

WERNER-BOYCE SALT SPRINGS STATE PARK

UNIT MANAGEMENT PLAN

APPROVED

STATE OF FLORIDA

DEPARTMENT OF ENVIRONMENTAL PROTECTION

Division of Recreation and Parks

OCTOBER 25, 2001



Department of Environmental Protection

Jeb Bush
Governor

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

David B. Struhs
Secretary

October 25, 2001

Ms. BryAnne White
Office of Park Planning
Division of Recreation & Parks
3900 Commonwealth Blvd., M.S. 525
Tallahassee, Florida 32399-3000

Werner-Boyce Salt Springs State Park

Lease Number: 4291

Dear Ms. White:

On October 25, 2001, the Acquisition and Restoration Council recommended approval of the Land Management Plan for Werner-Boyce Salt Springs State Park. Therefore, the Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund approves this plan. Pursuant to Section 253.034 and 259.032, Florida Statutes, and Chapter 18-2, Florida Administrative Code the plan's five-year update will be due in October 2006.

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.

Sincerely,

Delmas T. Barber

Delmas T. Barber, OMC Manager
Office of Environmental Services
Division of State Lands

"More Protection, Less Process"

Printed on recycled paper.

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INTRODUCTION

Werner-Boyce Salt Springs State Park is located in Pasco County (see Vicinity Map) immediately west of New Port Richey. Access to the park has not been officially established. The vicinity map also reflects significant land and water resources existing near the park.

The State of Florida acquired Werner-Boyce Salt Springs State Park under the CARL/P2000 program for the conservation and protection of natural resources with the establishment and operation of natural resource-based public outdoor recreation and related purposes. The park contains 3,295.77 acres consisting of 557.50 upland acres and 2,738.27 wetland-submerged acres.

On December 31, 1992, the Trustees purchased its portion of the Werner-Boyce Salt Springs State Park property and leased it to Pasco County. The county relinquished its leasehold interest in the property on February 15, 2000. Subsequently, the Trustees leased the property to the Division. This lease is for a period of fifty (50) years, which expires on June 30, 2050.

Pasco County obtained title to its portion of the Werner-Boyce Salt Springs State Park property, which is also known as Werner Boyce Preserve, on September 30, 1994. Half of the acquisition cost was funded under the Florida Communities Trust—P2000 program. The remaining half of the acquisition cost was provided by the owner of the parcel, Eugene V. Werner, in the form of an in-kind donation. On July 1, 2000, Pasco County leased the Werner-Boyce property to the Division. The lease is for a period of five (5) years and will expire on June 30, 2005.

According to the leases from Pasco County and the Trustees, the Division will manage Werner-Boyce Salt Springs State Park only for the conservation and protection of natural and historical resources and for resource-based public outdoor recreation which is compatible with the conservation and protection of the property.

At Werner-Boyce Salt Springs State Park, public outdoor recreation 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). This is the initial management plan for Werner-Boyce Salt Springs State Park.

PURPOSE AND SCOPE OF THE PLAN

This plan serves as the basic statement of policy and direction for the management of Werner-Boyce Salt Springs State Park as a unit of Florida's state park system. It identifies the objectives, criteria and standards that guide each aspect of park administration, and sets forth the specific measures that will be implemented to meet management objectives. The plan is intended to meet the requirements of Sections 253.034 and 259.032, Florida Statutes, Chapter 18-2, Florida Administrative Code, and intended to be consistent with the State Lands Management Plan. 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.

Legend

-  FDOT Local Roads
-  FDOT State Routes
-  Interstates
-  FDOT US Routes
-  Werner-Boyce Salt Springs State Park

Private Lands

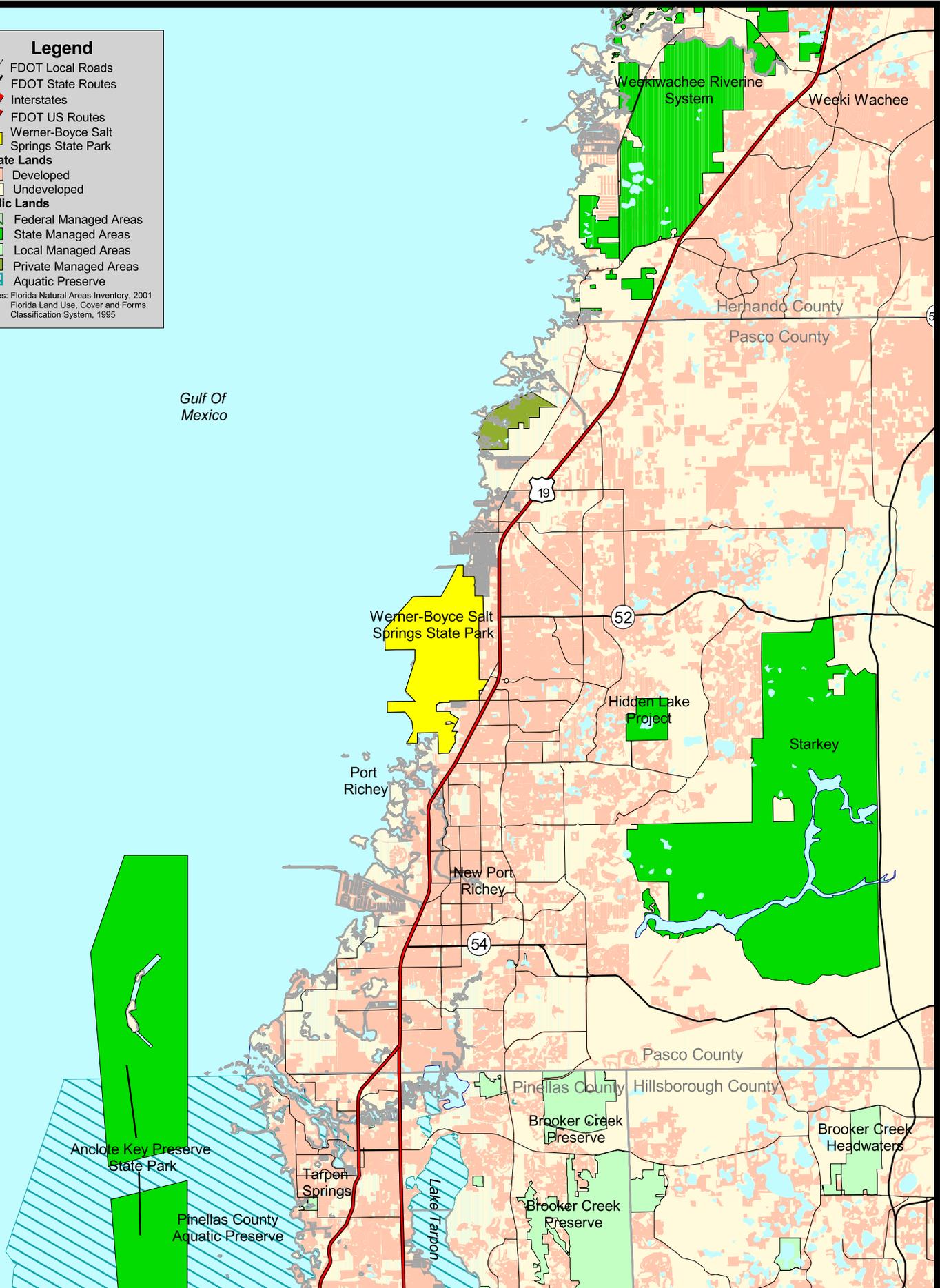
-  Developed
-  Undeveloped

Public Lands

-  Federal Managed Areas
-  State Managed Areas
-  Local Managed Areas
-  Private Managed Areas
-  Aquatic Preserve

Sources: Florida Natural Areas Inventory, 2001
Florida Land Use, Cover and Forms Classification System, 1995

Gulf Of Mexico



Werner-Boyce Salt Springs State Park Vicinity Map



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

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

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

In the development of this plan, the potential of the park to accommodate secondary management purposes (“multiple uses”) was analyzed. These secondary purposes were considered within the context of the Division’s statutory responsibilities and an analysis of the resource needs and values of the park. This analysis considered the park natural and cultural resources, management needs, aesthetic values, visitation, and visitor experiences. For Werner-Boyce Salt Springs State Park, it was determined that no secondary purposes could be accommodated in a manner that would not interfere with the primary purpose of resource-based outdoor recreation and conservation. Uses such as, water resource development projects, water supply projects, stormwater management projects, linear facilities and sustainable agriculture and forestry (other than those forest management activities specifically identified in this plan) are not consistent with this plan or the management purposes of the park and should be discouraged.

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

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

MANAGEMENT PROGRAM OVERVIEW

Management Authority and Responsibility

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

It shall be the policy of the Division of Recreation and Parks to promote the state park system for the use, enjoyment, and benefit of the people of Florida and visitors; to acquire typical portions of the original domain of the state which will be accessible to all of the people, and of such character as to emblemize the state's natural values; conserve these natural values for all time; administer the development, use and maintenance of these lands and render such public service in so doing, in such a manner as to enable the

people of Florida and visitors to enjoy these values without depleting them; to contribute materially to the development of a strong mental, moral, and physical fiber in the people; to provide for perpetual preservation of historic sites and memorials of statewide significance and interpretation of their history to the people; to contribute to the tourist appeal of Florida.

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

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

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

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.

1. Remove all invasive exotic plants from the park within five years.
 - A. Produce a plan, which includes a map and a schedule for eliminating cogongrass within two years.
 - B. Produce a plan, which includes a map and a schedule for eliminating Brazilian

- pepper within five years.
2. Begin a project to restore mesic flatwoods to a pre-disturbance condition.
 - A. Eliminate Brazilian peppers that have heavily infested the mesic flatwoods.
 - B. Conduct prescribed burning at a fire return interval rate of three years or less.
 - C. Begin mechanical treatment of saw palmetto to reduce its height and density.
 3. Biological Inventory and Monitoring.
 - A. Prepare a collection of vascular plants.
 - B. Conduct a thorough wildlife inventory.
 - C. Monitor and protect nests of the Southern bald eagle.
 - D. Monitor and protect resting sites for shorebirds.
 - E. Learn more about the artesian spring.
 4. Begin a program to control feral hogs
 5. Clean up the dumpsite.
 6. Assess water quantity and quality changes caused by stormwater runoff.
 - A. Assemble an interagency working group represented by Port Richey and New Port Richey, Pasco County, SWFWMD, and DEP to assess the impact from stormwater runoff and to recommend remedial measures.
 7. Investigate the possibility of restoring mosquito control ditches.
 8. Maintain, protect and interpret existing archaeological sites and their associated artifactual assemblage from vandalism, erosion and other forms of encroachment.
 9. Division policies have been formulated to prevent unintended damage to archaeological sites which may not be recognizable by nonprofessionals. These policies should be reviewed prior to disturbing the substrate for facility construction or for any other purpose.
 10. Regularly assess the condition of recorded and unrecorded cultural resources. Monitor the condition of sites in poor condition using photopoints.
 11. Patrol sites for vandalism and discourage casual trails through interpretative signage where appropriate.
 12. Provide for visitor access.
 - A. Construct roads and parking lots.
 13. Provide basic visitor amenities.
 - A. Construct picnic areas and restrooms.
 14. Provide recreation and interpretive facilities.
 - A. Layout and construct trails for hiking and biking.
 - B. Designate routes for paddlecraft (canoes/kayaks).
 - C. Construct boardwalks over the marine tidal marsh.
 - D. Designate and develop sites for primitive camping.
 - E. Identify and develop launch points for paddlecraft.
 - F. Construct an observation platform to overlook the marsh.

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 DRP staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC), assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within park boundaries. In addition, the

FFWCC aids the Division with wildlife management programs, including the development and management of Watchable Wildlife programs. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Wetland Resources aids staff in planning and 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.

Public Participation

An initial public workshop was held on July 25, 2000. The purpose of the meeting was to solicit comments from the public before the development of this draft management plan.

A second public workshop was held on February 12, 2001. The purpose of this meeting was to present the proposed land management plan for Werner-Boyce Salt Springs State Park to the public. A DEP Advisory Group meeting was held on February 22, 2001. The purpose of this meeting was to discuss the proposed land management plan for Werner-Boyce Salt Springs State Park with the DEP Advisory Group.

Other Designations

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

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 not within or adjacent to, an aquatic preserve under provision of the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes), however the Pinellas County Aquatic Preserve is a short distance south of the park.

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 greenline program (to delineate areas of park concern in an ecosystem context), a resource management evaluation program (to assess resource conditions, evaluate management activities, and refine management objectives), review of local comprehensive plans, and review of permit applications for park/ecosystem impacts.

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

The slope of the land is so gradual at this site it is barely defined on standard topographic maps: only the five-foot contour line can be discerned at a few sites along the eastern boundary of the park. The deepest offshore depth within the park boundaries is about three feet.

Geology

Werner-Boyce Salt Springs State Park is situated on the Pamlico Terrace, a former seabottom now partly emerged from the Gulf of Mexico. This geologic feature extends into the Gulf, where its western edge is about six feet below sea level. To the east it slopes upward to about 25 feet above sea level where it encounters an escarpment marking the edge of the Talbot Terrace, another former seabottom that is geologically older. These surface features, shaped by the dynamics of ancient shorelines, constitute a thin mantle of sand overlying a limestone base, which has been abundantly pocked and channeled by the dissolving action of water to create circular pools and meandering flows throughout the park. Karst topography is well displayed here.

This part of Florida is a low energy coast, having a mean annual wave height of 30cm and a spring tide range of 90cm. The reduced wave energy is largely an effect of the offshore Continental Shelf which is very wide in this region, with a low gradient that prevents waves coming onto the shore from building to a large size.

Soils

The Natural Resources Conservation Service identified 76 soil types in Pasco County, of which 12 are found in the park (see Soils Map). Addendum 3 contains detailed soil descriptions.

Although the majority of the park falls within the Coastal Swamps physiographic province, the landward (eastern) part is near the border of the Gulf Coastal Lowlands province (White, 1970). The soils of the park are characteristic of both of these provinces (SCS, 1982). The general soil units for the Coastal Swamps in the park are those of the Homosassa-Lacoochee-Weekiwachee and the Aripeka-Okeelanta-Terra Ceia complexes. The former includes soils associated with salt marsh habitats and the latter is more indicative of freshwater swamps. However, the relatively better drained Aripeka soils have flatwoods on them as well as some islands of maritime hammock. Both are nearly level and somewhat, to very poorly, drained and are high in organic matter as well as minerals, including limestone. The soils of the salt marsh are subject to daily flooding by normal tides. Soils representative of the Gulf Coastal Lowlands are located principally along the landward boundary of the park, specifically near Scenic Drive. The general soil unit in the park is Tavares-Adamsville-Narcossee. This is the soil complex for the saw palmetto dominated flatwoods. These soils are sandier and better drained than the other two general soil units, but still have a high organic component. The specific soils in the unit that are the best drained are Adamsville and Naracossee.

