ST. SEBASTIAN RIVER PRESERVE

STATE PARK

UNIT MANAGEMENT PLAN

APPROVED

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

OCTOBER 14, 2005

Department of Environmental Protection

Jeb Bush
Governor

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard, MS 140
Tallahassee, Florida 32399-3000
Phone: (850) 245-2784 Fax: (850) 245-2786

Colleen Castille
Secretary

November 7, 2005

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

Re: St. Sebastian River Preserve State Park Lease # 4118 and 4397

Dear Ms. White:

On October 14, 2005, the Acquisition and Restoration Council recommended approval of the St. Sebastian River Preserve State Park management plan. Therefore, the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, approved the management plan for the St. Sebastian River Preserve State Park. Pursuant to Sections 253.034 and 259.032, Florida Statutes, and Chapter 18-2, Florida Administrative Code this plan's ten-year update will be due on October 14, 2015.

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

Sincerely,

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

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St. Sebastian River Preserve State Park is located in Brevard and Indian River counties (see Vicinity Map). Access to the northern half of the park is from Buffer Preserve Drive, off Babcock Street, approximately three miles north of Fellsmere (see Reference Map). WW Ranch Road provides access to the southeast side of the park off County Road 512 approximately one mile west of the city of Sebastian and two miles east of Interstate 95. A third access point to the southwest side of the park off County Road 512 lies one mile west of Interstate 95 at the Ten Mile Ridge. Currently the park contains 21,748.42 acres. The vicinity map also reflects significant land and water resources existing near the park.

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

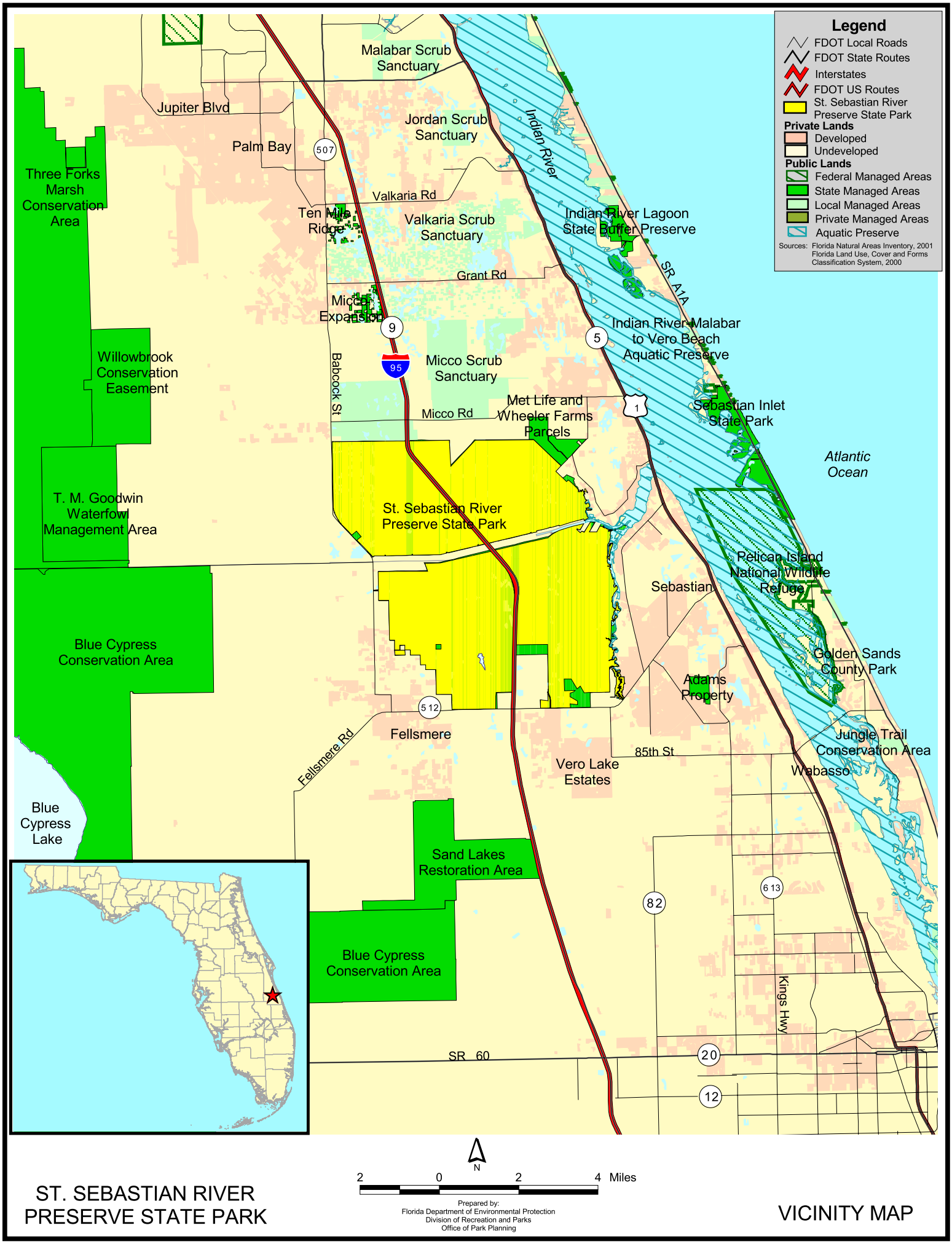
PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of St. Sebastian River Preserve State Park as a unit of Florida's state park system. It identifies the objectives, criteria and standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and intended to be consistent with the State Lands Management Plan. With approval, this management plan will replace the June, 1999 approved plan. All development and resource alteration encompassed in this plan is subject to the granting of appropriate permits; easements, licenses, and other required legal instruments. Approval of the management plan does not constitute an exemption from complying with the appropriate local, state or federal agencies. This plan is also intended to meet the requirements for beach and shore preservation, as defined in Chapter 161, Florida Statutes and Chapters 62B-33, 62B-36 and 62R-49, Florida Administrative Code.

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

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

In the development of this plan, the potential of the park to accommodate secondary management purposes (“multiple uses”) was analyzed. These secondary purposes were considered within the context of the Division’s statutory responsibilities and an analysis of the resource needs and values of the park. This analysis considered the park’s natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this park, it was determined that timber management and cattle grazing of the improved pastures could be accommodated in a manner that would be compatible and not interfere with the primary purpose of resource-based outdoor recreation and conservation. Uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities



ST. SEBASTIAN RIVER PRESERVE STATE PARK

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

VICINITY MAP

POWERLINE

HERNDON SWAMP

INTERSTATE 95

N. FORK ST. SEBASTIAN R.

BABCOCK ST

C-54 CANAL

FELLSMERE CANAL

S. FORK ST. SEBASTIAN R.

CR 507

FELLSMERE

CR 512 (FELLSMERE ROAD)

N. COUNTY REGIONAL PARK

ST. SEBASTIAN CANOE LAUNCH PARK (COUNTY)

LEGEND

- EXISTING FACILITY LOCATIONS
- TRAILS
- CANALS
- PARK BOUNDARY
- AQUATIC PRESERVE
- OTHER CONSERVATION AREAS

ST. SEBASTIAN PRESERVE STATE PARK

N

REFERENCE MAP

PREPARED BY: DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF RECREATION AND PARKS
OFFICE OF PARK PLANNING

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.

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

MANAGEMENT PROGRAM OVERVIEW

Management Authority and Responsibility

In accordance with Chapter 258, Florida Statutes, and Chapter 62D-2, Florida Administrative Code, the Division of Recreation and Parks (Division) is charged with the responsibility of developing and operating Florida's recreation and parks system. These are administered in accordance with the following policy:

> It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

The Trustees have also granted management authority of certain sovereign submerged lands to the Division under Management Agreement MA 68-086 (as amended January 19, 1988). The management area includes a 400-foot zone from the edge of mean high water where a park boundary borders sovereign submerged lands fronting beaches, bays, estuarine areas, rivers or streams. Where emergent wetland vegetation exists, the zone extends waterward 400 feet beyond the vegetation. The agreement is intended to provide additional protection to resources of the park and nearshore areas and to provide authority to manage activities that could adversely impact public recreational uses.

The St. Sebastian River Preserve State Park overlaps the Indian River - Malabar to Vero Beach Aquatic Preserve along the Sebastian River that is managed by the DEP Office of Coastal and Aquatic Managed Areas. Where the overlap occurs, legislative authority is shared by both Divisions.

Many operating procedures are standard system wide and are set by policy. These procedures are

outlined in the Division's Operations Manual (OM) that covers 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 St. Sebastian River Preserve State Park, preservation and enhancement of natural conditions is all important. Resource considerations are given priority over user considerations and development is restricted to the minimum necessary for ensuring its protection and maintenance, limited access, user safety and convenience, and appropriate interpretation. Permitted uses are primarily of a passive nature, related to the aesthetic, educational and recreational enjoyment of the preserve, although other compatible uses are permitted in limited amounts. Program emphasis is placed on interpretation of the natural and cultural attributes of the preserve.

Park Goals and Objectives

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

Estimates are developed for the funding and staff resources needed to implement the management plan based on these goals, objectives and priority management activities. Funding priorities for all state park management and development activities are reviewed each year as part of the Division'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. Conserve, protect and manage natural communities, significant habitat and ecological systems.
   - **A.** Eliminate exotic plant and animal species to the greatest extent practicable
   - **B.** Maintain fire as an ecosystem process.
   - **C.** Seek funding for additional staff to aid in the preparation, implementation, and evaluation of resource management, especially the prescribed fire program.
   - **D.** Monitor and evaluate the effects of prescribed fire, especially burn frequency and season of burn and how it relates to ecosystem change.

2. Restore the original hydrology of the preserve to the greatest extent practicable.
   - **A.** Seek funding for and develop a comprehensive hydrological restoration plan for the entire preserve
   - **B.** Continue to eliminate ditches by plugging and backfilling to restore wetland communities and prevent further degradation of adjacent communities, where feasible.
   - **C.** Evaluate raised roadbeds in the preserve that impede water flow. Reconnect or relocate roads wherever practicable.
   - **D.** Evaluate issues of soil compaction, erosion, scouring and disruption of sheetflow from recreational trail use. Improve or reroute trails determined to negatively impact the parks natural resources.

E. Evaluate the potential to increase water conveyance through Herndon Swamp at gas line road. Rework the remaining south drains into the C-54 canal.
F. Monitor and evaluate hydrological restoration efforts.

3. Maintain or increase populations of listed plants and animals occurring on the preserve.
A. Continue the Florida scrub-jay (*Aphelocoma coerulescens*) demographic study and implement management recommendations. Seek permanent funding for Florida scrub jay research and management. Develop a park specific recovery plan for the Florida scrub jay
B. Continue monitoring nesting success of red-cockaded woodpeckers (*Picoides borealis*) and implement management recommendations. Seek permanent funding for RCW research and management. Develop a park specific recovery plan for the RCW
C. Explore opportunities for wildlife connectivity, linkages, and wildlife crossings and corridors between all four quadrants of the park and with other public lands in the region.
D. Continue to inventory, map and monitor populations of protected plant species.
E. Conduct a comprehensive invertebrate survey.
F. Complete a bat survey.
G. Survey and monitor populations of gopher tortoises (*Gopherus polyphemus*).
H. Survey and monitor populations of gopher frogs (*Rana capito*).
I. Conduct a comprehensive herpetological inventory.
J. Complete a small mammal survey.
K. Develop environmental education programs to discourage visitors from collecting plants or disturbing wildlife.
L. When necessary create seasonal rotating area closures to allow sensitive habitat and species to recover from human induced impacts

4. Aid in the improvement of water quality in the St. Sebastian River and the Indian River Lagoon.
A. Continue interagency cooperative efforts to collect water quality and biological data in the St. Sebastian River and the Indian River Lagoon.
B. Provide trash collection and coordinate with Brevard County's Department of Natural Resources to provide monofilament recycling at any existing and proposed fishing area

Cultural Resources

1. Identify, preserve, interpret and actively manage cultural resources.
A. Take steps to protect and stabilize the Hardee Point Midden from erosion, and to interpret the site.
B. Ensure that steps are taken to protect all cultural resources from natural and man-made threats.
C. Seek grant funding for research projects to document the prehistory and history of the park and the surrounding area.
D. Develop and implement a written plan to protect and preserve the recorded archaeological sites from erosion, slumpage, animal burrowing, root damage, tree fall and vandalism.
E. Establish monitoring measures to monitor recorded archaeological sites for erosion, vegetation intrusion, animal burrowing and human disturbance.
F. Complete archaeological reconnaissance surveys of the park, marking the site locations with GPS technology.
G. Improve public awareness and encourage protection and stewardship of the cultural resources of the park through education, interpretation and enforcement of agency rules and regulations.

H. Recruit a volunteer to survey cultural sites.

Recreational Goals

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

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

Visitor Services

1. Provide environmental education and enhance public appreciation for elements of natural and cultural diversity.

- **A.** Design and conduct more interpretive programs and field trips for the general public, school groups and other organized groups to raise awareness of the various ecosystems on the preserve and the plants and animals that occur in them.
- **B.** Train additional volunteer tour guides.
- **C.** Staff the visitor's center and gift shop seven days/week with volunteers to provide information to the general public.
- **D.** Expand outreach opportunities through increased participation at local festivals, events, and group meetings by using volunteer staff.
- **E.** Continue to expand participation in the park's Citizen Support Organization, the Coastal Preserves Alliance, a nonprofit group that provides financial and other types of support to the preserve. A list of prioritized projects is compiled annually by the park manager and mutually agreed to by the group's Board of Directors.
- **F.** Develop a handicap accessible trail

Park Administration/Operations

1. Develop and maintain appropriate procedures and practices for effective, efficient management of the park's natural and cultural resources and facilities.

- **A.** Secure two new Full-Time Equivalent (FTE) positions to meet demands of development and operation of a new state park and visitor center.
- **B.** Secure sufficient, annual allotments of Expense, Other Personnel Services, Fixed Capital Outlay, Outsourcing, Other Capital Outlay and Resale funds.
- **C.** Train all staff in the areas of Administration, Maintenance, Protection, Resource Management and Visitor Services.
- **D.** Develop a Volunteer Program as an augmentative staff pool.
- **E.** Form partnerships and other alternatives to the legislative appropriations process for funding of park operations.
- **F.** Monitor activities outside the park that may affect park resources and operations, promoting public awareness of outside influences.
- **G.** Establish and maintain an active public relations program highlighting park objectives.
- **H.** Maintain compliance with local, state and federal safety guidelines by developing and maintaining a Park Protection Plan and providing ongoing safety training programs.
- **I.** Coordinate water resources protection and management activities such as restoration, water quality monitoring, facilities design, permitting, construction and maintenance with the SJRWMD, the DEP and others.
- **J.** Maintain a coordinated network of law enforcement agencies, including the Florida Park Patrol, other state agencies and applicable local governments for the protection of the natural and cultural resources of the state preserve and its visitors.
- **K.** Support administrative operations using current technology.

2. Provide efficient, coordinated access and programming to ensure a safe, quality workplace,

resource protection and visitor experiences.

A. Conduct all operations in accordance with the OM.
B. Plan and operate facilities to channel visitors while not compromising any resources.
C. Schedule park programming, when practicable.
D. Implement appropriate Visitor Service Provider or Special User Permit operations to augment park services.
E. Maintain facilities and produce all park informative materials in adherence with the Americans with Disabilities Act and the Florida Americans with Disability Accessibility Implementation Act.
F. Conduct routine inspections of all park operations, immediately correct safety discrepancies, regularly clean and maintain facilities and equipment.
G. Coordinate with recreational user and sport organizations to assist with development, monitoring and education programs to enhance the visitor experience.

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. Extensive management coordination with the U.S. Fish and Wildlife Service (USFWS) is ongoing for the federally listed species within the preserve. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Wetland Resources aids staff in planning and construction activities seaward of the Coastal Construction Line. In addition, the Bureau of Beaches and Wetland Resources aid the staff in the development of erosion control projects. Emphasis is placed on protection of existing resources as well as the promotion of compatible outdoor recreational uses.

At the St. Sebastian River Preserve State Park, ongoing coordination programs include active management of the park's listed animal species, particularly the red cockaded woodpecker and the Florida scrub jay, with the FWC and the USFWS. Division staff works with the St. Johns River Water Management District on an ambitious hydrological restoration program and with both the water management district and the U.S. Army Corps of Engineers on the management of the C-54 and Fellsmere canals and associated control and maintenance facilities. CAMA and Division staff collaborates regarding water quality protection and enhancement, in addition to other issues within the state park.

Public Participation

The Division provided opportunities for public input by conducting a public workshop and an advisory group meeting. A public workshop was held on July 6, 2005. The purpose of this meeting was to present this draft management plan to the public. An Advisory Group meeting was held on July 7, 2005. The purpose of this meeting was to provide the Advisory Group members the opportunity to discuss this draft management plan.

Other Designations

St. Sebastian River Preserve State Park is not within an Area of Critical State Concern as defined in section 380.05, Florida Statutes and it is not under study for such designation. The park is a component of the Florida Greenways and Trails System.

All waters within the unit have been designated as Outstanding Florida Waters, pursuant to Chapter 62-302 Florida Administrative Code. Surface waters in this unit are also classified as Class III waters by DEP. This unit is adjacent to the Indian River-Malabar to Vero Aquatic Preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes).

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

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

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

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

Because park units are often components of larger ecosystems, their proper management is often affected by conditions and occurrences beyond park boundaries. Ecosystem management is implemented through a resource management evaluation program (to assess resource conditions, evaluate management activities and refine management actions), review of local comprehensive plans and review of permit applications for park/ecosystem impacts.

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

Lands within the St. Sebastian River Preserve State Park are relatively flat, with an average elevation of 24 feet above mean sea level. The highest spots are in the scrubby flatwoods on the north side of the preserve, west of I-95, where elevations reach 33 to 34 feet. The property slopes gently to the east, towards the St. Sebastian River. The greatest topographic variation on the property can be found along the river, where periodically steep bluffs occur along the western bank. The elevation changes from approximately 5 feet to 20 feet above mean sea level in a relatively narrow band.

Geology

White (1970) divided Florida into three major geomorphic zones. The preserve falls within the Mid-Peninsular zone and is "characterized by discontinuous highlands in the form of sub-parallel ridges separated by broad valleys." In general, highlands are well drained and correspond to high recharge areas, while lowlands are often swampy and poorly drained. Within the Mid-Peninsular zone, the preserve lies within the Eastern Valley subunit and includes a portion of Ten Mile Ridge.

Soils

The preserve has 58 different soil types (see Soils Map), including those found in disturbed areas. The soil survey was compiled by the U.S. Department of Agriculture, Soil Conservation Service in the soil survey of Brevard County (Huckle et al. 1974) and Indian River County (Wettstein et al. 1987). Addendum 3 contains detailed descriptions of the soil types within this unit.

Soil and water conservation will be largely addressed under hydrologic restoration. Management activities will follow generally accepted best management practices to prevent soil erosion and conserve soil and water resources on the preserve. Removal of interior ditching and restoration of sheet flow to the greatest extent possible will result in improvements to water quality and erosion prevention.

Minerals

Valuable mineral resources, such as oil, gas or phosphate are not known in the area (Scott 1992).

Hydrology

Groundwater. The St. Sebastian River Preserve State Park overlies two aquifers (groundwater reservoirs), the Floridan and the surficial. The Floridan aquifer underlies the entire state of Florida and the Coastal Plain of Alabama, Georgia and South Carolina. In the region of the preserve, the top of the Floridan Aquifer is 100-500 feet below ground level, and is 2,800-3,200 feet thick. There are no areas of high recharge within the preserve. The surficial aquifer consists of sand and shell deposits with uppermost layers contiguous with the land surface. Both aquifers are artesian, meaning that the groundwater is confined beneath a non-porous geologic formation (Duncan et al. 1994).

Brevard and Indian River counties are areas of artesian flow and have low probabilities for sinkhole development. There are no springs within the preserve or within Brevard or Indian River counties (Fernald et al. 1985). However, numerous surficial springs do occur in both Indian River and Brevard Counties and may possibly occur at the SSRPSP.

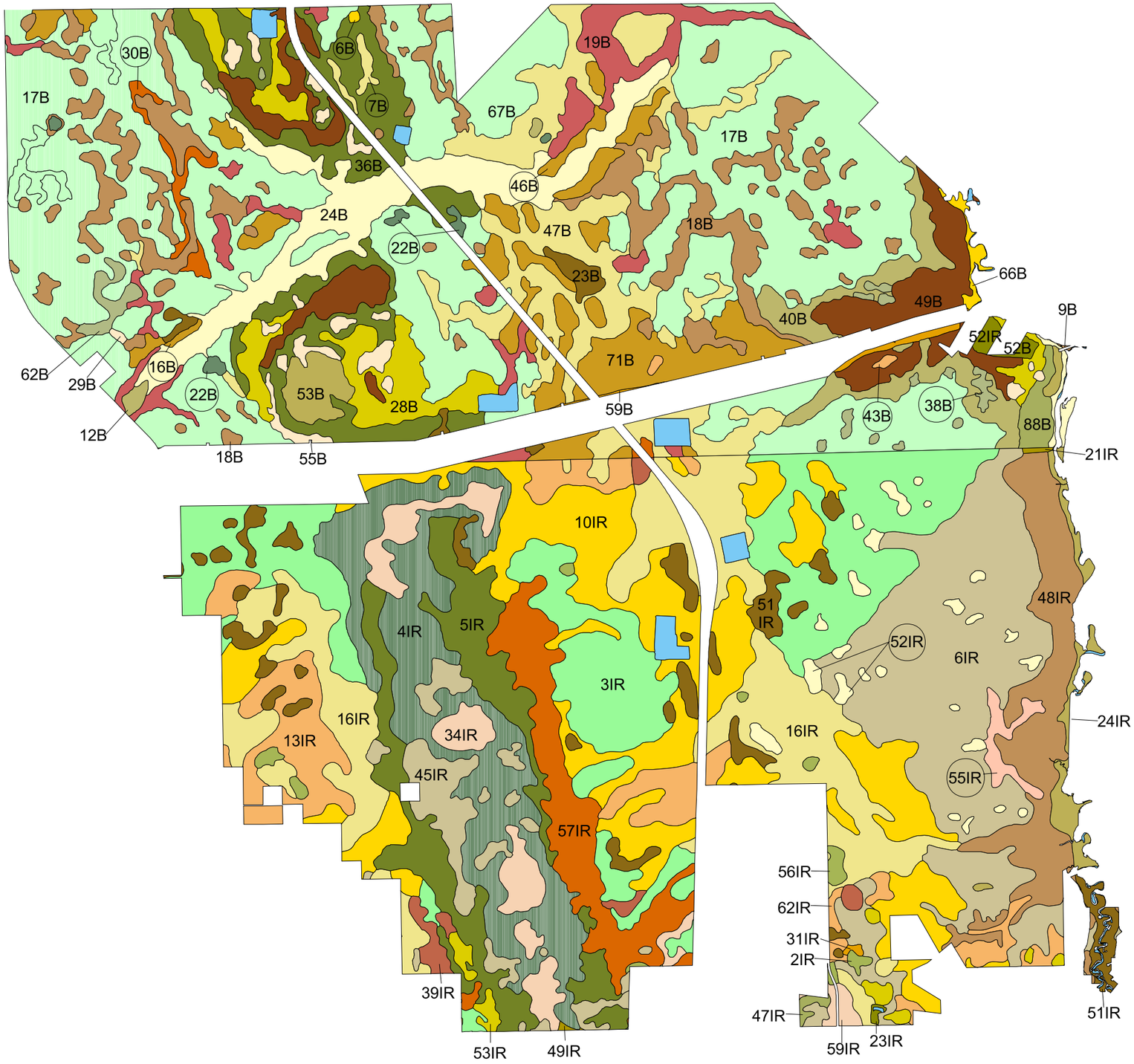
Surface Water. Major surface water features within the preserve include the St. Sebastian River and Herndon Swamp. The C-54 Canal is a man-made structure that was built to provide flood relief to the upper St. Johns River basin. During major storm events, water is discharged from the upper St. Johns River marsh through the C-54 Canal into the Indian River Lagoon. All surface waters within the preserve are designated as Class III waters. The St. Sebastian River Preserve State Park is adjacent to the Indian River – Malabar to Vero Beach Aquatic Preserve which has been designated as an Outstanding Florida Water, pursuant to Chapter 62-302 F.A.C. and classified as Class III waters by the DEP. The Indian River Lagoon is one of the country's most productive, diverse, and commercially and recreationally important estuaries.

Drainage Basin. The preserve lies within the St. Sebastian River drainage basin. Sub-basins are described by Steward and VanArman (1987).

Regional Drainage Patterns. The region is flat and was characterized historically by its many poorly drained swamps. Historically, the land drained naturally to the east into the St. Sebastian River. In recent times, drainage has been dramatically altered by the construction of numerous canal systems for urban and agricultural drainage. Thousands of acres of St. Johns River marsh floodplain were converted to agricultural land, adding abnormal amounts of freshwater to the Indian River Lagoon. Without the diversion canals, water would have discharged into the Indian

LEGEND

- 6B-Basinger sand, depressional
- 7B-Basinger sand
- 9B-Canaveral-Anclote complex, gently undulating
- 12B-Chobee sandy loam, frequently flooded
- 16B-Copeland-Bradenton-Wabasso complex
- 17B-EauGallie sand
- 18B-EauGallie, Winder, and Riviera soils, depressional
- 19B-Riviera sand
- 22B-Floridana sand, depressional
- 23B-Floridana sand
- 24B-Floridana, Chobee, and Felda soils, frequenly flooded
- 28B-Immokalee sand
- 29B-Malabar sand, high
- 30B-Malabar sand
- 36B-Myakka sand
- 38B-Myakka sand, depressional
- 40B-Oldsmar sand
- 43B-Paola fine sand, 0 to 5 percent slopes
- 46B-Hilolo fine sand
- 47B-Pineda sand
- 49B-Pomello sand
- 52B-Quartzipsamments, smoothed
- 53B-Satellite sand
- 55B-St. Johns sand, depressional
- 59B-Udorthents, steep
- 62B-Samsula muck, depressional
- 66B-Bessie muck, tidal
- 67B-Tomoka muck, undrained
- 71B-Wabasso sand
- 88B-Electra fine sand, 0 to 5 percent slopes
- 2IR-Chobee loamy fine sand
- 3IR-Jupiter fine sand
- 4IR-Canova muck
- 5IR-Myakka fine sand
- 6IR-Oldsmar fine sand
- 10IR-Riviera fine sand
- 13IR-Wabasso fine sand
- 14IR-Winder fine sand
- 16IR-Pineda fine sand
- 21IR-Pomello sand, 0 to 5 percent slopes
- 23IR-Arents, 0 to 5 percent slopes
- 24IR-Floridana sand
- 31IR-Jupiter fine sand
- 34IR-Satellite fine sand
- 39IR-Malabar fine sand
- 45IR-Myakka fine sand, depressional
- 47IR-Holopaw fine sand
- 48IR-Electra sand, 0 to 5 percent slopes
- 49IR-Pompano fine sand
- 51IR-Riviera fine sand,depressional
- 52IR-Oldsmar fine sand, depressional
- 53IR-Manatee mucky loamy fine sand, depressional
- 55IR-Floridana mucky fine sand, depressional
- 56IR-Pineda fine sand, depressional
- 57IR-Holopaw fine sand, depressional
- 59IR-Lokosee fine sand
- 62IR-Chobee mucky loamy fine sand, depressional
- Water



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

ST SEBASTIAN RIVER
PRESERVE STATE PARK

SOILS MAP

River Lagoon only during major floods.

Freshwater discharge enters the Indian River Lagoon as over-land flow and as point discharges through several natural creeks and man-made canals, including the Fellsmere Canal and C-54 Canal. The C-54 Canal was built as part of the old Upper St. Johns River Flood Control Project to convey excess floodwaters from the St. Johns River marshes to the Indian River Lagoon through the St. Sebastian River. The C-54 Canal empties into the St. Sebastian River at Structure S-157, which has a maximum discharge capacity of 6,500 cfs. Discharge from C-54 Canal has profound effects on the Indian River Lagoon system during hurricanes and tropical storms. The analysis and restoration of the lagoon's hydrology is a complex project being handled by St. Johns River Water Management District (SJRWMD) staff separately from the management of the preserve.

Drainage Patterns within the Preserve. Black and white aerial photography from 1943, 1951, 1958, 1980, 1989, and infrared aerial photography from 1984 and 1994 were used to determine changes in land use and hydrology over time. The evaluation indicated present drainage patterns in the preserve are considerably different from historic drainage patterns. Historically, preserve lands generally drained eastward to the St. Sebastian River. Construction of the C-54 Canal, Fellsmere Canal and Interstate 95, subdivided drainage into four nearly disjunct quadrants. Each of the quadrants is discussed below.

The major drainage feature within the northeast portion of the preserve is Herndon Swamp, which drains from the southwest to the northeast. Historically, water flowed from the swamp to the north prong of the St. Sebastian River through two drainage paths. One was east through an extension of the swamp and the second extended north from the preserve, then arched east and south to the north prong. The northern drainage route was lost when the land was converted to citrus groves; the North Canal was built as a drainage replacement. A portion of Herndon Swamp currently drains excessively into the North Canal through large erosion ditches cut into the north levee. A hydrologic barrier is needed on the north line to restore flow from the basin swamp east through an extension of Herndon Swamp and on to the north prong. In addition, erosion has deposited fill from the levee in adjacent wetlands. The SJRWMD is in the final planning phases of this restoration project.

The general drainage pattern for areas adjacent to Herndon Swamp is towards the swamp or North Canal, then east to the north prong. Areas south of Herndon Swamp nearer to the C-54 Canal generally drain south to what was once the west prong and is now the C-54 Canal. The north and west prongs converge and flow east to meet the south prong, which flows north/northeast and discharges into the Indian River Lagoon.

Herndon Swamp remains as the prominent drainage feature in the northwest portion of the preserve. Adjacent lands generally drain to the swamp, then northeast towards the north prong of the St. Sebastian River. Drainage northeast through the swamp has been disrupted by elevated roadbeds, a power line easement and I-95. Some flow in Herndon Swamp does continue northeast through culverts under I-95. Drainage through the swamp had also been disrupted by several ditches that diverted the historic flow southward to the C-54 Canal. Since the last management plan, mitigation monies were aggressively sought to fill in several of these ditches in efforts to restore the natural drainage to the greatest extent practicable.

The southwest quadrant of the preserve contains the Carson Platt tract and a portion of the Coraci tract, where a high sandy ridge west of I-95 divides the quadrant into easterly and westerly

drainages. On either side of the ridge, drainage historically flowed away from the ridge as sheetflow. East of the ridge, canals now intercept the sheet flow and divert surface water through culverts under I-95, and on to small creeks connecting to the St. Sebastian River. West of the ridge, 12 ditches running east to west drain into a canal located approximately ½ mile west of the preserve boundary.

Drainage in the southeast quadrant of the preserve historically flowed eastward across wet prairies, depression marshes, wet swales, and pine flatwoods, eventually collecting in numerous small seasonal streams which flowed on to the St. Sebastian River through sandy ridges along the south and west prongs. This pattern was disrupted when numerous ditches were constructed to drain pastures and surrounding wooded areas for agriculture. The network of ditches was connected to existing natural creeks along the eastern edge of the preserve that empty into the south prong of the St. Sebastian River and the C-54 Canal. In addition, several raised roadbeds constructed through the southeast quadrant of the preserve intercept sheet flow and divert it into the network of drainage ditches.

Natural Communities

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors, such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas 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 22 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.

Mesic flatwoods. This is the most widely represented plant community on the preserve. Mesic flatwoods occur primarily on poorly drained, seasonally inundated soils of the EauGallie, Wabasso, Myakka and Oldsmar groups. A number of other community types including domes, depression marsh and scrubby flatwoods occur within the mesic flatwoods matrix.

The overstory in mesic flatwoods is dominated by longleaf pine (*Pinus palustris*) or slash pine (*P. elliottii*), with the longleaf pine generally occurring on drier sites. Tree canopy closure is variable from site to site, but generally ranges between 33-66 percent. Several hardwood species including live oak (*Quercus virginiana*), laurel oak (*Q. laurifolia*), and loblolly bay (*Gordonia lasianthus*) occur sporadically in the overstory. The understory includes a mixture of saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), shiny lyonia (*Lyonia lucida*), rusty lyonia (*L. ferruginea*), tarflower (*Bejaria racemosa*), wax myrtle (*Myrica cerifera*), and other typical pine flatwoods species. The ground cover is vigorous and abundant in most areas, and includes a diverse mix of wiregrasses (*Aristida* spp.), bluestems (*Andropogon* spp.), and a variety of other herbaceous species. A number of rare plants including the celestial lily (*Nemastylis floridana*), redmargin zephyrlily (*Zephyranthes simpsonii*), grass pinks (*Calopogon multiflorus*) and Catesby's lily (*Lilium catesbaei*) occur in mesic flatwoods. Wildlife found in mesic flatwoods includes the red-cockaded woodpecker (*Picoides borealis*), Bachman's sparrow (*Aimophila aestivalis*), Eastern indigo snake (*Drymarchon corais couperi*), and bald eagle (*Haliaeetus*

LEGEND

- 8 - Mesic Flatwoods-10663.49 ac.
- 12 - Prairie Hammock-14.46 ac.
- 14 - Sandhill-210.69 ac.
- 15 - Scrub-297.21 ac.
- 16 - Scrubby Flatwoods-1431.02 ac.
- 21 - Upland Hardwood Forest-15.69 ac.
- 24 - Xeric Hammock-6.31 ac.
- 25 - Basin Marsh-671.20 ac.
- 27 - Baygall-333.56 ac.
- 28 - Bottomland Forest-91.22 ac.
- 31 - Depression Marsh-838.20 ac.
- 32 - Dome-248.65 ac.
- 34 - Floodplain marsh-16.11 ac.
- 35 - Floodplain Swamp-33.66 ac.
- 37 - Hydric Hammock-692.11 ac.
- 39 - Seepage Slope-105.19 ac.
- 41 - Strand Swamp-613.35 ac.
- 43 - Wet Flatwoods-55.59 ac.
- 44 - Wet Prairie-1619.05 ac.
- 55 - Blackwater Stream-9.27 ac.
- 66 - Estuarine Tidal Marsh-1.65 ac.
- 84 - Ruderal-3367.81 ac.
- 85 - Developed-12.93 ac.

