

# A Plan for the Use and Management of the Cypress Creek Preserve



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Southwest Florida Water Management District  
Brooksville, Florida



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## EXECUTIVE SUMMARY

The 7,400-acre Cypress Creek Preserve (Preserve) is located in central Pasco County approximately 3 miles east of Land O' Lakes. The Preserve has been designated a Wildlife Refuge by the Florida Fish and Wildlife Conservation Commission and serves as a migration corridor for neo-tropical migratory birds. 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 riverine swamp composed of cypress strands and domes, and stream and lake swamps associated with the Cypress Creek watercourse. The creek traverses the Preserve in a southerly direction and eventually flows to the Hillsborough River above Temple Terrace. The Southwest Florida Water Management District (District) began acquisition of the property in the 1970s using funds from the Water Resources Development Account. Later, beginning in the 1980's, lands to the south of the wellfield were added using Save Our Rivers and Preservation 2000 funds.

Water management benefits associated with the property include water supply, flood protection, and water quality protection and enhancement. Approximately 78 percent of the Preserve lies within the 100-year

floodplain as delineated by the Federal Emergency Management Agency. The riverine swamp that surrounds Cypress Creek provides natural flood protection and enhances the water quality of the river.

Wellfield production is, and will likely continue to be, the land use of paramount significance on this District-owned property. A portion of the Cypress Creek Wellfield exists on the Preserve. Five wells are actively producing on the Preserve and another 8 production wells exist on the adjacent property owned by the Tampa Bay Water. The Cypress Creek Wellfield provides potable water to Pinellas County and the City of St. Petersburg, and is under the management of Tampa Bay Water and regulatory authority of the District.

Permitted recreational uses of the preserve include hiking, biking, horseback riding, primitive group and equestrian camping, fishing, picnicking, and nature study. Two western entrances provide public parking with walk-through entrances and one eastern entrance provides walk-through access only.

A number of sites within the Preserve have been designated Special Protection Areas (SPA). These include archaeological and restoration sites, public supply wellheads (5 wells at

Cypress Creek Wellfield), monitoring wells, and Florida sandhill crane nesting areas. Although SPAs are not normally closed to public access, 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.

Major management needs and actions include the continuation of a prescribed burn program, semi-improved pasture restoration, and management and monitoring of resident wildlife, including the gopher tortoise, wood stork, and neo-tropical migrants. Management of the Preserve will help maintain existing biodiversity.

## **INTRODUCTION**

### **LOCATION**

The Cypress Creek Preserve (Preserve) is located 3 miles east and northeast of Land O'Lakes in central Pasco County (County). The Preserve is bounded on the north by an abandoned Seaboard Coastline Railroad right-of-way, to the south by SR 54, to the east by low-density residential development, and to the west by 20-mile Level Road, Parkway Boulevard, and residential development of Land O' Lakes (Figure 1).

### **GENERAL DESCRIPTION**

The 7,400-acre Preserve forms a continuous expanse of riverine corridor along a 10-mile segment of the Cypress Creek watercourse. The Preserve is dominated by riverine swamp, which covers the floodplain of Cypress Creek, with mesic hammock islands occurring throughout the swamp. The remainder of the Preserve is vegetated with regenerating pine flatwoods, dotted with isolated wetland systems, and a small area of xeric upland forest. The preserve has been designated a Wildlife Refuge by the Florida Fish and Wildlife Conservation Commission (FWC). A Wildlife Refuge is an area where the taking and possession of wildlife species is prohibited. In addition, the possession of firearms, dogs, traps or

any device for the taking of wildlife, and the possession of any device for freshwater fishing in areas that are closed to fishing are prohibited (FWC, 2003).

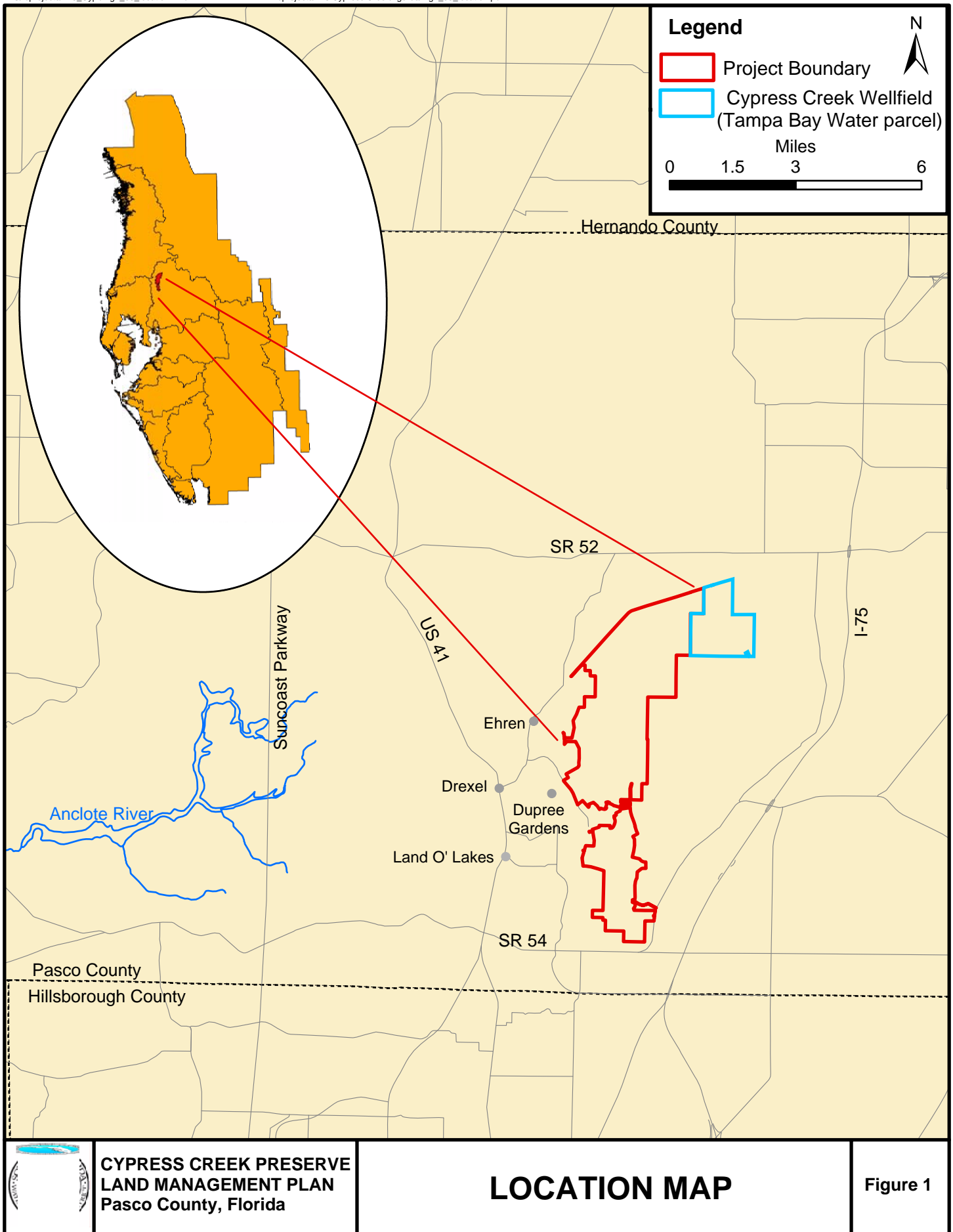
### **PROPERTY ATTRIBUTES**

#### **Cypress Creek and Other Conservation Lands**

Cypress Creek Preserve adds 7,400 acres to the network of protected conservation land in the region. Approximately 449,311 acres are included in conservation areas within Pasco, Citrus, Hernando, Hillsborough and Pinellas Counties (Table 1, Figure 2).

#### **Protected Species**

Protected wildlife species that are known or potentially occur on the Preserve include the federal and state threatened Eastern indigo snake and southern bald eagle. State listed wildlife species include the threatened Florida sandhill crane and southeastern American kestrel, and species of special concern including the Florida mouse and Sherman's fox squirrel. Wading birds include the federal and state endangered wood stork, and species of special concern include the limpkin, snowy egret, tricolored heron, little blue heron, and white ibis (Table 2). For management concerns associated with





