

Alafia River Corridor Nature Preserve Management Plan



Submitted to the Southwest Florida Water Management District
as a Requisite of the Save Our Rivers and Preservation 2000 Programs

Prepared by

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Prepared for
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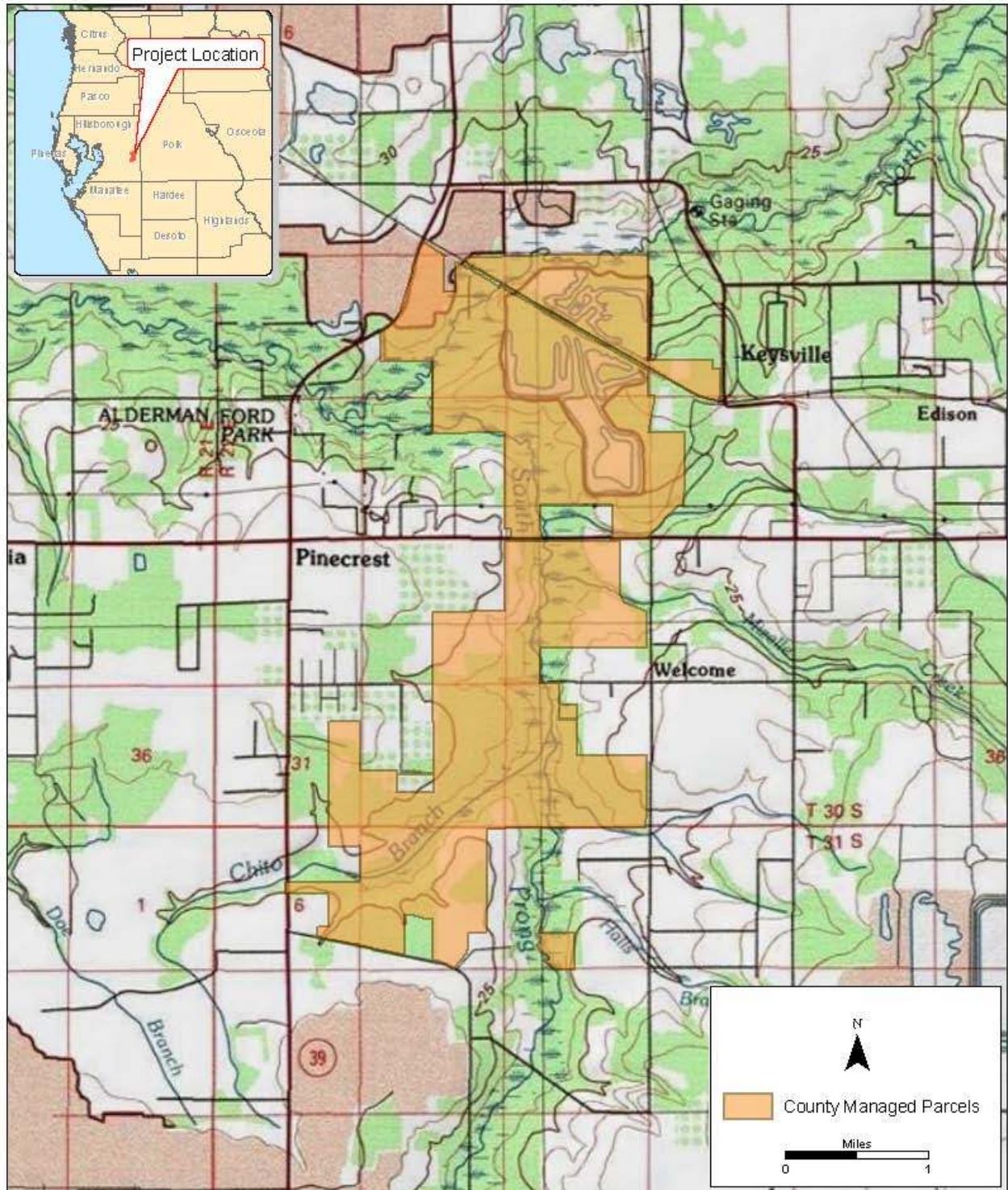
1. Purpose of Acquisition

The Alafia River Corridor Nature Preserve (ARCNP), located in eastern Hillsborough County, Florida, encompasses lands along the Alafia River east of the Bell Shoals Bridge, extending upstream along the North Prong into Polk County, and along the South Prong to Jameson Road. This plan only applies to lands upstream of Alderman's Ford County Park. The Alafia River, being a major tributary of Tampa Bay, is in need of protection due to the rapid development in the west-central Florida region. Acquisition of lands within the project area will protect the river and its floodplain and wildlife habitat from land development impacts. This will in turn provide continued protection to Tampa Bay, a designated number one priority water body under the Southwest Florida Water Management District's (SWFWMD) Surface Water Improvement and Management (SWIM) Program (SWIM, 2008). The limits of the Alafia River Corridor Nature Preserve are shown in **Figure 1**.

2. Location and Conformance with Local Plans

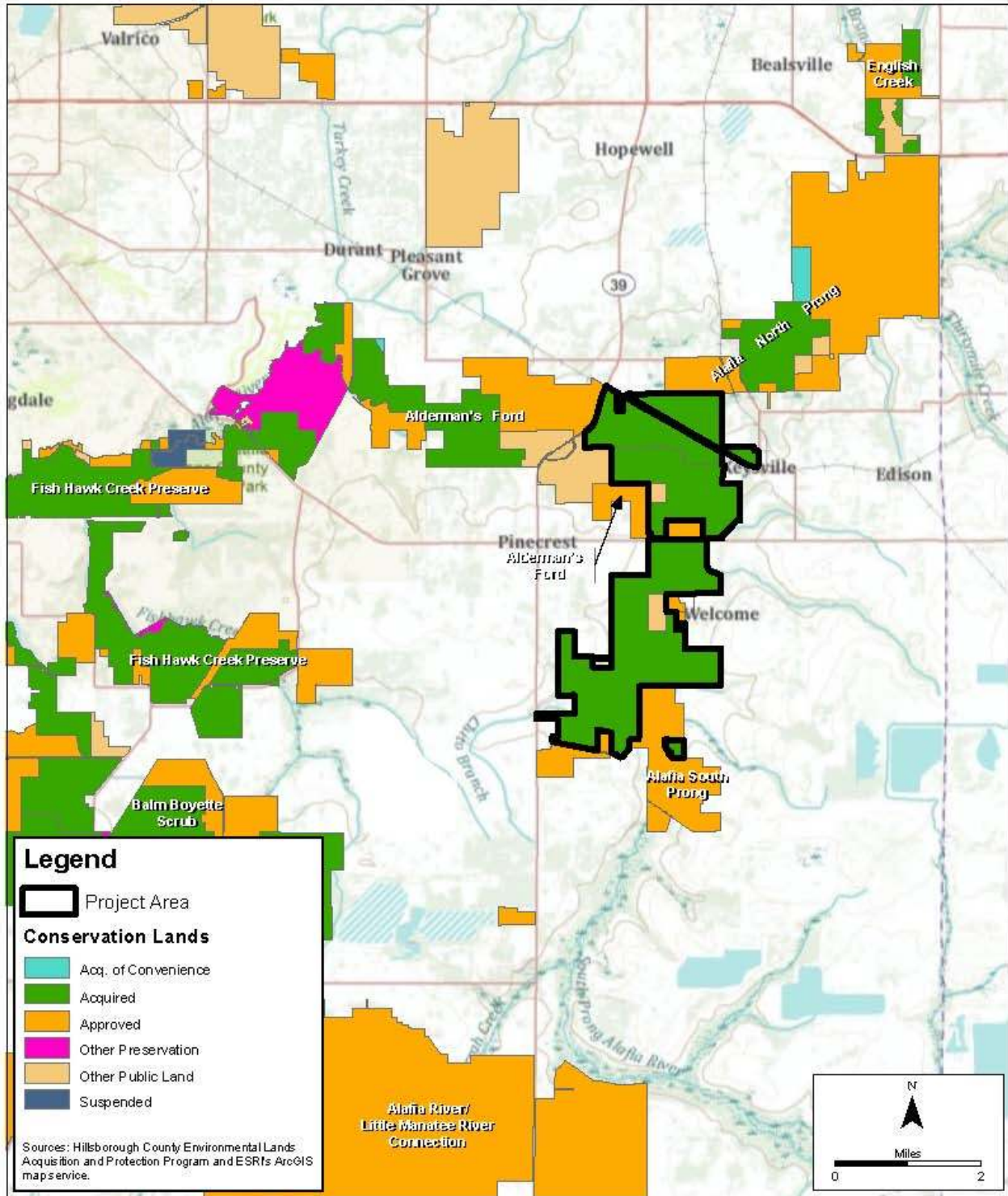
The parcels described in this management plan were acquired between 1994 and 2008 by SWFWMD through its Save Our Rivers (SOR) program, a non-lapsing fund for the acquisition, management, maintenance, and capital improvements of lands. Hillsborough County participated in the preservation effort by reimbursing SWFWMD for 50% of the purchase price of each parcel, using funds available through the Environmental Lands Acquisition and Protection Program (ELAPP). The parcels acquired to date in southeastern Hillsborough County total approximately 4,000 acres located in sections 28, 29, 31, 32 and 33, T30S, R22E; sections 4, 5, and 6, T31S, R22E; and sections 15, 16, 17, 20, 21 and 22, T30S, R22E. The original preserve, which was the subject of the 1997 management plan (Hillsborough County, 1997), consisted of the Knight/McDonald parcel to the north and the Pruitt parcel to the south. Since that time additional parcels have been added including the Read, Hopewell Land Partners, Jameson, Lane, Marnie, and Jordan parcels. The ARCNP currently encompasses 4,070 acres. See **Figure 1** for the current limits of the ARCNP. Other parcels purchased or under consideration for purchase within the Alafia River Corridor Project are illustrated in **Figure 2**. This plan is an update of the 1997 management plan referenced above.

The ARCNP falls within the boundaries of a designated area in the County known as the South Hillsborough Wildlife Corridor (SHWC). The SHWC includes lands along the Little Manatee and Alafia Rivers, as well as numerous tributaries. The SHWC was originally conceived by members of environmental groups with the objective of linking together large tracts of natural habitat along riverine corridors to enhance the ability of those lands to support listed species of animals and plants, provide recreational opportunities, and protect water quality in perpetuity, before those resources are permanently altered. The SHWC extends into Polk County as part of the SOR project area. Several parcels of land have been acquired in Hillsborough County to-date as part of both the ELAPP and the SOR programs (Hillsborough County, 2009). There are also other units of protected lands in the project area, including Alderman's Ford Park, located immediately west of the north parcel. For purposes of discussion the ARCNP can be generally divided into three areas: Area One, north of Lithia Pinecrest Road; Area Two, south of Lithia Pinecrest Road to just north of the horse trail entrance; and Area Three, south of the latter boundary to Jameson Road (**Figure 3**).



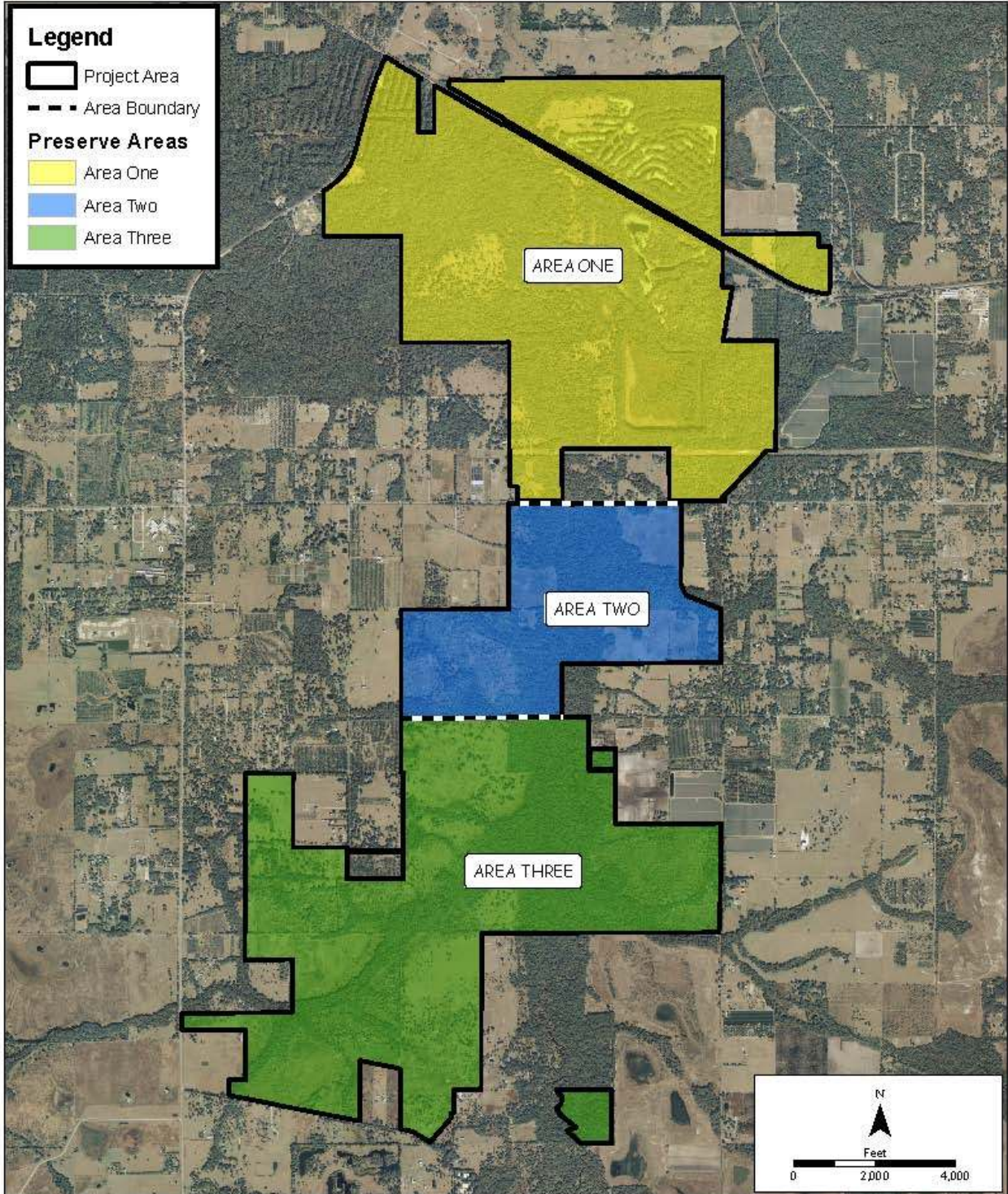
Alafia River Corridor
Site Location

Figure 1



Alafia River Corridor
Parcels Purchased or Under Consideration for Purchase

Figure 2



Alafia River Corridor
Preserve Areas

Figure 3

Plan Organization

Many issues addressed in this plan, including the habitat descriptions, wildlife use, management strategies, and burn unit histories, are likely to change through time. The information with respect to these (and other) topics documented in this plan represents a snapshot of conditions at the time this plan was developed. A complete list of County Ordinances can be found in **Appendix A**. Relevant comprehensive Plan Elements are provided in **Appendix B**. These and the remaining appendices provide relevant supporting documents that may assist the land managers in implementing land management. They appear in the order in which they were referenced in the text.