N

2000 0 2000 4000 Feet

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

ST SEBASTIAN RIVER PRESERVE STATE PARK

NATURAL COMMUNITIES MAP

leucocephalus).

Mesic flatwoods have been impacted by a number of disturbances including ditching, timbering, stumping, the construction of roads and utility easements, and conversion of native ground cover to improved pasture. These disturbances have resulted in localized changes in species composition, diversity and abundance, and have provided sites for invasion of exotic plant species. Changes in hydrology resulting from the ditch network and the prior conversion of native ground cover to improved pasture are the most problematic of these disturbances and will require significant restoration efforts. These issues are addressed separately in the sections on hydrology and management measures for natural resources.

Despite these perturbations, the majority of the mesic flatwoods on the northern portion of the preserve are in fair to excellent condition. The high species diversity and the open character of the land can be attributed to the former owners' fire management program and a very low cattle-stocking rate. The mesic flatwoods on the southern half of the preserve have not been burned as frequently and generally exhibit heavier fuel loadings. One or two dormant season prescribed burns will be required to reduce fuel loads in these areas before incorporating growing season burns.

Prairie hammock. Prairie hammocks occur as small islands within a matrix of wet prairie, mesic flatwoods and disturbed communities. This community type covers primarily the southern half of the preserve. Prairie hammocks are generally small, less than 1/3 of an acre in size, and roughly circular in shape. Vegetation typically includes a dense overstory of live oaks and sabal palms (*Sabal palmetto*) with an understory composed primarily of immature sabal palms and saw palmetto (*Serenoa repens*). Several shrub species such as American beautyberry (*Callicarpa americana*), wax myrtle, and marlberry (*Ardisia escallonioides*) occur sporadically in the understory. The ground cover stratum is typically very sparse or absent. Prairie hammocks are well adapted to fire and require no special fire management actions; they experience fire when the surrounding community burns.

Prairie hammocks remaining within existing natural communities appear to be in very good condition, with minimal invasion of exotic plants. Hammocks occurring within disturbed areas typically have some Brazilian pepper (*Schinus terebinthifolius*), Caesarweed (*Urena lobata*), and other exotic plant species. Several prairie hammocks occur within the existing cattle lease. These hammocks exhibit trails and browse lines from regular cattle use. Wild pigs (*Sus scrofa*) also frequent prairie hammocks, particularly when acorns are dropping. Invasion of exotic plant and animal species is the biggest threat to this community. Exotic plant species invade individual hammocks and replace the native understory vegetation; exotic animals such as wild pigs root up and destroy ground cover vegetation. Treatment of these non-native species is discussed further in the management measure for natural resources section.

Sandhill. This community occurs in the central-eastern portion of the preserve adjacent to the C-54 Canal. Small patches of sandhill are found on both the north and south sides of the canal. This distribution generally corresponds with deposits of Pomello sand on well-drained ridges that occurred along the old west prong of the St. Sebastian River. This represents one of the southernmost occurrences of this community type in the region.

Sandhill on the preserve is generally characterized by a sparse overstory of longleaf pine with abundant sand live oak (*Q. geminata*) and turkey oak (*Q. laevis*). Bluejack oak (*Q. incana*) and sand pine (*P. clausa*) occur occasionally in the overstory. Scattered saw palmetto, lyonia, myrtle

oak (*Q. myrtifolia*), and Chapman's oak (*Q. chapmanii*) occur in the understory. The ground cover, which includes wiregrass, bluestems, gopher apple (*Licania michauxii*), and various other herbaceous species, is patchy and poorly developed. Wildlife observed in the sandhill includes the Florida gopher frog (*Rana capito*), eastern indigo snake and gopher tortoise (*Gopherus polyphemus*).

In general, the sandhill is in fair to good condition. In some locations, the density and stature of oaks is higher than desired, particularly in the patches south of the C-54 Canal where prescribed burning was infrequent. The sandhill north of the C-54 Canal was burned every three to five years during the winter, which kept oak densities and fuel loads lower. The addition of growing season burns in these communities should further reduce the density and stature of oaks, and stimulate herbaceous species in the ground cover that have been suppressed by the lack of fire or dormant season burning.

Scrub. Scrub occurs in several locations along the eastern edge of the preserve on sandy ridges adjacent to the St. Sebastian River and along a sandy ridge in the Carson Platt parcel. This community type occurs primarily on Pomello sand and Electra sand 0-5 percent slopes.

Two types of scrub occur on the preserve: sand pine scrub and oak scrub. Sand pine scrub is characterized by a dense canopy of sand pine with an understory of saw palmetto, rusty lyonia, myrtle oak, Chapman's oak, and canopy species regeneration. Oak scrub is characterized by dense stands of sand live oak, myrtle oak, and Chapman's oak with widely scattered pines. Scrub wild olive (*Osmanthus megacarpus*) and scrub hickory (*Carya* floridana) occur occasionally in the canopy. The understory is composed of scattered saw palmetto and canopy species regeneration. Ground cover vegetation is sparse to absent in both types of scrub. Several listed species occur in scrub on the preserve including large-flowered rosemary (*Conradina grandiflora*), Curtiss' milkweed (*Asclepias curtissii*), and Florida scrub-jays (*Aphelocoma coerulescens*).

The scrub community on the preserve is in fair to good condition. Major efforts have been put into restoring this community type for the benefit of the Florida scrub-jay. These efforts will be discussed further under the Designated Species component of the Management Measures section. Mechanical treatments such as roller chopping have been used in the past and will continue to be utilized in many of the overgrown scrub areas on the south half of the unit to restore this community.

Scrubby flatwoods. Scrubby flatwoods are situated along north to south-oriented sandy ridges on the east side of I-95 and along the south prong of the St. Sebastian River. Its distribution corresponds with deposits of EauGallie sand and Electra sand 0-5 percent slopes. Scrubby flatwoods typically occurs in a mosaic with mesic flatwoods and scrub.

This community is characterized by an open canopy of longleaf pine and a diverse mix of mesic flatwoods and scrub species in the understory. The presence of myrtle oak and Chapman's oak are key indicators of this community type. The ground cover includes a mix of wiregrass, gopher apple, running oak (*Q. pumila*), narrowleaf silkgrass (*Pityopsis graminifolia*), and various other grasses and herbs. Wildlife found in scrubby flatwoods includes gopher frogs, gopher tortoises, eastern indigo snakes and Florida scrub-jays. Scrubby flatwoods are utilized extensively by Florida scrub-jays.

The condition of this community varies considerably throughout the preserve. Patches burned at

regular intervals (every three to eight years) are in very good condition and support a growing population of scrub-jays. Most scrubby flatwoods patches in the northern half of the unit are in very good condition because of regular prescribed burning. Scrubby flatwoods on the southern half of the preserve were in poor to fair quality before state acquisition due to lack of regular fire. However, they have received much management attention in the last several years and exhibit measurable habitat improvements and increased use by Florida scrub-jays.

As with oak scrub, prescribed burning overgrown scrubby flatwoods can be very difficult due to the lack of fine fuels available to carry fire into the oak canopy. When prescribed burning is attempted, burn objectives that include reducing the stature of the oak subcanopy may not be met because the area burns with a very low intensity fire through surface litter. Mechanical techniques such as roller chopping speed up the restoration process by immediately reducing the stature of the oak canopy and providing fuels to carry fire. Roller chopping in conjunction with prescribed burning also creates open patches that are important for scrub-jays. These techniques have been utilized and will continue to be utilized to restore and maintain scrubby flatwoods throughout the preserve.

Upland hardwood forest. Upland hardwood forest occurs adjacent to the old Carlton homestead on the southern half of the preserve. This community type is most likely an artifact of human habitation in the area. No special management actions are proposed for this community.

Xeric hammock. This community type occurs in narrow strips along the St. Sebastian River where it is protected from intense fires. Xeric hammock occurs adjacent to oak scrub and scrubby flatwoods communities, and probably represents an advanced successional stage of these communities.

Xeric hammock is characterized by a dense canopy of sand live oak with an understory of saw palmetto. Ground cover vegetation is very sparse or absent. Epiphytes, including the Florida butterfly orchid (*Encyclia tampensis*) and several species of airplants (*Tillandsia* spp.) are abundant. This community is in good condition and no special management actions are proposed.

Basin swamp. Basin swamp occurs in several locations on the northern half of the preserve adjacent to Herndon Swamp. This community type occurs in shallow depressions of EauGallie, Wabasso and Felda sands. Basin swamps are characterized by irregularly shaped, seasonally flooded depressions surrounded by mesic flatwoods and wet prairie. Vegetation includes an overstory of pond-cypress (*Taxodium ascendens*) with scattered slash pine and other hydrophytic trees. The understory and ground cover is comprised of a diverse mix of small woody shrubs, grasses, sedges, rushes, pipeworts (*Eriocaulon* spp.), and other herbaceous species.
Most basin swamps have been impacted by increased drainage through the network of ditches constructed prior to purchase by the State. This has altered the hydroperiod of the swamps resulting in encroachment of mesic and weedy pioneer species. As a result, this community is in poor condition. The filling of some of the ditches that has already occurred has drastically improved the hydrologic conditions of the associated basin swamps. Continued filling of the ditch network is needed to improve hydrologic conditions in this community.

Baygall. Baygall occurs in several seepage-maintained depressions adjacent to Herndon Swamp. The largest representative of this community type occurs in the north-central portion of the preserve on the west side of I-95; it is maintained by seepage from a large sandy ridge to the north.

Baygall is vegetated by dense stands of loblolly bay with fetterbush, wax myrtle, dahoon holly (*I. cassine*), and other hydrophytic shrubs and small trees in the understory. Ground cover vegetation includes toothed mid-sorus fern (*Blechnum serrulatum*), netted chain fern (*Woodwardia areolata*), cinnamon fern (*Osmunda cinnamomea*), and other herbaceous species like lizard's tail (*Saururus cernuus*).

As with most other wetland communities on site, baygall has been impacted by drainage ditches that reduced the hydroperiod and allowed encroachment of mesic species. Increased drainage also allowed more intense fires to encroach, killing canopy trees and setting the community back to an earlier successional stage. While this is a natural part of the life cycle of baygalls, repeated intense fires could eliminate the baygall community altogether. The ditches, which have been restored, have increased the hydroperiod within this community. As a result, this community is in poor condition. Continued ditch restoration will further prevent the drainage of this wetland community.

Bottomland forest. Bottomland forest occurs in two locations in the northern half of the preserve, along the north prong of the St. Sebastian River and the eastern extension of Herndon Swamp. Bottomland forest is characterized by a dense canopy of live oak, water oak (*Q. nigra*), red maple (*Acer rubrum*), water hickory (*C. aquatica*), and pignut hickory (*C. glabra*) with a dense subcanopy of sabal palms. A number of species occur in the understory and ground cover including wax myrtle, common buttonbush (*Cephalanthus occidentalis*), twinberry (*Myrcianthes fragrans*), lizard's tail, toothed mid-sorus fern, netted chain fern, and royal fern (*Osmunda regalis*). Hand fern (*Ophioglossum palmatum*), an endangered species, is one of the many species of epiphytes occurring in bottomland forest.

Along the eastern extension of Herndon Swamp, this community has been significantly impacted by increased drainage into a large ditch along the north boundary of the preserve known as the North Canal; this has reduced the quantity and frequency of water flowing through this extension to the north prong of the St. Sebastian River. This has promoted the invasion of exotic, native ruderal, and mesic species into the community, and allowed fire to encroach into areas that typically would not burn. The increased drainage into the North Canal has also impacted epiphyte populations, particularly hand fern, which depends on high humidity levels and protection from frequent fire. When completed, the SJRWMD's North Levee Restoration Project will greatly increase the quantity and frequency of water flowing through the bottomland forest community. As a result of the hydrological alterations, this community is in poor condition.

Depression marsh. The depression marsh community is characterized by seasonally wet ponds scattered throughout the matrix of other communities found on the preserve. Vegetation in this community type includes a diverse mixture of grasses, sedges, rushes and aquatic emergent species, organized in concentric bands based on tolerances to the level and duration of inundation. Small tree or shrub islands periodically occur within depression marshes. These wetlands are important breeding grounds for a number of reptiles and amphibians, as well as sandhill cranes (*Grus canadensis*).

Undisturbed depression marshes on this unit are in very good condition and require no special management actions. A number of marshes have been impacted by drainage ditches, roads and firelines. Marshes impacted by drainage ditches exhibit characteristic signs of encroachment by mesic species and a reduction in size due to a reduction in the level and duration of inundation. These ditches need to be filled to recover these wetlands; this is discussed further in the management measures for natural resources section. Some roads and firelines pass through or

around the perimeter of several marshes. Where possible these roads and firelines will be rerouted.

Dome. Domes occur in shallow depressions within mesic flatwoods and wet prairie communities. Domes are typically vegetated by pond cypress, which are frequently covered in bromeliads, with a mixed understory of hydrophytic shrubs such as wax myrtle, sandweed (*Hypericum fasciculatum*), and common buttonbush. Ground cover vegetation is variable. In more open cypress domes, a vigorous carpet of maidencane (*Panicum hemitomon*) or pickerelweed (*Pontederia cordata*) may occur; in domes with denser canopies, the ground cover may be limited to a few ferns.

Domes within the preserve are in very good to poor condition, depending upon the level of disturbance. Undisturbed domes typically have a very open understory with few shrubs and encroaching mesic species. Management activities for domes that are in good condition include maintenance of the appropriate hydroperiod and protection of bromeliads from collectors. Domes drained by ditches frequently contain abundant sandweed or wax myrtle, significant numbers of encroaching mesic species like slash pine, and evidence of frequent intense fires. These domes will require hydrological restoration by the backfilling of ditches.

Floodplain marsh. Floodplain marsh occurs in several small patches along the south prong of the St. Sebastian River. This community is maintained by periodic flooding of the river. Floodplain marsh is vegetated primarily by sand cordgrass (*Spartina bakeri*), giant leather fern (*Acrostichum danaeifolium*), and string-lily (*Crinum americanum*). Common buttonbush and pond apple (*Annona glabra*) also occur sporadically. Floodplain marsh on this unit is generally in good condition. Some areas have been invaded by Brazilian pepper or wild taro (*Colocasia esculenta*), but exotic control activities are targeting these invasions. No special management actions are proposed for this community other than continued treatment of the invading exotic plants.

Floodplain swamp. Floodplain swamp also occurs in several locations along the south prong of the St. Sebastian River. Vegetation includes a diverse overstory of red maple, bald cypress (*T. distichum*), laurel oak, water hickory, and other hydrophytic trees with a sparse understory including wax myrtle, common buttonbush, Carolina willow (*Salix caroliniana*), and dahoon holly. The ground cover includes a patchy assemblage of ferns and aquatic emergent species. Exotics such as Brazilian pepper occur sporadically. This community is in good condition and no special management actions other than exotic species control are proposed.

Hydric hammock. Hydric hammock occurs along the upper edges of other forested wetland communities and along several seasonal streams. These hammocks are generally vegetated by sabal palm, laurel oak and live oak, with little understory vegetation. Ferns are common in the ground cover. This community type also supports considerable numbers of epiphytes, including hand fern.

Hydric hammocks on site are in good to fair condition, depending on the level of disturbance resulting from drainage or adjacent land conversion. Drained areas typically exhibit some soil subsidence and increasing numbers of mesic species. Hammocks adjacent to lands cleared for pasture typically have been invaded by weedy pioneer species and invasive exotics such as Brazilian pepper. Recovering the disturbed hydric hammocks on site will require backfilling drainage ditches to restore the hydrology and replanting adjacent cleared areas to reduce edge and eliminate seed sources of pioneer species.

Seepage slope. The seepage slope community is found in one area on the south-central portion of the preserve. This community type is situated between two sandy ridges. The seepage slope is vegetated by a dense growth of fetterbush and gallberry with no overstory and minimal ground cover vegetation. This seepage area transitions upslope into mesic flatwoods and scrub. This community appears to be in good condition and other than prescribed burning, no special management actions are proposed.

Strand swamp. This community occurs in Herndon Swamp. It occurs primarily on seasonally flooded Floridana, Chobee and Felda soils. Herndon Swamp flows to the northeast and eventually empties into the north prong of the St. Sebastian River.

Herndon Swamp is characterized by a seasonally inundated linear depression vegetated by a diverse overstory of bald cypress, pond cypress, red maple, water hickory, and other hydrophytic trees. Sabal palm, dahoon holly, wax myrtle, and other small trees and shrubs occur in the understory. The ground cover includes a diverse mix of ferns, woodsgrass (*Oplismenus hirtellus*), and other hydrophytic species.

Herndon Swamp has suffered a number of disturbances. Cypress was harvested from the strand swamp in the 1920s. A large canal on the Egan tract was used to drain the southwest end of the swamp; the canal was partially filled in through a mitigation project and the remainder was filled in 2003 through a FDEP restoration project. A second canal along the northern boundary of the preserve diverts water from the northeast end of the swamp. The SJRWMD is in the planning phases of a project to restore the northeasterly flow through the swamp. Several utility corridors, I-95 and two old logging roads also impede the natural flow of water through the system. In addition to the increased drainage problems, these disturbances have resulted in the encroachment of exotic or ruderal species and a reduction in the size of the swamp. Continued drainage of this system, particularly on the northeast end, could result in the extirpation of a population of hand ferns. Management activities required to improve conditions include continued elimination of drainage ditches, installation of culverts through roads or berms impeding flow, the removal of exotic plants and the successful completion of SJRWMD North Levee Restoration Project.

Wet flatwoods. Wet flatwoods are characterized by scattered slash pine with an open grassy understory. Wet flatwoods generally occurs in association with mesic flatwoods and wet prairie.

Wet flatwoods on the preserve are in fair to good condition, depending upon the level of hydrological disturbance. In areas with minimal disturbance, the community is intact. In areas with adjacent drainage canals, the wet flatwoods community is transitioning to mesic flatwoods. Continued backfilling or plugging of drainage canals is needed to protect and restore this community.

Wet prairie. Wet prairie is scattered throughout the preserve. This community generally occurs in association with mesic flatwooods, dome and basin swamp communities. It is characterized by irregularly shaped, seasonally flooded drainages or depressions vegetated by a diversity of grasses, sedges, rushes, pipeworts, and other herbaceous species with sandweed and scattered slash pine and wax myrtle.

Wet prairie is extremely sensitive to hydrologic alterations; almost the entire historic wet prairie on the preserve has been heavily impacted. The construction of I-95, internal roads and utility easements, and interior drainage ditches altered historic flow patterns and decreased the

frequency and duration of inundation. This has resulted in the invasion of woody shrub species and pine trees into an herbaceous species-dominated community. On portions of the site, fire exclusion has also contributed to the invasion of woody species onto wet prairie.

Restoration of wet prairie will require continued backfilling or plugging of ditches to eliminate or reduce drainage and re-establishing historic drainage patterns by installing culverts through roads and berms. Restoring hydrological conditions coupled with prescribed fire should recover the wet prairie community. In areas where heavy encroachment of woody species has occurred, mechanical techniques such as roller chopping may be utilized to speed up or improve the efficacy of the restoration process.

Blackwater stream. This community type is represented by the upper reaches of the St. Sebastian River and several unnamed tributaries of the river.

The St. Sebastian River drains a watershed of approximately 78 square miles, one-third of which is contained within the preserve. Significant alterations in past years have dramatically changed the St. Sebastian River. The construction of the Fellsmere Canal (1916) and the C-54 Canal (1968) eliminated the historic west prong of the river and facilitated the discharge of large volumes of freshwater and nutrient-laden runoff from agricultural lands west of the preserve into the estuarine system. The upper reaches of the north prong were canalized and most of the associated wetlands north of the preserve were developed for residential uses or converted to agricultural lands. Residential and agricultural development has occurred along most of the south prong. Drainage from the surrounding development discharges into the river through canals. All of the unnamed tributaries on the preserve are characterized as seasonal, sand bottom, blackwater streams. Narrow linear wetland corridors are associated with the streams. Most of the historic stream channels remain intact; however, drainage ditches constructed in previous years to drain the preserve were connected to the streams. The ditches should be back-filled; this will force the water into depressional wetlands that would gradually drain into the streams through interconnected wetlands or as sheetflow.

Estuarine tidal swamp. Estuarine tidal swamp covers the perimeter of a peninsula that projects into the South Prong of the St. Sebastian River. Vegetation in this community consists primarily of red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), giant leather fern and string-lily. This community is in good condition and requires only maintenance removal of invasive exotic plants, primarily Brazilian pepper. No other management activities are proposed.

Ruderal. The majority of this is in 2,000 acres of improved pasture on the southern half of the preserve. The remaining 1,195 acres includes several smaller improved pasture areas, several borrow pits, utility corridors, spoil areas along the C-54 Canal, I-95, roads, and numerous ditches in the interior of the preserve. Over time as more ditches are restored and encroaching woody species are roller chopped, the improved pastures on the Coraci tract should eventually return to a matrix of wet prairie and pine islands.

Other ruderal areas including spoil berms and ditches will be restored to the greatest extent practicable. The ditches should be backfilled with spoil from the adjacent berms. These areas will be monitored for exotic invasions and left to revegetate naturally. There are no current plans to address the borrow pits on site. Backfilling these areas would be cost prohibitive since no fill is available and would have to be purchased and hauled to the site. Plans may include re-contouring the slopes of the pits to increase the littoral zone and improve fish and wildlife

habitat. Staff will continue to work with the power companies, gas companies, and the Florida Department of Transportation to minimize the impacts of the utility corridors.

Developed. These areas include the office site, two shop compounds, four residence compounds, two canoe landings, a bunkhouse, educational kiosks, picnic pavilions, six primitive campsites and horse corrals.

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.

Overall, management activities on the preserve will be based on an ecosystem management approach. Listed species are declining statewide and/or nationally and often require special management attention to ensure their continued survival. Parks or preserves usually encompass only a fragment of a species' original habitat, and habitat on adjacent lands can be lost to development. Development and land conversion has restricted movement within many species' ranges to small, disjunct fragments. For many listed species, government-managed lands offer the best hope for survival. The designated species found on the preserve will benefit from the large scale natural systems management approach that will be used.

A top management priority for the park is to maintain or increase existing populations of listed species of plants and animals occurring on site. Species that are more common will also be managed and inventories of all plants and animals found within the preserve will be maintained. There are currently 74 designated species that have been observed at the SSRPSP: 28 plants and 46 animals. Detailed discussions of several of these species are provided in the Management Measures section later in this plan. There are a number of these species for which a recovery plan has been developed. These include the Florida manatee, crested caracara, bald eagle, Florida scrub-jay, snail kite, wood stork, and the eastern indigo snake (USFWS 1999); the revised red-cockaded woodpecker plan was released in 2003. Management activities will be based on recommendations for the recovery of each of these species.

Due to the large number of protected species using the SSRPSP, management will consider temporary and/or seasonal closure of selected areas to allow sensitive habitat and species to recover from human induced impacts.

Special Natural Features

The St. Sebastian River Preserve State Park is the largest upland property in public ownership in the Indian River/south Brevard County region. The site also contains excellent examples of scrub community type and the only undeveloped sandhill habitat in Brevard County. As an interesting historical note, in 1889 the famous ornithologist Frank Chapman made a journey to the headwaters of the St. Sebastian River in search of Carolina paroquets. He found about 50 of these rapidly disappearing birds during the week. In a paper dated November 1, 1889, Frank Chapman described the St. Sebastian River – "The Sebastian is a beautiful river; no woods of mine can adequately describe it. Half a mile wide at its mouth, it narrows rapidly, and three miles above appears as a mere stream which at our camp, eight miles up, was not more than fifty feet in width and about fifteen in depth. Its course is exceedingly irregular and winding; the banks as we found them are high and for some distance from the water densely grown with palms and cypresses which, arching, meet overhead, forming most enchanting vistas, and in many places

there was wild profusion of blooming convolvulus [morning glory] and moon flower. Immediately back of this semi-tropical growth appeared the pines, which extended as far back as the eye could reach, with occasional openings termed ‘prairies’, varying in extent from two or three to as many as a hundred acres, where the trees were replaced by a species of tall grass growing scantily in the shallow water which flooded these meadows.” (Tales of Sebastian)

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.

There are currently 20 Florida Master Site File recorded archaeological sites within the boundaries of St. Sebastian River Preserve State Park. 8BR1780, the Herndon Homestead, was built around 1889 and burned in the early 1940s. The site is only a surface scatter of debris and whatever underground features may exist, therefore the condition assessment is poor. Since it is a known historic house site, development should be sited elsewhere, to avoid the site (Florida Department of State, Florida Master Site File: 8BR1780, Vojnovski et al. 2001).

8BR1781, Yates Homestead/Wilbur's Hammock, was originally planted in citrus, and currently exists as fencing debris, scrap, and a well point. The condition assessment is poor (Florida Department of State, Florida Master Site File: 8BR1781, Vojnovski et al. 2001).

8BR1782, the Graves Brothers Lumber/Turpentine Camp, is a 1930s satellite camp for the Graves brothers' turpentine and logging operation. All that survives is a row of burnt posts, and piers from a small structure, now destroyed. The condition assessment is poor. Staff should protect the remaining wooden posts and piers from additional burning during controlled burns by raking the site to reduce or remove the fuel load (Florida Department of State, Florida Master Site File: 8BR1782, Vojnovski et al. 2001).

8BR1783, the Survey Marker Midden, named for the 1964 U.S. Army Corps of Engineers survey marker located to the south of the site, is a dirt/bone/shell midden dating to the Malabar I culture. The site does not appear to have been disturbed, and the condition assessment is good (Florida Department of State, Florida Master Site File: 8BR1783, Vojnovski et al. 2001).

8BR1784, the Hanshaw/Widener House or L-House site, is the location of a 1920s homestead, now torn down, and the 1950s L-shaped ranch style house that replaced it on the same site. The horse barn dates to 1947, the dock to 1951 and a garage apartment east of the barn housed the construction workers building the L-House. The L-House itself was always used as a retreat by absentee landowners, but now is the residence of the park manager. Hardee Point Midden, a large Malabar I-II period site, is just to the north, and probably extends south onto the house site. There is not sufficient information on the site to determine if it is eligible for the National Register of Historic Places. The condition assessment is good (Florida Department of State, Florida Master Site File: 8BR1784, Vojnovski et al. 2001).

8BR1785, the Hernandez-Capron Trail, was built by Brigadier General Joseph M. Hernandez, commander of the East Florida Militia, during the Second Seminole War. The trail linked St. Augustine with Fort Pierce at St. Lucie. After the war, the new road allowed settlers to move into the Brevard/Indian River area, and ranchers used it to move cattle until the 1970s. Because of its importance as a major transportation route, especially during the Second Seminole War, and with its association with Hernandez, the trail is probably eligible for listing in the National Register of Historic Places. The trail has become overgrown with vegetation within the park, and its condition assessment is good (Florida Department of State, Florida Master Site File: 8BR1785, Vojnovski et al. 2001).

8BR1813, the Hardee Point Midden, is a Malabar I-II cultural period shell midden on a bluff on the west side of the St. Sebastian River. The site is being eroded by the river, and because of that threat, the condition assessment is poor. Site stabilization is recommended (Florida Department of State, Florida Master Site File: 8BR1813, Vojnovski et al. 2001).

8BR1824, the Frank Hunter Homestead, originally comprised three to five houses, all of which had burned by the early 1950s. Today all that remains of the homesteads are the ruins of associated cow pens. Currently there is insufficient information to determine if the site is eligible for the National Register of Historic Places. The condition assessment is poor (Florida Department of State, Florida Master Site File: 8BR1824, Vojnovski et al. 2001).

8BR1827, the Circle F Shop, is a late 1940s ranch barn. Currently the park uses the facility for equipment storage and repair. The condition assessment is good (Florida Department of State, Florida Master Site File: 8BR1827, Vojnovski et al. 2001).

8IR851, the Carlton House, was originally built in the neoclassical style at some point after 1895, by John B. Carlton. In the late 1930s or early 1940s his son, Chester Carlton, tore down the house and reduced it to standing wall sections and foundations. The condition assessment is poor. The ruins should be protected, preserved and interpreted for park visitors. Currently there is not sufficient information to determine if the site is eligible for the National Register (Florida Department of State, Florida Master Site File: 8IR851, Vojnovski et al. 2001).

8IR852, the River Bluff Shell Scatter, was recorded by David Dickel in 1992 as located on a bluff overlooking the St. Sebastian River. The 2001 CARL survey was unable to relocate this site, which perhaps has eroded away or been buried by shifting sand and vegetation. The condition assessment is unknown and perhaps destroyed (Florida Department of State, Florida Master Site File: 8IR852, Vojnovski et al. 2001).

8IR987, Creek Crossing, is the remains of an early 20th century bridge that crossed an unnamed creek. Two timbers are all that survive; therefore, the condition assessment is poor (Florida Department of State, Florida Master Site File: 8IR987, Vojnovski et al. 2001).

8IR988, the Graves Brothers Tram Line, is the surviving roadbed of an early 20th century logging tram rail line. Most of the rails were removed at the end of the logging lease. The condition assessment is poor (Florida Department of State, Florida Master Site File: 8IR988, Vojnovski et al. 2001).

8IR989, the Dinky Line or Trans-Florida Central Railway, is the surviving roadbed of an early to mid 20th century freight and passenger standard gauge rail line that ran across the park from Sebastian to Fellsmere and Broadmoor. Most of the rails have been removed. There are two

separate surviving sections of the roadbed, each section labeled with the same FMSF number. The condition assessment is good (Florida Department of State, Florida Master Site File: 8IR989, Vojnovski et al. 2001).

8IR990, the Hernandez-Capron Trail, is a separate section of the same Hernandez-Capron Trail listed above as 8BR1785, and is likely eligible for the National Register. The condition assessment is also good (Florida Department of State, Florida Master Site File: 8IR990, Vojnovski et al. 2001).

8IR991, the Pancoast-Moak Residence, is a frame vernacular structure built in 1948 as the foreman's residence and office for the cattle ranch. Renovated as a meeting facility by the Buffer Preserve, the house was flooded and damaged by hurricanes in the fall of 2004, and is currently being renovated for use as a bunkhouse. Once the renovation project is completed, the condition assessment will be excellent (Florida Department of State, Florida Master Site File: 8IR991, Vojnovski et al. 2001).

8IR992, the Fire Break Structures, are a complex of early 20th century structural remains, made of poured concrete, of uncertain use. The structures were damaged during the construction of a fire break, and the condition assessment is poor (Florida Department of State, Florida Master Site File: 9IR992, Vojnovski et al. 2001).

8IR993, the Frankie and Tony's Site, is a surface scatter and brick pile at the location of a house occupied by the two men named above, who farmed the site in the 1930s. No ruins of the house survive, and the condition assessment is poor (Florida Department of State, Florida Master Site File: 8IR993, Vojnovski et al. 2001).

8IR994, the Sam Dale Site, is the general site of an early 20th century homestead and farm, the ruins of which have now vanished. The condition assessment is poor (Florida Department of State, Florida Master Site File: 8IR994, Vojnovski et al. 2001).

8IR995, the Yates 2 Site, is the general site of an early 20th century homestead and farm of William D. Yates, who cut and delivered firewood off the property. No ruin of any structure survives, and the condition assessment is poor (Florida Department of State, Florida Master Site File: 8IR995, Vojnovski et al. 2001).

RESOURCE MANAGEMENT PROGRAM

Special Management Considerations

Timber Management Analysis

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

During the development of this plan, an analysis was made regarding the feasibility of timber

management activities for this park. It was then determined that timber management activities were appropriate. Addendum 6 contains the timber management assessment for the park.

Management Needs and Problems

1. There is a need for an increased law enforcement presence to prevent unauthorized access and poaching in the park
2. Increased physical and material support for the prescribed fire program will be needed to accomplish resource management goals
3. Additional funding to support continued botanical inventories in the park's diverse plant communities is needed
4. Funding to support continued Florida scrub-jay research and red-cockaded woodpecker research is needed
5. Additional funding to continue exotic plant and animal control programs is needed
6. Funding to continue hydrological restoration of areas not currently associated with a project is needed
7. Additional staff training in prescribed fire, native species and community type identification, restoration, GIS/GPS is needed

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. Conserve, protect and manage natural communities, significant habitat and ecological systems.
   - **A.** Eliminate exotic plant and animal species to the greatest extent practicable
   - **B.** Maintain fire as an ecosystem process
   - **C.** Seek funding for additional staff to aid in the preparation, implementation, and evaluation of resource management, especially the prescribed fire program
   - **D.** Monitor and evaluate the effects of prescribed fire, especially burn frequency and season of burn and how it relates to ecosystem change
2. Restore the original hydrology of the preserve to the greatest extent practicable.
   - **A.** Seek funding for and develop a comprehensive hydrological restoration plan for the entire preserve
   - **B.** Continue to eliminate ditches by plugging and backfilling to restore wetland communities and prevent further degradation of adjacent communities, where feasible
   - **C.** Evaluate raised roadbeds in the preserve that impede water flow. Reconnect or relocate roads wherever practicable
   - **D.** Evaluate the potential to increase water conveyance through Herndon Swamp at gas line road
   - **E.** Rework the remaining south drains into the C-54 canal.
   - **F.** Monitor and evaluate hydrological restoration efforts
3. Maintain or increase populations of listed plants and animals occurring on the preserve.
   - **A.** Continue the Florida scrub-jay demographic study and implement management recommendations. Seek permanent funding for Florida scrub jay research and management. Develop a park specific recovery plan for the Florida scrub jay in collaboration with FFWCC, USFWS, and other knowledgeable agencies.
   - **B.** Continue to monitor nesting success of red-cockaded woodpeckers and implement

management recommendations. Seek permanent funding for RCW research and management. Develop a park specific recovery plan for the RCW in collaboration with FFWCC, USFWS, and other knowledgeable agencies

C. Explore opportunities for wildlife connectivity, linkages, and wildlife crossings and corridors between all four quadrants of the park and with other public lands in the region.