**Table 1 Regional Conservation Land Network**

Name	Owner	Manager	County	Acreage
Weekiwachee Preserve	SWFWMD	SWFWMD	Hernando	10,735
Conner Preserve	SWFWMD	SWFWMD	Pasco	2,981
Lower Hillsborough FDA	SWFWMD	SWFWMD	Hillsborough	15,964
Hidden Lake	SWFWMD	SWFWMD	Pasco	589
Starkey Wilderness Preserve	SWFWMD	SWFWMD	Pasco	19,266
Brooker Creek Headwaters	SWFWMD	Hillsborough	Hillsborough	1,111
Upper Hillsborough FDA	SWFWMD	SWFWMD	Hill/Pas/Polk	17,991
Green Swamp	SWFWMD	SWFWMD	Pas/Lake/Polk	116,469
Werner-Boyce State Park	State	FDEP	Pasco	3,999
Chassahowitzka WMA	State	FWC	Hernando	27,183
Hillsborough River SP	State	FDEP	Hillsborough	3,414
Withlcoochie State Trail	State	FDEP	Cit/Hern/Pasco	760
Withlcoochie State Forest	State/SWFWMD	Div. Forestry	Cit/Hern/Pasco	157,481
Chisegut Nature Center	State/USDOE	FWC	Hernando	1,179
Janet Butterfield Brooks Preserve	The Nature Conservancy	TNC	Hernando	335
All-Bar Ranch	Pinellas County	Pinellas	Pasco	4,092
Cross Bar Ranch	Pinellas County	Pinellas	Pasco	7,931
Brooker Creek Preserve	Pinellas County	Pinellas	Pinellas	8,205
Cypress Lakes Preserve	Hernando County	Hernando	Hernando	322
Brooker Creek Buffer Preserve	Hillsborough County	Hillsborough	Hills/Pinellas	414
Cone Ranch	Hillsborough County	Hillsborough	Hillsborough	14,230
Cypress Creek Preserve	Hillsborough County	Hillsborough	Hillsborough	2,547
Chassahowitzka NWR	USFWS	USFWS	Citrus/Hernando	30,843
Cypress Creek Wellfield (TBW)	Tampa Bay Water (TBW)	TBW	Pasco	1,270
<b>Total</b>				<b>449,311</b>

SWFWMD - Southwest Florida Water Management District

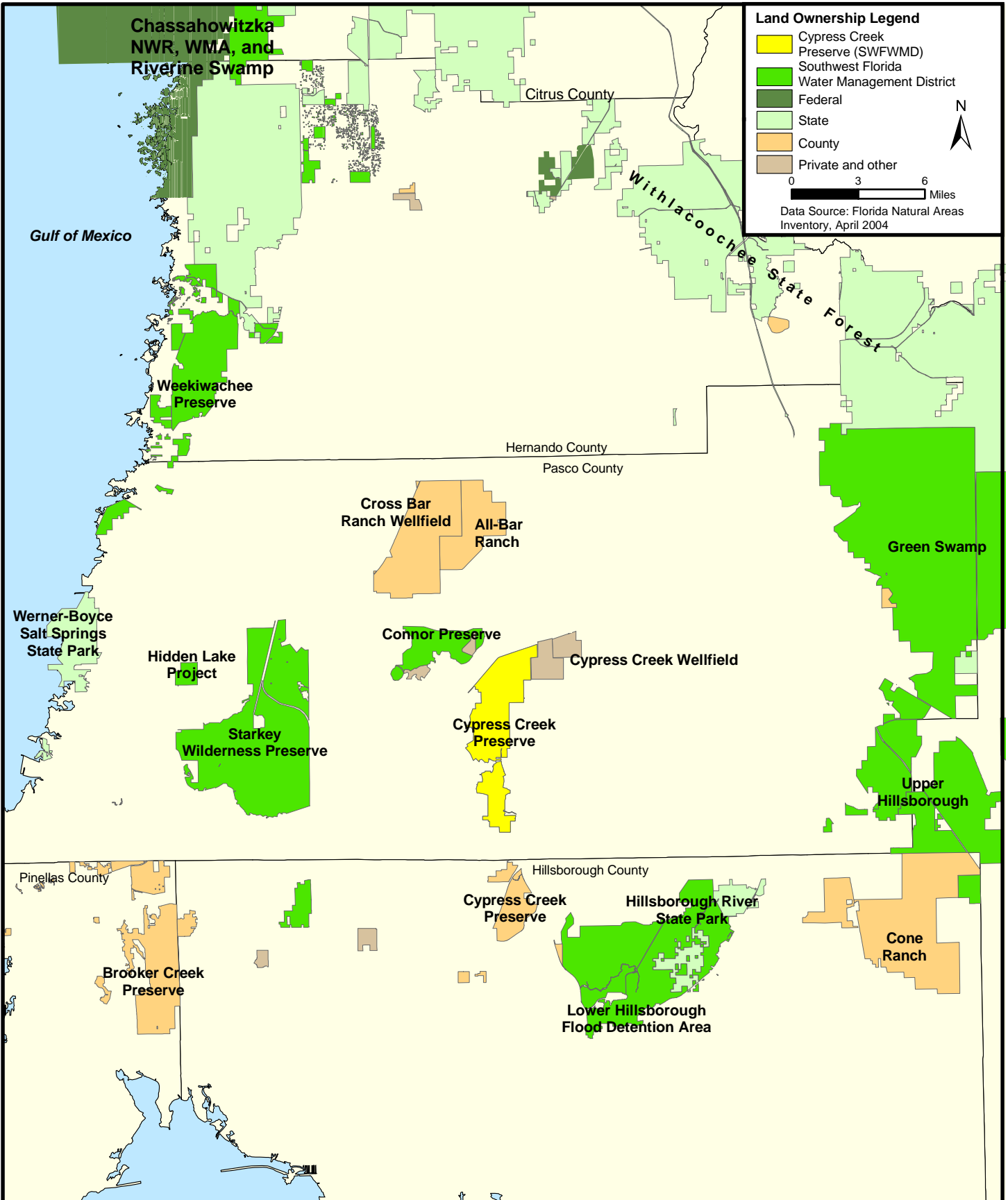
State - State of Florida

FDEP - Florida Department of Environmental Protection

FWC - Florida Fish and Wildlife Conservation Commission

USFWS - United States Fish and Wildlife Service

USDOE - United States Department of Energy



**CYPRESS CREEK PRESERVE  
LAND MANAGEMENT PLAN  
Pasco County, Florida**

## REGIONAL CONSERVATION LAND NETWORK

Figure 2

**Table 2 Protected Wildlife Species Known or Likely to Occur**

Verified	Species	FWC	USFWS	Management Recommendations
◆	American alligator <i>Alligator mississippiensis</i>	SSC	T(S/A)	Protect from illegal take; maintain wetland.
	Eastern indigo snake <i>Drymarchon corais couperi</i>	T	T	Manage as prescribed for tortoise.
◆	Gopher tortoise <i>Gopherus polyphemus</i>	SSC	-	Manage areas with dense tortoise populations and/or xeric soils with a sparse canopy and dominant herbaceous strata (see text).
◆	Florida scrub-jay <i>Aphelocoma coerulescens</i>	T	T	1 sighting on north end of preserve several years ago.
	Bald eagle <i>Haliaeetus leucocephalus</i>	T	T	Maintain primary and secondary zones consistent with guidelines established by USFWS.
◆	Listed wading birds*	See Below	-	Protect rookeries and foraging sites.
◆	Florida sandhill crane <i>Grus canadensis pratensis</i>	T	-	Protect nesting habitats and monitor/restore hydroperiods in altered marshes.
◆	Southeastern American kestrel <i>Falco sparverius paulus</i>	T	-	Maintain pyrogenic communities on appropriate burn frequency cycle; preserve snags.
	Florida mouse <i>Peromyscus floridanus</i>	SSC	-	Manage as prescribed for tortoise.
◆	Sherman's fox squirrel <i>Sciurus niger shermani</i>	SSC	-	Maintain pyrogenic communities on appropriate burn frequency cycle.

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

E - Endangered

T - Threatened

SSC - Species of Special Concern

T(S/A) - Threatened due to Similarity of Appearance

these species, see the Wildlife Management section.

State protected plant species that are known to occur on the Preserve include the endangered auricled spleenwort, Tampa mock vervain, brown hair-comb fern, cardinal airplant, giant airplant, hand fern, plume polypody, and swamp plume polypody. Threatened plant species include cardinal flower, Catesby's lily, gypsy spikes, hooded pitcher plant, northern needleleaf, rain lily, rose pogonia, Simpson's zephyr-lily, snowy orchid, twisted airplant and yellow-fringed orchid. Commercially exploited species include needle palm, cinnamon fern and royal fern (Table 3).

### **Archaeological Resources**

The Preserve contains 4 archeological sites that have been recorded in the Florida Master File of the Florida Department of State, Division of Historical Resources. These include the Barn Pond Mound (ceramic scatter), Big Cypress Swamp Mound (lithic scatter), Rattlesnake Island Flaking Area (lithic scatter/quarry), and the Cable Guy Site (pre-historic, but lacking pottery).

### **LAND COVER**

The Preserve lies in the Land O' Lakes subdivision of the Tampa Plain physiographic region in which elevation ranges from 5 to 90 feet. The Tampa

Plain is in the southern part of central Florida's Ocala Uplift District, and has soils consisting of medium to fine sand and silt covering limestone, shell, and clastic deposits (Brooks, 1981). The predominant landform is a flat, weakly dissected alluvial plain formed by deposition of continental sediments onto submerged, shallow continental shelf, which was later exposed by sea level subsidence. Generally, soils in this region are poorly drained, deep, and moderately textured. The Preserve is dominated by wetland systems associated with the floodplain of Cypress Creek. Among these wetlands the predominant vegetative community is riverine swamp, which consists of stream and lake swamps, mixed forested wetlands and cypress (Florida Land Use Cover Forms Classification System - FLUCFCS). Isolated wetland systems include freshwater marsh and wet prairie. Upland areas consist of mesic pine flatwood, mixed hardwood/conifer forest (mesic hammock), mixed rangeland, shrub and brushland, and pine plantation.

