ATLANTIC RIDGE PRESERVE STATE PARK

UNIT MANAGEMENT PLAN

APPROVED

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

December 9, 2005

Department of Environmental Protection

Jeb Bush
Governor

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

Colleen Castille
Secretary

March 21, 2006

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

Re: Atlantic Ridge Preserve State Park Lease #4288

Dear Ms. White:

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

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

Sincerely,

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

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INTRODUCTION

Atlantic Ridge Preserve State Park consists of two disjunct sections: Atlantic Ridge and the Medalist. Both sites are located in Martin County (see Vicinity Map) about 2.5 miles southwest of Port Salerno and six miles south of Stuart. The current management access to Atlantic Ridge is from Paulson Road located off State Road 722. Currently, there is no public access to Atlantic Ridge; however, an agreement was reached in 2004 with Martin County and an adjacent land developer to construct a shared entrance off Cove Road (see Reference Map). No public access is currently allowed on the Medalist section due to deed restrictions. The vicinity map also reflects significant land and water resources existing near the park.

The Atlantic Ridge is designated single-use to provide resource-based public outdoor recreation and other park related uses. Currently the park contains 5,746.68 acres. There are no legislative or executive directives that constrain the use of this property. The preserve was acquired in 1999, with funding from the CARL/P2000 program and with assistance from South Florida Water Management District and Martin County. The property was leased to the Division on December 6, 2000, under lease number, 4288 (see Addendum 1).

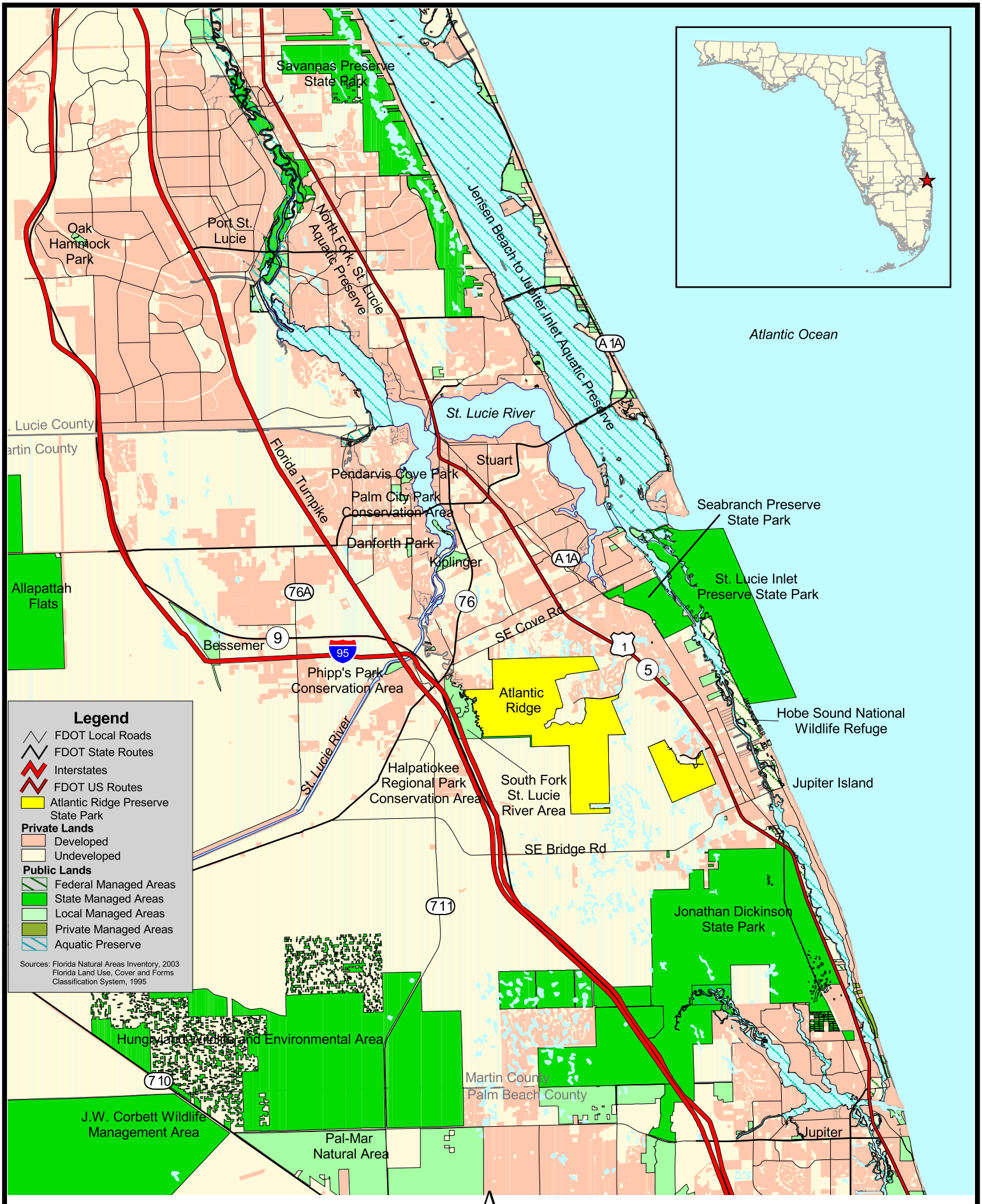
PURPOSE AND SCOPE OF THE PLAN

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

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

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

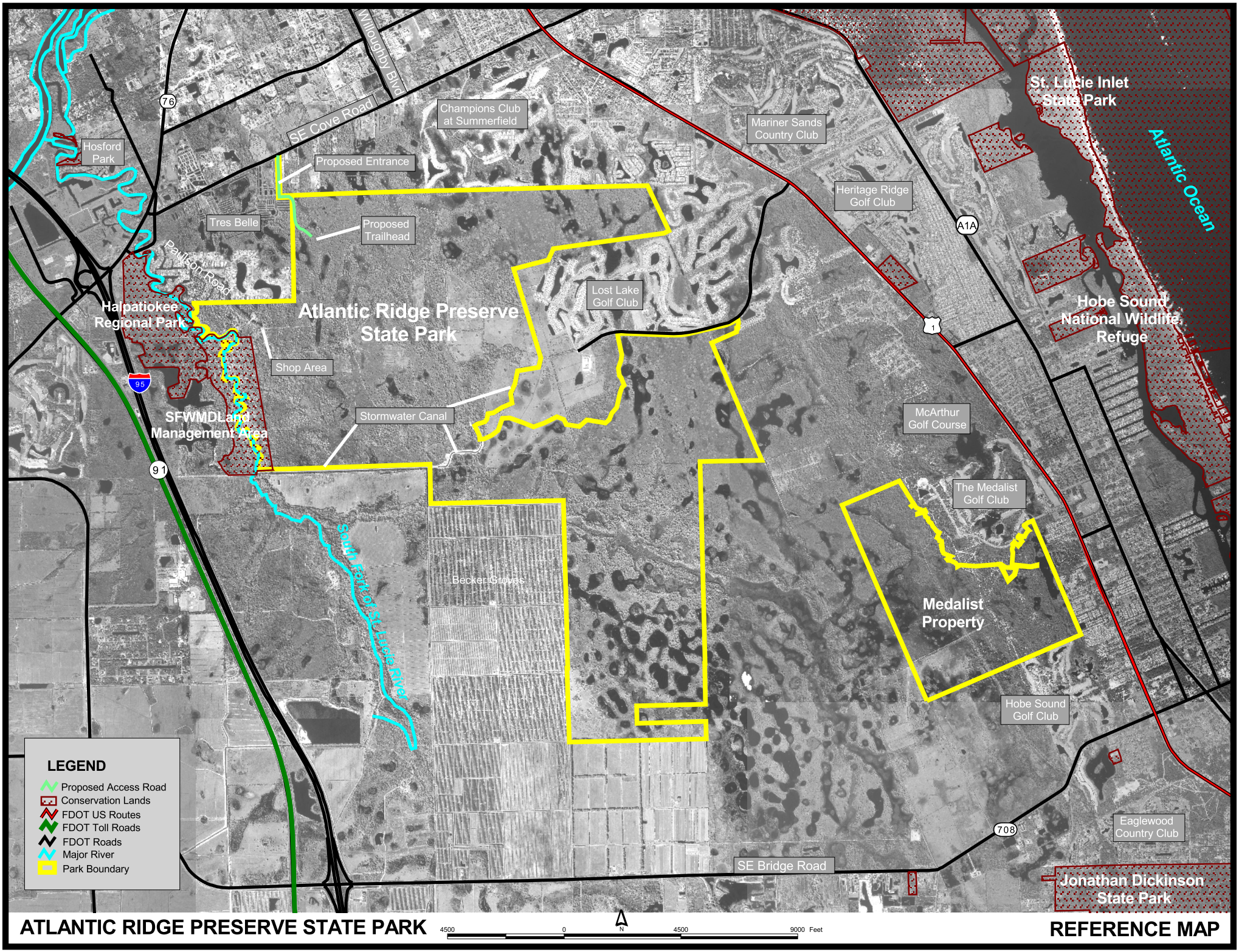
In the development of this plan, the potential of the preserve to accommodate secondary management purposes ("multiple uses") was analyzed. These secondary purposes were considered within the context of the Division's statutory responsibilities and an analysis of the resource needs and values of the preserve. This analysis considered the natural and cultural resources, management needs, aesthetic values, visitation and visitor experiences. For this



ATLANTIC RIDGE PRESERVE STATE PARK

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

VICINITY MAP


Willoughby Blvd
SE Cove Road
76
Champions Club at Summerfield
Mariner Sands Country Club
St. Lucie Inlet State Park
Atlantic Ocean
Hosford Park
Proposed Entrance
Heritage Ridge Golf Club
A1A
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Proposed Trailhead
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Proposed Access Road
Conservation Lands
FDOT US Routes
FDOT Toll Roads
FDOT Roads
Major River
Park Boundary
ATLANTIC RIDGE PRESERVE STATE PARK
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REFERENCE MAP

preserve, 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 preserve 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's Operations Manual (OM) that covers such areas as personnel management, uniforms and personal appearance, training, signs, communications, fiscal procedures, interpretation, concessions, camping regulations, resource management, law enforcement, protection, safety and maintenance.

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

Park Goals and Objectives

Natural Resources

1. Restore the historical water flow from the Atlantic Ridge to Jonathan Dickinson State Park by acquisition and restoration.
2. Restore the natural hydrology to the pine flatwood / wet prairie ecosystem.
3. Restore old fields and improved pastures within the park and reconnect this area to near pristine flatwoods / wet prairies that occur in the south section of the preserve.
4. Control and monitor invasive pest plants and animals that occur in the preserve.
5. Continue to update the plant and animal inventory and monitor designated species.
6. Implement an effective prescribed burn program to maintain the fire dependent communities that occur in the preserve.
7. Continue to participate in permit reviews of basin projects and comment on the Division's position.

Cultural Resources

1. Maintain, protect and interpret existing archaeological sites and their associated artifactual assemblage from vandalism, erosion and other forms of encroachment.
2. Conduct ground disturbing activities in accordance with the Department of State, Division of Historical Resources guidelines.
3. Fill out appropriate Florida Master Site File forms for unrecorded sites and structures.
4. Regularly assess unrecorded sites and monitor the condition of exposed cultural material using photopoints. Follow the Bureau of Natural and Cultural Resources (BNCR) vegetation management guidelines for historic structures.
5. Patrol sites for vandalism and discourage casual trails through interpretative signage where appropriate.
6. Pursue funding for a Phase I archaeological survey.
7. Establish a Cultural Resource Management File for the park, using the Guidelines for Cultural Resources Management Files, Chapter 15, OM.

Recreational Goals

1. Seek funding to provide quality resource based outdoor recreational and interpretive programs and facilities at the state park, as outlined in this management plan.
   A. Construct an entrance road off Cove Road.

B. Develop a shared-use trailhead area.
C. Provide interpretive/educational programming.

Administration/Operations

1. This preserve is currently being managed as part of Jonathan Dickinson State Park. Only one FTE position has been funded for this operation. Funding should be sought for two additional FTE positions dedicated to Atlantic Ridge Preserve State Park. In time, an additional FTE position should be sought for a Park Manager I position for this preserve.

Management Coordination

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

The Department of Agriculture and Consumer Services, Division of Forestry (DOF), assists Division staff in the development of wildfire emergency plans and provides the authorization required for prescribed burning. The Florida Fish and Wildlife Conservation Commission (FFWCC), assists staff in the enforcement of state laws pertaining to wildlife, freshwater fish and other aquatic life existing within park boundaries. In addition, the FFWCC aids the Division with wildlife management programs, including the development and management of Watchable Wildlife programs. The Department of State, Division of Historical Resources (DHR) assists staff to assure protection of archaeological and historical sites. The Department of Environmental Protection (DEP), Office of Coastal and Aquatic Managed Areas (CAMA) aids staff in aquatic preserves management programs. The DEP, Bureau of Beaches and Wetland Resources aids staff in 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 March 6, 2001. The purpose of the meeting was to solicit comments from the public before the development of this management plan.

The Division provided additional opportunities for public input by conducting a public workshop and an advisory group meeting. A public workshop was held on April 20, 2005. The purpose of this meeting was to present this draft management plan to the public. An Advisory Group meeting was held on April 21, 2005. The purpose of this meeting was to provide the Advisory Group members the opportunity to discuss this draft management plan.

Other Designations

Atlantic Ridge Preserve State Park is not within an area of critical State concern as defined in section 380.05, Florida Statutes. Currently it is not under study for such designation. The park is a component of the Florida Greenways and Trails System.

All waters within the unit will be designated as Outstanding Florida Waters, pursuant to Chapter 62-302 Florida Administrative Code. Surface waters in this unit are classified as Class III waters by DEP. This unit is not within or adjacent to an aquatic preserve as designated under the Florida Aquatic Preserve Act of 1975 (section 258.35, Florida Statutes).

RESOURCE MANAGEMENT COMPONENT

INTRODUCTION

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

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

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

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

RESOURCE DESCRIPTION AND ASSESSMENT

Natural Resources

Topography

The preserve is part of the Atlantic Coastal Ridge and the Eastern Flatwoods physiographic landform. Land within the preserve gradually slopes from northeast to southwest. Areas within the preserve are characterized by low, flat topography, poorly drained acidic soils and numerous shallow depressions. The topography of the preserve varies slightly in elevation ranging from 15 to 22 feet above mean sea level. It is characterized by gentle slopes and low surface relief. Slight changes in elevation are the result of deposition and sediment reworking the landscape when ancient seas occupied higher levels.

Geology

Landforms associated with the preserve can be attributed to the effects of marine forces on the landscape over millions of years. In ancient times, when the ocean covered the area, shallow marine currents and their associated erosion and deposition shaped the Eastern Flatwoods landform. All rocks and sediment underlying the preserve were deposited by eolian, fluvial or marine processes associated with near-shore marine environments and periods of high sea level.

According the Florida Geology Survey's Report of Investigation No. 32, Geology and Ground-Water Resources of Martin County, Florida (1975), the igneous and metamorphic rocks that

form the basement complex in peninsular Florida are covered in Martin County by approximately 13,000 feet of sedimentary rocks, most of which are of marine origin. In Martin County, the predominant rock types at depths below 700 feet are limestone and dolomite, but sediments above that depth are chiefly sand, silt and clay. The deepest water wells in the county penetrate about 1,500 feet of sediments, which include the Avon Park Limestone and limestones of the Ocala group, of Eocene age; the Suwannee limestone, of Oligocene age; the Hawthorn formation and possibly the Tampa and Tamiami formations, of Miocene age; the Caloosahatchee marl, of Pliocene age; and the Anastasia formation and the Pamlico sand of Pleistocene age.

An east-west geologic cross section of Martin County near the South Fork St. Lucie River (after Miller, 1980), indicates that the Atlantic Ridge area is underlain by approximately 20 to 25 feet of sand, followed by a shell layer of approximately 125 to 150 feet thick. Some limestone formations may be sporadically interspersed throughout this second layer. At approximately 175 to 200 feet deep, a layer of undetermined thickness exhibits interbedded sand, clay, shell and silt soil formations.

Martin County (and the Atlantic Ridge area) is underlain by two aquifer systems: the Surficial Aquifer System and the Floridan Aquifer System. The objectives of this hydro geologic assessment are focused strictly to the Surficial Aquifer System, and therefore, the following discussions are limited to the Surficial Aquifer System.

In Martin County, the Surficial Aquifer System is unconfined to semi-confined and is comprised of three hydro geologic zones: the surficial sands, the primary water-producing zone and a less permeable zone overlying the confining bed. The surficial sands are shallow and may not be completely saturated throughout the year. The primary water-producing zone consists of sand, shell, and relatively thin beds or lenses of sandstone/limestone. The less permeable zone is delineated as a sand, silt, shell and soft micritic limestone portion of the Tamiami Formation.

Soils

Twenty-eight different soils types (see Addendum 3) occur in Atlantic Ridge Preserve State Park (see Soil Map). Soils within the preserve are typical flatwoods soils characterized as nearly level, having low relief and poorly drained. Most of the flatwoods soils are sandy to a depth of 20 to 40 inches or sandy throughout. Some areas within the preserve have dark colored sandy subsoil that is weakly cemented and holds water during the rainy season. The general soil types found in the preserve are classified as Waveland-Lawnwood-Basinger, Wabasso-Riviera-Oldsmar, and Salerno-Jonathan-Hobe, and Paola-St. Lucie map units (McCollum and Cruz, 1981).

The Waveland-Lawnwood-Basinger map unit is nearly level with poorly drained soils. Subsoil in this mapping unit has a dark colored layer that is weakly cemented. This map unit consists of broad flatwoods interspersed with wet prairies.

The Wabasso-Riviera-Oldsmar map unit consists of soils that are poorly drained with a sandy substrate to a depth of 20-40 inches. However, some areas are sandy to a depth greater than 40 inches. Most of these soils have a subsoil that is dark colored and sandy in the upper portion and loamy in the lower portion. This map unit consists of broad flatwoods interspersed with wet prairies and long poorly defined drainages.

The Salerno-Jonathan-Hobe map unit consists of moderately drained soils that have dark colored, weakly cemented sandy subsoil below a depth of 50 inches. This soil is typically found on slightly elevated ridges. The natural community associated with this soil is scrubby flatwoods

LEGEND

- 2 - Lawnwood fine sand
- 3 - Lawnwood fine sand, depressional
- 4 - Waveland sand
- 5 - Waveland sand, depressional
- 7 - St. Lucie sand, 0 to 8 percent slopes
- 12 - St. Johns Variant sand
- 13 - Placid sand
- 14 - Satellite Variant sand
- 15 - Electra fine sand
- 17 - Wabasso sand
- 19 - Winder sand
- 21 - Pineda sand
- 22 - Okeelanta muck
- 34 - St. Lucie-Urban land complex, 0 to 8 percent slopes
- 35 - Salerno sand
- 36 - Arents, 0 to 2 percent slopes
- 38 - Floridana fine sand, depressional
- 40 - Sanibel muck
- 44 - Boca fine sand
- 45 - Hilolo fine sand
- 47 - Pinellas fine sand
- 48 - Jupiter sand
- 49 - Riviera fine sand, depressional
- 51 - Pompano fine sand, occasionally flooded
- 52 - Malabar sand
- 56 - Wabasso sand, depressional
- 57 - Chobee loamy sand
- 58 - Gator muck
- 60 - Tequesta Variant muck
- 62 - Nettles sand, depressional
- 63 - Nettles sand
- 64 - EauGallie fine sand
- 73 - Samsula muck
- Water

N

2000 0 2000 4000 Feet

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

ATLANTIC RIDGE PRESERVE STATE PARK

SOILS MAP

and is comprised of vegetation such as slash pine, sand pine, saw palmetto, staggerbush and scrub oaks (*Quercus* spp.). This soil type is a transition area between the poorly drained flatwoods and the excessively drained scrub communities.