Given the flat terrain at this park, there is little chance for erosion via the usual pattern of surface water flowing down an unvegetated slope. However, an inventory and assessment of archaeological sites (Memory and Newman 1992) noted that many of them were sited along creeks where boat wakes might have an erosive impact.

Minerals

There is no information available on minerals in Werner-Boyce Salt Springs State Park. No mineral deposits of commercial value are known to be present.

Hydrology

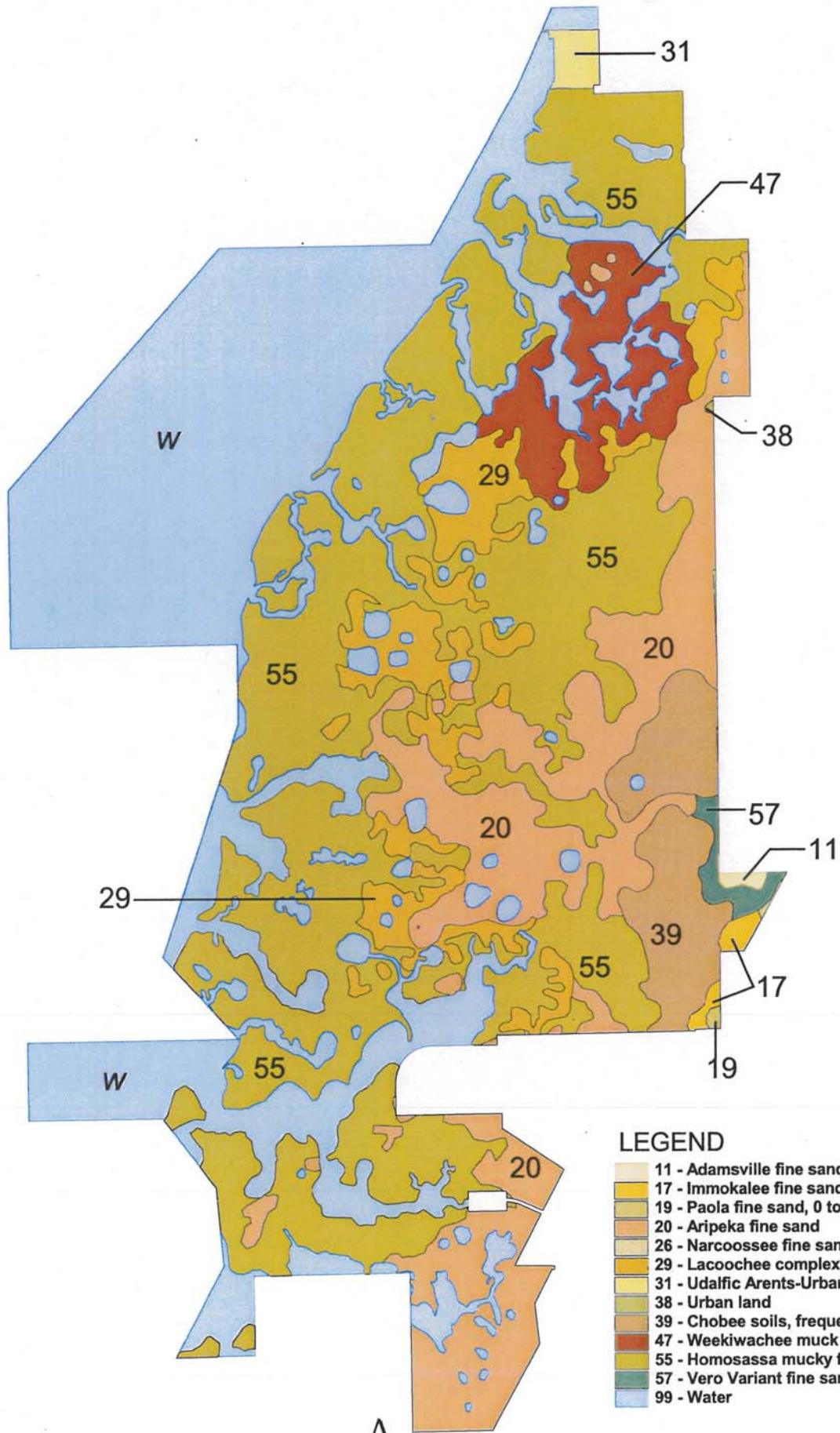
The surface hydrology of this park has been noticeably affected in two ways: by mosquito control ditches and by storm-water runoff. Mosquito control ditches were cut into the tidal marsh by a would-be developer; these appear to have had a minor effect on drainage at certain places in the tidal marsh. Stormwater runoff is via the Bear Creek drainage Basin. Discharge is regulated by SWFWMD, which maintains 19 water quality-sampling sites in the basin. Stormwater is a concern because of the potential for contaminants and nutrients to degrade Outstanding Florida Waters. Water quality at present does not exceed standards, but needs to be watched.

Salt Springs, a small artesian spring, is found at the edge of the property along the eastern boundary. A part of the spring appears to be beyond the park boundary, but a portion of it may be within the park.

Natural Communities

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI) **FNAI Descriptions**. The premise of this system is that physical factors, such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas which are similar with respect to these factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, despite similar physical conditions.

In other instances, physical factors are substantially different, yet the species compositions



LEGEND

- 11 - Adamsville fine sand
- 17 - Immokalee fine sand
- 19 - Paola fine sand, 0 to 8 percent slopes
- 20 - Aripeka fine sand
- 26 - Narcoossee fine sand
- 29 - Lacoochee complex
- 31 - Udalfic Arents-Urban land complex
- 38 - Urban land
- 39 - Chobee soils, frequently flooded
- 47 - Weekiwachee muck
- 55 - Homosassa mucky fine sandy loam
- 57 - Vero Variant fine sand
- 99 - Water



**WERNER-BOYCE SALT SPRINGS
STATE PARK**

Prepared by:
Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning
Date: November 28, 2000-BJB

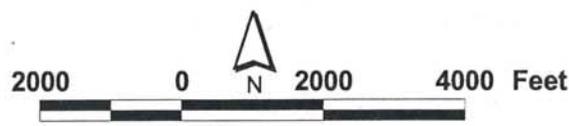
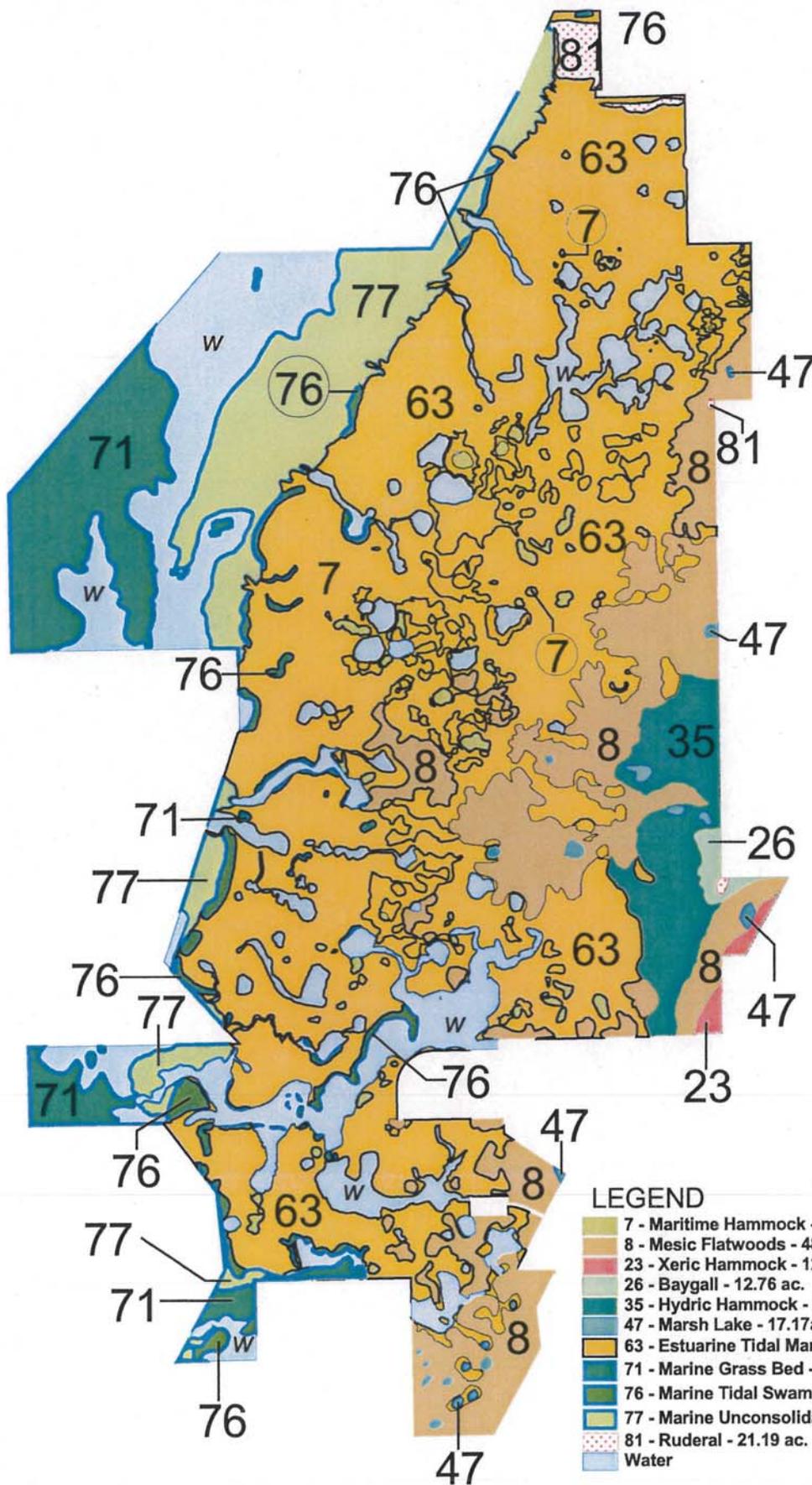
SOILS MAP

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 ten 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.

Maritime hammock. An ecological report on this region by the US Fish and Wildlife Service provides an exposition of coastal forests (Simons 1990), which is used as a guide in this plan to distinguish and describe maritime hammock and hydric hammock. Simons writes: “On the coast, the cabbage palm-live oak-southern red cedar forest breaks up into peninsulas and islands interspersed with the salt marsh to form one of Florida’s most scenic landscapes.” He notes that these islands support “...forest (maritime hammock) dominated by sand live oak (*Quercus geminata*) and live oak (*Quercus virginiana*) in association with cabbage palm (*Sabal palmetto*), southern red cedar (*Juniperus silicicola*) [which is now considered conspecific with *Juniperus virginiana*] and other trees.” He distinguishes maritime hammock from hydric hammock by the fact that the latter forms the vast majority of coastal live oak, cabbage palm, and red cedar forest in this region and that this forest is subject to flooding. It is assumed that Simons meant freshwater flooding and not tidal flooding, which may occasionally affect the islands and peninsulas classified here as maritime hammock. In this plan, the designation of maritime hammock is reserved for those drier, discontinuous, outlying fragments, i.e. islands and peninsulas in the tidal marsh, which are dominated by cabbage palm, southern live oak, and red cedar. The island maritime hammocks range in size from a few square feet to several acres. The dominant overstory here is composed of cabbage palms with increases in red cedar, South Florida slash pine (*Pinus elliottii* var. *densa*), and live oak as higher elevations are reached. Typical associates include Florida privet (*Forestiera segregata*), necklace pod (*Sophora tomentosa*), yaupon (*Ilex vomitoria*), buttonwood (*Conocarpus erectus*), saffron plum (*Sideroxylon celastrinum*), and marsh elder (*Iva frutescens*). Ground covers commonly include cordgrasses (*Spartina* spp.), sawgrass (*Cladium jamaicensis*), poison ivy (*Toxicodendron radicans*), saltgrass, needle rush or juncus (*Juncus roemerianus*), water pimpernel (*Samolus ebracteata*), goldenrods (*Solidago* spp.), keygrass (*Monanthochloe littoralis*), glasswort (*Salicornia virginica*), saltwort (*Batis maritima*), several grasses, and several sedges. Occasional clumps of butterfly orchids (*Encyclia tampensis*) occur epiphytically on live oaks on some islands along with several other epiphytes, mostly *Tillandsia* spp. The islands frequently are bordered by mangroves, buttonwood, marsh elder and salt bushes (*Baccharis* spp.). Unfortunately, Brazilian pepper (*Schinus terebinthifolius*) has become well established throughout.

Mesic flatwoods. This community type constitutes most of the upland acreage in the park. It is the primary buffer between the adjacent eastern urbanization and the tidal wetlands to the west. As is typical, slash pine and saw palmetto (*Serenoa repens*) prevail. Longleaf pine (*Pinus palustris*) is present in at least one location. Unlike nearby flatwoods further inland, cabbage palm is more abundant here. The prevalence of this species is likely a function of its calciphilous tendencies and the fact that the underlying limestone is close enough to the surface to influence the vegetation. Although the cabbage palm cannot tolerate lengthy tidal inundation, it tolerates saline soils sufficiently to give the appearance of infiltrating the mesic flatwoods from the Gulf side. Live oak and, in wetter spots, laurel oak (*Quercus laurifolia*), compose the remaining overstory species. Nearly all of the



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STATE PARK

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Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning
Date: November 20, 2000-BJB

NATURAL COMMUNITIES
MAP

remaining trees, shrubs, and woody vines are found scattered throughout the midstory and understory of this diverse plant community. As might be expected, portions of this community that have a more obvious fire history are the floristically richer sites. Several wet depressions are scattered throughout the flatwoods; most are too small to map, and they lack concentric bands of surrounding vegetation as would be typical for true depression marshes. As is described under the marsh lake community description, the vegetation is indicative of remnant examples of that community. Numerous ditches and washes crisscross the areas varying from freshwater runoff to brackish to saline encroachment from the mosquito ditches. Dominant understory species besides saw palmetto are: wax myrtle (*Myrica cerifera*), saltbushes (*Baccharis* spp.), greenbrier (*Smilax auriculata*), broomsedge (*Andropogon virginicus*), flattopped goldenrod (*Euthamia caroliniana*), dewberry (*Rubus trivialis*), several species of panic grass, and Brazilian pepper.