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

**Table 3 Protected and Commercially Exploited Plant Species**

Species	FDA	USFWS	Habitat Management Recommendations
Auricled speenwort <i>Asplenium erosum</i>	E	-	Cypress swamps and mesic hammocks; maintain habitat
Brown hair-comb fern <i>Ctenitis submarginalis</i>	E	-	Mesic hammock; maintain habitat
Cardinal airplant <i>Tillandsia fasciculata</i>	E	-	Mesic hammock, riverine swamp and cypress swamp; maintain habitat
Giant airplant <i>Tillandsia utriculata</i>	E	-	Mesic hammock, riverine swamp and cypress swamp; maintain habitat
Hand fern <i>Ophioglossum palmatum</i>	E	-	Mesic hammock; maintain habitat
Plume polypody <i>Pecluma plumula</i>	E	-	Mesic hammock; maintain habitat
Swamp plume polypody <i>Pecluma ptilodon</i>	E	-	Mesic hammock; maintain habitat
Tampa Mock Vervain <i>Verbena tamensis</i>	E		Mesic hammock; maintain habitat
Cardinal flower <i>Lobelia cardinalis</i>	T	-	Creek and river edges; sustain riparian systems
Catesby's lily <i>Lilium catesbaei</i>	T	-	Pine flatwoods, herbaceous wetlands; maintain habitat
Gypsy spikes <i>Plantantera flava</i>	T	-	Riverine swamp and cypress swamp; maintain habitat
Hooded pitcher plant <i>Sarracenia minor</i>	T	-	Herbaceous wetlands; maintain habitat
Northern needleleaf <i>Tillandsia balbisiana</i>	T	-	Mesic hammock; maintain habitat
Rain lily <i>Zephyranthes atamasco</i>	T	-	Herbaceous wetlands; maintain habitat
Rose pogonia <i>Pogonia ophioglossoides</i>	T	-	Pine Flatwood and cypress swamp
Simpson's zephyr-lily <i>Zephyranthes simpsonii</i>	T	-	Herbaceous wetlands; maintain habitat
Snowy orchid <i>Plantantera nivea</i>	T	-	Pine flatwoods and herbaceous wetlands; maintain habitat
Twisted airplant <i>Tillandisa flexuosa</i>	T	-	Riverine swamp; maintain habitat

Species	FDA	USFWS	Habitat Management Recommendations
Yellow-fringed orchid <i>Plantantera ciliaris</i>	T	-	Pine flatwoods and herbaceous wetlands; maintain habitat
Needle palm <i>Rhapidophyllum hystrix</i>	CE	-	Hydric hammock; control commercial exploitation
Cinnamon fern <i>Osmunda cinnamomea</i>	CE	-	Forested wetlands; control commercial exploitation
Royal fern <i>Osmunda regalis</i>	CE	-	Forested wetlands; control commercial exploitation

FDA - Florida Department of Agriculture and Consumer Services

USFWS - US Fish and Wildlife Service

E - Endangered

T - Threatened

CE - Commercially Exploited

## **Wetlands**

Approximately 66% of the Preserve consists of riverine swamp (Figure 3). This extensive stand of forested wetlands forms a continuous corridor along the entire on-site length of the Cypress Creek watercourse. The limits of the swamp correspond generally with the limits of the Cypress Creek 100-year floodplain, which varies in width from greater than 1-mile to less than ¼-mile. Cypress Creek, which flows north to south across the property, occurs as a deeply incised, well-defined channel in the upstream and downstream portions of the property. In contrast, the central reaches of the creek are characterized by a broad, ill-defined channel.

Dominant tree species in the riverine swamp include bald cypress, swamp tupelo, red maple, American elm, laurel oak, slash pine, and cabbage palm. Bald cypress and swamp tupelo assume their greatest dominance in the deepest areas of the swamp and encompass approximately 43 percent of the riverine swamp. Stream and lake swamp communities encompasses approximately 27 percent of the riverine swamp. Its canopy is dominated by hardwoods, which include red maple, sweet gum, water tupelo and bays. The remaining portion of the riverine swamp consists of mixed forested wetlands, which is a combination of the hardwoods and either slash or longleaf

pine. Common understory species in the riverine swamp include dahoon holly, buttonbush, beautyberry, and black haw. Groundcover species are characteristic of regularly inundated areas and include swamp fern, lizards tail, Florida shield fern, and the commercially exploited royal and cinnamon ferns. State threatened species include the cardinal flower (Table 3).

Freshwater marsh wetlands occupy approximately 54 acres of the Preserve. Many of these isolated marshes are found within the riverine swamp. These marsh systems are herbaceous or shrubby wetlands and are typically found within the deeper portions of the swamp. These marshes 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. Marsh systems encompassed within mesic flatwoods are typically isolated, circular, herbaceous wetlands that occur in low depressions within flatland communities. Fire-maintained depression marshes have more diverse species assemblages and fewer woody species than those that do not experience fire. Dominant species typically include



Project Boundary

FLUCFCS and Vegetation Type

Urban and Built-Up

Agriculture

Rangeland

Upland Coniferous Forests

Pine Flatwoods

Hardwood-Conifer Mixed

Coniferous Plantations

Open Water

Streams and Lake Swamps

Cypress

Wetland Forested Mixed

Freshwater Marshes and Wet Prairies

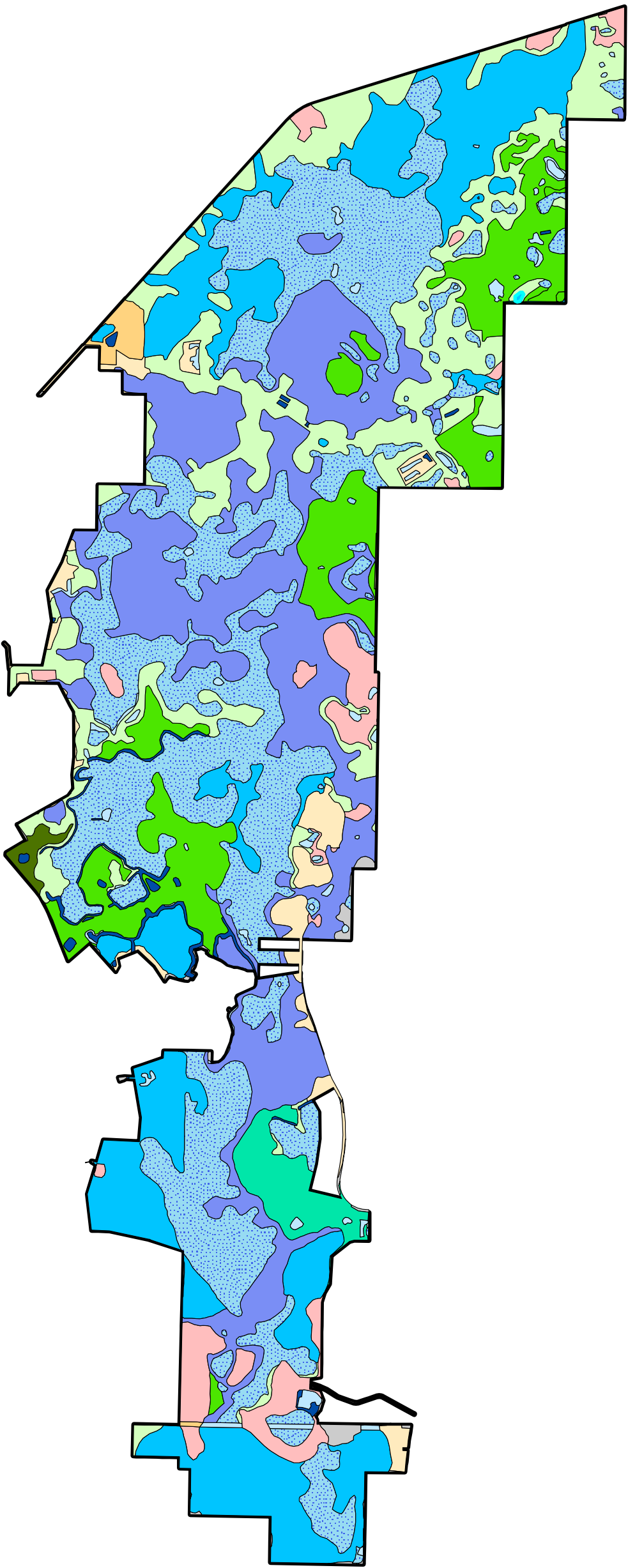
Utilities, Transportation, Disturbed Lands

N

00.3750.751.5

Miles

Data Source: SWFWMD 2004 Revised FLUCFCS





corkwood, maidencane, blue maidencane, spike rushes, beaksedges, St. John's wort, and redroot, among others.

Approximately 15 acres of wet prairie occupy the Preserve. Wet prairie is a herbaceous community with a dense groundcover of diverse grasses and herbs, and is closely affiliated with depression marshes. This community is typically dominated by wiregrass and blue maidencane, and in some cases is invaded by higher stratum (canopy, sub-canopy) species such as slash pine, wax myrtle, and gallberry. This community exists embedded in mesic flatwoods or borders the upper edges of depression marshes and dome swamps. The shorter hydroperiod of the wet prairie, relative to the marshes, often functions as the "transition" zone between the uplands and longer hydroperiod wetlands.