D. Provide seasonal protection zones to protect manatees from fishing impacts as recommended in the 2001, Florida Manatee Recovery Plan, Task 1.7.2, (enforce manatee protection regulation).

E.

F. Continue to inventory, map and monitor populations of protected plant species

G. Conduct a comprehensive invertebrate survey

H. Complete a bat survey

I. Survey and monitor populations of gopher tortoises

J. Survey and monitor populations of gopher frogs

K. Conduct a comprehensive herpetological inventory

L. Complete a small mammal survey

M. Develop environmental education programs to discourage visitors from collecting plants or disturbing wildlife

N. When necessary create seasonal rotating area closures to allow sensitive habitat and species to recover from human induced impacts

4. Aid in the improvement of water quality in the St. Sebastian River and the Indian River Lagoon.

A. Continue interagency cooperative efforts to collect water quality and biological data in the St. Sebastian River and the Indian River Lagoon. Support the Indian River – Malabar to Vero Beach Aquatic Preserve Staff

B. Provide trash collection and coordinate with Brevard County's Department of Natural Resources to provide monofilament recycling at any existing and proposed fishing area

5. Provide environmental education and enhance public appreciation for elements of natural and cultural diversity.

A. Design and conduct more interpretive programs and field trips for the general public, school groups and other organized groups to raise awareness of the various ecosystems on the preserve and the plants and animals that occur in them

B. Train additional volunteer tour guides

C. Staff the visitor's center and gift shop seven days/week with volunteers to provide information to the general public

D. Expand outreach opportunities through increased participation at local festivals, events, and group meetings by using volunteer staff

E. Continue to expand participation in the park's Citizen Support Organization, the Coastal Preserves Alliance, a nonprofit group that provides financial and other types of support to the preserve. A list of prioritized projects is compiled annually by the park manager and mutually agreed to by the group's Board of Directors.

Cultural Resources

1. Conduct ground disturbing activities in accordance with DHR guidelines.

2. Conduct an archaeological reconnaissance survey of St. Sebastian River Preserve State Park, focusing on significant sites identified by the previous C.A.R.L. archaeological survey.

3. Improve public awareness and encourage protection and stewardship of cultural resources through education and enforcement of agency rules and regulations.

Ecological Targets

Mesic flatwoods

1) Canopy cover of mature pines of multiple age classes (at least 3 age classes).
2) Herbaceous ground cover covering at least 50% of the community.
3) Saw palmetto-shrub component making up no more than half of the shrub cover.
4) Variety of shrubs in addition to saw palmetto, including but not limited to: *Lyonia lucida, L. ferruginea, Ilex glabra, Befaria racemosa, Vaccineum myrsinites.*

Scrub

1) A minimum of 10-15% of the area should be comprised of bare sand or other native herbaceous component following the foraging requirements of FSJs.
2) Vegetative characteristics should not exceed 3m in height.

Ruderal

1) Develop collaboration between interagency and non-agency professionals to help direct restoration efforts.
2) Interim management considerations prior to hydrological restoration consist of the following: harvesting of Bahia grass seed and sod removal.
3) Pasture restoration needs to follow hydrological restoration in order to determine the correct location and methodology for the pasture restoration.

Florida scrub-jay and Red-cockaded woodpecker

1) A working group will be formed which will help direct management of FSJs and RCWs which share adjacent habitat patches and have different life history requirements.
2) Increase the amount of territories and decrease the territory size for FSJs; increase the number of RCW breeding pairs.
3) Decrease midstory height of shrubs for RCWs.

Management Measures for Natural Resources

Hydrology

The preserve has endured a number of hydrologic alterations, including major disruptions within the preserve, and large-scale modifications to surrounding properties. Irreversible changes have occurred, complicating restoration efforts.

The first hydrologic alteration occurred in 1916 with the construction of the Fellsmere Canal. The canal is still present today and is located immediately south of the C-54 Canal. It drained marshland west of the preserve, carrying the water east to the west prong of the St. Sebastian River. The second major change occurred in the early 1920s when the Graves Brothers constructed 12 miles of elevated logging tram roads throughout the preserve. A railroad was installed on the tram roads and used to transport timber to Wabasso. The tracks were removed prior to 1937, but the tram roads are still present and serve as an obstacle to sheetflow.

Other than these two changes, natural drainage patterns within and around the preserve were still functioning as of 1943. Review of aerial photography from that year revealed that no canals had been built between Micco Road and the Fellsmere Canal. In the 1950s, a series of canals were built north of the preserve, including North Canal. Citrus groves were planted north and east of the preserve in the 1960s. The Hudman Tree Farm and two V-shaped canals were built in 1963. The northern drainage channel for Herndon Swamp was destroyed and replaced by North Canal.

Florida Power Company installed double power lines on the east side of the preserve in 1957, and Florida Gas installed an underground gas line through the center of the preserve in 1958. Both lines required construction of cleared, elevated roads. Culverts were installed in the sections through the swamp.

The C-54 Canal was constructed in 1968. It was built on top of the west prong of the St. Sebastian River and is bordered by large levees. The canal splits the preserve into northern and southern halves. Southerly drainage from the northern half of the preserve was provided by five drainage outlets to the canal. Unfortunately, the outlets were not placed at points of natural drainage. C-54 Canal and the drainage outlets reduced southerly drainage and had a major impact on the hydrology of the preserve.

Interstate-95 was built from 1968 to 1970, and split the preserve into disjunct east and west units. Although numerous culverts were placed under the highway, I-95 caused major changes in drainage patterns. Six borrow pits, with associated haul roads, were dug along the road corridor to provide fill for the elevated highway. A portion of flatwoods was cleared for an asphalt plant during construction of the highway and is an open field today. Two additional underground gas lines were installed on the west side of the I-95 corridor in 1970 and 1995.

After the alterations, portions of the Corrigan tract no longer drained effectively and some areas became excessively wet. A number of shallow ditches were dug between 1968 and 1993 to provide relief from flooding, to protect pine trees and restore cattle forage. In some cases, the ditching may have been too extensive, as some plant communities now have an insufficient hydroperiod to perpetuate themselves. For example, much of the wet prairie community on the preserve has an insufficient hydroperiod and is being invaded by woody shrubs and/or pine trees. Similarly, much of the basin swamp community has unnatural understory components and would benefit from a longer hydroperiod.

Three large ditches were constructed on the Mary A and Egan tracts prior to purchase by the State. The three interconnected ditches extended from the north boundary of the preserve and emptied into the C-54 Canal. In 1999, the ditch located in the Mary A parcel (the northernmost of the three ditches) was backfilled as part of a mitigation project. As a part of another mitigation project, the northern portion of Egan ditch was also backfilled. The remainder of the ditch was filled in 2003 as part of a Florida DEP Restoration project. Monitoring reports associated with these projects submitted to SJRWMD indicate that the hydrology has been successfully restored as evidenced by the high water elevation in the wetlands; recruitment of appropriate wetland vegetation was also apparent and was expected to continue.

A number of ditches were present on extreme southern portions of the Coraci tract prior to 1943; however, minimal interior ditching was present on the majority of the site. The ditches presumably were constructed to promote agricultural development in the area, primarily improved pasture for cattle grazing. Additional ditch construction accompanied conversion of natural habitat to agricultural lands until the early 1990s. Larger drainage canals including the Fleming Grant Canal, two canals associated with the industrial park, and several unnamed canals were constructed after 1943. The two canals associated with the industrial park are deeded, maintained drainage easements.

Hydrologic Restoration Projects. Hydrologic alterations within and around the preserve have been extensive. The system of ditches constructed to improve drainage for agricultural land uses has significantly impacted many natural communities by altering historic drainage patterns,

reducing the level and duration of inundation in wetlands, and reducing water retention in pine flatwoods communities. Ecological consequences of the increased drainage and reduced hydroperiod include a decrease in the size of many isolated wetland communities, shifts in the species composition and the physiognomy of plant communities, invasion by exotic species, and the encroachment of mesophytic species into wetlands. Drainage has also facilitated an increase in the frequency and intensity of fire in communities where infrequent low intensity fires would occur, such as dome, hydric hammock, and floodplain swamp. This has resulted in significant damage to many forested wetland areas, especially isolated cypress or black gum dominated dome and baygall communities.

Restoration of all impacted areas will not be possible; some alterations such as I-95 and the C-54 Canal are permanent. However, a number of projects have been identified and are listed below. Funding for these projects could be obtained from grants and wetlands mitigation for public and private projects. Due to the complexity of the hydrologic alterations that have occurred throughout the parks history, it is imperative that a park specific comprehensive hydrologic study and subsequent hydrological restoration plan be developed before any large scale restoration takes place. Completion of a comprehensive hydrology study would help managers better assess potential off site impacts and problems while effecting the greatest level of restoration possible.

1. Continue to evaluate the necessity of the drainage outlets that divert water from the north portion of the preserve into C-54 Canal. Install erosion control and bank stabilization measures on those deemed necessary and plug or backfill those not needed. Several should be relocated to areas that historically drained into the west prong of the St. Sebastian River.

2. Evaluate the need for additional culverts under the gas line road at Herndon Swamp. Install culverts as necessary to aid in water conveyance through the swamp.

3. Raised roadbeds in the preserve impede water flow and alter historic drainage patterns. In several areas, the roads bisect and divide wetland communities. All raised roads will be evaluated for areas needing reconnection or possible relocation. Where necessary culverts and/or low water crossings will be installed and where practicable roads may be relocated.

4. The interior ditch system drains a number of isolated wetland communities and disrupts sheet flow through upland areas. The remaining ditches need to be plugged and backfilled to restore the wetland communities and prevent further degradation of adjacent communities. Continued restoration of the interior ditch system throughout the preserve should be accomplished to the greatest extent practicable. As of 2005, 9.2 miles of the interior ditch system has been restored with mitigation monies; 35.6 miles are proposed and attached to mitigation projects currently in the process of permit review. An additional 27.3 miles are proposed and not currently attached to projects and 10.7 miles are not proposed, including roadside swales, gas lines, and the power line.

5. Two drainage easements on the south end of the preserve carry stormwater from an industrial park on the west boundary into tributaries of the south prong of the St. Sebastian River. These drainage canals also bisect and drain several wetlands along their length within the preserve. Purchase of the easement along the canals should be investigated. The canals ultimately should be rerouted into a retention system that would limit direct discharge into the St. Sebastian River system. This could be accomplished by incorporating drainage from the industrial park into the stormwater system currently being designed for the County Road 512 widening project or other road alignment projects.

The land now known as the St. Sebastian River Preserve State Park was originally acquired under CAMA to act as a buffer to the Indian River – Malabar to Vero Beach Aquatic Preserve. The protection of water quality in the St. Sebastian River and Indian River Lagoon remains a top

priority in the management of the preserve. The park staff will work closely with and provide support to Aquatic Preserve staff and other agencies charged with protecting the water quality of the Aquatic Preserve.

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 preserve is partitioned into burn zones, and burn prescriptions are implemented for each zone. The preserve burn plan is updated annually to meet current conditions. All prescribed burns are conducted with authorization from the Department of Agriculture and Consumer Services, Division of Forestry (DOF). Wildfire suppression activities will be coordinated between the Division and the DOF.

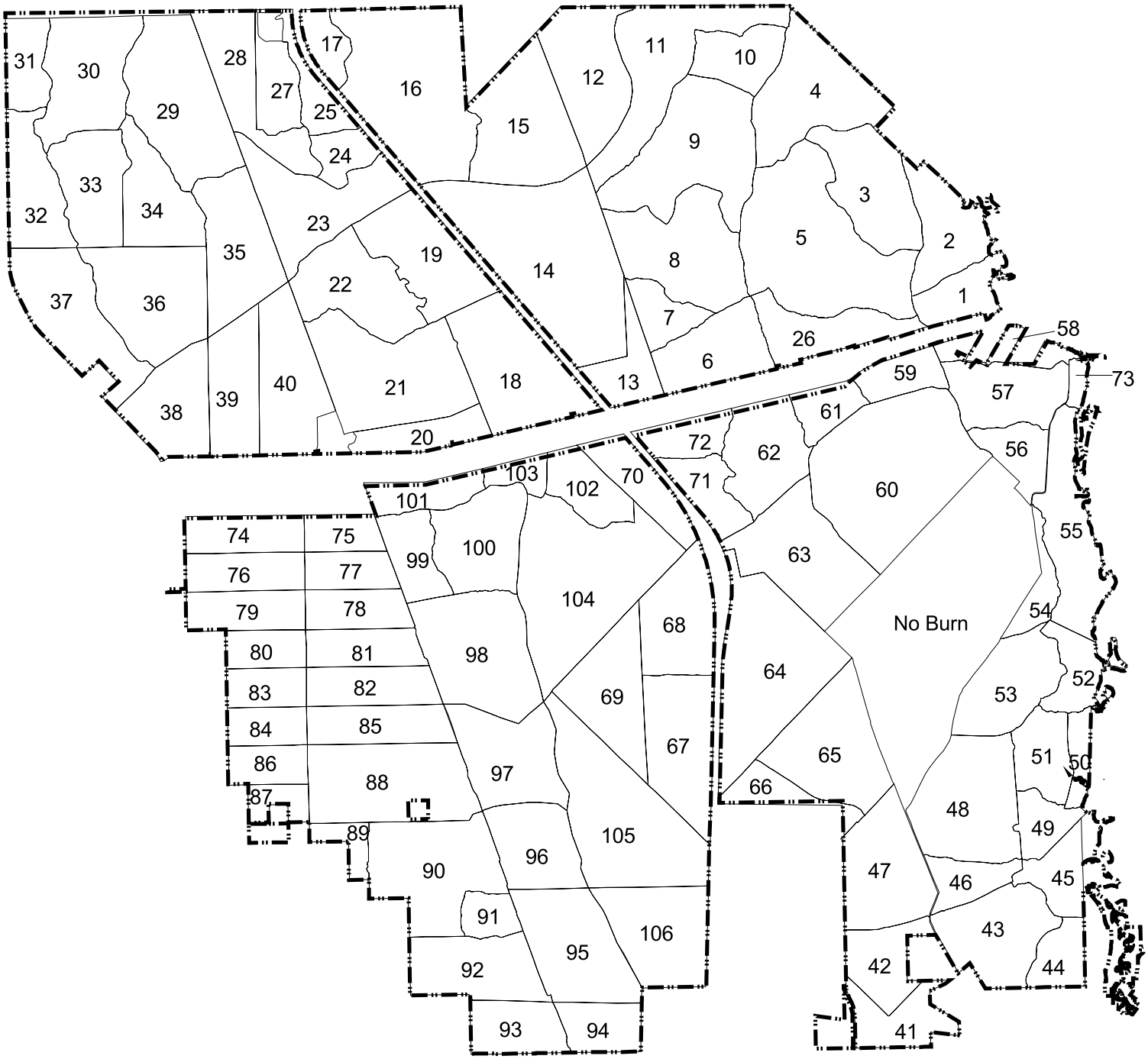
The fire management goals of the preserve are driven primarily by the evidence that fire historically has played a vital role in creating and maintaining Florida ecosystems, and that the plant and animal species in these ecosystems are dependent upon or adapted to periodic burning. It is also recognized that excluding fire from the preserve would alter successional patterns and create excessive fuel loading which could damage natural communities and pose safety hazards. The primary objectives of prescribed burning at the St. Sebastian River Preserve State Park are:

1. Restoration or preservation of fire-adapted natural communities.
2. Restoration or preservation of habitat for rare plant and animal species.
3. Creation of a vegetation mosaic by varying intensity, frequency and season of burn within each maintained natural community.
4. Promotion of diversity within natural communities.
5. Stimulation of flowering in herbs, forbs, and other vascular plants.
6. Reintroduction of lightning season fire regimes.
7. Reduction of hazardous fuels through cool season burns.
8. Maintenance of natural transition zones between vegetation types.
9. Reduction of wildfires and resulting smoke management problems through management of fuel loads.

To accomplish these stated objectives using prescribed fire, the preserve was partitioned into 106 burn zones utilizing natural breaks, existing roads, and fire lines (see Burn Zone Map). The burn zones range in size from 53 acres to 548 acres and most include a mosaic of habitat types. Prescribed burns will be conducted in the zones at appropriate fire return intervals based on habitat type and management objectives.

The following fire-adapted communities occur at the preserve:

Community	Interfire Interval
Mesic Flatwoods	3-5 years
Wet Flatwoods	3-8 years
Wet Prairie	2-4 years
Prairie Hammock	3-10 years
Depression Marsh	2-10 years
Sandhill	2-5 years
Scrubby Flatwoods	3-8 years
Scrub	6-80 years



LEGEND
Park Boundary
Burn Zones

N

3000 0 3000 6000 Feet

ST SEBASTIAN RIVER PRESERVE STATE PARK

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

BURN ZONE MAP

The interfire intervals listed above are generalized and apply to communities in relatively pristine conditions. For areas that are not in good condition, due to a lack of fire or a burn return interval that was too aggressive, hydrologic alterations, or other disturbances, the interfire interval may vary.

In some circumstances, the fire return interval may differ for the same community type. Two different types of scrub occur on the preserve, sand pine scrub and oak scrub. The generalized fire return interval listed above applies to both types, however, management strategies may differ. Some areas of oak scrub will be managed to maximize available scrub-jay habitat. This will require shorter fire return intervals than for sand pine scrub, which is not utilized extensively by scrub-jays.

Several communities at the preserve are not adapted to frequent fire. The edges of domes may burn every three to five years but the centers may go for 150 years or more without fire. Baygalls burn every fifty to one hundred years. Hydric hammock, xeric hammock, bottomland forest, strand swamp and basin swamp generally are fire resistant except under conditions of prolonged drought. These communities make excellent natural firebreaks during normal or wet conditions. The seasonal timing of prescribed burns is as important as their frequency. Since natural fires were ignited by lightning, most occurred during the summer thunderstorm season. Native Americans also started fires, probably at all times of the year, and were an important influence on Florida plant communities. Late spring and early summer burns are the most effective means of controlling hardwood encroachment in pyrogenic upland communities. A spring or summer fire should not be introduced into an upland community which has high fuel accumulations. When an upland community has not been burned for a number of years, consideration should be given to an initial fall or winter burn before using a spring or summer burn.

Herndon Swamp and the numerous bayheads, depressional wetlands, and cypress domes within the preserve can be used as natural firebreaks. Existing roads, firebreaks, canals, drainage ditches and the St. Sebastian River form a substantial system of fuel breaks. Existing fire breaks, both natural and human-made, should be utilized in all responses to wildfires within the property.

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. To avoid duplication of efforts and conserve staff resources, the Division will consult and coordinate with appropriate federal, state and local agencies for management of designated species. Specifically, data collected by the FFWCC and USFWS as part of their ongoing research and monitoring programs will be reviewed periodically to inform management of decisions that may have an impact on designated species at the park.

Virtually all of the designated species of plants and animals within the SSRPSP were listed because of habitat destruction. Although the major resource management action for designated species is habitat management, additional actions are warranted for several species. All management actions taken will be in accordance with approved USFWS recovery plans (i.e., U.S. Fish and Wildlife Service 1999). Staff will coordinate with the USFWS and FFWCC on any required permits related to management activities that affect designated species. A number of projects directed at designated species are ongoing and should be continued. Discussion of several designated species and management needs are discussed below.

Florida Manatee. The Florida manatee, an herbivorous marine mammal, is confined with rare exceptions to peninsular Florida and coastal Georgia. The behavior of manatees is distinguished by seasonal cold-induced migration and aggregations in warm-water refugia. Manatees are generalist herbivores and feed on all forms of fresh and brackish water aquatic vegetation, including emersed, floating and submerged varieties, and some overhanging and shoreline terrestrial plants (Hartman 1971; Husar 1978; and Hurst and Beck, 1988).

Two-day winter synoptic aerial surveys are used to estimate a minimum population of manatees. The highest two-day count occurred in January 2001, with an estimated minimum of 1,520 manatees in the Atlantic Coast Region of Florida, with an estimated 3,276 manatees statewide (USFWS 2001).

Brevard County, Florida is utilized by large proportion of the Atlantic Coast population of manatees. Manatees utilize the Indian River Lagoon, Banana River and the St. Sebastian River year-round. The region supports essential habitat and offers shelter, fresh water, feeding, resting, mating and calving areas. The St. Sebastian River is an important stop-over point and moderate winter warm-water aggregation site for manatees in migration along the East Coast. Data collected from aerial and ground surveys, and telemetry studies, demonstrate that greater than 150 manatees may occupy the St. Sebastian River area in winter and up to 100 in other seasons. In winter, manatees aggregate near the spillway structure, in North Prong, and C-54 Canal. Manatees are concentrated along the C-54 Canal near the Fellsmere Canal outfall and a freshwater seep on the southern bank of the canal across from the east end of the northern berm. Telemetry studies revealed these manatees often travel daily from the St. Sebastian River to the Indian River Lagoon to feed on seagrass beds. State and Federal wildlife managers expect numbers of over-wintering manatees to increase in the St. Sebastian River as nearby power plants with warm water effluents are phased-out over time.

The Florida Manatee Sanctuary Act of 1978 established motorboat speed regulation for manatee protection to regions of critical concern around the state. The surface waters surrounding the St. Sebastian Preserve State Park are regulated for manatee protection. The South Prong and the eastern portion of the C-54, St. Sebastian River have been designated as “Slow Speed” zones. “Idle Speed” zones are designated west from the north prong in C-54 and extend into the entire North Prong. A Motor Boats Prohibited one extends 2,500 feet east of the S-157 spillway structure.

Fish as well as manatees aggregated under the spillway structure and in C-54 during cold spells. Recreational fishing has become increasingly popular from shore following public ownership. Manatee researchers have documented that presently manatees in the C-54 Canal are being impacted by increased boat traffic, disturbance at resting and drinking areas, and are being hooked and entangled in fishing tackle. Increased pressure from recreational fishing is predicted, if additional access is provided to the southern banks of the C-54 from shore. As recommended in the 2001, Florida Manatee Recovery Plan, Task 1.7.2, (minimize manatee injuries and deaths caused by fisheries and entanglement), a seasonal “No Entry” zone is recommended along the southern bank of the C-54 and at the Spillway structure.

Sherman’s Fox Squirrel (*Sciurus niger shermani*). This mammal historically occurred in sandhill and pine flatwoods communities on the preserve; however, they have not been seen on the property for the last 30-40 years. Although reintroduction is possible with this species, it is not being considered at this time. Additional habitat restoration and improvements are necessary before reintroduction would be considered.

Bachman's Sparrow (*Aimophila aestivalis*). This species should flourish on the preserve without any special management attention due to the large acreage of well managed flatwoods habitat. Fine-tuning the burn program to include more growing-season burns may benefit this species.

Florida Scrub-Jay. Florida scrub-jays are listed as a threatened species by both state and federal authorities. The Florida scrub-jay is the only species of bird unique to Florida and is vulnerable to extinction because of habitat destruction, degradation and fragmentation (Breininger 2004). Scrub-jays occur primarily in patches of scrubby flatwoods and oak scrub. Jays also frequently utilize pastures and other open disturbed areas when they occur adjacent to oak scrub or scrubby flatwoods.

The St. Sebastian River Preserve comprises the largest portion of the south Brevard-Indian River-St. Lucie metapopulation, which is the fourth largest metapopulation in the state. Using new data, the south Brevard-Indian River-St. Lucie metapopulation meets the criteria that once defined core populations; core status will be designated in the new draft recovery plan soon to be released. The Florida scrub-jay recovery plan is likely to recommend a population increase at the St. Sebastian River Preserve. The large amount of scrub and flatwoods at the preserve probably make it the most important area for Florida scrub-jay recovery along the mainland of Florida's Atlantic Coast (Breininger 2004).

In 1997, a scrub-jay study on the Preserve began north of C-54 Canal with funding from the U.S. Fish and Wildlife Service (USFWS). The study expanded into the Coraci and Carson Platt tracts. Although USFWS funding expired in 2002, most territory clusters from Malabar through St. Sebastian River Preserve State Park continue to be studied by the investigator with the help of funding provided by the Florida Department of Environmental Protection. . The number of territories ranged from 13 in 1997 to 58 in 2003. The increase occurred as Coraci and Carson Platt were acquired and added to the original preserve. The 2005 population size was 42 territories which represented a 24% decline from 2004. Given that the population appeared stable for 7 years, the decline is probably temporary with an uncertain cause (Breininger, 2005). It has been proposed that the active 2004 hurricane season greatly affected food supply and reproduction. The estimated potential population size at the SSRPSP is 105 territories.

The Coraci tract would benefit by continued timbering and mechanical treatment of scrub that was degraded prior to state acquisition. Support of the scrub-jay demographic study should continue. The information collected and recommendations made will be used to improve management of scrub-jay habitat. Continued fire management should be combined with mechanical treatments when necessary to recover scrub-jay habitat in poor condition and manage higher quality habitat patches. Fine-tuning the existing fire management program by introducing additional summer burns once fuel loads have been reduced should further benefit scrub-jays. Care will be taken to avoid burning occupied habitat during nesting season.

Florida Sandhill Crane (*Grus canadensis pratensis*). This subspecies resides in Florida year round. The preserve offers an abundance of excellent crane habitat. The active fire management program on the preserve benefits cranes by maintaining the open vegetation structure they prefer. No special management activities beyond continuing the fire management program are needed to maintain sandhill cranes.

Bald Eagle. The bald eagle is listed as a threatened species by both state and federal authorities. Special management activities for eagles include site preparation of nest trees prior to prescribed

burning, burning zones with nest trees during the non-breeding season, and restricting human activity within the Primary Eagle Protection Zone during the active nesting season (October 15 to May 15, or from when adults return to the nest until young fledge). The primary zone extends 750 feet around the tree. These activities are consistent with the USFWS Southern Bald Eagle Management Guidelines.

Wood Stork (*Mycteria americana*). Large numbers of wood storks use the preserve during optimal feeding conditions when fluctuating water levels concentrate large numbers of fish in a limited area. The wading bird pond northeast of I-95 also provides good shallow water habitat for storks and other wading birds. The preserve also offers good resting habitat for storks. No special management activities are needed for wood storks.

Osprey (*Pandion haliaetus*). Osprey nest within the park and fish within the St. Sebastian River and C-54 Canal. Other than protecting nesting sites, no special management actions are required for this species.

Wading Birds. A number of listed wading bird species use the preserve for feeding and resting. No special attention is needed for these species except to continue the fire management program and to improve or increase habitat through hydrological restoration.

Raptors. Merlin (*Falco columbarius*) and northern harrier (*Circus cyaneus*) are winter residents in Florida and do not breed here. They favor wet prairies and marshes, dry prairies, and agricultural environments. They do not require any special management attention.

Red-cockaded Woodpecker. Red-cockaded woodpeckers (RCW) are declining statewide and are listed as endangered by the USFWS and as a species of special concern by FFWCC. This species requires old-growth pine forests where nest cavities are excavated in living trees infected with red heart disease. The woodpeckers flake off bark to create a smooth surface on the tree, and peck resin wells around the cavity to drip sap and repel egg-eating snakes. Red-cockaded woodpeckers are cooperative breeders that forage, nest and roost together as a family unit. The non-breeding young stay with the parents to assist in raising the next group of young. Each member of the family maintains its own active cavity tree, and the breeding male's cavity tree is used for nesting. Adults also work to create new cavity trees throughout the year, as it takes six months to over a year to create a suitable cavity.

From early population surveys, staff concluded that RCWs occurred on the preserve in low numbers and were not using all available habitats. In 1997, the SJRWMD funded a two-year study of the population at the preserve in order to obtain more information to ensure the survival of the species over the long-term. The study was designed to determine the population biology, evaluate habitat characteristics and provide management recommendations. During the study, nine active cluster sites were identified and monitored. However, at the conclusion of the study it was determined that with aggressive management, the preserve had the potential to support 25 clusters on about 5,000 acres of available RCW habitat. The RCW population at the preserve is listed as a Central Support Population in the USFWS Recovery Plan. State and Federal lands are considered designated as central support populations if they have the capacity to harbor 10 or more active clusters.

Since the last management plan and in collaboration with private contractors, SJRWMD, USFWS, and FFWCC the following actions have been taken to ensure the survival of the RCW population at the park; (1) an aggressive management program utilizing prescribed fire was

implemented; (2) continued monitoring tracked trends in population size, reproductive success, and survivorship of RCWs (3) new cluster sites were created and several artificial cavities were placed within existing clusters; (4) several RCWs were translocated to the SSRPSP.

In 2004, this area suffered from an extremely active hurricane season. Half of the cavity trees and slightly over half of the RCWs were lost because of Hurricanes Jean and Francis. Several birds were found dead inside their cavities after the hurricane. These cavity trees broke at the cavity and apparently trapped and killed the RCW simultaneously. Because of these devastating storms, aggressive measures such as an emergency post hurricane habitat assessment and translocation were implemented in efforts to help an already small and vulnerable population.

Several issues complicate the management of RCWs at the SSRPSP. The active 2004 hurricane season and associated heavy rainfall brought to light that much of the habitat that was once considered potential pine flatwoods and RCW habitat was more likely potential wet prairie. Furthermore, the Carson Platt, Johnson and Fisher tracts have been acquired since the initial study was conducted. Therefore, the original study that concluded the preserve had potential for 25 RCW clusters will need to be reinvestigated. A new habitat assessment and foraging zone analysis is required in order to determine actions needed to promote RCW recovery. In addition, on the SSRPSP, RCWs and Florida scrub-jays frequently occur in the same or in adjacent habitat patches, and management considerations differ between the two species. RCWs require an old growth pine canopy in which to forage and nest, and scrub- jays are most successful in areas where a canopy is limited. A working group comprised of USFWS, FWCC, SJRWMD, researchers, and other professionals needs to be organized to develop park-specific recovery plans that would balance the needs of these two important designated species, balance the hydrological restoration and RCW recovery goals, and provide guidance for site managers.

Crested Caracara. Crested caracaras (*Caracara cheriway*) have been documented using the preserve. This species is listed as threatened by the FFWCC and the USFWS. All observations have been of individuals foraging in open pasture areas. No pairs or nesting activity has been documented. No specific management actions are planned at this time.

Gopher Tortoise. Despite the abundance of available habitat, the excellent burn program, and the lack of past hunting, gopher tortoises are not abundant on the preserve. More surveys are needed to determine the population size of gopher tortoises, however. Information gathered will be used to evaluate habitat occupancy, provide demographic information on the tortoise population and evaluate the efficacy of habitat management activities.

Eastern Indigo Snake. The eastern indigo snake is listed by both the USFWS and FFWCC as a threatened species. Populations are declining due to habitat destruction and excessive collection for the pet trade. It is estimated that this large snake has a home range of approximately 125 to 250 acres. Seven adult eastern indigo snakes were radio-tracked between 1998 and 2004 on the park as part of a larger study of habitat use and survival in central Florida. The study was funded by the Bailey Wildlife Foundation, USFWS and Avon Park Bombing Range. The sample size was too small to characterize home range size and survival on SSRPSP alone. Habitat-specific survival information and home range sizes will be available after data analyses near completion. The first published product of the study is cited in Addendum 2. The results of this population viability analyses regarding SSRPSP were very uncertain because there was little data on recruitment and survival of several life history stages. It seemed that extinction risk on SSRPSP was high without further land acquisition adjacent to the park, but such risk declined rapidly if proposed acquisitions were completed. Within the current boundaries of the SSRPSP the eastern

indigo snake should benefit from the existing habitat management program and does not need special protection except enforcement of rules protecting all plants and animals and prohibiting collection.

Florida Gopher Frog. The Florida gopher frog is mostly a nocturnal species that utilizes ephemeral wetlands within the scrub and sandhill and is known to occupy gopher tortoise burrows. Surveys are needed to determine the population size and location of breeding habitat on the preserve. No special management actions are required to maintain this species.

Fishes. A comprehensive survey to inventory and monitor the distribution and abundance of fishes and selected invertebrates of the St. Sebastian River was conducted in 1999-2000 (Paperno and Brodie 2000). Three notable species (slashcheek goby (*Gobionellus pseudofasciatus*), opossum pipefish (*Oostethus brachyurus lineatus*), and bigmouth sleeper (*Gobiomorus dormitor*)) were found in the St. Sebastian River. They are among the few examples of euryhaline tropical freshwater species found in North America. The St. Sebastian River is thought to provide the only suitable habitat north of the Caribbean and Central America for these species because water temperatures are higher than in other freshwater tributaries of peninsular Florida. None of the above are protected species. Preserve staff will continue coordination with the FFWCC and Aquatic Preserve program to protect, manage, and monitor this crucial and rare habitat.

Plants. All plants and animals within the preserve are protected. Enforcement against collection and destruction will be an important part of conserving these rare species. Environmental education programs at the preserve will include information about rare plants and their conservation needs, as well as reasons why the public should not collect plants or animals from natural areas. For the most part, protection from collection, continuation of the existing fire management program, and continued hydrological restoration are the only steps available to protect rare plant species.

