A Plan for the Use and Management of the Starkey Wilderness Preserve



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Southwest Florida Water Management District Brooksville, Florida



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TABLE OF CONTENTS

| Section |
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| TABLE OF CONTENTS | iii |
|--|-----|
| LIST OF FIGURES | iv |
| LIST OF TABLES | v |
| EXECUTIVE SUMMARY | 1 |
| INTRODUCTION | 3 |
| LOCATION | 3 |
| GENERAL DESCRIPTION | 3 |
| Starkey and Other Conservation Lands | 3 |
| Protected Species | 3 |
| Archaeological Resources | 7 |
| LAND COVER | 7 |
| Wetlands | 10 |
| Uplands | 14 |
| SOILS | 16 |
| AREAS OF RESPONSIBILITY | 18 |
| Water Supply Protection | 19 |
| Flood Protection | 21 |
| Water Quality Protection and Enhancement | 22 |
| Natural Systems Protection | 23 |
| CONCEPTUAL LAND USE PLAN | 25 |
| LAND USE | 25 |
| Recreation | 25 |
| Public Access | 25 |
| Hiking | 28 |
| | 28 |
| Biking | 28 |
| Horseback Riding | 29 |
| Fishing | 29 |
| Hunting | 29 |
| | 29 |
| | 30 |
| | 30 |
| | 30 |
| Silviculture | 30 |

| Grazing | |
|---|---------------|
| UTILITIES AND OTHER PUBLIC FACILITIES | |
| Ridge Road Extension | |
| SECURITY | |
| SPECIAL PROTECTION AREAS | |
| Archaeological and Historical Sites | |
| Restoration Sites | |
| Production Wells and Monitoring Wells a | nd Stations35 |
| Florida Sandhill Crane Nesting Areas | |
| Wading Bird Rookeries | |
| Florida Scrub Jay Habitat | |
| LAND MANAGEMENT | |
| Prescribed Fire | |
| Habitat Restoration | |
| Wildlife Management | |
| Gopher Tortoise | |
| Red-Cockaded Woodpecker | |
| Flora | |
| CONTROL OF EXOTIC SPECIES | |
| Plants | |
| Animals | |
| PREPARATION OF MOSQUITO CONTROL PL | _AN 49 |
| PROJECTED COST OF MANAGEMENT | |
| ADMINISTRATION | |
| REFERENCES | 55 |
| | |

LIST OF FIGURES

Figure Page Figure 1 Location Map 4 Figure 2 Figure 3 Vegetation and Land Use Map 12 Soil Classification Map......17 Figure 4 Figure 5 Figure 6 Wilderness Road Vehicular Access Point and Recreational Facilities 26 Figure 7

| Figure 8 | Utilities and Other Public Facilities | 32 |
|-----------|---|----|
| Figure 9 | Hot Spots of Biological Resources | 36 |
| Figure 10 | Scrub Soil Map (Potential for Scrub Jays) | 44 |

LIST OF TABLES

| Table 1 | Regional Conservation Land Network | 5 |
|---------|---|---|
| Table 2 | Threatened and Endangered Wildlife Species Known or Likely to Occur | 8 |
| Table 3 | Threatened, Endangered, and Commercially Exploited Plant Species | 9 |
| Table 4 | Exotic Species Documented4 | 7 |

EXECUTIVE SUMMARY

The 19,266-acre Starkey Wilderness Preserve (Preserve) is located in west Pasco County (County) approximately 7 miles east of Port Richey. The Preserve consists of three units, the Starkey Wilderness Park (Park) and the Serenova and Anclote River Ranch preservation areas. This plan is designed to guide future management of the Preserve in a manner that will balance resource protection needs with public use.

The Preserve is dominated by pine flatwoods, scrub, scrubby flatwoods, cypress strands and domes, and forested floodplains associated with the Pithlachascotee and Anclote Rivers. These rivers traverse the Preserve in a southwesterly direction and eventually flow to the Gulf of Mexico. The Southwest Florida Water Management District (District) began purchasing the original property (approximately 8,000 acres) in the 1970s. Serenova (6,533 acres) and Anclote River Ranch (3,635 acres) units were added in 1998.

Water management benefits associated with the property include water supply, flood protection, and water quality protection and enhancement. Approximately half of the Preserve lies within the 100-year floodplain as delineated by the Federal Emergency Management Agency (FEMA). The Pithlachascotee and Anclote Rivers meander in a southwesterly direction across the property, and are bordered by a significant zone of bottomland hardwoods (forested swamp) that infiltrates sheet flow and contributes to the water quality of the river.

A number of sites within the Preserve have been designated Special Protection Areas (SPAs). These include the sand pine scrub where Florida scrub jays have been documented, public supply wellheads (14 wells at Starkey Wellfield and 4 wells at North Pasco Wellfield), and associated monitoring wells, archeological and historical sites, restoration sites, sandhill crane nesting sites, and wading bird rookeries. Although SPAs are not normally closed to public access, potentially incompatible recreational uses will generally be directed to other portions of the property. Management activities such as prescribed burning and control of exotic species will be tailored to meet site-specific needs of all SPAs.

Permitted recreational uses of the Preserve include hiking, biking (paved and off-road), horseback riding, primitive camping, fishing, picnicking, and nature study. The District manages the Preserve's natural resources. The environmental education center, campground, cabins, information center, trails and kiosks are managed by Pasco County. Near the west entrance of the Preserve, Pasco County owns and operates an adjacent 64-acre property with picnic pavilions, athletic field, two volleyball courts, playground, restrooms, parking areas, and a nature trail. The western entrance is located at the eastern end of Wilderness Road and provides access and parking for the equestrian staging areas, picnic pavilions, education centers, and bike, hiking, and horse trails. The public can access the Preserve from the north off of SR 52 where a trailhead for equestrian use and hiking is located.

Potential enhancements to recreational usage of the Preserve include a proposal to develop an additional trail for use by off-road bicyclists. The District will also consider constructing a bridge across the Anclote River that would allow recreational users to safely traverse the river and recreate on both the north and south sides of the Anclote River.

Major management needs and actions include the continuation of a prescribed burn program, scrub restoration, and management and monitoring of resident wildlife to maintain existing biodiversity, and control of several invasive, exotic (non-native) plant species.

INTRODUCTION

LOCATION

The Starkey Wilderness Preserve (Preserve) is located approximately seven miles east of Port Richey in westcentral Pasco County (County). It is bound on the north by SR 52, on the south by Starkey Ranch (north of SR 54), on the east by the Suncoast Parkway, and on the west by suburban developments that extend along Little Road (Figure 1).

GENERAL DESCRIPTION

The 19,266-acre Preserve is dominated by pine flatwoods, scrub, scrubby flatwoods, cypress strands and domes, and forested floodplains associated with the Pithlachascotee and Anclote Rivers. These rivers traverse the Preserve in a southwesterly direction where they eventually discharge to the Gulf of Mexico. The Preserve is comprised of the Starkey Wilderness Park (Park) (approximately 8,000 acres), which was purchased by the District in the 1970s, and the Serenova (6,533 acres) and Anclote River Ranch (3.635 acres) units added in 1998. The Park unit of the Preserve contains the majority of public recreational usage, with public facilities and enhancements such as paved trails centered in this portion of the property (see recreation section). Recreational usage and associated facilities are

managed by Pasco County in partnership with the District. Ownership of the Serenova and Anclote River Ranch units was transferred to the District to mitigate for impacts resulting from construction of the Suncoast Parkway, and the state's Board of Trustees of the Internal Improvement Trust Fund was given a conservation easement over both units. These units of the Preserve will be managed to preserve and/or restore natural values and to accommodate compatible recreational use (Figure 1).

Starkey and Other Conservation Lands

The Preserve adds 19,266 acres to the network of protected conservation land in the region. Approximately 111,545 acres are included in conservation areas that surround the Preserve within Pasco, Hernando, Hillsborough, and Pinellas Counties (Table 1, Figure 2).

Protected Species

Protected wildlife species that are known or potentially occur on the Property include the federally threatened Eastern indigo snake and Florida scrub jay. State listed wildlife species include the threatened sandhill crane, southeastern American kestrel, Florida black bear, and several species of special concern including the gopher frog, Florida pine snake, gopher tortoise,



Table 1 Regional Conservation Land Network

| Name | Owner | Manager | County | Acreage |
|-------------------------------|--------------|--------------|-----------------|---------|
| Weekiwachee Preserve | SWFWMD | SWFWMD | Hernando | 10,735 |
| Cypress Creek Preserve | SWFWMD | SWFWMD | Pasco | 7,393 |
| Conner Preserve | SWFWMD | SWFWMD | Pasco | 2,981 |
| Lower Hillsborough FDA | SWFWMD | SWFWMD | Hillsborough | 15,964 |
| Hidden Lake | SWFWMD | SWFWMD | Pasco | 589 |
| Brooker Creek Headwaters | SWFWMD | Hillsborough | Hillsborough | 1,111 |
| Chassahowitzka WMA | State | FWC | Hernando | 27,183 |
| Werner-Boyce State Park | State | FDEP | Pasco | 3,999 |
| Hillsborough River SP | State | FDEP | Hillsborough | 3,414 |
| Anclote Key Preserve SP | State | FDEP | Pasco/Pinellas | 12,177 |
| Honeymoon Island SP | State | FDEP | Pinellas | 2,810 |
| All-Bar Ranch | Pinellas | Pinellas | Pasco | 4,092 |
| Cross Bar Ranch | Pinellas | Pinellas | Pasco | 7,931 |
| Brooker Creek Preserve | Pinellas | Pinellas | Pinellas | 8,205 |
| Cypress Creek Preserve | Hillsborough | Hillsborough | Hillsborough | 2,547 |
| Brooker Creek Buffer Preserve | Hillsborough | Hillsborough | Hills/Pinellas | 414 |
| Chassahowitzka NWR | USFWS | USFWS | Citrus/Hernando | 111,545 |

SWFWMD - Southwest Florida Water Management District FDEP - Florida Department of Environmental Protection USFWS - United States Fish and Wildlife Service



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Florida mouse, and Sherman's fox squirrel. Listed wading birds include the federally endangered wood stork and several species of special concern including the limpkin, snowy egret, tricolored heron, little blue heron, and white ibis (Table 2). For management concerns, see the Wildlife Management section.

State protected plant species known to occur on the Property include the endangered Treat's rainlilly and pond spice, the threatened pitcher plant, cardinal flower, Catesby's lily, lacelip ladiestresses and Garberia. Commercially exploited species include the Florida butterfly orchid, green-fly orchid, cinnamon fern, royal fern and coontie (Table 3). For management concerns, see the Flora section.