It should be noted that the mesic flatwoods in this park are generally wetter than the mesic flatwoods described by FNAI, but not wet enough to call wet flatwoods. Several wetland species are present. Examples include, but are not limited to, semphaphore plant (*Eupatorium mikanioides*), scattered sawgrass, and Florida bully (*Sideroxylon reclinatum*). The last is typical of habitats where limestone is near the surface as is the case here.

Xeric hammock. This community is sparse in the park. Initially, the short-canopied oak overstory and scattered saw palmetto of the community give the appearance of a long-unburned scrubby flatwoods community. However, the presence of plant species associated with xeric hammock or scrub, namely scrub olive (*Osmanthus megacarpus*), deerberry (*Vaccinium stamineum*), and scrub or sandyfield beaksedge (*Rhynchospora megalocarpa*) support recognition of a xeric hammock which has been derived from scrub. According to FNAI (1990), xeric hammocks are derived from communities that were formerly sandhill or scrub. Although there are no examples of sandhill or scrub communities within the park, the soil type mapped by the SCS (1982) as Paola fine sand, 0 to 8 percent slopes, is characteristically known to support scrub. This soil type occurs within the park only along the boundary that adjoins part of Scenic Drive, which is the community in question. Most of the land occupied by this soil type is east of the park and has been developed. Further evidence that this community is not scrubby flatwoods is provided by Simons (1990) when he, rather definitively, says the following species are representative species of scrubby flatwoods of the Florida Springs Coast region: tarflower (*Befaria racemosa*), pennyroyal (*Piloblephis rigida*), and flatwoods pawpaw (*Asimina reticulata*). None of these species is present. Saw palmetto is present in both the xeric hammock and the adjacent flatwoods, but at densities low enough to make walking easy when compared to the adjacent flatwoods. Saw palmetto assumes aborescent proportions on one of the wetter edges. The dominant canopy species are sand live oak, Chapman's oak (*Quercus chapmanii*). Myrtle oak (*Quercus myrtifolia*) is common as a large shrub or small tree with an occasional crookedwood (*Lyonia ferruginea*). White leadtree (*Leucanea leucocephala*) is invading into the hammock from the eastern edge along Scenic Drive.

Baygall. The only well-defined wetland seepage community in the park is found along Scenic Drive, just in from the east boundary. Historically it appears to have formed the headwaters of Double Hammock Creek, but is now influenced by a canal that intersects perpendicularly with Scenic Drive. This community type is not common locally, and most examples are small, scattered patches ranging in size (Simons, 1990) from a few to about 100 acres. This one seems to stay wet year round as is typical of seepage swamp systems. Although the mapped soil type is Vero variant fine sand instead of the mucky soil types

usually associated with baygalls or bayheads, that soil type is described as being a wet type of South Florida Flatwoods (SCS, 1982). The soil is so soft and saturated with water (i.e. mucky) as to make walking extremely difficult. Although the typical loblolly bay (*Gordonia lasianthus*) is absent, sweet bay (*Magnolia virginiana*), swamp bay (*Persea palustris*) and some very large Carolina willows (*Salix carolinana*) form the primary canopy. Laurel greenbrier (*Smilax laurifolia*) and Virginia willow (*Itea virginica*) both indicators of wet conditions, are present. Swamp tupelo (*Nyssa sylvatica* var. *biflora*) is present on the western edge of this community that changes gradually into hydric hammock. Therefore, the mucky substrate and the dominant vegetation support recognition as baygall. Besides being easier to walk in than baygall, the adjoining hydric hammock dries out and stays dry most months of the year. Wild taro (*Colocasia esculenta*) has invaded the baygall community.

Hydric hammock. As mentioned above under Maritime Hammock, in this park the large, continuous, coastal forests dominated by live oak in association with cabbage palm, southern red cedar, sand live oak are classified as hydric hammock. Directly on the coast, where these forests (hydric hammocks) are broken up into peninsulas and islands “interspersed with the salt marsh”; they can be classified as maritime hammocks. When less dissected or more continuous, they form an open forest interspersed with patches of sawgrass and other marsh plants. Further inland, under the influence of more fresh water, these forests become more closed canopied and wetter, and support red maple (*Acer rubrum*) and sweet bay (*Magnolia virginiana*). Harper (1915) “noted that the low (hydric) hammocks of the Gulf Hammock region correspond approximately with soils of mixed marl, clay, sand, and humus, whereas the adjacent flatwoods are on acid soils, often with an organic hardpan. The boundaries between hammock and flatwoods here are quite irregular, and generally have no fire barriers other than the differences in vegetation.” Thus, these hammock forests generally lack slash pine in their overstory that is dominated by cabbage palms, oaks, and other mixed hardwoods. Loblolly pine (*Pinus taeda*), which is a common component of hydric hammocks further north along this coast, is absent from Pasco County. Though adjacent to the flatwoods, these hydric hammocks are slightly lower in elevation, hence moister and not fire maintained. The understory is semitropical in appearance with myrsine (*Rapanea punctata*), wild coffee (*Psychotria nervosa*) and string lily (*Crinum americanum*) common among large fern-covered oak trunks. As indicated above, the overstory varies from open to dense. In the latter case, sweet bay, red maple, and the Florida form of American elm (*Ulmus americana*) close the canopy and allow little light to penetrate to the forest floor. Swamp tupelo is occasionally present. Florida privet is more common in sunny spots. Poison ivy, leather fern (*Acrostichum danaeifolium*), swamp fern (*Blechnum serrulatum*), widespread maiden fern (*Thelypteris kunthii*), and greenbriers (*Smilax* spp.) are common understory plants. Less common are mulberry (*Ardisia escallonioides*), swamp dogwood (*Cornus foemina*), dahoon (*Ilex cassine*), and swamp bay (*Persea palustris*). The rather uncommon upland swamp-privet (*Forestiera ligustrina*) is present in at least one location. Pasco County is its southern range limit.

Marsh lake. Examples of this community have a small, mostly circular signature on the aerial photographs. These are nonforested wetlands, mostly towards the landward side of the property, with little or no tidal influence and, with a couple of exceptions, are deep enough to have an open water zone throughout the year. Most are surrounded with species typical of a freshwater marsh, including cattails and are ultimately surrounded by, or are adjacent to, mesic flatwoods. Most are too deep, and the surrounding freshwater marsh is

too extensive, in most cases, to be considered flatwoods lakes. Visits to the sites show them to have the following species along their margins: sawgrass, some bluestem grasses (*Andropogon* spp.), flat sedges (*Cyperus* spp.), beak rushes (*Rhynchospora* spp.), several scattered cattail (*Typha domingensis*) populations, and other typical freshwater species. The shallower, and usually smaller, ones have a preponderance of sawgrass (*Cladium jamaicense*) and Carolina willow (*Salix caroliniana*). Some of these remnants are too small to be effectively mapped. Prescribed burning in the surrounding flatwoods might burn into the edges of this community as well.

Estuarine tidal marsh. This is by far the largest natural community in the park. In shallower marsh that has infrequent tidal flooding, the dominant plant species is needle rush or juncus that is often accompanied by large numbers of saltmarsh fimbry (*Fimbristylis spadicea*). Other plants in this shallower zone are Gulfcoast spikerush (*Eleocharis cellulosa*), giant leather fern, marsh elder (*Iva frutescens*), buttonwood and all three species of mangrove; but the woody species are not abundant here and are scattered singly or in small groups. Numerous other plants occur less obvious among the needle rush and along manmade ditches. In deeper areas, subject to regular tidal flooding, smooth cordgrass (*Spartina alternifolia*) is dominant. The marsh is interrupted by coastal islands, tidal creeks, open pools, open flats, and reclaimed mosquito ditches above mean high tide. The soil type associated with this community, which is influenced by freshwater, is Homosassa mucky fine sandy loam. Towards the landward side of marsh, an increasing number of freshwater plants appear with a concomitant reduction in salt-tolerant species. Examples include marshhay cordgrass (*Spartina patens*), Gulf or prickly cordgrass (*S. spartineae*), and sand cordgrass (*S. bakeri*) with a progressive increase in sawgrass. Such plants are similar to those on the fringes of Marsh Lakes, a community that lacks tidal influence. Here and in the closely adjacent parts of the juncus marsh, one can occasionally see outcrops of large, striated limestone boulders. With no further information presently available, they appear to be vestiges of "sunken karst" features that White (1970) mapped further north along the coast.

Within the juncus marsh, patches of nonvegetated or sparsely vegetated ground can be seen which are particularly conspicuous on aerial photographs. These zones—more commonly known as "saltwater coastal flats" or simply "salt flats" or "salt barrens"—are a few inches higher in elevation than the surrounding or nearby densely graminoid-vegetated tidal marsh. A US Army Engineer Waterways Experiment Station report (1978) recognized these salt barrens as a separate community. Although they, as well as the juncus tidal marsh, both can have hypersaline soils [12%-13% or 120 to 130 parts/thousand according to the report (1978)], the higher ground of the salt barrens promotes higher evaporation of tidewater than occurs in the juncus marshes. This means the residual salt is left on dry ground instead of in shallow water. Furthermore, the juncus marshes have a broader range of salinity along the continuum to freshwater and can be considered brackish (1978 report). Although not mentioned in the cited report, this could be related to the fact that the slightly lower elevations within the juncus marsh allow freshwater flushing which does not occur as frequently (if at all) on the salt barrens discussed here. In contrast to the daily-flooded Homosassa mucky fine sandy loam soils of the juncus marsh, the salt barren soils of the Lacoochee complex are flooded during normal high tides but not necessarily daily or as regularly (SCS, 1982). Aerial photography and soil maps match up nicely as the salt barrens look "bleached out" from the air because they are sparsely vegetated (less than 25%). Vegetation in the salt barrens features a higher proportion of seashore saltgrass and especially keygrass and little or no

needlegrass (*Juncus roemerianus*). If needlegrass is present at all in the salt flats, it is stunted.

In one instance in the northern part of the park, near the landward side (Section 9), the typically nonlinear salt barren habitat conspicuously narrows to form a narrow ecotonal strip which appears like an irregular white line on the most current (ca. 1995) aerial photographs. It runs intermittently in a mostly north-south direction for about 1500 feet. This feature is interpreted to be a remnant of a more extensive salt flat region that extended to the west of the present strip. Evidence of this is seen in the nearby presence of slightly elevated acreage of former salt flats that are being weakly colonized with needle rush. This ecotonal strip forms an easily accessible, though often wet, foot passage between the cabbage palm infiltrated flatwoods to the east and the needle rush marsh to the west. The strip is currently vegetated mostly by saltgrass, glasswort, and other highly saline tolerant species.

Marine grass beds. Commonly called seagrass beds, these communities cover some 85,570 acres along Pasco County's shores Sargent *et al.* (1995). No other Florida counties southward have as much acreage of seagrass except Monroe and Miami-Dade. Pasco County is considered the southernmost of the Big Bend counties. Dominant species are turtle grass (*Thalassia testudinum*), shoal grass (*Halodule wrightii*), and manatee grass (*Syringodium filiforme*). Various algae are associated with these grass-like vascular plants. Species of the following genera are present: *Acanthophora* sp. (a red alga) *Caulerpa* sp. (a green alga), *Dictyota* sp. (a brown alga), *Halimeda* sp. (a green alga) and *Penicillus* sp. (a green alga) This saltwater aquatic wetland is distributed below the intertidal zone. The shoreward limit is apparently the elevation of the lower mean tide, and the seaward boundary is the limit of rooted plant growth; consequently, the plants are exposed above the water surface only during exceptionally low tides (US Army Engineer Waterways Experiment Station, 1978). These areas are heavily used by numerous sport and commercial fish and shellfish species and numerous wading birds and shorebirds. The saltwater aquatic wetland is important in the detrital food chain and in nutrient cycling. Seagrass beds stabilize sediments and provide nurseries, food and shelter to many estuarine organisms. A study just south of this park (specifically the nearshore areas of Honeymoon and Caladesi Islands) by Bard (1992) showed that seagrass coverage for the had decreased by 20 percent during the previous 20 years and that propeller scars had increased dramatically. These impacts were correlated with an increase in boat traffic as indicated by the rise in statewide boat registrations. According to Sargent *et al.* (Table 4, 1995), only five percent of Pasco County seagrass beds are scarred. Nevertheless, with the expected increase in boat traffic from increasing development nearby, coupled with the shallow waters, unless non-motorized restrictions are imposed, prop scarring may increase in the sea grass beds here as well.

Marine tidal swamp. A more appropriate term this far north in Florida might be "mangrove fringe". This community is limited to the frontage along the Gulf on shallow muddy substrates in the intertidal zone. This band of small trees or shrubs extends several hundred yards inland, interrupted only occasionally by tidal creeks and small inlets. It is composed almost entirely of the three species of mangroves, with black mangrove (*Avicennia germinans*) being dominant. Unlike the mangrove swamp ecosystems of South Florida, there is no typical zonation. Here the red mangroves (*Rhizophora mangle*) and white mangrove (*Laguncularia racemosa*) are irregularly intermixed, having been severely impacted by past freezes. Other occasional common plants include smooth cordgrass and saltwort along with needle rush on the sheltered side of the mangrove fringe.

Marine unconsolidated substrate. This community occurs on the gulf side of the park between the salt marsh and seagrass beds. It is probably better known by its FNAI (1990) synonym of “mudflat”. These flats are mostly above the surface of the water at low tide although there is sometimes a subtidal zone that is exposed only during extreme low tides. They support numerous organisms, mostly invertebrates that constitute a rich source of food for several species of birds.

Ruderal and developed. Three places in the park are classified as ruderal. The first and largest is in the northernmost parcel. Its soil type is “#31 Udalfic Arents – Urban land complex” (SCS, 1982) and the soils of the substrate are so intermingled that they cannot be separated at the scale used for soil mapping. This acreage apparently represents spoil that has been spread out over land that was likely either marine tidal swamp and/or marsh. Although seedling mangroves are present, it is infested with Brazilian pepper. The second ruderal zone is the spoil pile and the rudimentary road leading to it on the northeastern boundary that has an “urban land” soil type (#38, SCS, 1982). Exotics growing on the road and mound are torpedo grass (*Panicum repens*) and woody invasives such as Brazilian pepper and leadtree (*Leucaena leucocephala*). The third ruderal site represents a dense outgrowth of exotic plants that have grown from the dumping of landscape plants. Air potato (*Dioscorea bulbifera*) and various exotic aroids dominate the site.

Currently there are no developed areas in the park. Park facilities will be established in the near future.

Designated Species

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

Six species of listed plants have been identified in the park. None of these plants appears to be threatened by any actions or activities proposed in the development and use of the park. More listed species of plants may be found in the future.