Two species of wild pine, cardinal airplant (*Tillandsia fasciculata*) and giant air plant (*T. utriculata*) occur in moist hammocks, cypress domes and swamps in the preserve. Bromeliads in Florida suffer from two threats: harvest by collectors and destruction by the exotic metamasius weevil (*Metamasius callizona*). The weevil was imported along with bromeliads in the early 1990s. Since 2003, researchers from the University of Florida have been researching the effects of the metamasius weevil at the preserve; in several areas, the weevil has caused devastation to the local population.

The celestial lily (*Nemastylis floridana*) is endemic to Florida but only occurs in a few eastern counties. This perennial herb benefits from the fire management program, which maintains the required open habitat. Additional surveys will better document the occurrence of this species on the preserve.

Catesby's lily (*Lilium catesbaei*), also known as pine lily, is found in well-managed flatwoods. Other listed species found in pine flatwoods include garberia (*Garberia heterophylla*) and Florida beargrass (*Nolina atopocarpa*).

The hand fern (*Ophioglossum palmatum*) occurs in the boots of cabbage palms. Hand ferns can be killed by frost, fire, and increased drainage of their wetland habitat. Hand ferns will re-grow following infrequent low intensity fires, as long as the cabbage palm boots do not burn away. However, increased drainage of hand fern habitat allows higher intensity fires to encroach into

the wetlands. This frequently burns off the boots of the cabbage palms and eliminates the substrate they grow on. In addition, increased drainage alters the moist microclimate hand ferns require. Increasing the hydroperiod of hand fern habitat should greatly benefit this protected species.

The butterfly orchid (*Encyclia tampensis*) is an epiphytic orchid growing in swamps and wet hammocks within the preserve. Terrestrial orchid species including grass pink (*Calopogon multiflorus*) and several species of ladies-tresses (*Spiranthes* spp.) have been observed blooming in mesic flatwoods, particularly following prescribed burns. Orchids are extremely vulnerable to harvest by collectors.

Royal fern (*Osmunda regalis*) and cinnamon fern (*Osmunda cinnamomea*) are considered to be commercially exploited. Both grow in wet woods and swamps, and can be found in forested wetlands. Nodding clubmoss (*Lycopodium cernuum*), another commercially exploited species, occurs in wet pinelands and prairies.

Spoon-leaved sundew (*Drosera intermedia*), blue butterwort (*Pinguicula caerulea*), and yellow butterwort (*Pinguicula lutea*) are all small herbaceous plants found in pine flatwoods and wet prairie communities throughout the preserve. Protection of these species is dependent on maintaining the hydrologic and pyrogenic characteristics of their preferred habitats.

The hooded pitcher plant (*Sarracenia minor*) occurs around a depressional wetland next to the powerlines on the north side of the property and in seepage areas along the Ten Mile Ridge in the Carson Platt tract. This carnivorous plant has flourished under the active fire management program.

Large-flowered rosemary (*Conradina grandiflora*) occurs in scrub and scrubby flatwoods throughout the preserve. It favors open sandy areas and is most abundant along fire lines, roads, and fence lines.

Curtiss' milkweed (*Asclepias curtissi*) occurs in a small area of scrub on the southern half of the preserve. This endangered species favors open sandy patches in scrub and is generally most abundant along roads or fire lines. Nodding pinweed (*Lechea cernua*), a threatened species, also prefers open sandy areas in scrub. Both species depend on periodic fires to maintain openings. Prickly-pear cactus (*Opuntia stricta*) occurs only on one spoil mound at the intersection of C-54 Canal and the south prong. The presence of this species on site is an artifact of disturbance. No special management actions are required.

Twinberry (*Myrcianthes fragrans*) occurs in hammocks, primarily adjacent to the north and south prongs. Twinberry is abundant in several areas. No special management actions are required for this 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.

Feral Pig. Feral pigs (*Sus scrofa*) are the most serious exotic animal problem on the preserve. They occur throughout and can cause significant ecological damage unless their numbers are

kept low. They are voracious predators of ground-nesting birds and snakes, and can dig up large areas looking for tubers and roots. This creates patches of disturbed soil that provide habitat for exotic plant species. Wild pigs in Florida are also known to carry 47 different parasitic and infectious diseases, including pseudorabies and brucellosis (Forrester 1992). To reduce feral hog populations down to an acceptable level a hog removal contract has been implemented. This contract and other removal methods will be continued as long as necessary to control feral hog populations.

Nine-banded Armadillo. Nine-banded armadillos (*Dasypus novemcinctus*) are abundant throughout the preserve. Staff will monitor armadillos and their effects and remove them as they are encountered.

Other Exotic Species. The Corrigan's kept a number of exotic animal species at their residence compound. They kept a number of axis deer (*Axis axis* or *A. porcinus*) and fallow deer (*Dama dama*), which escaped from their enclosures. The exotic species may not be resistant to common diseases and parasites found in white-tailed deer populations, such as hemorrhagic disease. If exotic deer are found within the preserve, they will be removed.

Plants. The preserve has only a few serious exotic plant problems and many nuisance exotic plants. The goal is to eradicate all invasive exotic species, and to eliminate less-invasive species whenever possible. Below are descriptions of the most invasive exotic plant species found within the preserve, including the degree of threat each poses and management action.

Small-leaf climbing fern (*Lygodium microphyllum*) is an aggressive invader of wet areas. Within the preserve, the major concentrations are on the Egan tract, the northeastern portion of the Corrigan tract, and along the north prong of the St. Sebastian River. The species is largely under control at this time. Japanese climbing fern (*Lygodium japonicum*) has also been found on the preserve in small amounts. It is considered a similar threat to small leaf climbing fern and will be treated the same.

Melaleuca (*Melaleuca quinquinervia*) was found in about 70 scattered locations throughout the preserve. Most of the sites had less than 50 trees and only four were more than an acre in extent. Melaleuca was originally given top priority in invasive plant management and is under maintenance control. All known sites have been treated and the mature trees killed. These sites will be monitored for regrowth and new occurrences will be treated as they are found. Cogongrass (*Imperata cylindrica*) is found on the Coraci tract primarily in the pasture areas. Special care should be taken when operating equipment on firebreaks containing cogongrass in order to prevent its spread through seeds or rhizomes.

Brazilian pepper (*Schinus terebenthifolius*) occurs primarily along the major roads bisecting and bordering the preserve, C-54 Canal, and along the St. Sebastian River. Scattered individuals and small concentrations also occur throughout the natural communities on the preserve. The Coraci tract contained about 50 acres including those plants growing along the C-54 Canal. A monitoring and treatment plan has been implemented and is ongoing.

Australian pine or beefwood (*Casuarina cunninghamiana* and *C. glauca*) occurred on five sites on the southern half of the preserve. *Casuarina glauca* occurred on the south prong at an old homestead site, while *Casuarina cunninghamiana* occurred in four sites in the western portions of the preserve. All of the populations have been treated and will be monitored for regrowth and retreated if necessary.

Tropical soda apple (*Solanum viarum*) is found primarily in the pasture areas on the southern half of the preserve. Major concentrations occur near the cattle pens and in a hayfield in the southeast portion of the preserve. Previous land managers' control efforts and wet conditions have kept the species from spreading extensively. All known sites have been treated with herbicide and are monitored for regrowth and retreated if necessary. New sites will be treated as they are found.

Rosary pea (*Abrus precatorius*) occurs in disturbed areas and shows an affinity for dry sites such as scrub or sandhill. It is extremely difficult to eradicate due to very high seed production and a high germination rate. Large infestations occur in the north shop area and north of the residences on the southern half of the preserve. Smaller infestations occur on the Egan tract and in three sites along the north and south prong. All sites have been treated and are monitored and retreated as necessary.

Torpedo grass (*Panicum repens*) invades open wetland areas, displacing the native vegetative cover. On the preserve, it is confined to disturbed areas such as wet roads through woods, road shoulders and ponds in pastures. This species will be monitored to detect invasions into undisturbed wetlands and will be treated as necessary.

Air potato (*Dioscorea bulbifera*) expands rapidly once it is established in an area. A population found on the North Canal has been removed. This species will be eradicated immediately whenever found on the preserve.

Tuberous sword fern (*Nephrolepis cordifolia*) is an aggressive invader related to our native sword fern (*N. exaltata*). Both occur in shaded moist to wet woodlands. *Nephrolepis cordifolia* is capable of forming dense monocultures in the understory of hammocks. The non-native tuberous sword fern was found in three sites on the preserve. All areas are on the periphery of disturbed areas. These areas have been treated and are monitored for regrowth.

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.

Species such as American alligators, raccoons, and eastern gray squirrels can sometimes become a pest or nuisance when they come into frequent contact with humans. These species are not expected to become a problem on the preserve because a strict policy prohibiting feeding of wildlife will be enforced and visitation likely will not be as great or as concentrated as in other types of natural areas. Environmental education programs will include information about the harmful effects of feeding wildlife.

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.

The general objective for the management of the cultural resources of the park is to protect, preserve and interpret the prehistoric and historic resources. Because of the presence of recorded archaeological sites within the parks, management measures for cultural resources should include monitoring the recorded sites, and drafting a proposal for the protection and preservation of threatened sites.

Any ground disturbing activities should be conducted in accordance with DHR guidelines and Chapter 267, Florida Statutes. In addition, all such activities should be reviewed according to the Division's Cultural Resources Matrix.

If any previously unknown sites are located and identified, management measures for cultural resources should develop a phased plan for managing the resources in the context of their surroundings. This should include developing a workable written plan for the physical management of the identified resources. The plan should outline approved methodologies for executing the plan and training staff and volunteers to manage the cultural resources of the parks.

The park currently has a sufficient number of staff trained and certified as archaeological monitors. As staff changes over time, efforts should be made to insure that there are always at least two certified archaeological monitors at the park.

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.

Some research that has already been conducted on Florida scrub-jays and red-cockaded woodpeckers has already been discussed in previous sections. The nesting success of RCWs should continue to be monitored; active and potential foraging habitat should also continue to be monitored. Efforts to increase the population by creating new cluster sites, installing artificial cavities and translocating birds from other viable populations should be continued. In addition, the Florida scrub-jay demographic study should be continued.

Protected plant species such as Curtiss' milkweed, large-flowered false rosemary, hand fern, snowy orchid, giant orchid, hooded pitcher plants and red–margin zephyr-lily should continue to be monitored. The effects of resource management activities on protected species, especially those related to hydrological restoration and prescribed fire should also be monitored.

There is a need for a comprehensive invertebrate species survey, a bat survey, a comprehensive herpetological survey, and a small mammal survey. The survey and monitoring of gopher tortoises to estimate population size and recruitment should be continued. There is also a need for the gopher frog population to be surveyed and monitored. Additional methods for pasture restoration should be investigated.

Due to the complex nature of the proposed hydrological restoration for the preserve, it is imperative that a comprehensive park specific hydrological study be conducted before any large scale restoration projects begin.

Given the abundant opportunities for research at this unit, additional collaboration with universities and other professionals should be actively pursued.

Cultural Resources

Research is needed on environmental change and prehistoric adaptation, development of prehistoric settled communities and social complexity, and aboriginal cultural history. Research is needed on the history of the St. Sebastian River and Indian River Lagoon area during the First Spanish Period, the British Period, the Second Spanish Period, Territorial Period, and the Second Seminole War. Research is needed for possible evidence or documentation on the activities of the cattle, timber, turpentine, farming, and transportation industries, and the acquisition and operational history of St. Sebastian River Preserve State Park.

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 7. Cost estimates for conducting priority management activities are based on the most cost effective methods and recommendations currently available (see Addendum 7).

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.

St. Sebastian River Preserve State Park has not been subject to a land management review.

LAND USE COMPONENT

INTRODUCTION

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

The general planning and design process begins with an analysis of the natural and cultural resources of the unit, and then proceeds through the creation of a conceptual land use plan that culminates in the actual design and construction of park facilities. Input to the plan is provided by experts in environmental sciences, cultural resources, park operation and management, through public workshops, and environmental groups. With this approach, the Division objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

This component of the unit plan includes a brief inventory of the external conditions and the recreational potential of the unit. Existing uses, facilities, special conditions on use, and specific areas within the park that will be given special protection, are identified. The land use component then summarizes the current conceptual land use plan for the park, identifying the existing or proposed activities suited to the resource base of the park. Any new facilities needed to support the proposed activities are described and located in general terms.

EXTERNAL CONDITIONS

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

St. Sebastian River Preserve State Park is located in east central Florida in Indian River and Brevard Counties**,** just northeast of the town of Fellsmere, one mile west of Sebastian. The park is only 10 miles northwest of Vero Beach and 10 miles south of Melbourne. The populations of Indian River and Brevard Counties have grown 20.4 percent since 1990, and are projected to grow an additional 38.2 percent by 2020 (BEBR, University of Florida, 2000). As of 2003, 20.7 percent of residents in these counties were in the 0-17 age group, 45.5 percent in the 18-54 age group, 12.1 percent in the 55-64 age group, and 21.7 percent were aged 65 and over, which reflects populations lower than Florida state averages in the ages from 0 to 54 years and higher than state averages in persons aged 55 and older (BEBR, University of Florida, 2000). Nearly 925,000 people reside within 50 miles of the park, which includes the cities of Titusville, Cocoa and Cocoa Beach, Melbourne, Vero Beach, Fort Pierce, Port St. Lucie and Stuart, Okeechobee and St. Cloud (Census, 2000). The Division estimates that approximately 106,000 persons visited the park from July 1, 2004 to April 1, 2005.

Existing Use of Adjacent Lands

Land uses surrounding the state park are a mix of suburban residential, agricultural and commercial uses. East of the park are predominantly single-family residential developments and the town of Fellsmere is located just south of the park boundary. North and west of the park are predominantly agricultural lands, including ranches, citrus groves and pine

plantations. Publicly owned lands near the state park include the St. Johns River Water Management District's Blue Cypress, Fort Drum Marsh and Three Forks Marsh Conservation Areas, the Sand Lake Restoration Area, and the T.M. Goodwin Waterfowl Management Area administered by the Florid Fish and Wildlife Conservation Commission. Adjacent county-owned properties include Brevard County's Micco Scrub Sanctuary, north of the park, and Indian River County's Sebastian Canoe Launch, Dale Wimbrow Park and Donald McDonald Park (all providing access to the south prong of the St. Sebastian River) and the North County Regional Park, all located south or east of the state park boundary.

The park is divided into quadrants by the north-south alignment of Interstate 95 and the east-west alignment of the C-54 drainage canal.

Planned Use of Adjacent Lands

Future residential development pressure is anticipated in the privately owned areas surrounding the state park. Convenient access from Interstate 95 to Fellsmere Road along the southern park boundary, which is slated for widening in the next five years, will encourage the conversion of agricultural land in the area to suburban and related commercial development. Potential impacts to the park from future land use changes will include the possible degradation of surface water quality entering the park and complicate prescribed fire management activities in the park along the urban interface.

St. Sebastian River Preserve State Park has a great potential for connection with planned ecological and recreational greenways envisioned by local governments, other state agencies and the SJRWMD, and adjacent landowners. The Division actively supports creation of greenway connections and plans state parks for integration with adjacent greenways wherever it is feasible, given the specific environmental, public safety, operational or other constraints of the individual park. Division staff will continue to work with County governments, other agencies and adjacent landowners to facilitate greenway connections to the preserve. For example, as discussed in the Resource Management Component of this plan, the Division will work with local governments and the Florida Department of Transportation (DOT) to study the feasibility of constructing wildlife crossings for the I-95 corridor, when planning improvements of the highway are initiated by the DOT.

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

At nearly 22,000 acres, St. Sebastian River Preserve State Park provides a large expanse of natural resource land that is significant in both expanse and in quality. Twenty-one natural

communities have been mapped on the park, providing a wide range of recreational and interpretive opportunities for visitors. Many of these communities are wetlands or seasonally wet by nature, and access by the public will be limited to these areas during certain times of the year. With the exception of the maintenance road that runs parallel to the C-54 Canal and a park road extending from Fellsmere Road to a parking area near the South Prong of the St. Sebastian River, public vehicular access is limited to trailheads located at various points around the periphery of the park. The potential of this state park to provide a variety of recreational trails is exceptional and over 60 miles of shared-use trails are in place, located along existing park service roads and firebreaks.

Water Area

The St. Sebastian River provides recreational opportunities for canoeing and kayaking, with a variety of wildlife viewing opportunities. During the cooler months, manatees frequent the river and the C-54 Canal in large numbers. Access to the river is currently limited to the Indian River County canoe launch just north of Fellsmere Road and the county's Dale Wimbrow and Donald McDonald Parks. In addition, several private boat ramps and private docks provide access to the river. Motorized boat traffic is heavy, at times, along the south prong of the river. The C-54 Canal is a popular shoreline fishing resource, and provides opportunities for viewing manatees from its confluence with the river westward for approximately 2.4 miles to a water control structure.

Shoreline

The St. Sebastian River is divided into the North Prong and the South Prong, the former being narrower and less accessible to powerboats than the latter. The river shoreline is a steep, sandy bank providing outstanding scenic vistas, but highly susceptible to erosion if the vegetative cover is disturbed by foot traffic. Two canoe/kayak landings are provided in the park, one midway along the shoreline of the South Prong, and one just north of the C-54 Canal on the North Prong.

Natural Scenery

Visual resources in the state park are outstanding. Natural communities such as wet prairie, prairie hammocks, sandhill and mesic flatwoods provide broad vistas and interesting patterns of vegetation. The Herndon Swamp strand swamp community offers a shady and enclosed visual environment, rich with epiphytic plants and other wetland vegetation. Scrub and scrubby flatwoods areas of the park are less attractive to the average visitor, excepting birders. Derelict agricultural fields and C-54 and I-95 corridors, while providing occasional interesting vistas, have the least potential for scenery appreciation in the park.

Significant Wildlife Habitat

The most outstanding interpretive and recreational resources of the state park are provided by the diverse wildlife that inhabit the natural communities and use the river and drainage canal. Forty-six listed animal species inhabit or visit the state park, most notably bird species such as red cockaded woodpecker, Florida scrub-jay, bald eagle, sandhill cranes and wood storks. Manatees are common in the St. Sebastian River and the C-54 canal during winter and spring. Wildlife sightings including listed and common species, such as white-tailed deer and wild turkeys are the highlights of many visitors' park experiences. The variety of wildlife and habitats and, especially, the importance of the preserve as habitat for a number of important listed species, such as red-cockaded woodpeckers and Florida scrub jays, will be featured in the preserve's interpretive and education programs.

Archaeological and Historical Features

With 20 cultural sites listed on the Florida Site File, the state park provides a broad view of the cultural history of this part of Florida. Prehistoric sites include evidence of Native American uses extending from Paleolithic through Seminole cultures. Interesting historic sites include pioneer homesteads, a turpentine camp, a ranch house, the remains of a Neo-classical house on the bank of the river (the Carlton House), a bridge site, a logging tram, a historic railway and a historic cattle trail known as the Hernandez-Capron Trail. Two historic houses, located on the south prong of the river and a third house just north of the North County Regional Park, are used for staff housing, law enforcement housing and as a dormitory (Bunkhouse) for researchers and volunteers, respectively. Although few of the park's cultural sites will be suitable for public visits, the cultural landscape indicated by the array of resources should be prominently featured in the interpretive programs provided at the state park. Interpretive programs that feature the historic uses of the property for cattle ranching, timbering and turpentine harvesting will be incorporated both in the visitor center and at appropriate locations on the preserve.

Assessment of Use

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

Past Uses

The state park property has been used for cattle ranching, logging, turpentining and farming from the late 19th Century until it was acquired by public agencies. Public infrastructure development (I-95 and the C-54 Canal) and drainage canals to support the agricultural uses have created the greatest impacts to the property.

Recreational Uses

Hunting, fishing and horseback riding were the recreational uses of the property in the past.

Other Uses

Public infrastructure development and maintenance along the C-54 Canal, I-95, a major powerline corridor and two gas line corridors extending through the park are the primary other uses that affect park management.

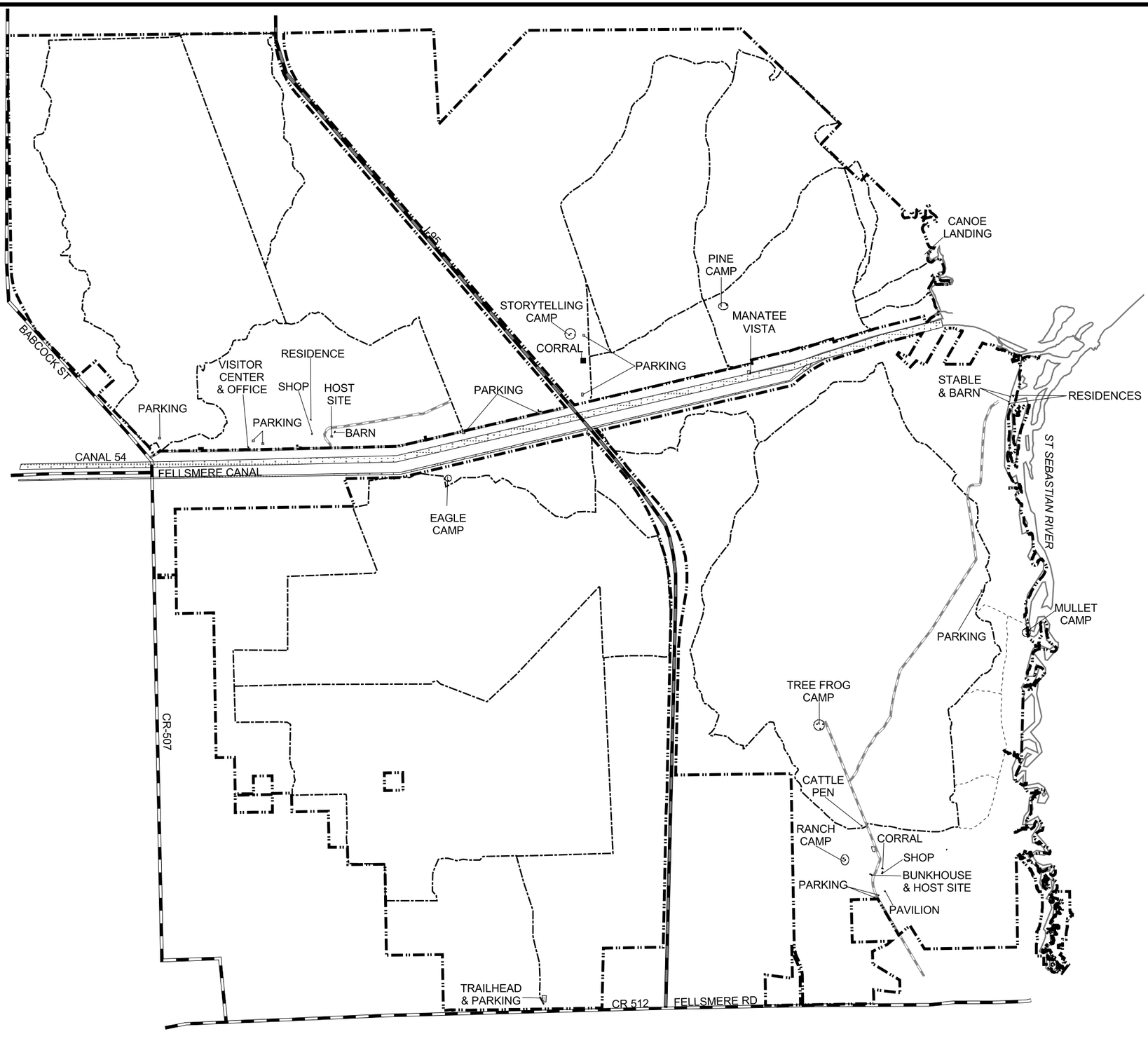
Protected Zones

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 St. Sebastian River Preserve State Park, all wetland communities, wet flatwoods and wet prairies, sandhills, scrub, scrubby flatwoods communities have been designated as protected zones as delineated on the Conceptual Land Use Plan.

Existing Facilities

A variety of public and support facilities were adapted or developed by the St. Sebastian



LEGEND
- Park Boundary
- State Road
- County Road
- Park Road Unpaved
- Hiking Trails
- Shared Use Trail
- Structures
- Parking Lots
- Camp Sites
- Marine Structures
- Water Control Structures

2000 0 2000 4000 Feet

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

ST. SEBASTIAN RIVER PRESERVE STATE PARK

BASE MAP

River Buffer Preserve staff prior to the transfer of the property to the Division of Recreation and Parks. The public facilities are in generally good condition, providing an extensive network of trails, campsites and interpretive opportunities throughout the park property.

Recreation Facilities

Trails (60 miles)
Primitive campsites (6)
Horse corrals (3)
Picnic shelters (2)
Canoe/kayak landings (2)
Trailheads (5)
Historic homesite

Support Facilities

Administrative office
Shop and storage buildings
Residences (3)
Bunkhouse
Small visitor center

CONCEPTUAL LAND USE PLAN

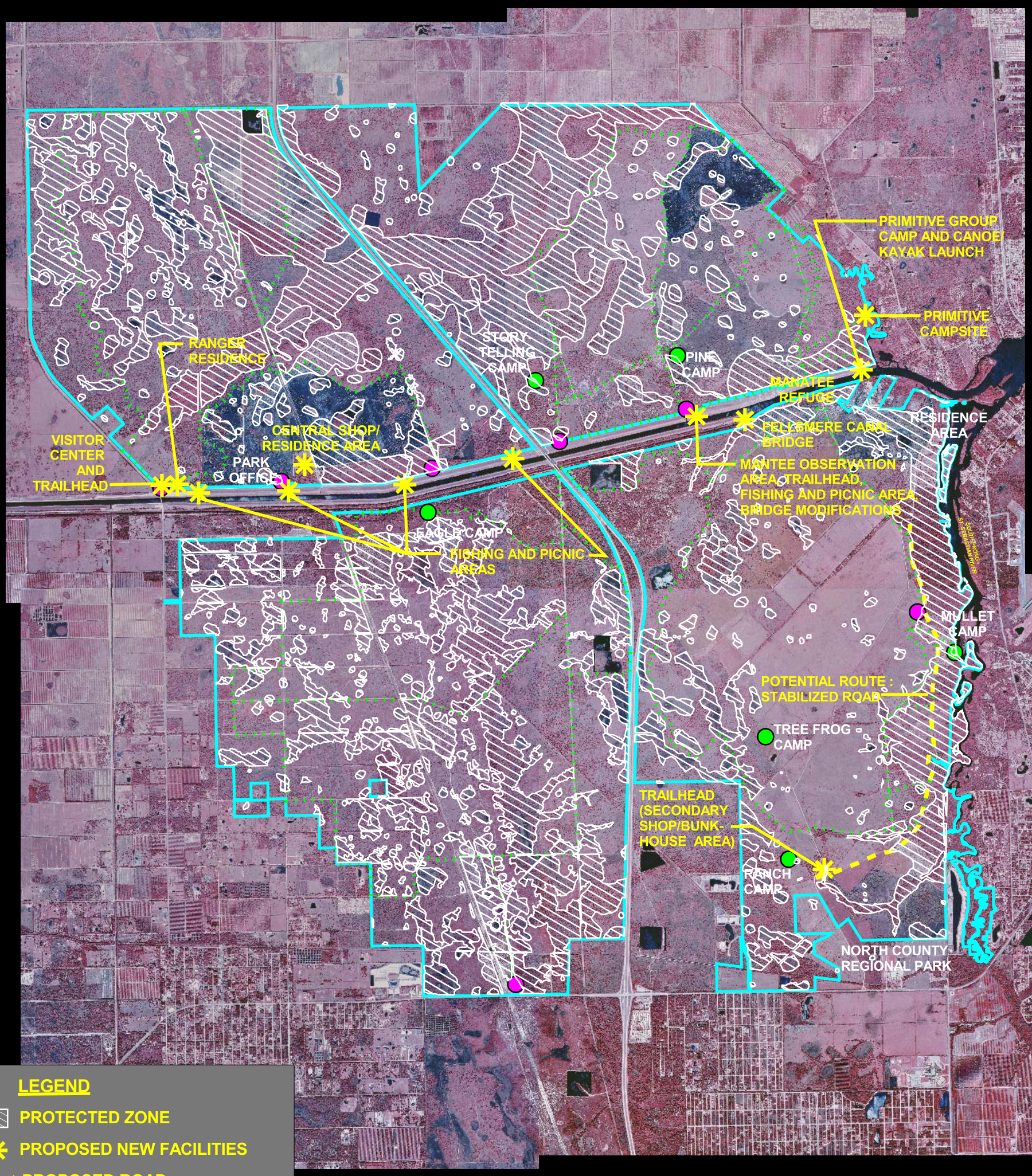
The following narrative represents the current conceptual land use proposal for this park. As new information is provided regarding the environment of the park, cultural resources, recreational use, and as new land is acquired, the conceptual land use plan may be amended to address the new conditions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

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

Potential Uses and Proposed Facilities

Management of the St. Sebastian River Preserve State Park is focused on the protection and enhancement of the park's natural and cultural resources while providing an appropriate level of recreational access to the property. Public uses are recommended to continue as established under management by the Office of Coastal and Aquatic Managed Areas, using the extensive network of trails and primitive campsites to provide unique, low-impact recreational experiences in the natural landscapes of the state park.

Expansion of the park's recreational programs are recommended to provide additional access for canoes and kayaks to the St. Sebastian River, expand and upgrade primitive camping sites, provide primitive group camping opportunities, and provide amenities for shoreline fishing. Over time, a variety of improvements to the preserve's trails will be implemented, with the



ST. SEBASTIAN RIVER PRESERVE STATE PARK

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4000 0 4000 Feet

CONCEPTUAL LAND USE PLAN

PREPARED BY: FL DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF RECREATION AND PARKS
OFFICE OF PARK PLANNING

help of construction and maintenance support from park volunteers.

New primitive campsites may be created to accommodate additional use in the future, and will be sited by park staff in disturbed areas along the trail network. As hydrological restoration projects go forward, the Tree Frog primitive camp will need to be relocated to higher ground, and others may be relocated as the effects of the restoration become evident. The Mullet Camp primitive site should also be relocated to provide a greater distance from the campsite to the Carlton House cultural site, for protection of that resource.

To expand the park's ability to provide interpretive and environmental education programs, a new visitor center is proposed to be located just north of the C-54 Canal on County Road 507. The visitor center will include laboratory facilities to provide support for research by visiting scientists and teaching resources for environmental education classes. Interpretive exhibits, office space for park staff and restrooms will be offered at the visitor center. A universally accessible loop trail will be developed to lead through a variety of natural community types to the north and east of the visitor center. A trailhead and kiosk for access and orientation to the preserve's other trail systems will be located south of the visitor center, on the C-54 canal right of way. When park visitation reaches a level at which honor box fee collections become inefficient, a toll booth may be installed on the C-54 Canal maintenance road adjacent to the visitor center.

Working in collaboration with the St. Johns River Water Management District and the US Army Corps of Engineers, the Division proposes to develop amenities for shoreline fishing at five points along the C-54 Canal (one of these is described with the manatee observation area below). Each site would provide a picnic shelter, a small restroom, parking for 6 to 8 vehicles, convenient access to the shoreline for fishing, and landscape plantings to provide shade. Replacement of the manatee observation deck near the C-54 Canal water control structure is recommended. A parking area for 20 to 25 vehicles near the observation point is proposed to provide parking for that facility, for picnickers and fishermen, and for trail users. A small restroom, two shelters and scattered picnic tables will be provided as amenities for these recreational users. Modification of the water control structure and construction of a new bridge across the Fellsmere Canal are recommended to provide access to the trails network south of the canal. The modification of the water control structure and the new bridge should be designed for use by park vehicles, providing a much-needed link for resource management between the northern and southern sides of the canal system. Public vehicles will not be allowed to cross the canals.

In the area of the canal frequented by manatees, public uses for fishing recreation, manatee observation and access to trails will be managed through educational kiosks, personal contacts by park staff, monitoring and other operational measures. As mentioned in the Resource Management Component of this plan, seasonal closure to fishing along the south bank of the canal below the water control structure is recommended. Division staff will coordinate the design, construction, maintenance and operation of all recreation and support facilities adjacent to the manatee sanctuary and elsewhere along the park's river shoreline with the FWC Imperiled Species Management Section, the Save the Manatee Club and other expert advisors. This will assure that interactions between the public and manatees occur in a manner that will enhance the public experience in the park and their understanding and awareness of manatees without negative consequences to the animals.

A canoe and kayak launch is recommended to be located near the eastern end of the C-54

canal, with parking for 12 to 15 vehicles, and a restroom. This launch will provide paddlers with convenient access to the North Prong of the river, a high-quality resource for non-motorized boating. A floating barricade should be installed just west of the proposed canoe launch to identify a manatee refuge area in the C-54 Canal from that point to the water control structure, a distance of over 1 mile, allowing the animals' undisturbed use of the canal. As discussed above, the protection of manatees is a priority consideration for the design and management of recreational activities here. Informational kiosks informing visitors of the proper ways to share waterways with manatees, monitoring of visitor activities and enforcement of protective rules and regulations are measures to be taken to assure that the animals are not disturbed by the activity. The canoe launch may be closed for an appropriate period if that is necessary to assure maximum protection of manatees during cold spells.

The proposed primitive group camp should also be located at the eastern end of the C-54 Canal right of way. The restroom mentioned above will be shared by the group camp and users of the day use canoe/kayak launching area. The group camp will be designed to accommodate groups of up to 30 persons, and will provide tent pads, fire rings, picnic tables and a shelter. Native trees should be planted to generate a canopy for shade.

Improvements for the preserve's trails will include stabilization of low or poorly drained areas with low-water crossings to allow trail use while protecting park resources. Sections of the existing trails that become flooded because of hydrological restoration projects will be relocated to higher ground, to the extent possible. Trail signage and maps for the trail system will be upgraded to address orientation problems that occur now, and additional watering stations will be provided for equestrian users, as needed. Working in collaboration with the Florida Trail Association, park staff will identify a route for a single-use hiking trail at the preserve. Construction and maintenance of that trail will be sponsored by the association. To improve the popular Storytelling camp for equestrian users, several new stalls and a facility for collection and pickup of animal wastes will be added.