Some of the isolated wetlands on the Preserve have been affected by wellfield withdrawals (Tampa Bay Water, 2003). The shortened hydroperiod of these wetlands causes tree leaning and eventual death and the encroachment of upland plant species. One solution is augmentation where the wetland is re-hydrated with groundwater. Tampa Bay Water is presently augmenting one wetland on the Preserve.

## ***Uplands***

Upland communities within the Preserve account for approximately 25% of the total land area. The predominance of wetland communities increases the overall significance of the uplands, which are a relative rarity within the landscape and which may fulfill critical habitat needs for a number of animal species.

The dominant upland vegetative community is mixed hardwood/conifer forest (mesic hammock), which constitutes 1,011 acres of the preserve, and occurs as islands in the riverine swamp. These areas make up some of the highest elevations in the floodplain. Typical overstory species include laurel oak, southern magnolia, sweet bay magnolia, slash pine, sweet gum, cabbage palm, and pignut hickory. Mesic hammocks in the Preserve support an especially diverse assemblage of plant species, including a number of species designated as endangered, threatened, or commercially exploited by the Florida Department of Agriculture. Among these are auricled spleenwort, needle palm, cinnamon fern, and royal fern (Table 3).

Pine flatwoods constitute 9.4 percent (687 acres) of the Preserve. The majority of pine flatwoods on the property are mesic and in various

stages of regeneration from semi-improved pasture (see Land Management section). The pine flatwoods on the property are open-canopy forests dominated by widely spaced longleaf or slash pine trees with little or no subcanopy, and a dense groundcover of herbs with a scattering of shrubs. A typical pine flatwood groundcover on the property includes broom sedge, yellow-eyed grass, Elliot's love grass, wiregrass, dog fennel, meadowbeauty, crabgrass, beaksedge, goldenrod, blackberry, panic grass, Bahia grass, and scattered saw palmetto. One endangered, endemic species, Tampa mock vervain has been identified along the wellfield road near an areas of cypress swamp. Three populations were identified and are expected to expand (SWFWMD, 1989).

The remaining 8% of the Preserve is made up of un-grazed rangeland, uncultivated agricultural lands, and pine plantation. Rangeland is characterized by grasses, grasslike plants, forbs, and shrubs. Typical rangeland on the Preserve consists of a dense groundcover of grasses such as Bahia and broomsedge, with a scattering of gallberry and wax myrtle with a sparse canopy of slash pine, represents the result of passive restoration including growing season burns and selective mechanical work for the establishment of native vegetation in former bahiagrass pasture. Mixed rangeland

(150 acres) refers to an intermixture of grassland or shrub-brushland range species. Agricultural land includes 51 acres of crop and pastureland, and 82 acres of unimproved pasture. A timber management zone (146 acres) exists on the southern portion of the property and consists of slash pine (for further information see Multiple Use section).

## **SOILS**

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 mesic hammock. Hydric soils support riverine swamp and other wetland communities.

Hydric soils are predominant on the Preserve and are represented by Chobee soils, Sellers mucky loam fine sands, and Pomona fine sand. Chobee soils underlie the entire riverine swamp. These soils are very poorly drained and are characteristic of a majority of all major river and stream drainages in Pasco County (Soil Conservation Service, 1982). Sellers mucky loam fine sands underlie the isolated wetlands systems including cypress domes and marshes, and are very poorly drained, typical of depressions, and are normally inundated for about six months per year. Pomona fine sand occurs in low ridge

areas of pine flatwoods and is also very poorly draining. Some of these hydric 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 oxidation resulting in decomposition of organic muck. With re-hydration, the organic component of the soils could regenerate as decaying vegetative matter is reintroduced to a saturated “oxygen free” (anaerobic) environment over time.

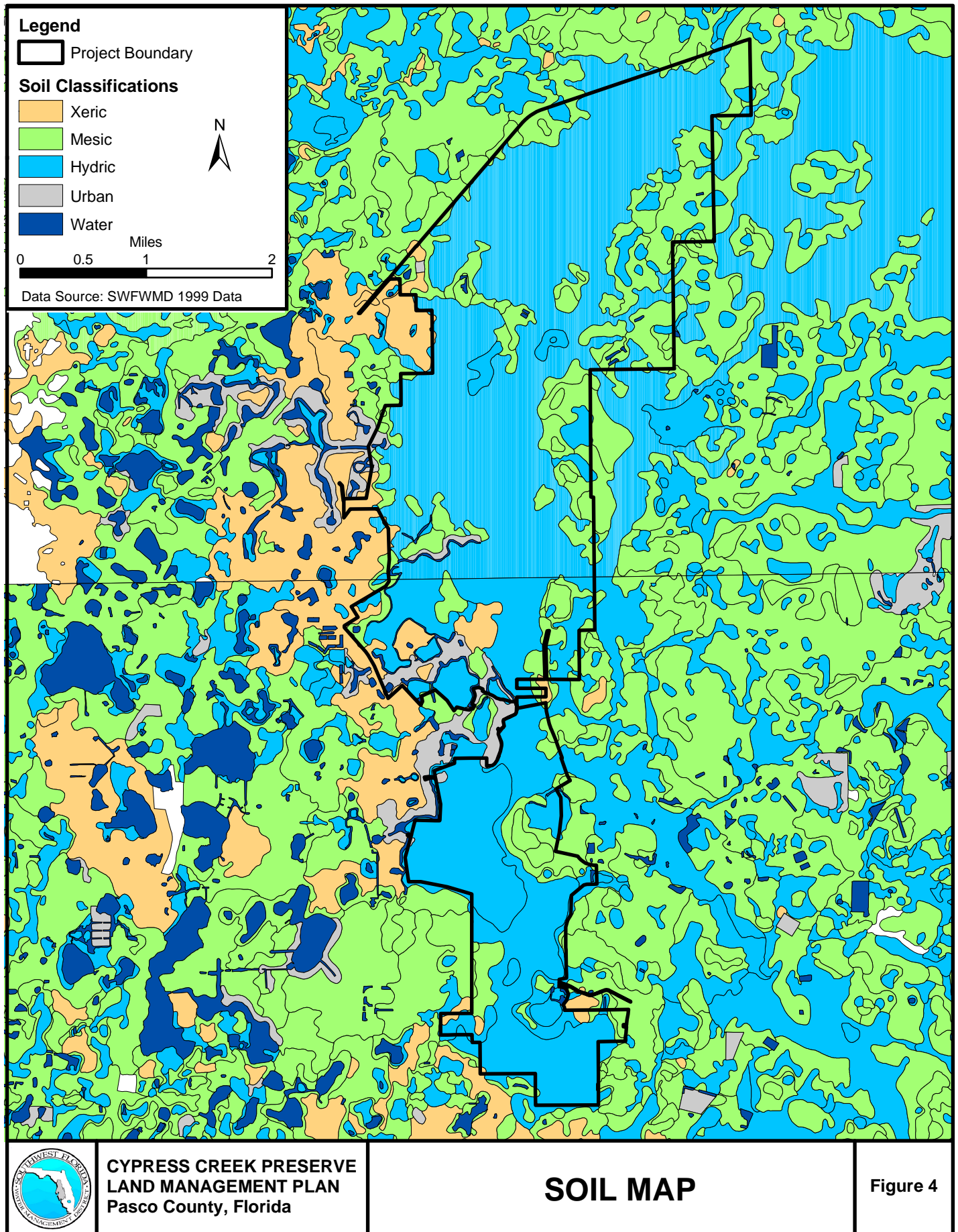
Mesic soils present on site are Narcoosse fine sand, Ona fine sand, Myakka fine sand, Symrna fine sand, Paisley fine sand, and Eaughallie fine sands, and underlie the pine flatwoods and pastureland on the Preserve. Although somewhat poorly drained, these soils are only infrequently inundated. Soil types in semi-improved pasture areas provide a “blueprint” for habitat restoration strategies. For example, hydric soils provide the basis for restoring an area to wetland. Xeric soils present on the Preserve include Tavares fine sand, which typically underlie sandhill vegetative communities. One expanse of semi-improved pasture is distinguished by Quartzipsamments. This category of soils is characteristic of areas where the native soils have been reworked by earthmoving equipment and most likely resulted from the rim-ditching of the adjacent swamp (Figure 4).