Archaeological Resources

The Preserve contains approximately 54 archaeological sites that have been recorded in the Florida Master Site File of the Department of State's Division of Historical Resources. These sites were small campsites used by coastal dwellers during seasonal hunting and fishing treks (Weisman and Marquardt, 1988). This finding supports the early hypothesis that near-coastal areas in this region served as hinterland for the exploitation of select resources by aboriginal Floridians residing on the coast (Wharton, 1982). Two of the documented archaeological sites are designated as significant on the basis of artifactual yield, the ability to place a date on the find, and the presence of buried deposits.

Features of local historical significance have also been documented on the Preserve. There are old turpentine camps dating to the early 1900s. An old tramway that was used to transport harvested timber from the Starkey property to the Lyon Pine Company's mill in Odessa remains as an elevated roadbed that traverses the middle of the property in a north-south alignment. In addition, a five-mile segment of the Old Dade Road traverses the Starkey Wilderness Park unit of the Preserve. This 41-mile, one-lane sand road was constructed in 1910 to link the coastal communities of Pasco County with the county seat in Dade City.

Management of these archaeological and historical resources will consist primarily of preventing disturbance. The sites may be made available for supervised study by archaeological researchers.

LAND COVER

The Preserve lies in the southwest portion of the Tampa Plain physiographic region where elevation ranges from 5 to 90 feet. The Tampa Plain is in the southern part of central

| Verified | Species | FWC | US FWS | Management Recommendations |
|----------|-------------------------------|-------|-----------|---------------------------------|
| • | Gopher frog | SSC | - | Maintain hydroperiod in |
| | Rana capito | | | isolated wetlands. |
| • | American alligator Alligator | SSC | Т | Protect from illegal take; |
| | mississipiensis | | (S/A) | maintain wetlands. |
| • | Eastern indigo snake | Т | Т | Manage as prescribed for |
| | Drymarchon corais couperi | | | tortoise. |
| | Florida pine snake | SSC | - | Manage as prescribed for |
| | Pituophis melanoleucus | | | tortoise. |
| | Short-tailed snake | I | - | Manage as prescribed for |
| • | Stilosoma extenuatum | 000 | | tortoise. |
| | Gopher tortoise | SSC | - | Manage areas with dense |
| | Goprierus polypriernus | | | vorio soile to maintain open |
| | | | | |
| • | Florida scrub jav | т | т | Documented summer 2004 |
| · | Aphelocoma coerulescens | | | after implementation of scrub |
| | | | | habitat restoration. |
| • | Red-cockaded woodpecker | SSC | Е | Not seen since late 1980s; |
| | Picoides borealis | | | cavity trees on site. Retain |
| | | | | existing burn regime. |
| • | Listed wading birds* | See | See | Protect rookeries and foraging |
| | See back for sc. names | Below | Below | sites. |
| • | Florida sandhill crane | Т | - | Protect nesting habitats and |
| | Grus Canadensis pratensis | | | monitor/restore hydroperiods in |
| | | | | altered marshes. |
| • | Southeastern American kestrel | Т | - | Maintain fire-adapted |
| | Falco sparverius paulus | | | communities on appropriate |
| | | | | burn frequency cycle; preserve |
| | Elorida mouso | 880 | | Managa as proscribed for |
| | Podomys floridanus | 330 | - | tortoise |
| | Sherman's fox squirrel | 222 | | Maintain pyrogenic |
| • | Sciurus niger shermani | 000 | _ | communities on appropriate |
| | | | | burn frequency cycle. |
| • | Florida black bear | Т | - | Documented on site |
| | Ursus americanus floridanus | | | occasionally; work with |
| | | | | acquisition programs to enlarge |
| | | | | and link conservation lands. |

Table 2 Threatened and Endangered Wildlife Species Known or Likely to Occur

*Listed wading birds = limpkin (SSC), snowy egret (SSC), tricolored heron (SSC), white ibis (SSC), little blue heron, and wood stork (E - FWC; E - USFWS). With the exception of the limpkin, all of these other species have been documented.

Two rookeries have been documented on site (Figure 6). These rookeries contain great egret, anhinga, little blue heron, cattle egret, and great blue heron.

Table 3 Threatened, Endangered, and Commercially Exploited Plant Species

| Species | FDA | Habitat/Management Recommendations | |
|--------------------------|------------------------|---|--|
| Treat's rainlilly | E | Protect pine flatwoods; wet prairie, wet roadside | |
| Zephyranthes atamasca | | ditches. | |
| | | Maintain habitat with appropriate burn regime. | |
| Pond spice | E | Protect dome swamps. | |
| Litsea aestivalis | | Allow dome swamp canopy species to mature. | |
| Cardinal flower | Т | Protect creeks and river edges. | |
| Lobelia cardinalis | | Sustain riparian systems, especially creeks and river | |
| | | edges. | |
| Catesby's lilly | Т | Protect pine flatwoods; wet prairies, wet roadside | |
| Lilium catesbaei | | ditches. | |
| | | Maintain habitat with appropriate burn regime. | |
| Garberia | Т | Protect sand pine scrub habitat. | |
| Garberia heterophylla | | Maintain habitat with appropriate burn regime. | |
| Lacelip ladiestresses | Т | Protect pine flatwoods; wet and dry prairie, wet | |
| Spiranthes laciniata | | roadside ditches. | |
| | | Maintain habitat with appropriate burn regime. | |
| Florida butterfly orchid | CE | Protect mesic and hydric hammock. | |
| Encyclia tampensis | | Prevent commercial exploitation. | |
| Green-fly orchid | CE | Protect mesic and hydric hammock. | |
| Epindrum conopseum | | Prevent commercial exploitation. | |
| Cinnamon fern | CE | Protect forested wetlands. | |
| Osmunda cinnamomea | | Prevent commercial exploitation. | |
| Royal fern | CE | Protect forested wetlands. | |
| Osmunda regalis | | Prevent commercial exploitation. | |
| Coontie | CE | Protect pine flatwoods and mesic hammock. | |
| Zamia pumila | | Prevent commercial exploitation. | |
| Pitcher plant | Т | Protect hydric hammock and wet prairie. | |
| Sarracenia sp. | | Prevent commercial exploitation. | |
| USFWS United States Fish | h and \overline{W} | ildlife Service | |
| E Endangered | | | |

E T CD

Endangered Threatened Commercially Exploited

Florida's Ocala Uplift District, and has soils consisting of medium to fine sand and silt covering limestone, shell, and clastic deposits (Brooks, 1981). A complex mosaic of upland community types including mesic pine flatwoods, sandhill, scrubby flatwoods, sand pine scrub, and oak scrub dominate the Preserve. Basin and dome swamps are the most prevalent wetland communities, and the property includes two blackwater streams, the Anclote and Pithlachascotee Rivers.

The following discussion provides a brief description of the natural vegetation and other land cover types occurring within the Preserve.

<u>Wetlands</u>

Wetlands consisting of dome swamps, basin marsh, depression marsh, wet prairie, floodplain forest, wet pine flatwoods, and hydric hammock occupy approximately 34 percent of the Preserve. Basin swamps dominate the wetland area at 18 percent (3,514 acres) and are typically isolated, large, forested, and irregularly shaped depressions not associated with rivers. They are vegetated with trees and shrubs that withstand extensive periods of inundation (hydroperiods) and thrive in nutrient poor, usually acidic peat soils, overlying an impervious soil layer. More than 160 swamps are found throughout the landscape and are largely

dominated by pond cypress, and to a lesser degree, red maple, swamp tupelo, slash pine, loblolly bay, sweet gum, persimmon, swamp bay, sabal palm, laurel oak, and water oak.

Shrubby species may be found throughout or around the perimeter and commonly include fetterbush, wax myrtle, saw palmetto, highbush blueberry, and sand blackberry. The most common herbaceous species include sawgrass, maidencane, and blue maidencane. Ferns are typical and abundant and include marsh fern, Virginia chain fern, and the commercially exploited cinnamon fern and royal fern. Sphagnum moss is commonly found throughout the bottom of these swamps and can form thick layers, helping to retain water during dry periods.

Dome swamps encompass 580 acres and are found throughout the Preserve. These swamps are typically isolated, shallow, forested, usually circular wetland basins in flatland communities. The domed profile is a result of smaller trees growing in the shallower water around the edges and larger trees growing in the deeper, interior water. Dome swamps are diverse in their structure and species composition depending on their fire and hydrological regime. Typically, dome swamp canopies are dominated by pond cypress with a large variety of associated canopy and subcanopy species including red maples, swamp tupelo, dahoon holly, swamp bay, persimmon, and laurel oak. Epiphytic species are highly abundant and include resurrection fern, Spanish moss, and various bromeliads. Shrub species commonly consist of wax myrtle and fetterbush; herbaceous cover is similar to basin swamps. A healthy population of a particularly rare shrub, pondspice, is found in an older, less disturbed dome swamp in the north-central portion of the Preserve.

Basin marsh (250 acres) is herbaceous or shrubby wetlands situated in a large and irregularly shaped basin (Figure 3). A majority of basin marshes are found within deeper portions of basin swamps and are dominated by aquatic plants, including bulltongue arrowhead, pickerelweed, frog's bit, water lilies, big floating heart, and pond lilies. Common shallow water species include a variety of grasses such as maidencane, sawgrass, blue maidencane, rushes, nutrushes, spikerushes, and sedges.

Depression marshes (120 acres) are found most commonly within mesic flatwoods. These marshes are typically isolated, circular, herbaceous (nonforested) wetlands that occur in low depressions within flatland communities. Fire-maintained depression marshes have more diverse species assemblages and fewer invading woody species than those that do not experience fire. Dominant species are corkwood, maidencane, blue maidencane, spike rushes, beaksedges, St. John's wort, and redroot among others. Some deeper depression marshes support American waterlily and pondlily.

Wet prairie (101 acres) is an herbaceous community with a dense groundcover of diverse grasses and herbs, and closely affiliated with depression marshes. This community is dominated by wiregrass and blue maidencane, and in some cases is invaded by higher stratum (canopy, subcanopy) species such as slash pine, wax myrtle, and gallberry. Also present are several species of beakrush, spikerushes, milkworts, fimbry, maidencane, sundew, and redroot. This community often exists embedded in mesic flatwoods or borders the upper edges of depression marshes and dome swamps, and connects basin swamps, dome swamps, and depression marshes. The lower hydroperiod of the wet prairie often act as the "transition" zone between the uplands and longer hydroperiod wetlands. Small seepage areas, characterized by saturated conditions and boggy vegetation (pitcher plant, sphagnum moss), are included within this land cover.