The Hillsborough County City-County Planning Commission reviewed the plan and found it consistent with the *Hillsborough County Comprehensive Plan*, more specifically, Objective 16 of the Conservation and Aquifer Recharge Element (letter dated 15 October 2010, Shawn College to Sheryl Bowman).

3. Natural Features

a. Vegetation/Plant Communities

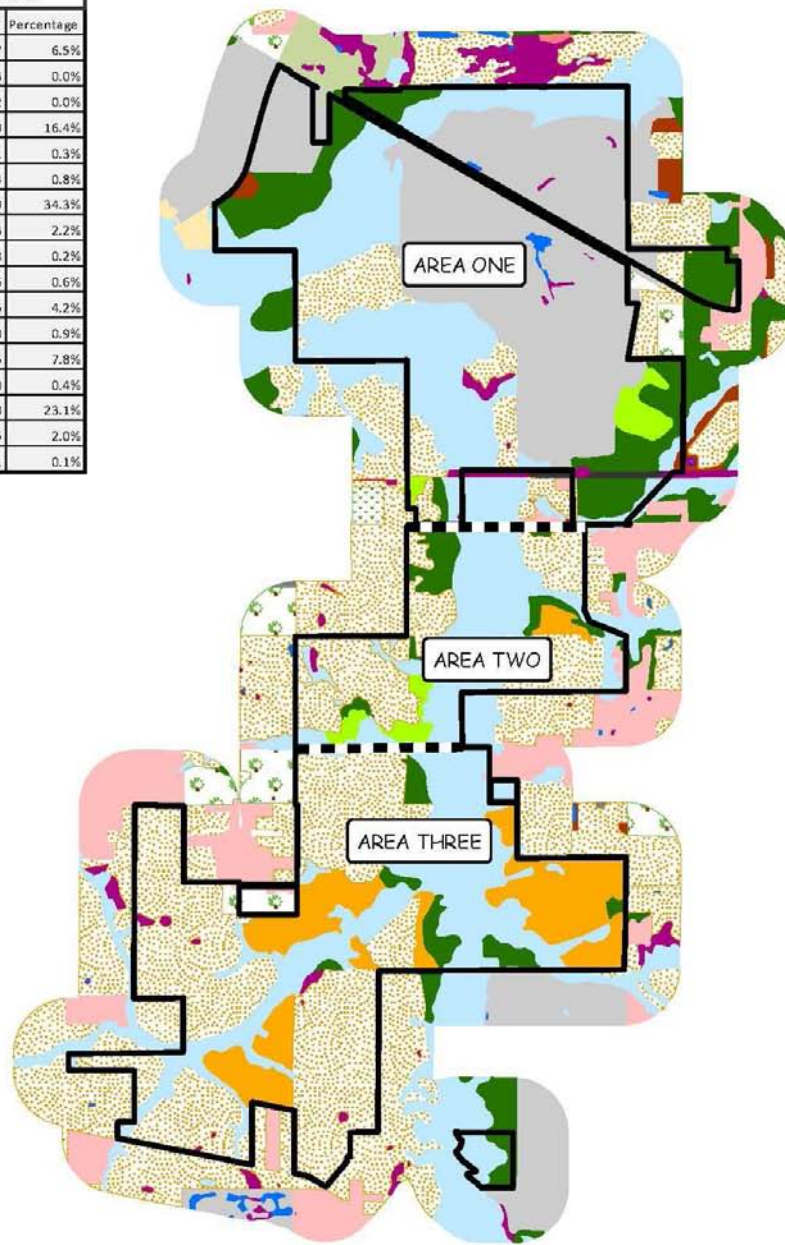
The vegetation/plant communities represented in the ARCNP, along with their associated Level 2 Florida Land Use/Land Cover (FLUCCS) code(s), are described in this section. The corresponding FLUCCS descriptors are provided on the land use/land cover map (Figure 4 below). Human activities such as agriculture, phosphate mining, and wildfire suppression have caused both subtle and dramatic changes in the region. Phosphate mining in the late 1920s to early 1930s resulted in complete destruction of the natural plant communities on several hundred acres of Area 1. Wildfire suppression allowed expansion of loblolly bay (*Gordonia lasianthus*) from riverine bottomland into upland areas, and invasion of hardwoods into open flatwoods sites (Clewell *et al.*, 1982).

While existing native vegetation of altered sites in the system is typical of more natural areas, many of the original plant communities have undergone drastic changes during the last 75 years. In describing the vegetation and plant communities of the parcels, staff at the Hillsborough County Parks, Recreation and Department (HCPRCD) have consulted published references, aerial photography, and expert witness interviews. See **Figure 4** for land use/land cover types, based on SWFWMD FLUCCS mapping, within the ARCNP. The following provides a description of these habitats and **Appendix C** provides a comprehensive list of plant species documented within the ARCNP.

Vegetation of Mined Areas (Extractive / FLUCCS 16)

Only fragments of the riverine ecosystem remain within the pit/berm areas in Area 1. Pines (*Pinus elliottii* and *P. palustris*), laurel oak (*Quercus laurifolia*), water oak (*Q. nigra*), sweetgum (*Liquidambar styraciflua*), pignut hickory (*Carya glabra*), and cabbage palm (*Sabal palmetto*) dominate the overstory of the berms and slopes. In the midstory, large specimens of summer haw (*Crataegus michauxii*) and coralbean (*Erythrina herbacea*) are found. The understory consists mainly of invasive exotic plants such as sword fern (*Nephrolepis* sp.), skunkvine (*Paederia foetida*) and Japanese climbing fern (*Lygodium japonicum*); the last two are vines which also climb into the canopy. Hardwood and pine litter provide additional groundcover and nutrients.

SWFWMD 2008 Land Use/Land Cover				
Code	Description	Acreage	Percentage	
11	Residential Low Density	507	6.5%	
12	Residential Medium Density	3	0.0%	
15	Industrial	2	0.0%	
16	Extractive	1269	16.4%	
18	Recreational	21	0.3%	
19	Open Land	64	0.8%	
21	Cropland and Pastureland	2659	34.3%	
22	Tree Crops	173	2.2%	
24	Nurseries and Vineyards	18	0.2%	
26	Other Open Lands < rural >	46	0.6%	
32	Shrub and Brushland	325	4.2%	
41	Pine Flatwoods	70	0.9%	
43	Hardwood Conifer Mixed	605	7.8%	
53	Reservoirs	30	0.4%	
61	Stream and Lake Swamps	1788	23.1%	
64	Emergent Aquatic Vegetation	155	2.0%	
83	Utilities	11	0.1%	



Legend

Project Area
 Area Boundary

Feet
 0 2,000 4,000



Alafia River Corridor
Land Use/Land Cover

Figure 4

Epiphytic ferns noted by HCPRCD staff include golden polypody (*Plebotidium aureum*), found growing on a steep berm slope, and resurrection fern (*Polypodium polypodioides*). The butterfly *tampensis*) and green-fly orchid (*Epidendrum conopseum*), both listed as commercially exploited by the FDACS, are found growing in the canopy of live oaks.

The phosphate pits that retain water, mainly on the northeastern portion of the mined areas, are covered with duckweed (*Lemna* sp.) and pennywort (*Hydrocotyle* sp.), and ringed primarily by cattails (*Typha* sp.), Carolina willow (*Salix caroliniana*), soft rush (*Juncus effusus*), primrose willow (*Ludwigia peruviana*), smartweed (*Polygonum* spp.), and maidencane (*Panicum hemitomom*). Occasional islands in the flooded pits retain similar understory plants, and overstory trees such as live oak (*Quercus virginiana*), eastern red cedar (*Juniperus virginiana*), and red maple (*Acer rubrum*). A few pits are plagued by the invasive exotics water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*).

Shallow pits and rolling uplands remain in the area formerly used by the Alafia River Rendezvous located west of the security residence. Bahiagrass dominates the groundcover, which also consists of broomsedges (*Andropogon* spp.), partridge-pea (*Chamaecrista fasciculata*), hairy indigo (*Indigofera hirsuta*), and passion-flower (*Passiflora incarnata*). Laurel oak, pignut hickory, wild cherry (*Prunus serotina*), sugarberry (*Celtis laevigata*), and pines surround this open area.

Flatwoods Plant Communities (Pine Flatwoods and Shrub and Brushland / FLUCCS 41 and 32)

One small area to the northwest near Highway 39, and a large portion of Areas 2 and 3 contain flatwoods communities. Most of the overstory of longleaf and slash pine had been logged on these parcels. In addition, flatwoods along Jameson road (Area 3) have been roller-chopped by previous owners to remove palmetto and improve native range. This area, and cleared flatwoods along Walter Hunter Road are dominated by Carolina jessamine (*Gelsemium sempervirens*), bluestems (*Andropogon* spp.), pineland threeawn (*Aristida beyrichiana*), low panicums (*Dichantherium* spp.), maidencane and other native grasses. Wetter areas host pale meadow beauty (*Rhexia mariana*), yellow bachelor's button (*Polygala rugelii*), redroot (*Lachnanthes caroliniana*), yellow-eyed grasses (*Xyris* spp.), ferns, and many other species. A few live oak and pines dot the open areas and mix with sweetgum, water oak, cabbage palm, and red maple along creek corridors that run through the site. The areas of the site which were converted from flatwoods to improved pasture and native range by the previous owners have begun to show the characteristic effects of decreased frequency of prescribed fire. These areas are now becoming overrun with small trees and shrubs, including various oaks, wax myrtle, Carolina willow, salt bush, and red maple. Although some native herbaceous species are present, the exotic species Bahia grass is still the dominant ground cover. If this pattern of ecological succession is allowed to continue these once open pastures will likely become dense thickets of woody shrubs that allow very little sunlight to reach the ground and, as a result, the herbaceous ground cover probably will be extirpated over time. Such a dense stand of woody shrubs and lack of herbaceous ground cover will cause these areas to become increasingly resistant to fire and therefore inhospitable to the native flora and fauna characteristic of the fire-maintained pine flatwoods of west-central Florida.

Sandhill and Upland Hardwood Hammock Communities (Hardwood/Conifer Mixed / FLUCCS 43)

Several sandhill/dry hammock sites in Area 1 are isolated by pit/berm areas and riverine floodplains. The majority of these areas have been altered, but components typical to the communities are still present. One small sandhill site, sandwiched in between ballfields and old phosphate pits on Highway 39, narrows along a road that stretches east to the river. This former trailer site hosts an understory of the exotic bahiagrass (*Paspalum notatum*), native grasses, and herbaceous plants such as elephant's-foot (*Elephantopus elatus*) and ironweed (*Vernonia gigantea*). The overstory consists of pines and oaks, most notably sand post oak (*Quercus margaretta*), which is occasional along the Alafia River system but generally uncommon south of Pasco County. Another sandhill site is located to the northeast, south of a strawberry field on adjacent property. Most of this site has been cleared and planted in bahiagrass pasture. The east side of this site remains in live oak hammock. At the edge of the hammock and pasture, numerous exotic plants cover the understory where a former homesite was located (see invasive exotic plants discussion). The largest sandhill, an area of approximately 95 acres lies directly east of Alderman's Ford Park. Longleaf pine and sand pine (*Pinus clausa*) have been logged from the site and the understory converted to bahiagrass pasture. A few pines, live oak, and cabbage palm are scattered throughout the area which is dominated by Hercules-club (*Zanthoxylum clava-herculis*), coralbean, American beauty-berry (*Callicarpa americana*), and lady lupine (*Lupinus villosus*).

To the south several sandhill sites occur within a mosaic of flatwoods, wetlands, and riverine floodplains. These sites have been cleared along with the flatwoods and either planted in bahiagrass or managed as native range. Upland hardwood hammock in Area 3 has been partially cleared for citrus. Presently, old citrus trees and a few live oaks remain scattered in a groundcover of bahiagrass pasture.

Live Oak Hammock (Hardwood/Conifer Mixed / FLUCCS 41, in Part)

A live oak hammock is situated on the far northeastern portion of the preserve (Area 1). A portion of this hammock is underlain by xeric scrub soils.

Riverine Floodplains (Stream and Lake Swamps / FLUCCS 61)

Floodplains of the Alafia River and its tributaries snake through a large portion of all three parcels, unaltered except where mining has occurred. The riverine forests are comprised of cabbage palm, and deciduous hardwoods such as red maple and sweetgum, while the tributary creeks host primarily loblolly bay, sweet-bay (*Magnolia virginiana*), swamp bay (*Persea palustris*) and other evergreen hardwoods. Carolina willow, buttonbush (*Cephalanthus occidentalis*), saw palmetto, swamp honeysuckle (*Rhododendron viscosum*), and ferns are common understory plants. Occasionally, goldenclub (*Orontium aquaticum*), string-lily (*Crinum americanum*), and other flowering plants are found growing at the waterline.

Freshwater Wetlands (Streams and Lake Swamps / FLUCCS 61, in Part)

Three small areas of freshwater wetlands occur in Area 1 within the flatwoods of the eastern and southern portion. These seasonally wet areas are characterized by sand cordgrass (*Spartina*

bakeri), bluestems, maidencane, panicums, and herbaceous plants such as pale meadow beauty and yellow-eyed grass. Oddly, cypress trees (*Taxodium* spp.) are considered uncommon components of this community along the Alafia River system (Clewell *et al.*, 1982).

b. Soils

The Hillsborough County Soil Survey (Doolittle, *et al.*, 1989) was consulted to provide information on soils and land use for each parcel. This soil survey is also available online electronically at http://soils.usda.gov/survey/online_surveys/florida. The vegetative associations given for each soil type were derived from aerial photographs, field observation, and soil descriptions in the soil survey manual. **Figure 5** corresponds with the following descriptions of the soil conditions on site.

