Estimated Cost: $20,000.**
4. Continue to map the aquatic cave system, in cooperation with certified cave divers from the National Speleological Society and the National Association of Cave Divers. 0-10 years. **Estimated Cost: $20,000** ($2,000 annually for 10 years).
5. Periodically conduct surveys of aquatic fauna, including fish, mollusks, snails, and crustaceans, in the springs and spring-run stream. **Estimated Cost: $20,000** (four times during 10-year period at $5,000 per survey).
6. Continue to monitor aquatic vegetation cover and composition in the springs and spring-run stream. **Estimated Cost: $10,000** ($1,000 annually for 10 years).
7. Continue efforts to eradicate hydrilla and other exotics from the springs and spring-run stream. **Estimated Cost: $10,000** ($1,000 annually for 10 years).
8. Develop and install educational and interpretive signs to address important park issues, including use of the springs by manatees, water quality of the springs, protecting the cave system from damage by divers, and the importance of preserving cultural sites. 1-3 years. **Estimated Cost: $10,000.**
9. Mechanically remove offsite hardwoods that have invaded fire-dependent natural communities. 0-10 years. **Estimated Cost: $30,000.**
10. Plant longleaf pines in areas that were clear cut to control Southern Pine Beetle outbreaks and also in zones undergoing natural community restoration. 0-5 years. **Estimated Cost $12,500.**
11. Remove, or redesign and retrofit, existing causeways through wetlands and river floodplains. Restore borrow pits to the extent practicable. 0-10 years. **Estimated Cost: $95,000.**
12. Perform a phase I archaeological survey of the entire park. 0-5 years. **Estimated Cost: $50,000.**
13. Perform a phase II archaeological survey of selected areas within the park. 0-10 years. **Estimated Cost: $60,000.**

ADMINISTRATION

Redesign or relocation of facilities that will prevent degradation of park water resources:

14. Redesign and retrofit the Hickory Campground to attenuate and treat storm water runoff and erosion into the sinkholes connected to the caves and spring. 0-2 years. **Estimated Cost: $50,000.**
15. Redesign and retrofit or relocate facilities that treat septic effluent in the vicinity of springs or the spring-run stream. 0-5 years. **Estimated Cost: $150,000.**
16. Redesign and reconstruct entrance drive to accommodate multiple motor homes around the ranger station. 0-2 years. **Estimated Cost: $50,000.**

Manatee Springs State Park

Capital Improvements

Item	Quantity	Unit	Unit Price	Multiplier	Amount
Recreation Facilities					
Canoe Launch	1.000	ea.	$20,000.00	1.00	$20,000.00
Concession Building	1.000	ea.	$225,000.00	1.00	$225,000.00
Demolish Existing Concession Building	1.000	ea.	$50,000.00	1.00	$50,000.00
Interpretive Exhibits	1.000	ea.	$25,000.00	1.00	$25,000.00
Medium Bathhouse	1.000	ea.	$135,000.00	1.00	$135,000.00
Renovate Bathhouse	2.000	ea.	$25,000.00	1.00	$50,000.00
Renovate Camp Sites	1.000	ea.	$15,000.00	1.00	$15,000.00
Stabilized Parking (10 Car)	1.000	per 10	$2,500.00	1.00	$2,500.00
Stabilized Road	0.250	mile	$140,000.00	1.00	$35,000.00
Standard Camping Area	1.000	ea.	$500,000.00	1.00	$500,000.00
Support Facilities					
Medium Area Native Plant Buffer Landscape	1.000	LS	$50,000.00	1.00	$50,000.00
Paved Pull-offs	1.000	ea.	$7,500.00	1.00	$7,500.00
Remove Boat Ramp and Reconfigure Access Road	1.000	ea.	$120,000.00	1.00	$120,000.00
Small Native Plant Buffer Landscape	2.000	LS	$20,000.00	1.00	$40,000.00
Swim Area Deck Repairs	1.000	ea.	$7,500.00	1.00	$7,500.00
Road improvements	1.000	LS	$45,000.00	1.00	$45,000.00
			Sub-Total		$1,352,500.00
			20 Percent Contingency Fee		$270,500.00
			Total		**$1,623,000.00**

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.

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 - 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*

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

A. GENERAL DISCUSSION

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

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

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

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

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

B. STATUTORY AUTHORITY

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

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

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

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

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

Contact Person: **Susan M. Harp**
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