Floodplain forests (1,844 acres) occur in the Anclote and Pithlachascotee River

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| 12 | | | |
|----|--|-----------------------------|----------|
| | STARKEY WILDERNESS PRESERVE LAND MANAGEMENT PLAN Pasco County, Florida | VEGETATION AND LAND USE MAP | Figure 3 |

floodplains and along their tributaries. These hardwood forests occur in lowlying areas bordering streams with distinct banks; they are inundated regularly and seasonally in response to rainfall. There is a dense, closed canopy made up primarily of aquatic and water-tolerant evergreen and deciduous hardwoods. The organic layer of floodplain forest is transported downstream during floods, providing important nutrients and minerals to other natural communities. The typical and diverse canopy species of floodplain forest include pond cypress, swamp tupelo, laurel oak, American elm, red maple, and live oak. Common subcanopy species include swamp bay, hornbeam, pop ash, cabbage palm, and swamp dogwood. Epiphytic plants are abundant. Common shrubby species include buttonbush and shortleaf wild coffee. Herbaceous species can be sparse or form a thick ground layer and include lizard's tail, swamp fern, marsh fern, millet beaksedge, and tall nutgrass. Deeper water herbs include smartweed and water paspalum. A particularly invasive exotic species, ceasarweed, is abundant in the high elevation portions of the Anclote River basin.

Wet (hydric) pine flatwoods (196 acres) have open canopies of scattered pine trees with a sparse understory and thick groundcover of hydrophytic herbs. The canopy consists of slash pine; wax myrtle dominates the subcanopy. Fire suppressed wet flatwoods have a dense shrubby understory and sparse herbaceous layer. Where exposure to fire has occurred there is a sparse shrub cover and dense groundcover of hydrophytic herbs and grasses. Common shrub species are fetterbush, persimmon, gallberry, Florida bully, and scattered saw palmetto. Characteristic herbs include blue maidencane, spadeleaf, beakrushes, yellow hatpins, rosy camphorweed, sawgrass, and redroot.

Hydric hammock occupies 70 acres and is composed of a canopy of hardwoods. Although some sizable hydric hammocks are located within the Preserve, this community is typically undistinguished from floodplain forest and basin swamp natural communities. The diverse, closed canopy and subcanopy typically consists of laurel oak, red maple, cabbage palm, sweetbay magnolia, American elm, red cedar, swamp bay, basswood, and sweetgum. The shrub layer includes pop ash, dahoon holly, swamp dogwood, wax myrtle, blue palmetto, saw palmetto, marlberry, wild coffee, and shortleaf wild coffee. Epiphytic species are abundant in the canopy. Herbaceous species can be dense or sparse and commonly consist of lizard's tail, sawgrass, false nettle, swamp fern, and other fern species.

<u>Uplands</u>

Mesic pine flatwoods constitute the most extensive land cover type on the property, covering approximately 7,427 acres, or 39 percent of the total land area. The mesic pine flatwoods of the property are open-canopy forests dominated by widely spaced longleaf pine trees with little or no subcanopy, and a dense groundcover of herbs and shrubs. The shrub layer is composed of saw palmetto, gallberry, fetterbush, coastal plain staggerbush, wax myrtle, shiny blueberry, dwarf huckleberry, and dwarf live oak. Mesic flatwoods are noted for their herbaceous diversity. including many rare species (Hardin and White 1989). Herbaceous species include wiregrass, lopsided Indiangrass, little bluestem, grass-leaved silkgrass, bracken fern, tall elephantfoot, witchgrasses, blue maidencane, and milkworts, among others. Listed species found in the property's flatwoods include the endangered Treat's rainlilly, the threatened Catesby's lily and Lacelip ladiestresses, and the commercially exploited coontie. Small to extensive inclusions of wet prairie intermixed in the mesic flatwoods are common.

Xeric communities occurring at the Preserve include oak scrub, sand pine scrub, scrubby flatwoods, xeric hammock, and sandhill. Collectively, these areas comprise approximately 2,745 acres or 14 percent of the Preserve. These communities are associated with ancient sand ridges, areas of well-drained soils, and are pyrogenic in nature. Fire is a natural occurrence in these communities and maintains the characteristics that support the native plant and wildlife species. Fire suppression in these communities leads to alteration of the natural characteristics of the community and succession to xeric oak hammock. Management with prescribed fire to reduce the affects of fire suppression will undoubtedly increase the acreage of potential scrub jay habitat (See scrub jay section).

Scrub communities (683 acres) occur in areas of white, well-drained, deep sandy soils and have a dense yet patchy shrub layer, few to no herbs, and many ground lichens. Oak scrub (174 acres) often contains patches of xeric hammock in areas where fire has been absent for long periods of time. Additionally, small patches of oak scrub are included within larger stands of scrubby flatwoods. Dominant shrubs include myrtle oak, sand live oak, rusty lyonia, and Chapman's oak.

A moderately closed canopy of sand pine dominates the sand pine scrub (509 acres). The shrub layer mimics that of oak scrub but includes sand pine scrub endemics such as the threatened garberia, Florida rosemary, scrub holly, and scrub wild olive. Some sand pine scrub communities in the southwestern portion of the Preserve have canopy components of extremely large, mature sand pines reaching heights of 100 feet. Other areas have been recently restored through the removal of sand pines. The federally listed Florida scrub jay was observed in a recently restored area.

Scrubby flatwoods (819 acres) occupy large areas and often have smaller inclusions of xeric hammock associated with it in areas of fire exclusion. Scrubby flatwoods are characterized by an open pine canopy with scattered clumps of scrub oaks and many areas of bare white sand. The vegetational composition is similar to that of mesic flatwoods and scrub; scrubby flatwoods often occupy broad transitions between the two communities. The open canopy consists mostly of mature longleaf pine with occasional sand pine. The subcanopy and tall shrub layer can be dense in areas of fire suppression but most commonly is a sparse mixture of sand live oak, myrtle oak, and Chapman's oak. The dense short shrub layer includes such species as saw palmetto, shiny lyonia, hog plum, and scrub endemic garberia. The herbaceous layer is extremely variable. The gopher tortoise, a state listed species of special concern, inhabits this community type.

Xeric hammock (561 acres) is widespread and is most common in the northeast and southwest sections. This community is characterized by a mature, closed canopy of scrub oaks reaching stature of short trees and a dense shrub laver, and is often the product of naturally occurring or human induced fire suppression of historical scrub, sandhill, or scrubby flatwood communities. The closed canopy is dominated by sand live oak with longleaf pine and sand pine occasionally emerging above. The shrub layer can be dense to sparse and dominated by saw palmetto, Chapman's oak, myrtle oak, and occasionally turkey oak. The herbaceous layer is sparse but often contains remnant, suppressed wiregrass as well as other species such as bracken fern, witchgrass, and sandyfield beaksedge.

Sandhill communities (681 acres) get their name from the gently rolling hills of sand on which they are located. The community consists of widely spaced pine trees with a sparse understory of deciduous oaks and a somewhat dense and diverse groundcover of grasses and herbs. Sandhills are common upland communities and often exist intermixed with scrub, scrubby flatwoods, and xeric hammock. The sandhill community is dominated by longleaf pine but can also contain sand pine with a subcanopy of younger longleaf pine, turkey oak, and bluejack oak. Shrubs are generally short and scattered and are dominated by saw palmetto but can include gopher apple and dwarf live oak. Much of the sandhill community on the property has recently been restored through mechanical removal of invading hardwoods, such as turkey oak, that attain unnatural dominance when fire is excluded. The state listed gopher tortoise is a keystone sandhill community species that thrives in wellmanaged sandhill.

One 55-acre plot of pine plantation exists and consists of a dense planting of slash pine with little remnant vegetation of the former native community. The herbaceous layer contains many weedy and exotic species such as bahiagrass, dog fennel, and sand blackberry. A wildfire caused high mortality of the slash pines within the southwest portion of this pine plantation.

Approximately 2,195 acres of the Preserve consists of disturbed lands including improved (2,010 acres) and semi-improved pasture (35 acres), and ruderal lands (150 acres) comprised of old agricultural fields, borrow pits, and other substantially modified lands. These ruderal lands are characterized by non-native and native weedy species. Semi-improved pastures exist where non-native forage grasses have been planted within existing native communities. The few examples that exist occur in mesic flatwoods where bahiagrass is planted throughout. Improved pastures are common and encompass large expanses of converted land. The Preserve's improved pastures typically have large live oaks and patches of flatwood vegetation including slash pine or longleaf pine, and shrubby vegetation such as saw palmetto, wax myrtle, and blackberry.

SOILS

Any given area's soil type provides a framework for the range of possible variability in vegetational composition. This is because soil types are static, while vegetative communities are variable; they are affected by rain, wind, and fire. For the most part, the Preserve's soils map (Figure 4) depicts the Preserve as it is, as it was, and as it will be, whereas the Vegetation and Land Use map is a current snapshot. For these reasons, soils mapping is practical for managers because it defines the boundaries of restoration efforts and management strategies that may not be readily apparent from cover type or habitat inspections. Improved pasture on xeric soils, for example, can never be "restored" to pine flatwoods.

The soils have been placed into three distinct groupings based on soil moisture: xeric, mesic, and hydric. Xeric soils are capable of supporting scrub, sandhill, scrubby flatwoods, and xeric



hammock. Mesic soils are capable of supporting pine flatwoods, and dry prairie. Hydric soils support hydric flatwoods and all wetland communities.

Xeric soil types present on site are Astatula, Paola, Pomello, and Tavares fine sands. If managed with fire, these soil types could all support scrub, although Tavares typically supports sandhill. Xeric soils are predominantly located in the northern Preserve area; community types that occur on these soils are xeric hammock, scrub, and scrubby flatwoods. Xeric hammock areas have been targets of restoration efforts to reduce the effects of fire suppression (see restoration section). Where these high, dry areas fall near "navigable waterways", the highest presettlement archaeological potential exists.

Mesic soil types present on site are Adamsville, Immokalee, Myakka, Cassia, Narcoossee, Paisley, Smyrna, and Vero fine sands. If managed with fire, these soil types could support pine flatwoods. Mesic soils correspond with pine flatwoods, mesic hammock, improved pastures, and some of the forested floodplains of the Anclote and Pithlachascotee Rivers. Soil types in improved pasture areas provide a "blueprint" for habitat restoration strategies. Hydric soils represented include Basinger, Chobee, Eaugallie, Pineda, Pomona, Sellers, and Zephyr muck. Hydric soils correspond to all of the site's wetlands. These soils have been altered in wetlands that have been desiccated by wellfield withdrawals. When water levels are drawn down for significant periods, the soils are exposed to oxygen resulting in oxidation or decomposition of organic muck. With re-hydration, the organic component of the soils will begin to rebuild as decaying vegetative matter is reintroduced to a saturated "oxygen free" (anaerobic) environment.