Adamsville fine sand (Map Unit 2). This is a somewhat poorly drained soil on broad ridges in the flatwoods. It has a very dark gray surface layer underlain by brown and pale brown sand. Available water capacity is low and permeability is rapid. In most years it has a seasonal high water table at depths of 20 to 40 inches for two to six months and recedes to 60 inches during prolonged dry periods. Under natural conditions this soil supports a sandhill growth including bluejack oak, turkey oak, longleaf pine, and slash pine. It mantles a 2.3-acre area in the northern edge of Area 2 immediately south of CR 640.

Arents, nearly level (Map Unit 4). This heterogeneous soil type results from excavation and reshaping of soil material. Arents do not contain well defined soil layers, but instead, consist of pockets and streaks of various types of sandy or loamy fill material. Soil properties are highly variable. Permeability and available water capacity vary widely from one area to another. This soil covers 30.8 acres in the north central portion of the site and covers 30.8. This open area contains steep depressions, and supports bahia pasture.

Basinger, Holopaw, and Samsula soils, depressional (Map Unit 5). This soil consists of approximately 35% of Basinger soil, 31% of Holopaw soil, and 18% of Samsula soil. Dissimilar soils (e.g., Ona and other sandy soils) make up the remainder of the mapped extent of this soil. This soil occurs in swamps and flatwood depressions. Available water capacity in Basinger soil is low, low to moderate in Holopaw soil, and high in Samsula soil. Permeability is rapid in Basinger and Samsula soils and rapid to moderately slow to moderate in Holopaw soil. The surface layer ranges from black muck to black fine sand, and the subsurface may be brown muck or gray fine sand. Undrained areas are ponded for about six months. Natural areas typically support cypress with maidencane, sawgrass, and other hydrophytic grasses. This soil, which covers 56.0 acres, occurs in six small areas to either side of South Prong in Areas 2 and 3.

Candler fine sand, 0-5% slopes (Map Unit 7). This upland soil is excessively drained, with level to gently sloping topography. The seasonal high water table is 80 or more inches in depth. Available water capacity is very low and permeability is rapid. This soil covers 144.2 acres and is found as small inclusions in the northwest and north central portions of the parcel as well as in the south near Chito Branch. The areas to the north and south were previously clear cut and do not support its natural sandhill habitat type. Its altered state includes widely spaced live oak,

NRCS, Soil Survey Geographic database (2006)			
Map Unit #	Map Unit Name	Acreeage	Percentage
02	ADAMSVILLE FINE SAND	2.3	0.1%
04	ARENTS, NEARLY LEVEL	30.8	0.8%
05	BASINGER, HOLOPAW, AND SAMSULA SOILS, DEPRESSIONAL	56.0	1.4%
07	CANDLER FINE SAND, 0-5% SLOPES	144.2	3.5%
12	CHOBEE SANDY LOAM, FREQUENTLY FLOODED	0.1	0.003%
15	FELDA FINE SAND	13.7	0.3%
18	FORT MEADE LOAMY FINE SAND, 0-5% SLOPES	8.1	0.2%
25	LAKE FINE SAND, 0-5% SLOPES	30.8	0.8%
27	MALABAR FINE SAND	59.8	1.5%
29	MYAKKA FINE SAND	898.2	22.1%
33	ONA FINE SAND	20.5	0.5%
36	ORSINO FINE SAND, 0-5% SLOPES	19.9	0.5%
39	ARENTS, VERY STEEP	334.3	8.2%
41	POMELLO FINE SAND, 0-5% SLOPES	24.4	0.6%
46	ST. JOHNS FINE SAND	60.3	1.5%
47	SEFFNER FINE SAND	116.4	2.9%
51	HAPLAQUENTS, CLAYEY	394.6	9.7%
52	SMYRNA FINE SAND	359.6	8.8%
60	WINDER FINE SAND, FREQUENTLY FLOODED	1189.5	29.2%
61	ZOLFO FINE SAND	286.7	7.0%
99	WATER	20.9	0.5%

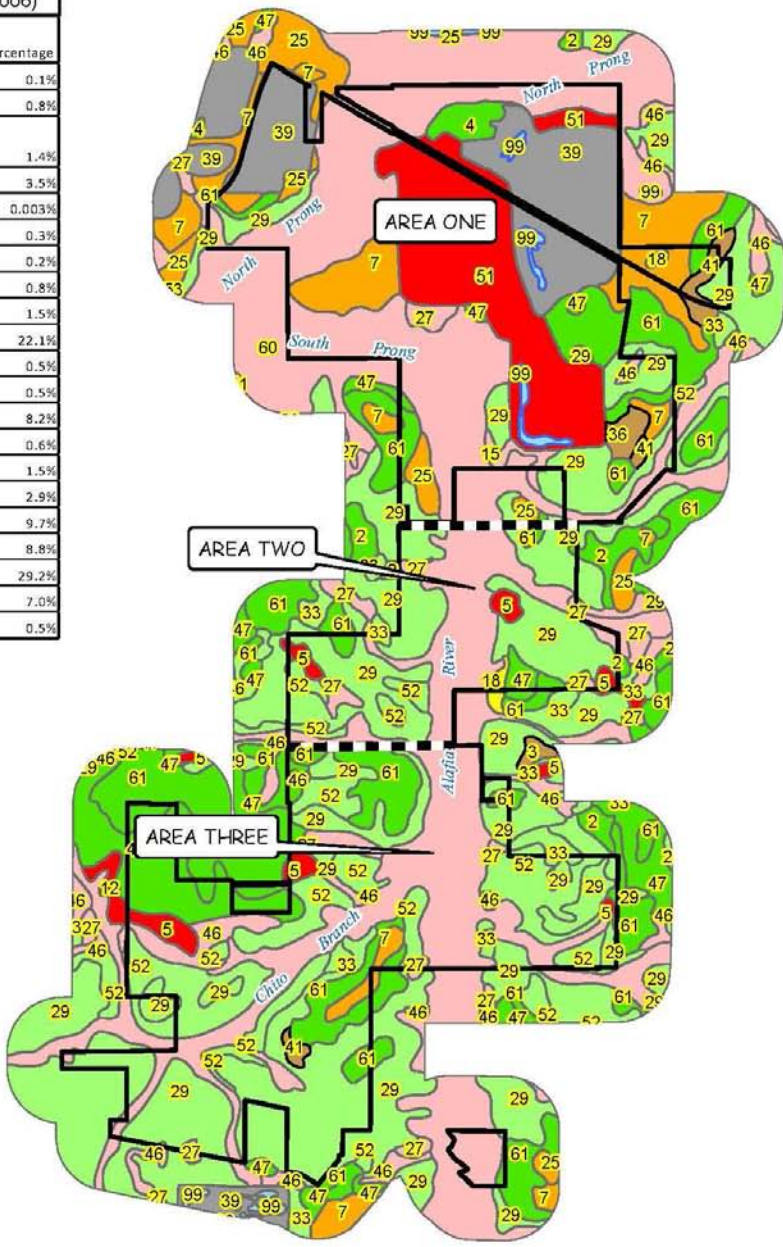
Legend

- ■ ■ Area Boundary
- Project Area

Soil Drainage Classes

- Orange: Excessively Drained
- Yellow: Well Drained
- Brown: Moderately Well Drained
- Light Green: Somewhat Poorly Drained
- Medium Green: Poorly Drained - Nonhydic
- Pink: Poorly Drained - Hydic
- Red: Very Poorly Drained
- Blue: Water
- Grey: Disturbed

Feet
0 2,400 4,800



HDR Alafia River Corridor Soils Figure 5

cabbage palm, persimmon, Hercules-club, bahia grass, and lupine.

Chobee sandy loam, frequently flooded (Map Unit 12). This soil is nearly level, very poorly drained, and occupies bottom lands. It typically has a surface layer of black sandy loam underlain by very dark gray to gray subsoil, and a light gray substratum. Available water capacity is high and permeability varies from moderately rapid to slow and very slow. It remains flooded for very long periods following prolonged intense rain. The seasonal high water table fluctuates between the surface and 10 inches below. It occurs in two minute patches (0.1 acre) on the western boundary of ARCNP in Area 3. Natural areas typically support a growth of cypress, Carolina willow, red maple, cabbage palm, and sweetgum, with an undergrowth of buttonbush, maidencane, sawgrass, and sedges.

Felda fine and (Map Unit 15). This is a nearly level, poorly drained hydric soil that occupies broad sloughs in the flatwoods. It typically has a very dark gray fine sand surface layer, a dark gray fine sand to dark grayish brown sandy clay loam subsurface layer, and a light gray loamy sand subsoil. Available water capacity is moderate and permeability is rapid to moderate. This soil occurs in one area in the northern part of Area 2 and cover 13.7 acres. Natural areas typically support cabbage palm and slash pine with an undergrowth of saw palmetto, wiregrass, and wax myrtle.

Fort Meade loamy fine sand, 0-5% slopes (Map Unit 18). This upland soil is well drained. The seasonal high water table is at a depth of greater than 72 inches. It typically has a very dark gray loamy fine sand to very dark grayish brown loamy sand surface layer, underlain by yellowish to light yellowish brown loamy sand. Available water capacity is low to moderate and permeability is rapid. This soil type occupies a 8.1-acre area in the north eastern portion of the site. Natural vegetation typically includes bluejack oak, live oak and slash pine; however, this area is primarily improved pasture.

Lake fine sand, 0-5% slopes (Map Unit 25). This is an excessively drained upland soil. The seasonal high water table is at a depth of greater than 80 inches. Permeability is rapid, and available water capacity is low or very low. This soil, which covers 30.8 acres, occurs west of the North Prong and to the west straddling the powerline. At the North Prong this soil type lies adjacent to a reclaimed phosphate mine which has altered the moisture regime of the area. This area has a shrubby understory with a mixed mesic hardwood, cabbage palm, and pine overstory. At the powerline (Area 1) vegetation is mixed mesic hardwood and some cleared areas maintained as and herbaceous strata with some low growing shrubs.

Malabar fine sand (Map Unit 27). This soil is a nearly level, poorly drained hydric soil that occupies low-lying sloughs and shallow depressions in the flatwoods. In most years, a seasonal high water table fluctuates between the surface and 10 inches below surface from two to six months each year. Permeability is rapid in the surface and subsurface layers, but is slow in the subsoil. Available water capacity is low to very low. This soil, which covers 59.8 acres, occupies numerous small pockets across the entire site and supports a variety of vegetation including open oak/cabbage palm hammock, saw palmetto, and bahia grass.

Myakka fine sand (Map Unit 29). This flatwoods soil is nearly level and poorly drained. The slope is 0-2 percent. The seasonal high water table reaches to a depth of 10 inches for one to four months, and to a depth of 40 inches during prolonged dry periods. Permeability is rapid in the surface and subsurface layers, and moderately rapid in the subsoil layer. Available water capacity is low. This soil is widespread across the site, covering 898.2 acres. Areas of this soil have largely been cleared but some areas support mixed hardwood/pine forest and cabbage palm.

Ona fine sand (Map Unit 33)- This flatwoods soil is poorly drained. The seasonal high water table fluctuates to a depth of 10 inches for greater than two months, and to 40 inches for six months or more. Permeability is rapid in the surface layer, and moderate or moderately rapid in the subsurface layer. Available water capacity is low or moderate. Small areas of Ona fine sand exist in close proximity to Myakka fine sand throughout the site. The soil covers 20.5 acres of the ARCNP. Vegetation is the same as that associated with Myakka fine sand.

Orsino fine sand, 0-5% slopes (Map Unit 36). This soil is a nearly level to gently sloping, moderately well drained soil on the uplands and on slope breaks to stream channels. It typically has a thin gray fine sand surface layer, a light gray to white fine sand subsurface layer, and a brownish yellow to yellow subsoil. The seasonal high water table is at a depth of 40 to 60 inches for more than six months and recedes to below 60 inches during prolonged dry periods. Available water capacity is low to very low and permeability is very rapid. A 19.9-acre area of this soil occurs in the southeastern part of Area 1.

Arents, very steep (Map Unit 39). This soil consists of mounds of very steep heterogeneous material, and is similar in vegetation and soil properties to soil unit (4). Available water capacity and permeability vary widely from one area to another. This soil lies in the unreclaimed phosphate mine areas in Area 1 and covers 334.3 acres.

Pomello fine sand (Map Unit 41). This soil is moderately well drained and is found on low ridges of the flatwoods. The seasonal high water table is from 24 to 40 inches in depth from one to four months and recedes to 60 inches during dry periods. Permeability in the surface and subsurface layers is very rapid and moderately rapid in the subsoil. Available water capacity is very low. This soil is present in three small areas east of the South Prong, with two in Area 1 and one in Area 3, collectively covering 24.4 acres. The natural growth associated with this soil consists of pines (longleaf, sand, and/or slash), with an undergrowth including palmetto, running oak, and wiregrass. The more northern one in Area 1 is located a little west of Keysville Road and features sand live oak as the dominant overstory species. The second Area 1 occurrence is located northwest of West Branch. In Area 3 south of Chito Branch, this soil is vegetated with an oak canopy that has largely been cleared and only scattered oaks remain.

St. Johns fine sand (Map Unit 46). This poorly drained soil is on low-lying plains on the flatwoods. A high water table to a depth of 15 inches exists for two to six months. Permeability is rapid in the surface and surface layers, providing for moderate available water capacity. It typically has a surface layer of black fine sand giving way to very dark grayish brown fine sand. The subsoil is a fine sand of light brownish gray, giving way to black fine sand, then dark reddish brown, and finally dark yellowish brown. The subsoil is a light brownish gray fine sand.

This soil type occupies 60.3 acres and primarily occurs west of Chito Branch in Area 3, and supports improved pasture and mixed native herbaceous vegetation. A small patch of this soil is located east of the mined areas in Area 1 and is dominated by woody vegetation.

Seffner fine sand (Map Unit 47). This flatwoods soil is nearly level and somewhat poorly drained. It occurs on the rims of depressions and on broad low ridges in the flatwoods. The seasonal high water table is at a depth of between 20 and 0 inches for two to six months and recedes to less than 60 inches during prolonged dry periods. Its surface layer is very dark gray fine sand and its subsurface layer is dark gray underlain by very pale brown and light gray fine sand. White fine sand makes up the substratum. Available water capacity is low to moderate. This soil covers 116.4 acres and is scattered across all three areas of the ARCNP. Natural areas of this soil support a growth of longleaf pine, slash pine, and laurel oak, with an understory including saw palmetto and wiregrass.

Haplaquents clayey (Map Unit 51). This soil occupies clay settling areas associated with phosphate mining. It consists of accumulations of fine-textured material (mostly montmorillonitic clay). This soil covers 394.6 acres within Area 1. It is confined in steep dikes, and retains ponds for extended periods unless drained. Natural vegetation typically consists of willow, smartweed, maidencane and cattail. The dikes support oaks, sugarberry, musclewood, beauty-berry, and greenbriar. Although land uses to which clay settling areas can be converted are limited, improved pasture has been established on some clay settling areas in the region.