The gopher tortoise is the only known species of listed reptile. Habitat fragmentation and small numbers may preclude viability in the population. Two species of listed mammals are the Florida black bear and the West Indian manatee, both have been documented. Bears frequent the coastal habitat north of this park, but the natural connectivity has been virtually severed by a finger of urban development at the north boundary that projects into the Gulf of Mexico. As for the manatee, only occurrence records are available, no detailed information.

Ten listed species of birds are known to be present. One pair of Southern bald eagles has a nest. American oystercatchers, Royal terns, and Caspian terns use the offshore flats as resting areas. Black rails have been recorded.

Special Natural Features

The artesian spring is a special natural feature.

Cultural Resources

Evaluating the condition of cultural resources is accomplished using a three part evaluative scale, expressed as good, fair, poor. These terms describe the present state of affairs, rather than comparing what exists against the ideal, a newly constructed

component. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair judgment is cause for concern. Poor describe an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action to reestablish physical stability.

The Florida Master Site File (FMSF) lists 19 sites identified within the Werner-Boyce Salt Springs State Park. The presence of these known archaeological sites on the property is the result of a Phase I survey undertaken in the context of a CARL acquisition (Memory and Newman 1997). The list of identified sites is contained in Addendum 6.

With the exception of 8PA115, the condition of the cultural sites is assessed to be good per Memory and Newman (1997). The greatest threat to the majority of sites is erosion and potential looting of exposed material on the shoreline.

8PA115, Salt Spring, is assessed to be in poor condition. When first recorded by Nancy White (1982), it was estimated that less than 5 percent of the site remained undisturbed. According to Memory and Newman (1997) the site has deteriorated further, based on the absence of observed prehistoric artifacts despite good surface visibility. Because most of the topsoil had been depleted due to erosion from construction and recreational activities, much of the site consists of exposed limestone.

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. It was determined that the primary management objectives of Werner-Boyce Salt Springs State Park could be met without conducting timber management activities for this management plan cycle. Timber management will be reevaluated during the next revision of this management plan.

Additional Considerations

The western boundary of this park shows a highly irregular configuration. For nearly two miles it approximates the shoreline. Elsewhere, two large bulges extend it nearly three-quarters of a mile offshore. The bulges are bulkhead lines, relics of a practice forbidden today in which landowners were allowed to dredge submerged land to create upland fill behind a bulkhead or seawall. Where the park boundary approximates the shoreline, park jurisdiction will extend 400 feet offshore.

The Division will assess the impacts of boating activities on the park's vegetation, cultural

sites and wildlife, particularly on shorebirds. If unacceptable impacts to the resources of the park are documented, then Division staff will recommend appropriate management actions.

Management Needs and Problems

A principal need at this park is for additional land along the eastern boundary. The situation along the eastern side is wanting: urban development, residential and commercial, presses close against the park wetlands, leaving a thin upland strip which itself is made discontinuous at one point by a residential intrusion reaching across it, into the tidal marsh. These narrow and fragmentary uplands constrain the establishment of facilities for public use and obstruct the movement of visitors north to south within the park. Any additional land that could be added would aid the design and placement of facilities to accommodate the public.

Like most natural lands in southern Florida, and in particular along the coast, Werner-Boyce Salt Springs State Park suffers from an invasion of exotic plants. Brazilian pepper is a heavy presence in all upland natural communities, and cogongrass is becoming abundant at several sites where roads are adjacent to the park or enter it. These invasive exotics must be eliminated.

The mesic flatwoods community has been degraded not only by the invasion of exotic plants mentioned above, but also by the long absence of fire. Saw palmettos have increased in height and density, a fact detrimental to many other native plant species that must compete, not only against the expansion of this native palm, but also against aggressive exotic plants. The three big needs of the mesic flatwoods are fire, exotic removal, and the mechanical treatment of saw palmetto. Feral hogs are also present and need to be eliminated.

A thorough biological inventory is needed for vascular plants and for all classes of vertebrates. There is at least one Southern bald eagle nest on the park; it will be monitored annually. The shoals at the seaward edge of the park offer a rich habitat to a variety of shorebirds. These will be monitored to insure that resting and feeding conditions are protected from undue disturbance.

Management Objectives

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

1. For invasive exotic plants the objective is to eliminate cogongrass within two years, and Brazilian pepper within five years.
2. The objective for mesic flatwoods is to return it to a condition that existed before the invasion of exotic plants and the exclusion of fire.
3. The objective for feral hogs is to establish a program that will keep the population to the lowest possible level.
4. The objective for prescribed burning is to employ it in mesic flatwoods, burning at intervals of three years or less.
5. The objective of a biological inventory is to identify the whole range of organisms present, this knowledge being the necessary foundation of biological management.

6. The objective of biological monitoring is to provide a continuing report and record of organisms present in the park, and to follow the wellbeing of species selected for special attention. The only species presently identified for special attention is the Southern bald eagle and shorebirds. Other species may warrant attention in the future.
7. The objective of hydrological management is to prevent the degradation of water quality in the park and to remediate to the extent possible any hydrological disruptions (mosquito ditches, stormwater inflows, etc.).
8. The objective for the artesian spring is to foster a geological survey that will describe the nature of the spring and reveal if any specific protective actions are required. Any portion of the spring beyond the boundary should be brought into public ownership.
9. The objective of cultural management is to inspect and produce an annual report on all archaeological sites identified in the park.

Management Measures for Natural Resources

Hydrology

An evaluation of the mosquito control ditches will be made to learn if restoration is feasible. As for stormwater runoff, DEP will consult with state and local water management authorities to insure that there is no degradation of water quality.

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 unit is partitioned into burn zones, and burn programs are implemented for each zone. These programs are periodically reviewed and maintained in the unit's burn plan. All prescribed burns are conducted under permit from the Department of Agriculture and Consumer Services, Division of Forestry (DOF). Wildfire suppression activities will be coordinated between staff of the DRP and the DOF.

A program of prescribed burning will be initiated in the mesic flatwoods. Burns will be repeated at intervals of three years or less.

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 which aggravate the particular problems of a species.

Six species of listed plants and thirteen species of listed vertebrates have been identified in Werner-Boyce Salt Springs State Park. Other species may be identified as the biological inventory advances. Bald eagle nesting will be monitored annually in coordination with the Florida Fish and Wildlife Conservation Commission. The offshore flats will be monitored to learn if protective measures (signs, exclusion zones) are needed to insure they are adequately protected as resting sites for shorebirds are for nonlisted as well as listed species. Manatee activity will be documented by the park staff to learn if measures should be taken for protection. Gopher tortoise burrows will be mapped following prescribed burns to estimate population size and distribution.

At the north end of the park is a large, square-shaped spoil site, indicated as ruderal on the natural communities' map. Wading birds, including wood storks, are reported nesting here. The site will be investigated to determine if specific management actions are needed.

Exotic Species Control

Exotic species are those plants or animals that are not native to Florida, but were introduced as a result 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 impact non-resistant native species. Thus, the policy of the Division is to remove exotic species from native natural communities.

Cogongrass is the most menacing invasive exotic discovered so far. It will have priority for removal. Brazilian peppers permeate the uplands of the park. A plan will be prepared within six months for systematic elimination.

Feral hogs are present. A program will be put in place within six months to eliminate them.

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 (problem alligators will be removed in accordance with policies of the FFWCC). Management must devise measures that balance designated species protection with problem species control.

No problem species have been identified at this park.

Management Measures for Cultural Resources

The management of cultural resources is often complicated because these resources are irreplaceable and extremely vulnerable to disturbances. The advice of historical and archaeological experts is required in this effort. Approval from Department of State, Division of Historical Resources (DHR) must be obtained before taking any actions, such as development or site improvements that could affect or disturb the cultural resources on state lands (see **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.

1. Regularly monitor cultural resources.
2. Division policies have been formulated to prevent unintended damage to archaeological sites which may not be recognizable by nonprofessionals. These policies should be reviewed before disturbing the substrate for facility construction or for any other purpose. Any proposed development of 8PA115, such as trail or road grading, should include monitoring for intact archaeological deposits.
3. Regularly assess the condition of recorded and unrecorded cultural resources. Monitor the condition of sites threatened by erosion and those in poor condition using photopoints.
4. Patrol sites for vandalism and discourage casual trails through interpretative signage that includes warnings against collecting artifacts in both terrestrial and aquatic environments.

Research Needs

Natural Resources

Any research or other activity that involves the collection of plant or animal species on park lands 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.

As mentioned above a biological inventory is needed. Shorebird use of the offshore flats will also be documented. Furthermore, an attempt will be made to learn more about the artesian spring near the boundary of the park.

Cultural Resources

Enough sites were discovered in the context of the CARL survey to make predictions of areas that may contain additional resources. These areas include hammock-islands and areas that are periodically inundated. At such time that funding becomes available, staff should pursue a Phase Two archaeological survey to focus on refining information on known sites. Phase Two surveys more intensively test sites to define boundaries, temporal periods and significance.

Resource Management Schedule

A priority schedule for conducting all management activities which 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.

Werner-Boyce Salt Springs State Park has not been subject to a land management review. Currently, a land management review has not been scheduled.

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, 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's objective is to provide quality development for resource-based recreation throughout the state with a high level of sensitivity to the natural and cultural resources at each park.

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

EXTERNAL CONDITIONS

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

Existing Use of Adjacent Lands

Existing land uses surrounding the state park consist of dense commercial development and high-density residential development, including single-family and mobile home communities. The Westport subdivision extends into the salt marsh wetlands, creating a break between uplands of the northern and southern portions of the park. A Pasco County School Board Marine Research facility is located at the southern edge of the park property, and a New Port Richey city park is located just south of the park, at the end of Koons Road. The primary environmental impact of adjacent development on the park is the influx of stormwater. Secondary impacts include disturbance of wildlife, traffic congestion, noise, unauthorized dumping and other typical effects of an urbanized location.

The Westport community, located at the eastern boundary of the park, has long enjoyed access to the Gulf of Mexico via a channel constructed by the developer of the subdivision. The Division does not intend to stop uses of the navigable waterway by residents of the subdivision or the public. Federal deed restrictions prohibiting future dredging of the waterway will be followed under the Division's management of the submerged land.

Planned Use of Adjacent Land

The majority of developable land adjacent to the park is already developed. The development of all land with development potential adjacent to the property should be anticipated.

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

Uplands in the park are limited to the eastern edge of the property, with the largest area located at the southeastern corner. Primarily mesic flatwoods and smaller areas of maritime hammock will provide a limited opportunity for development of public use facilities and park infrastructure. Trails, picnicking and primitive camping recreation appear to be the most appropriate upland recreational uses for this park. Most of the uplands are seasonally wet or flooded, interspersed fresh and saltwater wetlands will necessitate construction of roads, parking areas and buildings elevated above the natural grade, and numerous boardwalks to connect proposed trails.

Water Area

The predominant natural community of Werner-Boyce Salt Springs State Park is the estuarine tidal marsh. Tidal creeks connected to the Gulf of Mexico and open water areas within the marsh, where connected to the creeks, provide a significant resource for canoeing and kayaking activities. Shoreline fishing opportunities should be made available where access to the shoreline is possible from the uplands of the park. The approximately three miles of shoreline fronting the Gulf of Mexico are not accessible to the public except by watercraft. Seagrass beds, mudflats and mangroves along the shoreline and its utilization as shorebird resting and feeding areas indicate that extensive public uses are not appropriate.

Natural Scenery

The most abundant recreational resource at the state park is its natural scenery. Views of the salt marsh interspersed with hammock communities on outlying fingers and islands of higher ground are exceptional. These qualities are accentuated by the location of the park within a heavily developed area of the state, where vistas undisturbed by manmade structures are rare. Trail and boardwalk facilities to convey visitors into the marsh and elevated overlooks to provide access to the visual resources of the property should be a primary element of future development for this park.

Significant Wildlife Habitat

Due primarily to its urban location, the relatively undisturbed natural communities on this property are important habitat areas for a variety of wildlife. Wildlife observation opportunities should be supported by the development of public facilities and programs for the new state park. Screened wildlife observation platforms should allow viewing while minimizing disturbance to the animals that inhabit the upland and wetland areas of the park. Birdwatching opportunities in this park will be outstanding.

Natural Features

The salt springs, creeks and estuarine tidal marshes of the park are its outstanding natural features. Interpretive programs should provide opportunities for visitors to explore and understand the importance of these features. Although the salt springs have been used in the past as a local “swimming hole”, the limited area they provide and questions regarding safe water quality preclude development of the springs as a public swimming area. The salt springs should be incorporated into public uses in the park for interpretation of karst geology and the historic use of the springs as a salt works during the War Between the States.

Archaeological and Historical Features

The nineteen listed prehistoric and historic sites on the park will provide a basis for interpretive programs to expand visitors’ understanding of human interaction with the natural environment along the upland/saltmarsh boundary. None of the known sites except for the salt springs appears suitable for on-site interpretation. However, the long utilization of this property for hunting, fishing and harvesting of shellfish by prehistoric people will provide subject matter for interpretive signs along trails throughout the project.

Assessment of Use

All legal boundaries, significant natural features, structures, facilities, roads, trails and easements existing in the unit are delineated on the base map (see Base Map).

Specific uses made of the unit are briefly described in the following sections.

Past Uses

Fishing, hunting and swimming in the salt springs have been the primary public uses of the property in the past. Ditching of wetlands has occurred as preparation for development that did not proceed, and to create outlets for stormwater from adjacent developed areas. Unauthorized dumping on the property has occurred in several locations. The dumpsites are being secured and cleaned up by park staff at this time.

The shoreline, grass flats, tidal creeks and open water areas within the saltmarsh community of the new state park have traditionally supported a variety of recreational and commercial uses. Boating, fishing, airboating, canoeing, and kayaking are all activities with followers desiring continued recreational access to the area. The Division of Recreation and Parks will pursue a balanced policy toward water-based recreational activities in the park. The Division’s intent is to facilitate the safe enjoyment of the recreational resources of the park while providing effective protection for its natural and cultural resources.

Visitors who arrive by water will be expected to abide by the rules of the state park. The Division will make efforts to provide information and education regarding park rules and regulations at local boat ramps, through the media, and by other methods. Signage will be provided to mark the park boundaries and to inform visitors of the locations of private property within those boundaries.