AREAS OF RESPONSIBILITY

The acquisition of land important to the management of water resources is an important element in the District's effort to meet its four primary Areas of Responsibility (AOR). These AORs are flood protection, water supply protection, water quality protection, and natural systems protection. The following discussion describes hydrology of the Preserve, its role in regional water management, its importance as a water supply, and benefits resulting from its protection.

Location and geology of the property places it in a unique position for water management. Aquifer recharge in the region is known to occur at rates of two to ten inches annually, thereby offering the potential for large volumes of groundwater supply replenishment. Maintenance of recharge potential is essential in light of its use as a public supply wellfield. This recharge potential is preserved by maintaining the land in its natural state. The large percentage of land located within the 100-year floodplain (Figure 5) and the varied system of wetlands affords the opportunity to utilize natural lands as buffers against flooding by storing large volumes of water. Channels of the Pithlachascotee and Anclote Rivers constitute natural pathways for the conveyance of floodwaters from upstream portions of their respective drainage basins to the Gulf of Mexico. The undeveloped nature of the property assures that both runoff and recharge will be free of contamination normally associated with developed areas. These water management benefits are discussed in greater detail below.

Water Supply Protection

Ensuring adequate water supplies for humans and for the environment is central to the District's mission. A variety of effective water supply programs, including a water usepermitting program, regulate the amount of water taken from surface and groundwater sources. The District's regulatory efforts are balanced with incentives such as the New Water Sources Initiative (NWSI) and other Cooperative Funding projects that encourage development and use of reclaimed water, desalination, aquifer storage and recovery, and other nontraditional sources.

The purchase contract for the Starkey Wilderness Park unit of the Preserve included a provision that allows the land to be used for water management purposes, including the withdrawal of potable water. Wellfield production is, and will likely continue to be, the land use of paramount significance on this District-owned property. However, the deed also stipulates that wellfield withdrawals and other allowable land uses must be conducted in a manner that is complementary with the natural character of the property.

Two wellfields, the Starkey Wellfield (14 wells) and North Pasco Wellfield (4 wells, only 2 producing) exist on the Preserve. These wells provide potable water to Pasco County and the City of New Port Richey, and are under the management of Tampa Bay Water and regulatory authority of the District. During water year 2003 groundwater pumpage averaged 13.7 million gallons per day from the combined Starkey and North Pasco Wellfields.

The wellfield water withdrawals are controlled by District water use permits (WUP No. 2011771.00), which regulate the amount of water that may be



withdrawn at any given time. Wetland areas within the wellhead zone of influence are constantly monitored. If wetlands exhibit signs of stress, pumpage rates are adjusted accordingly. Moderate to severe stress was observed at several monitored wetlands within the zone of influence at the Starkey and North Pasco Wellfields as well as at other wellfields within the county (see Habitat Restoration Section). Wetland areas are essential for the retention of water, which results in recharge to the aquifer system and maintains water quality and provides flood protection.

The District's NWSI, administered in conjunction with Tampa Bay Water, is funding an innovative wellfield rehydration project to enhance recharge where it is most needed. The Starkey Wellfield project will use treated wastewater and/or stormwater to replenish the aquifer system. Sections 17-521 and 17-610, F.A.C. governs wellhead protection and the reuse of reclaimed water, respectively, and guides such efforts.

Flood Protection

Flood protection depended historically upon a structural approach to provide for the storage and controlled conveyance of floodwater. A nonstructural approach has since been adopted as a more environmentally benign, cost effective method in areas where such an approach is feasible. The District's primary flood protection strategy depends upon identifying and preserving natural floodplains and other land that can serve as storage areas for storm-generated floodwater.

With over 50 percent of the property being wetlands or lying in the 100-year floodplain, or otherwise recognized as flood prone, the Preserve provides considerable natural flood protection benefits. Isolated wetland areas and floodplains have a natural ability to store, detain, and absorb water generated by normal rains and most storm events. Approximately 6,700 acres of the Preserve are delineated as wetlands. Wetlands physically store floodwater, reduce peak elevation of floodwaters, and moderate or attenuate the release of floodwater (SWFWMD, 1987). Floodplain areas are generally distinguished by gently sloping topography and support a variety of natural communities and surface water depressions that store floodwaters and attenuate their release. Of the natural communities, extensive floodplain wetlands may make the most significant contribution to flood protection. The multitude of isolated wetland areas is also able to store significant amounts of water.

Mesic pine flatwoods, which account for over 39 percent of the Preserve's total

land area, also contribute to the property's flood protection value. The hydrology of these upland areas is strongly influenced by flat topography, sandy soils, and seasonal precipitation. These characteristics combine to produce a landform, which produces little storm water runoff. Downward percolation is retarded by poorly drained soils and where present, an underlying clay hardpan. These factors contribute to the presence of standing water over much of the site's flatwoods for various amounts of time during the rainy season, which is characteristic of flatwoods (Myers and Ewel, 1990).

During flood conditions, the riverine wetlands associated with the Pithlachascotee and Anclote Rivers serve as natural storage areas for the detention of floodwaters. Temporary storage of floodwaters in these wetlands reduces the downstream impacts that would be associated with an unattenuated release of storm-generated waters. The total volume of runoff generated by local storms may also be reduced somewhat through evaporation, transpiration, and percolation during the period of detention. Long-term preservation of these wetlands and adjacent uplands through public ownership will prevent development from encroaching upon the floodplain of these rivers and ensure that natural volumes of water storage are maintained.

Water Quality Protection and Enhancement

The District is actively involved in maintaining and improving water quality within its area of jurisdiction. Regulatory programs that govern well construction and water use permitting prevent contamination and overuse of groundwater and surface water supplies.

Protection or enhancement of water quality is a critical aspect of the land management planning process. Although natural agents sometimes cause contamination of surface water and groundwater, it is usually associated with human activities. As the demands placed upon water supply sources have intensified, issues of contamination and the treatment necessitated have likewise intensified. The ability of natural systems, particularly wetlands, to improve water quality has become an important consideration in water quality related issues. Wetlands are defined as transitional areas located between terrestrial and aquatic systems where the water table is at or near land surface for at least a portion of the year. As water passes through a wetland, its velocity is reduced causing sedimentation of suspended particles, which may include an array of toxic compounds, nutrients, and other pollutants. These can be consolidated

into bottom sediments or taken up through the metabolic processes of plants, animals, and microbes, which bind these compounds into living tissue. This natural process effectively removes many contaminants from the water column, preventing them from entering adjacent water bodies or the aquifer (SWFWMD, 1987). The loss of surrounding uplands can significantly alter the water quality enhancement function of wetlands. Uplands filter, catch, and retain dissolved and suspended matter carried by surface runoff from surrounding landscapes.

The most significant contribution of the property to water quality enhancement lies in its large area of unaltered floodplain vegetation. On-site wetlands associated with the Pithlachascotee and Anclote Rivers are regularly inundated during periods of high river stages of offsite water. In contrast, all or most of the water draining into the properties' isolated wetlands originate from natural areas on-site. As such, these isolated wetlands are expected to receive little or no input of suspended sediments and waterborne pollutants normally associated with stormwater drainage (District, 1990). A United States Geological Survey (USGS) station on the Pithlachascotee River at SR 52 indicted water quality measurements well within Class III water standards as of 1998 (SWFWMD, 1998). Water quality enhancement benefits realized

through the District's ownership and protection of the property are predicated primarily upon preservation of the riverine floodplain wetlands.

Natural Systems Protection

In the process of buying land to protect water resources or provide water management benefits, the District protects natural systems. All public lands managed by the District have at least one thing in common: they help achieve effective stewardship of water resources.

With the acquisition of the Preserve, all natural systems are enhanced through restoration and/or management activities. As was previously discussed, over 50 percent of the property lies within the 100-year floodplain. Preservation of these natural wetland and upland systems provides flood and water quality protection while preserving natural habitat for wildlife. There are many notable species of wildlife and plant life inhabiting the Preserve (Tables 2 and 3). Some of these species are protected by the state and/or the USFWS on the basis of imperilment. The continued presence of these species can be assured most effectively through implementation of general land management actions (see Land Management section). The appropriate application of prescribed fire and the control of invasive, non-native species

will be especially important measures in maintaining outstanding habitat values.

Habitat restoration is also a critical component of natural systems protection. District policy directs that sites on District-owned land that have been altered from a natural state and condition must be restored to a natural condition whenever practical.

Standard District practice is to locate site improvements on altered portions of a property whenever possible in order to avoid altering undisturbed sites. Habitat restoration is ongoing and is addressed elsewhere in this plan.

CONCEPTUAL LAND USE PLAN

LAND USE

Board Policy 610-3 stipulates that appropriate public recreational usage of District lands be permitted, provided that the usage is compatible with natural resource management and protection needs. Recreational activities that are not "resource based" will not normally be allowed. Resource-based activities generally consist of those outdoor recreational or educational pursuits in which natural surroundings are a fundamental requirement for engaging in the activity.

Recreation

The Starkey Wilderness Park and Serenova Units of the Preserve provide outstanding passive recreational opportunities. Extensive trail systems allow for hiking, bicycling, in-line skating, and horseback riding. Portions of the trail system are part of the State of Florida's Great Florida Birding Trail. Also available are an environmental education center, campgrounds, cabins, fishing, and picnicking. The environmental education center, campground, cabins, information center, trails, and kiosks are managed by Pasco County. Near the west entrance of the Preserve, Pasco County owns and operates an adjacent 64-acre property with picnic pavilions, athletic field, two

volleyball courts, playground, restrooms, parking areas, and a nature trail (Figure 6). All trails and recreation areas on the Serenova Unit are managed by the District. The newest addition to the trail system is an extension of the paved Starkey Trail, which linked the Preserve to the Suncoast Trail. Opened in 2001, the Suncoast trail is a 41-mile nonmotorized paved trail that begins in northern Hillsborough County and proceeds to Hernando County. The Trail is part of Florida's Statewide Greenways and Trails System and contains rest/interpretive areas that illustrate historical significance and emphasize transitions between ecological communities and identify native species. The Suncoast Trail runs along the Preserve's eastern border and crosses the various rivers and creeks that run through the Preserve including the Anclote and Pithlachascotee Rivers.