Smyrna fine sand (Map Units 52). This poorly drained soil is found on broad, low-lying areas of the flatwoods. A seasonal high water table exists from the soil surface to a depth of 10 inches for two or more months, and recedes to depths of 10 to 40 inches for six or more months. It has a surface layer of very dark gray fine sand and a subsurface layer of gray fine sand. The subsoil is dark brown to very dark grayish brown fine sand, below which is a light brownish gray to brown substratum. Permeability is rapid in the surface and subsurface layers and available water capacity is low. This soil, which covers 359.6 acres, occupies large areas of cleared land throughout Areas 2 and 3 of the site. Vegetation on this soil type includes improved pasture and mixed, native herbaceous vegetation. Natural areas typically support a growth of longleaf and slash pine, with an undergrowth including saw palmetto, wiregrass, gallberry, and wax myrtle.

Winder fine sand, frequently flooded (Map Unit 60). This is a soil of the floodplains. It is nearly level and poorly drained. The soil is flooded for very long periods following prolonged intense rain. The seasonal high water table fluctuates from the soil surface to a depth of 10 inches for two to six months. It has a black fine sand surface layer, a grayish brown fine sand subsurface layer, a gray sandy clay loam and white fine sand subsoil (mottled with depth), and a light brownish gray fine sand substratum. Permeability is rapid to the subsurface layer, and slow or very slow in the subsoil layer. Available water capacity is moderate. This is the most widespread soil type within the ARCNP, covering 1189.5 acres. It occupies the floodplain of the North and South Prongs. This soil type is the least impacted on the site. Forested wetlands including red maple, Carolina willow, cabbage palm, and sweetgum, with an undergrowth of buttonbush, maidencane, sawgrass, and sedges, represent the typical natural vegetation associated with this soil type.

Zolfo fine sand (Map Unit 61). This soil type is somewhat poorly drained and exists on low ridges on the flatwoods. The seasonal high water table lies between a depth of 24 and 40 inches for more than two to six months and recedes to 60 inches during prolonged dry periods. This soil has a very dark gray fine sand surface layer and a light gray to grayish brown fine sand subsurface layer. The subsoil consists of dark brown fine sand. Permeability is rapid through the subsurface, and slow or very slow in the subsoil. Available water capacity is moderate. Zolfo fine sand, which covers 286.7 acres, is found all three areas of the ARCNP. Most areas have been cleared and support a native of herbaceous ground cover and bahia grass. Under natural conditions it supports a growth of longleaf pine, slash pine, turkey oak, sand live oak, and live oak, with an undergrowth of broomsedge, bluestem, saw palmetto, and wiregrass.

Water (Map Unit 99). Water is not a classified soil type but rather is an artifact of phosphate mining. Three separate areas collectively covering 20.9 acres are embedded in the very steep Arents and clayey Haplaquents soil areas in Area 1 of the ARCNP.

c. Elevation

Information about elevation in the ARCNP was gathered from aerial photographs provided by SWFWMD and USGS 7.5 minute topographic quadrangles. Because of the strip mining activities which occurred in the past, and the fact that reclamation was not required, relief is greater in the ARCNP than in most other parts of west central Florida. Elevations to the north reach lows between 30 and 40 feet in the Alafia River floodplain. The former clay settling ponds and pits are perched, with elevations in the 60 to 80 foot range. The fastest change in relief occurs at the camp site previously utilized by the Florida Frontiersmen, where a rise of over 30 feet occurs in a distance of only 500 feet. In area 1 elevation changes are also variable, but much more gradual compared to the north, ranging from 50 feet at the edge of Chito Branch to almost 90 feet in the uplands north of Jameson Road.

d. Drainage Basin/Watershed/Hydrology

The Alafia River watershed encompasses 410 square miles. It extends from Interstate 4 south to SR 674, and from 12 miles east of the Hillsborough/Polk county line to Hillsborough Bay. The North and South Prong tributaries drain an area of 277 square miles including the project area (Webb and Weaver, 1987). The Chito Branch of the South Prong drains the southwest portion of the tract. Average annual flow for the South Prong is 70 mgd (SWFWMD, 1988).

Historical phosphate mining affected much of the South Prong's headwaters. However, current mining practices generate runoff that is required to meet Class III waste quality criteria. The North Prong has also been heavily affected by phosphate-mining activities, including mine pits, clay settling ponds, and phosphate processing plants (FDEP 2002). The historic and current water quality of the South Prong (including its mouth) were rated as good. The headwaters historically had fair water quality but current data suggest an improvement. Owens Branch and Mizelle Creek exhibit fair to fair/good water quality respectively (SWFWMD 2001).

In general, water quality is poor due in part to the high concentrations of sulfates, fluorides, and dissolved solids that enter the South Prong south of the ARCNP. Previous phosphate mining

activities on the site have disrupted the natural hydrology of the northern portion of the site including reduction/disruption of sheetflow to the riverine system, alteration of seepage springs, seepage of ponded water through the clay settling area dikes, and altered soil permeability (SWFWMD, 1988).

Trends in the HCEPC water quality data at the mouth of the South Prong show a decrease in chlorophyll a concentrations, a slight and steady decrease in total phosphorus concentrations, an increase in turbidity, and a marked decrease in bacteria after 1980, with little change thereafter. The only notable trend in the upper reaches of the South Prong between 1974 and 1995 was a two-fold decrease in total phosphorus. Bacteria standard non-compliance was less than 12 percent at the mouth, and less than 15 percent at the headwaters (SWFWMD 2001).

In a recent U.S. Environmental Protection Agency assessment, the lower South Prong basin has been identified as a 303(d) listed water for not attaining its designated uses on Florida's 1998 303(d) list for nutrients and dissolved oxygen (USEPA 2009). FDEP's Group 2 Basin Status Report identified coliform and nutrients as potentially impaired parameters on the 1998 303(d) list (FDEP 2002).

The North Prong of the Alafia River has also been heavily impacted by phosphate mining activities, including mine pits, clay settling ponds, and phosphate processing plants. It too has poor water quality due in part to high concentrations of sulfates, fluorides, and dissolved solids that enter the North Prong in upbasin reaches northeast of the ARCNP. The North Prong has had fair to poor water quality and exhibited considerably worse water quality than the South Prong. Samples collected from the North Prong near Mulberry and Nichols were given a fair rating (SWFWMD 2001).

Water quality trends at the mouth of the North Prong include a decrease in chlorophyll a, inorganic nitrogen, and phosphorus concentrations, and an increase in turbidity. Standard non-compliance at the mouth of the North Prong for total coliform bacteria was 18 percent and 8 percent for fecal coliform bacteria (SWFWMD 2001). FDEP's Group 2 Basin Status Report, identified lead as a potentially impaired parameter (based on the 2001 Impaired Surface Waters Rule) (FDEP 2002).

Ground water and soil contamination was reported associated with the Hopewell cattle dip vat, which is located immediately east of the southern lobe of the clay settling area in Area 1. Based on the results of assessments by AT&E and earlier work MRA, soil in two areas near the cattle dip vat has been contaminated with an arsenic-based pesticide. Sampling revealed elevated amounts of arsenic, with one area in particular having concentrations that exceeded FDEP's Restricted II Land Use criteria. Laboratory analysis of soil samples collected near the vat found concentrations of 4,4-DDT and dieldrin (both chlorinated pesticides). Water samples taken from inside the vat detected arsenic. Three monitoring wells (MW-1, MW-2, and MW-3) were installed and ground water samples collected for analysis of arsenic, volatile polynuclear aromatic hydrocarbons, and chlorinated pesticides. Xylenes, 1,3,5-trimethylbenzene, and 1,2,4-trimethylbenzene were detected in one of the wells (MW-2) at concentrations below thresholds

for a Class G-II aquifer. The source of these compounds was reported as unknown (AT&E 1998).

Because the soil near the vat exceeded the Restricted II Land Use criteria, remedial actions will be required in the future. Based on discussions with FDEP, AT&E reported that the State is not presently mandating remediation at cattle dips unless the present or future land use poses risk for exposure that could threaten human health. AT&E recommended that if SWFWMD does not plan to implement remedial activities in the near future, or if there is a change in land use, restriction of public access to the cattle dip vat should be considered, possibly through the use of fencing (AT&E 1998). The two affected areas are now fenced off and are off-limits to the public while awaiting remediation.

Both public and agricultural well pumping is occurring near the project area with most of the public supply wells to the north near the Alafia River. Effects of this on the hydrology of the site have yet to be determined. Observations, by live-on resident Billy Watson (personal communication, 1997), indicate that water levels in the phosphate pits have been steadily decreasing for several years, and water flow in general has decreased throughout the site.

4. History of Changes in Natural Features

There have been major changes in the natural plant communities which were once present on Areas 1, 2, and 3. To the north, the land was strip mined for phosphate in the 1920s and 30s. Much of this mining took place in the flood plain of the Alafia River, although some areas along the river were left intact. Mining was completed by the late 1930s and the land was left to revegetate on its own. The exception to this was ornamental plantings around the various homesites. However, the new contours of the land made natural revegetation difficult. The vegetation along the berms and in the pits returned with less diversity than what was in the original plant communities. In addition, the southern portion of the north parcels was once heavily wooded, but logged and cleared extensively by the 1970s.

In the 1930s, the most heavily wooded areas to the south were located along the riverine tributaries and their floodplains. The uplands were less heavily wooded, with large trees scattered throughout the property. Some areas of xeric soil were very open. There were two wetland marshes located near Jameson Road. One had an open water center. Some clearing has taken place in the southeast corner and the west side of an orange grove. For the next 50 years, uplands to the south became increasingly overgrown. In the early 1990s the owner did extensive land clearing and tree removal in the uplands, leaving scattered pines and converting to improved pasture in many areas. These areas are now managed primarily by fire to encourage the establishment of a more natural community.

5. Cultural Resources

There are five widely accepted categories of cultural resources: 1) archeological resources; 2) historic structures; 3) cultural landscapes; 4) ethnographic resources; and 5) museum collections. In the Alafia River Corridor Preserve, only archaeological resources and historic structures are known to be present. As defined in the National Historic Preservation Act and its implementing regulations in *36 Code of Federal Regulations* (CFR) 800, historic properties are those buildings, sites, districts, artifacts, and remains that are related to culturally important places and events, and that are listed in or eligible for inclusion in the National Register of Historic Places (NRHP). The significance of historic properties is assessed by the property's ability to meet the following four criteria for inclusion in the NRHP (36CFR60.4): (1) association with events that made a substantial contribution to our history; (2) association with the lives of persons important in our past; (3) sites that embody characteristics of a type, period, or methods of construction or that represent the work of a master, possess high artistic value, or represent a distinguishable entity; or (4) have yielded, or may be likely to yield, information important to prehistory or history.

a. Resource Descriptions

An archaeological survey of the Preserve was conducted in 2004, resulting in the documentation of four archaeological sites which are recorded on the Florida Master Site File (Weisman and Collins 2004). Portions of the Preserve remained unsurveyed due to high water conditions at the time of survey. In addition to the field survey, an archaeological resource suitability model encompassing the Preserve was generated, showing areas of high and medium suitability for containing undocumented archaeological sites. The old Seaboard Railway corridor (Hi11335), which bisects the Preserve's north parcel, was recorded as an historical resource during a survey of a nearby property (ACI 2008). None of the archaeological sites are considered by the surveyors as NRHP-eligible.

In order to protect these resources from disturbance, their locations and descriptions are withheld in this report. However, interpretation of the Preserve's cultural resources will be made available to the public through various educational forums including kiosks, signs, and education programs.

b. Management Measures for Cultural Resources

Although the majority of the Preserve will remain undisturbed by development activities, limited construction work has occurred on the property to accommodate public access and passive recreational uses. Prior to the construction of significant ground-disturbing improvements, a Phase I cultural resource assessment of any proposed construction areas within the unsurveyed portion will be conducted prior to any construction-related ground disturbance. Should cultural resources be discovered in the conduct of activities in this or any other portion of the Preserve, the Division of Historical Resources (DHR) will be immediately contacted. Park staff will consult the archaeological suitability model to assess the potential effects of proposed construction activities on undocumented archaeological resources.

The staff coordinates with DHR on the protection and management of archaeological and historical resources. The County typically has at least one staff DHR-certified in Archaeological Resource Management. The management of the archaeological and historic resources will comply with the provisions of Chapter 267, Florida Statutes, specifically Sections 267.061 2(a) and (b). The collection of artifacts or the disturbance of archaeological and historic sites on the project site will be prohibited, unless prior authorization has been obtained from DHR.

The staff also works closely with the local Florida Public Archaeology Network (<http://www.flpublicarchaeology.org/>) to learn more about the protection and interpretation of cultural resources. The only likely impacts to cultural resources would occur through the normal deterioration of the resource from weather and potential vandalism. Best Management Practices (BMPs) for protecting cultural resources should always be followed. These BMPs are detailed in the DHR publication titled *Best Management Practices: an Owner's Guide to Protecting Archaeological Sites* (DHR 2005), which is available online at the following web address: <http://dhr.dos.state.fl.us/archaeology/education/culturalmgmt/Handbook.pdf>.

6. Existing Facilities

a. Roads

There is an existing network of dirt roads throughout the preserve (**Figure 6**). The length of these roads (excluding segments coincident with the horse trails) is 34.13 miles.

b. Creek/River Crossings

A bridge over the Alafia River gives east-west access in the northern part of the preserve. It is located approximately 1/4 mile south of the Knight residence. In addition, there are three creek crossings of Chito Branch in the southern portion of the preserve; however, they can only be utilized in dry weather (**Figure 6**).

c. Access Points

There are several access points to the preserve. In Area 1 there are three access points. Two are designated for use by staff/public with one located on Keysville Road and the other on County Road 39 (**Figure 6**). The other provides access in the phosphate pit area and railroad trestle. In the north-central area there is a private property access point, two locations on Lithia Pinecrest Rd. and one off of Walter Hunter Rd. The Walter Hunter Road location provides very limited access to the preserve. In Area 3 there are also three access points. One is off of Old Welcome Road and two are on Jameson Rd; all can be accessed as walk-through gates for the public.

d. Recreation

There were no developed recreational facilities on the site prior to the initiation of management by HCPRCD, although certain areas were being (and continue to be) used for primitive camping. Since HCPRCD began managing the preserve, hiking and horse trails and group camping areas have been established (**Figure 6**). HCPRCD follows the recreational use policy for nature preserves outlined in **Appendix D**. There are no restroom, shower, or sanitary facilities on the ARCNP.