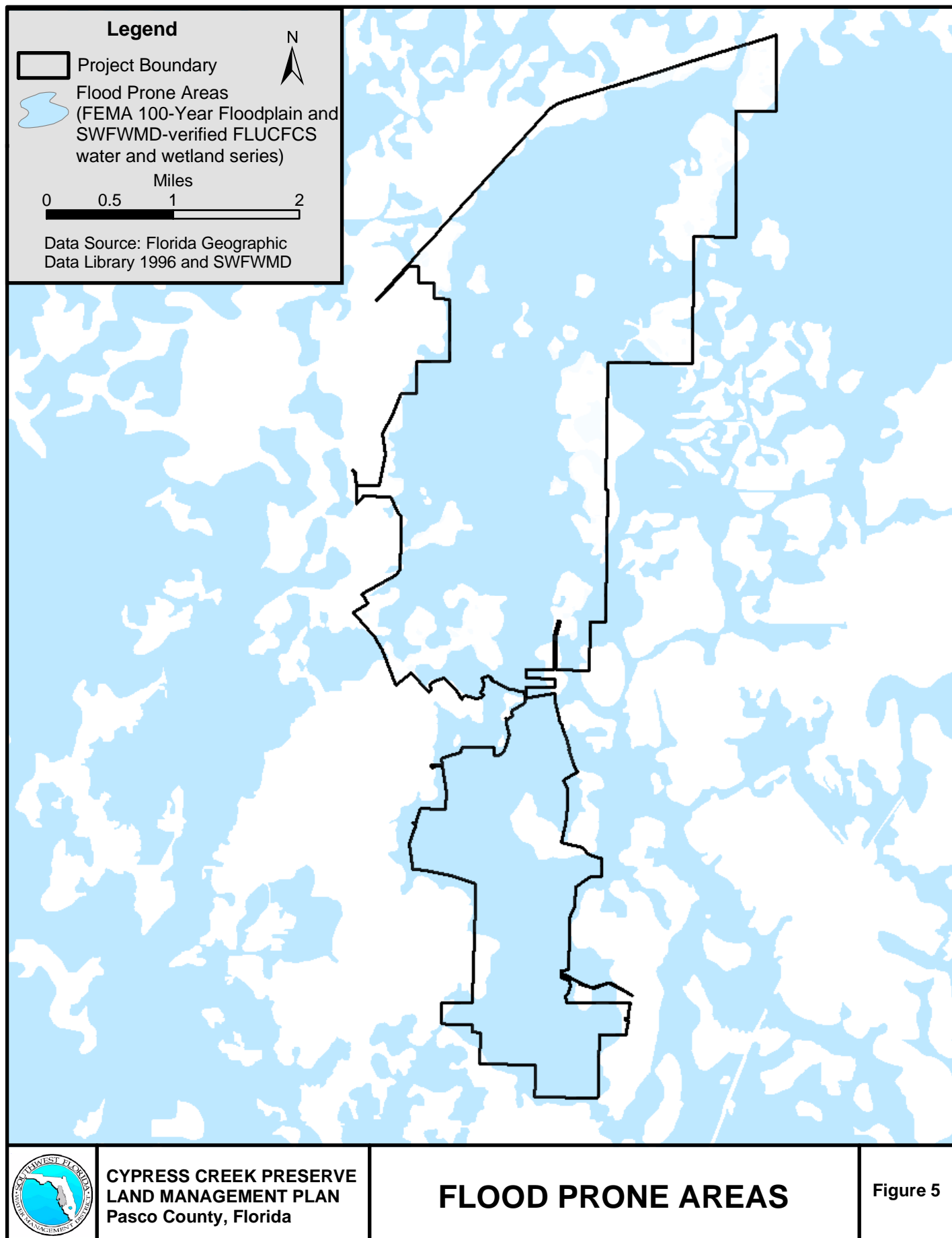
## AREAS OF RESPONSIBILITY

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

The Cypress Creek floodplain has been identified as an area of no aquifer recharge (SWFWMD, 1988), although wellfield withdrawals may induce recharge within the cone of depression of the wellfield. The decline in surface water levels at some on-site wetlands may reflect such recharge. The surficial and Floridan aquifers in the area of the Cypress Creek floodplain are separated by a leaky, discontinuous confining layer (Parker, 1987), which allows water in the surficial aquifer to leak downward and recharge the Floridan aquifer when potentiometric surface levels drop below the surficial aquifer during periods of drought. Typically, during the wet season, the Floridan may discharge to the surficial aquifer and contribute base flow to the Cypress Creek watercourse.

The large percentage (78%) 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. The channel of Cypress Creek constitutes a natural pathway for the conveyance of floodwater from upstream portions of its drainage basin to the Hillsborough River and eventually to Tampa Bay. 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 below.

### **Water Supply Protection**

Ensuring adequate water supplies for humans and for the environment is central to the District's mission. Wellfield production is, and will likely continue to be, the land use of paramount significance on this District-owned property. However, wellfield withdrawals and other allowable land uses must be conducted in a manner that is complementary with the natural character of the property.

A portion of the Cypress Creek Wellfield (5 production wells out of a total of 13) exists on the Preserve. This wellfield provides potable water to Pinellas County and the City of St. Petersburg, and is under the management of Tampa Bay Water and regulatory authority of the District. During water year 2003

(October 1 – September 30), groundwater pumpage averaged 11.4 million gallons per day from Cypress Creek Wellfield, of which 0.07 mgd was used for wetland augmentation.

The wellfield water withdrawals are managed under District water use permit (number 2011771.00, last renewed January 1999), which regulates the amount of water that may be withdrawn at any given time. The permit has required a reduction in pumpage from historic levels in order to reduce impacts to wetlands, which are monitored to determine if the reductions are sufficient to induce wetland recovery. Wetland areas within the wellhead zone of influence are regularly monitored; 14 hydrological monitoring stations and 23 ecological monitoring stations are located on the Preserve portion of the wellfield. If wetlands exhibit signs of stress, pumpage rates are adjusted accordingly. Moderate to severe stress has been observed at several monitored wetlands within the zone of influence at the Cypress Creek wellfield. Five of the severely impacted wetlands within the wellfield, one of which is located on the Preserve, have required augmentation, (see discussion in Restoration section).

### **Flood Protection**

Flood protection depended historically upon a structural approach to provide

for the storage and controlled conveyance of floodwater. A non-structural 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 78 percent of the property being wetlands or lying in the 100-year floodplain, or otherwise recognized as flood prone, public ownership of the property ensures preservation of a significant flood storage area of Cypress Creek and the Hillsborough River. Isolated wetland areas and floodplains have a natural ability to store, detain, and absorb water generated by normal rains and most storm events.

Approximately 5,365 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). The Preserve's extensive floodplain wetlands may make the most significant contribution to flood protection. The isolated wetland areas are also able to store significant amounts of water. Mesic pine flatwoods, which account for approximately 9.3 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 and a landform which produces little stormwater runoff. Downward percolations are 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).

A drainage basin area of approximately 117 square miles lies above the SR 54 crossing of Cypress Creek. The riverine swamp system of the Preserve receives drainage from this upstream area and provides natural floodwater storage during periods of high water (SWFWMD, 1992). Temporary storage of floodwaters in these wetlands reduces the downstream impacts that would be associated with an unattenuated release of storm-generated waters. Long-term preservation of these wetlands and adjacent uplands through public ownership will prevent development from encroaching upon the floodplain of Cypress Creek and ensure that natural volumes of water storage are maintained.

In addition to the natural flood protection, a levee system and water control structure exists over Cypress Creek. The wellfield road functions as a

levee and when used in concert with the water control structure, a pool of stream water can be detained within a portion of the riverine swamp lying north of the road. The levee and control structure were designed to fulfill a dual purpose: 1) during periods of flooding, the structure can be used to reduce flood levels in downstream areas; and 2) in the event that wellfield withdrawals cause groundwater levels to drop below regulatory minimums, or by an amount sufficient to stress the vegetation of the riverine swamp, stream waters can be detained to rehydrate the swamp and recharge groundwater stores.

In addition, Tampa Bay Water in conjunction with the District will implement the Cypress Creek Wellfield Surface Water Management Project in 2006 that would restore the natural flowways through the Preserve. The project objectives are to re-hydrate wetlands impacted by pumping from the Cypress Creek Wellfield and reduce flooding problems in adjacent subdivision areas. The project will remove conveyance restrictions caused by construction of roads, and enhance surface water storage within wetlands on the wellfield.

### **Water Quality Protection and Enhancement**

The District is actively involved in maintaining and improving water quality

through both regulatory and non-regulatory programs. The ability of natural systems, particularly wetlands, to improve water quality has become an important consideration in water quality related issues. 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 generated upgradient of the wetland. 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 waterbodies or the aquifer (SWFWMD, 1987).

The most significant contribution of the property to water quality enhancement lies in its large area of unaltered floodplain vegetation. On-site wetlands (riverine swamp) associated with the Cypress Creek watercourse are inundated by waters draining from agricultural areas that dominate the upstream portion of the drainage basin. Riverine swamps are particularly effective in assimilating nutrients from surface waters (Christianson, 1986). 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. 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 also protects natural systems.

The Preserve's on-site natural systems are maintained through restoration and/or management activities. These natural wetland and upland systems preserve natural habitat for many notable species of wildlife and plant life inhabiting the Preserve including many federal and state listed species including hooded pitcher plants, orchids, airplants, gopher tortoises, Florida sandhill cranes, southeastern American kestrels, wood storks and numerous wading birds (Tables 2 and 3). The Preserve also serves as a flyway to many neo-tropical migratory bird species that make use of the Preserve in the spring and fall. 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 should be restored to a natural condition whenever practical. Habitat restoration is ongoing and is addressed elsewhere in this plan.

Standard District practice is to locate site improvements on altered portions of a property whenever possible in order to avoid altering undisturbed sites.