Support facilities recommended for development at the state park include a central maintenance shop and equipment storage area and an additional ranger residence located just north of the C-54 Canal maintenance road, near the proposed visitor center. The existing trailer residence located near the proposed shop should be replaced with a permanent structure.

There is a need to provide all-weather access to public recreation sites and to the park residences located on the South Prong of the river, since the existing road is frequently flooded. Among other options, the potential re-establishment of the abandoned road shown on the Conceptual land use plan will be studied. This project will not go forward before completion of the recommended hydrological restoration plan, to allow planning to be based on the post-restoration flood elevation and other effects of the restoration. Careful mapping of RCW and scrub jay habitat, mapping of all other listed animal and plant populations, and mapping of all wetland features along the proposed corridor will be conducted. Overlay mapping analysis will be used in an effort to determine what route for the proposed road would keep impacts to the preserve's natural resources within acceptable levels.

A secondary shop and maintenance area and the Bunkhouse will continue to be located just north of the North County Regional Park. A new trailhead is proposed in that area to provide convenient access to the preserve's trails from Fellsmere Road.

Recreation Facilities

Visitor Center
Visitor Center trailhead (12 standard spaces, 8-10 equestrian spaces)
Primitive campsites (2)
Primitive group camp (30 persons)
Fishing amenities (4 - shelter, restroom, parking - 8 cars each, landscape)
Manatee observation area - deck, picnic shelters (2), restroom, parking (25 cars) landscape
Canoe/kayak launch, restroom and parking (15 cars)
Southeastern trailhead (10-12 spaces)
Trail and equestrian camp improvements

Support Facilities

Shop (4 bay)
Equipment storage building (4 bay)
Flammable storage building
Ranger residences (2)
Water control structure modifications
Fellsmere canal bridge
Stabilized Road (3.3 mi.)

Facilities Development

Preliminary cost estimates for the following list of proposed facilities are provided in Addendum 7. 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.

Existing Use and Optimum Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural values of the site. The carrying capacity of a unit is determined by identifying the land and water requirements for each recreation activity at the unit, and then applying these requirements to the unit's land and water base. Next, guidelines are applied which estimate the physical capacity of the unit's natural communities to withstand recreational uses without significant degradation. This analysis identifies a range within which the carrying capacity most appropriate to the specific activity, the activity site and the unit's classification is selected (see Table 1).

The optimum carrying capacity for this park is a preliminary estimate of the number of users the unit could accommodate after the current conceptual development program has been implemented. When developed, the proposed new facilities would approximately increase the unit's carrying capacity as shown in Table 1.

Optimum Boundary

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

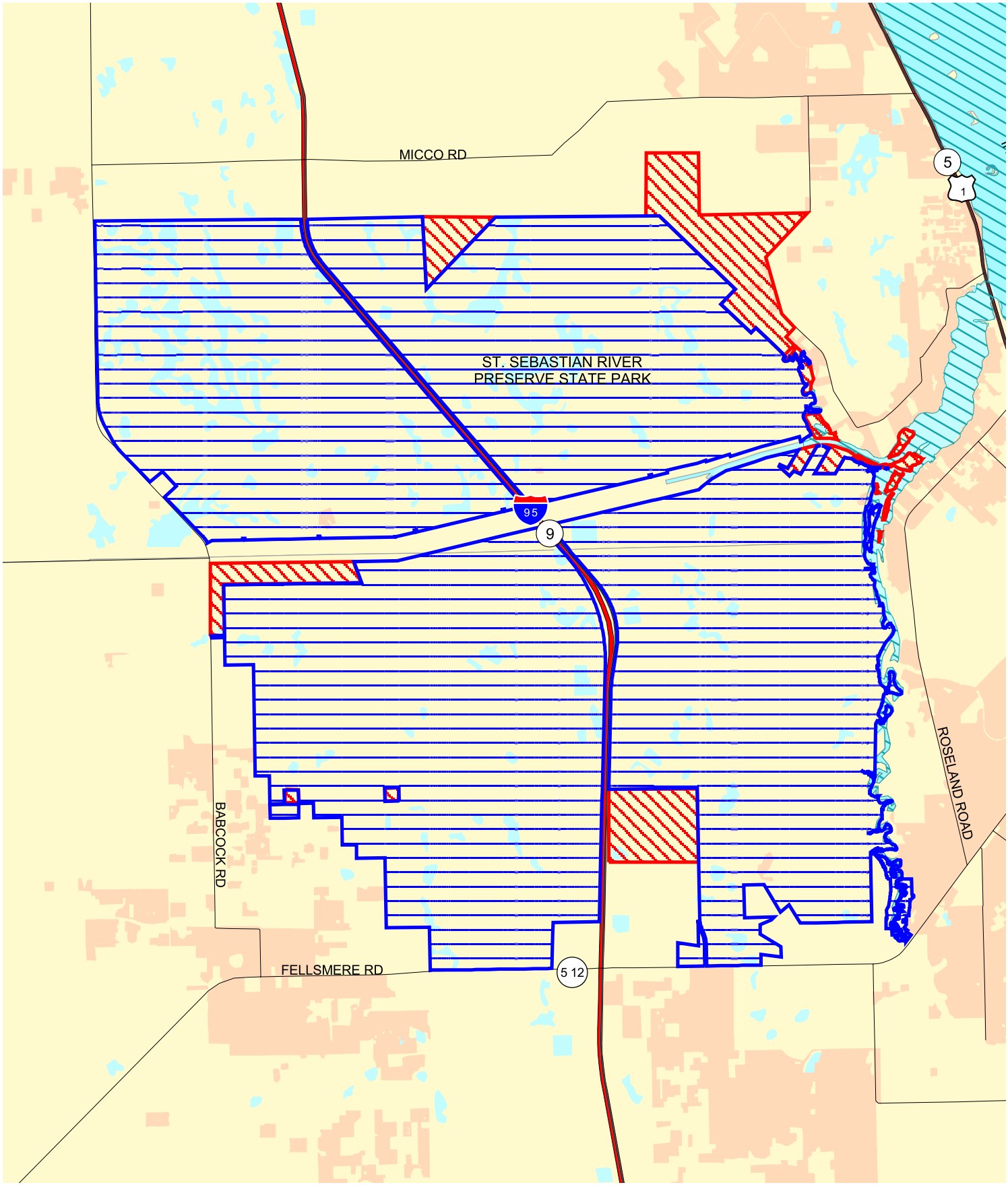
Table 1--Existing Use And Optimum Carrying Capacity

	Existing Capacity		Proposed Additional Capacity		Estimated Optimum Capacity	
Activity/Facility	**One Time**	**Daily**	**One Time**	**Daily**	**One Time**	**Daily**
Visitor Center			60	240	60	240
Trails						
Shared Use	160	320			160	320
Fishing/Picnicking	50	100	70	140	120	240
Boating						
Canoeing/kayaking	10	20	30	60	40	80
Camping						
Primitive	60	60	8	8	68	68
Group			30	30	30	30
TOTAL	280	500	198	478	478	978

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

Properties identified for optimum boundary for the state park are intended to modify the park boundary for greater management efficiency, exclude the potential for development of land supporting relatively undisturbed natural communities and areas that will protect the upper watershed of the North Prong of the St. Sebastian River.



ST. SEBASTIAN RIVER
PRESERVE STATE PARK

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

LEGEND
Park Boundary
Optimum Boundary

OPTIMUM BOUNDARY MAP

Addendum 1—Acquisition History and Advisory Group Documentation

Purpose of Acquisition

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) initially acquired St. Sebastian River Preserve State Park primarily to manage the property as a state buffer preserve.

Sequence of Acquisition

On January 4, 1995, the Trustees and the St. Johns River Water Management District (SJRWMD) purchased approximately 6,894-acre property, constituting the initial area of St. Sebastian River Preserve State Park. The Trustees and SJRWMD purchased the property from S. Thomas Hamilton, Jr., as personal representative of the Estate of Carson Plat. The purchase was funded under the P2000/CARL program, and the Trustees and the water management district each held undivided fifty percent interest in the property. Since this initial purchase, the Trustees and SJRWMD have jointly acquired several parcels and added them to St. Sebastian River Preserve State Park.

On February 16, 1996, the Trustees purchased a 7,058-acre property to be managed as part of St. Sebastian River Preserve State Park. The Trustees purchased the property from Anthony A. Coraci, and the purchase was funded under the CARL/P2000 program. Since this initial acquisition, the Trustees have purchased several parcels to add them to St. Sebastian River Preserve State Park.

Title Interest

The Trustees and SJRWMD hold fee simple title to portions of St. Sebastian River Preserve State Park, respectively.

Lease Agreements

Since St. Sebastian River Preserve State Park was initially purchased to be managed as a state buffer preserve, the property was leased to the Florida Department of Environmental Protection, Office of Coastal and Aquatic Managed Areas (CAMA). CAMA managed “the Trustees only” portion of the park, where the Trustees owns all the parcels, under Lease No. 4118 and the “commonly-owned” portion of the park, where the Trustees and SJRWMD jointly own the parcels, under lease No. 4397, until it relinquished its leasehold interest in the park in December of 2003. At present, the Division of Recreation and Parks (Division) manages both the Trustees and SJRWMD’s portions of St. Sebastian River Preserve State Park under the same leases, namely Lease No. 4118 and Lease No. 4397. The two leases are for a period of fifty (50) years; Lease No. 4118, which commenced on March 29, 1996, will expire on March 28, 2046; and Lease No. 4397, which commenced on January 31, 2003, will expire on January 30, 2053. The two leases comprise the present area of St. Sebastian River Preserve State Park, which is approximately 21,748 acres.

The Division manages St. Sebastian River Preserve State Park to develop, conserve and protect the natural and cultural resources of the property and to use the property for resource-based public outdoor recreation that is compatible with the conservation and protection of the property.

Special Conditions on Use

St. Sebastian River Preserve State Park is designated single-use to provide resource-based public outdoor recreation and other park related uses. Uses such as water resource development projects, water supply projects, storm-water management projects, and linear facilities and sustainable agriculture and forestry, unless specifically stated otherwise in the park's Unit Management Plan, are not consistent with the management purposes of the park.

Outstanding Reservations

Records show that there are a few easements in St. Sebastian River Preserve State Park. Florida Power and Light Corporation maintain an above ground powerline that traverses a certain section of the park. Two drainage easements drain an industrial park along 102nd Terrace through small tributaries to the Sebastian River.

St. Sebastian River Preserve State Park

Advisory Group Members List

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Indian River County Board of County Commissioners
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The Honorable Helen Voltz, Vice-Chairman, Brevard County Commission, District 3
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Represented by:
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Judy Avril, President
Eugenia Chapter, Florida Native Plant Society
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St. Sebastian River Preserve State Park

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Ms. Holly Hoier
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The Advisory Group appointed to review the proposed land management plan for the St. Sebastian River Preserve State Park met at the Fellsmere Community Center in Fellsmere, Florida on Thursday, July 7, 2005. Mr. Ernie Brown represented Brevard County Commissioner Volz and Ms. Susan Boyd represented Mr. Baker (Pelican Island Audubon Society). Ms. Boughton (Florida Fish and Wildlife Commission), Mr. Gunter (Indian River Soil and Water Conservation District), Mr. Crisafulli (Brevard Soil and Water Conservation District) and Ms. Carlson (Turtle Coast Sierra Club) did not attend the meeting. Division staff attending included Larry Fooks, Chief and Valinda Subic, Assistant Chief, FPS District 3 Bureau of Park Operations, Dustin DeVos, Park Manager and Samantha McGee, Park Biologist, St. Sebastian River Preserve State Park, and Lew Scruggs, Office of Park Planning.

Mr. Scruggs began the meeting by explaining the purpose of the advisory group, the meeting agenda and follow-up review process. He also provided a brief overview of the Division's planning process and summarized public comments received during the previous evening's public workshop. He then asked each member of the advisory group for his or her comments on the draft management plan.

Summary of Advisory Group Comments

Ms. Avril (Eugenia Chapter, Florida Native Plant Society) said that the draft plan addresses the Native Plant Society's interests in maintaining plant habitat. She offered the Society's assistance through volunteer efforts and solicitation of grants for projects at the state preserve. Ms. Avril also noted that the Indian River Mosquito Control District has a policy to avoid overspray and spray drift impacts to natural resource lands such as the preserve.

Ms. Cummins (Recreational canoeing/kayaking) approved the management plan in general. She noted that the area proposed for the canoe/kayak launch is ideal for launching in its current condition, and recommended that it remain as a slide-in launch rather than have any structural improvement.

Mr. Voltolina (St. Johns River Water Management District (District)) asked for information to be added to the draft plan regarding the District's involvement in red-cockaded woodpecker preservation efforts. He noted that the triangular piece of land at the park's north boundary, included in the Optimum Boundary map, may be acquired by the District, and that the District has a request from Brevard County for development of stormwater management facilities on the Wheeler Tract (an area also included on the draft Optimum Boundary map for the park).

Mr. Voltolina noted that some road improvements would be necessary to provide access to the proposed canoe/kayak launch. He inquired about the methods of sewage disposal that will be used for park facilities. Staff replied that composting toilet systems will likely be constructed at remote locations, and septic tank and drainfield systems will be used where proper separation of the systems from surface and groundwater resources can be assured and where power and water systems are available. Mr. Voltolina stated that the District will continue to work closely with the Division to coordinate management of the property.

Ms. Hoier (Adjacent landowner) noted that the plan lacks discussion of the hydrogeology of the property. She suggested adding discussion of existing surface and groundwater conditions, the hydrological studies now underway, and explanation of the proposed wetland mitigation

projects.

Ms. Hoier noted the importance of attracting public support and involvement in the park. She suggested discussion in the plan on opportunities for adjacent landowners and the general population to be informed and involved in the park's management activities. She suggested the park should provide guided tours to any sensitive areas that may be excluded for general access by the public. Ms. Hoier provided staff with written comments and suggestions for the draft management plan.

Ms. Tyson (Coastal and Aquatic Managed Areas) echoed the importance of keeping local residents informed regarding programs and management activities at the preserve. She recommended holding annual informational meetings, and providing both educational opportunities and special events for local elected officials.

Ms. Tyson discussed the importance of water quality protection at the preserve in its role as a buffer to the adjacent aquatic preserve. She emphasized that collection of trash and monofilament line will be important, and that the selection and maintenance of sewage disposal systems will be extremely important, especially as preserve attendance increases in the future. She pointed out that there is a concentration of wildlife in the northern half of the preserve due to the low volume of public use that has occurred there in the past. She suggested establishing protected zones in habitat areas for the various listed species, and to consider rotating closure of some areas to reduce disturbances to wildlife as visitation increases.

Ms. Tyson emphasized the great importance of this property as habitat for a long list of listed plant and animal species, and urged the Division to increase public awareness and recognition of that importance. She pointed out that some of the listed species information in the plan needs to be updated, and that the location of the preserve in the core foraging area for wood storks should be noted. She suggested that recommendations from the current listed species recovery plans should be included in the preserve's management plan.

Ms. Tyson also discussed the need for a universally accessible nature trail associated with the visitor center, the need to manage trail impacts such as soil compaction and drainage diversion, and suggested that the stable located adjacent to the residences on the South Prong of the river should be preserved as a cultural resource. Ms. Tyson has provided written comments that summarize and expand her verbal comments.

Ms. Sadowski (Army Corps of Engineers (ACOE)) noted that her agency will focus its attention on any proposed structures to be placed in navigable waters, and on wetland restoration efforts that may isolate wetland areas that are now connected to navigable waters, and therefore within the ACOE jurisdiction. Staff suggested that a comprehensive wetland restoration study and plan may be needed to provide the necessary base of knowledge and an overall vision and process for the long-term restoration activities that are proposed for the preserve.

Ms. Knight (US Fish and Wildlife Service (USFWS)) reiterated the importance of the listed species that use the preserve. She recommended that fire return interval for the scrub community in the park is targeted at 6 to 12 years to enhance habitat for the Florida scrub jay population, and that a statement explaining the Division's adaptive management strategy be added to the draft plan. She noted that red-cockaded woodpeckers (RCW) are listed as endangered by the USFWS

and as a species of special concern by the Florida Fish and Wildlife Commission. She urged aggressive management of the preserve's RCW population and habitat in response to the mortality that resulted from the 2004 hurricane season, and noted that the USFWS hopes to make regular relocations of birds to the preserve. She recommended the planting of pine trees to support the recovery efforts. She noted that the list of research needs for the preserve would exceed those listed in the draft plan, suggesting that research should not be limited to the topics discussed there. Staff assured her that the management plan does not limit the types of research that may occur at the preserve.

Ms. Knight recommended that the proposed road relocation project should be preceded by careful mapping of the natural communities and listed species locations along the proposed route. She urged that the feasibility of the project should be analyzed for potential impacts to both individual RCW and scrub jay groups and to the connections between groups along the corridor.

Ms. Fuchs (Treasure Coast Trail Riders Association) thanked staff for the opportunity to participate in planning process and thanked the preserve staff for their efforts to facilitate equestrian uses of the property. She said that her organization supports the preserve with a number of fundraising events and provides volunteer workers. She asked that the plan mention the importance of equestrian use to the recreational programs of the preserve.

Ms. Fuchs recommended the addition of several horse stalls at the equestrian camp. She also recommended that trails should be re-routed, or new trails established when wetland restoration projects flood existing trails, wherever feasible. Staff agreed that wetland restoration projects should include efforts to maintain the extensive trail network. The construction of stabilized low water crossings was suggested. Staff also suggested that a manure collection facility should be provided at the equestrian camp for the protection of water quality in that area.

Mr. Spataro (FL Division of Forestry (DOF)) noted that the preserve's prescribed fire program is going well. He said that DOF staff would continue to work with Division staff in that area of park management. Mr. Spataro pointed out that the preserve offers unique educational opportunities, particularly related to the history of pioneer timber and turpentine industries in south Florida. He suggested that plans for the preserve include establishing an interpretive pine plantation to support this interpretive program.

Ms. Boyd (Pelican Island Audubon Society) said that the draft management plan meets the Audubon Society's expectations with low-impact improvements and public uses.

Mr. Karolick (Indian River Chapter, Florida Trail Association) said that his FTA chapter maintains the Florida National Scenic Trail from State Road 60 to US Highway 50. He noted that the Association is very interested in establishing new hiking trails on non-hunting land, and is interested in working with the Division to develop single-use hiking trails at the preserve. Mr. Karolick pointed out that both trail signage and maintenance at the preserve need improvements. Staff responded that a workgroup has been formed to address those needs.

Mr. Brown (Brevard County Office of Natural Resources) noted that the Division will have to adapt its resource management and development plans to a variety of changing conditions over time. He said that he enjoyed a tour of the preserve with Division staff, and noted that the

staff appears to be doing an outstanding job.

Mr. Brown recommended collaboration with Brevard County on measures to maintain wildlife connectivity with other public lands in the preserve's vicinity, and requested a goal to that effect be added to the draft plan. He proposed that the draft plan should also include discussion of potential connections to the local greenways and blueways systems.

Mr. Brown suggested the Division establish a standing resource management workgroup with all related public agencies, and a workgroup that coordinates continuing public involvement in the management of the preserve. He noted that monofilament line recycling stations are available through the County's collection program.

Ms. Povinelli (Coastal Preserves Alliance) urged the Division to place the highest priority on resource management at the preserve, and that passive, low-impact public uses should be the focus of the recreational programs. She said that her organization is very excited about the development of the proposed visitor center, and said that the Alliance is most interested in helping to make the preserve a better place. She offered suggestions for revision of the Citizen Support Organization goals and objectives.

Ms. Povinelli noted a concern for potential environmental impacts (particularly impacts to listed plant and animal species) of the proposed primitive group camp, if it is located along the South Prong of the St. Sebastian River.

Written Comments by Florida Fish and Wildlife Conservation Commission (FWC)

Ms. Boughton (FWC) provided the following comments in writing. Her comments focus on management of the listed bird species on the preserve. She noted that the draft management plan appears adequate regarding management for the Florida scrub jay, with the exception that the proposed fire return interval for scrub should be the 6-12 year interval contained in the USFWS South Florida Multi-species Recovery Plan. Regarding management of the red-cockaded woodpeckers and habitat in the preserve, Ms Boughton stated that the preserve should continue to receive three pairs of translocated RCW every other year to support the regional recovery efforts for that species. She also recommended the restoration of natural stocking levels of pines relative to RCW management, and that a foraging zone analysis of the RCW habitat is needed to determine what actions are necessary for habitat restoration. She recommended that the Division's plan include an effort to achieve the recovery standard related to minimum basal area for pines, as described in the USFWS RCW Recovery Plan.

Summary of Comments by Other Attendees

Mr. Fisher (The Nature Conservancy, former manager of the preserve) provided comments reiterating that resource management activities are the highest priority at the preserve. He noted that the 10-year cycle of the management plan requires a strong guiding vision for natural resource restoration and management, and should provide statements of desired future conditions for the priority resources of the preserve, and should base goals and objectives on those desired outcomes. Mr. Fisher recommended that science-based ecological targets for listed species and other priority resources should be developed, and ongoing monitoring programs should be implemented to document progress toward the goals. He supported the idea of a comprehensive

hydrological restoration plan.

Mr. Fisher repeated that the 2004 hurricane season had a large impact on the preserve's red-cockaded woodpecker population. He suggested that there should be a preserve-specific recovery plan for the property. He noted that RCW and Florida scrub jays frequently occupy the same or adjacent habitat, causing basic conflicts regarding proper resource management and requiring detailed guidelines for management actions that balance the needs of both species. He pointed out that conflicts may occur between shoreline fishing and the use of the canal and river areas of the park by manatees, and suggested that fishing recreation needs to be directed to the appropriate locations and may need to be restricted during cold weather.

Mr. Fisher noted that the proposed re-alignment of the park road in the southeastern quadrant of the preserve may impact RCW and scrub jay habitat and will cross several wetland areas. He said that the proposed alignment also crosses areas of listed plant populations.

Mr. Fisher suggested that the preserve's optimum boundary should extend to connect the preserve to Brevard County's Micco Scrub Sanctuary and south to connect to District lands. Staff explained that the Division's Additions and In Holdings land acquisition funds were not sufficient to support these large land acquisitions, and they should be directed toward the statewide programs such as Florida Forever. If acquired, the areas discussed would be considered by the Division for addition to the preserve's management boundary.

Mr. Ohara (Brevard County Environmentally Endangered Lands program) suggested that the ranch road currently in use in the preserve's southeastern quadrant could be used by the public seasonally if the proposed relocation is not feasible. He pointed out that the projected doubling of visitation at the preserve without the addition of necessary staff will divert staff resources from resource management activities.

Mr. Glover (Friends of the Sebastian River) expressed support for the increased passive recreational opportunities discussed in the draft plan. He said that the attention paid to natural resource protection in the plan is appropriate. He asked if the existing primitive camping sites in the preserve are causing significant impacts, and urged that any new camping areas be allowed only if minimal impacts can be assured. He also recommended that the proposed canoe/kayak launch be carefully managed to avoid erosion problems.

Mr. Austin and Mr. Buckman (adjacent landowners/developers) provided the group with a brief description of efforts to provide a recreational trail connection through land north of the preserve boundary to District land and to the preserve. They asked that language be added to the plan to accommodate that connection, if it is determined to be consistent with the management goals of the preserve.

STAFF RECOMMENDATIONS

Several excellent suggestions and comments for additional discussion and information to improve the quality of the draft plan were received at the Advisory Group meeting. Staff recommends the following changes to the draft plan:

Introduction and Resource Management Component

- Recognition will be added for the involvement of the St. Johns River Water Management District in RCW restoration efforts.
- Better recognition of the adjacency of the Indian River - Malabar to Vero Beach Aquatic Preserve will be added.
- Updated listed species information from current species recovery plans and data will be incorporated.
- A description of existing manatee protection measures in the waters surrounding the preserve will be included.
- Emphasis will be placed on the importance of water quality protection, (including the need for frequent trash collection and recycling efforts to remove monofilament fishing line) especially in light of the original acquisition purpose for the property as a buffer to the aquatic preserve.
- Emphasis will be placed on the importance of the preserve as habitat for the long list of protected species, particularly the RCW and the Florida scrub jay.
- A commitment to the development of a park-specific recovery plan for RCW, in collaboration with the FWC and the USFWS will be added.
- Clarification will be added regarding the Division's adaptive management strategies for elements such as prescribed fire intervals and other "balancing acts" where resource management needs overlap and sometimes conflict.
- Support for future discussions with the Florida Department of Transportation regarding wildlife crossings for the I-95 corridor, if and when planning and design for highway reconstruction is scheduled, will be added.
- Discussion will be added for efforts to address recreational impacts to the park's natural resources through improved routing of recreational trails, measures to address soil compaction, erosion and drainage diversion, and the need to provide alternate trail routes in areas that may not be accessible, after hydrological restoration projects are completed.
- Many questions regarding resource management and park development at the preserve cannot be fully answered without a clearer direction regarding hydrological restoration. An objective to the hydrological restoration goal (Introduction of the draft plan) to seek funding and develop a comprehensive hydrological restoration plan for the entire preserve will be added. Additional revisions will be made in the text of the Resource Management Component to expand the recommendation.

Land Use Component

Recreational uses and facilities that are discussed in the management plan are appropriate, and, with one exception, should remain in the locations shown on the conceptual land use plan. The following is a summary of the recommended revisions to the Land Use Component of the plan:

- Discussion will be added for the potential of the preserve to connect with ecological and recreational greenways envisioned by local governments, other state agencies and the SJRWMD, and adjacent landowners, and the Division's interest in participating in the planning and implementation of those connections.
- Division staff has evaluated the possible locations for a primitive group camp, and recommend that one facility to accommodate up to 30 campers should be placed on the north side of the C-54 Canal berm at its eastern end. This location will allow the developed area to be located on cleared ground, eliminating impacts to native vegetation. This location will also allow the restroom proposed for the canoe/kayak launch to serve also as the restroom for the group camp, further reducing environmental impacts and reducing development and maintenance costs.
- A discussion of proposed trail improvements will be added to the draft plan, to include the addition of a universally accessible nature trail loop originating at the visitor center. The addition of 2 to 4 stalls and a manure collection area to the horseman's camp and improvements to the shared use trails and trail amenities of the preserve, such as watering stations and signage improvements, will be discussed. As noted above, relocation of trails that may be eliminated by wetland restoration will be discussed. The Division's interest in working with the Florida Trail Association to establish and maintain single-use hiking trails at the preserve will also be discussed.
- Text will be added to indicate that fishing recreation and manatee protection will be managed through operational measures, such as directing fishermen away from locations that would create hazards to the animals or, if necessary, instituting seasonal restrictions on fishing.
- Discussion will be added regarding the opportunities for interpretation provided by the preserve. This will include discussion of the pioneer timber and turpentine industry and the potential to interpret that aspect of the preserve's history both at the visitor center and at other locations on the property.
- The potential relocation of a park road along the ridge lying just west of the South Prong of the river will be discussed more thoroughly in the text of the draft plan to include more information on the planning and design process that will be applied. The project will not go forward before completion of the recommended hydrological restoration plan. This will allow planning to be based on the post-restoration flood elevation and other effects of the hydrological restoration project. Careful mapping of RCW and scrub jay habitat, mapping of all other listed animal and plant populations, and mapping of all wetland features along the proposed corridor will be conducted.
- Overlay mapping analysis will be used to determine what route for the proposed road would minimize impacts to the preserve's natural resources and keep them within acceptable levels. As in all decisions that affect the listed species, water quality and other protected elements of the preserve, this process will be conducted in collaboration with staff of the USFWS, the Florida FWC, the Aquatic Preserve and the District.

With these changes, staff recommends approval of the draft management plan for St. Sebastian River Preserve State Park.

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Addendum 3—Soils Descriptions

Anclote Series – Within this series, Anclote sand, depressional (2B) is found at the preserve. This is a nearly level, very poorly drained sandy soil in marshy depressions in the flatwoods, in broad areas on floodplains and in poorly defined drainageways. In most years the water table is within a depth of 10 inches for more than 6 months. In dry seasons it is deeper, but is seldom below a depth of 40 inches. This soil is occasionally flooded 2-7 days following heavy rains. Permeability is rapid in all layers. The available water capacity is moderate in the surface layer and low below this layer. Organic matter content is high in the surface layer, and natural fertility is low.

Arents, 0 to 5 percent slopes (23IR) – This soil consists of material dug from several areas that have different kinds of soil. This fill material is the result of earth-moving operations. This soil is used to fill such areas as sloughs, marshes, shallow depressions, swamps, and other low-lying areas above their natural ground levels. Permeability is moderately rapid to rapid. The water table varies with the amount of fill material and artificial drainage in any mapped area. In most years, the water table is at a depth of 24-36 inches for 2-4 months. During extended dry periods, no water table is within 5 feet of the surface.

Basinger Series – Within this series, Basinger sand, depressional (6B) and Basinger sand (7B) are found at this unit. This series consists of nearly level, poorly drained sandy soils in sloughs and depressions in the flatwoods. The soils formed in sandy marine sediments. Permeability is very rapid and the available water capacity is very low to low in all layers. Organic matter content is low.

Bessie Series – Within this series, Bessie muck, tidal (66B) is found at this unit. This series consists of very deep, very poorly drained, slow or very slow permeable organic soils in coastal mangrove swamps that are subject to daily or periodic flooding by high tides. They formed in marine deposits of organic materials over clayey and sandy sediments. Permeability is slow or very slow.

Canaveral Series - Within this series, the Canaveral-Anclote complex, gently undulating (9B) is found at this unit. These consist of nearly level and gently undulating, moderately well-drained sandy soils mixed with shell fragments. These soils are on low dune-like ridges bordering depressions and sloughs along the Atlantic Coast. They formed in marine sands and shell fragments. In most years the water table is at a depth of 10-40 inches for 2-6 months. Permeability is very rapid and the available water capacity is very low in all layers. Organic matter content is low.

Canova Series - Within this series, Canova muck (4IR) is found at this unit. The soils of this series are very poorly drained and moderately permeable; they were formed in sandy and loamy marine sediment under favorable conditions for the accumulation of organic material. These nearly level soils are in freshwater swamps and marshes. Under natural conditions, the water table is above the surface for most of the year.

Chobee Series - Within this series, Chobee sandy loam, frequently flooded (12B), Chobee loamy fine sand (2IR), and Chobee mucky loamy fine sand, depressional (62IR) are found at this unit. This series consists of nearly level, very poorly drained soils in marshy depressions and low areas of the floodplains. These soils formed in thick beds of moderately fine marine sediments. Under natural conditions, they are covered with shallow water or have a water table

within a depth of 10 inches of the surface for more than 6 months during most years.

Copeland Series - Within this series, the Copeland-Bradenton-Wabasso complex (16B) is found at this unit. This complex consists of several nearly level, very poorly drained soils on low flats. In most years the water table is within a depth of 10 inches for more than 6 months. In dry seasons it is between 10-30 inches. This soil is flooded for 7 days to a month once every 5-20 years. Some areas are underlain by coquina rock instead of limestone.

EauGallie Series - Within this series, EauGallie sand (17B) and EauGallie, Winder, and Riviera soils, depressional (18B) are found at this unit. This series consists of nearly level, poorly drained sandy soils in the flatwoods. These soils are mainly on broad, low ridges. Some are in sloughs and shallow ponds. All formed in beds of sandy and loamy marine sediments. In wet seasons, the water table is within a depth of 10 inches of the surface for 2-4 months. In most years, the water table is at a depth of 48 inches for more than 6 months. Organic matter content is low.

Electra Series - Within this series, Electra fine sand, 0 to 5 percent slopes (88B and 48IR) is found at this unit. These soils are deep, somewhat poorly drained, slowly permeable or very slowly permeable soils that formed in thick beds of sandy and loamy marine sediment. These nearly level to gently sloping soils are on knolls on the flatwoods and in adjacent drainageways. The water table is at a depth of 25-40 inches for 4 consecutive months during most years and recedes to a depth of more than 40 inches during drier periods.

Floridana Series - Within this series, Floridana sand, depressional (22B), Floridana sand (23B and 24IR), Floridana, Chobee, and Felda soils, frequently flooded (24B), and Floridana mucky fine sand, depressional (55IR) are found at this unit. They are very poorly drained, slowly permeable to very slowly permeable soils that formed in thick beds of sandy and loamy marine sediment. These nearly level soils are in depressions, in poorly defined drainageways, and on broad, low flats. The water table is above the surface for short periods after heavy rainfall or within a depth of 10 inches for more than 6 months during most years. It is at a depth of 10-30 inches for short periods during dry seasons. Depressional areas are ponded for 6 months or more.

Hilolo Series – Within this series, Hilolo fine sand (46B) is found at this unit. This series consists of deep, poorly drained slowly permeable soils formed in sandy and loamy marine sediments influenced by underlying alkaline materials. They occur on nearly level areas and along the borders of depressions and sloughs. Drainage is poor and runoff is slow. Permeability is moderate to very slow. The water table is within depths of 10 inches for 2-4 months and at depths of 10-40 inches for 6-9 months in most years.

Holopaw Series - Within this series, Holopaw fine sand (47IR) and Holopaw fine sand, depressional (57IR) are found at this unit. They are poorly drained, moderately slowly permeable soils that formed in thick beds of sandy and loamy marine sediment. These nearly level soils are on broad low flats, in poorly defined drainageways, and in depressional areas. The water table is within a depth of 10 inches of the surface for 2-6 months each year. The depressional areas are ponded for 6-9 months or more.

Immokalee Series - Within this series, Immokalee sand (28B) is found at this unit. Soils in this series are poorly drained, moderately permeable soils that formed in beds of sandy marine

sediment. These nearly level soils are on broad flatwoods. In most years, the water table is within a depth of 10 inches of the surface for 1-3 months and at a depth of 10-40 inches for 6-9 months.