A small portion of the Paola-St. Lucie map units exists in the southern portion of the Medalist tract. This map unit consists of nearly level to gently sloping ridges and occurs on ancient coastal dunes. These soils are excessively drained. Typically, the surface layer is gray sand about 4 inches thick with the subsurface layer of white sand about 32 inches thick. Natural vegetation includes sand pine, scrub oaks (*Quercus* spp.), scrub hickory, lupine, pinweed, and various grasses and herbs.

Soil erosion is not a problem within the preserve. Most areas, with the exception of improved pastures, are in natural vegetation. In addition, the low relief of the landscape inhibits slow runoff. Excessive erosion has occurred along the banks of the Seawind Canal that runs through the center of the preserve. Stabilization of the canal banks may be difficult because surges of runoff during periods of intense rainfall erode and destabilize bank vegetation. Areas classified as improved pasture will be restored in the future by using fire, chemical and mechanical methods. As these areas are cleared of introduced grasses, some replanting of native grasses, shrubs and trees may be required for control of wind and water erosion.

Minerals

There are no known minerals of commercial value in the preserve.

Hydrology

Hydrologic characterization may be defined as the interaction of the hydrologic cycle components as a function of soils, topography and vegetation in a given environment. The main components of the hydrologic cycle are rainfall, runoff, shallow infiltration, deep percolation and evapo-transpiration (ET).

Observation of the 1995 orthophotos of the Atlantic Ridge property indicate that intensive channelization by agricultural cross ditching has significantly altered the timing and function of the hydrologic cycle components in the ecosystem upland and wetland vegetative communities. To qualify and quantify the impact of ditches and canals in the Atlantic Ridge area, 1940 black and white photos of the Atlantic Ridge area were sectioned and overlain with planimetric features such as ditches, canals and adjacent property boundaries.

The photos indicate that the main portion of the Atlantic Ridge property (old Seawind) that is managed by the Division is located within the historical watershed of the South Fork of the St. Lucie River. The smaller separate parcel (Medalist) of the Atlantic Ridge area is located within the historical watershed of Kitching Creek, a tributary of the Loxahatchee River.

In addition, the photos indicate that a tributary of the South Fork of the St. Lucie River historically traversed, from east to west, the center portion of the Atlantic Ridge area. The development of the Becker Groves along the southwest boundary of the Atlantic Ridge area effectively encroached into the tributary's historical flood plain and blocked upstream surface flows from reaching the main course of the South Fork St. Lucie River.

Further to the north in the Atlantic Ridge property, agricultural cross ditching was implemented to drain the wetland ecosystem and maximize upland utilization for cattle grazing and other related agricultural practices. The hydrologic impact from channelization is the reduction in wetland hydroperiod as ditches and canals are dug below the normal water level depth. During

the dry season, base flow in ditches and canals results from channels intercepting the falling water table at wetlands and carrying these flows away from the ecosystem. During the wet season, ditches and canals also carry the excess surface water away from the ecosystem. The net result of this process is not significant during normal rainfall periods as nature compensates for relative highs and lows in the ecosystem. However, during drought years, the ability of ditches and canals to convey base flows away have had a devastating effect on the wetland ecosystem. Groundwater levels that would have normally compensated for the lack of rainfall during drought periods are no longer available to recover.

Research indicates that loss of wetland hydroperiod from cross ditching normally takes place in a hydrologic period that includes at least two consecutive droughts. Analysis of the SFWMD rainfall station S-80 data shows that two such drought events took place in the 1980s after ditching occurred on the Atlantic Ridge property.

Further proof of the impact of cross ditching in the Atlantic Ridge wetlands can be observed by the type of vegetation that has established roots in the areas with lowered hydroperiod. Normal vegetation succession would follow a typical hydrologic gradient corresponding to the topographic characteristics of the ecosystem. For the Atlantic Ridge wetland ecosystem, this would be from pine flatwoods in the upper elevation ranges, through mixed wetland hardwoods, freshwater marshes, wet prairies, to the tidal wetlands along the low range elevations of the South Fork of the St. Lucie River floodplain. Instead, bare soils along ditches and canals across the wetland ecosystem have allowed invasion of Brazilian pepper and other exotic plants. Lack of inundation from depleted wetland hydroperiod has promoted untimely migration/succession of plant species and the establishment of dry prairies, typical of pastureland practices.

Piezometer data was collected from February 1995 through January 1996 by the Westerra Development environmental consultants. These data provide a synoptic picture of the hydrologic behavior of the Atlantic Ridge wetland ecosystem during that period. Data for eight shallow piezometers installed throughout the Seawind property to monitor water table levels at or near marsh formations during the 2/1995-1/1996 periods is provided in the Seawind Project Stormwater Management Report submitted to the SFWMD for review.

The rainfall volume recorded at SFWMD station S-80 for 1995 was approximately 85 inches. This volume is substantially higher than the 56-year historical mean of approximately 55 inches calculated for Martin County and the Kitching Creek project, which indicates that 1995 was a “wet” year by hydrologic standards.

The piezometer data indicate that depths to seasonal high water table (SHWT) levels vary from 0.08 to 2.68 feet with a prevalent depth of approximately 2 feet for most wells throughout the site. Given the wetness of the 1995 rainfall year, the observed water table depths seem to indicate that the Atlantic Ridge marsh wetland ecosystem may not be functioning per optimum hydroperiod criteria. The typical marsh hydroperiod duration and depth of inundation has been calculated (Duever, 1975) to be in the range of 224 to 278 days and 6- 16 inches for marsh formations typical of coastal ranges. A detailed inundation analysis of these proprietary well data could verify this assumption.

The piezometer well data also indicated the occurrence of a hard pan at approximately 2-4 feet below the ground surface at some of the wetland locations. The hard pan is typical of the sub-soil conditions found at marsh wetland formations of the coastal ridge. The poor hydraulic conductivity associated with finely cemented sands such as found in hardpan limit infiltration

through the hardpan layer. The slow infiltration process causes the lengthy inundation in these wetland systems. Although vegetation communities have been significantly impacted along the northern portion of the Atlantic Ridge (formerly Seawind) property, the occurrence of the hard pan is indicative that restoration of wetland hydroperiod function is possible by the removal of the man-made ditches and canals.

Analysis of the property also reveals an existing legal drainage outfall for stormwater discharges from the residential developments along Seabranch Boulevard. The portion of the outfall along the proposed western boundary of the Retreat Development has been in existence since the mid 1980s. Approximately 40 percent of the Lost Lakes and DoubleTree residential drainage areas discharge through this outfall. The lower portion of the outfall (3400 linear feet) was constructed in 1998 per the request of the Westerra Development Company, to provide additional outfall capacity for discharges from the proposed Seawind stormwater management system.

In September 1997, SFWMD entered into negotiations with Westerra to purchase approximately 2500 acres along the South Fork St. Lucie River and the southern end of the Seawind project through the CARL program. At the time, the Double Tree development owned a blanket drainage easement through the proposed purchase area. The easement provided an impediment to the parcel acquisition by the SFWMD. Westerra/Seawind indicated that the easement could be lifted and the parcel purchased if a comparable alternative drainage outfall became available to the Double Tree Country Club.

In 1998, Westerra proposed and the District accepted the construction of an alternative alignment or outfall for the existing Double Tree and proposed Seawind storm water management discharges. In May 14, 1998, the SFWMD issued Surface Water Management permit Modification No. 43-00355-S for the construction of the alternative outfall. The permit modified the original SWMM No. 43-00355-S permit (issued February 1991) for the construction of a storm water management system to support 173 acres of residential development and golf course (Double Tree Country Club).

The outfall entailed the construction of 3400 linear feet of an open channel conveyance canal and an 8 feet wide weir with a crest elevation of 12 feet NGVD. The canal dimensions were approximately 20 feet wide with a bottom elevation of 6 feet NGVD and a top of bank of 19 feet NGVD. The proposed canal was designed to be isolated from existing wetlands using impermeable barriers. The control structure was designed as a “Morning Glory” riser made from a 96-inch CMP, with 282 feet of 96-inch outfall pipe into the Becker Grove canal. The outfall pipe has an invert elevation of 11 feet NGVD.

The alternative outfall canal was designed to serve a drainage area of 6,188 acres. This included the 5942.5 acres of the proposed Seawind parcel and 245.5 acres of the existing Double Tree Country Club property plus adjacent roadway right-of-way (Seabranch Boulevard).

The alteration of historical surface runoff patterns in the upper Atlantic Ridge area has had an impact on the quantity and timing of freshwater discharges to the South Fork of the St. Lucie and Loxahatchee Rivers, and on the recharge of the surficial aquifer. Before the channelization of the upper Atlantic Ridge area, surface runoff discharges were a function of wetland marsh and slough hydroperiods within the South Fork of the St. Lucie River watershed.

As marsh water levels in the main Atlantic Ridge property rose during the wet season wetland sloughs slowly but steadily conveyed excess hydroperiod stages to the South Fork of the St.

Lucie River floodplain. Surface runoff in the smaller and eastern (Medalist) Atlantic Ridge parcel was (and is still) directed west from the sandy ridges until reaching the wetland sloughs forming the headwaters of the North Fork of the Loxahatchee River.

Channelization of the upper watershed along the Atlantic Ridge property has caused surface flows to be conveyed earlier to the South Fork of the St. Lucie River. Likewise, discharges from storm water management systems of developments along Seabranch Boulevard outfall to the South Fork of the St. Lucie River instead of the historical discharge path to the Loxahatchee River. Both of these discharge effects have created consequences of regional impact. The channelization, dewatering and faster diversion of wetland flows to the South Fork of the St. Lucie River prevent appropriate recharge of the surficial aquifer beneath Atlantic Ridge. The discharge of flows from developments along Seabranch Boulevard prevents historical Kitching Creek flows from reaching the Loxahatchee River, currently lacking minimum flows to sustain ecosystem resources in the estuary.

Discharges of poor water quality to the South Fork St. Lucie and Loxahatchee Rivers from the Kitching Creek watershed, including the northern and central portions of the Atlantic Ridge Unit, have been documented by the Florida Department of Environmental Protection, the Jonathan Dickinson State Park (JDSP) and the Loxahatchee River District (LRD).

In 1985, the JDSP Loxahatchee River swimming area was closed due to high *E. coli* bacteria counts detected in the water. The location of the swimming area immediately downstream of the Kitching Creek junction with the Loxahatchee River, lead to an early conclusion that the Kitching Creek watershed was the source of *E. coli* bacteria. Periodic fish kills have taken place at the St. Lucie River Estuary. Toxins from agricultural runoff discharge from the C-44 canal, the North and South Forks of the St. Lucie River have been identified as potential culprits. A significant portion of the Atlantic Ridge Unit discharges to the South Fork of the St. Lucie River.

During 1999-2000, a detailed bacteriological study was conducted of surface and groundwater sampling of the suspected Kitching Creek watershed areas. Water samples including surface water runoff and groundwater from the northern and eastern portion of the Atlantic Ridge were sampled at a location near Bridge Road (CR708), and at wetland formations downstream of the Medalist and Hobe Sound Country Club golf courses. Groundwater, representative of the Atlantic Ridge Unit wetland recharge, was also obtained north of CR708.

Geochemical and bacteriological analysis results of surface and groundwater runoff failed to demonstrate Kitching Creek as the source of the *E. coli* bacteria that closed the JDSP swimming area. A report has been prepared regarding these findings (The Forensic Assessment of Fecal Coliform contamination of the Loxahatchee River from Kitching Creek Sources, January 2000).

The impact of the early (1985-1986) *E. coli* detection of bacteria in the headwaters of Kitching Creek was to alarm the public and force the state and local health agencies to close the swimming area to the public. The new findings should reverse these actions.

The 1999-2000 water quality study demonstrated that infrequent sources of *E. coli* bacteria are located within the Kitching Creek watershed and Atlantic Ridge Ecosystem Unit. However, these sources: cattle grazing areas, horse stables, dog kennels and septic tanks exist all over the state and can not be considered “plumes” of consistent contamination (plumes are indication of significant long term, continuous sources). The study also indicated that the current drainage network found in the 138th Street, Powerline and Kitching Creek Roads, was the conveyance

mechanism for infrequent *E. coli* bacteria to reach the JDSP and the Loxahatchee River. All potential sources of coliform bacteria (horse barn pond, kennel pond and pastures) are conveyed to the Jenkins Ditch via roadside ditches along 138th Street. Any storm event in excess of 3 to 4-inches of rainfall will cause these sources to "lift" and migrate to the ditch where they concentrate. However, colder groundwater in the Jenkins Ditch and downstream-vegetated channels causes to *E. coli* bacteria concentrations to be substantially reduced to ambient levels after entering JDSP.

In addition to the Forensic *E. coli* Assessment sampling, two additional baseline-sampling events were conducted for surface and groundwater throughout the study area. Baseline sampling was conducted at three golf courses in the study area (Medalist, Hobe Sound Country Club and Eaglewood) and at the outfall to the North Fork of the Loxahatchee River. All three golf courses are located within the east network or North Fork of the Loxahatchee River. This tributary collects runoff from the upper reaches of the Atlantic Ridge Unit near Cove Road, from the storm water discharges of the Mac Arthur, Medalist, Hobe Sound Country Club and Eaglewood golf courses and from JDSP.

Results of the baseline-sampling event performed at the anchor lake or outfall discharges of the three golf courses found in the study area. With the exception of copper and iron, no other heavy metals were detected during the sampling. Given the extensive use of fertilizers in these areas, other representative concentrations of heavy metals, or pesticides were expected (prior to the sampling event on 12/09/99).

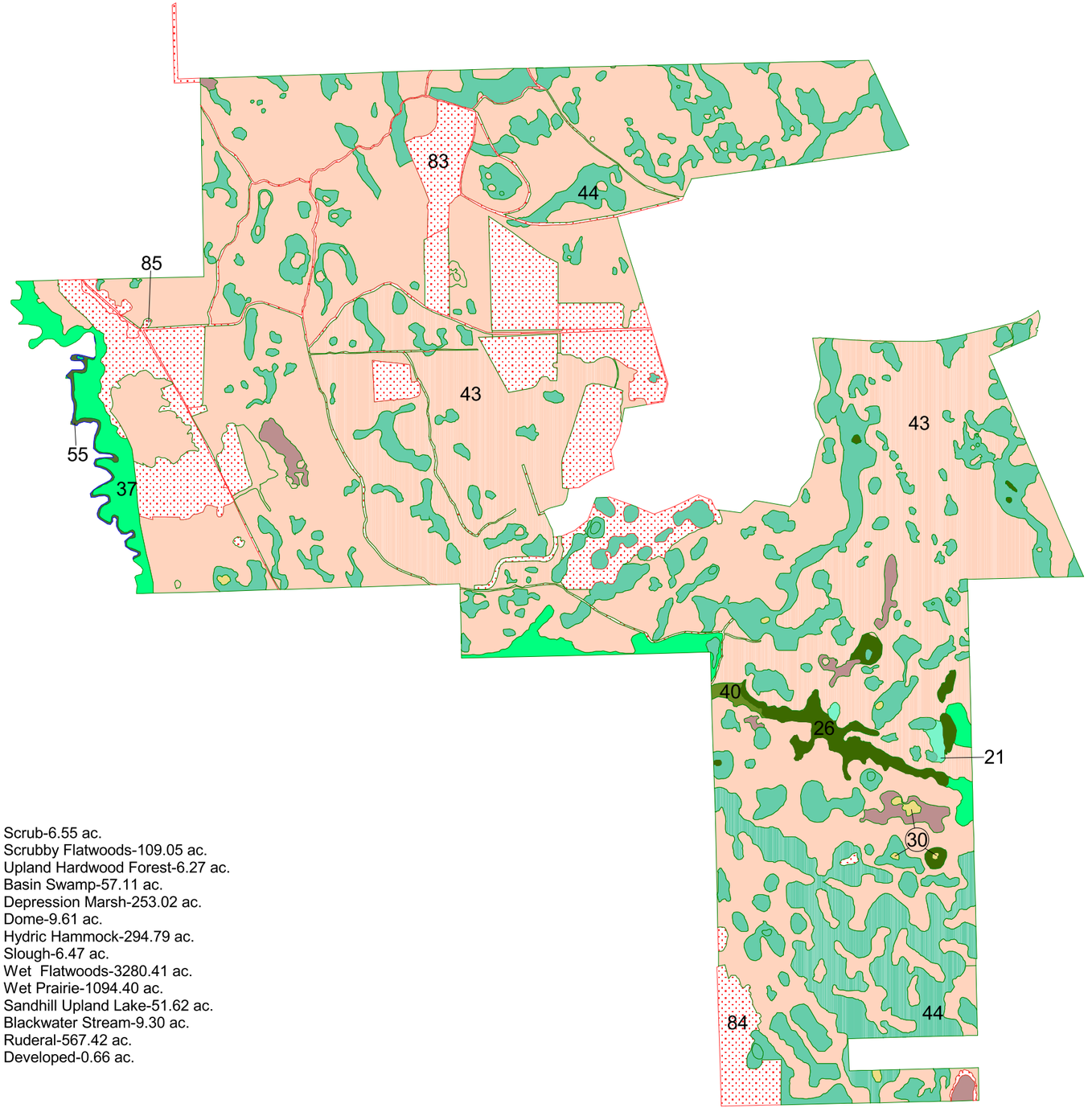
A plausible explanation for the lack of heavy metals or pesticides is that the stormwater management systems in these golf courses are composed of natural wetlands and man-made lakes or ponds. It would appear that the storm water management facilities (wet detention ponds) successfully trap and settle the pollutant loading from golf course discharges. Whatever amount of pollutants not trapped at these locations, appear to be further deposited or up taken by downstream wetland communities. This scenario specifically applies to the Medalist and Hobe Sound Country Club's storm water management systems. The Medalist storm water management system discharges into downstream wetlands, which are flood-routed hydraulically, conveyed through the man-made lakes and other wetlands of the Hobe Sound Country Club.

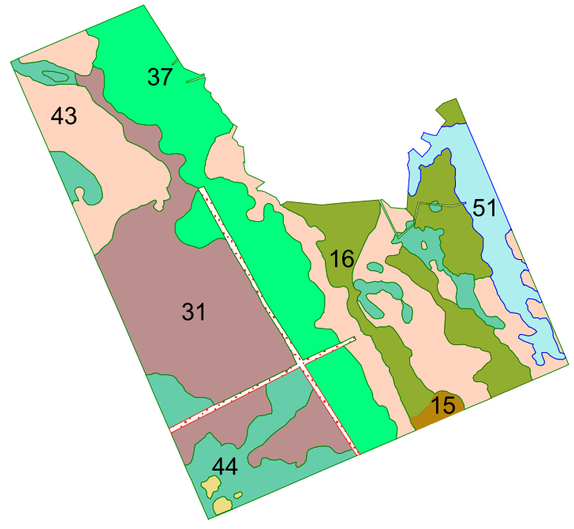
In general, both the surface and groundwater baseline water quality sampling events indicates a watershed with excellent water resources. Although a one-time baseline-sampling event is not sufficient for development of watershed water quality management policy, it provides the basis to develop a more comprehensive long-term water quality-monitoring program.

Natural Communities

The system of classifying natural communities employed in this plan was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors, such as climate, geology, soil, hydrology and fire frequency generally determine the species composition of an area, and that areas which are similar with respect to these factors will tend to have natural communities with similar species compositions. Obvious differences in species composition can occur, despite similar physical conditions. In other instances, physical factors are substantially different, yet the species compositions are quite similar. For example, coastal strand and scrub--two communities with similar species compositions--generally have quite different climatic environments, and these necessitate different management programs.

The park contains 12 distinct natural communities (see Natural Communities Map) in addition to ruderal and developed areas. Park specific assessments of the existing natural communities are





LEGEND

- 15 - Scrub-6.55 ac.
- 16 - Scrubby Flatwoods-109.05 ac.
- 21 - Upland Hardwood Forest-6.27 ac.
- 26 - Basin Swamp-57.11 ac.
- 31 - Depression Marsh-253.02 ac.
- 32 - Dome-9.61 ac.
- 37 - Hydric Hammock-294.79 ac.
- 40 - Slough-6.47 ac.
- 43 - Wet Flatwoods-3280.41 ac.
- 44 - Wet Prairie-1094.40 ac.
- 51 - Sandhill Upland Lake-51.62 ac.
- 55 - Blackwater Stream-9.30 ac.
- 84 - Ruderal-567.42 ac.
- 85 - Developed-0.66 ac.