Public Access

Public access will be via a primary entrance located on the west side of the Park off Wilderness Road. A parking area and the park facilities described previously are located near this access point. A secondary access point located at the north end of the property off SR 52 provides a grassed parking area that is designed to provide access to camping and picnicking areas (Figure 7). These are the only existing points of vehicular entry that can be approached





from a public right-of-way. Vehicular access beyond these entrance facilities will not be permitted, although special permits may be granted on a case-bycase basis to allow vehicular access to the interior of the Preserve for certain activities or to accommodate special circumstances. A third access point is located where the Starkey Trail meets the Suncoast Trail and can only be accessed on foot or on bicycle by users of the trail. A future access point may exist from the Ridge Road Extension which when built will traverse the Serenova portion of the Preserve. An old bridge traversing the Anclote River has been deemed unsafe for use and the District will consider replacing the bridge to accommodate movement across the river by recreational users.

Hiking

Hiking is a low-impact recreational activity that appeals to a broad segment of the public. The unobtrusive qualities of hiking make it an ideal mode for observing wildlife. The Preserve provides an outstanding opportunity for those seeking an outdoor experience in a natural setting. A 38-mile network of paved and unpaved trails provides a series of loops that will allow hikers to tailor their hike to personal preferences of both hike duration and the variety of landscapes traversed. In addition, a 6.6-mile unpaved, off-road biking loop trail has been proposed that will link to the paved hiking/biking trail (Figure 7).

Management Action

 The District will secure a limited access easement from Progress Energy for the proposed off-road biking trail to cross the utility corridor. This easement will be similar to one that allowed the paved Starkey Trail to cross the utility corridor. Bikers will be restricted to the designated trail across this easement.

Camping

The developed campground within the Park contains 16 tent sites and 8 primitive cabins (Figures 6 and 7). There are restroom and shower facilities as well as grills and fire rings, and a picnic shelter in the tent camping area. Primitive campsites exist along the backcountry trails and are available for walk-in and equestrian camping. Equestrian camping is currently permitted at the SR 52 entrance. This is a favored site among equestrian users as it allows the opportunity to camp with their equestrian trailer.

Biking

The popularity of bicycling as a recreational activity has increased dramatically in recent years, due in large part to the emergence of off-road bicycling. Approximately 18 miles of

paved and unpaved trails are available to bicyclists throughout the Park portion of the Preserve (Figure 6). Extension of the paved Starkey Trail to the Suncoast Trail makes it possible to traverse the entire park, on foot or on bicycle, and expands trail use to include the full length of the Suncoast Trail north to US 98 in Hernando County or south to Lutz Lake Fern Road in Hillsborough County. The Suncoast Trail is 41 miles of nonmotorized paved trail that traverses suburban, agricultural and natural areas. The Park's trail system can either be accessed through the Wilderness Road access point or from the Suncoast Trail.

Horseback Riding

An equestrian parking/staging area is available on the west side of the Park near the primary access point and a parking area is available at the secondary access point off of SR 52 (Figure 7). Approximately 20 miles of trail are available for equestrian use throughout the Preserve.

Fishing

Freshwater fishing is a passive recreational activity on the Preserve. Fishing is available along the Anclote and Pithlachascotee Rivers with the proper permits from the Florida Fish and Wildlife Conservation Commission (FWC).

Management Action

 Evaluate the fisheries value of the existing lakes and pits with FWC, and their suitability for stocking with fish.

Hunting

The Starkey Deed for the original Starkey Wilderness Park unit stipulated that the District was to permit no hunting on the Property after acquisition, therefore no hunting is permitted in the Wildnerness Park. The District may consider a limited amount of low intensity hunting on the Serenova unit of the Preserve. In 2004, it was agreed to permit a one-year trial program with the National Wild Turkey Federation (NWTF) to conduct a low-intensity, twoday deer hunt on the Serenova unit. The low-intensity hunt was successfully conducted by disabled participants through the NWTF Wheelin' Sportsmen program. The District will consider other such low intensity hunts on the Serenova Unit in the future.

Picnicking

Sheltered picnic tables (some with water stations and garbage facilities) are available along the paved biking/hiking trails within the Park. In addition the Pasco County parcel offers picnic shelters seating up to 50 people and a large pavilion with seating for 200 are available (Figure 6).

Birding

The sub-tropical climate, the mixture of natural communities present at the site, and its occurrence along the migratory path of many neotropical migrants results in the presence of a great diversity of bird species. More than 470 verified species occur in Florida (FWC, Great Florida Birding Trail). Encompassed within the Preserve are portions of the FWC's Great Florida Birding Trail, which is a 2,000-mile highway trail, which unifies existing and new birding sites throughout Florida. Along the trail is a collection of sites selected for their excellent bird watching or bird education opportunities. The network of recreational trails at the Preserve provides convenient access for birders and other wildlife-viewing enthusiasts. Over 115 species have been documented as confirmed breeders in Pasco County including 14 listed species (FWC, Florida Breeding Bird Atlas).

OPPORTUNITIES FOR ENVIRONMENTAL EDUCATION

The Starkey Environmental Education Center, located in the Park, provides information about watersheds, freshwater systems, and natural areas (Figure 6). The School Board of Pasco County and the Pasco County Parks and Recreation Department partnered with the District to create the center in 2001. The District and the School Board provide a full-time teacher and educational programming for middle school field trips. The Center provides a three-day Wetlands Ambassadors field trip program that teaches more than 1,500 students per year about the Springs Coast watershed through participation in water quality testing, soil sampling and habitat identification. Students also participate in classroom activities at the Center that complement their experience in the Preserve's natural areas.

MULTIPLE USE POTENTIAL

In 1996, the District began to evaluate various alternatives for generating revenue on District-held lands in order to assure a continuous source of funding to support land management. Legislative constraints on the use of lands held in trust by the District limited the range of options to those that would be compatible with resource protection needs. In certain areas of the Preserve, silviculture, grazing, and haying were deemed compatible although grazing and haying have been phased out (see grazing section).

Silviculture

The District's evaluation of the Preserve concluded that no sites suitable for revenue generating silviculture exist on the property. An existing, 55-acre slash pine plantation is scheduled for harvest as a prelude to restoration of native sandhill vegetation. Timber harvests have been used to restore dense, overgrown sand pine scrub to early successional scrub. This technique will continue to be employed, as necessary on the Preserve.

Grazing

Grazing activities have been phased out and cattle removed from the Preserve. Under the existing conservation easement the property is to be conserved and protected in its natural state. Improved pasture areas that were once suitable for grazing are in the process of restoration. The Anclote River Ranch unit of the Preserve once consisted of 1,313 acres of pasture suitable for cattle grazing. The ranch parcel was acquired by the District as part of mitigation for the Suncoast Parkway impacts. Pasco County, with the consent of the District, has included restoration of this pasture as mitigation for the Ridge Road Extension in its ERP Permit application for that project (see Ridge Road Extension Section).

UTILITIES AND OTHER PUBLIC FACILITIES

Consistent with legislation that was adopted by the state in 1999, lands acquired through state-funded acquisition programs can be used for a variety of public facilities.

These include utility lines and other linear facilities; stormwater management projects; water supply development projects; and sustainable agriculture or forestry. Approval of such uses is contingent upon a number of criteria, including:

- The use must be compatible with the natural resource values of the property.
- Reasonable compensation must be provided to the titleholder of said lands.
- The proposed use must be located appropriately on the lands, with due consideration given to use of other lands.
- The proposed use must not be inconsistent with the management plan for the property.

The Preserve has a number of public facilities and utilities lines (Figure 8). A Progress Energy (PE) right-of-way, which is a 295-foot wide 500 killowatt power transmission corridor, bisects the Preserve. This right-of-way begins at SR 52 north of the Serenova unit and travels south through the Preserve. The Florida Gas Transmission Company (FGTC) currently has a 40-foot easement that parallels the PE



transmission corridor for the operation and maintenance of a 30-inch natural gas pipeline, and Tampa Bay Water has a 16-inch water transmission line from Starkey Wellfield. These utilities form a utility corridor that bisects the Preserve from SR 52 south through the Property (Figure 8). This concentration of linear infrastructure is the basis for the District's concept of co-location. The co-location of these utility lines provides benefits to both the environment and to the utility companies. This concept reduces environmental impacts by decreasing the amount of lands that have to be crossed, thereby decreasing disruption to natural communities and associated flora and fauna, and also reduces the financial impacts to companies that must piece together corridors to accommodate such facilities.

The Preserve also has a number of utilities that exist outside of the utility corridor. The Starkey and North Pasco Wellfields are located on the property (see discussion in water supply protection section). Also existing on the Property is the County constructed 24inch reclaimed water pipeline, which is part of the West Pasco Reuse System transmission loop that stretches from the PE right-of-way in the Starkey Wellfield north to Hays Road. The County also has a 20-foot utility easement for maintenance and operation of the pipeline that states it may be utilized for water, sewer, and general-purpose utilities (Figure 8).

Ridge Road Extension

Pasco County proposes to construct a four-lane collector roadway known as the Ridge Road Extension across the Serenova unit of the Preserve. In February 1997, the District entered into an agreement with the County, which provides that the District will convey property within the Serenova unit of the Preserve for the construction of the extension. The extension will connect the existing intersection at Ridge Road and Moon Lake Road to the proposed interchange at the intersection of the extension and the Suncoast Parkway (Figure 8). The conservation easement over the property will not preclude the construction of the proposed extension of Ridge Road through the Serenova unit, as it was a pre-existing agreement between the County, Florida Department of Transportation (FDOT) and the District. Provisions for the construction of the extension include that all wetland mitigation associated with Ridge Road Extension and Ridge Road interchange construction is performed off-site, and not on the property controlled by the easement. Also, the right-of-way through the Serenova property shall be fenced, with limited access right-of-way for management purposes only. The construction of Ridge Road will include

wildlife crossings to the specification of the FWC. District staff will work closely with Pasco County and its consultants to minimize habitat disturbance and impacts to District properties.

SECURITY

District staff secure the property by maintaining boundary fences and removing unauthorized access gates, posting appropriate signs along the property boundaries, identifying frequent points of unauthorized access, documenting evidence of illegal activities, and placing entry barriers at designated points to stop unauthorized vehicular access.

Security on the Starkey Wilderness Preserve is provided by the Pasco County Sheriff's Office with supplemental security provided by a private security company.

SPECIAL PROTECTION AREAS

Areas that are extremely sensitive to disturbance, that harbor unique or regionally significant natural features, or that play a critical role in maintenance of the water management values attributed to the property, merit designation as a Special Protection Area (SPA). SPAs are typically discrete features that can be readily defined. Although public access to such sites is not normally prohibited, protective measures will take precedence over most other land use and management considerations.

SPAs designated for the Preserve include archeological and historical sites, restoration sites, water supply wells, wellfield monitoring stations, sandhill crane nesting sites, two wading bird rookeries, and occupied Florida scrub jay habitat. Additional SPAs may be designated in the future on the basis of colonization or regular use by an imperiled species, or in recognition of other significant resource values or concerns.