Jupiter Series – Within this series, Jupiter fine sand (3IR and 31IR) is found at this unit. They are poorly drained, rapidly permeable soils that formed in thin beds of sandy marine sediment underlain by fractured limestone bedrock. These nearly level soils are on low flats and hammocks. They are saturated during the wet periods.

Lokosee Series - Within this series, Lokosee fine sand (59IR) is found at this unit. These soils are poorly drained, slowly or very slowly permeable; they were formed in thick beds of sandy and loamy marine sediment. They occur on low hammocks, on broad low flats that are adjacent to the flatwoods, and in poorly defined drainageways. In most years, the water table is within a depth of 10 inches of the surface for 2-4 months and at a depth of 10-40 inches for more than 6 months. During extended dry periods, it recedes to a depth of more than 40 inches.

Malabar Series - Within this series, Malabar sand, high (29B), Malabar sand (30B), and Malabar fine sand (39IR) are found at this unit. These soils are poorly drained, slowly permeable to very slowly permeable; they formed in thick beds of sandy and loamy marine sediment. They are found in low, narrow to broad sloughs, on flats, and in poorly defined drainageways. The water table is at a depth of less than 10 inches of the surface for 2-6 months each year and at a depth of 10-40 inches for most of the remainder of the year.

Manatee Series - Within this series, Manatee mucky loamy fine sand, depressional 53(IR) is found at this unit. Soils in this series are very poorly drained and moderately permeable; they formed in sandy and loamy marine sediment. These nearly level soils are in depressions, in poorly defined drainageways, and on broad, low flats. Under natural conditions, these soils are covered with shallow water, or they have a water table within a depth of 10 inches of the surface for more than 6 months of most years. Runoff is slow.

Myakka Series - Within this series, Myakka sand (36B), Myakka sand, depressional (38B), Myakka fine sand (5IR) and Myakka fine sand, depressional (45IR) are found at this unit. They are poorly drained, moderately permeable to moderately rapidly permeable soils that formed in beds of sandy marine sediment. These nearly level soils are on broad flatwoods and in depressions. In most years, the water table is within a depth of 10 inches of the surface for 1-3 months and at a depth of 10-40 inches for 6-9 months. Depressional areas are ponded for 6 months or more each year.

Oldsmar Series - Within this series, Oldsmar sand (40B), Oldsmar fine sand (6IR), and Oldsmar fine sand, depressional (52IR) are found at this unit. They are poorly drained, slowly permeable soils that formed in sandy and loamy marine sediment. These nearly level soils are on broad flatwoods and in depressional areas in the flatwoods. In most years, the water table is at a depth of 10-40 inches for more than 6 months and at a depth of less than 10 inches for 1-2 months.

Paola Series - Within this series, Paola fine sand, 0 to 5 percent slopes (43B) is found at this unit. They are excessively drained, very rapidly permeable soils that formed in thick deposits of marine or eolian sand. These nearly level to gently sloping soils are on the Atlantic Coastal Ridge. The water table is at a depth of more than 72 inches.

Pineda Series - Within this series, Pineda sand (47B and 16IR), and Pineda fine sand,

depressional (56IR) are found at this unit. They are deep, poorly drained, slowly permeable to very slowly permeable soils that formed in thick beds of sandy and loamy marine sediment. These nearly level soils are on low hammocks and in broad, poorly defined sloughs. In most years, the water table is within a depth of 10 inches of the surface for 1-6 months and at a depth of 10-40 inches for more than 6 months. It recedes to a depth of more than 40 inches during extended dry periods.

Pomello Series - Within this series, Pomello sand (49B) and Pomello sand, 0 to 5 percent slopes (27IR) are found at this unit. They are moderately well-drained, moderately rapidly permeable soils that formed in thick beds of marine sediment. These nearly level to gently sloping soils are on low ridges and knolls in the flatwoods. The water table is at a depth of 24-40 inches for about 1-4 months during wet periods and at a depth of 40-60 inches during drier periods.

Pompano Series - Within this series, Pompano fine san (49IR) is found at this unit. These are poorly drained, rapidly permeable soils that formed in thick deposits of sandy marine sediment. These nearly level soils are in sloughs and poorly defined drainageways. The water table is within a depth of 10 inches of the surface for 2-6 months each year. During the drier periods, it is within a depth of about 30 inches for more than 9 months each year. Some areas are occasionally flooded for 2-7 days in some years.

Quartzipsamments, smoothed (52B) – this soil is nearly level to gently sloping and moderately well drained to somewhat poorly drained. It consists of thick deposits of sand and of mixed sand and shell fragments. This fill material is the result of earthmoving operations. They are commonly along major highways. Many areas are former sloughs, marshes, or shallow ponds that have been filled with various soil material to surrounding ground level or to elevations above natural ground level. Some areas were originally high ridges that have been excavated to below natural ground level and reworked. In a few places soils have been reworked in place and not moved. Drainage is variable. Most excavated areas are well-drained, but the water table is generally within a depth of 50 inches in filled areas. Permeability is variable but generally is very rapid. Available water capacity is also variable but generally is very low. Organic matter content is low.

Riviera Series - Within this series, Riviera sand (19B), Riviera fine sand (10IR), and Riviera fine sand, depressional (51IR) are found at this unit. They are poorly drained, slowly permeable to very slowly permeable soils that formed in beds of sandy and loamy marine sediment. These nearly level soils are on low hammocks, in poorly defined drainageways, on broad, low flats, and in depressional areas. The water table is within a depth of 10 inches of the surface for 1-6 months and at a depth of 10-40 inches for more than 6 months in most years. It recedes to a depth of more than 40 inches during extended dry periods. The depressional areas are ponded for 6-9 months or more each year. The slope ranges from 0-2 percent.

Samsula Series – Within this series, Samsula muck, depressional (62B) is found at this unit. These are very poorly drained, rapidly permeable soils that formed in moderately thick beds of hydrophytic non-woody plant residue. These nearly level soils are in small depressions, poorly defined drainageways, and freshwater marshes and swamps. The water table is at or above the surface except during extended dry periods.

Satellite Series - Within this series, Satellite sand (53B) and Satellite fine sand (34IR) are found

at this unit. These are somewhat poorly drained, very rapidly permeable soils that formed in theick beds of sandy marine sediment. These nearly level soils are on low knolls and ridges on the flatwoods. The water table is at a depth of 18-40 inches for 2-6 months and at a depth of 40-72 inches for 6 months or more in most years.

St. Johns Series - Within this series, St. Johns sand, depressional (55B) is found at this unit. This series consists of nearly level, poorly drained sandy soils on broad low ridges, in sloughs, in poorly defined drainageways, and in shallow intermittent ponds in the flatwoods. These soils formed in marine sands. Permeability is moderate in the weakly cemented layers and very rapid in all other layers. The available water capacity is moderate in the surface layer and weakly cemented layers and very low to low in all other layers. Organic matter content is moderate in the surface layer and weakly cemented layers and low in other layers.

Tomoka Series - Within this series, Tomoka muck, undrained (67B) is found at this unit. This series consists of nearly level, very poorly drained, well-decomposed organic soils in broad, flat marshes, small depressions, and swamps. These soils formed in moderately thick beds of hydrophytic, non-woody plant remains underlain by sandy and loamy mineral layers. Permeability is rapid in the organic layers and sandy layers and moderate to moderately rapid in the loamy layers. The available water capacity is very high in the organic layers, low in the sandy layers, and moderate in the loamy layers. Organic matter content is very high.

Udorthents, steep (59B) – this soil consists of well-drained heterogeneous mixtures of sand, shell, and unconsolidated material that has been excavated from adjacent canals or other areas and deposited in irregular piles. These deposits are deep and form a continuous embankment along major canals; in other places, they may be only a few feet thick and may be spread over large areas. The seasonal high water table is usually below a depth of 72 inches. Permeability is variable but is generally rapid; available water capacity is also variable but usually is low.

Wabasso Series - Within this series, Wabasso sand (71B) and Wabasso fine sand (13IR) are found at this unit. They are poorly drained, slowly permeable or very slowly permeable soils that formed in sandy and loamy marine sediment. These nearly level soils are on broad flatwoods. In most years, the water table is at a depth of 10-40 inches for more than 6 months and at a depth of less than 10 inches of the surface for 1-2 months.

Addendum 4—Plant And Animal List

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	BRYOPHYTES	
Sphagnum moss	*Sphagnum* sp.	
	PTERIDOPHYTES	
Giant leather fern	*Acrostichum danaeifolium*	
Toothed midsorus fern; swamp fern	*Blechnum serrulatum*	
Long strap fern	*Campyloneurum phyllitidis*	
Nodding club-moss	*Lycopodiella cernua*	26,30,35,41
Japanese climbing fern*	*Lygodium japonicum*	
Small-leaf climbing fern*	*Lygodium microphyllum*	
Tuberous sword fern*	*Nephrolepis cordifolia*	
Sword fern; wild Boston fern	*Nephrolepis exaltata*	
Hand fern	*Ophioglossum palmatum*	28,33
Cinnamon fern	*Osmunda cinnamomea*	25,26,29,32,33
Royal fern	*Osmunda regalis*	25,26,28,32,33
Golden polypody	*Phlebodium aureum*	
Resurrection fern	*Pleopeltis polypodioides* var. *michauxiana*	
Whisk-fern	*Psilotum nudum*	
Bracken fern	*Pteridium aquilinum* var. *pseudocaudatum*	
Meadow spike-moss	*Selaginella apoda*	
Shoestring fern	*Vittaria lineata*	
Netted chain fern	*Woodwardia areolata*	
	GYMNOSPERMS	
Red cedar	*Juniperus virginiana*	
Pond-cypress	*Taxodium ascendens*	
Bald-cypress	*Taxodium distichum*	
Sand pine	*Pinus clausa*	
Slash pine	*Pinus elliottii*	
Longleaf pine	*Pinus palustris*	
	MONOCOTS	
Flatspike sedge	*Abildgaardia ovata*	
Yellow colicroot	*Aletris lutea*	
Blue maidencane	*Amphicarpum muhlenbergianum*	
Florida bluestem	*Andropogon floridanus*	
Bushy bluestem	*Andropogon glomeratus* var. *hirsutior*	
Chalky bluestem	*Andropogon virginicus* var. *glaucus*	
Broomsedge bluestem	*Andropogon virginicus* var. *virginicus*	

* Non-Native Species

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Jack-in-the-pulpit	*Arisaema triphyllum*	
Wiregrass	*Aristida beyrichiana*	
Arrowfeather threeawn	*Aristida purpurascens*	
Florida threeawn	*Aristida rhizomophora*	
Bottlebrush threeawn	*Aristida spiciformis*	
Common asparagus-fern*	*Asparagus setaceus*	
Common bamboo *	*Bambusa vulgaris*	
Densetuft hairsedge	*Bulbostylis ciliatifolia*	
Ware's hairsedge	*Bulbostylis warei*	
Southern bluethread	*Burmannia capitata*	
Manyflowered grasspink	*Calopogon multiflorus*	8
Bandana-of-the-everglades	*Canna flaccida*	
Hop sedge	*Carex lupulina*	
Southern sandbur	*Cenchrus echinatus*	
Slender woodoats	*Chasmanthium laxum*	
Jamaica swamp sawgrass	*Cladium jamaicense*	
Wild taro*	*Colocasia esculenta*	
Dayflower	*Commelina diffusa*	
Whitemouth dayflower	*Commelina erecta*	
Seven-sisters; string-lily	*Crinum americanum*	
Toothachegrass	*Ctenium aromaticum*	
Baldwin's flatsedge	*Cyperus croceus*	
Yellow nutgrass; chufa flatsedge*	*Cyperus esculentus*	
Haspan flatsedge	*Cyperus haspan*	
Swamp flatsedge	*Cyperus ligularis*	
Papyrus flatsedge*	*Cyperus papyrus*	
Manyspike flatsedge	*Cyperus polystachyos*	
Pinebarren flatsedge	*Cyperus retrorsus*	
Tropical flatsedge	*Cyperus surinamensis*	
Durban crowfootgrass*	*Dactyloctenium aegyptium*	
Eggleaf witchgrass	*Dichanthelium ovale*	
India crabgrass*	*Digitaria longiflora*	
Air-potato*	*Dioscorea bulbifera*	
Baldwin's spikerush; roadgrass	*Eleocharis baldwinii*	
Yellow spikerush; pale spikerush	*Eleocharis flavescens*	
Indian goosegrass*	*Eleusine indica*	
Florida butterfly orchid	*Encyclia tampensis*	23,25,28,39
Golden pothos*	*Epipremnum pinnatum*	
Thalia lovegrass*	*Eragrostis atrovirens*	
Elliott's lovegrass	*Eragrostis elliottii*	
Slimflower lovegrass*	*Eragrostis gangetica*	
Purple lovegrass	*Eragrostis spectabilis*	
Flattened pipewort	*Eriocaulon compressum*	

* Non-Native Species

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Tenangle pipewort	*Eriocaulon decangulare*	
Wild coco	*Eulophia alta*	
Saltmarsh fingergrass	*Eustachys glauca*	
Pinewoods fingergrass	*Eustachys petraea*	
Hurricanegrass	*Fimbristylis cymosa*	
Ditch fimbry*	*Fimbristylis schoenoides*	
Southern umbrellasedge	*Fuirena scirpoidea*	
Toothpetal false reinorchid	*Habenaria floribunda*	
Snowy orchis	*Habenaria nivea*	41,42
Waterthyme*	*Hydrilla verticillata*	
Coastalplain spiderlily	*Hymenocallis crassifolia*	
Fringed yellow stargrass	*Hypoxis juncea*	
Cogongrass*	*Imperata cylindrica*	
Dixie iris; prairie iris	*Iris hexagona*	
Forked rush	*Juncus dichotomus*	
Soft rush	*Juncus effusus* ssp. *solutus*	
Bog rush; Elliott's rush	*Juncus elliottii*	
Shore rush; grassleaf rush	*Juncus marginatus*	
Bighead rush	*Juncus megacephalus*	
Manyhead rush	*Juncus polycephalos*	
Needlepod rush	*Juncus scirpoides*	
Carolina redroot	*Lachnanthes caroliniana*	
Whitehead bogbutton	*Lachnocaulon anceps*	
Southern bogbutton	*Lachnocaulon beyrichianum*	
Catesby's lily; pine lily	*Lilium catesbaei*	8,41,42
American spongeplant; frog's-bit	*Limnobium spongia*	
Common banana*	*Musa* x *paradisiaca*	
Celestial lily; fallflowering ixia	*Nemastylis floridana*	32,33,41
Florida beargrass	*Nolina atopocarpa*	41
Woodsgrass; basketgrass	*Oplismenus hirtellus*	
Goldenclub; neverwet	*Orontium aquaticum*	
Beaked panicum	*Panicum anceps*	
Maidencane	*Panicum hemitomon*	
Guineagrass*	*Panicum maximum*	
Torpedograss*	*Panicum repens*	
Bahiagrass*	*Paspalum notatum* var. *saurae*	
Early paspalum	*Paspalum praecox*	
Water paspalum	*Paspalum repens*	
Thin paspalum	*Paspalum setaceum*	
Vaseygrass *	*Paspalum urvillei*	
Green arrow arum	*Peltandra virginica*	
Elephantgrass; napiergrass*	*Pennisetum purpureum*	
Senegal date palm*	*Phoenix reclinata*	

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Common reed	*Phragmites australis*	
Water-lettuce*	*Pistia stratiotes*	
Pickerelweed	*Pontederia cordata*	
Giant orchid	*Pteroglossaspis ecristata*	13,15,23
Rose natalgrass*	*Rhynchelytrum repens*	
Starrush whitetop	*Rhynchospora colorata*	
Starrush whitetop	*Rhynchospora colorata*	
Fascicled beaksedge	*Rhynchospora fascicularis*	
Pinebarren beaksedge	*Rhynchospora intermedia*	
Narrowfruit horned beaksedge	*Rhynchospora inundata*	
Giant whitetop; sandswamp whitetop	*Rhynchospora latifolia*	
Sandyfield beaksedge	*Rhynchospora megalocarpa*	
Southern beaksedge	*Rhynchospora microcarpa*	
Bunched beaksedge	*Rhynchospora microcephala*	
Shortbeak beaksedge; baldrush	*Rhynchospora nitens*	
Pineland beaksedge	*Rhynchospora perplexa*	
Plumed beaksedge	*Rhynchospora plumosa*	
Fairy beaksedge	*Rhynchospora pusilla*	
Wright's beaksedge	*Rhynchospora wrightiana*	
Cabbage palm	*Sabal palmetto*	
Sugarcane plumegrass	*Saccharum giganteum*	
Leafless beaked ladiestresses	*Sacoila lanceolata* var. *lanceolata*	8,11,81
Indian cupscale*	*Sacciolepis indica*	
Grassy arrowhead	*Sagittaria graminea*	
Bulltongue arrowhead	*Sagittaria lancifolia*	
Water spangles	*Salvinia minima*	
Bowstring hemp*	*Sansevieria hyacinthoides*	
White sunnybell	*Schoenolirion albiflorum*	
Softstem bulrush	*Scirpus tabernaemontani*	
Baldwin's nutrush	*Scleria baldwinii*	
Fringed nutrush	*Scleria ciliata* var. *ciliata*	
Netted nutrush	*Scleria reticularis*	
Tall nutgrass; whip nutrush	*Scleria triglomerata*	
Saw palmetto	*Serenoa repens*	
Yellow bristlegrass; yellow foxtail	*Setaria parviflora*	
Narrowleaf blueeyed grass	*Sisyrinchium angustifolium*	
Annual blueeyed grass*	*Sisyrinchium rosulatum*	
Jeweled blueeyed grass	*Sisyrinchium xerophyllum*	
Earleaf greenbrier	*Smilax auriculata*	
Laurel greenbrier	*Smilax laurifolia*	
Bristly greenbrier	*Smilax tamnoides*	
Lopsided Indiangrass	*Sorghastrum secundum*	
Sand cordgrass	*Spartina bakeri*	

* Non-Native Species

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Lacelip ladiestresses	*Spiranthes laciniata*	29,32,39
Spring ladiestresses	*Spiranthes vernalis*	8,32,33,37,39
Smutgrass*	*Sporobolus indicus*	
Pineywoods dropseed	*Sporobolus junceus*	
St. Augustinegrass*	*Stenotaphrum secundatum*	
Yellow hatpins	*Syngonanthus flavidulus*	
Fivefingers*	*Syngonium angustatum*	
Alligatorflag; fireflag	*Thalia geniculata*	
Cardinal airplant	*Tillandsia fasciculata* var. *densispica*	33,35,39
Potbelly airplant	*Tillandsia paucifolia*	
Ballmoss	*Tillandsia recurvata*	
Southern needleleaf	*Tillandsia setacea*	
Spanish moss	*Tillandsia usneoides*	
Giant airplant	*Tillandsia utriculata*	33,35,39
Purplequeen*	*Tradescantia pallida*	
Moses-in-the-cradle; oysterplant*	*Tradescantia spathacea*	
Eastern gamagrass; Fakahatcheegrass	*Tripsacum dactyloides*	
Southern cattail	*Typha domingensis*	
Broadleaf cattail	*Typha latifolia*	
Paragrass*	*Urochloa mutica*	
Shortleaf yelloweyed grass	*Xyris brevifolia*	
Carolina yelloweyed grass	*Xyris caroliniana*	
Elliott's yelloweyed grass	*Xyris elliottii*	
Spanish bayonet; aloe yucca*	*Yucca aloifolia*	
Adam's needle	*Yucca filamentosa*	
Redmargin zephyrlily	*Zephyranthes simpsonii*	41,42
Soldier's orchid; lawn orchid*	*Zeuxine strateumatica*	
Crowpoison; Osceola's plume	*Zigadenus densus*	
Corn; maize*	*Zea mays*	
	DICOTS	
Rosary pea*	*Abrus precatorius*	
Sweet acacia	*Acacia farnesiana*	
Pineland acacia	*Acacia pinetorum*	
Red maple	*Acer rubrum*	
Shyleaf	*Aeschynomene americana*	
Indian jointvetch*	*Aeschynomene indica*	
Purple false foxglove	*Agalinis purpurea*	
Hammock snakeroot	*Ageratina jucunda*	
Golden trumpet*	*Allamanda cathartica*	

* Non-Native Species

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Alligatorweed*	*Alternanthera philoxeroides*	
Sessile joyweed*	*Alternanthera sessilis*	
Spiny amaranth*	*Amaranthus spinosus*	
Common ragweed	*Ambrosia artemisiifolia*	
Bastard indigobush; False indigobush	*Amorpha fruticosa*	
Peppervine	*Ampelopsis arborea*	
Pond apple	*Annona glabra*	
Groundnut	*Apios americana*	
Marlberry	*Ardisia escallonioides*	
Florida Indian plantain	*Arnoglossum floridanum*	
Ovateleaf Indian plantain	*Arnoglossum ovatum*	
Scarlet milkweed; bloodflower*	*Asclepias curassavica*	
Curtiss' milkweed	*Asclepias curtissii*	14
Florida milkweed	*Asclepias feayi*	
Swamp milkweed	*Asclepias incarnata*	
Fewflower milkweed	*Asclepias lanceolata*	
Savannah milkweed	*Asclepias pedicellata*	
Velvetleaf milkweed	*Asclepias tomentosa*	
Netted pawpaw	*Asimina reticulata*	
Climbing aster	*Aster carolinianus*	
Whitetop aster; pinebarren aster	*Aster reticulatus*	
Annual saltmarsh aster	*Aster subulatus*	
Whitetop aster; Dixie aster	*Aster tortifolius*	
Black mangrove	*Avicennia germinans*	
Silverling	*Baccharis glomeruliflora*	
Groundsel tree; sea myrtle	*Baccharis halimifolia*	
Lemon bacopa; blue waterhyssop	*Bacopa caroliniana*	
Herb-of-grace	*Bacopa monnieri*	
Coastalplain honeycombhead	*Balduina angustifolia*	
Tarflower	*Bejaria racemosa*	
Alabama supplejack; rattan vine	*Berchemia scandens*	
Beggarticks; romerillo	*Bidens alba*	
Burrmarigold; smooth beggarticks	*Bidens laevis*	
Smallfruit beggarticks	*Bidens mitis*	
Pineland rayless goldenrod	*Bigelowia nudata* ssp. *australis*	
False nettle; bog hemp	*Boehmeria cylindrica*	
Bushy seaside oxeye	*Borrichia frutescens*	
American bluehearts	*Buchnera americana*	
American beautyberry	*Callicarpa americana*	
Papaya*	*Carica papaya*	
Pineland chaffhead	*Carphephorus carnosus*	
Coastalplain chaffhead	*Carphephorus corymbosus*	

* Non-Native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Vanillaleaf	*Carphephorus odoratissimus*	
Hairy chaffhead	*Carphephorus paniculatus*	
Water hickory	*Carya aquatica*	
Scrub hickory	*Carya floridana*	
Pignut hickory	*Carya glabra*	
Love vine; devil's gut	*Cassytha filiformis*	
River sheoak*	*Casuarina cunninghamiana*	
Australian-pine*	*Casuarina equisetifolia*	
Gray sheoak*	*Casuarina glauca*	
Madagascar periwinkle *	*Catharanthus roseus*	
Sugarberry; hackberry	*Celtis laevigata*	
Spadeleaf	*Centella asiatica*	
Spurred butterfly pea	*Centrosema virginianum*	
Common buttonbush	*Cephalanthus occidentalis*	
Florida rosemary; sand heath	*Ceratiola ericoides*	
Partridge pea	*Chamaechrista fasciculata*	
Sensitive pea	*Chamaecrista nictitans*	
Pillpod sandmat	*Chamaesyce hirta*	
Hyssopleaf sandmat	*Chamaesyce hyssopifolia*	
Spotted sandmat	*Chamaesyce maculata*	
Gulf sandmat	*Chamaesyce thymifolia*	
Woolly sonbonnets; pineland daisy	*Chaptalia tomentosa*	
Mexican tea*	*Chenopodium ambrosioides*	
Coastalplain goldenaster	*Chrysopsis scabrella*	
Scrubland goldenaster	*Chrysopsis subulata*	
Spotted water hemlock	*Cicuta maculata*	
Camphortree *	*Cinnamomum camphora*	
Yellow thistle	*Cirsium horridulum*	
Nuttall's thistle	*Cirsium nuttallii*	
Citron*	*Citrullus lanatus*	
Sour orange *	*Citrus aurantium*	
Tangerine *	*Citrus reticulata*	
Sweet orange *	*Citrus sinensis*	
Grapefruit *	*Citrus* x *paradisi*	
Pine-hyacinth	*Clematis baldwinii*	
Tread-softly; finger-rot	*Cnidoscolus stimulosus*	
Blue mistflower	*Conoclinium coelestinum*	
Large-flowered rosemary	*Conradina grandiflora*	14
Canadian horseweed	*Conyza canadensis* var. *pusilla*	
Florida tickseed	*Coreopsis floridana*	
Leavenworth's tickseed	*Coreopsis leavenworthii*	
Swamp dogwood; stiff dogwood	*Cornus foemina*	
Lanceleaf rattlebox*	*Crotalaria lanceolata*	

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Smooth rattlebox*	*Crotalaria pallida* var. *obovata*	
Rabbitbells	*Crotalaria rotundifolia*	
Showy rattlebox*	*Crotalaria spectabilis*	
Vente conmigo	*Croton glandulosus*	
Colombian waxweed	*Cuphea carthagenensis*	
Marsh parsley *	*Cyclospermum leptophyllum*	
Leafless swallowwort	*Cynanchum scoparium*	
Coinvine	*Dalbergia ecastophyllum*	
Whitetassels	*Dalea carnea*	
Feay's prairieclover	*Dalea feayi*	
Summer farewell	*Dalea pinnata* var. *adenopoda*	
Ticktrefoil	*Desmodium incanum*	
Panicledleaf ticktrefoil	*Desmodium paniculatum*	
Threeflower ticktrefoil*	*Desmodium triflorum*	
Carolina ponysfoot	*Dichondra caroliniensis*	
Poor joe; rough buttonweed	*Diodia teres*	
Virginia buttonweed	*Diodia virginiana*	
Common persimmon	*Diospyros virginiana*	
Pink sundew	*Drosera capillaris*	
Water sundew; spoonleaf sundew	*Drosera intermedia*	29,30
Oblongleaf twinflower	*Dyschoriste oblongifolia*	
Devil's potato; rubber vine	*Echites umbellata*	
False daisy	*Eclipta prostrata*	
Tall elephantsfoot	*Elephantopus elatus*	
Florida tasselflower*	*Emilia fosbergii*	
Lilac tasselflower*	*Emilia sonchifolia*	
American burnweed; fireweed	*Erechtites hieracifolia*	
Oakleaf fleabane	*Erigeron quercifolius*	
Prairie fleabane	*Erigeron strigosus*	
Early whitetop fleabane	*Erigeron vernus*	
Loquat*	*Eriobotrya japonica*	
Fragrant eryngo	*Eryngium aromaticum*	
Baldwin's eryngo	*Eryngium baldwinii*	
Button rattlesnakemaster	*Eryngium yuccifolium*	
Coralbean; Cherokee bean	*Erythrina herbacea*	
White stopper	*Eugenia axillaris*	
Spanish stopper; boxleaf stopper	*Eugenia foetida*	
Surinam cherry*	*Eugenia uniflora*	
Dogfennel	*Eupatorium capillifolium*	
Mohr's thoroughwort	*Eupatorium mohrii*	
Roundleaf thoroughwort	*Eupatorium rotundifolium*	
Lateflowering thoroughwort	*Eupatorium serotinum*	
Lesser Florida spurge	*Euphorbia polyphylla*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Slender goldenrod	*Euthamia caroliniana*	
Silver dwarf morningglory	*Evolvulus sericeus*	
Strangler fig; golden fig	*Ficus aurea*	
Weeping fig*	*Ficus benjamina*	
Florida swampprivet	*Forestiera segregata*	
Elliott's milkpea	*Galactia elliottii*	
Eastern milkpea	*Galactia regularis*	
Downy milkpea	*Galactia volubilis*	
Coastal bedstraw	*Galium hispidulum*	
Stiff marsh bedstraw	*Galium tinctorium*	
Garberia	*Garberia heterophylla*	14,15
Southern beeblossom	*Gaura angustifolia*	
Dwarf huckleberry	*Gaylussacia dumosa*	
Carolina cranesbill	*Geranium carolinianum*	
Narrowleaf purple everlasting	*Gnaphalium falcatum*	
Sweet everlasting; rabbit tobacco	*Gnaphalium obtusifolium*	
Pennsylvania everlasting	*Gnaphalium pensylvanicum*	
Spoonleaf purple everlasting	*Gnaphalium purpureum*	
Globe amaranth *	*Gomphrena serrata*	
Loblolly bay	*Gordonia lasianthus*	
Rough hedgehyssop	*Gratiola hispida*	
Shaggy hedgehyssop	*Gratiola pilosa*	
English ivy*	*Hedera helix*	
Spanish daisy; bitterweed	*Helenium amarum*	
Southeastern sneezeweed	*Helenium pinnatifidum*	
Pinebarren frostweed	*Helianthemum corymbosum*	
Florida scrub frostweed	*Helianthemum nashii*	
Common sunflower*	*Helianthus annuus*	
Florida sunflower	*Helianthus floridanus*	
Stiff sunflower	*Helianthus radula*	
Pineland heliotrope	*Heliotropium polyphyllum*	
Limpograss*	*Hemarthria altissima*	
Swamp rosemallow	*Hibiscus grandiflorus*	
Rosemallow*	*Hibiscus rosa-sinensis* var. *rosa-sinensis*	
Queen-devil	*Hieracium gronovii*	
Coastalplain hawkweed	*Hieracium megacephalon*	
Manyflower marshpennywort	*Hydrocotyle umbellata*	
Skyflower	*Hydrolea corymbosa*	
Coastalplain St. John's-wort	*Hypericum brachyphyllum*	
Roundpod St. John's-wort	*Hypericum cistifolium*	
Sandweed; peelbark St. John's-wort	*Hypericum fasciculatum*	
Pineweeds; orangegrass	*Hypericum gentianoides*	
St. Andrew's-cross	*Hypericum hypericoides*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Dwarf St. John's-wort	*Hypericum mutilum*	
Atlantic St. John's-wort	*Hypericum reductum*	
Fourpetal St. John's-wort	*Hypericum tetrapetalum*	
Clustered bushmint; musky mint	*Hyptis alata*	
Comb bushmint*	*Hyptis pectinata*	
John Charles*	*Hyptis verticillata*	
Carolina holly; sand holly	*Ilex ambigua* var. *ambigua*	
Dahoon holly	*Ilex cassine*	
Inkberry; gallberry	*Ilex glabra*	
Yaupon	*Ilex vomitoria*	
Hairy indigo*	*Indigofera hirsuta*	
Trailing indigo*	*Indigofera spicata*	
Indigo	*Indigofera suffruticosa*	
Moonflowers	*Ipomoea alba*	
Mile-a-minute vine*	*Ipomoea cairica*	
Tievine	*Ipomoea cordatotriloba*	
Oceanblue morningglory	*Ipomoea indica*	
Man-of-the-earth	*Ipomoea pandurata*	
Saltmarsh morningglory	*Ipomoea sagittata*	
Heavenlyblue morningglory	*Ipomoea violacea*	
Juba's bush	*Iresine diffusa*	
Virginia willow; Virginia sweetspire	*Itea virginica*	
Bigleaf sumpweed	*Iva frutescens*	
Pineland waterwillow	*Justicia angusta*	
Shrimpplant*	*Justicia brandegeana*	
Virginia saltmarsh mallow	*Kosteletzkya virginica*	
Crapemyrtle*	*Lagerstroemia indica*	
White mangrove	*Laguncularia racemosa*	
Lantana; shrubverbena*	*Lantana camara*	
Nodding pinweed	*Lechea cernua*	14
Dickert's pinweed	*Lechea deckertii*	
Drysand pinweed	*Lechea divaricata*	8
Piedmont pinweed	*Lechea torreyi*	
Virginia pepperweed	*Lepidium virginicum*	
Chapman's gayfeather	*Liatris chapmanii*	
Garber's gayfeather	*Liatris garberi*	
Slender gayfeather	*Liatris gracilis*	
Dense gayfeather	*Liatris spicata*	
Shortleaf gayfeather	*Liatris tenuifolia* var. *quadriflora*	
Gopher apple	*Licania michauxii*	
Glossy privet*	*Ligustrum lucidum*	
Canada toadflax	*Linaria canadensis*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Apalachicola toadflax	*Linaria floridana*	
Savannah false pimpernel	*Lindernia grandiflora*	
Florida yellow flax	*Linum floridanum*	
Bay lobelia	*Lobelia feayana*	
Glade lobelia	*Lobelia glandulosa*	
White lobelia	*Lobelia paludosa*	
Winged primrosewillow	*Ludwigia alata*	
Seedbox	*Ludwigia alternifolia*	
Piedmont primrosewillow	*Ludwigia arcuata*	
Southeastern primrosewillow	*Ludwigia linifolia*	
Seaside primrosewillow	*Ludwigia maritima*	
Mexican primrosewillow	*Ludwigia octovalvis*	
Peruvian primrosewillow*	*Ludwigia peruviana*	
Creeping primrosewillow	*Ludwigia repens*	
Shrubby primrosewillow	*Ludwigia suffruticosa*	
Skyblue lupine	*Lupinus diffusus*	
Rose-rush	*Lygodesmia aphylla*	
Rusty staggerbush	*Lyonia ferruginea*	
Coastalplain staggerbush	*Lyonia fruticosa*	
Fetterbush	*Lyonia lucida*	
Loosestrife	*Lythrum alatum* var. *lanceolatum*	
Wild bushbean*	*Macroptilium lathyroides*	
Southern magnolia	*Magnolia grandiflora*	
Grassleaf Barbara's buttons	*Marshallia tenuifolia*	
Florida milkvine	*Matelea floridana*	11,23
Axilflower	*Mecardonia acuminata*	
Black medick*	*Medicago lupulina*	
Punktree*	*Melaleuca quinquenervia*	
Chinaberrytree*	*Melia azedarach*	
White sweetclover *	*Melilotus albus*	
Chocolateweed*	*Melochia corchorifolia*	
Creeping cucumber	*Melothria pendula*	
Florida keys hempvine	*Mikania cordifolia*	
Climbing hempvine	*Mikania scandens*	
Sensitive brier	*Mimosa quadrivalvis* var. *angustata*	
Partridgeberry; twinberry	*Mitchella repens*	
Lax hornpod	*Mitreola petiolata*	
Swamp hornpod	*Mitreola sessilifolia*	
Balsampear*	*Momordica charantia*	
Indianpipe	*Monotropa uniflora*	
Latexplant*	*Morrenia odorata*	
White mulberry*	*Morus alba*	
Red mulberry	*Morus rubra*	