## **CONCEPTUAL LAND USE PLAN**

### **LAND USE**

District Board Policy 610-3 directs 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**

Recreational activities permitted at the Preserve include hiking, bicycling, horseback riding, camping (group and equestrian), fishing (designated areas only), in-line skating on the paved Pump Station Road Road, birding, and nature study. Prohibited uses include swimming, boating of any kind (including canoeing or kayaking), and hunting. Swimming is prohibited in the creek and various borrow pits and small waterbodies on the property. This prohibition reduces potential hazards associated with the waterbodies, and allows the promotion of the ongoing re-establishment of native vegetation along the borders of the waterbodies. Although some of the on-site sections of

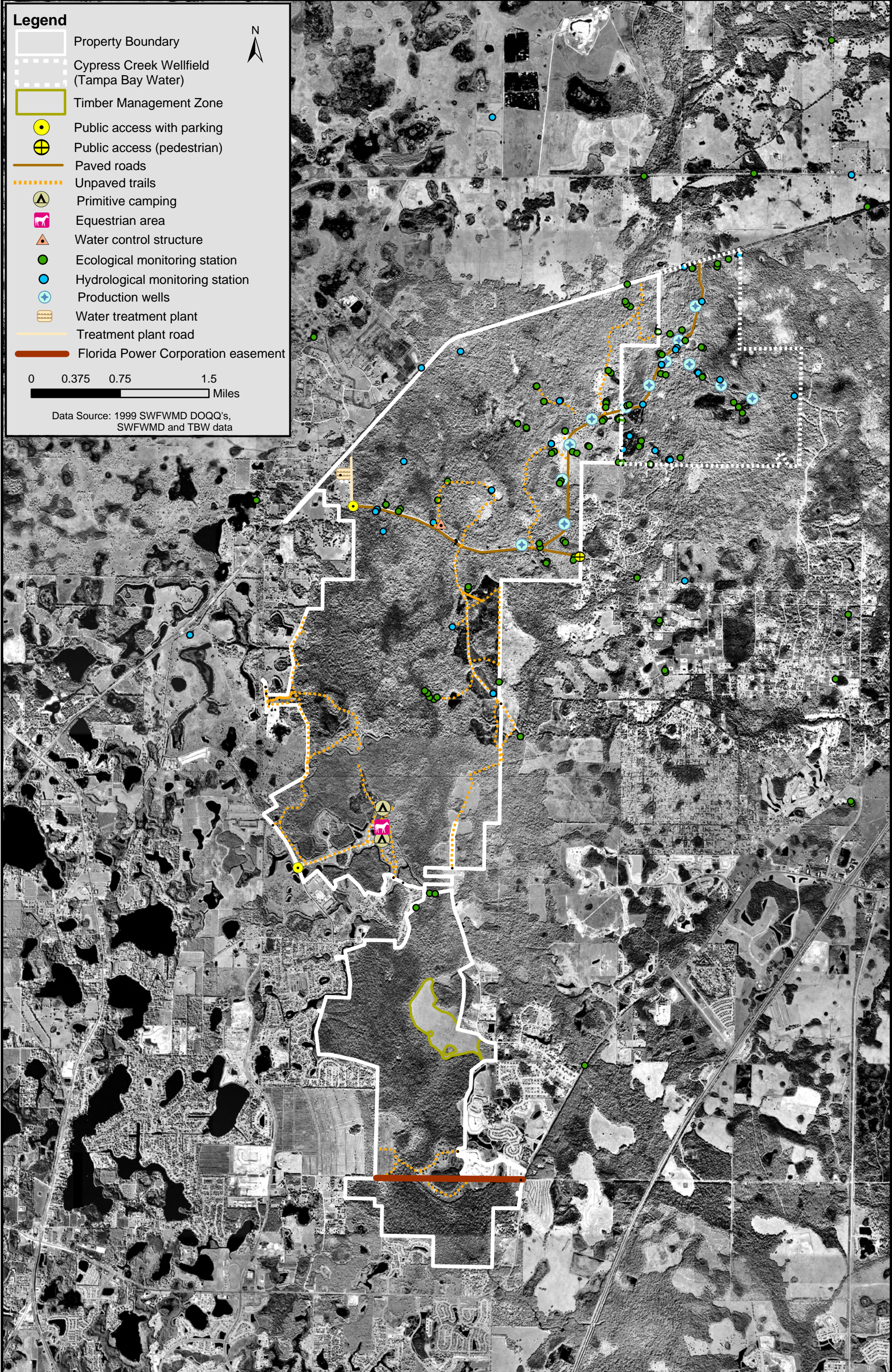
the Cypress Creek watercourse may be suitable for canoeing or kayaking on a seasonal basis, the majority of the creek bed is too shallow and ill-defined for this purpose. The water control structure located at the intersection of the creek and the wellfield road serves as an additional impediment to this use. Canoeing/kayaking in this area could pose a danger to both the structure and the paddler.

The Preserve’s status as a wildlife refuge prohibits the taking of wildlife. Consistent with this designation, and in recognition of the developed nature of the surrounding area, hunting is prohibited across the entire Cypress Creek property.

### ***Public Access***

Motorized access on the Preserve is restricted to authorized personnel engaged in wellfield operations or other official business. Public access to the property is provided by two access points that provide parking with walk-through gates and one access point that provides a walk-through entrance only (Figure 6). Access to the northern portion of the Preserve is provided by a gate at the west end of Pump Station Road, which is accessed from Ehren Cutoff (CR 583), midway between SR 52 and US 41. A parking area and sign-in log are provided at this point. A second gate located at the west end of







the preserve on Parkway Boulevard, 0.7 miles north of Pine View Middle School, provides access to the southern portions of the property. This access point also provides a small parking area and sign-in log. A third access gate exists on the east side of the property at the end of Quail Hollow Boulevard.

### ***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 an area that showcases a mosaic of upland and wetland communities. There is an extensive network of trails, approximately 18 miles both paved and un-paved, that provide loops that allow hikers to tailor their hike to personal preferences of both hike duration and the variety of landscapes traversed. (Figure 6).

### ***Bicycling***

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 five miles of paved and unpaved trails are available to bicyclists throughout the Preserve (Figure 6).

### ***Horseback Riding***

Six miles of designated or marked trails are available for horseback riding and a group equestrian camping area is available. Each rider must carry proof that their horse has had negative Coggins test results for Equine Infectious Anemia.

### ***Camping***

The Preserve provides a primitive group campsite that can be accessed from the Parkway Boulevard gate. The campsite is equipped with a picnic pavilion, fire ring, and portable toilets, but provides no water. An equestrian group camping area is provided in close proximity to the group campsite and is equipped in the same manner (Figure 6). No other primitive camping is available on the Preserve.

### ***Fishing***

Freshwater fishing can be conducted in Cypress Creek and man-made impoundments, that dot the property. Fishing is permitted only with proper permits issued by the FWC.

### ***Birding***

The sub-tropical climate and 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. Recreational trails will provide access for birders and other wildlife-viewing enthusiasts.

### **Scientific Research**

The use of District-owned lands for bona fide scientific research projects is promoted as an appropriate use of these lands, provided that the projects will not result in long-term impacts to the property's resources. The District will continue to make the Preserve available for scientific research. Proposals to conduct research of these lands will be considered on a case-by-case basis. Typically the District will require interim and/or final reports that summarize the results or information generated by the research and copies of any associated articles or other publications.

### **Opportunities for Environmental Education**

No formal educational facilities exist on the Preserve. Environmental education programs are currently accommodated at other nearby sites, such as Brooker Creek Preserve and Starkey Wilderness Preserve. Although the Preserve does not provide an opportunity for an intensive, highly structured program, it does provide an outstanding setting for passive or informal forms of nature study and environmental education and these will be permitted.

## **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. As a result, the District considered only those alternatives that would capitalize on existing resources and not result in alteration of natural, undisturbed lands.

### ***Silviculture***

A 146-acre planted pine Timber Management Zone (TMZ) exists on the Preserve (Figure 6). The District manages TMZs to generate revenue that supplements land management funding. Permanent timber areas such as this are located on previously altered sites such as fallow agricultural fields or pastures as opposed to natural lands. TMZs are managed by intermediate thinning that allow the growth of mature trees. The mature trees are then clear-cut and replanting occurs. Mature trees provide a seed source to regenerate the timber and the harvested trees provide revenue.

## ***Grazing***

Cattle grazing has been phased out of the Preserve since District acquisition. Given the status of the Preserve as a wildlife refuge, the ongoing natural regeneration of flatwoods vegetation in pasture areas and the resulting improvement in habitat value, the Preserve will not be used for cattle grazing purposes.

## **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; and water supply development projects. 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; and

- the proposed use must not be inconsistent with the management plan for the property.

The Preserve supports a number of public facilities and utilities lines (Figure 6). A Florida Power Corporation right-of-way containing a transmission line crosses the southern portion of the property and is not directly associated with District functions. The other utility lines on the property provide service exclusively to on-site facilities. Utility easements, which enter the property and provide service to the on-site facilities, include two Withlacoochee River Electric Cooperative power line easements and a GTE telephone line.

The Cypress Creek Wellfield is located on the northern end of the Preserve and is managed by Tampa Bay Water (see discussion in Water Supply section). The wellfield facilities include a total of 13 potable water production wells, 5 of which are located on the Preserve. The Cypress Creek Water Treatment Plant, which currently produces 60 million gallons of treated water per day, is located on the west end of the Preserve near the west gate at Pump Station Road and serves the Cypress Creek, Cross Bar Ranch and Cypress Bridge Wellfields. The treatment plant is the primary operations center for Tampa Bay Water and controls all water distribution to member counties. Three transmission mains service the

treatment plant. One of the mains enters the property from the north, transporting water from Cross-bar Ranch Wellfield to the Cypress Creek treatment plant. Another conveys treated water from the treatment plant to Pinellas County and the third links the Cypress Creek pumping station with the Cypress Bridge Wellfield to the south. Also on site are two 5-million gallon water storage tanks, a pumping station, and a series of monitoring stations (Figure 6).