Visitors will be expected to behave in ways that protect both the resources of the site and the safety of all users. Division staff will work with representatives of the recreational users of the park to develop visitor management systems that are appropriate for the state park. Visitor management methods may include the designation of general and specific trails, the provision of interpretive signage, outreach programs through print and broadcast media, personal contacts by park staff or volunteers or actions by law enforcement staff, as appropriate. Boating regulations, including speed restrictions and exclusion zones, may be implemented if they are necessary for the Division to fulfill its responsibilities as manager

LEGEND

 US HIGHWAY 19
PARK BOUNDARY

GULF
OF
MEXICO

US HIGHWAY 19



Prepared by:
Florida Department of Environmental Protection
Division of Recreation and Parks
Office of Park Planning
Date: November 28, 2000-BJB
Printed: February 9, 2001
Advisory Group Review Draft

WERNER-BOYCE SALT SPRINGS
STATE PARK

BASE MAP

of the property. If restrictions on boat speeds or exclusion zones are recommended to address resource impacts or safety hazards in the future, public workshops will be held in the local area. The purpose of the workshops will be to explain proposed management actions and receive input on the recommendations before final management decisions are made.

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 Werner-Boyce Salt Springs State Park, the wetland communities, particularly the salt springs themselves and known locations of bald eagle nests have been designated as protected zones (see the Conceptual Land Use Plan).

Existing Facilities

There are no facilities existing on the park at this time.

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 preserve staff monitors conditions to ensure that impacts remain within acceptable levels.

Potential Uses and Proposed Facilities

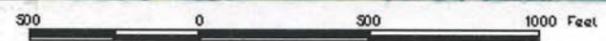
Recreational activities that should be provided at Werner-Boyce Salt Springs State Park include canoeing, kayaking, shoreline fishing, motor boating, hiking, biking and nature trail uses, wildlife observation and picnicking. Interpretative programs should focus on the saltmarsh ecology, wildlife utilization of this habitat, the karst geology evidenced by the salt springs, and the prehistoric human uses of the area evidenced by the variety of known prehistoric cultural sites. A primitive group camp in the southern area of the park and



LEGEND

- * PROPOSED FACILITIES
- PROPOSED DEVELOPMENT AREAS
- PROPOSED OVERLOOKS
- PROPOSED ROAD
- PROPOSED NATURE TRAILS/ BOARDWALKS
- Park boundary(258)

**CONCEPTUAL LAND USE PLAN
 WERNER-BOYCE SALT SPRINGS STATE PARK
 SHEET 2 OF 2**



PREPARED BY: FL DEPARTMENT OF ENVIRONMENTAL PROTECTION
 DIVISION OF RECREATION AND PARKS
 OFFICE OF PARK PLANNING
 MARCH, 2001

canoe-in, hike-in and bike-in primitive campsites in the northern portions of the property are recommended.

Division staff will work with the City of Port Richey and Pasco County in the planning and development of a paved bicycle/pedestrian recreational trail. Where it is feasible, the local greenway may be aligned along the eastern park boundary. Park facilities will be connected to that trail and local roads by paved spurs at each of the entry points to the state park to encourage access to the park by bicyclists and pedestrians. Bicycle racks should be provided at each proposed use area in the park.

The Salt Springs are very small areas of open water that will provide an interesting destination for a trail. In the future development plan for the state park, the springs are not considered viable for public swimming due to the small size, shallow depths, and low shorelines prone to muckiness, and questionable water quality. The Division will work with the local historical society to coordinate placement of a historical marker at the Salt Springs to interpret the use of that feature as a salt works during the War Between the States.

Consideration in this plan is given to the regional demographics of the Pasco County area of Florida. Many of the future clientele of the park are senior residents and visitors. Many will not be capable of more strenuous activities such as canoeing/kayaking long distances or hiking or biking long distances on backcountry trails. With universally accessible trails, boardwalks and elevated observation platforms, however, older persons will have unique opportunities here to surround themselves in the salt marsh community. Wildlife watching opportunities, especially birdwatching, will be promoted through the provision of the nature trail/boardwalk systems with numerous overlooks and screened wildlife blinds.

Public use areas in the state park are divided into southern and northern units, separated by the Westport subdivision, located approximately 4,000 feet north of the southern boundary of the park. The southern area of the park provides the largest area of uplands that will support typical park facilities and infrastructure including picnic areas, interpretive trails, the proposed primitive group camp, a park road and parking areas. To support one of the primary recreational opportunities of the park, access to the saltmarsh creeks and the Gulf shoreline, launches for canoes, kayaks and hand-carried boats are recommended in association with the picnic area and with the group camp in the southern unit. Interpretive trails to the Salt Springs, into the pine flatwoods, and on a long boardwalk providing access across Salt Springs Run into the heart of the salt marsh are proposed to originate from this main use area. Elevated observation platforms, an observation tower, screened wildlife blinds and seating areas will be important elements of the boardwalk and interpretive trail system to provide access to the park's visual resources and to support wildlife observation.

Park staff will work with volunteer representatives of the paddling recreation community and the motor boating community to develop policies and procedures for visitor management. The recreational groups will be encouraged to participate in decisions on designating paddling trails and managing boating activities in the saltmarsh wetlands of the state park. Trails will be designated for canoeing and kayaking, and maps and limited signage will be provided to inform visitors of their locations. As discussed under Past Uses, above, motorized watercraft regulations may be developed, as needed, to protect the natural resources of the park and the safety of all visitors. Safety measures will be developed to make visitors in small boats more visible to operators of motorized boats where the two groups share waterways with limited sight lines.

Great care will be taken to locate all water-based recreational activities in the park in ways that avoid disturbances to sensitive natural areas such as eagle nests, water bird resting, feeding and nesting areas, and areas supporting mangrove vegetation. One eagle nest was discovered in the southern area of the property as this management plan was undergoing final review. All eagle nests on the park will be mapped during the design of facilities, and facilities will be designed to comply with best management practices for their protection. The guidelines established by the US Fish and Wildlife Service regarding separation of human activities from active nests will be followed. Buffer zones of 1,500 feet during nesting season and 750 feet during the rest of the year will be established and maintained around any active nesting trees. The locations of facilities depicted in the conceptual land use plan are outside these recommended buffer distances from the known nest tree in the southern area of the park.

Public access to the northern unit of the park is recommended from two entry points where smaller parking and picnic areas will anchor a system of shared use and interpretive trails exploring the flatwoods, hammock and salt marsh communities. Again, observation platforms and interpretive signs are recommended to provide access to the visual resources and watchable wildlife opportunities of the park and interpret the natural and cultural resources preserved here.

The northernmost access point should provide parking, restroom and picnic facilities and will include two medium and one large picnic shelter, providing group picnicking opportunities for families and large groups. Access to over 5 miles of shared use upland trails, approximately 2,500 feet of wetland boardwalks, three low observation platforms and an observation tower will be provided in this area. Universally accessible pathways will connect the parking area and developed facilities. With the exception of an interpretive center, these facilities will satisfy the public use requirements of the Pasco County management plan for the Werner Boyce Gulf Coast Preserve Florida Communities Trust acquisition, which were transferred with the land parcel to the Division in the acquisition process for the new state park. Future management plans for the new state park will consider the potential of this park to support a large interpretive center, as discussed in the County's management plan.

A central trailhead is recommended for access to the extensive trail system proposed for the northern unit. This will be the site of development of a basic amenity project to provide access to the state park in the near future. A small parking area, restroom and picnic shelter will constitute the proposed trailhead.

Recreation Facilities

North Unit

Medium picnic shelters—2
 Large picnic shelter—1
 Shared use trail—5 mi.
 Boardwalks —2,500 ft.
 Interpretive kiosk and signs
 Observation platforms—3
 Observation tower—1

Central Trailhead

Interpretive kiosk—1
 Small picnic shelter—1
 Observation tower—1

South Unit

Canoe launch

South Unit

Large picnic shelters—2
 Medium picnic shelters—6
 Interpretive kiosks—3
 Interpretive signs—10
 Salt marsh boardwalk—1400 ft.
 Observation platforms—3
 Observation tower—1
 Interpretive trails and
 boardwalks—2 mi.

Primitive Group Camp
Large picnic shelter—1

Canoe launch
Fire rings—4

Support Facilities

Typical state park support facilities will be needed to put the park into full operation. A ranger station will be located on the main park entrance drive of the South Unit. Two ranger residences and a maintenance shop complex should be located in the central portion of the South Unit, and a small shop and storage area should be provided at the North Unit. Due to the extensive Gulf shoreline, wetland and marsh creek area to be managed by park staff, a dock for park and law enforcement watercraft should be provided in association with these support facilities. A third ranger residence should be provided at the North Unit for nighttime security for that area of the park.

Sewage disposal at this unit may be complicated by the high water table and proximity of development sites to wetland natural communities. Sewage generated from facilities located in the southern use area of the park will be disposed through a local municipal sewage collection and treatment system. Facilities at the proposed central trailhead and at the northern use area will utilize best available technologies for on-site sewage systems, such as composting toilets, small package treatment plants or septic tanks and drainfields located the required distance above the water table.

North Unit

Parking area—30 cars
Medium picnic area restroom
Ranger residence
Park road, bike path
and gate—0.1 mi.

Utilities

Central Trailhead

Parking—20 cars
Composting restroom
Park road, bike path, and gate

South Unit

Ranger station
Medium picnic area restrooms—2
Medium bathhouse—Group Camp
Maintenance shop—4 bay
Equipment shelter—3 bay
Flammable storage building
Dock—2 slips
Parking areas—3 areas, up to 100 cars
Park road and bike path—1 mi.)
Gates, fencing and landscaping
Ranger residence
Utilities

Facilities Development

Preliminary cost estimates for the 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.

Table 1—Existing Use and Optimum Carrying Capacity

Activity/Facility	Existing Capacity		Proposed Additional Capacity		Estimated Optimum Capacity	
	One Time	Daily	One Time	Daily	One Time	Daily
Boating*						
Canoe, Kayak, Small boat			80	160	80	160
Trails and Boardwalks						
Interpretive			40	80	40	80
Shared use			40	80	40	80
Picnicking			160	320	160	320
Primitive Group Camp			60	60	60	60
TOTALS			380	700	380	700

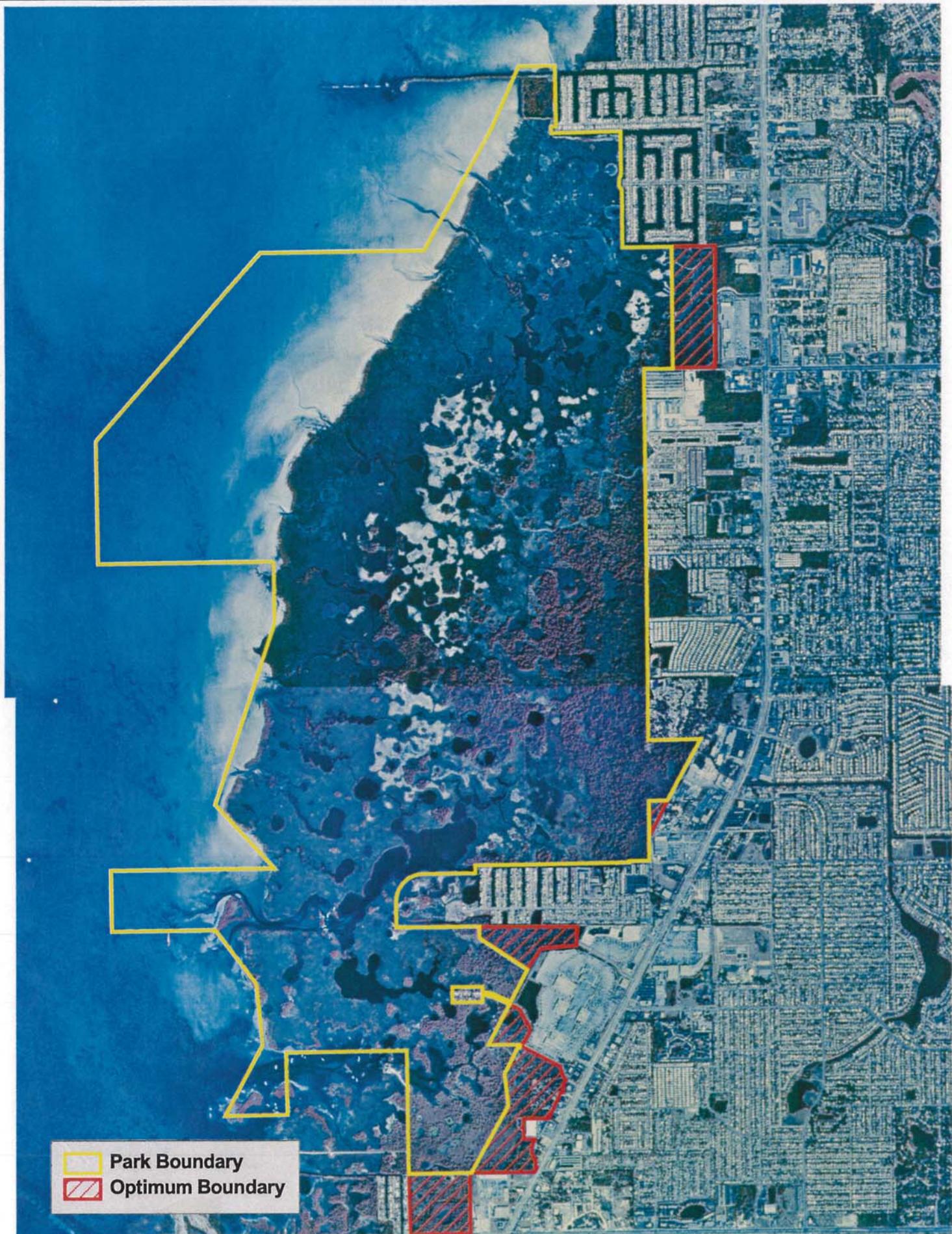
Note: Carrying capacity guidelines for motorized boating originating from outside park boundaries cannot be provided at this time. Division staff will work with representatives of the boating, offshore fishing and paddling recreation communities to develop management policies and procedures for boating activities, as discussed in the body of the Land Use Component of this plan.

Optimum Boundary

As additional needs are identified through park use, development, research, and as adjacent land uses change on private properties, modification of the unit's optimum boundary may occur for the enhancement of natural and cultural resources, recreational values, and management efficiency.

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

The optimum boundary map reflects lands identified for direct management by the Division as part of the park. These parcels may include public as well as privately owned lands that improve the continuity of existing park lands, provide additional natural and cultural resource protection, and/or allow for future expansion of recreational activities. At this time, no lands are considered surplus to the needs of the park.



 Park Boundary
 Optimum Boundary

1000 0 1000 2000 Feet

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



WERNER-BOYCE SALT SPRINGS
STATE PARK

OPTIMUM BOUNDARY
MAP

Addendum 1—Acquisition History

Werner-Boyce Salt Springs State Park Acquisition History

Purpose and Sequence of Acquisition

The State of Florida acquired Werner-Boyce Salt Springs State Park for the conservation and protection of natural resources and for the establishment and operation of natural resource-based public outdoor recreation and related purposes. The Department of Environmental Protection, Division of Recreation and Parks (DEP/Division) manages Werner-Boyce Salt Springs State Park under leases from the Board of Trustees and Pasco County.