N

2000 0 2000 4000 Feet

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

ATLANTIC RIDGE PRESERVE STATE PARK

NATURAL COMMUNITIES MAP

provided in the narrative below. A list of plants and animals occurring in the unit is contained in Addendum 4.

Scrub. A small portion of this community exists on the south boundary of the Medalist portion of the preserve. The small portion of scrub that exists in the preserve is characterized by a canopy dominated by sand pines and an understory dominated by scrub oaks. This community once covered large areas of the Atlantic Coastal Ridge, but many areas of this community, especially in southeast Florida, have been converted to residential developments.

Scrubby flatwoods. Scrubby flatwoods are also limited to the east section of the Medalist property. This community is in excellent shape and contains several rare plants such as the perforated lichen and nodding pinweed. Previously, the original landowner constructed a series of roads through this community that helped maintain sections in an early successional stage. Currently, the community can be classified as early to mid-successional forest containing widely scattered slash pines, scrub oaks (*Quercus* spp.), saw palmetto and a variety of herbaceous plants.

Upland mixed forest. This community is limited to one part of the park. It is similar to hydric hammock but is dominated by live oak, cabbage palm and red bay. The understory consists of saw palmetto and beauty berry. This community is higher in elevation and more well-drained than hydric hammock.

Basin swamps. This community is represented in the preserve by small bay head areas containing bays, wax myrtle and buttonbush and occurs as islands within marsh and wet prairie. Within the preserve, this community has irregular shapes and is often inundated for extended periods.

Depression marsh. This community is limited to several areas scattered throughout the preserve. Dominant vegetation that is characteristic of this community includes sawgrass, willows and maidencane. Potentially, these areas may support nesting sites for wading birds such as herons and egrets. This community is in good shape and has not been invaded by exotic vegetation. However, due to changes in the hydroperiod from the canals and ditches constructed throughout the preserve, many of the depression marshes appear to be succeeding into a more woody community dominated by maples, bays, willows, wax myrtle and slash pine.

Dome. This community is represented by a single cypress dome located along the west side near the middle of the preserve just north of Seawinds Canal. This community is presently in good condition, but Old World climbing fern has invaded portions of the swamp and the diversion of water through canals and ditches has degraded its hydrological pattern.

Hydric hammock. The best example of this community is along the western section of the preserve and is adjacent to the South Fork of the St. Lucie River. This community is in good condition, but exotics such as Brazilian pepper, Old-World climbing fern and strawberry guava are present. This community is dominated by temperate species such as sabal palm, live oak and swamp bay. The understory is a mixture of temperate (saw palmetto, wax myrtle, etc.) and tropical vegetation (myrsine, wild coffee, etc.).

Slough. A pond apple slough is present in the south-central section of the preserve. This community is rare in Florida. Based on old photographs, this section of the preserve was historically a branch of the South Fork of the St. Lucie River until the stream west of the

preserve was eliminated by the construction of a citrus grove. Brazilian pepper and Old World climbing fern have invaded portions of this community and treatment of these invasive exotics in the slough needs immediate attention.

Wet flatwoods. Wet flatwoods are the dominant natural community in the preserve and occur on slightly higher elevations than wet prairies. This community exists throughout the preserve except along the extreme western preserve boundary. It is interspersed with numerous wet prairies of varying size. Vegetation in the wet flatwoods is dominated by an overstory of slash pine and an understory of saw palmetto, gallberry, staggerbush and wax myrtle. A high diversity of herbaceous plants and grasses also exists. Most of the flatwoods in the preserve are in excellent condition because they were burned frequently by the previous landowner. Few invasive exotics occur in the wet flatwoods, though Old World climbing fern, melaleuca and Brazilian pepper have been documented individually and in scattered patches.

Some areas that were historically wet flatwoods were previously utilized for cattle grazing and are now succeeding back into early successional flatwoods. Numerous canals and ditches constructed throughout the preserve have affected the hydrology of this community. Normally, the water table is just below or at ground level during normal wet seasons, and 1-2 feet below during drier periods.

Seasonal precipitation along with flat topography and sandy soils strongly influence the hydrologic process in wet flatwoods. During the rainy season, water slowly percolates through the sandy soils and there is little or no runoff. Many areas in the flatwoods have a hardpan several feet below the surface that impedes water from moving further down the soil horizon. Once saturation occurs, water moves very slowly horizontally through the soil profile and the soil becomes flooded. The numerous canals and ditches in the preserve channel much of the precipitation directly out of the preserve and saturation takes longer to achieve; thus, it appears that many of the wet flatwoods in the preserve have a shorter hydroperiod than normal. Restoration, through filling in the canals and ditches, would greatly improve the hydrologic regime of the flatwoods.

Wet prairie. Wet prairies are the second most common natural community in the preserve and are closely associated with the pine flatwoods. This community is characterized by its lack of trees and sparse to dense ground cover of grasses and herbs, especially St. John's wort (*Hypericum* spp.). The south end of the preserve contains numerous wet prairies while scattered wet prairies exist in the northern section of the preserve.

Wet prairies in the preserve are generally classified as good to excellent. The best examples of this community exist in the southern portion of the preserve where no ditches or canals have been constructed to divert water flow. However, the reduced seepage of rainfall and groundwater flowing into these communities in the northern section of the preserve from drainage through ditches and canals threatens to change the structure of these wetlands to a more shrub-dominated community. Some successional change is already occurring as slash pines and other woody species have been observed in several wet prairies.

This community is an important foraging area for the herons and egrets in addition to listed species such as the Florida sandhill crane and wood stork. These ephemeral wetlands are also important breeding sites for amphibians because predatory fish are not present.

Restoration of these wetlands should be a top priority. Initial restoration could be accomplished

by filling the exit canals and ditches that drain these wetlands. Long-term restoration should focus on complete closure of these canals and ditches that drain the prairies. Many of the wet prairies in the preserve have been drained through a series of ditches and canals; thus, many wet prairies in the preserve no longer maintain their normal hydro period.

Sandhill upland lake. This community is found along the eastern boundary of the Medalist portion of the preserve in areas that were once depressions or small swales located between the sand ridges along former shorelines. These areas are extremely important breeding areas for terrestrial amphibians, as well as many unusual and endemic insects. They are also important sources of water for many mammals and birds that inhabit the neighboring xeric scrub and scrubby flatwoods communities. This community is in good condition, although several of these areas are exhibiting decreased water levels as indicated by the plant succession along their edges. Because this area is bordered by development to the east, there are also concerns for the serious deleterious effects on water quality through stormwater and residential yard runoff. Any future and ongoing impacts that would alter the balance and cause an irreversible change in the preserve's flora and fauna should not be permitted.

Blackwater stream. This community occurs along the western boundary of the preserve and is part of the St. Lucie River system, eventually draining into the Atlantic Ocean 20 miles away. The water in this stream contains an abundance of tannin particulate derived from drainage through swamps, wet prairies, marshes and the Seawinds Canal. The stream is bordered by hydric hammock for most of its course along the preserve boundary.

Ruderal. These disturbed areas in the preserve include early successional fields, mid-successional fields, improved pastures, canals, ditches, and a single man-made pond. Only remnants of natural communities exist in these sites. Most ruderal sites within the preserve are in need of enhancement or restoration. Many of the early successional and mid-successional fields are slowly succeeding back into flatwoods. Some fields have little native plant diversity, dominated by native wax myrtle and exotic Brazilian pepper. Improved pastures are dominated by Bahia grass and Brazilian pepper with little native vegetation present. Tropical soda apple, a Category I exotic invasive plant (Florida Exotic Pest Plant Council), has also been documented in several improved pastures as well as other ruderal areas within the preserve. Most of the canals and ditches within the preserve boundary are lined with Old-World climbing fern. While not a serious problem in the rest of the natural communities, Old-World climbing fern has the potential to invade other communities and displace native vegetation. The man-made pond is located in the northeastern portion of preserve and is surrounded by pine flatwoods. The pond holds water during extreme dry periods and may be one of the few sources of water available to wildlife during prolonged droughts.

Developed. Only one small section in the northwest corner of the preserve is developed. This residential home is occupied by a park ranger. This area, once dominated by Australian pines, was recently cleared as part of the initial development of the preserve.

Designated Species

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

There are eight species of plants and fifteen species of animals found in the preserve that are classified as either commercially exploited, species of special concern, threatened or endangered. Because the preserve was recently purchased, limited surveys have been conducted, and it is presumed that the number of listed species found in the preserve is substantially higher.

Several ferns found in the preserve are listed by the Florida Department of Agriculture as commercially exploited. These ferns, which include the giant leather fern, cinnamon fern and royal fern, are typically found in hydric hammock. The giant leather fern occurs along the banks of the South Fork of the St. Lucie River and in the interior portion of the hydric hammock along oxbows and isolated wetlands. In some areas of the hydric hammock, cinnamon and royal ferns often occur in dense stands under a closed canopy.

The snowy orchid is a terrestrial species that inhabits the wet flatwoods and other wet areas within the preserve. The Florida Department of Agriculture lists the snowy orchid as threatened. Two species of bromeliads, common wild pine and giant air plant, can be found in most natural communities throughout the preserve but are most common in the hydric hammock. These two air plants have been exploited by collectors and others to the point that they are now protected on state lands.

The Federally endangered perforate reindeer lichen is found in the scrubby flatwoods of the Medalist section of the preserve. This species, though it cannot survive fire, depends on disturbed sites with an open canopy and a lack of fine ground fuels. Nodding pinweed is a perennial herb that is found in open, disturbed areas of the scrubby flatwoods and scrub communities within the Medalist section of the preserve.

The American alligator is most common in the South Fork of the St. Lucie River and the larger canals in the preserve, most notably the Seawind Canal. Alligators may also be found in other wetlands within the preserve during periods of normal rain. Gopher tortoises are most common in the scrubby flatwoods and scrub communities in the Medalist section of the property. Gopher tortoises are also found in the disturbed areas of the main portion of the preserve along roadways, canal berms and hydrologically altered sites.

The majority of the listed species that occur in the preserve are wading birds that include several species of herons and egrets, white ibis, woodstorks, and sandhill cranes. Most of these species utilize the wet prairies and other wetlands in the preserve for foraging. Due to limited surveys, it is unknown if any of these species nest in the preserve.

Sandhill cranes may be the most commonly observed listed species in the preserve. This species utilizes the wet prairies and old fields for foraging. They typically nest and roost in protected areas bordered on all sides by water. It is not presently known if this species breeds and nests within the preserve.

Bald eagles nest in the wet flatwoods of the extreme northeast section of the preserve. During the summer months, swallow-tailed kites have been observed soaring along the western section of the preserve near the South Fork of the St. Lucie River.

The endangered Florida manatee utilizes the South Fork of the St. Lucie River during the winter months. Because of limited boat traffic on this stretch of the river, this portion of the preserve provides a safe refuge for this imperiled species. Detailed information on Martin County manatees and specific measures to protect these animals in county waterways can be found

online in the Martin County Manatee Protection Plan.

Special Natural Features

Even though the South Fork of the St. Lucie River has been impacted by past agricultural practices, it is a unique blackwater stream.

The pond apple slough present within the preserve may represent one of the largest examples of this community along the southeast coast of Florida. Pond apple, a tropical species, once lined the banks of Lake Okeechobee. It has long since disappeared because of the channelization and the diking of the lake.

Although the scrub community accounts for less than one percent of the total area within the preserve, it remains one of the rarest communities in southern Florida. Finally, the preserve is also part of the Loxahatchee Greenway Project that connects the St. Lucie River Watershed to the Loxahatchee River Watershed.

Cultural Resources

Evaluating the condition of cultural resources is accomplished using a three part evaluative scale, expressed as good, fair, and poor. These terms describe the present state of affairs, rather than comparing what exists against the ideal, a newly constructed component. Good describes a condition of structural stability and physical wholeness, where no obvious deterioration other than normal occurs. Fair describes a condition in which there is a discernible decline in condition between inspections, and the wholeness or physical integrity is and continues to be threatened by factors other than normal wear. A fair judgment is cause for concern. Poor describe an unstable condition where there is palpable, accelerating decline, and physical integrity is being compromised quickly. A resource in poor condition suffers obvious declines in physical integrity from year to year. A poor condition suggests immediate action to reestablish physical stability.

The Florida Master Site File (FMSF) lists no sites of cultural or historic significance within the park.

In February of 1995, Janus Research of St. Petersburg, Florida conducted an archaeological field survey along the South Fork of the St. Lucie River. All areas along the river that seemed suitable for prehistoric occupation or use were investigated. In addition, 25 isolated islands within the interior of the tract were investigated that appeared to be high archaeological site potential based on aerial photos. Field checks at all sites included surface inspection and a limited number of subsurface shovel tests. Soils from the shovel test were sifted through ¼-inch hardware cloth suspended in a wooden frame. This field study found no evidence of midden deposits, artifacts, cultural features or other indicators of prehistoric cultural activity on the surface or along the banks of the river. This summary indicated that this area along the South Fork of the St. Lucie River might not have been intensively used during prehistoric times.

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 preserve during the period covered by this

plan was considered in context of the Division's statutory responsibilities, and an analysis of the preserve's resource needs and values. The long-term management goal for forest communities in the state park system is to maintain or re-establish old-growth characteristics to the degree practicable, with the exception of early successional communities such as sand pine scrub and coastal strand.

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

Additional Considerations

Managing natural communities is often enhanced by physically restoring areas that have been disturbed or otherwise manipulated by people. Such management is often achieved in the course of hydrologic, scenic or other restoration measures, such that two or more management goals can often be achieved simultaneously. Restoration projects in the preserve will require cooperation from other agencies to obtain success. Priority areas within the preserve include: restoration of the ditches and canals in the north section of the preserve, enhancement of old fields and improved pastures and reviewing all permit application that have the potential to affect the natural resources of the preserve. Priority will be given to those sites that include the greatest biodiversity desirable for the long-term health of natural communities. Expansion of such sites will provide the necessary seed source for similar, adjacent natural communities that are currently degraded.

1. **Hydrological restoration.** Restoration of the numerous canals in the north section of the preserve will be a top priority. These canals and ditches will need to be filled to restore that natural hydroperiod and groundwater storage of the wet prairies. Many of the small wet prairies in the preserve appear to be succeeding into more woody communities dominated by slash pine. Numerous canals and ditches in the north section of the preserve rapidly route rainfall outside the preserve boundary. Cooperation with the South Florida Water Management District in this endeavor will be required along with a source of funding to enhance water quality, surface water retention and groundwater storage.
2. **Restoration of Old Fields and Improved Pastures.** Large areas along the east side of the preserve were historically used for cattle grazing. Historically, these areas were pine flatwoods interspersed with wet prairies. Presently, these areas are: 1) succeeding back to pine flatwoods, 2) being overtaken by wax myrtle and Brazilian pepper, or 3) dominated by Bahia grass. Restoration of these sites along with hydrological restoration will increase the area flatwoods / wet prairie ecosystem within the preserve. In addition, restoration of these areas will also allow connectivity to the well-preserved flatwoods / wet prairies in the southern portion of the preserve.
3. **Future development.** In addition, a new residential development and golf course are currently slated for development at the preserve's northeast boundary. It is important that preserve-staff review future permit applications and respond accordingly to protect the preserve's natural resources. Further development along the preserve's boundary is inevitable but every effort should be made to reduce the degradation of the state preserve's resources. Potential impacts of newly proposed developments can include visual encroachment, noise pollution, edge effects, exotic pest plant invasion, stray dog and cat problems and interference with prescribed burns and hydrological impacts. Wherever possible, a buffer on private lands should be established to minimize any changes caused by the proposed development plan.

Management Needs and Problems

1. As depicted on the historical aerial photography, there is increased agricultural and urban growth in this region that has significantly altered the wetlands, as well as the quantity and timing of freshwater discharges to the St. Lucie and Loxahatchee Rivers. In those areas of wetlands and flatwoods that were converted to improved pasture, the land needs to be restored by filling in canals and ditches, especially those that drain the many wet prairies.
2. Because the preserve is bordered by development to the north and east, there are concerns about the deleterious effects on water quality through stormwater, residential, and golf course runoff to both the wetlands and the South Fork of the St. Lucie River. Every effort needs to be made to negate these impacts.
3. In addition, due to the urbanization and roads surrounding the preserve, the prescribed burn program needs to become more sophisticated and implemented in a manner to reduce possible smoke management problems.
4. Both exotic plants and animals including cogon grass, Old World climbing fern, downy rose myrtle, Melaleuca, Brazilian pepper, torpedo grass Australian pines, Bahia grass and feral hogs are all problems the preserve staff must make a high priority, aggressively making every effort to eliminate them.
5. As this is a newly acquired property, both the plant and animal inventories need to be intensified. Special management efforts need to be implemented as well for the preserve's designated species.
6. Regarding cultural history, funding for a Phase I archaeological survey is needed.

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. Improve the water quality of drainages into the South Fork of the St. Lucie River.
2. With the assistance of other agencies, improve the hydrological regime in the flatwoods and wet prairies by filling in the canals and ditches in the north section of the preserve.
3. Restore old fields and improved pastures along the east side of the preserve to pine flatwoods for connectivity with the undisturbed flatwoods to the south.
4. Develop and maintain an effective prescribed burn program for the fire-dependent communities that occur in the preserve.
5. Develop and implement a program to control and monitor invasive plants and animals, especially in the pond apple slough and cypress dome.
6. Continue to update the preserve's plant and animal inventory, with an emphasis on listed species.
7. Encourage and support outside research within the preserve to address management needs and problems, including all aspects of natural and cultural resource management.

Management Measures for Natural Resources

Hydrology

The numerous canals and ditches that occur in the north section of the preserve have greatly affected the wet prairies by rapidly diverting precipitation outside the preserve. Restoration of these canals and ditches would greatly improve the hydrological patterns of the wet prairies.

Restoration of the canals and ditches can be accomplished by filling them in to grade, which in turn would eliminate the drainage of these prairies. Enhancement, which would be a cheaper option, would consist of blocking the exit with an impermeable material that would retain water in the wet prairies. Either of these options would improve the hydroperiod of the wet prairies as well as increasing ground water storage by allowing precipitation to stay on-site instead of being diverted into canals and ditches, and eventually out of the preserve.

Runoff from the residential communities northeast of the preserve, and the citrus grove and sod farm located south of the preserve have the potential to decrease the water quality that flows into the preserve and South Fork of the St. Lucie.