Fishing – The pits on the south side of the railroad tracks (Area 1) provide opportunity for fishing (**Figure 6**). The only access to the pits is by hiking approximately two miles via the hiking trail. Without vehicle access for boat trailers, shore line fishing is allowed during daylight hours.

Horseback Riding – The horse trail is approximately 13.15 miles in length (**Figure 6**). Watering points are located at each of the river or stream crossings, however some are seasonally dry. Facilities include a trailer entrance and parking area at the end of Old Welcome Road. There is also a walk-through gate at Jameson Road. Horses must be thoroughly broken, properly restrained and prevented from straying unattended. All riders must provide proof of a negative Coggins test.

Camping – Primitive and group camping in Area A north of the CSX railroad tracks is permitted on a reservation basis only (**Figure 6**). Each camp group must present a letter of permission from the Conservation Services Office. As previously mentioned, no restroom or shower facilities are

located at the camping areas or anywhere on the ARCNP. The closest facilities are located at Alderman's Ford Park.

e. Recommendations

The following are recommendations to improve the existing facilities or correct deficiencies. Availability of adequate funding may require the County to prioritize these recommended improvements.

- The creek crossings should be rehabilitated through either the use of rip rap (requirement of permitting) to ensure a solid bottom, or the development of a bridge (contingent upon funding availability).
- The trail system(s) should be clearly demarcated at the public access point. Trails should be clearly marked, and the distances to destinations (e.g., fishing area) be identified. Public roadways, maintenance trails, and firebreaks should be clearly marked on the map and with signage along the appropriate trails. Trail marking is particularly important at intersections between the various trail types.
- The limits of designated fishing areas along the shoreline should be clearly identified so as not to compromise the integrity of the entire shoreline/littoral zone.
- The County should consider making eco-toilets (i.e., composting toilet systems) available for users of the designated camping areas.

7. Legal

a. Management Agreement

The lease agreement between Hillsborough County and the SWFWMD was executed on July 31, 1996. The lease enabled the County to manage the ARCNP for the purpose of management and restoration of wildlife habitat, as well as the development of resource-based recreational facilities. The lease runs for 30 years with an option to renew for an additional 30 years. See **Appendix E** for details.

b. Easements/Right-of-Ways

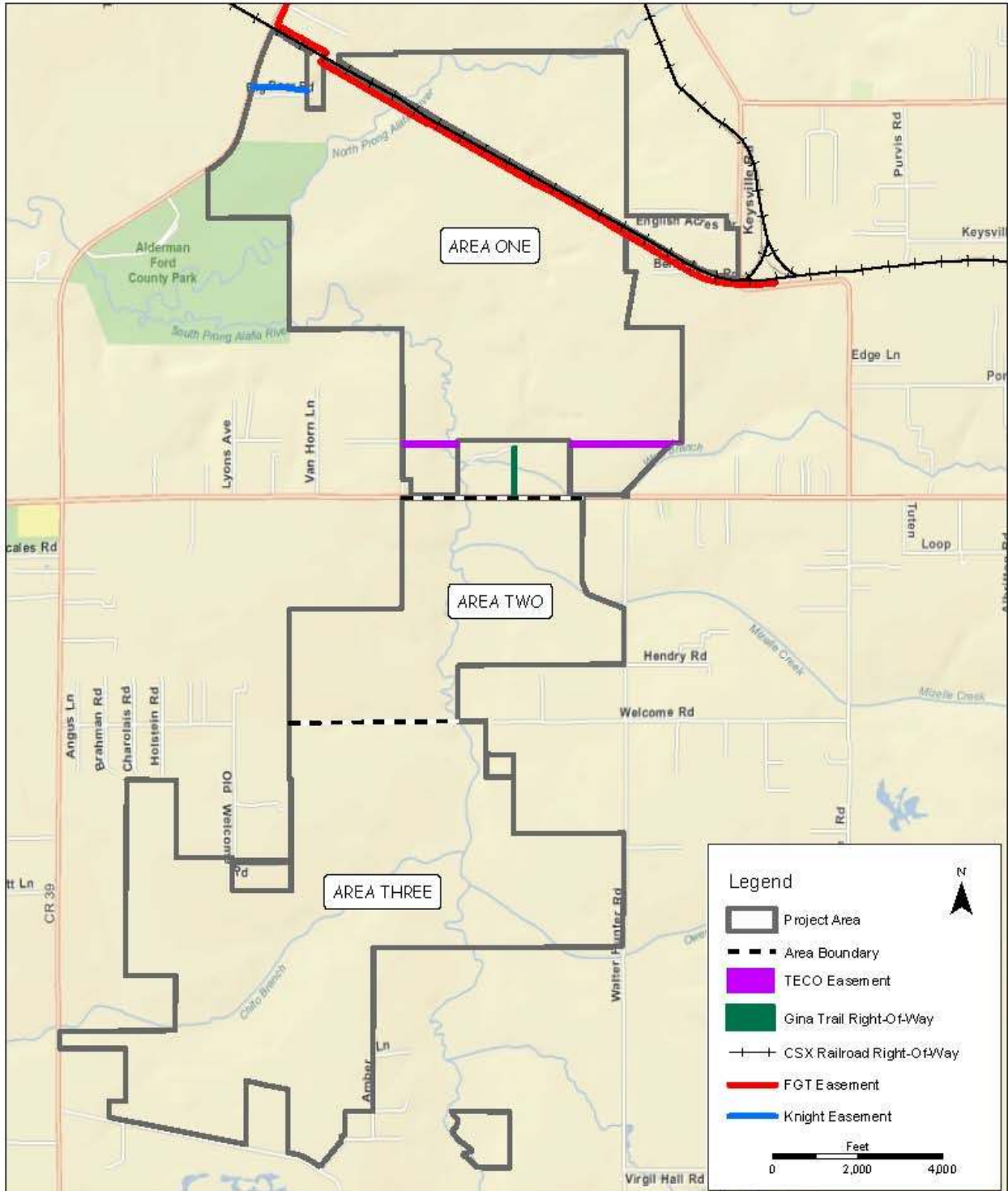
The following is a summary of easements and right-of-ways in the ARCNP:

- A Tampa Electric Company (TECO) powerline easement runs in an east-west direction through the access easement leading into the south side of Area 1.
- The Knight family has an access easement through the northern portion of the ARCNP from Highway 39 east to their property and residence.
- The CSX railroad right-of-way creates a diagonal slash from the northwest corner to the southeast corner of Area 1.
- SWFWMD holds an easement along Gina Trail extending north from the north boundary of Area 2 to the TECO easement immediately south of Area 1.
- Florida Gas Transmission (FGT) entered into a non-exclusive agreement with SWFWMD for a 50-foot wide corridor (encompassing 9.427 ac.) along the south edge of the CSX right-of-way for natural gas pipeline construction (part of FGT's proposed Phase VIII Expansion) and additional areas for temporary staging (7.984 ac.).

These easements and rights-of-way are shown on **Figure 7**.

c. Proposed Leases

There are areas in the southern portion of the ARCNP in which cattle and hay leases will be initiated. The exact locations have not been determined as yet. HCPRCD has discussed these leasing options with the water management district and they have been very supportive in the past.



Alafia River Corridor
Easements and Rights-of-Way

Figure 7

8. Administration and Coordination

The preserve is administered by the Conservation Services Office of the Hillsborough County Parks, Recreation and Conservation Department. The Environmental Lands Acquisition and Protection Program as a whole is administered by the Parks, Recreation and Conservation Department (<http://www.hillsboroughcounty.org/parks/conservationservices/>). The County is assisted with various management functions by the following agencies on an as-needed basis:

Security - Hillsborough County currently has two Sheriff's deputies assigned to handle issues with parks and nature preserves. Other Sheriff's Department divisions are contacted for problems such as agriculture (stray agricultural animals) and environmental (illegal dumping).

Prescribed burns - Florida Division of Forestry (FDOF) and the County's contractor are primary contacts.

Tree planting, fencing - Youth Environmental Services (YES) of Wimauma or volunteer organizations.

Arson - Florida Department of Agriculture and Consumer Services.

Compliance with management agreement – The Southwest Florida Water Management District, Brooksville, Florida makes periodic inspections of the Preserve to ascertain compliance with the agreement.

9. Site Security

One of the primary objectives in protecting the ARCNP is to prevent unauthorized activities such as poaching, target shooting, and illegal entry by vehicles. In order to continue protecting the parcel, HCPRCD has constructed and maintained perimeter fences, and repaired existing fences. Gates are replaced on an as-needed basis. The perimeter is posted with signs in accordance with State of Florida Statutes, but needs updated ordinance numbers.

a. Live-on

HCPRCD has a security agreement with William A. Watson, specifically for the ARCNP (**Appendix F**). Mr. Watson's duties include perimeter surveillance, reports of illegal activities, signing checks, interior patrol, and wildlife observation. Security residents are required to keep a log and submit reports if there have been any significant occurrences, or necessary follow up action.

b. Law Enforcement

The County or site security resident may call on law enforcement agencies such as the Sheriff's Department or the Florida Fish and Wildlife Conservation Commission for additional law enforcement when needed. Both agencies patrol the Preserve at unannounced times, particularly during hunting season, to assist with law enforcement.

c. Recommendations

Given the large size of the ARCNP, it is recommended that a second security residence be established somewhere in the southern portion of the preserve, in the vicinity of the horse trailer parking on Old Welcome Road.

10. Resource Management Strategies

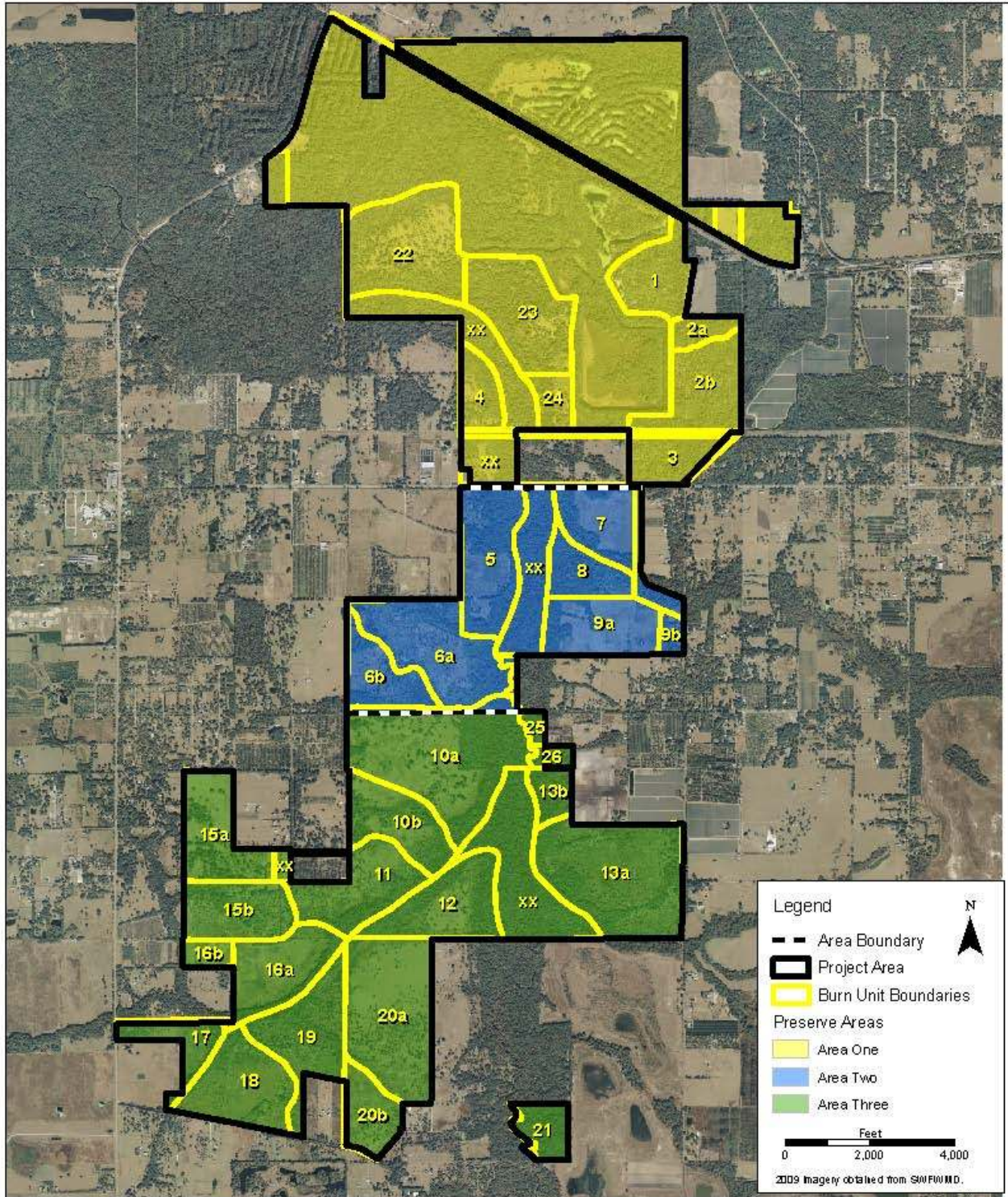
a. Prescribed Burning

The ARCNP has been divided into 26 burn units, with eight of the units further partitioned into subunits. **Figure 8** provides boundaries of and designations for, the burn units across the preserve. There have been eight prescribed burns, with most of them concentrating on remnant sandhill/scrub and flatwoods areas located south of CR 640. The northern portion of the Preserve has been so severely impacted by phosphate mining in the distant past that it is, for the most part, impractical to attempt to burn the vast majority of this area, due to hydrological perturbation, terrain alteration and inaccessibility, vegetation structural changes (i.e., overgrowth of hardwoods on steep/tall tailing mounds and artificially-created depressions). Since very little of the Preserve remains in an undisturbed or natural state, with over 90 percent of the upland communities being converted to semi-improved pasture prior to acquisition, most of the burns have been for fuel reduction in the wildland/urban interface and maintaining open areas for wildlife forage, especially gopher tortoises.

At least five arson-related wildfires have impacted the Preserve, with County staff assisting the Florida Division of Forestry and Hillsborough County Fire Rescue with containment and mop-up operations. On several of these wildfires, the incident commander determined that the prudent course of action, both for public safety and from an ecological standpoint, would be for a “prescribed burn-out” to take place. These prescribed burns totaled approximately 450 acres of uplands.

A major problem that the County has faced in the past ten years has been increasing development adjacent to the preserve. New owners have purchased five to ten acre tracts of land and in many cases brought in animals that are sensitive to smoke and/or fire in close proximity. This has limited the wind direction for the various units, which, in turn, reduced the number of available burning days and restricted the season(s) where burning is possible.