Archaeological and Historical Sites

Fifty-four (54) sites have been identified throughout the Preserve including prehistoric lithic scatters and an old Cracker Homestead site with interpretive signs (see Archaeology section).

Management Actions

- All known archaeological and historical sites, except for those that have been determined to be insignificant, will be treated as SPAs in order to prevent physical disturbance.
- Proposals to conduct archaeological research on the Preserve will be reviewed by the District on a caseby-case basis and permitted research must be consistent with any

requirements or protocols established by the Florida Department of State, Division of Historic Resources.

Restoration Sites

Restoration activities are ongoing and are described in the restoration section.

Production Wells and Monitoring Wells and Stations

There are 18 production wells, 34 permitted Surficial Aquifer System monitoring wells, and 18 Upper Florida Aquifer System monitoring wells, stream gages, staff gages, rain gages, and ecological and hydrological monitoring stations within the Preserve.

Management Actions

 Site all facilities and other structural improvements such that they, and recreational activities, will be physically isolated from production and monitoring well locations in order to minimize the likelihood of damage or disturbance to the existing wells.

Florida Sandhill Crane Nesting Areas

Several nests sites of this threatened species have been documented to occur on the Preserve (Figure 9). A loose cluster of nest sites is located in the northwestern portion of the property. Florida sandhill cranes are one of three subspecies that are non-migratory and generally will inhabit the same home range throughout their lives and will return to the same wetland system to nest if possible. Research indicates that nesting Florida sandhill cranes are susceptible to human-induced disturbance and a buffer zone of at least 125 meters around an active nest is recommended (Nesbitt, 1996).

Management Actions

- Identify and protect Florida sandhill crane nesting sites by limiting human access to marshes where cranes nest during the nesting period (January – May). New recreational facilities and trails will not be sited in proximity to known nesting areas.
- Maintain marshes with appropriate application of fire (Nesbitt, 1996).

Wading Bird Rookeries

Two active wading bird rookeries were located within the Preserve in 2003 (J.B. Starkey and North Pasco Wellfields Annual Monitoring Report, 2004). Bird species utilizing the rookeries include great egrets, little blue herons, great blue herons, anhingas, and cattle egrets.

Management Actions

• Continue monitoring of the wetland systems containing rookeries on a



semi-annual basis for nesting activity.

- Management of the surrounding areas will be tailored to prevent disturbance to rookeries in accordance with recommended guidelines, which include a 100meter (328 feet) buffer zone, that excludes pedestrian and boat traffic, surrounding the rookery (Rodgers and Smith, 1995).
- Guide recreational uses that would be incompatible with wading bird rookeries, but otherwise compatible with resource management needs, to other portions of the property.

Florida Scrub Jay Habitat

Florida scrub jays have been documented within the Preserve in the northwestern region in scrub and scrubby flatwood communities. Scrub jays use scrub and scrubby flatwood communities that need to be burned periodically. With the continued effort of scrub restoration and management (see Habitat Restoration and Prescribed Burn sections) the possibility exists for the dispersal of scrub jays and the expansion of scrub jay habitat (see Wildlife Management section).

LAND MANAGEMENT

The District engages in a variety of land management activities designed to

protect or enhance the natural resource values of its properties and to ensure public safety. The following is a discussion of the management practices and resource protection measures to be employed at the Preserve.

Prescribed Fire

Fire is the most important management tool available to public land managers in Florida. Approximately 56 percent (10,740 acres) of the Preserve's 19,266 acres supports vegetation that will benefit from regular controlled applications of fire. The mesic pine flatwoods, oak scrub, sand pine scrub, scrubby flatwoods, xeric hammock, sandhill, freshwater marsh systems, and cypress dome communities at the Preserve are fire-maintained systems that are dependent upon recurring fire for their long-term maintenance and viability. In the prolonged absence of fire, the vegetative structure and species composition of these communities would gradually change and be of reduced value to wildlife. Given the degree to which the natural Florida landscape has been altered and the need to prevent fires from escaping to adjoining private lands, the natural mechanism of lightning-induced fires cannot be expected to fulfill the fire needs of these communities. The use of prescribed fire will be necessary to achieve some of the land management objectives established for this property. Long-term

fire management will be critical to preserving the fire-dependent communities in a natural, biologically productive state and to maintaining low fuel loads that will pose less risk of spawning catastrophic wildfires.

The inclusion of a detailed prescribed burn strategy is beyond the scope of this plan. Burn plans are developed for each District-held property individually, and independently of site-specific land management plans such as this. The District's land management staff has extensive experience in the use of prescribed fire, and a burn program has already been implemented on the property. Generally, prescribed fires will be designed to mimic natural fires. Appropriate burn seasons and fire return frequencies (burn intervals) will be established for each fire-maintained community and will be adhered to whenever possible. Burns will attempt to create a natural mosaic of burned and unburned patches to maximize diversity. Additional details on the use of prescribed fire are included in some of the management discussions related to wildlife management issues, including a rationale for maintaining scrubby conditions for scrub jays and other scrub endemics by maintaining open conditions where gopher tortoise populations are naturally concentrated.

Smoke management during burns is becoming increasingly problematic as

new development encroaches upon the property and as new roadways (such as the Suncoast Parkway) and other "smoke sensitive" areas, become major factors when planning prescribed fires. Burn prescriptions will be developed to ensure that smoke impacts to smoke sensitive areas are minimized.

Firebreaks have already been established throughout the Preserve where uplands lie adjacent to the site's perimeter. These breaks are maintained through regular discing or other mechanical methods. The Preserve's network of firebreaks is complemented by natural firebreaks, such as the sites' numerous cypress strands and domes as well as the Anclote and Pithlachascotee Rivers and their tributaries. Wetlands, particularly herbaceous marsh, only serve as firebreaks in the wet season. This has been considered in the layout of the burn units and man-made fire breaks.

Management Action

 Continue the prescribed burn program in the Preserve's firedependent natural communities that is designed to (1) prevent the escape of fire to adjacent properties; (2) minimize the potential for placement of fire-generated smoke over sensitive areas; and (3) restore/maintain appropriate and diversified fire frequencies.

Habitat Restoration

District policy stipulates that sites on District-managed land that have been altered from a natural state and condition will be restored to a natural condition whenever practical.

The majority of uplands that comprise the original Park are in excellent ecological condition as a result of the aggressive prescribed burn program that has been implemented since acquisition of the Preserve. However, some of the wetlands, particularly within the wellhead zones of influence, have exhibited severe to moderate levels of stress (see Starkey Wellfield Annual Monitoring Reports). The majority of disturbed uplands are on the Anclote River Ranch unit, which consists predominantly of improved pasture, and to the north in the Serenova unit.

Cattle were removed from Anclote River Ranch pastures approximately two years ago. Pasco County has proposed to restore this 1,313-acre parcel at an average rate of 75 acres a year, as mitigation for impacts of the Ridge Road Extension. Restoration techniques would include using a combination of herbicides and prescribed burns to reduce the bahiagrass competition, followed by broadcast seeding of flatwoods vegetation distributed mainly in the fall. The impacts of fire suppression on the Preserve's xeric habitats are being reversed as previously discussed. Scrub restoration is being accomplished by selective thinning of the canopy. When unnaturally dense canopies are dominant the areas are selectively logged and the habitat burned. Commercially valuable softwoods such as sand pine are then sold to generate revenue for land management activities. Selective thinning of the canopy allows sunlight to reach the forest subcanopy and result in regeneration of the herbaceous and shrub stratum (Freeman, 2001). Such selective thinning restores the natural scrub structure and will allow for the return of rare, endemic scrub species such as the Florida scrub jay (see Wildlife management section).

Wellfield withdrawal impacts to wetlands are being partially offset by pumping cutbacks in all wellfields. Impacts to wetlands include the lowering of the water table, draining wetlands and reducing hydroperiods all which may lead to the eventual death of wetland species, both plant and animal, and loss of flood and water quality values of the wetland. The two wellfields located within the Preserve (14 wells in Starkey Wellfield and 6 in North Pasco Wellfield) will be connected to the regional system by 2007 and will provide managers with another means to offset potential impacts. By connecting to the regional

system, managers have greater flexibility to rotate pumpage among wells to reduce draw down in wetlands. This will assist water managers in meeting the objective of reducing and/or offsetting severe impacts within any localized area. Currently, there are two wetlands that are being augmented with groundwater in the Preserve.

In addition to the impacts from groundwater withdrawl, several surface water conveyance systems within the Preserve have been altered by past land use practices. These alterations include fill roads with culverts, drainage ditches, and logging trams. These restrict natural flow into the Pithlachascotee River and its tributary creeks. To address these alterations, the District's Governing Board approved the Hydrologic and Wetlands Restoration of District-owned Lands Initiative in January 2004. The initiative focuses on two primary goals: 1) restore water storage and conveyance functions in affect wetlands and streams; and 2) restore water quality benefits and wildlife habitat provided by the system in its previous undisturbed state. Within the Serenova Tract. several wetland crossings have been improved and restored. To complete this work, several other sites have been identified as candidates for restoration under this initiative. Restoration will be accomplished using funds from the FDOT Mitigation Program.

Lastly, Progress Energy manages the power transmission corridor bisecting the property longitudinally with the goal of assuring that the landscape does not in any way impede the operation and maintenance of its transmission main. The primary objective of the Progress Energy strategy is to assure that woody vegetation is maintained at a nominal height that will not conflict with power lines or towers. Again, the District's policy stipulates that sites on Districtmanaged land that have been altered from a natural state and condition will be restored to a natural condition whenever practical.

The District's objective is to manage the portions of the power line corridor owned by the District in a way that meets its management policy objectives as well as those of Progress Energy. Currently, the power line easement corridor is not managed to sustain natural biological diversity or control nuisance exotic species. Furthermore, power line corridors are conduits for the dispersal of nuisance exotic species such as skunk vine (Colvin et al., 1994, Pitcher, 1984).

These conditions can be remedied in a manner that is consistent and compatible with Progress Energy's transmission main management objectives. There is precedence for this action; Tampa Electric Company has developed a transmission corridor management plan at Balm-Boyette Scrub Preserve that stipulates that resource management shall be conducted in the power line corridor and include, but is not limited to, (1) development and implementation of an exotic species control plan and (2) resource management of fire-adapted communities (vegetation shall be maintained at a nominal height of six feet).

Management Actions

- If an ERP Permit is issued for the Ridge Road Extension, coordinate closely with the Regulatory Department of the District and Pasco County on their mitigation plan to ensure that the restoration efforts comply with success criteria contained in the ERP Permit.
- Reduce effects of fire suppression within the Serenova unit, thus creating a mosaic of habitat conditions that differ as a result of fire frequency and soil moisture.
- Reduce effects of fragmentation resulting from the power line corridor by managing islands of shrubby vegetation, to help bridge the gap for species especially susceptible to such fragmentation, in a manner consistent with Preserve management. This action will

require coordination with Progress Energy land management.