Prescribed Burning

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

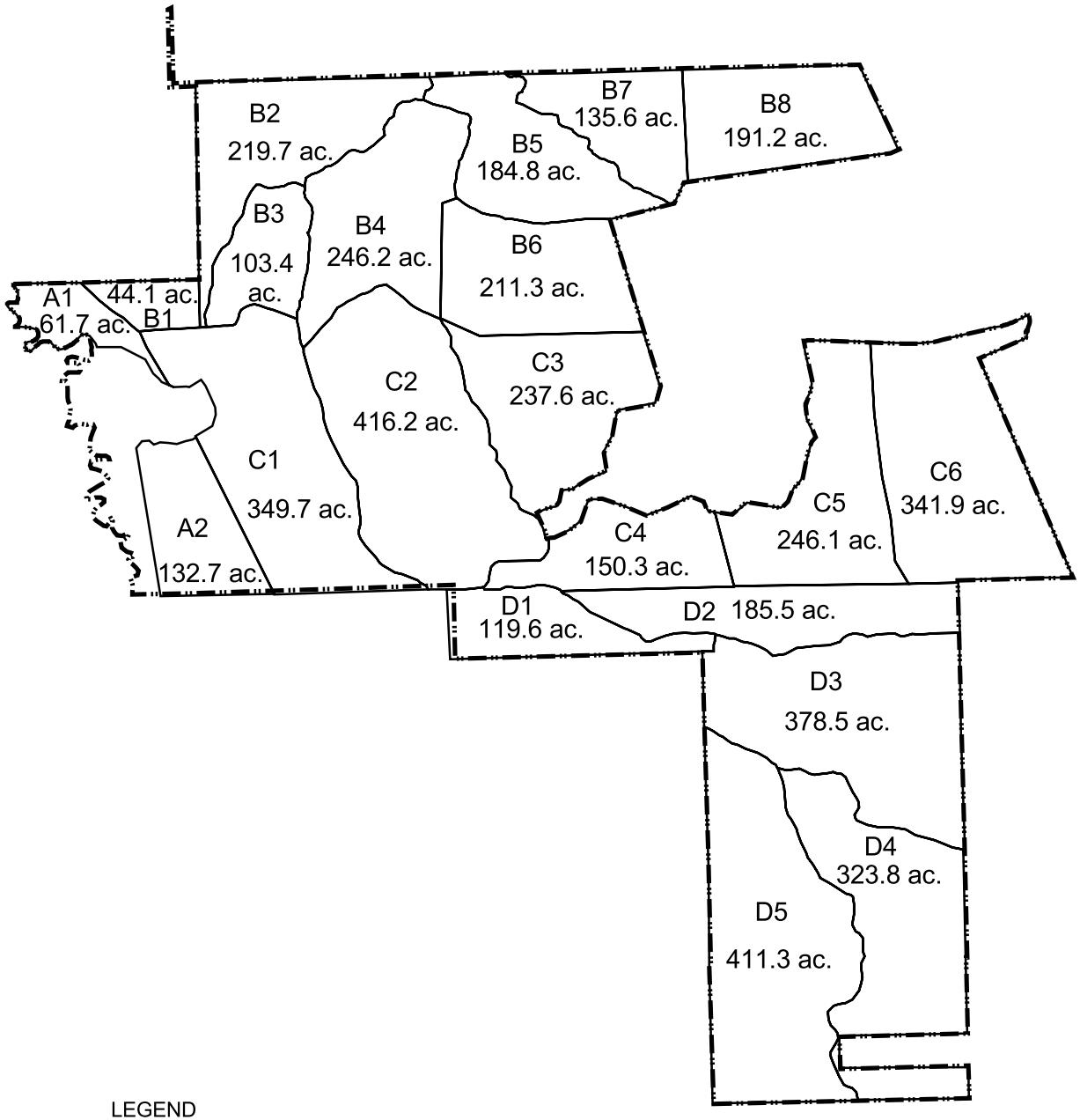
Fire dependent communities that occur within Atlantic Ridge Preserve State Park include pine flatwoods, scrubby flatwoods, and scrub (see Burn Zones Map). An annual plan is written by the preserve manager and district biologist listing the burn objectives for the year. Contained within each prescription are specific weather conditions, ignition patterns, equipment and staff requirements, and any special precautions or management actions that need to be followed. Prescribed burn records and evaluations are maintained by district biologists. All prescribed fires and wildfires within the preserve are mapped with GPS and downloaded into Arc View GIS database.

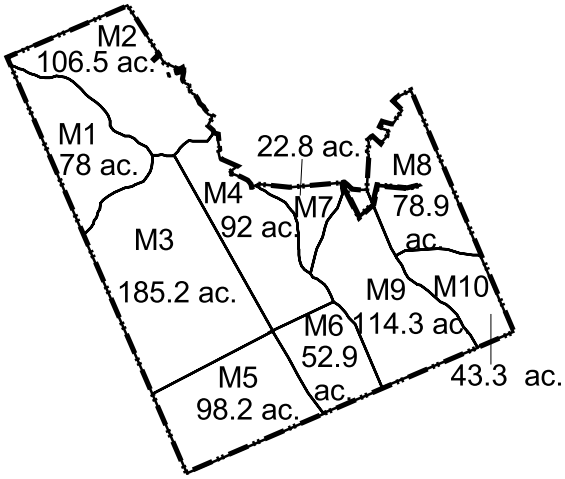
Because of the increasing suburban setting around Atlantic Ridge Preserve State Park, fire management in the preserve will require careful consideration of smoke management. In order to successfully maintain a fire management program, burning may have to occur during the non-lightning season (winter months), particularly along the north boundary of the preserve and in the scrubby flatwoods and scrub sections of the Medalist property. In time, if the surrounding residential communities are willing to accept small amounts of smoke, then some lightning season burns can be accomplished in the pine flatwoods and scrubby flatwoods.

The previous landowner burned the flatwoods on a three-year rotation, which roughly translates to ca. 1500-1600 acres burned per year. The flatwoods occurring within the main section of the preserve are in excellent shape and contain low fuel loads. It is important that a progressive prescribed burn program be maintained, especially because urban development is rapidly enclosing in on the preserve boundary. Regular prescribed burns in the preserve will maintain low fuel loads and decrease the threat of wildfires and spotovers in the future as fuel loads increase without prescribed burns.

Designated Species Protection

The welfare of designated species is an important concern of the Division. In many cases, these species will benefit most from proper management of their natural communities. At times, however, additional management measures are needed because of the poor condition of some communities, or because of unusual circumstances that aggravate the particular problems of a species. To avoid duplication of efforts and conserve staff resources, the Division will consult





LEGEND
Park boundary
Burn Zones

N

2000 0 2000 4000 Feet

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

ATLANTIC RIDGE PRESERVE STATE PARK

BURN ZONE MAP

and coordinate with appropriate federal, state and local agencies for management of designated species. Specifically, data collected by the FWC and USFWS as part of their ongoing research and monitoring programs will be reviewed periodically to inform management of decisions that may have an impact on designated species at the park.

Ecosystem management at Atlantic Ridge will focus on maintaining and improving the integrity of the existing natural communities, which includes the protection of all flora and fauna within the system, restoring impacted areas, and eliminating outside threats (e.g., nutrient rich runoff, feral animals, invasive vegetation, etc.). Thus, no specific species of flora or fauna is exclusively managed for, but consideration is given to areas the species may inhabit with a community. For example, many listed species of plants are found in the scrub and scrubby flatwoods communities. Because of the pyrogenic nature of scrub and scrubby flatwoods and their close proximity to major roadways and residential communities, mechanical methods may have to be applied to reduce the fuel loads in these communities before prescribed fire can be applied to make the habitat suitable for early successional plants. In defined areas known to contain a listed species, such as a pair of nesting eagles, the area may have to be posted or fenced to ensure the protection of the species from disturbance.

Exotic Species Control

Exotic species are those plants or animals that are not native to Florida, but were introduced because of human-related activities. Exotics have fewer natural enemies and may have a higher survival rate than do native species, as well. They may also harbor diseases or parasites that significantly affect non-resistant native species. Consequently, it is the strategy of the Division to remove exotic species from native natural communities.

The control and management of exotic species is a resource management priority at Atlantic Ridge Preserve State Park. Relatively speaking, the park is in good condition in regards to exotic species and has improved due to park staff management actions. The most concerning exotic plant species are Old World Climbing Fern, Downy Rose Myrtle and Melaleuca. Additionally, feral pigs pose a significant threat to the wetland dominated systems of Atlantic Ridge.

Five exotic species are of particular concern: Cogon Grass, Old World Climbing Fern, Downy Rose Myrtle, Melaleuca and Brazilian Pepper. Cogon Grass has been found and treated in the preserve and should be watched for in future. Brazilian Pepper exists throughout the preserve in wet and dry areas and in disturbed and natural habitats. Old World Climbing Fern exists in wet areas in small to medium sized patches, and along many of the canals and ditches that have been dug in the preserve. Torpedo Grass is also a problem, especially in the western cypress dome and ditches. Priorities for exotic removal and maintenance are wetland areas such as the pond apple slough, and the floodplain swamp along the South Fork of the St. Lucie River (mostly for climbing fern and pepper). Then, the heavy infestation of downy rose myrtle along the eastern border, areas with Old World Climbing Fern, sites heavily infested with melaleuca, other natural areas, and finally the old cattle pasture infested with Brazilian Pepper should be addressed. All areas of the preserve should eventually be brought to manageable levels.

All exotic removal should be done with the appropriate herbicides, using current removal technology and the appropriate protective gear. A more detailed plan will be written by district biologists and maintained as a working document for coordination of exotic removal. The plan, once completed, will be kept on file at the preserve and district office.

Damage from wild hogs is prominent in many areas throughout the preserve. A population study on wild hogs is being conducted by the U.S. Department of Agriculture's Animal and Plant

Health Inspection Service. Information from this study will be used to determine the proper control method of wild hogs. Armadillos, another exotic animal, occur in the preserve and are treated according to the Division Operations Manual (OM).

Being that portions of the preserve exist at the wildland-urban interface, feral cats and dogs may become a problem in the preserve. Educating adjacent landowners on the negative impacts of feral animals on native wildlife to homeowners may help to alleviate this problem.

Problem Species

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

Some areas used for cattle grazing by the previous landowner and were historically pine flatwoods are succeeding into thickets of wax myrtle, Brazilian pepper and are dominated by Bahia grass, an exotic pasture grass. Plans to restore these areas will be written by district biologists along with the preserve manager. Restoration of these sites should include the treatment or removal of wax myrtle and exotics plus the replanting of slash pines. Some tilling of the soil may be required to break up the compacted soil in some areas from years of compaction from cattle grazing.

Raccoons have become a problem in many urban preserves as the local residents feed these animals. Informing local residents about the dangers and laws associated with feeding wild animals may help to alleviate this problem.

Mosquitoes may become numerous in the preserve during the rainy season and large numbers of these arthropods may hatch adjacent to residential communities prompting complaints from local residents. Martin County's Mosquito Control Program responds to the calls of local citizens and utilizes larvicides, thermal fog spraying and aerial spraying to control mosquitoes. Because the preserve is located adjacent to or near several affluent residential communities and golf courses, a higher level of mosquito control than normal may be requested. Excessive mosquito control can have negative impacts on the food chain and alter the invertebrate fauna in the preserve.

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.

Due to the passive recreation activities proposed for the preserve, no management measures are currently needed for the preserve. No known sites, either cultural or historical, are known to exist in the preserve. Many areas within the preserve were regularly burned on a three-year rotation and with the exception of the canals and ditches, no excavation have occurred in the preserve.

Only a small area of the preserve is classified as developed and no large-scale development is currently planned for the preserve. Any future development that includes soil excavation or disturbance will be coordinated through DHR. In addition, any cultural or historical research within the preserve by outside sources will be welcomed.

Research Needs

Natural Resources

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

Presently, only a cursory list of plants and animals has been documented from the preserve. Because the preserve was recently turned over to the Florida Park Service as the primary management agency, surveys of plants, invertebrates and vertebrates in the preserve are needed. The Florida Park Service offers scientists and researchers the opportunity to do specific studies on this property.

Water quality and quantity monitoring stations need to be established in the preserve to determine the effects of discharges from residential communities and agriculture sites into the Seawinds canal and the South Fork of the St. Lucie River.

Currently, a population study on wild hogs is being conducted to estimate the density index of this exotic animal. Park staff are mapping natural communities and documenting plant and animal observations within the preserve. A hydrological study has been completed by a private consulting firm focusing on the effects of the canals and ditches.

Cultural Resources

The potential for cultural or historical sites within the preserve is most likely to occur along the South Fork of the St. Lucie River. However, a field study along the river failed to discover any cultural or historical sites. No other cultural or historical sites are known from the immediate area based the DHR records. Any cultural or historical research within the preserve by other agencies or sources will be welcomed and encouraged. Park staff has limited experience and knowledge on this matter. However, park staff is very knowledgeable on the preliminary judgment of such sites. Any potential cultural or historical site that is observed by park staff will be reported to the DHR for further assessment.

Resource Management Schedule

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

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.

A land management review has not been conducted for Atlantic Ridge Preserve State Park.

LAND USE COMPONENT

INTRODUCTION

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

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

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

EXTERNAL CONDITIONS

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

Atlantic Ridge Preserve State Park is located in Martin County, about six miles south of Stuart in the southeast part of the state. The populations of Martin County and the adjacent Palm Beach and St. Lucie Counties have grown 40 percent since 1990, and are projected to grow an additional 37 percent by 2020 (BEBR, University of Florida, 2004). The median age of Martin, Palm Beach and St. Lucie Counties are 48.6, 42.6 and 43.3 which is significantly older than the state average of 39.4 (BEBR, University of Florida, 2004). Nearly 1.6 million people reside within 50 miles of the park, which includes the cities of Sebastian, Vero Beach, Ft. Pierce, Port St. Lucie, Jensen Beach, Stuart, Okeechobee, Belle Glade, Hobe Sound, Jupiter, Palm Beach Gardens, Riviera Beach, West Palm Beach, Palm Beach, Lake Worth, Boynton Beach, Delray Beach and Boca Raton (Census, 2000).

Atlantic Ridge Preserve State Park recorded no visitors in fiscal year 2003/2004 because the property was not accessible to the public. An access agreement was reached in 2004 with Martin County and an adjacent residential developer. Once the entrance road is constructed and park facilities are added, the park is expected to receive low visitation because the park will be developed for passive recreation. By Division estimates, park expenditures contributed $118,298 in direct economic impact and the equivalent of 2.4 jobs to the local economy (Florida Department of Environmental Protection, 2004).

Existing Use of Adjacent Lands

Atlantic Ridge Preserve State Park consists of two distinct sections: Atlantic Ridge and the Medalist property. A variety of existing land uses surrounds each section, some of which create challenges to managing the properties. The area adjacent to the northwest corner of Atlantic Ridge property, near the proposed entrance and existing service road, is composed of low-density residential developments. To the north of the park boundary is rural residential with small homes on larger tracts of land. New residential areas with golf courses have been developed in recent years along the northeast corner of the park as well as within the large outparcel that juts into the park, practically bisecting it. A large stormwater canal provides drainage for this residential development and runs along its border with the state park across park property to the southern boundary of the state park, and then empties into the South Fork of the St. Lucie River. This and other canals and ditches have disrupted the natural hydrological process in the state park. South of the park boundary are agricultural lands that currently grow citrus, tomatoes, sugar and sod. Much of the agricultural runoff is channeled to the large canal mentioned above.

The Medalist property is separated from the Atlantic Ridge property by agriculture and private hunting lands. The eastern portion of the Medalist property, however, is bordered by a mixture of residential neighborhoods, mobile homes, and a golf course.

Across the South Fork River are public lands managed by Martin County. Halpatiokee Regional Park is a 200-acre county park offering picnicking, canoe/kayaking, hiking trails, and active sport fields. Just south of this park is another 100-acres managed by Martin County under lease from the SFWMD which provides additional opportunities for fishing, hiking, canoeing, boating, primitive camping, and nature study. A couple of miles downstream is another county park, Hosford Park, which provides another launching/landing area for canoes/kayaks and small boats. Less than 2 miles south of Atlantic Ridge Preserve State Park is the entrance to Jonathan Dickinson State Park. This popular state park offers nature trails, off-road bike trails, two campgrounds, cabins, a group camp, picnicking, a swimming area, canoe/kayaking, boating, and interpretive programs. Other state parks within the vicinity include St. Lucie Inlet Preserve State Park which is accessible only by boat and provides a boardwalk to the beach and picnicking; Savannas Preserve State Park which offers nature trails, canoe/kayaking, picnicking and educational programs; and Seabranch Preserve State Park which currently offers hiking, picnicking and nature appreciation.

Planned Use of Adjacent Lands

The Future Land Use Map for Martin County (Martin County, 2003) identifies the various land use designations for the properties surrounding Atlantic Ridge Preserve State Park. The area adjacent to the northwest corner of the Atlantic Ridge property is identified as low-density residential which allows up to 5 dwelling units per acre (UPA) and estate-density residential (1 UPA). A new residential development and public school is slated for this area. An agreement has been reached between the developer and the Division of Recreation and Parks to share the proposed entrance road off Cove Road. Along the remainder of the northern park boundary has been identified as rural-density residential (0.5 UPA) and estate-density residential (1 UPA and 2 UPA). The land east of the park allows for a variety of residential densities including rural-density (0.5 UPA), low-density (5 UPA), and estate-density (2 UPA). Another new residential development and golf course is anticipated at the park's northeast boundary. Further development along the boundary is inevitable. South of the park boundary is designated for agriculture and agricultural ranchettes. West of the South Fork of the St. Lucie River are the conservation and recreational lands managed by the South Florida Water

Management District and Martin County.

A road extension is proposed in the Comprehensive Growth Plan (2003) for Willoughby Boulevard to cross the Atlantic Ridge property connecting Cove Road and Bridge Road. If constructed, this road may have a negative impact on the park resources and the natural hydrological process of the preserve.

The land bordering the western half of the Medalist property is designated as rural-density residential (0.5 UPA), while the eastern half is bordered by a mixture of low-density residential (5 UPA), medium-density residential (8 UPA), and mobile home-density (8 UPA). Further development around this property is also expected.

Potential impacts of new residential developments can include visual encroachment, noise pollution, edge effects, exotic pest plant invasion, stray dog and cat problems, and interference with prescribed burns and hydrological impacts.

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

Atlantic Ridge Preserve State Park includes over 5,700 acres of upland and wetland plant communities. The vast majority of the preserve is composed of wet flatwoods and wet prairie. It also consists of hydric hammock, slough, depression marsh, upland hardwood forest, scrubby flatwoods, scrub, sandhill upland lake, basin swamp and dome swamp. The topography varies only slightly. The preserve is best suited for passive recreation such as hiking and equestrian trails, wildlife viewing, birding and picnicking. Interpretive programs linked to recreational trail access on the preserve should highlight the interconnected nature of Florida ecosystems and explain the impacts of land development on critical habitat and aquifer recharge areas throughout the state.

Water Area

The South Fork of the St. Lucie River serves as the westernmost boundary for Atlantic Ridge Preserve State Park. A unique blackwater stream retains a wild and scenic appearance. A tributary of the river once flowed from east to west along the center portion of the preserve. The development of an orange grove along the southwest boundary of the preserve has since blocked this historical floodplain and blocked upstream surface flows from reaching the river. The creation of agricultural ditches and canals throughout the property has also impacted the natural hydrological regime. Hydrological restoration has become a focus of resource management at the preserve. The properties provide a source of groundwater base flow for the

South Fork of the St. Lucie River and the North and Northwest Forks of the Loxahatchee River.

Shoreline

The preserve borders the South Fork of the St. Lucie River for approximately 2.6 miles. This entire section of the river is undeveloped, as both shorelines are public lands managed for conservation and public recreation. Access to the river for recreational pursuits is not feasible because of the wide floodplain. Moreover, small craft landings are available across the river within the Halpatiokee Regional Park as well as downstream at Hosford Park.

Natural Scenery

The wet flatwoods that dominate the landscape of the preserve provide a picturesque setting for picnicking, hiking and horseback riding. The South Fork of the St. Lucie River is also very scenic.

Significant Wildlife Habitat

The preserve is home to at least eight plant and 15 animal species that are classified as endangered, threatened, of special concern, or commercially exploited. Notable species include the snowy orchid, reindeer lichen, American alligator, Gopher tortoise, Florida manatee, bald eagle and a variety of wading birds.

Although the scrub community is small, it remains one of the rarest communities in southern Florida. All scrub community is potential habitat for the threatened Florida scrub jay and should therefore be managed appropriately. In addition, the pond apple slough within the preserve may represent one of the largest examples of this community along the southeast coast of Florida.

Archaeological and Historical Features

No cultural or historical sites have been identified. The most likely locations are along the South Fork of the St. Lucie River; however, a field study conducted in 1995 failed to find any sites.