On December 31, 1992, the Board of Trustees purchased its portion of the Werner-Boyce Salt Springs State Park property under P2000/CARL program and leased it to Pasco County. The county relinquished its leasehold interest in the property on February 15, 2000. Subsequently, the Board of Trustees leased the property to DEP/Division. This lease is for a period of fifty (50) years, which expires on June 30, 2050.

Pasco County obtained title to its portion of the Werner-Boyce Salt Springs State Park property, which is also known as Werner Boyce Preserve, on September 30, 1994. Half of the acquisition cost was funded under the Florida Communities Trust/P2000 program. The remaining half of the acquisition cost was provided in the form of an in-kind donation. On July 1, 2000, Pasco County leased its portion of the Werner-Boyce property to DEP/Division. The lease is for a period of five (5) years and will expire on June 30, 2005.

According to the leases from Pasco County and the Trustees, the Division will manage Werner-Boyce Salt Springs State Park only for the conservation and protection of natural and historical resources and for resource-based public outdoor recreation which is compatible with the conservation and protection of the property.

Title Interest

The Trustees and Pasco County hold fee simple title to Werner-Boyce Salt Springs State Park respectively.

Special Conditions on Use

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

Outstanding Reservations

Following is a list of outstanding rights, reservations, and encumbrances which apply to Werner-Boyce Salt Springs State Park.

Werner-Boyce Salt Springs State Park

Acquisition History

Instrument:	Warranty Deed
Instrument Holder:	Pasco County
Beginning Date:	September 30, 1994
Ending Date:	There Is No Specific Ending Date Given.
Outstanding Rights, Uses, Etc.:	The deed is subject to a certain Florida Community Trust Grant Award Agreement terms and conditions; a certain drainage easement as recorded in Circuit Court Minute Book I, page 350; a certain reservation to phosphate, mineral, metal and petroleum, as contained in deed recorded in record book 296, page 347; and a certain drilling lease as recorded in Deed Book 139, page 352, all being in Pasco County.
Instrument:	Warranty Deed
Instrument Holder:	Trustees
Beginning Date:	December 31, 1992
Ending Date:	There Is No Specific Ending Date Given.
Outstanding Rights, Uses, Etc.:	The deed is subject to a road right of way granted to Pasco County as recorded in book 951, page 1999 and a certain non-exclusive easement for access, recorded in book 950, page 186.

Addendum 2—References Cited

Werner - Boyce Salt Springs State Park
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Addendum 3—Soils Descriptions

Werner - Boyce Salt Springs State Park
Soils Descriptions

(11) Adamsville fine sand - This nearly level, somewhat poorly drained soil is on low broad flats that are less than 2 feet higher in elevation than the adjacent sloughs. Individual areas are irregular in shape and range from 5 to 200 acres. Slopes are less than 2 percent.

Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is grayish brown fine sand 5 inches thick. The underlying material to a depth of 80 inches or more is fine sand. It is very pale brown to a depth of about 23 inches, light gray to a depth of about 57 inches, and white below 57 inches.

Included with this soil in mapping are small areas of Narcoossee, Tavares, and Zolfo soils. Also included, along rivers, are a few areas of soils that occasionally are flooded. The included soils generally make up less than 10 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 20 to 40 inches for 2 to 6 months; but it may rise to within 20 inches of the surface for less than 2 weeks during very wet seasons. It recedes to a depth of more than 40 inches during dry periods. In this soil, available water capacity is low to very low. Natural fertility is low. Permeability is rapid.

A large part of this soil is in natural vegetation of slash pine, longleaf pine, laurel, bluejack, turkey oak, water oak, and an understory of sawpalmetto and pineland threeawn.

(17) Immokalee fine sand - This nearly level, poorly drained soil is in broad flatwood areas. Individual areas are somewhat oblong in shape. Slopes are smooth to convex and range from 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 4 inches thick. The subsurface layer is gray sand to a depth of about 16 inches and white fine sand to a depth of 33 inches. The subsoil is dark reddish brown fine sand in the upper 12 inches and dark brown fine sand in the lower 17 inches. Below the subsoil, to a depth of 80 inches or more, is very pale brown fine sand.

Included with this soil in mapping are similar soils that differ by having a dark-colored surface layer thicker than 8 inches. Also included are small areas of Myakka and Pomona soils. The included soils make up about 15 percent of the map unit.

The water table is at a depth of less than 10 inches for 2 months in most years and is between depths of 10 and 40 inches for a period of more than 8 months each year. It is at a depth of more than 40 inches during dry periods. The available water capacity is medium in the subsoil but very low or low in the other layers. Permeability is rapid in the surface and subsurface layers and in the substratum and is moderate in the subsoil. Internal drainage and runoff are slow. Natural fertility is low.

Areas that have adequate drainage are used mainly for improved pasture. Other areas are used for range or remain in forest. The natural vegetation is longleaf pine, slash pine, and an undergrowth of sawpalmetto, running threeawn, and scattered fetterbush.

(19) Paola fine sand, 0 to 8 percent slopes – This excessively drained, nearly level to sloping soil is in the sandhill areas of the county. Individual areas are irregular in shape. Slopes are smooth to concave.

Typically, the surface layer is gray fine sand about 3 inches thick. The subsurface layer is white fine sand and extends to a depth of about 26 inches. The subsoil is brownish yellow fine sand that has a few tongues of white fine sand from the subsurface layer mixed with it. Below a depth of 57 inches, and extending to a depth of 80 inches or more, is very pale brown fine sand.

Included with this soil in mapping are small areas of Astatula, Candler, and Tavares soils. The included soils make up less than 10 percent of the map unit.

The water table is below a depth of 72 inches. Both the available water capacity and natural

Werner - Boyce Salt Springs State Park Soils Descriptions

fertility are very low. Permeability is very rapid throughout.

Few areas of this soil have been cleared. The native vegetation is sand pine, scrub live oak, scattered turkey oak, bluejack oak, and an undergrowth of scattered sawpalmetto, sand heath, cacti, mosses, and lichens.

(20) Aripeka fine sand - This nearly level, somewhat poorly drained soil is on low ridges adjacent to the saltwater marsh. Individual areas are commonly long and narrow and are parallel to the marsh. Slopes are less than 2 percent.

Typically, the surface layer is dark grayish brown fine sand about 2 inches thick. The subsurface layer consists of fine sand and is 10 inches thick; it is grayish brown in the upper 7 inches and white in the lower 3 inches. The subsoil begins at a depth of 12 inches and extends to a depth of 26 inches. It is yellowish brown fine sand in the upper 5 inches, strong brown fine sandy loam in the next 6 inches, and strong brown sand clay loam, which contains limestone cobbles, in the lower 3 inches. Hard, white and yellow limestone begins at a depth of 26 inches. Solution holes that vary in depth and diameter are in the limestone.

Included with this soil in mapping are similar soils which have a subsoil texture of sand clay, are more poorly drained, have surface and subsurface layers that are more than 20 inches thick, or have limestone within a depth of 20 inches. The included soils make up about 25 percent of the map unit.

The water table is at a depth of 18 to 30 inches for 2 to 6 months and at a depth of 30 to 60 inches for 6 months or more during most years. During severe storms, this soil may be very briefly flooded by storm tides. The available water capacity is low in the surface and subsurface layers and is medium in the subsoil. Natural fertility is low. Permeability is rapid in the surface and subsurface layers and is moderately rapid in the subsoil.

The native vegetation is longleaf and slash pines, live oak, southern redcedar, and cabbage palm, with an undergrowth dominantly of sawpalmetto, pineland threeawn, and a few scattered gallberry.

(26) Narcoossee fine sand – This somewhat poorly drained soil is on low knolls and ridges in the flatwoods. Individual areas are irregular in shape. Slopes are less than 2 percent.

Typically, the surface layer is very dark gray fine sand about 3 inches thick. The subsurface layer is grayish brown fine sand about 6 inches thick. The subsoil is fine sand about 9 inches thick and a layer of light yellowish brown fine sand, which extends to a depth of 62 inches. From 62 to 75 inches is pale brown fine sand.

Included with this soil in mapping are small areas of Adamsville and Smyrna soils. Also included are very similar soils which have a second dark-colored sandy subsoil. This second subsoil is commonly at a depth of 75 inches or more. The included soils make up about 20 percent of the map unit.

In most years, under natural conditions, the water table is at a depth of 2 to 3.5 feet for 4 to 6 months. During extended dry periods, the water table recedes to a depth of more than 60 inches. During the wet season, after heavy rains, the water table may briefly rise above a depth of 2 feet. The available water capacity is very low or low. Natural fertility is low. Permeability is rapid in all layers except in the subsoil, which has moderately rapid permeability.

A large part of the acreage of this soil is in natural vegetation of slash pine, longleaf pine, live oak, laurel oak, willow oak, water oak, and an understory of greenbrier, sawpalmetto, pineland threeawn, creeping bluestem, lovegrass, and lopsided indiagrass.

(29) Lacoossee complex - This complex consists of Lacoossee fine sandy loam and other similar nearly level, poorly drained soils in low, broad tidal marsh areas. These soils are so intermingled

Werner - Boyce Salt Springs State Park Soils Descriptions

that they can not be separated at the scale selected for mapping. Individual areas of the complex are irregular in shape. Slopes are smooth to concave and range from 0 to 2 percent.

Lacoochee fine sandy loam makes up about 40 to 60 percent of each mapped area. Typically, the surface layer is light brownish gray fine sandy loam about 8 inches thick. It is high in carbonates. The subsurface layer is dark grayish brown loamy fine sand about 3 inches thick. The subsoil is brownish yellow fine sand to a depth of about 18 inches. Below 18 inches is white soft limestone.

About 20 to 40 percent of the complex consists of soils that are similar to the Lacoochee soil except that limestone is at a depth of slightly less than 40 inches. In many places, these similar soils have a loamy subsoil. About 12 percent of the complex consists of soils that are similar to the Lacoochee soil except that they have a surface layer that is not calcareous. About 10 percent of the complex is scattered small areas of Aripeka and Homosassa soils. Limestone boulders are common on the surface.

The water table fluctuates with the tide, and the soil is flooded during normal high tides. The available water capacity is high in the surface layer and medium below. Permeability is moderate in the surface layer and moderately rapid below.

The natural vegetation is seashore saltgrass, needlegrass rush, and gulf cordgrass. Vegetation is commonly sparse.

(31) Udalfic Arents – Urban land complex – This complex consists of small areas of nearly level Udalfic Arents and Urban land that are so intermingled they can not be separated at the scale used for mapping. The complex is in the western part of the county, near the Gulf of Mexico. Slopes are predominantly 0 to 2 percent, but they are much steeper along canal banks.

About 40 to 50 percent of the complex consists of Udalfic Arents. Udalfic Arents are highly variable within short distances, but one of the more common profiles is mixed black fine sand and dark gray, gray, and brownish yellow sand loam, and sandy clay in the upper 30 inches. The next 15 inches is a mixture of brownish yellow sandy clay loam and black sand containing many fragments of limestone, which range up to 3 inches in diameter. Below this is a layer of grayish brown loamy fine sand 15 inches thick. Below this is a layer of brown sandy loam 11 inches thick. White limestone rock is at a depth of 61 inches.

About 30 to 45 percent of the complex is Urban land, which is covered by shopping centers, parking lots, houses, buildings, streets, sidewalks, and other related structures.

Included with this complex in mapping are sanitary landfill sites. The mixed soil materials covering the waste material are Udalfic Arents.

(38) Urban land – In this miscellaneous area, the original soil has been modified through cutting, grading, filling, and shaping for urban development. Major soil properties that originally limited urban uses have been overcome in an acceptable manner. Urban facilities such as paved parking areas, streets, industrial buildings, houses, shopping centers, and underground utilities have been constructed on 75 percent or more of the mapped area. In the places not covered by urban facilities, the soils generally have been so altered that identification is not feasible.

Urban land is primarily in downtown areas, shopping districts, industrial parks, and along main thoroughfares of cities and towns. It is also in isolated shopping centers and small business areas at intersections of primary roads. In places, there are small, less intensively developed areas and small areas of unidentifiable soils.

(39) Chobee soils, frequently flooded - These nearly level, very poorly drained soils are in swamps along the flood plains of most of the major rivers and streams in the county. Most areas of the unit are long and narrow and tend to parallel the streams and rivers. Some large areas lie slightly removed from the streams, but they are connected to the streams by narrow flood channels.

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The unit consists of Chobee soils and closely similar soils that do not occur in a regular and repeating pattern. One or all of these soils make up about 75 percent of each mapped area. Individual areas of each soil are large enough to map separately in most map units. However, because of inaccessibility and present and predicted use they were not separated in mapping.

In one of the more typical pedons of Chobee soils, the surface layer is fine sandy loam about 11 inches thick. It is black in the upper 6 inches and very dark gray in the lower part. The subsoil is calcareous and extends to a depth of about 56 inches. In the upper 14 inches it is gray sandy clay loam which has olive brown mottles in the lower part. The substratum, extending from a depth of 56 inches to 80 inches or more, is mixed greenish gray and light greenish gray calcareous sandy clay loam.

Under natural conditions, the water table of the Chobee soils is within 10 inches of the surface for more than 6 months in most years. Flooding occurs frequently during the rainy season. The duration and extent of flooding are variable and are related directly to the intensity and frequency of rainfall. In most years, the lowest lying area and the areas along the streams are flooded during the rainy season. During periods of intense, long-lasting rainfall, nearly all of the area of these soils may be flooded. Flooding normally lasts from 1 to 4 months. Runoff and internal drainage are slow. The available water capacity is medium, and natural fertility is low. Permeability is moderately rapid in the surface layer and slow to very slow in the subsoil.

Some of the soils similar to Chobee soils are on a similar landscape position and are subject to the same flooding. Typically, the surface layer is black loamy fine sand 18 inches thick. Below this, to a depth of 80 inches or more, is very dark gray and light gray sandy loam. These soils have a water table within a depth of 10 inches for more than 6 months during most years. Flooding occurs frequently during the rainy season. The available water capacity is medium in the surface layer and low in the subsoil. Permeability is moderately rapid in the surface layer and moderate in the other layers.