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Twinberry	*Myrcianthes fragrans*	11
Southern bayberry; wax myrtle	*Myrica cerifera*	
Spatterdock; yellow pondlily	*Nuphar lutea*	
Cape blue waterlily*	*Nymphaea capensis* var. *zanzibariensis*	
American white waterlily	*Nymphaea odorata*	
Big floatingheart	*Nymphoides aquatica*	
Swamp tupelo	*Nyssa sylvatica* var. *biflora*	
Cutleaf eveningprimrose	*Oenothera laciniata*	
Flattop mille graines*	*Oldenlandia corymbosa*	
Innocence; roundleaf bluet	*Oldenlandia procumbens*	
Clustered mille graine	*Oldenlandia uniflora*	
Pricklypear	*Opuntia humifusa*	
Erect pricklypear	*Opuntia stricta*	11,23
Scrub wild olive	*Osmanthus megacarpus*	
Common yellow woodsorrel	*Oxalis corniculata*	
Pink woodsorrel*	*Oxalis debilis* var. *corymbosa*	
Water cowbane	*Oxypolis filiformis*	
Feay's palafox	*Palafoxia feayi*	
Florida pellitory	*Parietaria floridana*	
Jerusalem thorn*	*Parkinsonia aculeata*	
Virginia creeper; woodbine	*Parthenocissus quinquefolia*	
Corkystem passionflower	*Passiflora suberosa*	
Avocado*	*Persea americana*	
Red bay	*Persea borbonia* var. *borbonia*	
Swamp bay	*Persea palustris*	
Florida false sunflower	*Phoebanthus grandiflorus*	
Oak mistletoe	*Phoradendron leucarpum*	
Turkey tangle fogfruit; capeweed	*Phyla nodiflora*	
Mascarene island leafflower*	*Phyllanthus tenellus*	
Cutleaf groundcherry	*Physalis angulata*	
American pokeweed	*Phytolacca americana*	
Wild pennyroyal	*Piloblephis rigida*	
Blueflower butterwort	*Pinguicula caerulea*	37,41,42
Yellow butterwort	*Pinguicula lutea*	37,41,42
Small butterwort	*Pinguicula pumila*	
Pitted stripeseed	*Piriqueta caroliniana*	
Narrowleaf silkgrass	*Pityopsis graminifolia*	
Virginia plantain; southern plantain	*Plantago virginica*	
Stinking camphorweed	*Pluchea foetida*	
Sweetscent	*Pluchea odorata*	
Rosy camphorweed	*Pluchea rosea*	
Paintedleaf; fire-on-the-mountain	*Poinsettia cyathophora*	
Baldwin's milkwort	*Polygala balduinii*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Drumheads	*Polygala cruciata*	
Tall pinebarren milkwort	*Polygala cymosa*	
Showy milkwort	*Polygala grandiflora*	
Procession flower	*Polygala incarnata*	
Orange milkwort	*Polygala lutea*	
Candyroot	*Polygala nana*	
Racemed milkwort	*Polygala polygama*	
Low pinebarren milkwort	*Polygala ramosa*	
Yellow milkwort	*Polygala rugelii*	
Coastalplain milkwort	*Polygala setacea*	
Hairy jointweed	*Polygonella ciliata*	
Tall jointweed	*Polygonella gracilis*	
October flower	*Polygonella polygama*	
Dotted smartweed	*Polygonum punctatum*	
Rustweed; juniperleaf	*Polypremum procumbens*	
Paraguayan purslane*	*Portulaca amilis*	
Pink purslane; kiss-me-quick	*Portulaca pilosa*	
Combleaf mermaidweed	*Proserpinaca pectinata*	
Carolina laurelcherry	*Prunus caroliniana*	
Strawberry guava*	*Psidium cattleianum*	
Guava*	*Psidium guajava*	
Wild coffee	*Psychotria nervosa*	
Shortleaf wild coffee	*Psychotria sulzneri*	
Blackroot	*Pterocaulon pycnostachyum*	
Mock bishopsweed; herbwilliam	*Ptilimnium capillaceum*	
Carolina desertchicory	*Pyrrhopappus carolinianus*	
Chapman's oak	*Quercus chapmanii*	
Sand live oak	*Quercus geminata*	
Bluejack oak	*Quercus incana*	
Turkey oak	*Quercus laevis*	
Laurel oak; diamond oak	*Quercus laurifolia*	
Dwarf live oak	*Quercus minima*	
Myrtle oak	*Quercus myrtifolia*	
Water oak	*Quercus nigra*	
Running oak	*Quercus pumila*	
Virginia live oak	*Quercus virginiana*	
Myrsine; colicwood	*Rapanea punctata*	
Rubbervine; mangrovevine	*Rhabdadenia biflora*	
West Indian meadowbeauty	*Rhexia cubensis*	
Pale meadowbeauty	*Rhexia mariana*	
Maid marian	*Rhexia nashii*	
Red mangrove	*Rhizophora mangle*	
Winged sumac	*Rhus copallinum*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Tropical Mexican clover*	*Richardia brasiliensis*	
Rough Mexican clover*	*Richardia scabra*	
Castorbean *	*Ricinus communis*	
Rougeplant	*Rivina humilis*	
Sand blackberry	*Rubus cuneifolius*	
Southern dewberry	*Rubus trivialis*	
Blackeyed Susan	*Rudbeckia hirta*	
Carolina wild petunia	*Ruellia caroliniensis*	
Britton's wild petunia*	*Ruellia tweediana*	
Swamp dock	*Rumex verticillatus*	
Bartram's rosegentian	*Sabatia bartramii*	
Shortleaf rosegentian	*Sabatia brevifolia*	
Coastal rosegentian	*Sabatia calycina*	
Largeflower rosegentian	*Sabatia grandiflora*	
Carolina willow; coastalplain willow	*Salix caroliniana*	
Lyreleaf sage	*Salvia lyrata*	
American elder; elderberry	*Sambucus nigra*	
Water pimpernel	*Samolus ebracteatus*	
Pineland pimpernel	*Samolus valerandi* ssp. *parviflorus*	
Popcorntree; Chinese tallowtree*	*Sapium sebiferum*	
White twinevine	*Sarcostemma clausum*	
Hooded pitcherplant	*Sarracenia minor*	30,41
Lizard's tail	*Saururus cernuus*	
Australian umbrella tree*	*Schefflera actinophylla*	
Brazilian pepper *	*Schinus terebinthifolius*	
Sweetbroom; licoriceweed	*Scoparia dulcis*	
Butterweed	*Senecio glabellus*	
Coffeeweed; sicklepod	*Senna obtusifolia*	
Danglepod	*Sesbania herbacea*	
Rattlebox*	*Sesbania punicea*	
Bladderpod; bagpod	*Sesbania vesicaria*	
Piedmont blacksenna	*Seymeria pectinata*	
Common wireweed; common fanpetals	*Sida acuta*	
Lima*	*Sida cordifolia*	
Cuban jute; Indian hemp	*Sida rhombifolia*	
Gum bully	*Sideroxylon lanuginosum*	
Florida bully	*Sideroxylon reclinatum* ssp. *reclinatum*	
Tough bully	*Sideroxylon tenax*	
American black nightshade	*Solanum americanum*	
Soda apple; cockroachberry	*Solanum capsicoides*	
Twoleaf nightshade*	*Solanum diphyllum*	
Tropical soda apple*	*Solanum viarum*	

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Chapman's goldenrod	*Solidago odora* var. *chapmanii*	
Wand goldenrod	*Solidago stricta*	
Spiny sowthistle*	*Sonchus asper*	
Common sowthistle*	*Sonchus oleraceus*	
Woodland false buttonweed	*Spermacoce assurgens*	
Prostrate false buttonweed	*Spermacoce prostrata*	
Creeping oxeye*	*Sphagneticola trilobata*	
Common chickweed*	*Stellaria media*	
Sweet shaggytuft	*Stenandrium dulce*	
Water toothleaf; corkwood	*Stillingia aquatica*	
Queensdelight	*Stillingia sylvatica*	
Pineland scalypink	*Stipulicida setacea*	
Eastern poison ivy	*Toxicodendron radicans*	
Virginia marsh St. John's-wort	*Triadenum virginicum*	
Forked bluecurls	*Trichostema dichotomum*	
Coatbuttons*	*Tridax procumbens*	
White clover; Dutch clover*	*Trifolium repens*	
American elm; Florida elm	*Ulmus americana*	
Caesarweed	*Urena lobata*	
Humped bladderwort	*Utricularia gibba*	
Floating bladderwort	*Utricularia inflata*	
Eastern purple bladderwort	*Utricularia purpurea*	
Little floating bladderwort	*Utricularia radiata*	
Zigzag bladderwort	*Utricularia subulata*	
Highbush blueberry	*Vaccinium corymbosum*	
Darrow's blueberry	*Vaccinium darrowii*	
Shiny blueberry	*Vaccinium myrsinites*	
Deerberry	*Vaccinium stamineum*	
Purpletop vervain*	*Verbena bonariensis*	
White crownbeard; frostweed	*Verbesina virginica*	
Giant ironweed	*Vernonia gigantea*	
Walter's viburnum	*Viburnum obovatum*	
Fourleaf vetch	*Vicia acutifolia*	
Hairypod cowpea	*Vigna luteola*	
Bog white violet	*Viola lanceolata*	
Early blue violet	*Viola palmata*	
Common blue violet	*Viola sororia*	
Summer grape	*Vitis aestivalis*	
Muscadine	*Vitis rotundifolia*	
Tallow wood; hog plum	*Ximenia americana*	
Oriental false hawksbeard*	*Youngia japonica*	
Hercules'-club	*Zanthoxylum clava-herculis*	

St. Sebastian River Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)

* Non-Native Species

St. Sebastian River Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
	INVERTEBRATES	
Molluscs		
Channeled apple snail*	*Pomacea canaliculata*	water
Crustaceans		
Crab	*Callinectes ornatus*	53
Blue crab	*Callinectes sapidus*	53
Brown shrimp	*Farfantepenaeus aztecus*	53
Pink shrimp	*Farfantepenaeus duorarum*	53
White shrimp	*Litopenaeus setiferus*	53
	FISH	
Lined sole	*Achirus lineatus*	53
Mountain mullet	*Agonostomus monticola*	53
Striped anchovy	*Anchoa hepsetus*	53
Bay anchovy	*Anchoa mitchilli*	53
Bowfin	*Amia calva*	53
Sheepshead	*Archosargus probatocephalus*	53
Sea catfish	*Arius felis*	53
Silver perch	*Bairdiella chrysoura*	53
Frillfin goby	*Bathyogobius soporator*	53
Menhaden	*Brevoortia* spp.	53
Crevalle jack	*Caranx hippos*	53
Horse-eye jack	*Caranx latus*	53
Swordspine snook	*Centropomus ensiferus*	53
Fat snook	*Centropomus parallelus*	53
Tarpon snook	*Centropomus pectinatus*	53
Snook	*Centropomus undecimalis*	53
Atlantic spadefish	*Chaetodipterus faber*	53
Florida blenny	*Chasmodes saburrae*	53
Bay whiff	*Citharichthys spilopterus*	53
Walking catfish*	*Clarias batrachus*	53
Spotted seatrout	*Cynoscion nebulosus*	53
Sheepshead minnow	*Cyprinodon variegatus*	53
Atlantic stingray	*Dasyatis sabina*	53
Bluntnose stingray	*Dasyatis say*	53
Irish pompano	*Diapterus auratus*	53
Striped mojarra	*Diapterus plumieri*	53
Fat sleeper	*Dormitator maculatus*	53
Gizzard shad	*Dorosoma cepedianum*	53
Threadfin shad	*Dorosoma petenense*	53

* Non-Native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Spinycheek sleeper	*Eleotris pisonis*	53
Ladyfish	*Elops saurus*	53
Chain pickerel	*Esox niger*	53
Swamp darter	*Etheostoma fusiforme*	53
Silver jenny	*Eucinostomus gula*	53
Tidewater mojarra	*Eucinostomus harengulus*	53
Slender mojarra	*Eucinostomus jonesi*	53
Mojarra	*Eucinostomus* spp.	53
Lyre goby	*Evorthodus lyricus*	53
Eastern mosquitofish	*Gambusia holbrooki*	53
Yellowfin mojarra	*Gerres cinereus*	53
Bigmouth sleeper	*Gobiomorus dormitory*	53
Darter goby	*Gobionellus boleosoma*	53
Highfin goby	*Gobionellus oceanicus*	53
Slashcheek goby	*Gobionellus pseudofasciatus*	53
Freshwater goby	*Gobionellus shufeldti*	53
Marked goby	*Gibionellus stigmaticus*	53
Naked goby	*Gobiosoma bosc*	53
Code goby	*Gobiosoma robustum*	53
Scaled sardine	*Harengula jaguana*	53
Least killifish	*Heterandria formosa*	53
Brown hoplo*	*Hoplosternum littorale*	53
Suckermouth catfish	*Hypostomus plecostomus*	53
Flagfish	*Jordanella floridae*	53
Brook silversides	*Labidesthes sicculus*	53
Pinfish	*Lagodon rhomboides*	53
Spot	*Leiostomus xanthurus*	53
Longnose gar	*Lepisosteus osseus*	53
Florida gar	*Lepisosteus platyrhincus*	53
Sunfish	*Lepomis auritus*	53
Warmouth	*Lepomis gulosus*	53
Bluegill	*Lepomis macrochirus*	53
Dollar sunfish	*Lepomis marginatus*	53
Redear sunfish	*Lepomis microlophus*	53
Spotted sunfish	*Lepomis punctatus*	53
Crested goby	*Lophogobius cyprinoides*	53
Bluefin killifish	*Lucania goodei*	53
Rainwater killifish	*Lucania parva*	53
Snapper	*Lutjanus apodus*	53
Gray snapper	*Lutjanus griseus*	53
Tarpon	*Megalops atlanticus*	53
Silverside	*Menidia* spp.	53
Clown goby	*Microgobius gulosus*	53

St. Sebastian River Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Opossum pipefish	*Microphis brachyurus*	53
Atlantic croaker	*Micropogonias undulatus*	53
Largemouth bass	*Micropterus salmoides*	53
Planehead filefish	*Monacanthus hispidus*	53
Striped mullet	*Mugil cephalus*	53
White mullet	*Mugil curema*	53
Taillight shiner	*Notropis maculatus*	53
Coastal shiner	*Notropis petersoni*	53
Leatherjack	*Oligoplites saurus*	53
Atlantic thread-herring	*Opisthonema oglinum*	53
Pigfish	*Orthopristis chrysoptera*	53
Southern flounder	*Paralichthys lethostigma*	53
Sailfin molly	*Poecilia latipinna*	53
Blackdrum	*Pogonias cromis*	53
Burro grunt	*Pomadasys crocro*	53
Bluefish	*Pomatomus saltatrix*	53
Red drum	*Sciaenops ocellatus*	53
Lookdown	*Selene vomer*	53
Southern puffer	*Sphoeroides nephalus*	53
Checkered puffer	*Sphoeroides testudineus*	53
Great barracuda	*Sphyraena barracuda*	53
Atlantic needlefish	*Strongylura marina*	53
Redfin needlefish	*Strongylura notata*	53
Timucu	*Strongylura timucu*	53
Chain pipefish	*Syngnathus louisianae*	53
Gulf pipefish	*Syngnathus scovelli*	53
Inshore lizardfish	*Synodus foetens*	53
Spotted tilapia*	*Tilapia mariae*	53
Blackchin tilapia*	*Tilapia melanotheron*	53
Hogchoker	*Trinectes maculatus*	53
	AMPHIBIANS	
Salamanders		
Two-toed amphiuma	*Amphiuma means means*	25,26,29,35,37,53
Frogs and Toads		
Florida cricket frog	*Acris gryllus dorsalis*	29,32
Oak toad	*Bufo quercicus*	13,14,15,29,32
Southern toad	*Bufo terrestris*	MTC
Greenhouse frog*	*Eleutherodactylus planirostris*	MTC
Eastern narrow-mouthed toad	*Gastrophryne carolinensis*	MTC
Green treefrog	*Hyla cinerea*	MTC

* Non-Native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Pinewoods treefrog	*Hyla femoralis*	8,15,41,42
Barking treefrog	*Hyla gratiosa*	11,23,35
Squirrel treefrog	*Hyla squirella*	MTC
Cuban treefrog*	*Osteopilus septentrionalis*	81,82
Southern chorus frog	*Pseudacris nigrita verrucosa*	8,14,15,41
Little grass frog	*Pseudocris ocularis*	8,14,15,41
Florida gopher frog	*Rana capito aesopus*	8,14,15,29,41
Pig frog	*Rana grylio*	water
Southern leopard frog	*Rana utriculata*	MTC
Eastern spadefoot toad	*Scaphiopus holbrooki holbrooki*	8,14,15,29,33
	REPTILES	
Crocodilians		
American alligator	*Alligator mississippiensis*	33,53
Turtles		
Florida softshell turtle	*Apalone ferox*	53
Florida snapping turtle	*Chelydra serpentina osceola*	53
Florida chicken turtle	*Deirochelys reticularia chrysea*	30,53
Gopher tortoise	*Gopherus polyphemus*	8,13,14,15,41,81
Striped mud turtle	*Kinosternon baurii palmarum*	33,53
Florida mud turtle	*Kinosternon subrubrum*	33,53
Peninsula cooter	*Pseudemys floridana peninsularis*	30,53
Florida redbelly turtle	*Pseudemys nelsoni*	30,53
Florida box turtle	*Terrapene carolina bauri*	8,11,15,20,35
Lizards		
Green anole	*Anolis carolinensis*	MTC
Cuban brown anole*	*Anolis sagrei*	81,82
Six-lined racerunner	*Cnemidophorus sexlineatus*	13,14,15
Southeastern five-lined skink	*Eumeces inexpectatus*	11,23,35
Indo-Pacific gecko*	*Hemidactylus garnottii*	81,82
Eastern slender glass lizard	*Ophisaurus attenuatus longicaudus*	MTC
Island glass lizard	*Ophisaurus compressus*	8,14,15,23
Eastern glass lizard	*Ophisaurus ventralis*	MTC
Ground skink	*Scincella lateralis*	11,23,35
Snakes		
Florida cottonmouth	*Agkistrodon piscivorus conanti*	25,28,33,53
Florida scarlet snake	*Cemophora coccinea coccinea*	11,36
Southern black racer	*Coluber constrictor priapus*	MTC
Eastern diamondback rattlesnake	*Crotalus adamanteus*	8,11,13,14,15

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Southern ringneck snake	*Diadophis punctatus punctatus*	MTC
Eastern indigo snake	*Drymarchon corais couperi*	8,11,13,14,15
Corn snake	*Elaphe guttata guttata*	MTC
Yellow rat snake	*Elaphe obsoleta quadrivittata*	MTC
Striped swamp snake	*Regina alleni*	30,32,39,42
Eastern coachwhip	*Masticophis flagellum flagellum*	13,14,15,20
Eastern coral snake	*Micrurus fulvius fulvius*	13,14,15,20
Florida water snake	*Nerodia fasciata pictiventris*	25,28,33,53
Brown water snake	*Nerodia taxispilota*	25,28,33,53
Rough green snake	*Opheodrys aestivus aestvus*	8,15,41
Florida pine snake	*Pituophis melanoleucus mugitus*	8,11,13,14,15
South Florida black swamp snake	*Seminatrix pygaea cyclas*	30,21,29,42
Florida brown snake	*Storeria dekayi victa*	MTC
Peninsula ribbon snake	*Thamnophis sauritus sackenii*	MTC
Eastern garter snake	*Thamnophis sirtalis sirtalis*	MTC
	BIRDS	
Common Loon	*Gavia immer*	OF
Pied-billed Grebe	*Podilymbus podiceps*	25,30,32,33,39,53
American White Pelican	*Pelecanus erythrorhynchos*	water
Brown Pelican	*Pelecanus occidentalis*	water
Magnificent Frigatebird	*Frigata magnificens*	OF
Double-crested Cormorant	*Phalocrocorax auritus*	25,30,33,39,53,64
Anhinga	*Anhinga anhinga*	25,30,33,39,53,64
Great Egret	*Ardea alba*	MTC
Great Blue Heron	*Ardea herodias*	MTC
American Bittern	*Botaurus lentiginosus*	29,30,32,39,42,64
Cattle Egret*	*Bubulcus ibis*	MTC
Green Heron	*Butorides virescens*	MTC
Little Blue Heron	*Egretta caerulea*	MTC
Snowy Egret	*Egretta thula*	MTC
Tricolored Heron	*Egretta tricolor*	MTC
Least Bittern	*Ixobrychus exilis*	29,30,32,39,42,53
Yellow-crowned Night-heron	*Nyctanassa violacea*	25,26,30,32,33,64
Black-crowned Night-Heron	*Mycticorax nycticorax*	25,26,30,32,33,64
White Ibis	*Eudocimus albus*	MTC
Glossy Ibis	*Plegadis falcinellus*	25,26,29,30,32,42
Wood Stork	*Mycteria americana*	25,29,32,33,42,64
Roseate Spoonbill	*Platalea ajaja*	64
Northern Pintail	*Anas acuta*	water,29,32,33,64
Northern Shoveler	*Anas clypeata*	water,29,32,33,64
American Green-winged Teal	*Anas crecca*	water,29,32,33,64

* Non-Native Species

St. Sebastian River Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Blue-winged Teal	*Anas discors*	water,29,32,33,64
Mottled Duck	*Anas fulvigula*	water,29,32,53,64
Mallard	*Anas platyrhynchos*	25,26,30,33,42,53
Wood Duck	*Aix sponsa*	25,26,30,33,42,53
Muscovy Duck*	*Cairina moschata*	water
Black-bellied Whistling-duck	*Dendrocygna autumnalis*	29,32,33,42
Hooded Merganser	*Lophodytes cucullatus*	water,26,29,32,53
Cooper's Hawk	*Accipiter cooperii*	MTC
Sharp-shinned Hawk	*Accipiter striatus*	MTC
Red-tailed Hawk	*Buteo jamaicensis*	MTC
Red-shouldered Hawk	*Buteo lineatus*	MTC
Broad-winged Hawk	*Buteo platypterus*	MTC
Crested Caracara	*Caracara cheriway*	81
Northern Harrier	*Circus cyaneus*	MTC
Swallow-tailed Kite	*Elanoides forficatus*	MTC
American Kestrel	*Falco sparverius*	MTC
Merlin	*Falco columbarius*	MTC
Peregrine Falcon	*Falco peregrinus*	MTC
Bald Eagle	*Haliaeetus leucocephalus*	MTC
Osprey	*Pandion haliaetus*	30,32,33,42,64
Snail Kite	*Rostrhamus sociabilis*	29,32,42
Turkey Vulture	*Cathartes aura*	MTC
Black Vulture	*Coragyps atratus*	MTC
Northern Bobwhite	*Colinus virginianus*	8,11,13,15,20,23
Sandhill Crane	*Grus canadensis*	MTC
Florida Sandhill Crane	*Grus canadensis pratensis*	MTC
Wild Turkey	*Meleagris gallopavo*	MTC
Sora	*Porzana carolina*	29,32,33,42,64
King Rail	*Rallus elegans*	29,32,33,42,64
Virginia Rail	*Rallus limicola*	29,32,33,42,64
Florida Clapper Rail	*Rallus longirostris scottii*	29,32,33,42,64
American Coot	*Fulica americana*	water,29,32,33,53
Common Moorhen	*Gallinula chloropus*	water,29,32,33,53
American Oystercatcher	*Haematopus palliatus*	81
Black-necked Stilt	*Himantopus mexicanus*	water,29,32,33,53
Limpkin	*Aramus guarauna*	25,30,32,33,39,53
Spotted Sandpiper	*Actitis macularia*	25,28,33,39,64
Upland Sandpiper	*Bartramia longicauda*	29,32,33,42,64
Pectoral Sandpiper	*Calidris melanotos*	29,32,33,42,64
Least Sandpiper	*Calidris minutilla*	29,32,33,42,64
Semipalmated Sandpiper	*Calidris pusilla*	29,32,33,42,64
Semipalmated Plover	*Charadrius semipalmatus*	81
Killdeer	*Charadrius vociferous*	81,82

* Non-Native Species

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Common Snipe	*Gallinago gallinago*	29,32,42
Long-billed Dowitcher	*Limnodromus scolopaceus*	29,32,42,64
American Woodcock	*Scolopax minor*	28,32,35,37,42,64
Lesser Yellowlegs	*Tringa flavipes*	29,32,42,64
Greater Yellowlegs	*Tringa melanoleuca*	29,32,42,64
Solitary Sandpiper	*Tringa solitaria*	26,28,33,35,42,64
Herring Gull	*Larus argentatus*	OF
Laughing Gull	*Larus atricilla*	OF
Ring-billed Gull	*Larus delawarensis*	OF
Black Skimmer	*Rhynchops niger*	81,OF
Least Tern	*Sterna antillarum*	81,OF
Caspian Tern	*Sterna caspia*	81,OF
Forster's Tern	*Sterna forsteri*	81,OF
Royal Tern	*Sterna maxima*	81,OF
Rock Dove*	*Columba livia*	81
Common Ground-dove	*Columbina passerina*	MTC
Eurasian Collared-dove*	*Streptopelia decaocto*	81
White-winged Dove*	*Zenaida asiatica*	MTC
Mourning Dove	*Zenaida macroura*	MTC
Yellow-billed Cuckoo	*Coccyzus americanus*	MTC
Burrowing Owl	*Athene cunicularia*	81
Great Horned Owl	*Bubo virginianus*	MTC
Eastern Screech Owl	*Otus asio*	MTC
Barred Owl	*Strix varia*	MTC
Barn Owl	*Tyto alba*	MTC
Chuck-will's-willow	*Caprimulgus carolinensis*	MTC
Whip-poor-will	*Caprimulgus vociferous*	MTC
Common Nighthawk	*Chordeiles minor*	OF
Chimney Swift	*Chaetura pelagica*	OF
Ruby-throated Hummingbird	*Archilochus colubris*	MTC
Belted Kingfisher	*Ceryle alcyon*	MTC
Northern Flicker	*Colaptes auratus*	MTC
Pileated Woodpecker	*Dryocopus pileatus*	MTC
Red-bellied Woodpecker	*Melanerpes carolinus*	MTC
Red-headed Woodpecker	*Melanerpes erythrocephalus*	13,14,15,23,82
Red-cockaded Woodpecker	*Picoides borealis*	8
Downy Woodpecker	*Picoides pubescens*	MTC
Hairy Woodpecker	*Picoides villosus*	MTC
Yellow-bellied Sapsucker	*Sphyrapicus varius*	MTC
Eastern Wood-Pewee	*Contopus virens*	8,11,13,14,15,23
Acadian Flycatcher	*Empidonax virescens*	MTC
Great Crested Flycatcher	*Myiarchus crinitus*	MTC
Eastern Phoebe	*Sayornis phoebe*	MTC

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Gray Kingbird	*Tyrannus dominicensis*	35,64,82
Scissor-tailed Flycatcher	*Tyrannus forficatus*	82
Eastern Kingbird	*Tyrannus tyrannus*	20,82
Loggerhead Shrike	*Lanius ludovicianus*	13,82
Yellow-throated Vireo	*Vireo flavifrons*	MTC
White-eyed Vireo	*Vireo griseus*	MTC
Red-eyed Vireo	*Vireo olivaceus*	MTC
Blue-headed Vireo	*Vireo solitarius*	MTC
Florida Scrub-jay	*Aphelocoma coerulescens*	14,15
American Crow	*Corvus brachyrhynchos*	MTC
Fish Crow	*Corvus ossifragus*	MTC
Blue Jay	*Cyanocitta cristata*	MTC
Purple Martin	*Progne subis*	OF
Barn Swallow	*Hirundo rustica*	OF
Cliff Swallow	*Petrochelidon pyrrhonota*	OF
Northern Rough-winged Swallow	*Stelgidopteryx serripennis*	OF
Tree Swallow	*Tachycineta bicolor*	OF
Tufted Titmouse	*Baeolophus bicolor*	MTC
Brown-headed Nuthatch	*Sitta pusilla*	8,13,41
Carolina Wren	*Thryothorus ludovicianus*	MTC
House Wren	*Troglodytes aedon*	MTC
Blue-gray Gnatcatcher	*Polioptila caerulea*	MTC
Ruby-crowned Kinglet	*Regulus calendula*	MTC
Veery	*Catharus fuscescens*	8,20,23
Hermit Thrush	*Catharus guttatus*	20,23,25,26,28
Swainson's Thrush	*Catharus ustulatus*	8,11,20,39
Eastern Bluebird	*Sialia sialis*	8,11,81
American Robin	*Turdus migratorius*	MTC
Marsh Wren	*Cistothorus palustris*	29,32,42
Sedge Wren	*Cistothorus platensis*	29,32,42,64
Gray Catbird	*Dumetella carolinensis*	MTC
Northern Mockingbird	*Mimus polyglottos*	MTC
Brown Thrasher	*Toxostoma rufum*	MTC
Cedar Waxwing	*Bombycilla cedrorum*	MTC
Black-throated Blue Warbler	*Dendroica caerulescens*	MTC
Yellow-rumped Warbler	*Dendroica coronata*	MTC
Prairie Warbler	*Dendroica discolor*	8,11,13,14,15
Yellow-throated Warbler	*Dendroica dominica*	MTC
Blackburnian Warbler	*Dendroica fusca*	MTC
Magnolia Warbler	*Dendroica magnolia*	MTC
Palm Warbler	*Dendroica palmarum*	MTC
Chestnut-sided Warbler	*Dendroica pensylvanica*	MTC
Yellow Warbler	*Dendroica petechia*	25,26,28,33,35,39

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Pine Warbler	*Dendroica pinus*	8,11,13,14,15,41
Blackpoll Warbler	*Dendroica striata*	MTC
Cape May Warbler	*Dendroica tigrina*	MTC
Common Yellowthroat	*Geothlypis trichas*	MTC
Worm-eating Warbler	*Helmitheros vermivorus*	11,13,20,23
Swainson's Warbler	*Limnothlypis swainsonii*	MTC
Black-and-white Warbler	*Mniotilta varia*	MTC
Northern Parula	*Parula americana*	MTC
Prothonotary Warbler	*Protonotaria citrea*	25,30,33,39
Ovenbird	*Seiurus aurocapillus*	MTC
Louisiana Waterthrush	*Seiurus motacilla*	MTC
Northern Waterthrush	*Seiurus noveboracensis*	MTC
American Redstart	*Setophaga ruticilla*	MTC
Orange-crowned Warbler	*Vermivora celata*	11,13,20,23
Golden-winged Warbler	*Vermivora chrysoptera*	MTC
Tennessee Warbler	*Vermivora peregrina*	MTC
Blue-winged Warbler	*Vermivora pinus*	MTC
Hooded Warbler	*Wilsonia citrina*	8,25,41
Scarlet Tanager	*Piranga olivacea*	8,13,20
Summer Tanager	*Piranga rubra*	8,13,20
Bachman's Sparrow	*Aimophila aestivalis*	8,15,41
Grasshopper Sparrow	*Ammodramus savannarum*	81
Lark Sparrow	*Chondestes grammacus*	81
Swamp Sparrow	*Melospiza georgiana*	MTC
Song Sparrow	*Melospiza melodia*	8,11,13,14,15,20
Savannah Sparrow	*Passerculus sandwichensis*	81
Eastern Towhee	*Pipilo erythrophthalmus*	8,11,14,15
Vesper Sparrow	*Pooecetes gramineus*	8,15,81
Clay-colored Sparrow	*Spizella pallida*	81
Chipping Sparrow	*Spizella passerina*	81
Field Sparrow	*Spizella pusilla*	81
White-throated Sparrow	*Zonotrichia albicollis*	MTC
Red-winged Blackbird	*Agelaius phoeniceus*	29,30,32,35,42,64
Bobolink	*Dolichonyx oryzivorus*	8,29,32,42,41,81
Baltimore Oriole	*Icterus galbula*	MTC
Brown-headed Cowbird *	*Molothrus ater*	MTC
Boat-tailed Grackle	*Quiscalus major*	MTC
Common Grackle	*Quiscalus quiscula*	MTC
Eastern Meadowlark	*Sturnella magna*	11,81
European Starling*	*Sturnella vulgaris*	81
Northern Cardinal	*Cardinalis cardinalis*	MTC
Blue Grosbeak	*Guiraca caerulea*	8,11,81
Painted Bunting	*Passerina ciris*	8,11,13,14,15,20