Assessment of Use

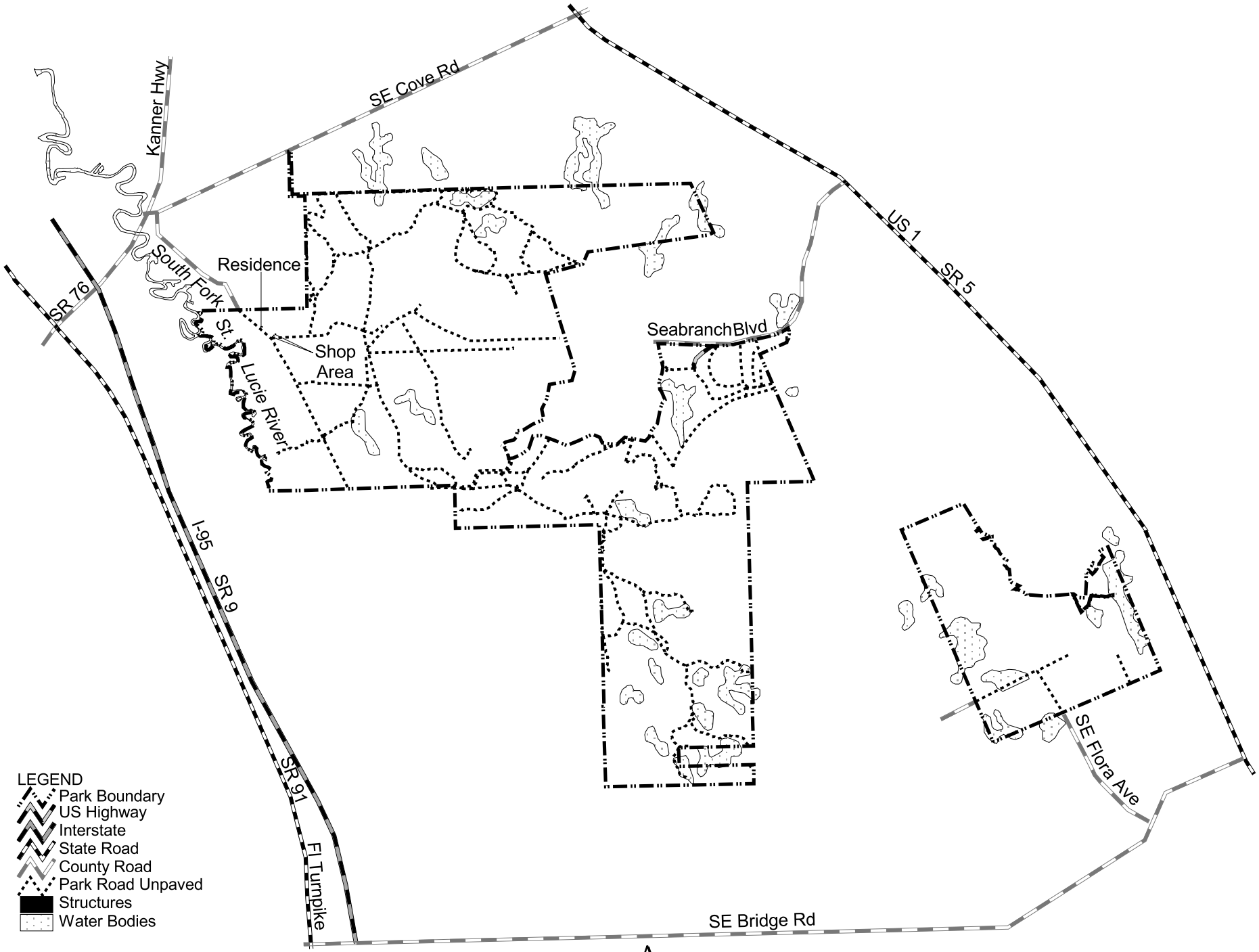
All legal boundaries, significant natural features, structures, facilities, roads and trails existing in the unit are delineated on the base map (see Base Map). Specific uses made of the unit are briefly described in the following sections.

Past Uses

Past uses of the property include agriculture and hunting. Previous owners constructed agricultural cross ditches upon much of the property to drain the wetland ecosystem and maximize upland utilization for cattle grazing and other related agricultural practices. Hydrological restoration is now a major focus of managing the preserve. In addition, some areas of the preserve were managed for quail hunting.

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



ATLANTIC RIDGE PRESERVE STATE PARK

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

BASE MAP

site planning and analysis.

At Atlantic Ridge Preserve State Park, the scrub, scrubby flatwoods and all of the wetland communities (wet prairie, hydric hammock, slough, basin swamp, depression marsh, dome swamp, sandhill upland lake, and blackwater stream) have been designated as protected zones as delineated on the Conceptual Land Use Plan.

Existing Facilities

The preserve has not yet opened to the public due to the lack of a public access road. Once the proposed entrance road is constructed, the preserve will be available for passive recreation such as hiking, horseback riding, picnicking, wildlife observation and birding.

Recreation facilities. Currently, there are no recreation facilities at the preserve

Support facilities. One ranger residence and a small maintenance area are located just inside the park boundary off Paulson Road.

CONCEPTUAL LAND USE PLAN

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

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

Potential Uses and Proposed Facilities

The management focus at Atlantic Ridge Preserve State Park is on restoring and preserving the natural resources and hydrological regime. Recreational opportunities should be limited to passive uses, such as hiking, horseback riding, picnicking, wildlife observation and birding. The following facilities are recommended to develop the preserve:

Recreation Facilities

Entrance Road. An agreement has been reached with the county and an adjacent land developer to share an access road from Cove Road near the northwest corner of the preserve. Once in the preserve, the entrance road will be routed around wetlands, when possible, and

ENTRANCE ROAD

COVE ROAD

TRAILHEAD AREA

MAINTENANCE AREA

TRAIL SYSTEM

LEGEND

- DEVELOPMENT AREA
- ENTRANCE ROAD
- SERVICE ROAD/ TRAIL SYSTEM
- PROTECTED ZONE
- PARK BOUNDARY

N

2500 0 2500 5000 Feet

ATLANTIC RIDGE PRESERVE STATE PARK

CONCEPTUAL LAND USE PLAN

deliver visitors to a trailhead area.

Trailhead. A trailhead facility is recommended near the northwest corner of the preserve, a sufficient distance from the park boundary as to provide a buffer from adjacent development (see Conceptual Land Use Plan). Recommended facilities include stabilized parking for 25 vehicles with horse trailers, a large picnic pavilion, a restroom and an interpretive kiosk.

Trail System. From the trailhead, visitors can access the approximately 30 miles of service roads that will be enhanced and serve as the preserve's trail system. Interpretive signs will be placed at appropriate locations to teach visitors about the ecological role of wetland systems, the human impacts to hydrological regimes, restoration efforts, the rare natural communities, listed species, the role of prescribed burning, and the threat of invasive exotic species.

Potential Greenway Linkage. The Division of Recreation and Parks support trail connections to local greenways. If and when a possible connection to Atlantic Ridge Preserve State Park is identified, the Division will support the idea upon considering the sensitivity of the natural and cultural resources of the property and concerns related to park operations. The Division will decide the most appropriate route for the trail within the state park and what additional facilities to provide. A linkage to Jonathan Dickinson State Park depends on the acquisition of lands between them. Successful implementation of other trail linkages will require Division coordination with the Martin County Planning Department.

Primitive Camping. Once the preserve is open and trail use becomes established, the Division will consider establishing a couple of primitive campsites in the southern portion of the Atlantic Ridge property.

Support Facilities

The existing maintenance area should be expanded to enhance management of the property. Recommended facilities include a 4-bay equipment shelter, a shop building with office space, and one additional ranger residence.

Facilities Development

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

Recreation Facilities

Entrance Road (1/2 mile)
Stabilized Parking Area (25 vehicles w/trailer)
Large Picnic Pavilion
Restroom
Interpretive Kiosk (1)
Interpretive Signs (10)

Support Facilities

4-Bay Equipment Shelter
Shop Building
Ranger Residence

Existing Use and Optimum Carrying Capacity

Carrying capacity is an estimate of the number of users a recreation resource or facility can accommodate and still provide a high quality recreational experience and preserve the natural

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

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

Table 1--Existing Use And Optimum Carrying Capacity

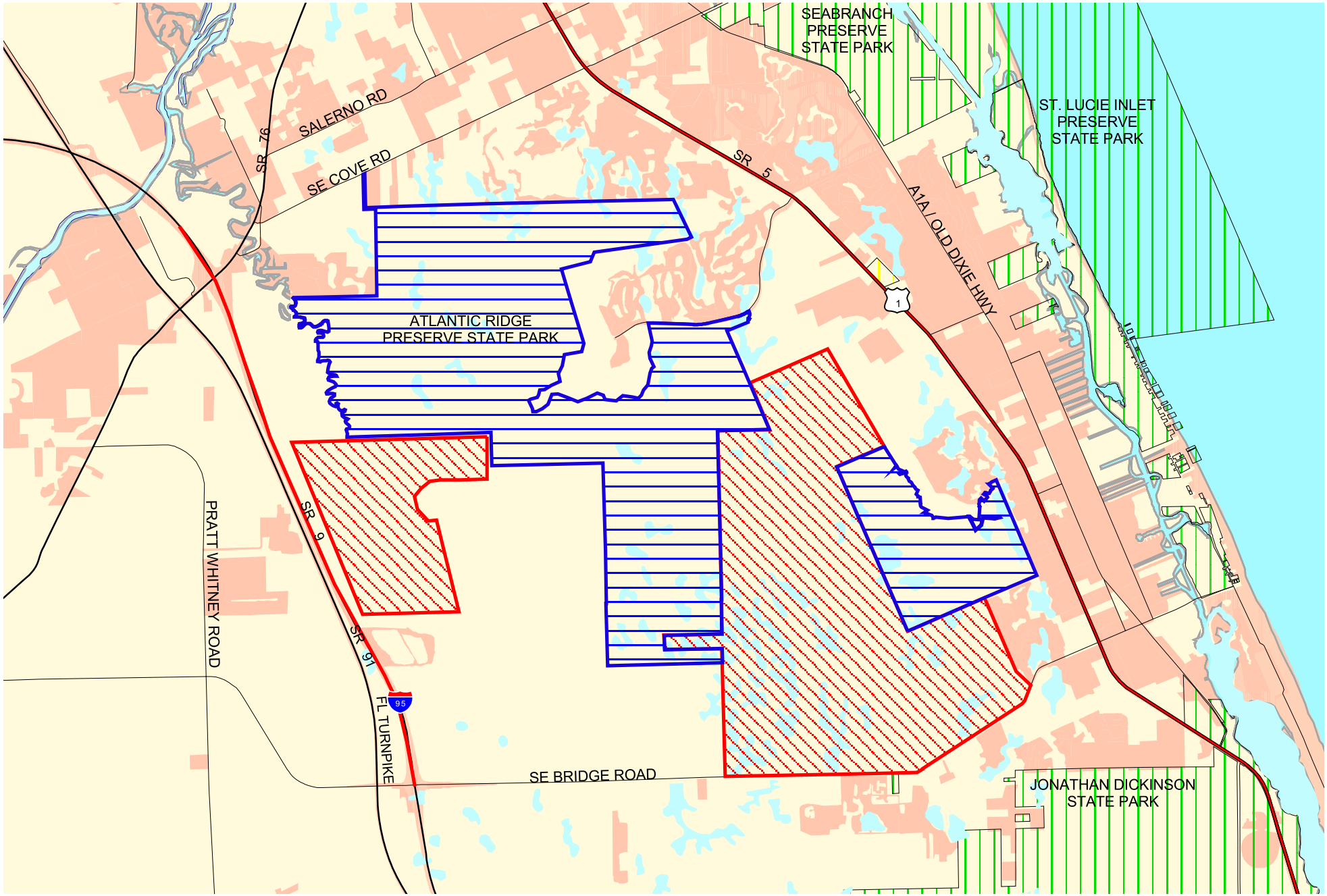
	Existing Capacity		Proposed Additional Capacity		Estimated Optimum Capacity	
Activity/Facility	**One Time**	**Daily**	**One Time**	**Daily**	**One Time**	**Daily**
Trails						
Shared Use			50	100	50	100
Picnicking			40	80	40	80
TOTAL	**0**	**0**	**90**	**180**	**90**	**180**

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

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

The optimum boundary 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.



ATLANTIC RIDGE
PRESERVE STATE PARK

3000 0 N 3000 6000 Feet

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

LEGEND
Park Boundary
Optimum Boundary

OPTIMUM BOUNDARY MAP

All remaining undeveloped land within the Florida Forever Atlantic Ridge Ecosystem project that lies north of Bridge Road is identified as the optimum boundary for Atlantic Ridge Preserve State Park. The lands within this project area south of Bridge Road are part of the optimum boundary for Jonathan Dickinson State Park. These lands are considered important in protecting one of the largest patches of natural land left on this coast – conserving an important scrub, pine flatwoods, marshes, and the floodplain of the South Fork of the St. Lucie River, protecting the quality of water in the St. Lucie and Loxahatchee River basins, and allowing the public to enjoy the original landscape of this fast-growing area.

Addendum 1—Acquisition History and Advisory Group Documentation

Purpose of Acquisition

The Board of Trustees of the Internal Improvement Trust Fund of the State of Florida (Trustees) and the South Florida Water Management District (District) have acquired Atlantic Ridge to manage the property in such a way as to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

Sequence of Acquisition

On November 4, 1998, the Trustees and the District obtained title to a 5,716.00-acre property constituting the initial area of Atlantic Ridge. The Trustees and the District, which maintain undivided 50% interest in this property, purchased the property from Westerra Seawind L.P. for $18,768,105. The purchase was funded under the P2000/CARL program.

Management Agreements

On December 6, 2000, the Trustees and the District together leased Atlantic Ridge to the Department of Environmental Protection, Division of Recreation and Parks (Division) under Lease No. 4288. The lease is for a period of fifty (50) years, which will expire on December 5, 2050.

On February 14, 2002, the Divisionleased approximately 200-acre parcel from the District to manage the property as part of Atlantic Ridge. The term of this lease is for a period of fifty (50) years, and the lease will expire on February 13, 2052. Since the Division released approximately 100 acres of this lease, it currently manages only about 100 acres of the original lease.

According to the two leases, the Division manages Atlantic Ridge only for the development, conservation and protection of natural and cultural resources of the park and to use the property for resource-based public outdoor recreation compatible with the conservation and protection of the resources.

Title Interest

The Trustees and the District hold title to Atlantic Ridge.

Special Conditions On Use

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

Outstanding Reservations

Following is a listing of outstanding rights, reservations and encumbrances that apply to Atlantic Ridge.

Instrument: .....Easement No. 31322
Instrument Holder: .....Trustees
Beginning Date: .....November 16, 2004
Ending Date: .....When the easement area is no longer used for public right of way
Outstanding Rights, Uses, Etc.: .....The easement allows Martin County to use a certain portion of the park as a public right-of-way

Instrument: .....Lease Agreement, Lease No. 4288
Instrument Holder: .....Trustees and District
Beginning Date: .....December 6, 2000
Ending Date: .....December 5, 2050
Outstanding Rights, Uses, Etc.: .....The Division's leasehold interest in the area referred to as Exhibit "B" in the lease agreement will be terminated if public access for this property is not acquired prior to December 5, 2005.

Instrument: .....Quitclaim Deed
Instrument Holder: .....South Florida Water Management District
Beginning Date: .....May 11, 2000
Ending Date: .....Forever
Outstanding Rights, Uses, Etc.: .....The deed is subject to a certain drainage easement

Instrument: .....Special Warranty Deed
Instrument Holder: .....Westerra Seawind L.P.
Beginning Date: .....December 29, 1999
Ending Date: .....Forever
Outstanding Rights, Uses, Etc.: .....The deed is subject to certain utility, ingress and egress, and drainage easements.

Instrument: .....Warrant Deed
Instrument Holder: .....Westerra Seawind L.P.
Beginning Date: .....November 4, 1998
Ending Date: .....Forever
Outstanding Rights, Uses, Etc.: .....The deed is subject to three drainage easements.

Instrument: .....Permit
Instrument Holder: .....Hobe-St. Lucie Conservancy District
Beginning Date: .....October 27, 1998

Ending Date:.....No specific date is given.
Outstanding Rights, Uses, Etc.: .....The permit allows Westerra Seawind, L.P. to construct a culvert drainage connection to the Hobe-St. Lucie Conservancy District facilities.

Instrument:.....Drainage Easement Agreement
Instrument Holder:.....Westerra Seawind, L.P., Lost Lake Golf Properties, Double Tree Property Owners Association, Inc., Double Tree, Inc.
Beginning Date:.....September 15, 1998
Ending Date:.....Perpetual
Outstanding Rights, Uses, Etc.: .....The easement allows the Lost Lake Golf Properties and Double Tree, Inc. to establish a drainage system to discharge surface water under and across the property.

Atlantic Ridge Preserve State Park

List of Advisory Group Members

The Honorable Lee Weberman, Chair
Martin County Board of
County Commissioners
Martin County Administrative Center
2401 SE Monterey Road
Stuart, Florida 34996

Mr. Mark Nelson, Park Manager
Jonathan Dickinson State Park
16450 Southeast Federal Highway
Hobe Sound, Florida 33455

Mr. Chuck Collins, Regional Director
South Region
Florida Fish and Wildlife Conservation
Commission
8535 Northlake Boulevard
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Mr. Dale Armstrong, Senior Forester
Florida Division of Forestry
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David Lennard, Chairman
Martin Soil and Water Conservation District
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Ron Shewmaker, President
Palm City Farms Trail Association
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Steve Bucina, President
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Ms. Pamela Bates
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Greg Braun, Executive Director
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Debra Klein, Chapter President
Florida Native Plant Society, Cocoplum
Chapter
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Stuart, Florida 34995

Gene Weber, President
Lost Lake Golf Club Property Owner's
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Hobe Sound, Florida 33455

Represented by:
Roger Petraglia
8064 Southeast Peppercorn Court
Hobe Sound, Florida 33455

Paul Toma
8113 Southeast Paurotis Lane
Hobe Sound, Florida 33455

Warren Skidmore
8161 Southeast Palm Hammock Lane
Hobe Sound, Florida 33455

The Advisory Group meeting to review the proposed land management plan for Atlantic Ridge Preserve State Park was held at the District 5 Administration Office on April 21, 2005. Gene Weber (Lost Lake Golf Club Property Owner's Association) was represented by Roger Petraglia, Paul Toma and Warren Skidmore. Chairman Weberman (Martin County Board of County Commissioners), Chuck Collins (Florida Fish and Wildlife Conservation Commission), David Lennard (Martin County Soil and Water Conservation District), and Pamela Bates (Sierra Club) did not attend. All other appointed Advisory Group members were present. Attending staff were Mark Nelson, George Jones, Rob Rossmanith, Paul Rice, Bill Haluska, and Brian Burket.

Mr. Burket began the meeting by explaining the purpose of the Advisory Group and reviewing the meeting agenda. He provided a brief overview of the Division's planning process and summarized public comments received during the previous evening's public workshop. He also discussed the Division's unit classification system and recommendation to designate the property as a preserve. He provided a handout describing the classification options and announced that the group would vote on the preferred designation at the conclusion of the meeting. He then asked each member of the advisory group to express his or her comments on the plan.

Summary of Advisory Group Comments

Dale Armstrong (Florida Division of Forestry) stated his support for the plan, especially the burn program. He offered to help with prescribed burning and restoration efforts.

Ron Shewmaker (Palm City Farms Trail Association) offered volunteers from the Palm City Farms Trail Association to help develop and maintain the trail system.

Tom Clements (Florida Trail Association) recommended linking the preserve's trails to the trail system on neighboring conservation lands across the South Fork of the St. Lucie River. He requested that primitive campsites be established in the southern portion of the Atlantic Ridge property. He identified the need to acquire lands to join Atlantic Ridge to the Medalist property. He also offered volunteers from the Florida Trail Association to help blaze the trails in the preserve.