The County should prioritize prescribed burns in the sandhill and oak scrub communities, in order to promote open habitat and manage for listed species such as gopher tortoises. Some examples of these are burn units are #2b, 4, 6a, 12, 10a and the as-yet numbered “cedar field” located in the southeastern quadrant of S-T-R 17-30-22, continuing down into the northeastern corner of S-T-R 20-30-22.



Alafia River Corridor
Burn Units

Figure 8

A secondary objective, but no less important, is to keep open grassy areas free from encroachment by shrubs until funds become available for restoration. This can be accomplished through a combination of burning, mowing and grazing leases. These areas are currently supporting some of the larger populations of gopher tortoises found in the preserve and are vital for the continued health of the surviving indigenous population of tortoises in this part of the county and state.

Control and suppression of exotic invasive pest plants (cogongrass, skunk vine, air potato, etc.) in these areas must be included with the prescribed fire program.

In March of 2009, HCPRCD contracted with Eco-Logic Restoration Services, LLC, to provide prescribed fire services. The HCPRCD established specific burn units with the objectives of improved wildlife habitat, plant community restoration, access for recreational trail development, invasive exotic plant control, and other management activities. Staff follows the procedures outlined in **Appendix G**.

b. Invasive Exotic Plant Control

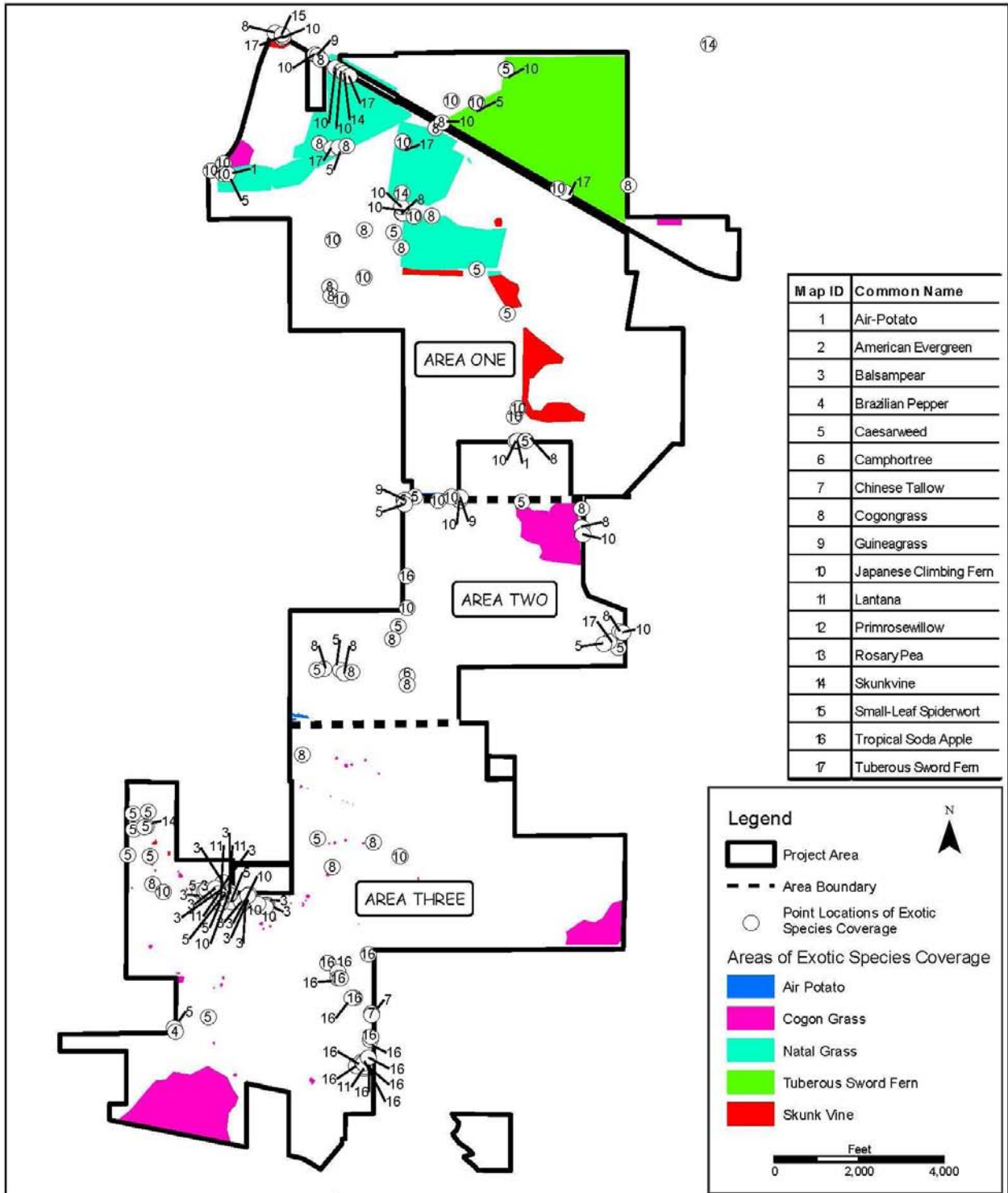
Exotic plant invasion is extensive in some areas due to disturbance by phosphate mining, cattle grazing, and human activities. **Figure 9** shows the reported occurrence of invasive exotic plants within the ARCNP. The majority of invasive plants occur around old phosphate pits and berms, and on former homesites. The Southern portion of the ARCNP is impacted by one invasive species, tropical soda apple, which is commonly spread by cattle and other animals (especially wild hogs) when the fruit is ingested.

The HCPRCD approach at ARCNP is to control the core populations in the least disturbed areas first, to prevent further spread. Other control activities may take precedence, however, due to the urgency of timing the removal of fruit and seed. Because of the extensive nature of the vine and fern infestations in the heavily mined areas to the north, control of these invasive exotic plants will be secondary and efforts to eradicate them will depend on any future plans for restoration of these areas. Presently, some of these plants (i.e., *Nephrolepis* sp. ferns) may serve to stabilize the steep slopes and prevent erosion of the berm roads.

Major invasive exotic plants established on the property include:

--Tropical soda apple (*Solanum viarum*) - Some infestations had been observed where cattle grazing had occurred. Populations were usually clustered beneath large oak trees (shady areas) with some outlying plants scattered elsewhere on the property. Students from YES have collected and bagged the fruit in the past to remove the seed source. After fruit removal, the plants were mowed and sprayed by staff. Staff spent the better part of four years (2001-2004) eradicating TSA whenever time would allow in the preserve and the invasive is now in maintenance phase, with only periodic spraying episodes necessary to keep in check.

--Cogongrass (*Imperata cylindrica*) - Numerous small infestations have occurred on the north and south parcels in the past, mainly adjacent to fence lines and structures. Under ideal conditions, staff annually initiate prescription burns or mow infestations six to eight weeks prior



Alafia River Corridor
Exotic Species

Figure 9

to chemical treatment. Staff has enlisted the services of University of Florida experts on the eradication of this species because of the potential devastating effects this species can have on native plant populations and restoration activities. Glyphosate alone or mixed with Plateau/Arsenal are generally applied in late summer or early fall. This procedure, in conjunction with burning and discing activities, were the recommendations from these experts, and the present methodology that staff have instituted to combat this dangerous grass. This species was also treated during the Suncoast working group visits by Southeast Chemtreat in 2001-2003 and is now in maintenance phase, with only annual spraying events necessary to keep this invasive under control. .

--Skunkvine (*Paederia foetida*) - Most of the populations are isolated within the old pit/berm areas on the north parcel, but outlying infestations could also be present along creek and river corridors in both north and south parcels. Small infestations found outside of the pit/berm areas will be hand-pulled and chemically sprayed or just sprayed with glyphosate, depending on the size of the population and the time of year. The population located in the forested, central portion of Area 1 has been visited on three consecutive occasions (2001-2003) by the same contractor, hired through the use of funding from the DEP (now FWC) Suncoast working group annual grant program. The infestation was knocked back considerably for years by these visits but has subsequently re-infested the forested area. The magnitude of the infestation is too large for County personnel to tackle with current staffing levels. This area will be left alone until plans for restoration of the pits/mined area are finalized. The remainder of the ARC is in maintenance phase for this species, and is often treated at the same time as the annual TSA and cogon grass spraying events.

--Japanese climbing fern (*Lygodium japonicum*) - This vine grows independently or intermingled with skunkvine and is found covering the ground and climbing into trees in the same areas. This is another species that was targeted for herbicide treatment by the Suncoast working group funding of 2001-2003 and is presently in maintenance phase. It is sprayed at the same time and identical manner to skunkvine. The vine is targeted to become part of a field experiment later in 2010 to test a *Lygodium* moth as potential biological control in central Florida.

--Water hyacinth (*Eichhornia crassipes*) and water lettuce (*Pistia stratiotes*) - These aquatic pest plants are present in at least one of the pit ponds in the northern mined portion of the property. The Hillsborough County Mosquito Control Unit of the Roadway Maintenance Division has been responsible in the past for treating aquatic pests and mosquito breeding areas such as these. Once restoration plans are finalized for the mined areas, a more aggressive treatment plan will be instituted for this species.

Chinese tallow (*Sapium sebiferum*) - Several trees of this very invasive pest were found growing on one of the old homesites in the north parcel. A seedling was pulled out by staff on the South parcel. These trees will be basal-bark treated with herbicides as they are encountered during visits to the north parcels and are presently under control.

--Air potato (*Dioscorea bulbifera*) and air yam (*Dioscorea alata*) - These vines are known to be near an old homesite to the north and in some of the old pit/berms. Glyphosate is routinely be

sprayed on the vines during the late summer to early fall or whenever they are encountered. This species is currently being controlled in the Preserve.

--Old World Climbing Fern (*Lygodium microphyllum*) – This invasive exotic vine surrounds at least one of the ‘pit-lakes’ just south of the CSX railroad tracks. Its habit is to climb into trees and shade out the native vegetation. It can also be a fire hazard, frequently enabling small ground fires to reach into the tree canopies and kill off growing branches.

--Strawberry Guava (*Psidium cattleianum*) – This Brazilian exotic evergreen shrub or small tree is present in the mined areas. It forms thickets and shades out native vegetation in forests and open woodlands and is a major host for the naturalized Caribbean fruit fly, which occasionally spreads to commercial citrus crops.

Two old homesites on the northern portion of the ARCNP host a wide variety of scattered exotic plants which are potentially invasive. These include Indian rosewood (*Dalbergia sissoo*), golden raintree (*Koelreuteria elegans*), hearts-of-flame (*Bromelia* sp.), rice-paper plant (*Tetrapanax papyriferus*), *Clerodendron* sp., John Charles mint (*Hyptis verticillata*), chinaberry (*Melia azedarach*), elephant’s-ear (*Colocasia esculentum*), arrowhead vine (*Syngonium* sp.), *Wedelia trilobata*, sword fern (*Nephrolepis cordifolia*), and others. Except for sword fern, none of these species pose an immediate threat of infestation to the ARC. All of these species, except sword fern which is located for the most part in the pits/berm areas, are eradicated as they are encountered during routine spraying events in the Preserve and are presently under control.

c. Exotic Wildlife Control

In order to provide quality habitat and to meet management goals for this area, any exotic wildlife that threatens a population of native wildlife or threatens the successful establishment or function of a natural system should be removed from the Preserve. Currently, feral hogs (*Sus scrofa*) are the only known exotic/naturalized wildlife species that poses a problem to the site. Feral hogs spread invasive exotic plants (Tropical Soda Apple and others), decrease the success of restoration efforts, and alter understory vegetation in a variety of habitats. Feral hogs have been well documented to cause severe damage to natural plant communities through their rooting activities and can be aggressive toward humans (Engeman, 2004; Giuliano and Tanner, 2005) and are known to spread disease (Davis, Donald S., n.d.). Staff, upon monitoring their activity in the Preserve, has observed numerous problems. As a result, the County has hired contractors to control feral hog populations in preserves, including the ARCNP.

The Mexican weevil (*Metamasius callizona*) poses a major threat to the giant airplant (*Tillandsia utriculata*). The Conservation Services staff is collaborating with Dr. Teresa Cooper (University of Florida) to document infestations. A number of infestations have been documented in the vicinity of the preserve, and it is likely they are in the preserve. Additional studies are recommended.

11. Wildlife Assessment: Existing Populations and Management Strategies

Appendix H provides a list of observed wildlife based on incidental observations by live-on site security resident, HCPRCD staff, non-profit organizations, and the public. Table 1 provides a list of protected species observed on site. **Appendix I** provides a blank copy of the Florida Natural Areas Inventory Documentation Form.

Table 1. Existing populations of listed wildlife species in the ARCNP.

Common Name	Scientific Name	GFC	USFWS	Comments
Gopher tortoise	<i>Gopherus polyphemus</i>	T	C2	
Eastern indigo snake	<i>Drymarchon c. couperi</i>	T	T	
American alligator	<i>Alligator mississippiensis</i>	SSC	T(S/A)	
Florida sandhill crane	<i>Grus canadensis pratensis</i>	T		No known nesting habitat. Observed foraging on site.
Southeastern American kestrel	<i>Falco sparverius paulus</i>	T	C2	
Snowy egret	<i>Egretta thula</i>	SSC		
White ibis	<i>Eudocymus albus</i>	SSC		
Little blue heron	<i>Egretta caerulea</i>	SSC		
Tricolored heron	<i>Egretta tricolor</i>	SSC		
Wood stork	<i>Mycteria americana</i>	E	E	Unconfirmed nesting on site. Seen roosting on site.
Burrowing owl	<i>Athene cunicularia</i>	SSC		Using abandoned gopher tortoise burrow at the old Alafia Rendezvous site off of Jameson Road
Sherman's fox squirrel	<i>Sciurus niger shermani</i>	SSC	C2	On site
Florida black bear	<i>Ursus americanus floridanus</i>	T	C2	Not seen on site since 1975

Florida Fish and Wildlife Conservation Commission:

E = Endangered; T = Threatened; SSC = Species of Special Concern

United States Fish and Wildlife Service:

C2 = A candidate for listing, with some evidence of vulnerability, but for which not enough data exists to support listing.

T(S/A) = Threatened due to similarity of appearance.

a. Listed Species Management

There are at least 11 listed species of wildlife known to inhabit the project area in recent years. To date, all documentation of wildlife occurrences was obtained through incidental sightings by the live-on security resident, HCPRCD staff, non-profit organizations, and the public. More extensive wildlife data, including species occurrence and habitat use, should be obtained for the preserve to assist in the overall management strategies employed on site.