## **SECURITY**

District staff secure the property by maintaining all fence lines and removing unauthorized access gates, posting appropriate boundary 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 vehicle access. In addition, Tampa Bay Water provides security in the Preserve with a high level of security afforded the treatment plant because of its importance in the regional water supply.

District staff will also pay close attention to poaching issues. Although there are no reported incidents, wildlife and plant poaching are common problems within preserve areas. If poaching becomes prevalent the District will coordinate with the FWC on security issues.

## **Management Action**

- Coordinate with FWC concerning security issues with the poaching of wildlife.

## **SPECIAL PROTECTION AREAS**

Certain areas within the Preserve will warrant special protection efforts in order to more effectively preserve water management functions and/or other outstanding natural values. Any 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 will merit designation as a Special Protection Area (SPA). Typically, SPAs must be discrete features that can be readily defined. Protective measures in these areas will take precedence over most other land use and management considerations.

SPAs designated for the Preserve include archeological and restoration sites, water supply wells, wellfield monitoring stations (both hydrological and ecological) and Florida sandhill crane nests. 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 Sites**

Any future structures or recreational improvements, including foot trails, will be directed away from known archaeological sites. Management priorities for these sites will focus primarily on the prevention of looting. Although the District does not generally provide funding to support archaeological investigations and assessments, the Preserve's sites will be made available for supervised study by professional archaeological researchers.

### **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 case-by-case basis and permitted research must be consistent with any requirements or protocols established by the Florida Department of State Division of Historical Resources.

### **Restoration Sites**

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

### **Production Wells and Monitoring Wells and Stations**

There are 5 production wells, 14 hydrological monitoring stations, and 23 ecological monitoring stations, stream gages, staff gages, and rain gages within the Preserve. Management actions will include:

### **Management Action**

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

### **Florida Sandhill Crane Nesting Areas**

Several nest sites of this threatened species have been documented to occur on the Preserve. Florida sandhill cranes generally will inhabit the same home range throughout their lives and will return to the same wetland system to nest if possible. Nesting occurs in emergent wetland systems that are dominated by pickerelweed and maidencane which are relatively rare, therefore they are a valuable resource on the Preserve. 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).

## **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 primary management practices and resource protection measures to be employed at Cypress Creek.

### Prescribed Fire

Fire is the most important management tool available to public land managers in Florida. Approximately 756 acres of the Preserve, or 10.2% of the total land area, supports vegetation that will benefit from regular controlled applications of fire. The mesic pine flatwoods at the Preserve and

associated wet prairies and marshes are fire- adapted 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 this community would gradually change and be of reduced value to wildlife. Due to fragmentation of habitats within the region by roads and development, the natural mechanism of lightning-induced fires cannot be expected to fulfill the fire needs of the Preserve's fire-adapted 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-adapted 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 burning 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 burning program has already been implemented on the property. Generally, prescribed fires at the Preserve will be designed to mimic natural lightning-induced fires.

Appropriate burn seasons and fire return frequencies 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 at the Preserve are included in some of the discussions related to wildlife management issues.

### Management Actions

- Continue the prescribed fire program of the Preserve's fire-dependent natural communities that includes prescription parameters designed to (1) prevent the escape of fire to adjoining 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 the Preserve's pine flatwoods are in various stages of regeneration from semi-improved pasture. The implementation of an aggressive prescribed burn program

and plantings of longleaf and slash pine in pasture areas since acquisition of the Preserve has resulted in an increase in pine flatwoods in variable stages of recovery. However, there are still areas of semi-improved pasture where the exotic bahiagrass is common; these areas require restoration.

Wetlands within the wellhead zones of influence have exhibited varying degrees of hydroperiod reduction (see Cypress Creek Wellfield Annual Monitoring Reports). Wellfield withdrawal impacts to wetlands are being partially offset by forced pumping cutbacks in all wellfields located in Pasco County. The Cypress Creek Wellfield, partially located within the Preserve (5 wells), 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 will have the ability to vary pumping amounts at different wells and wellfields in response to ecological conditions. This will result in the reduction of hydroperiod impacts within any localized area. Currently, Tampa Bay Water is augmenting one wetland (groundwater) within the Preserve, and an additional four sites are being augmented within the adjacent Tampa Bay Water parcel.

The 488-acre Cypress Creek Mitigation Project was conducted in 1996-1998 by

the Florida Department of Transportation (FDOT) District Seven as mitigation for wetland impacts associated with roadway improvements to Interstate 4. Prior to District acquisition, the Cypress Creek Mitigation Area was heavily disturbed by construction work in the 1970s, including the creation of several large rim-ditches that were dredged adjacent to a cypress slough system. The soils that were removed were then placed in the adjacent pastures, which were historically predominantly flatwoods. The project entailed the removal of the three to ten feet of fill material from the uplands to return them to historical grade, and the re-disposal of the fill into the rim-ditch system. Additionally, both wetland and upland plants were installed in the newly restored wetlands and pine flatwoods.

#### Management Actions

- Continue prescribed burn programs that facilitate the regeneration of pine flatwoods from pastureland.
- Restore appropriate bahiagrass pastureland using a combination of herbicides and prescribed burns to reduce bahiagrass competition, followed by broadcast over-seeding of flatwoods vegetation if feasible.
- 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

Ten listed (federally and/or state protected) species have been documented on the Preserve. Another three potentially occur because suitable habitat exists and the Preserve is within the species' known range. 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 such species documented to occur on the Preserve, and that is consistent with an overall management approach that seeks to maintain healthy ecosystems as the fundamental basis for meeting the needs of the greatest number of native species. Management recommendations for listed species that are known or likely to occur on the Preserve are presented in Table 3. Three assemblages of desirable species known to inhabit the site, are discussed in more detail below. Management

strategies that promote favorable conditions for these species also benefit other desirable species.

**The gopher tortoise**, designated by the state as a Species of Special Concern (SSC), is most prevalent in sandhill communities but also occur in scrub, xeric hammock, pine flatwoods, dry prairie, and open ruderal communities with well-drained soils. At Cypress Creek Preserve, gopher tortoises exist in the pine flatwoods, rangeland, and hardwood-conifer mixed forest. Areas with concentrations of gopher tortoise or the potential for gopher tortoises will be managed to maintain habitat characteristic preferred by gopher tortoise including a canopy cover of less than 60% and diverse, herbaceous groundcover approaching 80% (Cox et al., 1987). Gopher tortoise burrows provide shelter to many other listed species including the Florida gopher frog (SSC), Florida pine snake (SSC), Eastern indigo snake (Federally threatened, state threatened), and Florida mouse (SSC). Other native species that benefit from management for tortoise include: eastern spadefoot (toad), eastern coachwhip, Bachman's sparrow, brown-headed nuthatch, eastern towhee, cotton mouse, and cotton rat.

### Management Actions

- Use prescribed fire and/or mechanical methods to maintain:
  - A canopy cover of less than 60 percent.
  - Herbaceous ground cover approaching 80 percent.
- Collect baseline data in areas inhabited or suitable (Cox et al., 1987) for gopher tortoise populations. Tortoise population density can be calculated from this information. In selected monitoring areas, burrow sizes may be measured (as per Alford 1980) to determine population demographics.

**The wood stork**, designated an Endangered species by the federal and state governments, has been documented in virtually all of the wetland habitats at the Preserve. Wood storks typically use freshwater wetlands as feeding, nesting, and roosting sites. Wood storks are especially sensitive to environmental conditions at feeding sites and thus fly relatively long distances either daily or between regions annually, seeking adequate food resources. Wood storks are tactile feeders that require a concentration of fish in drying wetlands that are relatively uncluttered with aquatic vegetation. They typically nest in colonies either in

woody vegetation over standing water or on islands surrounded by broad expanses of water.

Wading birds can serve as indicators of the quality of wetland systems and water resources (Bildstein et al., 1991). Therefore, management of the Preserve's wetlands to promote natural hydrological (hydroperiod) and vegetative variability promotes conditions that are optimal for a variety of wading birds, including the wood stork and several wading birds designated Species of Special Concern: little blue heron, snowy egret, limpkin, white ibis, and tricolored heron. By preserving the property's wetlands in their natural condition and managing those affected by wellfield drawdown, species richness of fish and arthropods will be maintained and attract wading birds. No wading bird rookeries currently occupy the Preserve; however, there is a wading bird rookery on the Tampa Bay Water parcel of the wellfield.

This rookery is within the 15 km foraging zone (Cox et al., 1994) established for the little blue heron, snowy egret, tricolored heron, and white ibis, and within the 30 km foraging zone of the wood stork.