Roger Petraglia, Paul Toma and Warren Skidmore (Lost Lake Golf Club Community) expressed concern with drainage issues affecting the Lost Lake Golf Club Community. They stated that they are losing slash pine due to water accumulation. Mr. Armstrong explained that this is an appropriate change as the hydrology of the area is restored. The gentlemen from Lost Lake asked why the SFWMD has not developed a drainage plan for the northern portion of Atlantic Ridge and wondered how the park would reestablish flow to Jonathan Dickinson State Park. Mr. Nelson described how water currently moves through area which was confirmed by a consulting survey. Mr. Petraglia also recommended establishing bird sanctuaries within the preserve. Mr. Nelson responded that as the land is appropriately managed, the entire preserve essentially becomes a bird sanctuary. Mr. Nelson then asked about the best way to announce prescribed burning plans to the community residents. Mr. Petraglia requested that the park contact the property manager and they would notify the residents on channel 63. Mr. Toma reminded the Division of the community's legal drainage easement across the preserve and their intentions to keep it clear of debris. Mr. Helfferich recommended using the main Seawind ditch instead of

maintaining the north outflow easement. Mr. Nelson stated that the park staff has worked well with the community in the past and will continue to work together in the future to address any concerns.

Steve Bucina (Club Scrub Off-Road Bicycle Trail Club) stated his support for the Florida Forever acquisition project for the Atlantic Ridge ecosystem. He expressed doubt for the trail system's suitability for bicycle use due to the sandy nature of the preserve. He voiced support for greenway efforts and offered volunteers from Club Scrub Bike Club to help maintain trails.

Greg Braun (Martin County Audubon Society) complimented the thoroughness of the management plan. He suggested that "conservation" be listed before "recreation" as the designated use of the property in the Introduction. He requested that the plan acknowledge the joint acquisition efforts for the property by SFWMD and Martin County. He suggested that natural resource objective #7 regarding the participation in permit review of basin projects include commenting on the Division's position. He recommended using the Florida Exotic Pest Plant Council (EPPC) categories in the plan when discussing invasive plants. In regards to listed species, he stated that *Thelypteris serrata* (toothed maiden fern) can be found across the river, red cockaded woodpeckers are in the area, bald eagles do not nest in the park every year, and Martin County developed a manatee protection plan that should be mentioned in the plan. He recommended that the plan state the Division's strong opposition to a Willoughby Road extension through the preserve. Mr. Nelson commented that the Division and SFWMD have approached Martin County to voice their opposition to extending the road and the County has agreed to remove the idea from their comprehensive plan. Mr. Braun suggested that the "Management Needs and Problems" on p.22 mention non-native animal species and the exotic plant list include all pasture grasses. He recommended that plan state that a goal of burning is to restore the natural fire regime, and he suggested disclosing the burning impact area to realtors so future neighbors will be aware of burn program at preserve. Mr. Nelson replied that he is already working on this. Mr. Braun suggested providing an observation tower near the eagle nest. Mr. Burket explained the ADA constraints for building towers and discussed the possibility of an observation platform outside the protected zone around the nest. Mr. Nelson suggested a special trail to a viewing location with interpretive kiosk instead of a structure. In regards to the preserve's optimum boundary, Mr. Braun encouraged the Division to "think bigger" and identified lands he recommends adding. He also requested that the optimum boundary map show the boundary of the Florida Forever Project. Mr. Armstrong identified the northern section of the Becker Groves as priority because of its potential to be developed. Mr. Braun concluded with a recommendation to offer the preserve as an outdoor laboratory to local schools such as Indian River Community College.

Debra Klein (Florida Native Plant Society) seconded Mr. Braun's comments. She mentioned that potential greenway projects should also consider wildlife connectivity and water flow. She expressed strong opposition to a Willoughby Road extension through the preserve. She offered volunteers from the Florida Native Plant Society to help with plant surveys. And, she stated her support for the Division's acquisition efforts.

Bill Helfferich (South Florida Water Management District) complimented the quality of the management plan. He asked if management funding from Florida Forever is adequate. Mr.

Nelson said no; they only receive $18,000/year for the entire 5700 acres. Mr. Helfferich pointed out that the SFWMD land across the river is managed by Martin County. He requested that Addendum 1 of the plan mention the acquisition of the Medalist property. He recommended that hydrological restoration begin with filling all the secondary ditches which should result in restoring 90% of the natural water flow. He also suggested that the Division apply for money through the Natural Resources Conservation Service for wetland restoration.

The meeting concluded with a vote on the preferred unit classification designation for the property. All those in attendance unanimously agreed to support the Division's recommendation to manage the property as a state preserve.

Summary of Written Comments

Ricardo Zambrano (Florida Fish and Wildlife Conservation Commission) recommended that a thorough survey be conducted for terrestrial and freshwater invertebrates prior to allowing any mosquito control within the park's boundary. If mosquito control is necessary, he recommended using larvicides over adulticides and ground spraying instead of aerial spraying.

Staff Recommendations

The staff recommends approval of the proposed management plan for Atlantic Ridge Preserve State Park as presented with the following changes:

Potential Greenway Linkage. The Division of Recreation and Parks supports trail connections to local greenways. If and when a possible connection to Atlantic Ridge Preserve State Park is identified, the Division will support the idea upon considering the sensitivity of the natural and cultural resources of the property and concerns related to park operations. The Division will decide the most appropriate route for the trail within the state park and what additional facilities to provide. A linkage to Jonathan Dickinson State Park will depend on the acquisition of lands between them. Successful implementation of other trail linkages will require Division coordination with the Martin County Planning Department.

Primitive Camping. Once the preserve is open and trail use becomes established, the Division will consider establishing a couple of primitive campsites in the southern portion of the Atlantic Ridge property.

Addendum 2—References Cited

References Cited

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Addendum 3—Soils Descriptions

(2) Lawnwood Fine Sand - This nearly level soil is poorly drained. It is in broad areas of flatwoods. Slopes are dominantly smooth and range from 0 to 2 percent.

Typically, the surface layer is black and dark grayish brown fine sand. The subsurface layer is light brownish gray fine sand to a depth of 28 inches. The subsoil is a fine sand to a depth of 80 inches or more. The upper part of the subsoil is black and weakly cemented, the middle part is dark reddish brown and weakly cemented, and the lower part is brown and has darker colored, weakly cemented fragments.

Water table depth is less than 10 inches for 2 to 4 months and at a depth of 10 to 40 inches for 6 months or more per year. Permeability is rapid in the surface and subsurface layers and slow to very slow in the subsoil.

(4) Waveland Sand - This nearly level soil is poorly drained. It is in broad areas of flatwoods. Slopes are dominantly smooth and range from 0 to 2 percent.

Typically, the surface layer is dark gray sand. The subsurface layer is light gray and grayish brown. The subsoil begins at a depth of 43 inches. The upper 4 inches of the subsoil is black sand and is not cemented. The next 30 inches is weakly cemented, black and dark reddish brown loamy sand. The next 14 inches is loose black sand, and below that is dark brown sand.

Water table depth is less than 10 inches for 2 to 4 months and within a depth at a depth 40 inches for 6 months or more per year. Permeability is rapid in the surface and subsurface layers and very slow in the subsoil.

(5) Waveland Sand, Depression - This poorly drained soil is in depressions in the flatwoods. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is very dray gray sand. The subsurface layer is gray, light gray, and light brownish gray sand to a depth of 48 inches. The subsoil is black, weakly cemented sand and noncemented, dark reddish brown sand. Below this is brown sand to a depth of 80 inches or more.

This soil is inundated for 6 to 9 months or more during most years. Permeability is rapid in the surface and subsurface layers and very slow to moderately slow in the subsoil.

(6) Paola Sand, 0-8 percent slopes - This nearly level to sloping sandy soil is excessively drained. It is on dry coastal ridges and on isolated knolls near coastal areas. Areas are many hundred acres in size. Slopes are generally smooth to convex.

Typically, the surface layer is gray sand. The subsurface layer is white sand. Below this is yellowish sand to a depth of 80 inches or more.

The water table is below a depth of 72 inches throughout the year. Permeability is very rapid, and the available water capacity is very low throughout the profile.

(9) Pomello Sand, 0 to 5 percent slopes - This nearly level to gently sloping soil is moderately

well drained. It occurs on low ridges and knolls in the flatwoods. Areas range from about 5 to 100 acres in size. Slopes are smooth to convex.

Typically, the surface layer is gray sand about 3 inches thick. The subsurface layer is light gray sand about 43 inches thick. The subsoil is dark reddish brown sand about 21 inches thick and has scattered, weakly cemented fragments throughout. Below this is brown sand to a depth of 80 inches or more.

The water table is at a depth of 24 to 40 inches for about 2 to 4 months during the wet season. It ranges from a depth of 40 to 60 inches for about 8 months during the drier periods. Permeability is very rapid in the surface and subsurface layers and moderately rapid in the subsoil.

(13) Placid Sand - This nearly level soil is very poorly drained. It is in wet depressions and drainageways in the flatwoods. Areas range from a few acres to about 30 acres. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black sand. The subsurface layer is sand to a depth of more than 80 inches. It is dark grayish brown, gray and light brownish gray.

Most areas of this soil are ponded or inundated for 6 months or more each year. Water table depth is less than 10 inches for most of the year, except for extended dry periods. Permeability is rapid throughout the profile.

(14) Satellite Variant Sand - This deep, nearly level sandy soil is moderately well drained. It is on slightly elevated ridges and knolls in the flatwoods. Areas range from about 5 to 200 acres. Slopes are smooth to convex and range from 0 to 2 percent.

Typically, the surface layer is gray sand about 5 inches thick. Underlying this is sand to a depth of more than 80 inches. The upper 12 inches of this sand is light gray, the next 22 inches is light brownish gray, and the lower 41 inches is grayish brown.

The water table is at a depth of 40 to 60 inches for 6 to 9 months in most years and between depths of 30 to 40 inches for less than 60 cumulative days. It reaches below a depth of 60 inches for 2 to 4 months in drier seasons. Permeability is very rapid throughout the profile.

(16) Oldsmar Fine Sand - This nearly level soil is poorly drained. It is in broad areas of in the flatwoods. Areas are generally large, ranging to 1000 acres or more. Slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is black fine sand about 5 inches thick. The subsurface layer is fine sand to a depth of 35 inches. The upper 9 inches of the subsurface layer is gray, and the lower 21 inches is light gray. The upper 11 inches of the subsoil is black and brown fine sand and has organic matter coatings on the sand grains. The lower part of the subsoil is grayish brown fine sandy loam to a depth of 60 inches or more.

The water table is at a depth of less than 10 inches for 1 to 3 months during the wet seasons in most years. It is at a depth of 10 to 40 inches for 6 months or more, and recedes to a greater

depth during extended dry periods. Permeability is rapid in the surface and subsurface layers, and moderately rapid to moderately slow in the upper sandy part of the subsoil and slow to very slow in the lower loamy part.

(17) Wabasso Sand - This nearly level soil is poorly drained. It is in broad, open areas in the flatwoods. Areas generally range up to about 1,000 acres. Slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is black and very dark gray sand about 7 inches thick. The subsurface layer is gray and light brownish gray sand. The upper part of the subsoil is black sand, and the lower part is very dark grayish brown, dark grayish brown, and olive gray sandy clay loam. The substratum is olive gray and greenish gray sandy clay loam.

The water table is at a depth of 10 to 40 inches for more than 6 months in most years and at a depth of less than 10 inches for 1 to 2 months. Permeability is rapid in the surface and subsurface layers, moderate in the sandy part of the subsoil, and slow to very slow in the loamy part.

(19) Winder Sand - This nearly level soil is poorly drained. It occurs in long, low depressions in the flatwoods. Slopes are smooth to concave and are less than 2 percent.

Typically, the surface layer is dark gray sand about 7 inches thick. The subsurface layer is gray sand about 8 inches thick. The subsoil is light brownish gray sandy clay loam and has sandy streaks in the upper 11 inches and light gray sandy clay loam in the lower 16 inches. The substratum is below a depth of 42 inches. It is greenish gray loamy sand and has white shell fragments in the lower part.

The soil is ponded for 6 to 9 months in most years, and the water table is at a depth of less than 40 inches the rest of the time. Permeability is rapid in the surface and subsurface layers, moderately slow in the upper part of the subsoil, and slow to very slow in the lower part of the subsoil.

(21) Pineda Sand - This nearly level soil is poorly drained. It is on low grassy flats in most parts of the area. Slopes are smooth and dominantly less than 1 percent but range from 0 to 2 percent.

Typically, the surface layer is dark gray and dark grayish brown sand. The subsurface layer is brown fine sand and has yellow and brownish yellow mottles. The upper part of the subsoil is brownish yellow and very pale brown fine sand that is coated with iron oxides. The lower part of the subsoil is mottled, gray fine sandy loam. Below this is grayish fine sandy loam. The substratum is a mixture of gray sand and white shell fragments to a depth of 72 inches or more.

The water table is within a depth of 10 inches for 2 to 6 months during wet seasons in most years, and at a depth of 10 to 40 inches for most of the remaining time. Some areas are covered with shallow water for 1 to 2 months. Permeability is rapid, except it is slow to very slow in the lower part of the subsoil.

(22) Okeelanta Muck - This nearly level soil is very poorly drained. It is found in depressions, and freshwater swamps and marshes. Slopes are smooth to concave and 0 to 1 percent.

The surface layer is typically black muck about 4 inches thick. Next is a reddish brown muck about 22 inches thick over a 4 inch layer of black muck mixed with sand. Below this to a depth of 80 inches or more is sand that is very dark gray in the upper 18 inches and dark grayish brown below.

This soil is ponded about 6 to 9 months in most years. The water table is within a depth of 10 inches the remainder of the year. Internal drainage is slow because it is inhibited by the high water table. Permeability is rapid in all layers.

(35) Salerno Sand - This nearly level soil is poorly drained. It is in broad areas of flatwoods. Areas range from about 20 to 500 acres. Slopes are dominantly smooth and range from 0 to 2 percent.

Typically, the surface layer is black to very dray gray sand about 9 inches thick. The subsurface layer is dark gray to brown fine sand about 15 inches thick. Below this is dark reddish brown sand that has weakly cemented fragments to a depth of 100 inches or more.

The water table is within a depth of 10 inches for 2 to 4 months during the wet season in most years and below a depth of 40 inches for 1 to 4 months in the dry season. Internal drainage is slow and is impeded by the water table that is perched above the subsoil or long periods. Permeability is rapid to a depth of 61 inches and very slow to moderately slow between depths of 61 and 76 inches.

(36) Arents, 0 to 2% Slopes - This nearly level soil is poorly somewhat poorly to moderately well drained. It consists of fill material that was excavated and spread over the surface of wet mineral soils, then smoothed to suit the desired use. The mixed fill material was spread to a depth of about 20 to 50 inches. Areas are irregular in shape an small in size.

The texture and thickness of the layers of this soil are highly variable from place to place. A common profile has a surface layer of light brownish gray fine sand about 30 inches thick. It has numerous small to large lumps of dark grayish brown sandy loam and sandy clay loam and few to common, firm, black and dark reddish brown fragments. Below this is the natural undisturbed soil in which the upper 6 inches is black, mucky fine sand that has a few small pockets of dark gray and very dark gray fine sand and black organic matter. Below a depth of 36 inches is dark grayish brown fine sand that has a few lenses of very dark gray fine sand and pockets of dark gray and light gray fine sand to a depth of 60 inches or more.

The water table is below a depth of 30 inches during most of the year. Permeability is variable but generally very rapid.

(38) Floridana Fine Sand, Depressional – This nearly level soil is very poorly drained. It is in wet sloughs and depressions. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is black fine sand about 15 inches thick. The subsurface layer is light brownish gray fine sand to a depth of 27 inches. The subsoil is grayish brown sandy clay loam. Next is grayish brown fine sandy loam, and below this light gray fine sand to a depth of 62 inches or more. The soil is ponded for more than 6 months during most years.

Water table depth is less than 10 inches for much of the remainder of the year. Permeability is rapid in the surface and subsurface layers and slow to very slow in the subsoil.

(40) Sanibel Muck - This nearly level soil is very poorly drained. It is in marshes and swamps, depressions, and poorly defined drainageways. Areas range from about 5 to 100 acres. Slopes are smooth to concave and are less than 1 percent.

Typically, the surface layer is muck about 12 inches thick; the upper 7 inches of the surface layer is black, and the lower 5 inches is dark reddish brown. Next is very dark grayish brown sand about 4 inches thick. Below this is sand to a depth of 80 inches or more. The upper 7 inches of the sand is grayish brown, and the lower part is light gray.

The water table is at a depth of less than 10 inches for 6 to 12 months in most years. Water is ponded on the surface for 2 to 6 months during wet seasons. Permeability is rapid throughout the profile.

(44) Boca Fine Sand - This nearly level soil is poorly drained. It is in areas of flatwoods. Slopes are less than 2 percent.

Typically, the surface layer is fine sand to a depth of 8 inches. The upper 4 inches of the surface layer is very dark gray, and the lower 4 inches is dark gray, and the lower 4 inches is dark gray. The subsurface layer is fine sand about 17 inches thick. The upper 8 inches of the subsurface layer is light gray, and the lower 9 inches is pale brown. The subsoil is light gray fine sandy loam about 7 inches thick. Below this is hard limestone about 8 inches thick. Underlying the limestone are layers of light gray fine sand, greenish gray loamy fine sand, and light gray fine sand mixed with shell fragments to a depth of 60 inches or more.

The water table is at a depth of less than 10 inches for 2 to 4 months in most years. During drier periods, the depth of the water table coincides with the depth of the limestone layer. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil.

(47) Pinellas Fine Sand - This nearly level soil is poorly drained. It is in the flatwoods and hammock areas bordering sloughs and depressions. Areas are typically small (5 to 50 acres) in size. Slopes are smooth and range from 0 to 2 percent.

The surface layer is typically fine black sand about 5 inches thick. The subsurface layer is a fine sand to a depth of about 26 inches. The upper 6 inches of the subsurface layer is grayish brown. The lower part of the subsurface layer has carbonate accumulations and is calcareous. It is dark grayish brown in the upper 2 inches, light gray in the next 3 inches, and white in the lower 10 inches. The subsoil is light olive gray fine sandy loam about 12 inches thick. Below this is about 14 inches of light olive gray fine sand over light gray fine sand and shell fragments to a depth of 60 inches or more.

The water table is within a depth of 10 inches for less than 3 months and at a depth of 10 to 40 inches for 4 to 6 months during most years. The water table can recede to a depth of more than 40 inches during extended dry periods. Permeability is rapid in the surface and subsurface layers and moderate in the subsoil.

(48) Jupiter Sand - This nearly level, shallow soil is poorly drained. It is in low flats and hammocks along the fringes of broad, marshy drainageways. Slopes are smooth to convex and are dominantly 1 percent or less.

Typically, the surface layer is sand about 10 inches thick. The upper 4 inches of the surface layer is black, and the lower 6 inches is very dark grayish brown. Below this is hard, fractured limestone about 12 inches thick. The substratum is calcareous loamy sand. The upper 10 inches of the substratum is light brownish gray, the next 16 inches is light gray, the next 24 inches is olive gray, and the lower part is greenish gray and is mixed with white shell fragments to a depth of 84 inches or more.

Some areas are covered with water for short periods during the rainy season. The water table is at a depth of less than 10 inches for 2 to 4 months in the wet season during most years. It is at a depth of 10 to 40 inches in drier seasons. Permeability is rapid in the sandy surface layer above the rock. The hard limestone rock is impermeable but has sufficient fractures and solution holes to permit water movement. Permeability is rapid in the substratum.

(49) Riviera Fine Sand, Depression - This nearly level soil is poorly drained. It is in depressions. Slopes are smooth to concave and range from 0 to 2 percent.

Typically, the surface layer is gray fine sand about 2 inches thick. The subsurface layer is gray fine sand to a depth of 28 inches is light brownish gray. The upper 10 inches of the subsoil is gray fine sandy loam that has pocket and tongues of material from the subsurface layer, and the lower 11 inches is grayish brown sandy clay loam. Below this is grayish brown loamy fine sand to a depth of 50 inches or more.

This soil is ponded for 6 to 9 months in most years. During the dry season, the water table recedes to a depth of 10 to 40 inches. Permeability is rapid in the sandy surface and subsurface layers, slow or very slow in the upper part of the subsoil, and rapid below this.