Gopher Tortoise (*Gopherus polyphemus*-T) – Gopher tortoises occupy a wide range of upland habitat types. They need well-drained, sandy soil in which to dig their burrows, an abundance of herbaceous ground cover for foraging, and an area of open canopy and sparse shrub cover that allows sunlight to reach the ground for proper egg incubation. A future survey to determine current numbers and population sizes is recommended. These data would assist in the determination to see if tortoises could be relocated to the site and potentially serve as a tortoise mitigation bank. The determination of whether and how to relocate will follow the existing policy outlined in **Appendix J**. The best tortoise habitat - the more xeric soils (Adamsville, Candler, Fort Meade, Lake, Orsino, Pomello, Seffner, and Zolfo soils) - consist of small patches that occur in a matrix of flatwoods soils. These patches of xeric soils range in size from less than an acre to nearly 90 acres and averaging 15 acres. Thirty-three of the 43 xeric soil areas on the ARCNP cover less than 20 acres and are probably too small and fragmented to support viable populations of gopher tortoise. However, in the context of the large expanses of mesic soils, there may be future potential as a recipient site. Many of the county's other preserves (e.g. Golden Aster, Balm-Boyette) are perhaps better recipient sites, however, the county reserves the right to evaluate the Alafia River Corridor site's potential as a recipient site in the future. An evaluation will be conducted of suitability of ARCNP as a potential recipient site. Any tortoise relocations done on this site must follow the FFWCC's *Gopher Tortoise Permitting Guidelines* (FFWCC 2010).

Eastern Indigo snake (*Drymarchon c. couperi*-T) – Eastern Indigo snakes are found in a variety of habitats, and utilize gopher tortoise burrows extensively. They require large tracts of suitable habitat. Eastern Indigo snakes have been observed on site; however there is no data relative to population numbers. Site security will continue in order to prevent illegal practices such as “Gopher gassing” and collecting of the snakes.

Other listed wildlife species that may be found on site, some of which are gopher tortoise burrow associates, include:

Florida Pine Snake (*Pituophis melanoleucus mugitus*-SSC) – seem to prefer pocket gopher burrows, but utilize tortoise burrows (Franz, 1986).

Gopher frog (*Rana areolata*) – utilizes gopher burrows and breed in shallow grassy ponds. Many of the flatwoods ponds are ideal for breeding gopher frogs. Gopher frog surveys are advisable.

Florida Mouse (*Podomys floridanus*-SSC) – are also frequent inhabitants of gopher tortoise burrows. They can be distinguished definitively from the more common cotton mouse (*Peromyscus gossypinus*) by the number of planar tubercles on their hind foot (six vs. five).

Short-tailed snakes (*Stilosoma extenuatum*-T) – are known to use tortoise burrows and occupy the same habitats including scrub and sandhills (Highton, 1976). None have been documented on site, to date.

Florida Sandhill Crane (*Grus canadensis pratensis*-T) – Florida sandhill cranes prefer wet prairies, marshy lake margins, low lying improved cattle pastures, sparsely vegetated marshes, and shallow flooded open areas. They usually nest in the shallow water of lakes, ponds, and open marshes that contain pickerelweed. They have been observed foraging in the Southern portions of the ARCNP, but no known nesting habitat is found on site.

American Alligator (*Alligator mississippiensis*-TS/A) – American alligators inhabit freshwater lakes, ponds, and rivers. The alligators on site are most frequently found in the phosphate pits. Here they are beneficial to the heron rookery by preying upon the raccoons and other predators trying to make their way to the island. Frequent security patrols will help deter poaching of the alligators.

Snowy Egret (*Egretta thula* - SSC), Little Blue Heron (*Egretta caerulea*-SSC), White Ibis (*Eudocymus albus*-SSC), Tricolored Heron (*Egretta tricolor*-SSC), Green Heron (*Butorides striatus*-not listed), Black-crowned Night Heron (*Nycticorax nycticorax*-not listed), Wood Stork (*Mycteria americana*-E), and Cattle Egret (*Bubulcus ibis* – not listed) – all breed and forage in marshes and in and along riverine systems. All have been documented using the heron rookery on the island in the phosphate pit for one or more months between 1998 and 2008.

Southeastern American Kestrel (*Falco sparverius paulus*-T) – The Southeastern American Kestrel has a variety of specific habitat requirements including: cavity nest sites, perches, and open foraging habitat. Although kestrels can be found throughout the ARCNP, the southern portion provides more favorable kestrel habitat. A burn rotation of two to three years should be adopted for the open areas, in order to maintain foraging habitat.

Wood Stork (*Mycteria americana*-E) – Wood storks use freshwater and estuarine wetlands for feeding, nesting, and roosting. Almost any shallow wetland depression where fish tend to become concentrated may be used by storks. A major reason for the wood stork decline has been the loss and degradation of their feeding habitat which reflects their “Endangered” listing by FFWCC and the USFWS. Currently, it is not confirmed that wood storks are nesting on site, but they have been seen roosting in the heron rookery between 1998 and 2001. This rookery has been and will continue to be monitored yearly by Audubon and/or County staff to determine if the wood stork is nesting. If they do nest, necessary restrictions of adequate distance from the nests will be enforced to ensure proper protection to the nesting storks and young.

Burrowing Owl (*Athene cunicularia*-SSC) – Burrowing owls live in burrows in the ground in treeless grassy/pasture areas. They prefer habitat with a sandy soil type such as sandhill. Burrowing owls on site are thought to inhabit a vacant gopher tortoise burrow within the former

Alafia River Rendezvous site (Arents, nearly level soil type). Surveys are recommended to determine the number of burrows on site. Vegetation should be kept open in the immediate vicinity of the burrow, and can be accomplished through periodic mowing. If necessary, a “T” perch will be placed by their burrows. Restoration activities should result in improved habitat for the owls.

Sherman’s Fox Squirrel (*Sciurus niger shermani*-SSC) – Sherman’s fox squirrels prefer mixed oak/pine forests with a relatively open understory. The ARCNP has good potential for fox squirrel habitat and individuals have been observed. Reestablishment of pines and sandhill type community would improve the quality of habitat for the Shermans’ fox squirrel.

Florida Black Bear (*Ursus americanus floridanus*-T) – The last known Florida black bear sighting in the area occurred in 1975 (B. Watson, personal communication, 1997). It is now unlikely that habitat of adequate size exists in the project and surrounding areas to support black bears.

A total of 14 species of listed plants occur on site. A plant list is maintained by the HCPRCD. All the plants shown below are listed by the Florida Department of Agriculture and Consumer Services as either threatened (T), endangered (E), or commercially exploited (C) (Coile and Garland, 2003).

Table 2. Listed plant species occurring in the ARCNP.

Name	Status	Habitat	Management Strategy*
<i>Encyclia tampensis</i> , butterfly orchid	C	riverine floodplain	1
<i>Epidendrom conopseum</i> , greenfly orchid	C	riverine floodplain	1
<i>Eulophia alta</i> , wild coco	T	wet, open areas	1, 2, 3
<i>Harrisella porrecta</i> , needleroot airplant	T	swamps	1
<i>Gonolobus suberosus</i> , angularfruit milkvine	T	hammocks	1
<i>Matelea pubiflora</i> , sandill spiny pod	E	sandhill	1
<i>Osmunda cinnamomea</i> , cinnamon fern	C	moist areas	1, 2
<i>Osmunda regalis</i> , royal fern	C	moist areas	1, 2
<i>Pecluma dispersa</i> , widespread polypody	E	dry open hammocks	1
<i>Pecluma ptilodon</i> var. <i>bourgeauana</i> , comb polypody	E	riverine floodplain	1
<i>Pteroglossapsis ecristata</i> , giant orchid	T	open fields	2
<i>Rhapidophyllum hystrix</i> , needle palm	C	riverine floodplain	1, 2
<i>Sacoila lanceolata</i> , leafless beaked ladiestresses	T	moist areas	1
<i>Tillandsia utriculata</i> , giant airplant	E	hammocks and swamps	1

* Management Strategy

1. Protect from poaching
2. Plan placement of trails and firelanes, protect from invasive exotic plants and feral hogs
3. Protect from shading.

** Expected but not observed

b. Protection of Bird Rookeries

Two Great blue heron nesting colonies and one heron rookery are found on the northern portion of the ARCNP. The Great blue heron colonies are located south of the railroad tracks, near the North Prong which runs through the middle of the northern portion of the tract. These colonies are nesting in cypress trees located in the flood plain. In the mid to late 1990s the larger of the two colonies contained approximately 80 to 90 nesting pairs of Great blue herons. Current numbers are not available. The heron rookery is located within hardwoods on an island in a phosphate pit north of the railroad tracks. This rookery contains, but is not limited to, Great egrets, Snowy egrets, Cattle egrets, Little blue herons, White ibis, Anhingas, Double-crested cormorants, Black-crowned night heron, Tricolored heron, and Wood storks.

The heron rookery, located on an island in a phosphate pit, is significant because it is completely surrounded by water. This limits predation and provides isolation from disturbance. Although alligators are present, and may dine on an occasional juvenile bird that falls into the water, they do not cause many problems for the colony. They actually help deter the raccoons and other predators from reaching the island. Information passed on from the live-on security resident suggests that the water levels in the pits are dropping in part due to pumping at nearby wells. Audubon of Florida, Florida Coastal Islands Sanctuaries, has conducted annual surveys of this site beginning in June 1998, although no surveys were completed in 2005 or 2009. Surveys in April 2002, May 2003, May 2007 and June 2010 found the rookery abandoned apparently due to low water. . The endangered Wood Stork was common in the rookery from 1998 through 2001 but have not returned since the 2002/2003 dry period when no birds used the rookery.

A colony is usually a small site where a large number of birds nest making it extremely vulnerable to disturbance by humans, dogs, and natural predators. During the nesting season (March through July) minimum access to the colony should be 100 to 150 feet away (R. Paul, personal communication, 1997). The current distance from the island to the main land is 100 to 150 feet.

Protection of bird rookeries falls under the Migratory Bird Treaty Act of 1918 (16 U.S.C. 703-712). The County also has the option of requesting in writing to have the colony designated by the FFWCC as a bird sanctuary under Rule 68A-19.002 (FAC).

12. Restoration

a. Facilities Maintenance

Fence Removal. There are numerous internal barbed wire fences, formerly used to divide cattle into different pastures. Since the cattle lease has been terminated, and because the fencing obstructs other activities such as prescribed burning and recreation, much of the fencing to the north parcel was removed by the previous owner as a requirement of the sale. Remaining fencing has been removed and recycled by YES with assistance from HCPRCD.

Structural Removal. All structures determined to be unnecessary to the north were removed by the previous owners. To the south there were some remaining cow pens which have been removed.

Structural Repair. One or more of the bridges may be in need of structural report now or in the foreseeable future.

Erosion. Soil erosion is a moderately serious problem in the ARCNP because of the steepness of the slopes in the old phosphate pits and the lack of understory vegetation on those slopes (Area 1) or horse crossings in creek crossing (Area 1) which have washed out. Some of the roads, including portions of the hiking trail and service roads have eroded to the point where it is becoming dangerous to drive on them.

HCPRCD will create and maintain a list of erosion problems in this preserve, and create a plan, including a budget if necessary, to stop or prevent the problem. Unsafe areas will be closed until further notice.

b. Habitat Restoration

Uplands. Most of the upland areas were cleared, dredged, or altered in some way in the past. All of the upland areas have some components of the original plant communities. In some areas for example, there is a mature tree canopy, but mid-level and understory shrubs and groundcover is lacking. In other areas much of the tree canopy and understory has been removed. In certain areas, a shrub and groundcover layer is returning. In other areas, however, the groundcover is dominated by bahia grass and dog fennel.

For those areas of upland where native canopy, mid-storey, and ground cover continues to persist efforts for habitat restoration will be focused on returning the species composition of the plant community and relative abundances of the various native species to conditions characteristically seen in habitats subjected to frequent, growing season burns. Hardwood encroachment is a critical issue affecting restoration/enhancement efforts. In areas where hardwood infestations are relatively light it may be possible to accomplish this goal simply by increasing the frequency of prescribed burns conducted during the growing season. For those areas where hardwood infestations are more severe (e.g., in burn unit 13a), it may be necessary to first reduce the overall density of hardwoods before the frequency of growing season fires can be increased.

The majority of intact, unmined upland soils on this preserve supported cattle pastures and row crops at the time of acquisition. Subsequent to acquisition cattle were removed from the site and row crop areas were allowed to go fallow. As a result, these once relatively open areas now have a ground cover of Bahia grass and support stands of opportunistic woody shrubs and young hardwood trees that likely will increase in density over time if left unchecked. The overall goal for the restoration of the former row crop fields and cattle pastures will be to establish native herbaceous ground cover so these areas can be subsequently harvested for seed which in turn will be used for restoration of other disturbed ELAPP lands. To accomplish this restoration goal the existing shrub layer will have to be removed, either by a substantial increase in the frequency of growing season fires, or by mechanical means such as with mulching mowers or a hydroaxe. The Bahia grass ground cover also will have to be removed, either by the repeated application of herbicides, or possibly by harvesting the grass as sod.

Following removal of the shrub and exotic grass layers, fields will be seeded with native herbaceous species. The material used either will be harvested from other ELAPP preserves, or purchased from seed vendors. The species composition of what is seeded on any particular pasture will be determined based on the perceived long-term need of future restoration projects.

It is highly unlikely that there will be sufficient amounts of native seed to attempt simultaneous restoration of all abandoned row crop fields and pastures. Even if sufficient seed were to be available, attempting to restore all pastures and fields at once would not be a judicious use of limited financial resources because of circumstances beyond human control, such as a severe and prolonged drought. A more prudent approach will be for Conservation Services to hedge its bet by planning for the restoration of these areas over a time span of several years. By sequencing restoration of pastures and fields over several years Conservation Services may preclude a catastrophic financial loss which could result if all areas are seeded at once and there then followed a single calamitous event leading to a preserve-wide failure of the restoration project. Scheduling restoration of the fields over several years also presents Conservation Services with opportunities to adjust the species composition of individual pastures in order to take into account changes in restoration needs.

Some sandhill enhancement was begun approximately five years ago, when SWFWMD hydroaxed 50 acres of hardwood and sand pine in burn unit 2b. This restoration will be followed up with the application of prescribed fire – which has been recently attempted twice, but thwarted by weather on both occasions. Prescribed burns will be attempted again within the next calendar year. Some additional work, such as herbicidal treatment, may be required.

The potential for timbering on the ARCNP is low. Timber interests have lobbied SWFWMD in the past to provide timbering opportunities on its landholdings. Timbering has its pros and cons.