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Indigo Bunting	*Passerina cyanea*	MTC
Rose-breasted Grosbeak	*Pheucticus ludovicianus*	MTC
American Goldfinch	*Carduelis tristis*	MTC
	MAMMALS	
Domestic cattle*	*Bos taurus*	81
Opossum	*Didelphis virginiana*	MTC
Nine-banded armadillo *	*Dasypus novemcinctus*	MTC
Eastern cottontail	*Sylvilagus floridanus*	8,15
Marsh rabbit	*Sylvilagus palustris*	28,29,32
Southern flying squirrel	*Glaucomys volans*	20
House mouse*	*Mus musculus*	81
Cotton mouse	*Peromyscus gossypinus*	8,13,15,20
Gray squirrel	*Sciurus carolinensis*	MTC
Hispid cotton rat	*Sigmodon hispidus*	8,11,20,41
Florida manatee	*Trichechus manatus latirostris*	water
Coyote*	*Canis latrans*	MTC
Feral cat*	*Felis domesticus*	81,82
Bobcat	*Felis rufus*	MTC
River otter	*Lutra canadensis*	53
Striped skunk	*Mephitis mephitis*	MTC
Raccoon	*Procyon lotor*	MTC
Eastern spotted skunk	*Spilogale putorius*	15,20
Gray fox	*Urocyon cinereoargenteus*	MTC
Atlantic bottle-nosed dolphin	*Tursiops truncatus*	water
Axis deer*	*Axis axis*	MTC
Fallow deer*	*Dama dama*	MTC
White-tailed deer	*Odocoileus virginianus*	MTC
Wild pig *	*Sus scrofa*	MTC

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
43. Coastal Rockland Lake
44. Flatwood/Prairie Lake

Lacustrine--Continued
45. Marsh Lake
46. River Floodplain Lake
47. Sandhill Upland Lake
48. Sinkhole Lake
49. Swamp Lake

Riverine
50. Alluvial Stream
51. Blackwater Stream
52. Seepage Stream
53. Spring-Run Stream

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

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

Subterranean
77. Aquatic Cave
78. Terrestral Cave

Miscellaneous
79. Ruderal
80. Developed

MTC Many Types Of Communities
OF Overflying

Addendum 5—Designated Species List

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

LEGAL STATUS

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

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

St. Sebastian River Preserve State Park

Designated Species—Plants

Common Name/ *Scientific Name*	Designated Species Status FDA	USFWS	FNAI
Curtiss' milkweed *Asclepias curtissii*	E		
Manyflowered grasspink *Calopogon multiflorus*	E		
Large-flowered false rosemary *Conradina grandiflora*	T		G3, S3
Spoonleaf sundew *Drosera intermedia*	T		G5, S3
Florida butterfly orchid *Encyclia tampensis*	CE		
Garberia *Garberia heterophylla*	T		
Snowy orchid *Habenaria nivea*	T		
Nodding pinweed *Lechea cernua*	T		G3, S3
Drysand pinweed *Lechea divaricata*	E		G2, S2
Catesby's lily *Lilium catesbaei*	T		
Nodding club-moss *Lycopodiella cernua*	CE		
Florida milkwine *Matelea floridana*	E		G2, S2
Twinberry *Myrcianthes fragrans*	T		
Celestial lily *Nemastylis floridana*	E		G2, S2
Florida beargrass *Nolina atopocarpa*	T		G3, S3
Hand fern *Ophioglossum palmatum*	E		G4, S2
Erect pricklypear *Opuntia stricta*	T		
Cinnamon fern *Osmunda cinnamomea*	CE		
Royal fern *Osmunda regalis* var. *spectabilis*	CE		
Blueflower butterwort *Pinguicula caerulea*	T		
Yellow butterwort *Pinguicula lutea*	T		
Giant orchid *Pteroglossaspis ecristata*	T		G2, S2

St. Sebastian River Preserve State Park

Designated Species—Plants

Common Name/ *Scientific Name*	**Designated Species Status** FDA	USFWS	FNAI
Leafless beaked orchid *Sacoila lanceolata*	T		
Hooded pitcherplant *Sarracenia minor*	T		
Lacelip ladiestresses *Spiranthes laciniata*	T		
Cardinal airplant *Tillandsia fasciculata* var. *densispica*	E		
Giant airplant *Tillandsia utriculata*	E		
Red-margin zephyr-lily *Zephyranthes simpsonii*	T		G2G3, S2S3

St. Sebastian River Preserve State Park

Designated Species—Animals

Common Name/ *Scientific Name*	Designated Species Status FFWCC	USFWS	FNAI
FISH			
Bigmouth sleeper *Gobiomorus dormitor*			G4, S2
Slashcheek goby *Gobinellus pseudofasciatus*			G3G5, S1
Opossum pipefish *Microphus brachyurus*			G4G5, S2
AMPHIBIANS			
Florida gopher frog *Rana capito*	LS		G3G4, S3
REPTILES			
American alligator *Alligator mississippiensis*	LS	T(S/A)	G5, S4
Eastern diamondback rattlesnake *Crotalus adamanteus*			G4, S3
Eastern indigo snake *Drymarchon corais cooperi*	LT	LT	G4T3, S3
Gopher tortoise *Gopherus polyphemus*	LS		G3, S3
Florida pine snake *Pituophis melanoleucus mugitus*	LS		G4T3?, S3
BIRDS			
Cooper's hawk *Accipiter cooperii*			G5, S3?
Bachman's sparrow *Aimophila aestivalis*			G3, S3
Roseate spoonbill *Platalea ajaja*	LS		G5, S2
Florida scrub-jay *Apheloma coerulescens*	T	T	G2, S2
Limpkin *Aramus guarauna*	LS		G5, S3

St. Sebastian River Preserve State Park

Designated Species—Animals

Common Name/ *Scientific Name*	Designated Species Status FFWCC	USFWS	FNAI
Burrowing owl *Athene cunicularia*	LS		G4T3, S3
Crested caracara *Caracara cheriway*	T	T	G5, S2
Little blue heron *Egretta caerulea*	LS		G5, S4
Snowy egret *Egretta thula*	LS		G5, S3
Tricolored heron *Egretta tricolor*	LS		G5, S4
Swallow-tailed kite *Elanoides forficatus*			G5, S2
White ibis *Eudocimus albus*	LS		G5, S4
Merlin *Falco columbarius*			G5, S2
Peregrine falcon *Falco peregrinus*	E		G4, S2
Magnificent frigatebird *Fregata magnificens*			G5, S1
Florida sandhill crane *Grus canadensis pratensis*	T		G5T2T3, S2S3
American oystercatcher *Haematopus palliatus*	LS		G5, S2
Bald eagle *Haliaeetus leucocephalus*	LT	LT	G4, S3
Worm-eating warbler *Helmitheros vermivorus*			G5, S1
Least bittern *Ixobrychus exilis*			G5, S4
Wood stork *Mycteria americana*	LE	LE	G4, S2
Yellow-crowned night-heron *Nyctanassa violacea*			G5, S3
Black-crowned night-heron *Nycticorax nycticorax*			G5, S3
Osprey *Pandion haliaetus*			G5, S3S4
Painted bunting *Passerina ciris*			G5, S3
Brown pelican *Pelecanus occidentalis*	LS		G4, S3

St. Sebastian River Preserve State Park

Designated Species—Animals

Common Name/ *Scientific Name*	Designated Species Status FFWCC	USFWS	FNAI
Red-cockaded woodpecker *Picoides borealis*	LT	LE	G3, S2
Hairy woodpecker *Picoides villosus*			G5, S3
Florida clapper rail *Rallus longirostris scottii*			G5T3?, S3?
Snail kite *Rostrhamus sociabilis plumbeus*	E	E	G4G5, T2
Black skimmer *Rhynchops niger*	LS		G5, S3
Louisiana waterthrush *Seiurus motacilla*			G5, S2
American redstart *Setophaga ruticilla ruticilla*			G5, S2
Least tern *Sterna antillarum*	T		G4, S3
Caspian tern *Sterna caspia*			G5, S2
Royal tern *Sterna maxima*			G5, S3
MAMMALS			
Florida manatee *Trichechus manatus latirostris*	E	E	G2, S2

St. Sebastian River Preserve State Park

Designated Species—Animals

Common Name/ *Scientific Name*	Designated Species Status FFWCC	USFWS	FNAI

Addendum 6—Timber Management Analysis

Purpose

This document is intended to fulfill the timber assessment requirement for the St. Sebastian River Preserve State Park (SSRPSP) as required by Section 253.036, Florida Statutes. The goal of this *Timber Assessment* is to evaluate the potential and feasibility of utilizing silvicultural techniques in assisting managers in achieving objectives at the St. Sebastian River Preserve State Park.

Forest Resource Background and History

The property that encompasses the St. Sebastian River Preserve State Park is located in northern Indian River and southern Brevard counties. Multiple purchases have joined parcels into an area that includes approximately 21,944 acres, with the first purchase occurring in 1995. The park property is divided roughly north to south by Interstate 95 and east to west by the Fellsmere and C-54 canals along the Indian River/Brevard county line.

Numerous human activities have occurred on and around this property since European settlement of the area. Drainage in this area began in the late 1800's and early 1900's. Canals and ditches were dug to drain the marshes and lowlands. Areas that previously held water long enough to suppress saw palmetto and young pine regeneration were drained which then allowed regeneration to occur in the previously wetter areas. Other areas were cleared for citrus groves and other crops or pasture.

Evidence of past turpentine operations are still present on parts of the park. Some of the old catfaced longleaf pine can be seen on the property. The first known commercial timber harvesting on the property occurred during the 1920's and 1930's. The Graves Brothers Company moved a sawmill, said to handle both pine and cypress, to the area and built railroad tram lines to move the timber to the mill. Their initial purchase of 32,000 acres, which included part of the current park property, was said to contain an estimated 32 million board feet of longleaf pine timber.

Past timber harvests have left much of the area under stocked of mature pines. Some regeneration is occurring where there is an adequate seed source. Prescribed burning techniques and timing may need to be adjusted until the regeneration reaches an age and size that can withstand prescribed fire. A good job has been done by local managers identifying fire management zones on the park.

Cattle grazing has been the dominate activity on the park since the 1930's. Many different landowners and lessees have utilized the property during this time. Most of the prior management activities were geared toward grazing and timber management had not been a major consideration.

Goals and Objectives Related to Timber Management

The St. Sebastian River Preserve State Park is designated as a single use area for conservation with the first acquisition occurring in 1995. Original conservation plans were directed toward the Florida manatee. Protection from adverse development along the shoreline of the St. Sebastian River prompted preservation efforts. After further assessment, numerous rare plant and animal

species and habitats were discovered around the original site. Several other purchases were made and these tracts now make up the St. Sebastian River Preserve State Park.

The following goals and objectives as outlined in the 1999 Unit Management Plan (UMP) for St. Sebastian River Preserve State Park are related to timber management. Other objectives found in the UMP are related to hydrology, recreation, archeological and historical sites, and exotic species control and are not listed here.

1) To conserve, protect, and manage significant habitat for native species, particularly endangered and threatened species.
2) To conserve, protect, and manage natural communities and ecological systems.
3) To maintain or increase populations of listed plants and animals occurring on the buffer preserve.
4) To restore natural communities and original ecosystems functions, to the greatest extent possible.

Natural Communities, Ecological Trends, Timber Resources and Management Options

There are 22 separate natural communities as classified by the Florida Natural Areas Inventory (FNAI) on the St. Sebastian River Preserve State Park. Of these, only 5 will be discussed here along with the ruderal areas as they are, and were the most capable of growing timber species and could benefit from silvicultural treatments.

Wet, Mesic and Scrubby Flatwoods

There are approximately 12,333 acres of wet, mesic, and scrubby flatwoods located on St. Sebastian River Preserve State Park. Wet, mesic, and scrubby flatwoods are discussed together because it is sometimes difficult to discern their boundaries and because the management objectives for them are similar.

Ecological Trends

Much of the wet flatwoods on the Park are in fair to good condition and have a slash pine overstory. Due to drainage on the property, the current 56 acres of wet flatwoods may be only a portion of what was once there. As hydrological restoration continues on the property, more of this ecotype may be restored but some of it may be lost due to increased flooding. The lost portions will probably revert to wet prairie and the gained acreages will come from the mesic flatwoods communities.

Most of the mesic and scrubby flatwoods ecotypes on the park are in fair to good ecological condition as well and include approximately 12,277 acres. Slash and longleaf pine are the primary overstory species. Past land uses have left many of these areas with few quality mature trees and below average stocking for these habitat types. Regeneration is occurring where older, mature seed trees are present. Park management is doing a good job with their prescribed burning frequency to help maintain control of the understory. Areas where slash pine dominates may need the burning frequency, timing, or techniques adjusted to allow more regeneration to occur and increase stocking levels. Longleaf pine regeneration is occurring where adequate seed sources are available as well. Middle aged replacement trees for the older mature trees are few, probably due to past harvests and land uses. Park management should allow for replacement

trees, especially in areas where Red-Cockaded Woodpecker colonies are present. A series of thinnings may be needed to get the age structures and densities preferable for this type of habitat management once adequate stocking is achieved.

Timber Resources

These community types comprise a total of approximately 12,333 acres on the Park and consist of an overstory of mainly slash and longleaf pine. Pine basal areas (BA) are extremely variable and range from <10 -100 sq ft/acre or more where regeneration is occurring.

Management Options

1) No Action. Areas with higher densities of timber will continue to grow but at a much slower rate and become more susceptible to insect, disease and wildfire. Wildlife habitat for some species will decrease as basal areas increase and some ground vegetation is shaded out. The less dense stands will continue to grow and increase in basal area and in time will become overstocked, increasing potential for insect, disease and wildfire. The under stocked areas will eventually regenerate naturally where there is an adequate seed source. Hardwood encroachment could become problematic in areas where fire is infrequent or absent.

2) Prescribed Fire Only. Areas with higher densities of timber will continue to grow but at a much slower rate and become more susceptible to insect, disease and wildfire. Wildlife habitat for some species will decrease, as ground vegetation will continue to be shaded out. The less dense stands will continue to grow and increase in basal area and in time will become over stocked, increasing potential for insect, disease and wildfire. Under stocked stands with slash pine as the primary overstory species will continue to remain under stocked unless burn rotations are adjusted to allow the slash pine regeneration to reach a fire tolerant age and size. The flatwoods areas which contain longleaf pine will do the best since longleaf pine is a more fire tolerant species.

3) Timber Management Emphasis – There may be certain areas within the Park that could be managed for timber revenue. This option will be discussed briefly because managing exclusively for timber would conflict with objectives found in the St. Sebastian River Preserve State Park UMP. It is included here only to advise of the alternatives available for management. It is not expected or recommended that the natural pine communities be managed in this manner except on a small scale. Consideration must also be made in areas where endangered species are present.

These stands will need to be thinned when live crowns in the majority of the dominant and co-dominant trees have been reduced to approximately 1/3 of their total height. This will help ensure a healthy stand of trees. These stands should be thinned back to 60 – 80 sq. ft. BA per acre each time they reach 100 sq. ft. BA per acre or more. An added benefit of opening the canopy is that more sunlight will reach the forest floor increasing forage production for wildlife. Once the stand has reached maturity, it can be harvested and planted or naturally regenerated.

4) Ecosystem Management (Restoration) Emphasis – This option is similar to the Timber Management Emphasis above, however, this strategy gradually transitions the stands to 30-50 sq. ft. BA per acre through a series of thinnings if the current BA is higher. This strategy will increase the amount of sunlight reaching the forest floor, increasing the amount and variety of ground cover. Over time, this method will also increase the

uneven-aged character of the stands, which will benefit wildlife and longevity of the forest structure.

A variety of thinning methods can be utilized. Thinning options to consider are: thinning with relatively even spacing, group selection, group seed tree, or a combination of all three. Natural regeneration should become established without much difficulty after harvest if the ground is sufficiently scarified. Thinnings in mesic and scrubby flatwoods should favor longleaf over slash pine as leave trees for restoration purposes, especially on the drier sites.

In under stocked areas, longleaf pine should be planted if the sites and soil types are suitable. This species is more adapted to fire and is longer lived than the other southern pines. A "rule of thumb" is that if palmetto is dominant, longleaf can be planted. If gallberry dominates, then it is probably too wet for longleaf and slash pine should be planted.

Scrub
There is approximately 324 acres of scrub located on St. Sebastian River Preserve State Park.

Ecological Trends
The scrub component, for the most part, is in good ecological condition. Most of the scrub areas at the Park are currently in the early successional stage and the park management's goal is to return most of the scrub areas to the early successional stage to benefit the Florida scrub jay. Past timber harvests and prescribed burning of sand pine and oak has helped in the restoration process. If allowed to grow unburned or undisturbed, these areas will grow into mature stands of sand pine in 40-50 years. If prescribed fire is used after harvest, these areas should remain in the early successional stages.

Timber Resources
Timber resources within the scrub communities are presently limited to a few small pockets of mature, pulpwood size sand pine. The largest area of mature sand pine is south of the C-54 canal and close to the south prong of the St. Sebastian River. Further inspection would be needed to see if another timber harvest would be feasible in these areas to aid in the restoration process.

Management Options
1) No Action – Mature scrub will remain in the same climax condition unless some sort of natural disturbance (fire or wind) occurs to reset the successional clock back to zero. Other successional stages will continue to move toward ecological climax unless a disturbance occurs.
2) Timber Management Emphasis – Due to the relatively low quality of sand pine for wood fiber products, exclusive timber management would not be a reasonable option within these areas. Also, managing the scrub on the park strictly for timber would not be compatible with management objectives of the park.
3) Ecosystem Management Emphasis – This approach would attempt to keep the scrub component on the Park in various stages of ecological succession. This could be accomplished by allowing some areas to grow to maturity and then clearcutting a percentage of the acreage to move it back to an early successional stage, leaving some of the mature scrub. As the young scrub grows, more of the mature scrub could be cut. This method would ensure the longevity of habitat for species that require different stages of scrub succession.

Sandhill
There are approximately 201 acres classified as Sandhill community at The St. Sebastian River Preserve State Park. These areas are in the eastern side of the preserve and adjacent to the C-54 canal on both the north and south sides.

Ecological Trends
The majority of the sandhill community appears to be in good ecological condition. Most of the sandhill ecosystem has been maintained or is currently being maintained with prescribed fire. Hardwood encroachment is always a concern when fire is excluded or the return interval too great in this community type. There are some areas where the hardwood component is increasing and could become difficult to control through normal prescribed burning. Other options may need to be considered if this becomes a problem.

Timber Resources
This community type comprises a total of 201 acres on the St. Sebastian River Preserve State Park and is composed of longleaf pine overstory with scattered turkey and live oak as well as some sand pine in the mid-story. Pine basal areas are extremely variable and range from <10 -90 sq ft/acre. Old catfaced trees from past naval stores operations are present in some areas and were excluded from past harvests. There form is probably not as good as the trees that were removed during past harvests but they do provide an adequate seed source for regeneration due to their age and maturity.

Management Options
1) No Action – Areas with higher densities of timber will continue to grow but at a much slower rate and become more susceptible to insect, disease and wildfire. The hardwood component will become more dominant and these stands will eventually succeed to an upland hardwood forest type with the pine component being lost. Wildlife habitat for some species will decrease, as ground vegetation will continue to be shaded out. The less dense stands will continue to grow and increase in basal area and in time will become overstocked, increasing potential for insect, disease and wildfire The under stocked areas will eventually regenerate naturally where there is an adequate seed source.

2) Prescribed Fire Only. Areas with higher densities of pine timber will continue to grow but at a much slower rate and will eventually become more susceptible to insect, disease and wildfire. Wildlife habitat for some species will decrease, as ground vegetation will continue to be shaded out. The less dense stands will continue to grow and increase in basal area and in time will become overstocked, increasing potential for insect, disease and wildfire. Openings created naturally or by prescribed burn mortality will seed in creating additional age classes. The areas that are predominately longleaf pine should eventually succeed to an uneven-aged pine forest. Under stocked stands will also seed in slowly and ultimately become fully stocked but this could take many years. Areas with no stocking of longleaf pine will continue to remain void of longleaf pines unless seedlings are planted.

3) Timber Management Emphasis –There may be certain areas within the Park that could be managed for timber revenue. This option will be discussed briefly because managing exclusively for timber would conflict with objectives found in the St. Sebastian River Preserve State Park UMP. It is included here only to advise of the alternatives available for management. It is not expected or recommended that the natural pine communities be

managed in this manner except on a small scale.

These stands will need to be thinned when live crowns in the majority of the dominant and co-dominant trees have been reduced to approximately 1/3 of their total height. This will help ensure a healthy stand of trees. These stands should be thinned back to 60 – 80 sq. ft. BA per acre each time they reach 100 sq. ft. BA per acre or more. One of the added benefits of opening the canopy is that more sunlight will reach the forest floor increasing forage production for wildlife. Normally, once the stand has reached maturity, it is harvested and replanted or allowed to regenerate naturally. Consideration must also be given to areas of the sandhill communities where endangered species are found.

4) 4) Ecosystem Management Emphasis –This option is similar to the Timber Management Emphasis, however, this strategy gradually transitions the stand back to 30-50 sq. ft. BA per acre through a series of thinnings. This strategy will increase the amount of sunlight reaching the forest floor, increasing the amount and variety of ground cover. Over time, this method will also increase the uneven-aged character of the stands, which will benefit wildlife.

A variety of thinning methods can be utilized. Thinning options to consider are: normal thinning with relatively even spacing, group selection, group seed tree, or a combination of all three. Natural regeneration should become established without much difficulty after harvest if the ground is sufficiently scarified. In all instances, the hardwood component should be controlled by prescribed fire or some other suitable method.

This method will generally produce the same results as the prescribed fire only option with two major differences. This method will move the stand to an uneven-aged condition more quickly and will generate revenue to help offset management costs. Disturbances from logging operations usually cause minimal damage to the ground cover with the damage being only temporary.

Ruderal Areas
The ruderal areas of The St. Sebastian River Preserve State Park total approximately 3414 acres and include developed sites, borrow pits, spoil sites and pasture land. For the purpose of this Timber Assessment, the ruderal areas to be discussed are mainly improved pasture land and contain approximately 2500 acres.

Ecological Trends
Approximately 900 acres of the improved pasture land area is currently being leased for cattle grazing. Drainage of these and surrounding areas has helped in the establishment of the improved pastures. Park management is currently working on restoration efforts to fill many of the ditches and allow for more historical natural drainage and natural communities to re-establish.

Timber Resources
There are no timber resources within the pasture areas currently. Some of these areas do have potential for future timber resources if these areas are planted and restored to more natural conditions as dictated by soil types and elevation.

Management Options

1) No Action- With removal of the cattle, the pastures will start to be invaded by wax myrtle, dog fennel, palmetto, blackberry, and other woody and herbaceous plants. Some pine regeneration will occur along the edges and spread inward until it is stopped by the other invading competition.

2) Restoration Emphasis- Restoration of pasture land is considered to be a two-part process and many resource managers are still trying to perfect the best, most economical method to accomplish this. Both the native groundcover and pine overstory must be considered. The native groundcover is the more costly and difficult part of the process so some feel it should be accomplished first. Others believe that establishing the pine overstory will help control the non-native pasture grasses by shading them out and future thinnings designed to create openings in the overstory will provide places for reintroduction of desired groundcover. Also, the natural needle cast from the pine overstory will add to the fine fuels needed to carry prescribed fire across these areas. The economic benefit of overstory first restoration is that revenue generated from future timber harvests can be used to supplement funding for groundcover restoration. With an area as large as this, it may take many years to restore.

If possible, grazing should be allowed to continue to help control the competition prior to the planting of the trees or groundcover, but should be eliminated immediately after restoration efforts have begun to prevent trampling, rubbing, and eating of the newly established plants.

Access

Access to most of the Park is fair to average. Most of the interior roads are limited access depending on weather conditions. The timing of silvicultural activities must be considered due to these circumstances. Buffer Preserve Drive runs in an east-west direction directly north of the C-54 canal and is one of the best interior roads providing access to the northern half of the Park. Areas south of the C-54 canal must be accessed from either Babcock Street to the west or County Road 512 to the south.

Prescribed Fire

Prescribed fire is an important tool for ecosystem management in Florida. Before European settlement, natural fires occurred at regular intervals averaging every two to five years. These fires reduced the fuel load, kept competition of hardwood and woody herbaceous species in check, produced a seedbed for pine regeneration and released nutrients back into the soil. In certain community types, prescribed fire, coupled with a well-planned timber harvest, is often the most economical and responsible method for conducting ecosystem management. Managers at the park have been actively prescribed burning the areas since the state began managing this property. Currently the goal is to burn fire-adapted natural communities on a natural cycle. Since there is already an active burn program in place on the park, this document will briefly discuss prescribed fire only as it relates to timber management.

Some flatwoods areas on the park have experienced increased hardwood encroachment due to longer fire return intervals. Since the state started managing the park, fire frequency has increased to a more natural cycle, but some of these areas were allowed to go too long between prescribed fires and are now posing problems. When hardwoods are allowed to become established, control with prescribed burning becomes more difficult and dangerous. Burning hot

enough to control established hardwoods will frequently damage the preferable, established pine species. Some of these areas may require other, possibly mechanical, means of treatment to control or eliminate the hardwood problems.

The major objective when prescribed burning in pine timber should be to maintain and restore ground cover while minimizing pine tree mortality. It is believed that historic natural fires caused very little pine tree mortality. Slash pine is much less tolerant to fire than longleaf pine, especially during the seedling and sapling stages. Therefore, fire intervals may need to be adjusted for slash pine regeneration until the majority of the trees are big enough to withstand a prescribed burn. Hot fires can be problematic even in mature timber. While a hot fire may not kill trees initially, it can stress them enough to dramatically increase their susceptibility to insect and disease attack. This is especially true when combined with other stresses, such as drought or flood.

Economics

It is difficult to predict with any certainty the amount of revenue that can be derived through timber harvests on the St. Sebastian River Preserve State Park. The park is located in southern Brevard and northern Indian River Counties and is approximately 160 miles to the nearest major wood processing facilities in Palatka, Florida. Smaller markets are also scattered throughout the southern and central part of the state and provide other opportunities to sell forest products. Market conditions, harvest prescriptions, product mix, logging conditions and distance to manufacturing facilities are factors in stumpage prices. Even though economics are hard to predict, they must be analyzed before making any management decisions.

Summary

There are approximately 15,358 acres on the St. Sebastian River Preserve State Park with current or future potential for timber management. Exclusive timber management would not meet the objectives for which this property was purchased, however, Silviculture is a valuable tool to restore native ecosystems, increase diversity and improve wildlife habitat. It is possible to manage most of the wet, mesic, and scrubby flatwoods, scrub, and ruderal areas on St. Sebastian River Preserve State Park in order to retain or restore their natural appearance and produce revenue through timber harvests.

There is currently a market for timber products in this area of Brevard and Indian River counties.

Road access is limited internally on St. Sebastian River Preserve State Park and should be addressed as silvicultural projects are proposed.

Prepared by James Roberts
Region 5, Other Public Lands Forester
Florida Division of Forestry
May 2005

Addendum 7—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. Conserve, protect, and manage natural communities, significant habitat, and ecological systems.
- **A.** Eliminate exotic plant and animal species to the greatest extent practicable. 0-10 years. **Estimated Cost: $10,000/year reoccurring.**
- **B.** Maintain fire as an ecosystem process. 0-10 years. **Estimated Cost: $45,000/year reoccurring.**
- **C.** Seek funding for additional staff to aid in the preparation, implementation, and evaluation of resource management, especially the prescribed fire program. 0-10 years. **Estimated Cost: $47,000/year reoccurring.**
- **D.** Monitor and evaluate the effects of prescribed fire, especially burn frequency and season of burn and how it relates to ecosystem change. 0-10 years. **Estimated Cost: $10,000/year reoccurring.**

2. Restore the preserve's original hydrology to the greatest extent practicable.
- **A.** Seek funding for and develop a comprehensive hydrological restoration plan for the entire preserve. 0-4 years. **Estimated Cost: $200,000**
- **B.** Continue to eliminate ditches by plugging and backfilling to restore wetland communities and prevent further degradation of adjacent communities, where feasible. 0-10 years. **Estimated Cost: $5,000,000.**
- **C.** Evaluate the raised roadbeds in the preserve that impede water flow. Reconnect or relocate wherever practicable. 0-10 years. **Estimated Cost: Unknown.**
- **D.** Evaluate issues of soil compaction, erosion, scouring, and disruption of sheet flow from recreational trail use. Improve or reroute trails determined to negatively impact the parks natural resources. **Estimated Cost: Unknown.**
- **E.** Evaluate the potential to increase water conveyance through Herndon Swamp at gas line road. **Estimated Cost: Unknown.**
- **F.** Rework the remaining south drains into the C-54 canal. 0-10 years. **Estimated Cost: Unknown.**
- **G.** Monitor and evaluate hydrological restoration efforts. 0-10 years. **Estimated Cost: $7,000/year reoccurring.**

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

3. Maintain or increase populations of listed plant and animal species occurring on the preserve.

- **A.** Continue the Florida scrub-jay demographic study and implement management recommendations. 0-10 years. **Estimated Cost: $15,000/year reoccurring.**
- **B.** Continue monitoring the nesting success of red-cockaded woodpeckers and implement management recommendations. 0-10 years. **Estimated Cost: $12,000/year reoccurring.**
- **C.** Explore opportunities for wildlife connectivity, linkages, and wildlife crossings and corridors between all four quadrants of the park and with other public lands in the region. 0-10 years. **Estimated Cost: Unknown.**
- **D.** Continue to inventory, map, and monitor populations of protected plant species. 0-10 years. **Estimated Cost: 2,500/year reoccurring.**
- **E.** Conduct a comprehensive invertebrate survey. 0-3 years. **Estimated Cost: $10,000.**
- **F.** Complete a bat survey. 0-5 years. **Estimated Cost: $5,000.**
- **G.** Survey and monitor populations of gopher tortoises. 0-10 years. **Estimated Cost: $2,000/year reoccurring.**
- **H.** Survey and monitor populations of gopher frogs. 0-10 years. **Estimated Cost: $2,000/year reoccurring.**
- **I.** Conduct a comprehensive herpetological inventory. 0-10 years. **Estimated Cost: $2,000/year reoccurring**
- **J.** Complete a small mammal survey. 0-10 years. **Estimated Cost: $2,000/year reoccurring**
- **K.** Develop environmental education programs to discourage visitors from collecting plants or disturbing wildlife. 0-10 years. **Estimated Cost: Unknown.**
- **L.** When necessary create seasonal rotating area closures to allow sensitive habitat and species to recover from human induced impacts. 0-10 years. **No Cost**

4. Aid in the improvement of water quality in the St. Sebastian River and the Indian River Lagoon.

- **A.** Continue interagency cooperative efforts to collect water quality and biological data in the St. Sebastian River and the Indian River Lagoon. Support the Indian River – Malabar to Vero Beach Aquatic Preserve Staff. 0-10 years. **Estimated Cost: $3,000/year reoccurring.**
- **B.** Provide trash collection and coordinate with Brevard County's Department of Natural Resources to provide monofilament recycling at fishing areas. 0-10 years. **Estimated Cost: $1,000/year reoccurring.**

5. Provide environmental education and volunteer opportunities to enhance public appreciation for natural diversity.

- **A.** Design and conduct more interpretive programs and field trips for the general public, school groups and other organized groups to raise awareness of the various ecosystems on the preserve and the plants and animals that occur in them. Volunteers should be utilized to reduce cost. 0-10 years. **Estimated Cost: FTE staff time based on frequency of tours.**
- **B.** Train additional volunteer tour guides. 0-10 years. **Estimated Cost: FTE staff time.**
- **C.** Staff the visitor's center and gift shop seven days/week with volunteers to provide

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

information to the general public. 0-10 years. **Estimated Cost: No cost.**

D. Expand outreach opportunities through increased participation at local festivals, events, and group meetings by using volunteer staff. 0-10 years. **Estimated Cost: No cost.**

E. Continue to expand participation in the park's Citizen Support Organization, the Coastal Preserves Alliance, a nonprofit group that provides financial and other types of support to the preserve. A list of prioritized projects is compiled annually by the park manager and mutually agreed to by the group's Board of Directors. 0-10 years. **Estimated Cost: FTE staff time.**

6. Identify, preserve, interpret and actively manage cultural resources.

A. Take steps to protect and stabilize the Hardee Point Midden from erosion, and to interpret the site. 0-3 years. $20,000.

B. Ensure that steps are taken to protect all cultural resources from natural and man-made threats. 0-10 years. $2,000/year reoccurring.

C. Seek grant funding for research projects to document the prehistory and history of the park and the surrounding area. 1-3 years. $1,000/year reoccurring.

D. Develop and implement a written plan to protect and preserve the recorded archaeological sites from erosion, slumpage, animal burrowing, root damage, tree fall, and vandalism. 3-10 years. $5,000.

E. Establish monitoring measures to monitor recorded archaeological sites for erosion, vegetation intrusion, animal burrowing, and human disturbance. 1-3 years. $1,000/year reoccurring.

F. Complete archaeological reconnaissance survey of the park, marking the site locations with GPS technology. 1-10 years. $30,000.

G. Improve public awareness and encourage protection and stewardship of the cultural resources of the park through education, interpretation, and enforcement of agency rules and regulations. 1-10 years. $1,000/year reoccurring.

H. Recruit a volunteer to survey cultural sites. 1-10 years. $500/year reoccurring.

Administration

1. Meet staffing needs associated with routine maintenance, resource management, visitor services and park operations. 0-10 years. **Estimated Cost: $170,000/year in recurring costs.**

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

Capital Improvements

Recreationa Facilities

Fishing Areas, Canoe-kayak Launch, Manatee Area	305,000.00
Primitive Campsites Upgrades (6)	121,500.00
Primitive Group Camp	75,000.00
Trails	180,000.00
Visitor Center	660,000.00
Support Facilities	1,361,000.00
Total w/contingency	**3,243,000.00**

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.

Additional Information

FNAI Descriptions

DHR Cultural Management Statement

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*

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]).

The Division 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

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