(52) Malabar Sand - This soil is nearly level and poorly drained. It occurs in broad, low areas of flatwoods and sloughs. Areas range in size from about 10 to 100 acres. Slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is very dark gray sand about 5 inches thick. The subsurface layer is light gray sand about 10 inches thick. The upper 14 inches of the subsoil is brownish yellow sand, and the next 13 inches is very pale brown sand. Below this is a gray sandy loam to a depth of 80 inches or more.

The water table is within a depth of 10 inches for 2 to 6 months during most years. It is at a depth of 10 to 40 inches most of the remainder of the year. Permeability is rapid in all layers

above the subsoil and slow to very slow in the subsoil.

(56) Wabasso Sand, Depressional – This nearly level soil is poorly drained. It is in wet depressions in the flatwoods. Slopes are smooth to concave and range frim 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 5 inches thick. The subsurface layer is white and light gray fine sand about 26 inches thick. The upper part of the subsoil is black fine sand about 4 inches thick, and the lower part is grayish brown sandy clay loam about 8 inches thick. The substratum is light brownish gray loamy fine sand.

This soil is ponded for 6 to 9 months or more in most years. Permeability is rapid in the surface and subsurface layers. It is moderate in the upper, sand part of the subsoil and slow or very slow in the lower part.

(57) Chobee Loamy Sand - This nearly level soil is very poorly drained. It is in small to large depressions and poorly defined drainageways and on broad, low flats. Areas of this soil type within the park are small (< 10 acres). Slopes are smooth to concave and range from 0 to 2 percent.

The soil typically has a 3-inch layer of black muck on the surface. The surface mineral layer is black loamy sand about 6 inches thick. Subsoil is a sandy loam and sandy clay loam about 36 inches thick. The upper part of the subsoil is black, and the lower part is gray. Below this is the calcareous substratum to a depth of 80 inches or more. The upper 7 inches of the substratum is grayish brown sandy loam, the next 9 inches is light olive sandy clay loam, and the lower 22 inches is greenish gray sandy clay loam that has pockets of loamy sand.

The water table is above the surface or within a depth of 10 inches for 6 to 9 months or more in most years. It is at a depth of 10 to 30 inches for short periods during dry seasons. Permeability is moderately rapid in the surface layer, and slow or very slow in the subsoil and substratum.

(58) Gator Muck – This nearly level soil is very poorly drained. I is in wet depressions and broad marsh areas. Slopes are less than 1 percent.

Typically, the surface layer is muck about 24 inches thick. The upper 11 inches of the muck is black, and the lower 13 inches is dark reddish brown. Next is very dark gray fine sand sandy loam about 24 inches thick. Below this is gray and brownish gray sand and common shell fragments to a depth of 56 inches or more.

This soil is typically covered with water, or the water table is within a depth of 10 inches except during extended dry seasons. Permeability is rapid in the organic layer and moderate in the loamy layer.

(63) Nettles Sand - This nearly level soil is poorly drained. It is in broad areas of flatwoods. Areas are generally quite large, ranging up to 2,000 acres. Slopes are smooth and range from 0 to 2 percent.

Typically, the surface layer is about 12 inches thick. The upper 5 inches of the surface layer is

very dark gray sand, and the lower 7 inches is dark gray fine sand. The subsurface layer is gray fine sand about 20 inches thick. The upper part of the subsoil is fine sand weakly cemented with organic mater. It is black in the upper 11 inches and dark reddish brown in the lower 8 inches. The lower part of the subsoil is grayish brown fine sandy loam about 11 inches thick. Below this is about 9 inches of dark grayish brown loamy fine sand over grayish brown loamy fine sand to a depth of 80 inches.

The water table is at a depth of 10 to 40 inches for 4 to 6 months or more during most years. It is at a depth of less than 10 inches for 2 to 4 months during wet seasons. Permeability is rapid in the surface and subsurface layers and very slow to moderately slow in the subsoil.

(73) Samsula Muck - This nearly level, organic soil is very poorly drained. It is in depressions and in freshwater swamps and marshes. Slopes are smooth to concave and are 0 to 1 percent.

Typically, the surface layer is muck about 34 inches thick. The upper 12 inches of the surface layer is black, and the lower 22 inches is dark reddish brown. Below this is sand to a depth of 80 inches or more. The upper 10 inches of the sand is very dark gray, the lower 36 inches is light brownish gray.

In natural conditions, this soil is ponded for 6 to 9 months or more in most years. The water table is at a depth of less than 10 inches the rest of the year. Permeability is rapid in all layers.

Addendum 4—Plant And Animal List

Atlantic Ridge Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
	LICHENS	
Perforate reindeer moss	*Cladonia perforata*	15
Reindeer moss	*Cladina* spp.	
Sand spikemoss	*Selaginella arenicola*	
	FERNS	
Giant leather fern	*Acrostichum danaeifolium*	53
Swamp fern	*Blechnum serrulatum*	
Climbing fern*	*Lygodium microphyllum*	
Club moss	*Lycopodiella spp*	
Boston fern	*Nephrolepis biserrata*	
Tuberous sword fern*	*Nephrolepis cordifolia*	
Boston fern	*Nephrolepis exaltata*	
Cinnamon fern	*Osmunda cinnamomea*	35,38,41
Royal fern	*Osmunda regalis*	35,41
Golden polypody	*Phlebodium aureum*	
Resurrection fern	*Pleopeltis polypodioides*	
Bracken fern	*Pteridium aquilinum*	
Shoestring fern	*Vittaria lineata*	
Chain fern	*Woodwardia virginica*	
	GYMNOSPREMS AND CYCADS	
Slash pine	*Pinus elliottii*	
Sand pine	*Pinus clausa*	
Pond cypress	*Taxodium ascendens*	
Bald cypress	*Taxodium distichum*	
	MONOCOTS	
Florida blustem	*Andropogon floridanus*	
Bluestem grass	*Andropogon virginicus*	
Wire grass	*Aristida beyrichiana*	
Wire grass	*Aristida stricta*	
Southern sandspur	*Cenchrus echinatus*	
Sandbur sandspur	*Cenchrus gracillimus*	
Saw grass	*Cladium jamaicense*	
Day flower	*Commelina diffusa var.diffusa*	
Bermuda grass*	*Cynodon dactylon*	
Crowfoot grass*	*Dactyloctenium aegyptium*	
Club rush	*Eleocharis cellulosa*	

* Non-native Species

Atlantic Ridge Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Golden pothos*	*Epipremnum pinnatum*	
Red root	*Lachnanthes caroliana*	
Maidencane	*Panicum hemitomon*	
Bahia grass	*Paspalum notatum var. saurae*	
Snowy orchid	*Plantanthera nivea*	35
Pickerel weed	*Pontederia cordata*	
White-top sedge	*Rhynchospora colorata*	
Beak sedge	*Rhynchospora megalocarpa*	
Cabbage palm	*Sabal palmetto*	
Saw palmetto	*Serenoa repens*	
Earleaf greenbrier	*Smilax auriculata*	
Common wildpine	*Tillandsia fasciculata*	30,35,38
Ball moss	*Tillandsia recurvata*	
Needle-leaved airplant	*Tillandsia setacea*	
Spanish moss	*Tillandsia usneoides*	
Giant airplant	*Tillandsia utriculata*	30,35,38
Wandering Jew*	*Tradescantia zebrina*	
Southern cattail	*Typha domingensis*	
Broadleaf cattail	*Typha latifolia*	
Blue-eyed grass	*Sisyrinchium solstitiale*	
Ladies tresses	*Spiranthes spp.*	
	DICOTS	
Rosary pea*	*Abrus precatorius*	
Ear leaf acacia*	*Acacia auriculiformis*	
Red maple	*Acer rubrum*	
Colic root	*Aletris lutea*	
Common ragweed	*Ambrosia artemisiifolia*	
Pepper vine	*Ampelopsis arborea*	
Pond apple	*Annona glabra*	
Groundnut	*Apios americana*	
Marlberry	*Ardisia escallonioides*	
Lanceleaf milkweed	*Asclepias lanceolata*	
Dwarf pawpaw	*Asimina reticulata*	
Saltbush	*Baccharis halimifolia*	
Tarflower	*Befaria racemosa*	
Begger ticks	*Bidens bipinnata*	
Bluehearts	*Buchnera americana*	
Beauty berry	*Callicarpa americana*	
Water hickory	*Carya aquatica*	
Australian pine	*Casuarina glauca*	
Partridge pea	*Cassia chamaecrista*	

* Non-native Species

Atlantic Ridge Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Love vine	*Cassytha filiformis*	
Madagascar periwinkle*	*Catharanthus roseus*	
Coinwort	*Centella asiatica*	
Butterfly pea	*Centrosema virginianum*	
Buttonbush	*Cephalanthus occidentalis*	
Rosemary	*Ceratiola ericoides*	
Mexican tea*	*Chenopodium ambrosioides*	
Snowberry	*Chiococca alba*	
Cocoplum	*Chrysobalanus icaco*	
Florida golden aster	*Chrysopsis floridana*	
Yellow thistle	*Cirsium horridulum*	
Thistle	*Cirsium nuttallii*	
Sour orange*	*Citrus aurantium*	
Tread softly	*Cnidoscolus stimulosus*	
Carrotwood*	*Cupaniopsis anacardioides*	
Scrub clover	*Dalea feayi*	
Beggar ticks	*Desmodium incanum*	
Persimmon	*Diospyros virginiana*	
Pink sundew	*Drosera capillaaaris*	
Fragrant eryngium	*Eryngium aromaticum*	
Button snakeroot	*Eryngium yuccifolium*	
Surinam cherry	*Eugenia uniflora*	
Dog fennel	*Eupatorium capillifolium*	
Erect scrub spurge	*Euphorbia polyphylla*	
Semaphore Eupatorium	*Eupatorium mikanioides*	
Pop ash	*Fraxinus caroliniana*	
White milk pea	*Galactia elliottii*	
Milk pea	*Galactia volubilis*	
Dwarf huckleberry	*Gaylussacia dumosa*	
Rabbit tobacco	*Gnaphalium obtusifolium*	
Loblolly bay	*Gordonia lasianthus*	
Innocence	*Hedyotis procumbens*	
Pineland heliotrope	*Heliotropium polyphyllum*	
Camphorweed	*Heterotheca subaxillaris*	
Sandweed	*Hypericum fasciculatum*	
St. Andrew's cross	*Hypericum hypericoides*	
Four petal St. John's-wort	*Hypericum tetrapetalum*	
Dahoon holly	*Ilex cassine var. cassine*	
Gallberry	*Ilex glabra*	
Yaupon holly	*Ilex vomitoria*	
Virginia willow	*Itea virginica*	
Nodding pinweed	*Lechea cernua*	14,15
Duck weed	*Lemna aequinoctialis*	

* Non-native Species

Atlantic Ridge Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Duckweed	*Lemna obscura*	
Pepper weed	*Lepidium virginicum*	
Gopher apple	*Licania michauxii*	
Blazing star	*Liatris tenuifolia*	
Primrose willow*	*Ludwigia peruviana*	
Primrose	*Ludwigia spp*	
Sky-blue lupine	*Lupinus diffusus*	
Rose rush	*Lygodesmia aphylla*	
Staggerbush	*Lyonia fruticosa*	
Fetterbush	*Lyonia lucida*	
Sweetbay	*Magnolia virginiana*	
Cajeput tree*	*Melaleuca quinquenervia*	
Climbing hemp vine	*Mikania scandens*	
Sensitive brier	*Mimosa quadrivalus var.floridan*a	
Twinberry	*Mitchella repens*	
Mulberry	*Morus rubra*	
Wax myrtle	*Myrica cerifera*	
Prickley-pear cactus	*Opuntia humifusa*	
Palafoxia	*Palafoxia feayi*	
Virginia creeper	*Parthenocissus quinquefolia*	
Red bay	*Persea borbonia var. borbonia*	
Swamp bay	*Persea palustris*	
Match head	*Phyla nodiflora*	
Pokeweed	*Phytolacca americana*	
Leaf flower	*Phyllanthus abnormis*	
Pennyroyal	*Piloblephis rigida*	
Narrowleaf silkgrass	*Pityopsis graminifolia*	
Southern plantian	*Plantago virginica*	
Marsh fleabane	*Pluchea odorata*	
White fleabane	*Pluchea foetida*	
Leadwort*	*Plumbago auriculata*	
Printed leaf	*Poinsettia cyathophora*	
Drumheads	*Polygala cruciata*	
Tall milkwort	*Polygala cymosa*	
Orange milkwort	*Polygala lutea*	
Yellow bachelor's button	*Polygala rugelii*	
Wireweed	*Polygonella gracilis*	
Jointweed	*Polygonella polygama*	
Strawberry guava*	*Psidium cattleianum*	
Guava*	*Psidium guajava*	
Wild coffee	*Psychotria nervosa*	
Wild coffee	*Psychotria sulzneri*	
Black root	*Pterocaulon pycnostachyum*	

* Non-native Species

Atlantic Ridge Preserve State Park

Plants

Common Name	*Scientific Name*	Primary Habitat Codes (for designated species)
Mock bishop's weed	*Ptilimnium capillaceum*	
Chapman's oak	*Quercus chapmanii*	
Scrub live oak	*Quercus geminata*	
Laurel oak	*Quercus laurifolia*	
Myrtle oak	*Quercus myrtifolia*	
Running oak	*Quercus pumila*	
Live oak	*Quercus virginiana*	
White indigo berry	*Randia aculeata*	
Myrsine	*Rapanea punctata*	
Downy rose myrtle*	*Rhodomyrtus tomentosa*	
Winged sumac	*Rhus copallinum*	
Dewberry	*Rubus trivialis*	
Rouge plant	*Rivina humilis*	
Coastal plain sabatia	*Sabatia calycina*	
Large flowered sabatia	*Sabatia grandiflora*	
Carolina willow	*Salix caroliniana*	
Elderberry	*Sambucus canadensis*	
Pineland pimpernel	*Samolus valerandi* subsp.*parviflorus*	
White vine	*Sarcostemma clausum*	
Lizard's tail	*Saururus cernuus*	
Brazilian pepper*	*Schinus terebinthifolius*	
Gulf greytwig	*Schoepfia chrysophlloides*	
Heartleaf sida*	*Sida cordifolia*	
Common nightshade	*Solanum americanum*	
Tropical soda apple*	*Solanum viarum*	
Queen's delight	*Stillingia sylvatica*	
Wire plant	*Stipulicida setacea var. lacerata*	
Poison ivy	*Toxicodendron radicans*	
Puncture vine*	*Tribulus cistoides*	
Caesar's weed*	*Urena lobata*	
bladderwort	*Utricularia* spp.	
Shiny blueberry	*Vaccinium myrsinites*	
Muscadine grape	*Vitis rotundifolia*	
Creeping oxeye*	*Wedelia trilobata*	
Hog plum	*Ximenia americana*	
Asiatic hawk's beard*	*Youngia japonica*	

* Non-native Species

Atlantic Ridge Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
	FISH	
Mosquitofish	*Gambusia holbrooki*	53
Yellow bullhead	*Ictalurus natalis*	53
Florida gar	*Lepisosteus platyrhincus*	53
Redbreast sunfish	*Lepomis auritus*	53
Warmouth	*Lepomis gulosus*	53
Bluegill	*Lepomis macrochirus*	55
Redear sunfish	*Lepomis microlophus*	53
Largemouth bass	*Micropterus salmoides*	53
Striped mullet	*Mugil cephalus*	53
Sailfin molly	*Poecilia latipinna*	53
Black crappie	*Pomoxis nigromaculatus*	53
Grass carp*	Ctenopharyngodon idella	53
	AMPHIBIANS	
Eastern narrowmouth toad	*Gastrophryne carolinensis*	20,35
Florida cricket frog	*Acris gyrllus dorsalis*	15,41,42
Green treefrog	*Hyla cinerea*	30,35
Pine woods treefrog	*Hyla femoralis*	8,41,42
Squirrel treefrog	*Hyla squirella*	20,35
Florida chorus frog	*Pseudacris nigrita verrucosa*	41,42
Greenhouse frog*	*Eleutherodactylus planirostris planirostris*	14,15,41
Pig frog	*Rana grylio*	30,53
Southern leopard frog	*Rana utricularia*	30,81
Oak toad	*Bufo quericus*	14,15,41,42
Southern toad	*Bufo terrestris*	20,81
	REPTILES	
American Alligator	*Alligator mississippiensis*	53
Gopher Tortoise	*Gopherus polyphemus*	81
Eastern Mud Turtle	*Kinosternon subrubrum*	53
River Cooter	*Pseudemys concinna*	53
Florida Cooter	*Pseudemys floridana*	53
Stinkpot	*Sternotherus odoratus*	53
Box Turtle	*Terrapene carolina*	20,35
Florida Softshell Turtle	*Trionyx ferox*	53
Island Glass Lizard	*Ophisarus compressus*	49,53
Green Anole	*Anolis carolinensis*	MTC
Southeastern Five-lined Skink	*Eumeces inexpectatus*	20,35

* Non-native Species

Atlantic Ridge Preserve State Park

Animals

Common Name	***Scientific Name***	**Primary Habitat Codes (for all species)**
Ground Skink	*Scincella laterale*	MTC
Corn Snake	*Elaphe guttata guttata*	14,15
Black Racer	*Coluber constrictor*	MTC
Ring-necked Snake	*Diadophis punctatus*	MTC
Red Rat Snake	*Elaphe guttata*	20,35
Black Swamp Snake	*Seminatrix pygaea*	30,40,53
Peninsula Ribbon Snake	*Thamnophis sauritus sackeni*	14,15,41
Eastern Garter Snake	*Thamnophis sirtalis*	MTC
Eastern Diamondback Rattlesnake	*Crotalus adamanteus*	33,41
Pygmy Rattlesnake	*Sistrurus milliarius barbouri*	15,41

* Non-native Species

Atlantic Ridge Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
	BIRDS	
Great Blue Heron	*Ardea herodias*	42,53
Great Egret	*Ardea alba*	42,53
Snowy Egret	*Egretta thula*	42,53
Little Blue Heron	*Egretta caerulea*	42,53
Tricolored Heron	*Egretta tricolor*	53
Green Heron	*Butorides virescens*	42,53
White Ibis	*Eudocimus albus*	42,53
Wood Stork	*Mycteria americana*	42,55
Black Vulture	*Coragyps atratus*	OF
Turkey Vulture	*Cathartes aura*	OF
Wood Duck	*Aix sponsa*	53
Mottled duck	*Anas fulvigula*	53
Osprey	*Pandion haliaetus*	53
Swallow-tailed Kite	*Elanoides forficatus*	53
Northern Harrier	*Circus cyaneus*	41,42
Red-shouldered Hawk	*Buteo lineatus*	MTC
Red-tailed Hawk	*Buteo jamaicensis*	MTC
Wild Turkey	*Meleagris gallopavo*	20,30,35,41
Northern Bobwhite	*Colinus virginianus*	20,81
Common Moorhen	*Gallinula chloropus*	53
Sandhill Crane	*Grus canadensis*	42
Killdeer	*Charadrius vociferus*	81
Common Snipe	*Gallinago gallinago*	42
Mourning Dove	*Zenaida macroura*	MTC
Eastern Screech Owl	*Otus asio*	20,35
Great Horned Owl	*Bubo virginianus*	20,35
Barred Owl	*Strix varia*	20,35,41
Common Nighthawk	*Chordeiles minor*	20,41
Chuck-will's-widow	*Caprimulgus carolinensis*	20,41
Chimney Swift	*Chaetura pelagica*	MTC
Belted Kingfisher	*Ceryle alcyon*	53
Red-bellied Woodpecker	*Melanerpes carolinus*	20,35,41
Yellow-bellied Sapsucker	*Sphyrapicus varius*	20,35,41
Downy Woodpecker	*Picoides pubescens*	20,41
Northern Flicker	*Colaptes auratus*	20,41
Pileated Woodpecker	*Dryocopus pileatus*	20,35,41
Eastern Phoebe	*Sayornis phoebe*	38,53
Great Crested Flycatcher	*Myiarchus crinitus*	MTC
Purple Martin	*Progne subis*	MTC
Tree Swallow	*Tachycineta bicolor*	MTC
Blue Jay	*Cyanocitta cristata*	MTC