Other soils similar to Chobee soils differ by having limestone at a depth of about 320 inches. These soils are in small areas scattered throughout the map unit but are most significant in the southeastern part of the county. Typically, the surface layer is black and very dark grayish brown fine sand about 10 inches thick. Below this is a layer of dark gray fine sand about 4 inches thick. The subsoil extends from a depth of 14 inches to 30 inches and is light gray sandy clay loam. Hard limestone is at a depth of 30 inches. These similar soils have a water table within a depth of 10 inches for more than 6 months during most years. They are subject to frequent flooding during the rainy season. The available water capacity is medium to low in all layers above the rock. Permeability is rapid in the sandy layers and moderate in the subsoil.

Other soils similar to Chobee soils are slightly less subject to flooding but are still frequently flooded. These similar soils are very slightly elevated on the landscape and are flooded for slightly shorter periods. Typically, the surface layer is black fine sand about 12 inches thick. Below this, and extending to a depth of about 30 inches, is grayish brown fine sand. Next is about 9 inches of dark gray sandy clay loam. Below this and extending to a depth of 80 inches or more is dark gray and gray sandy loam. The water table of these similar soils is at a depth of less than 10 inches for more than 6 months in most years. These soils are frequently flooded. The available water capacity is medium in the surface layer, low in the subsurface layer, and medium in the subsoil. Permeability is rapid in the surface and subsurface layers and is moderately slow in the subsoil.

Minor soils make up about 25 percent of the mapped areas. Pineda, Nobleton, and Zephyr soils are scattered throughout most areas but are most significant in the eastern and south-central parts of the county. Okeelanta and Terra Ceia soils are common minor soils west of U.S. Highway 41.

Nearly all the acreage of this map unit remains in natural vegetation of water oak, cypress, elm, ash, hickory, red maple, and sweetgum. The understory vegetation is water-tolerant plants such as

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maidencane, sawgrass, swamp primrose, buttonbush, smartweed, and sedges.

(47) Weekiwachee muck - This nearly level, very poorly drained organic soil is in the tidal marsh. Individual areas are irregular in shape. Slopes are less than 1 percent.

Typically, the surface is black muck about 31 inches thick. Beneath the muck is dark gray fine sand about 8 inches thick. Below this, to a depth of 44 inches, is white soft limestone surrounding cobbles and boulders of hard limestone. Below a depth of 44 inches is hard limestone that can be chipped but not dug with a spade.

Included with this soil in mapping are small areas of Lacoochee and Homosassa soils. The included soils make up about 15 percent of the map unit.

The water table fluctuates with the tide. This soil is flooded during normal daily high tides. The available water capacity is very high in the organic layers and medium in the mineral layers. Natural fertility is high, and permeability is moderately rapid.

The native vegetation is dominantly needlegrass rush, seashore saltgrass, marshhay cordgrass, big cordgrass, and smooth cordgrass.

(55) Homosassa mucky fine sandy loam - This nearly level, very poorly drained soil is in the tidal marsh. Individual areas are irregular to elongated in shape. Slopes are less than 1 percent.

Typically, the surface layer is 16 inches thick. The upper 11 inches is very dark gray mucky fine sandy loam, and the lower 5 inches is very dark grayish brown loamy fine sand. The next layer is grayish brown loamy fine sand 9 inches thick, and below this is a layer of light brownish gray loamy fine sand 3 inches thick. Between depths of 28 and 37 inches is light gray, soft limestone.

Included with this soil in mapping are large areas of similar soils that differ mainly by having fine sandy loam or mucky sandy clay loam texture in the surface layer. Also included are small areas of Lacoochee and Weekiwachee soils. The included soils make up about 40 percent of the mapped area.

The water table fluctuates with the tide. The soil is flooded daily during normal high tides. The available water capacity is very high in the surface layer and is medium below. Permeability is moderately rapid to rapid throughout the soil.

The native vegetation is predominantly seashore saltgrass, needlegrass rush, smooth cordgrass, sawgrass, and marshhay cordgrass.

(57) Vero Variant fine sand – This nearly level, poorly drained soil is in the flatwoods. Individual areas are relatively long and narrow. Areas of this soil occur in two parts of the county. The largest areas are west of Highway 19. These are rapidly being reduced in extent by mining operations for limestone. The other areas of this soil are in the Withlacoochee State Forest in the northeastern part of the county. Here, delineations are small and scattered. Slopes range from 0 to 2 percent.

Typically, the surface layer is fine sand about 9 inches thick. It is black in the upper 4 inches and dark gray in the lower 5 inches. The subsurface layer is gray fine sand about 7 inches thick. The upper part of the subsoil is fine sand about 10 inches thick. It is dark reddish brown in the upper 3 inches, dark brown in the next 4 inches, and brown in the lower 3 inches. Separating the upper and lower parts of the subsoil is a layer of light yellowish brown fine sand about 3 inches thick. Next is strong brown fine sandy loam to a depth of 35 inches and below that, strong brown sandy clay loam to a depth of about 39 inches. Soft, white limestone is at a depth of 39 inches, and hard limestone is at a depth of about 45 inches.

Included with this soil in mapping are similar soils that differ by having a loamy subsoil within 20 inches of the surface. Also included are small areas of Aripeka soils. The included soils make up

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about 30 percent of the map unit.

In most years, the water table is at a depth of 10 to 40 inches for more than 5 months. It is at a depth of less than 10 inches for less than 45 days in wet seasons, and it is at a depth of more than 40 inches during very dry seasons. Areas of this soil located west of Highway 19 may be covered by water for short periods after severe storms. The available water capacity is very low or low in the surface and subsurface layers and is medium in the subsoil. Permeability is rapid in the surface layer, the subsurface layer, and the layer between the upper and lower parts of the subsoil. It is moderate in the subsoil. Natural fertility is low.

Native vegetation is longleaf pine, slash pine, cabbage palm, and an undergrowth that is dominantly sawpalmetto, pineland threeawn, inkberry, lopsided indiagrass, chalky bluestem, creeping bluestem, hairy panicum, and fetterbush lyonia.

Addendum 4—Plant And Animal List

Werner - Boyce Salt Springs State Park

Plants

Common Name	Scientific Name	Primary Habitat (For Designated Species)
Pineland acacia	<i>Acacia pinetorum</i>	
Red maple	<i>Acer rubrum</i>	
Giant leather fern	<i>Acrostichum danaeifolium</i>	7, 35, 63
Saltmarsh foxglove	<i>Agalinus maritima</i>	
Common Ragweed	<i>Ambrosia artemisiifolia</i>	
Pepper vine	<i>Ampelopsis arborea</i>	
Bushy bluestem	<i>Andropogon glomeratus</i>	
Broomsedge bluestem	<i>Andropogon virginicus</i>	
Chalky bluestem	<i>Andropogon virginicus var. glaucus</i>	
Marlberry	<i>Ardisia escallonioides</i>	
Jack-in-the-pulpit	<i>Arisaema triphyllum</i>	
Wiregrass	<i>Aristida beyrichiana</i>	
Tall threeawn	<i>Aristida patula</i>	
Bottlebrush threeawn	<i>Aristida spiciformis</i>	
Bigleaf pawpaw	<i>Asimina obovata</i>	
Aster	<i>Aster sp.</i>	
Saltmarsh aster	<i>Aster subulatus</i>	
Black mangrove	<i>Avicennia germinans</i>	
Saltwater false-willow	<i>Baccharis angustifolia</i>	
Silverling	<i>Baccharis glomeruliflora</i>	
Salt Myrtle; Saltbush; Groundsel	<i>Baccharis halimifolia</i>	
Herb-of-grace	<i>Bacopa monnieri</i>	
Saltwort	<i>Batis maritima</i>	
Rattan vine	<i>Berchemia scandens</i>	
Beggar tick	<i>Bidens alba</i>	
Swamp fern	<i>Blechnum serrulatum</i>	
False nettle	<i>Boehmeria cylindrica</i>	
Oxeye daisy	<i>Borrichia frutescens</i>	
Paper mulberry *	<i>Broussonetia papyrifera</i>	
American beautyberry	<i>Callicarpa americana</i>	
Deer tongue	<i>Carphephorus sp.</i>	
Australian pine *	<i>Casuarina equisetifolia</i>	
Coastal sandspur	<i>Cenchrus incertus</i>	
Coinwort	<i>Centella asiatica</i>	
Camphortree *	<i>Cinnamomum camphora</i>	
Yellow thistle	<i>Cirsium horridulum</i>	
Sawgrass	<i>Cladium jamacience</i>	
Wild taro *	<i>Colocasia esculenta</i>	
Buttonwood	<i>Conocarpus erectus</i>	
Swamp dogwood	<i>Cornus foemina</i>	
String lily	<i>Crinum americanum</i>	
Rabbit bells	<i>Crotolaria spp.</i>	
Gulfcoast swallowwort	<i>Cyanchum angustifolium</i>	
Bermuda grass *	<i>Cynodon dactylon</i>	
Fragrant flatsedge	<i>Cyperus odoratus</i>	
Variable witchgrass	<i>Dicanthelium commutatum</i>	
Witchgrass	<i>Dicanthelium ensifolium</i>	
Air potato *	<i>Dioscorea bulbifera</i>	
Persimmon	<i>Diospyros virginiana</i>	

* Non-native Species

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Plants

Common Name	Scientific Name	Primary Habitat (For Designated Species)
Saltgrass	<i>Distichilis spicata</i>	
Gulfcoast spikerush	<i>Eleocharis cellulosa</i>	
Canada spikerush	<i>Eleocharis geniculata</i>	
Florida elephant's foot	<i>Elephantopus elatus</i>	
Tampa butterfly orchid	<i>Encyclia tampensis</i>	35
Green fly orchid	<i>Epidendrum conopseum</i>	7
Coralbean	<i>Erythrina herbacea</i>	
White stopper	<i>Eugenia axillaris</i>	
Dog fennel	<i>Eupatorium capillifolium</i>	
Semaphore thoroughwort	<i>Eupatorium mikanioides</i>	
Lateflowering thoroughwort	<i>Eupatorium serotinum</i>	
Saltmarsh fingergrass	<i>Eustachys glauca</i>	
Marsh gentian; Seaside gentian	<i>Eustoma exaltatum</i>	
Flat-topped goldenrod	<i>Euthamia caroliniana</i>	
Marsh fimbry	<i>Fimbristylis spadicea</i>	
Upland swampprivet	<i>Forestiera ligustrina</i>	
Florida swampprivet	<i>Forestiera segregata</i>	
Elliott's milkpea	<i>Galactia elliotii</i>	
Tampa vervain	<i>Glandularia tampensis</i>	
Toothpetal false reinorchid	<i>Habenaria floribunda</i>	
Shoalgrass	<i>Halodule wrightii</i>	
Narrowleaf sunflower	<i>Helenianthus angustifolia</i>	
Sneezeweed	<i>Helenium amarum</i>	
Camphorweed	<i>Heterotheca subaxillaris</i>	
Manyflower marshpennywort	<i>Hydrocotyle umbellata</i>	
St. Andrew's-cross	<i>Hypericum hypericoides</i>	
Four-petaled St. John's wort	<i>Hypericum tetrapetalum</i>	
Musky mint	<i>Hyptis alata</i>	
Carolina holly	<i>Ilex ambigua</i>	
Dahoon holly	<i>Ilex cassine</i>	
Yaupon holly	<i>Ilex vomitoria</i>	
Cogon grass *	<i>Imperata cylindrica</i>	
Hairy indigo *	<i>Indigofera hirsuta</i>	
Saltmarsh morning glory	<i>Ipomoea sagittata</i>	
Virginia willow	<i>Itea virginica</i>	
Bigleaf sumpweed; Marsh elder	<i>Iva frutescens</i>	
Piedmont marsh elder	<i>Iva microcephala</i>	
Needle rush; Black rush	<i>Juncus roemerianus</i>	
Freshwater rushes	<i>Juncus spp.</i>	
Southern red cedar	<i>Juniperus virginiana</i>	
Virginia saltmarsh mallow	<i>Kosteletzkya virginica</i>	
White mangrove	<i>Lagnuncularia racemosa</i>	
Lantana; Shrub verbena *	<i>Lantana camara</i>	
Duckweed	<i>Lemna sp.</i>	
White leadtree *	<i>Leucanea leucocephala</i>	
Blazing stars	<i>Liatris spp.</i>	
Carolina sealavendar	<i>Limonium carolinianum</i>	
Mexican primrose-willow	<i>Ludwigia octovalvis</i>	
Peruvian primrose-willow	<i>Ludwigia peruviana</i>	

* Non-native Species

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Plants

Common Name	Scientific Name	Primary Habitat (For Designated Species)
Creeping primrose-willow	<i>Ludwigia repens</i>	
Christmas berry	<i>Lycium carolinianum</i>	
Staggerbush	<i>Lyonia ferruginea</i>	
Fetterbush	<i>Lyonia lucida</i>	
Wand loosestrife	<i>Lythrum lineare</i>	
Wild bushbean *	<i>Macroptilium lathyroides</i>	
Southern magnolia	<i>Magnolia grandifolia</i>	
Sweetbay	<i>Magnolia virginiana</i>	
Chinaberry tree *	<i>Melia azedarach</i>	
White sweet clover	<i>Melilotus alba</i>	
Climbing hempvine	<i>Mikania scandens</i>	
Shoregrass; Keygrass	<i>Monanthochloe littoralis</i>	
Red mulberry	<i>Morus rubra</i>	
Muhly grass	<i>Muhlenbergia capillaris</i>	
Banana *	<i>Musa paradisiaca</i>	
Waxmyrtle	<i>Myrica cerifera</i>	
Wild Boston fern	<i>Nephrolepis exaltata</i>	
Oleander *	<i>Nerium oleander</i>	
Swamp tupelo	<i>Nyssa sylvatica var. biflora</i>	
Prickly pear	<i>Opuntia humifusa</i>	
Tuna *	<i>Opuntia sp.</i>	
Erect prickly pear	<i>Opuntia stricta</i>	7, 8
Scrub wild olive	<i>Osmanthus megacarpus</i>	
Yellow wood sorrel	<i>Oxalis stricta</i>	
Skunkvine *	<i>Paederia foetida</i>	
Torpedo grass *	<i>Panicum repens</i>	
Redtop panicum	<i>Panicum rigidulum</i>	
Switchgrass	<i>Panicum virgatum</i>	
Muscadine	<i>Parthenocissus quinquefolia</i>	
Seashore paspalum	<i>Paspalum distichum</i>	
Yellow passionflower	<i>Passiflora lutea</i>	
Corkystem passionflower	<i>Passiflora suberosa</i>	
Swampbay	<i>Persea palustris</i>	
Golden polypoidy	<i>Phlebodium aureum</i>	
Mistletoe	<i>Phorodendron leucarpum</i>	
Groundcherry	<i>Physalis sp.</i>	
Pokeweed; Pokeberry	<i>Phytolacca americana</i>	
Small butterwort	<i>Pinguicula pumila</i>	
Sand pine	<i>Pinus clausa</i>	
Longleaf pine	<i>Pinus palustris</i>	
Water lettuce *	<i>Pistia stratiotes</i>	
Resurrection fern	<i>Pleopeltis polypodioides</i>	
Rosy camphorweed	<i>Pluchea rosea</i>	
Painted leaf	<i>Poinsettia heterophylla</i>	
Boykin's milkwort	<i>Polygala boykinii</i>	
Dwarf bachelor's buttons	<i>Polygala nana</i>	
Swamp smartweed	<i>Polygonum hydropiperoides</i>	
Wild coffee	<i>Psychotria nervosa</i>	
Bracken fern	<i>Pteridium aquilinum</i>	