The benefits of selective harvesting of pines is that it can reduce the effects of fire suppression while generating revenue for management. This is provided that the timber removed has some commercial value. This should be conducted under the supervision of an ecologist to ensure that the proposed canopy density is consistent with the ecological management objectives for the area to be harvested.

On the other hand, harvesting of pines necessitates the use of heavy equipment for timber cutting and removal. This has two potential negatives. The timbering operation can impact the site's microtopography and expose soils that are highly susceptible to recruitment from potentially undesirable species, including nuisance exotic pioneer species. These impacts can be minimized by removing timber when conditions are dry, maximizing the use of existing trails/firebreaks, NS making sure that all equipment that enters the site is washed sufficiently to ensure that no undesirable seed sources are introduced into the timbered areas or the site.

A timber assessment will be needed prior to establishing any timber harvesting arrangements.

Wetlands. Unlike the uplands, the natural wetlands on ARCNP have not been altered or degraded to a significant degree or extent. Substantial areas of wetland were of course destroyed by phosphate mining in the early 20th century, and while the natural wetlands probably do not closely resemble their predevelopment conditions, subsequent land conversion (with the notable exception of phosphate mining) and drainage activities have not adversely affected a substantial portion of the on-site wetlands. Currently, HCPRCED has no plans for the restoration of wetlands on the site.

Surface-Mined Areas. At present HCPRCD has no specific plans for the restoration of either the deep pits or adjacent steeply-sloped spoil piles which are the vestiges of previous surface mining for phosphatic ores. HCPRCD recognizes, however, that the dense hardwood canopy covering most of the spoil piles is of little value for many upland-dwelling fire dependent floral and faunal species. These mined areas also may pose serious challenges to the overall quality of surrounding natural habitats because the mined lands currently support significant populations of exotic invasive plant species which can infest surrounding natural habitats. If funding becomes available, HCPRCD will seek the services of qualified professionals to assess the feasibility of restoration projects that could alleviate the magnitude of the problems posed by these mined lands.

13. Additional Acquisitions

Several additional parcels abutting the ARCNP on all sides have been approved for acquisition (Figure 2). These include the Alafia South Prong acquisition (1,158 ac.) to the south and east, the Alderman's Ford acquisition (1,323 ac.) to the west (including the parcel sandwiched between Areas 1 and 2 north of CR 640), and the Alafia North Prong acquisition (3,189 ac.) to the northeast. Should all the parcels eventually be purchased, their collective acreage would expand the ARCNP by 5,670 acres, increased of about 140 percent its current size.

14. Funding – Management Budget

Hillsborough County has a centralized management operation for all natural preserve lands in the County which have been acquired through the ELAPP program. With the exception of capital improvements, such as fencing, road construction, security residences, etc., site management expenses are not budgeted on a site specific basis. The program is funded to cover capital equipment, personnel, and operating expenses for the Conservation Services team of the HCPRCD, which is the County agency primarily responsible for ELAPP site management.

The Conservation Services team currently consists of 24 full time employees and two permanent part time employees. Funding for the Preserve comes from the Countywide General Fund which must be re-submitted every two years.

In past years, the Conservation Services section budget primarily derived from the revenue set aside for the ELAP Program by the 1990 voter approved referenda. Conservation Services current, Fiscal Year 2010 Budget, comes from the Countywide General Fund. A new Ordinance (08-16) to extend the program was approved at a referendum by a majority vote of the electorate on November 4, 2008 (**Appendix A**). This Ordinance allows for bond proceeds to be expended to finance capital projects relating to the acquisition, preservation, protection, management and restoration of environmentally sensitive lands. The current revenue structure does not generate sufficient funding to fully support the current management program, and recent budget cuts have further exacerbated the lack of management and operational funding. Additional funds for personnel are provided by the Phosphate Severance Taxes, since some other ELAPP lands acquired to date have been mined for phosphate (Hillsborough County, 1997).

Additional funds for operation and capital have been secured by earmarking interest revenue from reimbursements received from agencies participating in joint acquisitions. This option is only available for projects which were originally acquired with Ad Valorem proceeds, since reimbursement funds for Bond funded acquisitions must be used to retire the Bonds. Some additional funding for site restoration and maintenance efforts has been secured through grants, and other agencies have entered into restoration partnerships for large scale habitat restoration projects.

15. Monitoring

HCPRCD will use generally accepted scientific methods for monitoring the flora and fauna of this preserve. The frequency of monitoring, methods used, and level of sampling effort will vary depending on targeted species or the particular project, such as habitat restoration or an effort to eradicate invasive plants.

Monitoring of the plant community will, at a minimum, consist of seasonally appropriate annual pedestrian transects to sample for the presence of new exotic plant infestations. For those projects and management activities that could result in substantial changes to the structure and species composition of the plant community (e.g. a reduction of hardwood trees, eradication of exotic species, or a pasture restoration), monitoring will include appropriate standardized field methods such as line transects, fixed-plot or point sampling, and photo monitoring. The overall goal of such project-specific monitoring will be to accurately assess the progress of the project. The schedule, frequency, and sampling effort of the monitoring will be determined on a case-by-case basis. Any habitat monitoring associated with a regulatory action, such as for habitat mitigation or if a portion of the preserve is used as a recipient site for translocated listed species, will be in compliance with the specific conditions of the relevant permits.

There are several components to the monitoring of wildlife on this preserve. Periodic surveys of the small vertebrate community will be conducted at appropriate times of the year in order to update the species list for this preserve. These periodic surveys will be done using standardized field methods such as pedestrian transects, acoustic listening stations, cover boards, drift fences, and terrestrial and aquatic funnel traps. Pre-burn surveys also will be conducted as part of the prescribed burn program when circumstances warrant, such as to avoid impacts to listed bird species that may be nesting in the burn unit (e.g. sandhill cranes). As part of the assessment of all habitat restoration efforts, pre- and post- treatment wildlife surveys will be scheduled for each restoration project.

Taxa- or species-specific monitoring projects are either on-going or will be initiated on an as-needed basis. Areas used by wading birds for roosting or as rookeries are presently being monitored by Audubon of Florida on a seasonally-appropriate basis and it is anticipated this monitoring program will continue into the foreseeable future. Other species-specific monitoring will be conducted on an as-needed basis. These species-specific efforts may focus on either exotic or native fauna. Monitoring of exotic fauna will be conducted in order to assess the effectiveness of efforts to either eradicate extant populations of exotic wildlife or control levels of infestation. Species-specific monitoring of native fauna may be done for a number of reasons, such as for tracking changes in the population of an 'indicator species' whose presence is dependent upon specific habitat conditions, or as a way of estimating the resident population of a listed species in order to determine whether the preserve could be a suitable recipient site for translocated members of that taxon. Monitoring programs and surveys that focus on listed species will be in compliance with all relevant state and federal regulations that are in effect at that time.

The types of monitoring HCPRCD will implement will depend on what is done with the site over the long term. If HCPRCD decides to develop this site as a "seed source" for restoration projects

then certain types of monitoring would need to be done on a regular basis in order to assess the progress of the seed "crops" and protect the County's investment (e.g., control exotic plant infestations, etc.). Although the size, condition, shape, and distribution of the upland patches are probably not ideal for the site to be used as a gopher tortoise recipient site (as previously discussed), it is not entirely inconceivable that preserve might serve as a recipient site, in which case, FFWCC will require certain types of monitoring in their permit.

16. References

- Archaeological Consultants, Inc. (ACI). 2008. *Cultural resource assessment survey Meadow Pond Acres, Hillsborough County, FL*. Report prepared for G2 Services. Manuscript on file, Florida Master Site File, Tallahassee, Florida.
- Atlanta Testing & Engineering, Inc. (AT&E) 1998. Contamination Assessment Report Hopewell Cattle Dip Vat SWF Parcel No. 11-709-109, Keyville, Hillsborough County, FL. Prepared for the Southwest Florida Water Management District. AT&E Job No. 27-2928.
- Audubon of Florida. 1998 – 2008. *Alderman's Ford South Prong ELAPP Addition Bird Surveys*. Florida Coastal Island Sanctuaries, 410 South Ware Boulevard, Suite 702, Tampa, FL 33619.
- Bruder Stephens, Inc. 1996. *Phase I Environmental Site Assessment*. 6902 East 7th Avenue, #100. Tampa, Florida 33619.
- Clewell, A.F., J.A. Goolsby, and A.G. Shuey. 1982. *Riverine Forests of the South Prong Alafia River System, Florida*. Wetlands: 2: 21-72.
- Coile, Nancy C. and Mark A. Garland. 2003. *Notes on Florida's Endangered and Threatened Plant*. Florida Department of Agriculture and Consumer Services. Bureau of Entomology, Nematology, and Plant Pathology – Botany Section. Contribution No. 38, 4th Edition – 2003.
- Davis, Donald S. n.d. *Feral Hogs and Disease: Implications for Humans and Livestock*. <http://texnat.tamu.edu/symposia/feral/feral-12.htm>.
- Doolittle, James A. 1989. *Soil Survey of Hillsborough County, Florida*. United States Department of Agriculture, Soil Conservation Service in cooperation with University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations and Soil Science Department, and Florida Department of Agriculture and Consumer Services.
- Engeman, Richard M. *et al.* (2004). *The amount and economic cost of feral swine damage to the last remnant of a basin marsh system in Florida*. Journal for Nature Conservation 12 (2004): 143-147.
- Florida Exotic Pest Plant Council (FLEPPC). 2009. *List of Florida's Invasive Plant Species*. Florida Exotic Pest Plant Council. Internet: <http://www.fleppc.org/list/09list.htm> or *Wildland Weeds* Vol. 10(4), Fall 2009.
- Florida Department of Environmental Protection (FDEP). 2002. Group 2 Basin Status Report: Tampa Bay tributaries, including the Hillsborough, Alafia, Little Manatee, and Manatee rivers. Division of Water Resource Management. Southwest District, Group 2 Basin, June 2002.
- Florida Fish and Wildlife Conservation Commission (FFWCC). 2010. *Gopher Tortoise Permitting Guidelines*. April 2008 (revised June 2010). Tallahassee, Florida.

Franz, R. 1986. *The Florida gopher frog and the Florida pine snake as burrow associates of the gopher tortoise in northern Florida*. Pp. 16-20 in D.R. Jackson and R. J. Bryant (eds.). *The gopher tortoise and its community*. Proc. 5th Ann. Mtg. Gopher Tortoise Council.

Gruver, Bradley J., Ph.D., Listed Species Coordinator, Species of Conservation Planning Section, Division of Habitat and Species Conservation, Florida Fish and Wildlife Conservation Commission. 2010. *Florida's Endangered Species, Threatened Species, and Species of Special Concern*. Florida Fish and Wildlife Conservation Commission.

Guiliano, William M. and George W. Tanner. 2005. *Ecology of Wild Hogs in Florida*. Publication #WEC 191, <http://edis.ifas.ufl.edu/UW220>.

Highton, R. 1976. *Stilosoma extenuatum*. Cat. Amer. Amphib. Rept.: 183.1-183-2.

Hillsborough County. 1997. *Management Needs and Future Use of the Alafia River Corridor Project*. Submitted to the Southwest Florida Water Management District as a requisite of the Save Our Rivers and Preservation 2000 programs. Hillsborough County Parks and Recreation Department, Resource Management Team, 310 N. Falkenburg Road, Tampa, Florida 33619-0903. November, 1997.

Hillsborough County. 2009. Recommendations Concerning: Hillsborough County's Environmental Lands Acquisition and Protection Program (ELAPP) 2009 Annual Report. Parks, Recreation and Conservation Department and Real Estate Department. December 2009.

Hillsborough County Parks, Recreation, and Conservation Department (HCPRCD) website: <http://www.hillsboroughcounty.org/parks/>

Hillsborough County Environmental Lands Acquisition and Protection Program (ELAPP) website: <http://www.hillsboroughcounty.org/parks/conservationservices/elapp/>

Ogden, John C. *Habitat Management Guidelines for the Wood Stork in the Southeast Region*. Everglades National Park.

Paul, Rich. 1997. Personal communication. National Audubon Society, Tampa, Florida.

Perry, Mike. 1997. Personal communication. Florida Division of Forestry, Lakeland, Florida.

Richards, Tony, *et al.* 1997. *Exotic Plant Invasion on Florida's Water Management District Lands*. A Cooperative Inter-District Report. Florida Institute of Government, University of South Florida.

Rodgers, James A. Jr., Ph.D. 1989. *Threatened and Endangered Bird Research: Minimum Buffer Zone Requirements to Protect Nesting Bird Colonies from Human Disturbance*.

Southwest Florida Water Management District. 1996. *Land Management Resource Monitoring Program*. Land Management Section, Land Resources Department. Brooksville, FL.

Southwest Florida Water Management District. 2001. *Alafia River Comprehensive Watershed Management Plan*. Brooksville, Florida.

Surface Water Improvement and Management Program. 2008. *2007 Annual Report covering the period January 1 to December 31, 2007*.

Silvey, Mike. 1997. Personal communication. Southwest Florida Water Management District, Brooksville, Florida.

U.S. Environmental Protection Agency (USEPA). 2009. Model Report: WBID – 1653. South Prong Alafia River for Nutrients and Dissolved Oxygen. September 30, 2009.

Watson, Billy. 1997. Personal communication. Hillsborough County Parks and Recreation Department, Tampa, Florida.

Weisman, Brent R., and Lori D. Collins. 2004. *A GIS archaeological model and testing of nine ELAPP Preserves, Hillsborough County, FL. Report prepared for the Hillsborough County Environmental Lands Acquisition and Protection Program (ELAPP) by the University of South Florida, Department of Anthropology*. Tampa, FL. Manuscript on file, Florida Master Site File, Tallahassee, Florida.

Wunderlin, Richard P., and Bruce F. Hansen. 2008. *Atlas of Florida Vascular Plants* (<http://www.plantatlas.usf.edu/>). [S. M. Landry and K. N. Campbell (application development), Florida Center for Community Design and Research.] Institute for Systematic Botany, University of South Florida, Tampa.

Appendices

Appendix A: County Ordinances

Appendix B: Preserve Comprehensive Plan Elements

Appendix C: Comprehensive List of Plant Species

Appendix D: Recreational Use Policy

Appendix E: Agreement between Hillsborough County and SWFWMD

Appendix F: Security Agreement with William Watson

Appendix G: ELAPP Burn Policies

Appendix H: Comprehensive List of Wildlife Species

Appendix I: Florida Natural Areas Inventory Documentation Form

Appendix J: Gopher Tortoise Relocation Policy

**Appendix K: Agreement between Hillsborough County and SWFWMD
on Phosphate Mine Reclamation**