The Preserve is within the core foraging area (30 km) of a wood stork rookery and should be managed as recommended in the US Fish and

Wildlife Service (USFWS): Habitat Management Guidelines for the Wood Stork in the Southeast Region:

### Management Actions

#### Foraging Area Management:

- Maintain a wide range of feeding site options, which requires that many different wetlands, with both relatively short and long hydroperiods, be preserved. Feeding sites should not be subjected to water management practices that alter traditional water levels or the seasonally normal drying pattern and rates.
- The introduction of contaminants, fertilizers, or herbicides into wetlands should be avoided, especially those compounds that could adversely alter the diversity and numbers of native fish or change the characteristics of aquatic vegetation.
- Human intrusion into feeding sites should be avoided. Human activity should be no closer than 300 feet where a solid vegetation screen exists and no more than 750 feet where no vegetation screen is present.

#### Nesting and Roosting Area Management:

- If any nesting or roosting colonies are found on the Preserve, the USFWS Habitat Management Guideline for the Wood Stork should be followed for the protection of this species.

**Neo-tropical migrants** are those species of birds that migrate annually from Canada and the United States to extreme southern United States, Mexico, Central America, or South America. These species of birds include wood warblers, tanagers, swifts, and sparrows among others. Many of these migrants use the Florida peninsula as a stop over on their migration south. In the fall neo-tropical migrants often travel along forested, uninterrupted, forested riparian corridors that extend longitudinally through our region, such as the Cypress Creek floodplain.

This wide stretch of uninterrupted, contiguous riparian forest also provides suitable nesting habitat for interior species, such as the red-eyed vireo and barred owl. The mature riparian forest in combination with the fire-adapted adjacent flatwoods provides excellent edges for species that occur in habitat transitional zones, such as the white-eyed vireo, yellow-throated vireo, northern parula, and yellow-throated vireo.

According to the USFWS program 'Partners in Flight'; the recent decline in

neo-tropical species of birds is due in part to habitat loss and degradation. Habitat needed for food and shelter during winter months is disappearing in Latin America and in the United States and Canada there is not enough habitat for some species to nest and raise their young. In some areas where appropriate habitat can be found, it may be too close to human disturbances, or the habitat patches may be too small to support viable populations of some species. Habitat suitable to sustain viable neo-tropical migrant populations for nesting, over-wintering, and migration is decreasing. There is a heightened need to manage those remaining suitable habitats as efficiently and effectively as possible.

#### Management Action

- Continue to preserve and maintain the woodlands of the riverine swamp within the Cypress Creek floodplain.

#### Control of Exotic Species

##### ***Plants***

Nine invasive exotic plant species have been documented on the Preserve. Of these, 7 have been ranked Category I Invasive Exotics by the Florida Exotic Pest Plant Council (FLEPPC), which are defined as exotics that are altering native communities by displacing native species, changing community structure



or ecological functions, or hybridizing with natives (FLEPPC, 2003). Two species have been ranked as Category II Invasive Exotics, which 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, Chinese tallow, camphor, skunk vine, Japanese climbing fern, and cogongrass. In accordance with Board Procedure 61-9, the District will continue 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 predominantly dispersed by wind. Brazilian pepper, tallow tree, and camphor are predominantly dispersed by wildlife that consume the fruits and disperse 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 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, and public use areas. The District will remain alert for the appearance of all other 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 target species and densities, but generally consist of the application of herbicide (basal bark treatments, cut stump applications, and foliar applications) often in combination with mowing and/or prescribed fire. District staff are highly experienced in the application of the latest species- and condition-specific eradication techniques.

In addition to nuisance exotics, 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 Habitat Restoration).

Table 4 Exotic Species Documented

Common Name	Scientific Name	FLEPPC Rank*
Air potato	<i>Discorea bulbifera</i>	I
Bahiagrass	<i>Paspalum notatum</i>	
Bermudagrass	<i>Cynodon dactylon</i>	
Brazilian pepper	<i>Shinus terebinthifolius</i>	I
Caesarweed	<i>Urena lobata</i>	II
Camphor tree	<i>Cinnamomum camphora</i>	I
Cogongrass	<i>Imperata cylindrica</i>	I
Hydrilla	<i>Hydrilla verticillata</i>	I
Japanese climbing fern	<i>Lygodium japonicum</i>	I
Natalgrass	<i>Rhynchelytrum repens</i>	II
Smutgrass	<i>Sporobolus indicus</i>	
Skunk vine	<i>Paederia foetida</i>	I
Torpedo grass	<i>Panicum repens</i>	
Water hyacinth	<i>Eichhornia crassipes</i>	I

FLEPPC - Florida Exotic Pest Plant Council Rankings

Category I consists of species that are invading and disrupting native plant communities in Florida.

Category II consists of species that have shown a potential to disrupt native plant communities.



### Management Actions

- Monitor the property, particularly along major interior roads, trails, and any other interfaces with developed areas 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.
- Management and recreational activities on the property that may spread exotic propagules should be accompanied by appropriate contamination procedures and minimization measures to reduce the spread of exotic vegetation.

### ***Animals***

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 16<sup>th</sup> century. Unchecked, hog populations produce major alterations to a landscape. They primarily forage by "rooting", which results in severe damage to vegetation, and microtopographical changes that affect sheet flow drainage. This can lead to an increase in siltation. Hogs also compete

for hard mast (acorns), the preferred diet of many Florida natives.

To eliminate hogs in 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 control hog populations and associated damage at or below acceptable levels.

### Management Actions

- Monitor for evidence of feral hog damage and control with trapping program.
- Develop a localized public education strategy that notifies the public that release of non-native and native species is prohibited. This may include information developed for the Preserve's public entrance kiosk, an amendment to the Cypress Creek Preserve recreational activities pamphlet, or a specific pamphlet distributed to a pre-selected target audience.

### **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 plan outlines an agreement between the Pasco County Mosquito Control District (PCMCD) and the District.

This agreement authorizes the PCMCD to monitor mosquito populations using a variety of techniques including: (1) adult sampling traps over the populated portions 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 goes on to restrict the use of adulticides on the Preserve. The PCMCD also propagates the top-feeding mosquito fish and releases them into waters that are serving as larval habitat. The use of *Bacillus thuringiensis*, a naturally occurring pathogen specific to mosquito larvae, is also authorized under the MCMP.

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 percent while achieving the same level of control. Consequently, the District will coordinate with the PCMCD to discuss amending of the MCMP so as to better protect the site’s ecological integrity while meeting the public health objectives of the mosquito control program.

#### Management Actions

- Coordinate with the PCMCD to update the 1995 Mosquito Control Management Plan to:
  - protect the Preserve’s ecological integrity;

- refine the approach to control to achieve equivalent control with fewer applications/chemicals, thus resulting in less impact to natural systems; and
- implement the PCMCD's directive to apply appropriate arthropod control measures.

## **PROJECTED COST OF MANAGEMENT**

Costs of management include costs related specifically to prescription burn events, man hours for District staff to coordinate externally, and monitoring activities of key ecological resources. The extent of burning and monitoring activities is affected by local weather conditions and staff availability.

Management costs may be grouped into two categories: costs associated with facilities operation and costs associated with ecological management.

Facilities operation costs include recreational infrastructure maintenance (trails, signage, emptying garbage cans, etc.), site security, culvert and road maintenance, fence maintenance, and maintenance of access areas. 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 costs spent by the District

on Cypress Creek between 2002-2004 was \$66,300.

Costs associated with outside interests:

Tampa Bay Water operates the wellfield facilities and is responsible for all necessary hydrologic restoration, wetland augmentation, and permit-driven monitoring requirements.

Monitoring costs and restoration of pasture to indigenous plant communities on the FDOT mitigation site have been completed and all sites have been deemed to have achieved success criteria and released from further monitoring and maintenance.

## **ADMINISTRATION**

### **EXTERNAL COORDINATION**

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 will require outside coordination.

#### **United State Fish and Wildlife Service**

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 is known to occur on the property, or that colonizes the site in the future. Management and protection guidelines for the wood stork, a federally endangered 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**

The FWC is the agency with primary responsibility for protecting and managing Florida's wildlife resources and has declared the Preserve a Wildlife

Refuge. As such, the District should coordinate closely with the FWC in the management and monitoring of state-listed wildlife issues of poaching and critical habitat areas.

#### **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.

#### **Florida Department of Environmental Protection**

The FDEP administers many of Florida's environmental regulations, including many that are designed to protect water quality. The District will work closely with the FDEP to resolve any threats to water quality in the Preserve. The District will also work with the FDEP to acquire any Environmental Resource Permits (ERP) that may be required for restoration projects.

#### **Tampa Bay Water**

Tampa Bay Water maintains 5 production wells, 14 hydrological monitoring wells, and 23 ecological monitoring wells on the Property as part of a monitoring program developed in response to the District water use permit

number 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 wellfields monitoring report shall be sent to the Resource Management Department.

### **Local Governments**

The Preserve encompasses lands lying within Pasco County, which exercises land use authority over all lands located within its area of jurisdiction. As such, the District must work cooperatively with the county government concerning incompatible land uses that may contaminate groundwater or surface water resources of the Preserve, or that are otherwise incompatible with the Preserve's status as a regionally significant haven for wildlife and passive recreationists.

### **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.

### **Internal Coordination**

District staff from the Land Resources Department, Operations Department, and the Environmental Section of the Resource Management Department have played key roles in the development of this land use plan. The effective implementation of the plan will require the continued cooperation of these and other departments of the District.



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