 Continue to track the recovery of the wellfield-impacted wetlands through evaluation of the Tampa Bay Water monitoring reports on wetlands near the wellheads, and based on their recovery, develop a long-term restoration strategy for all impacted wetlands.

Wildlife Management

Fifteen (15) species of wildlife protected by federal and/or state authority on the basis of imperilment have been documented on the Preserve. An additional 5 such species potentially occur because suitable habitat exists and the Preserve is within the species' known range. It is important to note that exhaustive surveys to document the occurrence of threatened and endangered species have not been conducted. There is a high likelihood that additional species meriting special attention and consideration in land management planning will be documented on the property. The District employs an adaptive approach to land management that will be responsive to the presence of any additional listed species documented to occur, and that is consistent with an overall management approach that seeks to maintain natural processes and healthy ecosystems as the basis for

meeting the needs of the greatest number of native species. Management recommendations for listed species that are likely to occur are presented in Table 2. Three of these species are discussed in more detail below because of their unique contribution to the overall biodiversity and character of the habitats they inhabit.

- Gopher tortoise provides burrows and shelter to many species that are adapted to life in pyrogenic communities.
- Florida scrub jay a federal and state threatened species that requires scrub and scrubby flatwoods to be managed in a way that benefits other native scrub species.
- Red-cockaded woodpecker a federally endangered species and state species of special concern that provides cavities in living trees and requires characteristics that benefit other desirable species that inhabit the same habitat.

Management actions prescribed for these three species promote habitat characteristics that are favorable for large suites of wildlife species dependent on the same or similar habitat characteristics.

Gopher Tortoise

Gopher tortoises are in upland areas throughout the Preserve; the highest concentrations are in the open fields south of the main entrance and in the xeric habitats to the north and south. Gopher tortoises prefer turkey oak sandhill. They also utilize many other on-site plant communities, including sand pine scrub, scrubby flatwoods, pine flatwoods, mesic hammock, and semi-improved and improved pastures. Areas with concentrations of gopher tortoises or the potential for gopher tortoises will be managed to maintain habitat characteristic preferred by the gopher tortoise including an open canopy cover (less than 60%) and dense, herbaceous ground cover (80%) (Cox et al., 1987).

There are many listed species that rely on gopher tortoise burrows for food and/or shelter. Gopher tortoise burrow associates that are known to occur onsite include the gopher frog, eastern indigo snake, and Florida mouse. Although not documented on site, the Florida pine snake another burrow associate, has been identified in the vicinity.

Management Actions

 In xeric areas and areas where high tortoise populations are concentrated, use prescribed fire and/or mechanical methods to maintain:

- A canopy cover of less than 60%; and
- Herbaceous groundcover of 80%.
- Collect baseline data on burrow density, activity, and size (Alford, 1980) in areas inhabited (Cox et al., 1987) by gopher tortoises.

Florida Scrub Jay

Florida scrub jays have been recently documented on the Serenova unit. This area has been undergoing intensive scrub restoration and this recent sighting is encouraging. Some scrub restoration was funded by the Florida Department of Transportation's Florida Turnpike Enterprise (FDOTFTE) as mitigation for a scrub jay "take" during the Suncoast Parkway construction. Approximately 2,744 acres of the Preserve are comprised of xeric vegetative communities including oak scrub, scrubby flatwoods, sand pine scrub, xeric hammock and sandhill (for acreages see natural community types). In addition 282 acres of disturbed lands (crop and pastureland, pine plantation and utility lands) are comprised of xeric soils that have the potential to be restored as scrub or scrubby flatwoods (Figure 10). All of these communities have the potential for scrub jay

occupation if managed or restored according to Fitzpatrick et al., 1991:

- Scrub jays prefer the presence of scrub oaks (sand live oak, Chapmans oak and myrtle oak) that are 1 to 2 meters tall, with over 50 to 75% coverage.
- Ground cover should consist of sparse vegetation with at least 25% of the ground exposed.
 Scrub jays have broad diet but prefer acorns, which they collect and often cache in the sand for later use.
- Canopy cover must be less than 20%.

Based on scrub jay territory size estimates (80 acres on average) and individuals per territory (3 on average), the Preserves 2,744 acres of potentially suitable habitat could conceivably support 300 scrub jays on 100 territories (based on Fitzpatrick et al., 1991). Completion of the proposed scrub restoration plan and management of existing xeric vegetation communities will increase the acreage of potential habitat for scrub jays as well as other wildlife that use scrub.



Management Actions

- Managers need to survey for scrub jays using appropriate methods (Fitzpatrick et al., 1991) prior to the initiation of any nesting season (March-June) burns in scrub or scrubby flatwood habitat.
- Maintain xeric habitats of the Preserve as optimal habitat for scrub jays, and other species that utilize xeric habitats.
- Do not burn nesting areas during nesting season (March-June) until lack of nesting activities are verified.
- Follow management guidelines per Fitzpatrick et al. 1991.

Red-Cockaded Woodpecker

Red-cockaded woodpeckers (RCW) – No RCWs currently inhabit the Starkey Wilderness Preserve (Bowman 2002). Land management strategies that favor this species, however, promote conditions favorable to other desirable flatwoods species including: Bachman's sparrow (a federal candidate species), brown-headed nuthatch, northern bobwhite, common yellow throat, and ground dove.

In 2002, a study conducted by Archbold Biological Research Station found that the site's flatwoods currently provide suitable foraging habitat for RCWs. However, suitable nest trees (RCWs nest in mature pines typically over 60 years old) were sparse. The lack of mature pines is due to past logging activities. The Archbold study recommended that standard RCW management guidelines (USFWS, 2000) be implemented.

These guidelines and the Archbold study recognize that RCWs prefer mature, open pine woodlands with a short burn frequency and plenty of old growth longleaf or slash pine trees. Good foraging habitat supports an uneven-aged stand of pines that includes:

- 1. A range of density for midrange and small pines.
- 2. A sparse to nonexistent hardwood subcanopy.
- 3. A sparse hardwood canopy component.
- 4. Native, fire-adapted herbaceous ground cover greater than 40%.
- Contiguity (less than 60 m gaps) with other fire-adapted foraging habitat components.

The objectives of the RCW management actions recommended below are twofold: First, to rehabilitate and sustain enough pine flatwoods on Starkey so that future RCW reintroduction is an option and, secondly, to promote conditions that favor other desirable, but less common flatwoods species. These actions were developed from the 2002 Archbold study recommendations.

Management Action

- Maintain 40-60% of all pine habitats as good quality foraging habitat for RCWs (Bowman, 2002).
- Consider reintroduction of RCWs if the USFWS deem the site a priority site in the future.

Flora

At least five listed plant species and five commercially exploited species have been documented (Table 3). No additional management actions are recommended for these species; implementation of previous management actions will ensure the continued presence of these species.

CONTROL OF EXOTIC SPECIES Plants

At least 44 invasive exotic (non-native) plant species have been documented on the Preserve. Of these, 12 have been ranked Category I Invasive Exotics by the Florida Exotic Pest Plant Council (FLEPCC). Category I are those capable of altering native communities by displacing native species, changing community structure or ecological functions, or hybridizing with natives (FLEPPC, 2003). Three species have been ranked as Category II Invasive Exotics and are defined as those that have increased in abundance or frequency, but have not yet altered Florida plant communities to the extent shown by Category I species (Table 4). The most problematic of these invasive exotics includes Brazilian pepper, camphor tree, chinaberry, skunk vine, Chinese tallow, Japanese climbing fern, cogongrass, tropical soda apple, water hyacinth, and water lettuce. In accordance with Board Procedure 61-9, the District will work to eradicate or control the growth of these invasive, exotic species.

Problematic invasive, exotic species disperse through a variety of mechanisms. Japanese climbing fern and cogongrass are dispersed primarily by wind. Water lettuce and water hyacinth spread through shallow waterways and form mats that are dispersed by wind and water. Brazilian pepper, tallow tree, and camphor are dispersed primarily by wildlife that consume the fruits and then defecate the seeds. Perhaps the most common dispersal mechanism for both exotic plants and animals is transport by humans. Power line corridors can serve as conduits for exotic species as maintenance vehicles that patrol the corridors transport seeds and other

| Table 4 | Exotic | Species | Documented |
|---------|--------|---------|------------|
|---------|--------|---------|------------|

| | | FLEPPC |
|---------------------------|---------------------------------|--------|
| Common Name | Scientific Name | Rank* |
| Air potato | Dioscorea bulbifera | |
| Annual blue-eyed grass | Sisyrinchium rosulatum | |
| Asiatic pennywort | Centella asiatica | |
| Bahiagrass | Paspalum notatum var. saurae | |
| Bermudagrass | Cynodon dactylon | |
| Black medick | Medicago lupulina | |
| Brazilian pepper | Schinus terebinthifolius | I |
| Brazilian vervain | Verbena brasiliensis | |
| Caesarweed | Urena lobata | I |
| Camphor tree | Cinnamomum camphora | I |
| Centipedegrass | Eremochloa ophiuroides | |
| Chinaberry | Melia azedarach | I |
| Chinese tallow | Sapium sebiferum | I |
| Cogongrass | Imperata cylindrica | I |
| Columbian waxweed | Cuphea carthagenensis | |
| Common dayflower | Commelina diffusa | |
| Coral ardesia | Ardesia crenata | I |
| Crape-myrtle | Lagerstoemia indica | |
| Durban crowfootgrass | Dactyloctenium aegyptium | |
| Hariy indigo | Indigofera hirsuta | |
| Japanese climbing fern | Lygodium japonicum | |
| Japanese wisteria | Wisteria floribunda | |
| Lanceleaf rattlebox | Crotalaria lanceolata | |
| Malaysian false pimpernel | Lindernia crustacea | |
| Mexican tea | Chenopodium ambrosioides | |
| Mimosa (silk tree) | Albizia julibrissin | II |
| Natalgrass | Rhynchelytrum repens | II |
| Showy rattlebox | Crotalaria spectabilis | |
| Skunk vine | Paederia foetida | I |
| Smooth rattlebox | Crotalaria pallida var. obovata | |
| Smutgrass | Sporobolus indicus | |
| Soldier's orchid | Zeuxine strateumatica | |
| Southern rockbell | Wahlenbergia marginata | |
| Thalia lovegrass | Eragrostis atrovirens | |
| Torpedo grass | Panicum repens | I |
| Tropical bushmint | Hyptis mutabilis | |
| Tropical Mexican flower | Richardia brasiliensis | |
| Tropical soda apple | Solanum viarum | I |
| Vaseygrass | Paspalum urvillei | |
| Water hyacinth | Eichornia crassipes | I |
| Water lettuce | Pistia stratiotes | |
| Wild bushbean | Macroptilium lathyroides | |
| Wild taro | Colocasia esculenta | |
| Zarzabacoa comun | Desmodium incanum | |

(Nuisance Exotic Species are listed in bold) *FLEPPC (Florida Exotic Pest Plant Council Rankings: I = Category I: Species that are invading and disrupting native plant communities in Florida. II = Category II: species that have shown a potential to disrupt native plant communities.

propagules from one corridor to another. Seeds are often inadvertently transmitted through mulch.