* Non-native Species

Atlantic Ridge Preserve State Park

Animals

Common Name	*Scientific Name*	Primary Habitat Codes (for all species)
Fish Crow	*Corvus ossifragus*	MTC
Tufted Titmouse	*Parus bicolor*	20,41
Carolina Wren	*Thryothorus ludovicianus*	20,35,41
Blue-gray Gnatcatcher	*Polioptila caerulea*	20,35,41
American Robin	*Turdus migratorius*	MTC
Gray Catbird	*Dumetella carolinensis*	20,35,81
Northern Mockingbird	*Mimus polyglottos*	MTC
Brown Thrasher	*Toxostoma rufum*	20,35,81
Loggerhead Shrike	*Lanius ludovicianus*	81
Yellow-throated Vireo	*Vireo flavifrons*	20,35
Northern Parula	*Parula americana*	20,35
Yellow-rumped Warbler	*Dendroica coronata*	20,35,41
Pine Warbler	*Dendroica pinus*	41
Palm Warbler	*Dendroica palmarum*	MTC
Common Yellowthroat	*Geothlypis trichas*	20,35,41
Northern Cardinal	*Cardinalis cardinalis*	MTC
Rufous-sided Towhee	*Pipilo erythrophthalmus*	20,41
Red-winged Blackbird	*Agelaius phoeniceus*	25,30,42
Boat-tailed Grackle	*Quiscalus major*	25,30,42
Common Grackle	*Quiscalus quiscula*	MTC
	MAMMALS	
Coyote*	*Canis latrans*	MTC
Nine-banded armadillo*	*Dasypus novemcinctus*	MTC
Opossum	*Didelphis marsupialis*	20,35,81
Bobcat	*Felis rufus*	20,35
River otter	*Lutra canadensis*	53
Evening bat	*Nyteceius humeralis*	MTC
White-tailed deer	*Odocoileus virginianus*	20,35
Cotton mouse	*Peromyscus gossypinus*	MTC
Raccoon	*Procyon lotor*	20,35,81
Eastern mole	*Scalopus aquaticus*	MTC
Gray squirrel	*Sciurus carolinensis*	20,30,35
Eastern cottontail	*Sylvilagus floridanus*	20,81
Wild hog*	*Sus scrofa*	MTC
Brazilian free-tailed bat	*Tadarida brasiliensis*	MTC
West Indian manatee	*Trichechus manatus*	53
Gray fox	*Urocyon cinereoargenteus*	20,35,81

* Non-native Species

TERRESTRIAL

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

PALUSTRINE

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

LACUSTRINE

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

LACUSTRINE—Continued

48. River Floodplain Lake
49. Sandhill Upland Lake
50. Sinkhole Lake
51. Swamp Lake

RIVERINE

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

ESTUARINE

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

MARINE

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

SUBTERRANEAN

79. Aquatic Cave
80. Terrestral Cave

MISCELLANEOUS

81. Ruderal
82. Developed

MTC Many Types Of Communities
OF Overflying

Addendum 5—Designated Species List

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

LEGAL STATUS

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

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

STATE

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

LE	=	Listed as Endangered Species by the FFWCC. Defined as a species, subspecies, or isolated population which is so rare or depleted in number or so restricted in range of habitat due to any man-made or natural factors that it is in immediate danger of extinction or extirpation from the state, or which may attain such a status within the immediate future.
LT	=	Listed as Threatened Species by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
LS	=	Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

Plants **(Listed by the Florida Department of Agriculture and Consumer Services - FDACS)**

LE	=	Listed as Endangered Plants in the Preservation of Native Flora of Florida Act. Defined as species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the Federal Endangered Species Act of 1973, as amended.
LT	=	Listed as Threatened Plants in the Preservation of Native Flora of Florida Act. Defined as species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.
CE	=	Commercially Exploited

Atlantic Ridge Preserve State Park

Designated Species

Plants

Common Name/ ***Scientific Name***	**Designated Species Status**		
	FDA	**USFWS**	**FNAI**
Giant leather fern			
Acrostichum danaeifolium	CE		
Perforate reindeer lichen			
Cladonia perforata	LE	LE	G1,S1
Nodding pinweed			
Lechea cernua	LT		G3,S3
Cinnamon fern			
Osmunda cinnamomea	CE		
Royal fern			
Osmunda regalis var. *spectabilis*	CE		
Snowy orchid			
Plantanthera nivea	LT		
Common wild pine			
Tillandsia fasciculata	LE		
Giant air plant			
Tillandsia utriculata	LE		

Atlantic Ridge Preserve State Park

Designated Species

Animals

Common Name/ ***Scientific Name***	**Designated Species Status**		
	FFWCC	**USFWS**	**FNAI**
REPTILES			
American alligator *Alligator mississippiensis*	LS	T(S/A)	G5,S4
Gopher tortoise *Gopherus polyphemus*	LS		G3,S3
BIRDS			
Little blue heron *Egretta caerulea*	LS		G5,S4
Great egret *Ardea alba*			G5,S4
Snowy egret *Egretta thula*	LS		G5,S4
Tricolored heron *Egretta tricolor*	LS		G5,S4
Florida sandhill crane *Grus canadensis*	LT		G5,T2T3
Black-crowned night heron *Nycticorax nycticorax*			G5,S3?
Yellow-crowned night heron *Nycticorax violaceus*			G5,S3?
Wood stork *Mycteria americana*	LE	LE	G4,S2
White ibis *Eudocimus albus*	LS		G5,S4
Southern bald eagle *Haliaeetus leucocephalus*	LT	LT	G4,S3
Swallow-tailed kite *Elanoides forficatus*			G4,S2S3
Osprey *Pandion haliaetus*			G5, S3S4
MAMMALS			
West Indiana Manatee *Trichechus manatus*	LE	LE	G5T1, S1

Addendum 6—Priority Schedule And Cost Estimates

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

Resource Management

1. Continue with 5 more miles of park boundary fencing. **Estimated Cost**: $75,000.
2. Hydrological study on filling in the canals and ditches, plus prevent neighborhood flooding to restore the hydrological regime of the preserve's wet prairies and flatwoods. **Estimated Cost**: $100,000.00
3. Conduct water quality and hydrological monitoring for 10 years, including ground water. **Estimated Cost:** $600,000.00
4. Restore and fill in canals and ditches, plus permits according to results of the hydrological study. **Estimated Cost**: $1,125,000.00
5. Provide more contract labor for exotic species control. **Estimated Cost**: $50,000 / year
6. Establish five acre pilot project to restore native vegetation in old fields and improve pastures. **Estimated Cost**: $75,000.00
   If pilot project is successful, then establish a 50-acre project. **Estimated Cost:** 1,000,000.00.
7. Maintain the prescribed burn program of the fire dependent communities (excluding sand pine scrub) including labor and equipment for 10 years. **Estimated Cost**: $500,000.00
8. Improve the management of sand pine scrub through more use of mechanical techniques plus prescribed fire within 10 years. **Estimated Cost**: $10,000.00
9. Conduct hydrological study of the effects of the Sea Wind and Becker Grove canals on the South Fork of the St. Lucie River. **Estimated Cost**: $175,000.00
10. Promote environmental awareness for park users and people living next to the park through educational materials. **Estimated Cost**: $10,000.00
11. Improve fire line construction. **Estimated Cost**: $65,000.00
12. Conduct a Level I archaeological survey of the park. **Estimated Cost**: $20,000

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

Capital Improvements

Development Area or Facilities	Cost
Support Facilities	$647,500.00
Trailhead Area	548,250.00
Total w/contingency	**$1,434,900.00**

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

Addendum 7—Additional Information

FNAI Descriptions

DHR Cultural Management Statement

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

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

The levels of the hierarchy are:

Natural Community Category - defined by hydrology and vegetation.

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

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

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

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

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

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

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

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

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

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

Coastal Grassland - coastal flatland with sand substrate; xeric-mesic; subtropical or temperate; occasional fire; grasses, herbs, and shrubs with or without slash pine and/or cabbage palm.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Mesic Flatwoods - flatland with sand substrate; mesic; subtropical or temperate; frequent fire; slash

pine and/or longleaf pine with saw palmetto, gallberry and/or wiregrass or cutthroat grass understory.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

high mineral content (sodium, chloride).

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

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

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

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

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

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

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

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

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

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

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

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

Aquatic Cave - cavernicolous area permanently or periodically submerged; often characterized by troglobitic crustaceans and salamanders; includes high energy systems which receive large quantities

of organic detritus and low energy systems.

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

MARINE/ESTUARINE (The distinction between the Marine and Estuarine Natural Communities is often subtle, and the natural communities types found under these two community categories have the same descriptions. For these reasons they have been grouped together.) - Subtidal, intertidal and supratidal zones of the sea, landward to the point at which seawater becomes significantly diluted with freshwater inflow from the land.

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

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

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

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

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

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

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

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

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

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

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

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

DEFINITIONS OF TERMS Terrestrial and Palustrine Natural Communities

Physiography

Upland - high area in region with significant topographic relief; generally undulating
Lowland - low area in region with or without significant topographic relief; generally flat to gently sloping
Flatland - generally level area in region without significant topographic relief; flat to gently sloping
Basin - large, relatively level lowland with slopes confined to the perimeter or isolated interior locations
Depression - small depression with sloping sides, deepest in center and progressively shallower towards the perimeter
Floodplain - lowland adjacent to a stream; topography influenced by recent fluvial processes
Bottomland - lowland not on active floodplain; sand/clay/organic substrate

Hydrology

occasionally inundated - surface water present only after heavy rains and/or during flood stages
seasonally inundated - surface water present during wet season and flood periods
usually inundated - surface water present except during droughts

Climatic Affinity of the Flora

tropical - community generally occurs in practically frost-free areas
subtropical - community generally occurs in areas that experience occasional frost, but where freezing temperatures are not frequent enough to cause true winter dormancy
temperate - community generally occurs in areas that freeze often enough that vegetation goes into winter dormancy

Fire

annual fire - burns about every 1-2 years
frequent fire - burns about every 3-7 years
occasional fire - burns about every 8-25 years
rare fire - burns about every 26-100 years
no fire - community develops only when site goes more than 100 years without burning

LATIN NAMES OF PLANTS MENTIONED IN NATURAL COMMUNITY DESCRIPTIONS

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

A. GENERAL DISCUSSION

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

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

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

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

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

B. STATUTORY AUTHORITY

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

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

1. Provide leadership in the preservation of the state's historic resources; [and]
2. Administer state-owned or state-controlled historic resources in a spirit of stewardship and trusteeship;...

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

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

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

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

transferred, sold, demolished, substantially altered, or allowed to deteriorate significantly.

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

5. Each state agency of the executive branch, in seeking to acquire additional space through new construction or lease, shall give preference to the acquisition or use of historic properties when such acquisition or use is determined to be feasible and prudent compared with available alternatives. The acquisition or use of historic properties is considered feasible and prudent if the cost of purchase or lease, the cost of rehabilitation, remodeling, or altering the building to meet compliance standards and the agency's needs, and the projected costs of maintaining the building and providing utilities and other services is less than or equal to the same costs for available alternatives. The agency shall request the division to assist in determining if the acquisition or use of a historic property is feasible and prudent. Within 60 days after making a determination that additional space is needed, the agency shall request the division to assist in identifying buildings within the appropriate geographic area that are historic properties suitable for acquisition or lease by the agency, whether or not such properties are in need of repair, alteration, or addition.

6. Consistent with the agency's mission and authority, all state agencies of the executive branch shall carry out agency programs and projects, including those under which any state assistance is provided, in a manner which is generally sensitive to the preservation of historic properties and shall give consideration to programs and projects which will further the purposes of this section.

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

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

C. MANAGEMENT POLICY

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

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

It should be noted that while many archaeological and historical sites are already recorded within state--owned or controlled--lands, the majority of the uplands areas and nearly all of the inundated areas have not been surveyed to locate and assess the significance of such resources. The known sites are, thus, only an incomplete sample of the actual resources - i.e., the number, density, distribution, age, character and condition of archaeological and historic sites - on these tracts. Unfortunately, the lack of specific knowledge of the actual resources prevents formulation of any sort of detailed management or use plan involving decisions about the relative historic value of individual sites. For this reason, a generalized policy of conservation is recommended until the resources have been better addressed.

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

1. State land managers shall coordinate all planned activities involving known archaeological or historic sites or potential site areas closely with the Division of Historical Resources in order to prevent any kind of disturbance to significant archaeological or historic sites that may exist on the tract. Under 267.061(1)(b), F.S., the Division of Historical Resources is vested with title to archaeological and historic resources abandoned on state lands and is responsible for administration and protection of such resources. The Division will cooperate with the land manager in the management of these resources. Furthermore, provisions of 267.061(2) and 267.13, F.S., combined with those in 267.061(3) and 253.034(4), F.S., require that other managing (or permitting) agencies coordinate their plans with the Division of Historical Resources at a sufficiently early stage to preclude inadvertent damage or destruction to known or potentially occurring, presently unknown archaeological and historic sites. The provisions pertaining to human burial sites must also be followed by state land managers when such remains are known or suspected to be present (see 872.02 and 872.05, F.S., and 1A-44, F.A.C.)

2. Since the actual resources are so poorly known, the potential impact of the managing agency's activities on historic archaeological sites may not be immediately apparent. Special field survey for such sites may be required to identify the potential endangerment as a result of particular management or permitting activities. The Division may perform surveys, as its resources permit, to aid the planning of other state agencies in their management activities, but outside archaeological consultants may have to be retained by the managing agency. This would be especially necessary in the cases of activities contemplating ground disturbance over large areas and unexpected occurrences. It should be noted, however, that in most instances Division staff's knowledge of known and expected site distribution is such that actual field surveys may not be necessary, and the project may be reviewed by submitting a project location map (preferably a 7.5 minute U.S.G.S. Quadrangle map or portion thereof) and project descriptive data, including detailed construction plans. To avoid delays, Division staff should be contacted to discuss specific project documentation review needs.

3. In the case of known significant sites, which may be affected by proposed project activities, the managing agency will generally be expected to alter proposed management or development plans, as necessary, or else make special provisions to minimize or mitigate damage to such sites.

4. If in the course of management activities, or as a result of development or the permitting of dredge activities (see 403.918(2)(6)a, F.S.), it is determined that valuable historic or archaeological sites will be damaged or destroyed, the Division reserves the right, pursuant to 267.061(1)(b), F.S., to require salvage measures to mitigate the destructive impact of such activities to such sites. Such salvage measures would be accomplished before the Division would grant permission for destruction of the affected site areas. The funding needed to implement salvage measures would be the responsibility of the managing agency planning the site destructive activity. Mitigation of historic structures at a minimum involves the preparation of measured drawings and documentary photographs. Mitigation of archaeological resources involves the excavation, analysis and reporting of the project findings and must be planned to

occur sufficiently in advance to avoid project construction delays. If these services are to be contracted by the state agency, the selected consultant will need to obtain an Archaeological Research Permit from the Division of Historical Resources, Bureau of Archaeological Research (see 267.12, F.S. and Rules 1A-32 and 1A-46 F.A.C.).

5. For the near future, excavation of non-endangered (i.e., sites not being lost to erosion or development) archaeological site is discouraged. There are many endangered sites in Florida (on both private and public lands) in need of excavation because of the threat of development or other factors. Those within state-owned or controlled lands should be left undisturbed for the present - with particular attention devoted to preventing site looting by "treasure hunters". On the other hand, the archaeological and historic survey of these tracts is encouraged in order to build an inventory of the resources present, and to assess their scientific research potential and historic or architectural significance.

6. The cooperation of land managers in reporting sites to the Division that their field personnel may discover is encouraged. The Division will help inform field personnel from other resource managing agencies about the characteristics and appearance of sites. The Division has initiated a cultural resource management training program to help accomplish this. Upon request the Division will also provide to other agencies archaeological and historical summaries of the known and potentially occurring resources so that information may be incorporated into management plans and public awareness programs (See Management Implementation).

7. Any discovery of instances of looting or unauthorized destruction of sites must be reported to the agent for the Board of Trustees of the Internal Improvement Trust Fund and the Division so that appropriate action may be initiated. When human burial sites are involved, the provisions of 872.02 and 872.05, F. S. and Rule 1A-44, F.A.C., as applicable, must also be followed. Any state agent with law enforcement authority observing individuals or groups clearly and incontrovertibly vandalizing, looting or destroying archaeological or historic sites within state-owned or controlled lands without demonstrable permission from the Division will make arrests and detain those individuals or groups under the provisions of 267.13, 901.15, and 901.21, F.S., and related statutory authority pertaining to such illegal activities on state-owned or controlled lands. County Sheriffs' officers are urged to assist in efforts to stop and/or prevent site looting and destruction.

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

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

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alterations of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; those changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a historic property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of

missing features shall be substantiated by documentary, physical, or pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archaeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

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

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

D. MANAGEMENT IMPLEMENTATION

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

1. All land managing agencies should contact the Division and send U.S.G.S. 7.5 minute quadrangle maps outlining the boundaries of their various properties.

2. The Division will in turn identify site locations on those maps and provide descriptions for known archaeological and historical sites to the managing agency.

3. Further, the Division may also identify on the maps areas of high archaeological and historic site location probability within the subject tract. These are only probability zones, and sites may be found outside of these areas. Therefore, actual ground inspections of project areas may still be necessary.

4. The Division will send archaeological field recording forms and historic structure field recording forms to representatives of the agency to facilitate the recording of information on such resources.

5. Land managers will update information on recorded sites and properties.

6. Land managers will supply the Division with new information as it becomes available on previously unrecorded sites that their staff locate. The following details the kind of information the Division wishes to obtain for any new sites or structures that the land managers may report:

A. Historic Sites

(1) Type of structure (dwelling, church, factory, etc.).

(2) Known or estimated age or construction date for each structure and addition.

(3) Location of building (identify location on a map of the property, and building placement, i.e., detached, row, etc.).

(4) General Characteristics: (include photographs if possible) overall shape of plan (rectangle, "L" "T" "H" "U", etc.); number of stories; number of vertical divisions of bays; construction materials (brick, frame, stone, etc.); wall finish (kind of bond, coursing, shingle, etc.); roof shape.

(5) Specific features including location, number and appearance of:
(a) Important decorative elements;
(b) Interior features contributing to the character of the building;

(c) Number, type, and location of outbuildings, as well as date(s) of construction;
(d) Notation if property has been moved;
(e) Notation of known alterations to building.

B. Archaeological Sites

(1) Site location (written narrative and mapped location).
(2) Cultural affiliation and period.
(3) Site type (midden, burial mound, artifact scatter, building rubble, etc.).
(4) Threats to site (deterioration, vandalism, etc.).
(5) Site size (acreage, square meters, etc.).
(6) Artifacts observed on ground surface (pottery, bone, glass, etc.).
(7) Description of surrounding environment.

7. No land disturbing activities should be undertaken in areas of known archaeological or historic sites or areas of high site probability without prior review by the Division early in the project planning.

8. Ground disturbing activities may proceed elsewhere but land managers should stop disturbance in the immediate vicinity of artifact finds and notifies the Division if previously unknown archaeological or historic remains are uncovered. The provisions of Chapter 872, F.S., must be followed when human remains are encountered.

9. Excavation and collection of archaeological and historic sites on state lands without a permit from the Division are a violation of state law and shall be reported to a law enforcement officer. The use of metal detectors to search for historic artifacts shall be prohibited on state lands except when authorized in a 1A-32, F.A.C., research permit from the Division.

10. Interpretation and visitation which will increase public understanding and enjoyment of archaeological and historic sites without site destruction or vandalism is strongly encouraged.

11. Development of interpretive programs including trails, signage, kiosks, and exhibits is encouraged and should be coordinated with the Division.

12. Artifacts found or collected on state lands are by law the property of the Division. Land managers shall contact the Division whenever such material is found so that arrangements may be made for recording and conservation. This material, if taken to Tallahassee, can be returned for public display on a long term loan.

E. ADMINISTERING AGENCY

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

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

Contact Person

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