* Non-native Species

Werner - Boyce Salt Springs State Park

Plants

Common Name	Scientific Name	Primary Habitat (For Designated Species)
Blackroot	<i>Pterocaulon virgatum</i>	
Chapman's oak	<i>Quercus chapmanii</i>	
Sand live oak	<i>Quercus geminata</i>	
Laurel oak; Diamond oak	<i>Quercus laurifolia</i>	
Dwarf live oak	<i>Quercus minima</i>	
Myrtle oak	<i>Quercus myrtifolia</i>	
Water oak	<i>Quercus nigra</i>	
Live oak	<i>Quercus virginiana</i>	
Myrsine	<i>Rapanaea punctata</i>	
Red mangrove	<i>Rhizophora mangle</i>	
Winged sumac	<i>Rhus copallinum</i>	
Starrush whitetop	<i>Rhynchospora colorata</i>	
Sandyfields beaksedge	<i>Rhynchospora megalocarpa</i>	
Millet beaksedge	<i>Rhynchospora miliacea</i>	
Southern dewberry	<i>Rubus trivalis</i>	
Widgeon grass	<i>Ruppia maritima</i>	
Cabbage palm	<i>Sabal palmetto</i>	
Sugarcane plumegrass	<i>Saccharum giganteum</i>	
Bulltongue arrowhead	<i>Sagittaria lancifolia</i>	
Glasswort	<i>Salicornia perrenis</i>	
Carolina willow	<i>Salix caroliniana</i>	
Water pimpernel	<i>Samolus ebracteatus</i>	
Brazilian pepper *	<i>Schinus terebinthifolius</i>	
Black bogrush; Black sedge	<i>Schoenus nigricans</i>	
Bulrush	<i>Scirpus validus</i>	
Saw palmetto	<i>Serenoa repens</i>	
Sesbans	<i>Sesbania spp.</i>	
Seapurslane	<i>Sesuvium portulacastrum</i>	
Knotroot foxtail	<i>Setaria parviflora</i>	
Saffron plum	<i>Sideroxylon celastrinum</i>	
Gum bumelia	<i>Sideroxylon lanuginosum</i>	
Florida bully	<i>Sideroxylon reclinatum</i>	
Narrowleaf blueeyed grass	<i>Sisyrinchium angustifolium</i>	
Ear-leaf greenbrier	<i>Smilax auriculata</i>	
Saw greenbrier	<i>Smilax bona-nox</i>	
Laurel greenbrier	<i>Smilax laurifolia</i>	
Aniscented goldenrod	<i>Solidago odora</i>	
Seaside goldenrod	<i>Solidago sempervirens</i>	
Yellow necklace pod	<i>Sophora tomentosa</i>	
Lopsided indiagrass	<i>Sorghastrum secundum</i>	
Smooth cordgrass	<i>Spartina alternifolia</i>	
Sand cordgrass	<i>Spartina bakeri</i>	
Marshhay cordgrass	<i>Spartina patens</i>	
Marshhay cordgrass	<i>Spartina spartinae</i>	
Smut grass *	<i>Sporobolus indicus</i>	
Seashore dropseed	<i>Sporobolus virginicus</i>	
St. Augustine grass *	<i>Stenotaphrum secundatum</i>	
Manateegrass	<i>Syringodium filiforme</i>	
Turtle grass	<i>Thalassia testudinum</i>	

* Non-native Species

Werner - Boyce Salt Springs State Park

Plants

Common Name	Scientific Name	Primary Habitat (For Designated Species)
Hottentot fern	<i>Thelypteris interrupta</i>	
Widespread maiden fern	<i>Thelypteris kunthii</i>	
Marsh fern	<i>Thelypteris palustris</i>	
Bartram's airplant	<i>Tillandsia bartramii</i>	
Ball moss	<i>Tillandsia recurvata</i>	
Spanish moss	<i>Tillandsia usneoides</i>	
Poison ivy	<i>Toxicodendron radicans</i>	
American elm	<i>Ulmus americana</i>	
Caesarweed	<i>Urena lobata</i>	
Shiny blueberry	<i>Vaccinium myrsinites</i>	
Deerberry	<i>Vaccinium stamineum</i>	
Frostweed	<i>Verbesina virginica</i>	
Giant ironweed	<i>Vernonia gigantea</i>	
Hairy pod cowpea	<i>Vigna luteola</i>	
Virginia creeper	<i>Vitis rotundifolia</i>	
Creeping oxeye *	<i>Wedelia trilobata</i>	
Virginia chainfern	<i>Woodwardia virginica</i>	
Spanish bayonet; Aloe yucca	<i>Yucca aloifolia</i>	
Coontie	<i>Zamia pusilla</i>	8

* Non-native Species

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Animals

Common Name	Scientific Name	Primary Habitat (for all species)
REPTILES		
Gopher tortoise	<i>Gopherus polyphemus</i>	8,23
Yellow rat snake	<i>Elaphe obsoleta quadrivittata</i>	8
BIRDS		
Horned grebe	<i>Podiceps auritus</i>	71
Little blue heron	<i>Egretta caerulea</i>	63
Reddish egret	<i>Egretta rufescens</i>	63
Green heron	<i>Butorides virescens</i>	76
White ibis	<i>Eudocimus albus</i>	63
Northern shoveler	<i>Anas clypeata</i>	47
Redhead	<i>Aythya americana</i>	47
Common merganser	<i>Mergus merganser</i>	71
Red-breasted merganser	<i>Mergus serrator</i>	71
Osprey	<i>Pandion haliaetus</i>	OF
Southern bald eagle	<i>Haliaeetus leucocephalus</i>	OF
Northern harrier	<i>Circus cyaneus</i>	63
Merlin	<i>Falco columbarius</i>	8,63
Virginia rail	<i>Rallus limicola</i>	63
Sora	<i>Porzana carolina</i>	63
Clapper rail	<i>Rallus longirostris</i>	63
Black rail	<i>Laterallus jamaicensis</i>	63
American oystercatcher	<i>Haematopus palliatus</i>	OF
Red knot	<i>Calidris canutus</i>	63
Sanderling	<i>Calidris alba</i>	63
Stilt sandpiper	<i>Calidris himantopus</i>	63
Herring gull	<i>Larus argentatus</i>	OF
Ring-billed gull	<i>Larus delawarensis</i>	OF
Laughing gull	<i>Larus atricilla</i>	OF
Royal tern	<i>Sterna maxima</i>	OF
Caspian tern	<i>Sterna caspia</i>	OF
White-winged dove	<i>Zenaida asiatica</i>	8
Mourning dove	<i>Zenaida macroura</i>	8
Eurasian collared dove*	<i>Streptopelia decaocto</i>	8
Monk parakeet*	<i>Myiopsitta monachus</i>	OF
Belted kingfisher	<i>Ceryle alcyon</i>	76
Gray kingbird	<i>Tyrannus dominicensis</i>	76
Barn swallow	<i>Hirundo rustica</i>	OF
Carolina wren	<i>Thryothorus ludovicianus</i>	8,26
Sedge wren	<i>Cistothorus platensis</i>	63
American robin	<i>Turdus migratorius</i>	7,8,35
Yellow-headed blackbird	<i>Xanthocephalus xanthocephalus</i>	47
MAMMALS		
Nine-banded armadillo *	<i>Dasyopus novemcinctus</i>	8
Florida black bear	<i>Ursus americanus floridanus</i>	MTC
Raccoon	<i>Procyon lotor</i>	MTC

* Non-native Species

Werner - Boyce Salt Springs State Park

Animals

Common Name	<i>Scientific Name</i>	Primary Habitat (for all species)
Bobcat	<i>Felis rufus</i>	8,35
West Indian manatee	<i>Trichechus manatus</i>	71
Atlantic bottle-nosed dolphin	<i>Tursiops truncatus</i>	71

Habitat Codes

TERRESTRIAL

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

PALUSTRINE

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

LACUSTRINE

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

LACUSTRINE

- 50 Sinkhole Lake
- 51 Swamp Lake

RIVERINE

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

ESTUARINE

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

MARINE

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

SUBTERRANEAN

- 79 Aquatic Cave
- 80 Terrestrial Cave

MISCELLANEOUS

- 81 Ruderal
Of Communities
- 82 Developed
- MTC Many Types
Of Communities
- OF Overflying

Addendum 5—Designated Species List

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

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

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

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

FNAI GLOBAL RANK DEFINITIONS

- G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- G4 = apparently secure globally (may be rare in parts of range)
- G5 = demonstrably secure globally
- GH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- GX = believed to be extinct throughout range
- GXC = extirpated from the wild but still known from captivity or cultivation
- G#? = tentative rank (e.g., G2?)
- G#G# = range of rank; insufficient data to assign specific global rank (e.g., G2G3)
- G#T# = rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1)
- G#Q = rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q)
- G#T#Q = same as above, but validity as subspecies or variety is questioned.
- GU = due to lack of information, no rank or range can be assigned (e.g., GUT2).
- G? = not yet ranked (temporary)
- S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- S3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction of other factors.
- S4 = apparently secure in Florida (may be rare in parts of range)
- S5 = demonstrably secure in Florida
- SH = of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker)
- SX = believed to be extinct throughout range
- SA = accidental in Florida, i.e., not part of the established biota
- SE = an exotic species established in Florida may be native elsewhere in North America
- SN = regularly occurring, but widely and unreliably distributed; sites for conservation hard to determine
- SU = due to lack of information, no rank or range can be assigned (e.g., SUT2).
- S? = not yet ranked (temporary)

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

LEGAL STATUS

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

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

- LE = Listed as Endangered Species in the List of Endangered and Threatened Wildlife and Plants under the provisions of the Endangered Species Act. Defined as any species which 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 which is likely to become an endangered species within the foreseeable 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.

Werner - Boyce Salt Springs State Park

Designated Species

Plants

Common Name/ <i>Scientific Name</i>	<u>Designated Species Status</u>		
	FDA	USFWS	FNAI
Erect prickly pear <i>Opuntia stricta</i>	T		

Werner - Boyce Salt Springs State Park

Designated Species

Animals

Common Name/ Scientific Name	Designated Species Status		
	FFWCC	USFWS	FNAI
REPTILES			
Gopher tortoise <i>Gopherus polyphemus</i>	LS		G3/S3
BIRDS			
Little Blue Heron <i>Egretta caerulea</i>	LS		G5/S4
Reddish Egret <i>Egretta rufescens</i>	LS		G4/S2
White ibis <i>Eudocimus albus</i>	LS		G5/S4
Southern Bald Eagle <i>Haliaeetus leucocephalus</i>	LT	LT	G4/S3
Osprey <i>Pandion haliaetus</i>			G5/S3S4
Merlin <i>Falco columbarius</i>			G4/SU
Black Rail <i>Laterallus jamaicensis</i>			G4/S3?
American Oystercatcher <i>Haematopus palliatus</i>	LS		G5/S3
Royal Tern <i>Sterna maxima</i>			G5/S3
Caspian Tern <i>Sterna caspia</i>			G5/S2?
MAMMALS			
Florida Black Bear <i>Ursus americanus floridanus</i>	LT		G5T2/S2
West Indian Manatee <i>Trichechus manatus</i>	LE	LE	G2/S2

Addendum 6—Florida Master Site File List Of Recorded Cultural Sites

Werner - Boyce Salt Springs State Park
Florida Master Site File List Of Recorded Cultural Sites

FMSF #	Site Name	Survey	Culture	Site Type
1. 8PA115	Salt Spring	White 1982	Indeterminate prehistoric; historic 19 th and 20 th century (per informant)	Prehistoric Campsite/ historic lithic scatter
2. 8PA566	Styrofoam Hammock	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
3. 8PA567	Doorshutter Pond	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
4. 8PA568	Gilligan's Island	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
5. 8PA569	North of Energy	Memory and Newman 1997	Indeterminate prehistoric	Prehistoric campsite/ artifact scatter
6. 8PA570	Little Pepper	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
7. 8PA571	Pepper Heaven	Memory and Newman 1997	Indeterminate prehistoric; 20 th century historic	Lithic and artifact scatter
8. 8PA572	Prickly Pear	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
9. 8PA573	Double Isle	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
10. 8PA574	Three Palm Hammock	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
11. 8PA575	Lonely Point	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
12. 8PA576	Long Leaf	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
13. 8PA577	Skimmer Site	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
14. 8PA578	Blue Plate Quarry	Memory and Newman 1997	Indeterminate prehistoric; mid-20 th c. U.S.	Lithic scatter; historic debris
15. 8PA579	Chunk-O-Chert	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
16. 8PA580	Dover	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
17. 8PA581	Canal Mouth	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
18. 8PA582	Mystery	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter
19. 8PA583	Mini	Memory and Newman 1997	Indeterminate prehistoric	Lithic scatter

Addendum 7—Priority Schedule And Cost Estimates

Werner - Boyce Salt Springs State Park

Priority Schedule And Cost Estimates

1. Exotic plant removal, completed over five years. Contracted cost including manpower, herbicide, and travel is \$1500/ac for removal of Brazilian pepper. There are approximately 450 acres requiring Brazilian pepper removal within five years. Cogongrass and other exotic plants (torpedo grass, leadtree, air potato, etc.), will be eliminated within two years with annual costs estimated at \$5,000, including 300 man-hours/year, and \$2,000/year, for herbicides and application equipment and supplies.
Estimated Cost: \$685,000 for five years.
2. Maintenance of natural communities and restoration of ruderal sites over five years.
Estimated Cost: \$41,120 for five years.
3. Protection of shorebird use of the offshore flats and wintering habitat. Monitoring and biological inventory of shorebird and wading bird activity over five years. **Estimated Cost:** \$69,200 for five years.
4. Monitor Southern bald eagle nesting and Osprey nesting over five years. **Estimated Cost:** \$20,600 for five years.