Recognition of these dispersal mechanisms allows managers to focus their vigilance on areas most susceptible to invasion: the site's interface with developed areas, power line corridor, and public use areas. The District will remain alert for the appearance of any Category I or Category II species and will implement suitable eradication or control measures when these species are encountered.

These eradication measures involve a combination of techniques depending on species and densities including herbiciding (basal bark treatments, cut stump applications, and foliar applications) mowing, and/or prescribed fire. District staff are highly experienced in the application of the latest eradication techniques.

The nuisance species bahiagrass dominates the improved pastures. This exotic is difficult to eradicate and competes effectively with natives in mesic and to a lesser extent xeric soils. Bahiagrass is being slowly eradicated from the site as a result of habitat restoration efforts where improved pastures are restored to natural plant communities – most notably pine flatwoods (see Restoration, above).

Management Actions

 Monitor the property, particularly along major interior roads and the power line corridor, for new occurrences of invasive exotic species and eradicate or control the growth of such species to prevent establishment consistent with the direction provided in Board Procedure 61-9.

<u>Animals</u>

Non-native animal species also pose a threat to Florida's natural communities. The only such animal that has been noted on the property is the feral hog. Feral hogs have been in Florida since the Spaniards brought them in the 16th century. Unchecked, hog populations can result in major alterations to a landscape. They forage primarily by "rooting". This results in severe damage to vegetation, microtopographical changes that affect sheet flow drainage, and an increase in siltation. Hogs also compete for hard mast (acorns), the preferred diet of scrub jays.

To eliminate hogs from a Preserve this large is difficult. The management objective is to minimize damage through vigilant control. In the absence of hunting this is most effectively achieved with trapping. Contract hog trapping will be employed as required to manage hog numbers and minimize associated damage to acceptable levels.

Management Actions

 Monitor for evidence of feral hog damage and control with trapping program.

PREPARATION OF MOSQUITO CONTROL PLAN

Florida Statutes, Section 388.4111(1) states "It is declared to be in the best interests of the state that certain environmentally sensitive and biologically highly productive public lands owned by the state or any political subdivision thereof where arthropods incubate, hatch, or occur so as to constitute a public health or nuisance problem may be subject to arthropod control measures."

A Mosquito Control Management Plan (MCMP) for the Park was finalized on May 3, 1995. The MCMP was formulated before the addition of the Serenova and Anclote River Ranch portions of the Preserve; therefore the aforementioned portions are not included in the plan. The Park plan outlines an agreement between the Pasco County Mosquito Control District (PCMCD) and the District. The PCMCD was established in 1951 when mosquito control activities began in the County. The original control area included coastal Pasco County and extended into the western portions of the Preserve. PCMCD expanded their activities to the east in 1978 and encompassed all of the Preserve.

This agreement authorizes the PCMCD to monitor mosquito populations using a variety of techniques including: (1) adult sampling traps over the populated areas of its service area that check species richness (diversity), numbers, and sex; (2) landing rate evaluations to determine the number of mosquitoes that land on a human per unit time, and (3) larval sampling by dipping or aspirating a quantity of water and visually identifying species richness, number, and larval developmental stages. Based on certain thresholds identified in this monitoring strategy, larviciding treatments using "environmentally friendly" materials shall be applied. These applications shall not occur without advance notice to the District. The PCMCD is to submit reports covering treatments (date, time, area, chemicals) and biological surveillance information that initiated the treatment on a monthly basis throughout the mosquito production months.

The agreement also stipulates that adulticiding operations will only be performed on designated improved roadways within the Preserve at the request of District or County managers. PCMCD also releases the top-feeding mosquito fish into semi-permanent waters that are serving as habitat for mosquito larval.

Since the 1995 MCMP was adopted, there have been new advancements in control technology related to application techniques, application equipment, and an understanding of the target mosquito populations. As a consequence of these well-researched advancements, chemical applications have been reduced by as much as 75% while achieving the same level of control. Consequently, the District will coordinate with the PCMCD to discuss refinements of the MCMP, while expanding area to include the Serenova and Anclote River Ranch units, so as to better protect the site's ecological integrity while meeting the objectives of Florida Statute 388.4111(1).

Management Actions

- Work with Florida Department of Agriculture and Consumer Services to officially designate the Serenova and Anclote River Ranch portions of the Preserve as "environmentally sensitive and biologically productive".
- Coordinate with the PCMCD to update the 1995 Mosquito Control Management Plan to:
 - Encompass the entire land area.

- Protect the Preserve's ecological integrity.
- Refine the approach to control to achieve equivalent control with fewer applications/chemicals.
- Implement the PCMCD's directive to apply appropriate arthropod control measures.

PROJECTED COST OF MANAGEMENT

Management costs may be grouped into two categories: recurring and non-recurring costs.

Recurring costs consist of facility operation costs including recreational infrastructure construction and maintenance (trails, signage, emptying garbage cans, etc.), site security, and fence maintenance. Park-related infrastructure, camping areas, cabins, and picnic areas located off Wilderness Road (Figure 8) are the responsibility of Pasco County. The access and parking located off SR 54 are the responsibility of the District.

Costs associated with ecological management include firebreak maintenance, exotic species removal, prescribed burns, floral and faunal monitoring, and restoration. The average annual recurring land management cost for the Preserve in 2004 was \$131,730.

Hydrologic restoration/augmentation is funded largely by Tampa Bay Water as a requirement of their Water Use Permit.

The proposed restoration of improved pasture on the Anclote River Ranch unit will be funded by Pasco County as mitigation for the Ridge Road Extension wetland impacts.

Ecological management of selected portions of the power line easement will involve some exotic species removal, localized rollerchopping, and broadcast seeding. Recommended budget for initial restoration and monitoring is projected to cost between \$15,000 and \$18,000 annually.

ADMINISTRATION

The District coordinates with many outside public agencies and private interest groups to effectively manage its properties. This section identifies those management and land use activities that cross, or potentially cross, the limits of jurisdictional authority and interest, and therefore, will require outside coordination.

United States Fish and Wildlife Service (USFWS)

The USFWS is the agency with primary responsibility for protecting the nation's wildlife resources. This responsibility includes the administration of the Endangered Species Act (ESA). The USFWS will be consulted regarding special management needs of any species protected under provisions of the ESA that are known to occur on the property, or that colonize the site in the future. Management and protection guidelines for the Florida scrub jay, a federally threatened species, have been noted previously in this plan and are consistent with federal guidelines for the protection of this species.

Florida Fish and Wildlife Conservation Commission (FWC)

The FWC is the agency with primary responsibility for protecting and managing Florida's wildlife resources. As such, the District will coordinate closely with the FWC in the management and monitoring of statelisted wildlife and critical habitat areas.

Florida Department of Environmental Protection (FDEP)

The FDEP's Office of Environmental Services is responsible for monitoring the District's compliance with the conservation easement that protects the Serenova and Anclote River Ranch Units. These two units were added to the property to mitigate for impacts resulting from construction of the Suncoast Parkway.

The FDEP administers many of the State of Florida's environmental regulations, including many that are designed to protect water quality. The District will coordinate with the FDEP to ensure compliance in the mitigation areas and to resolve any water quality issues that may arise on the Preserve.

Tampa Bay Water

Tampa Bay Water maintains 18 production wells, 18 monitoring wells for the Upper Floridan Aquifer, and 34 monitoring wells for the Surficial Aquifer System as part of a monitoring program developed in response to the District water use permit # 2011771.00. The purpose of the program is to monitor changes in water levels and water quality associated with changes in rainfall, off-site public supply withdraw activities, and wellfield operational activities. Tampa Bay Water will continue to coordinate all necessary access to wells and will deliver reports on a monthly basis to the District's regulatory department. In turn, an electronic version of the wellfield's monitoring report shall be sent to the Resource Management Department.

Florida Department Of State (DOS)

The Division of Historical Resources of the DOS maintains the Florida Master Site File and oversees management and protection of documented archaeological sites. Although only two significant archaeological sites have been documented on the Preserve. The site's location along the Anclote River, coupled with the on-site presence of upland sites immediately adjacent to navigable water, suggest a high likelihood of aboriginal habitation. Proposals to conduct archaeological surveys or related archaeological research at the Preserve will be welcomed by the District. Such proposals will be reviewed by the District on a case-by-case basis to ensure that they satisfy the requirements and protocols dictated by the Division of Historical Resources for the investigation of sites on state-owned lands. District approval of such proposals will require that any undocumented sites discovered through the course of conducting such research

be registered in the Florida Master Site File.

Florida Division of Forestry (DOF)

All prescribed burns receive an authorization number from DOF. This authorization is based upon review of each burn prescription submitted prior to burn initiation. The District should coordinate with the DOF concerning the control of wildfires or muck fires that may occur at the Preserve.

Pasco County

Pasco County is responsible for the management of all recreational improvements and facilities including picnic areas, cabins, campsites, rest rooms, equestrian staging areas, and the Starkey Environmental Education Center. The District is responsible for ecological management of all lands inside the Preserve, including trail maintenance, security issues, and recreational infrastructure at the Preserve's access off SR 52. The District will coordinate with Pasco County on proposed mitigation for the Ridge Road Extension should it be permitted.

Pasco County School Board

The school board of Pasco County and Pasco County Parks and Recreation Department partnered with the District to create the Starkey Environmental Education Center in 2001. The District and the School Board maintain a partnership that provides a full-time teacher and educational programming for middle school field trips.

Progress Energy

PE maintains the Transmission Main Corridor so as to ensure that vegetation does not conflict or potentially conflict with utility corridor maintenance that extend the length of the transmission corridor right-of-way.

Other Private Interests

There are various private interests that may eventually play a role in the future management and use of the Preserve. The District has worked with the Florida Trail Association, Inc. and other organizations that represent recreational user-groups to enhance recreational opportunities on District-managed lands. The District will be prepared to work with these and other stakeholder groups in the development and enhancement of recreational uses.

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