

BLACKWATER CREEK NATURE PRESERVE LAND MANAGEMENT AND LAND USE PLAN

FCT Award #93-018-P3A

1.0 GENERAL INFORMATION

1.1 Location of the Blackwater Creek Nature Preserve

The Blackwater Creek Nature Preserve (Preserve) is located in northeastern Hillsborough County, (County), Florida in Sections 12, 13, and 14 of Township 27 South, Range 21 East and Sections 7, 18, and 19, of Township 27 South, Range 22 East. The Preserve lies west of State Road 39, near the Pasco/Hillsborough County line. The 2,014-acre Preserve encompasses a portion of the Blackwater Creek floodplain in the northern part of the County. Surrounding land use includes low density residential areas, and agriculture. The Cone Ranch well field lies east of SR 39. Figure 1 provides a location map of the Blackwater Creek Nature Preserve, as well as other public lands in the vicinity. Appendix A provides the legal description, easements, and other legal documents for the Preserve. The future land use (FLU) designation of the Preserve is “Natural Preservation.”

1.2 History of the Preserve

The majority of the Blackwater Creek Nature Preserve was purchased between 1997 and 2003, by the Environmental Lands Acquisition and Protection Program (ELAPP) of Hillsborough County, in cooperation with the Florida Communities Trust (FCT Award # 93-018-P3A), for approximately \$4,000,000 (Hillsborough County, 2007). Grant funding from FCT was used to acquire the Preserve and this Management Plan is a revision of the 1996 Management Plan which was developed to ensure that the Preserve will continue to function in accordance with the Grant Award Agreement and in furtherance of the purpose of the grant application. Additional property (approximately 200 acres) was purchased at that time by the County as an Acquisition of Convenience (shown in Figure 1), because it was part of the parcel but did not meet the requirements for the FCT grant. This additional property is managed separately as part of the Preserve.

Five additional subsequent acquisitions (including the Robison/Kovacs property along SR 39) have increased the initial 1,900 acre purchase to the current Preserve size of 2,014 acres. The majority of the land that encompasses the Blackwater Creek Nature Preserve was historically used for low intensity cattle grazing and silviculture, and was purchased by the Weiss family in the 1940's. The Weiss family continued the logging and cattle grazing until the land was purchased by Hillsborough County (Hillsborough County, 1997). Figure 2 provides an aerial photograph of the site taken in 1938.

FIGURE 1

Figure 2

The Hillsborough County Parks, Recreation and Conservation Department has been responsible for stewardship of the Preserve from 1997 to present, and since that time with the help of the cattle lessees Lance and Gayle Ham has maintained the ongoing prescribed burn program, including summer burns; maintained an ongoing invasive plant and animal program; installed, repaired, and posted boundary fencing; applied for grant assistance and removed derelict buildings with assistance from the AmeriCorps program and Youth Environmental Services (YES) of Wimauma, Florida (both programs benefit and educate youth); initiated a Stream-Water watch station and monitored and reported water quality in Blackwater Creek since 2000; installed a parking lot, kiosk, picnic tables, entrance walkover, marked hiking trail, and a Florida Communities Trust acknowledgement sign. The County also developed a brochure which is currently publicized through their web site. The Preserve also survived large wildfires in 2000 and 2001 and major flooding after the hurricanes of 2004.

Environmental site assessments were conducted on the Weiss and Robison/Kovacs Properties prior to their purchase. Neither site presented any existing or potential environmental hazards (GLE and Associates, Inc., 1998 and HAS Environmental, 1997).

1.3 The Purpose of the Blackwater Creek Nature Preserve

The primary purpose of acquiring the Blackwater Creek Nature Preserve was to provide protection for natural plant communities, the Blackwater Creek floodplain, and wildlife in Hillsborough County. A secondary purpose was to provide resource based recreation. Blackwater Creek Nature Preserve will continue to be managed only for the conservation, protection and enhancement of natural resources, and for public outdoor recreation that is compatible with the conservation, protection and enhancement of the site. The existing recreational uses are restricted to passive activities, such as hiking and nature study, compatible with management of the Preserve's natural resources. The Preserve provides hiking trails through different wooded habitat areas with mature trees and a varied understory, as well as through palmetto prairie and riverine swamp. The trails are marked and signage clearly states that the Preserve is open during daylight hours.

1.4 The Management Objectives for the Preserve

Management objectives for the Preserve include the following:

1. Continue active habitat management activities such as prescribed burns and invasive species control.
2. Develop specific management plans for listed species present in order to protect and perpetuate the species populations.
3. The County will continue to work with neighbors and volunteers for cleanup and security and encourage a sense of shared responsibility for the benefit of the Preserve.
4. The integrity of the natural habitat will be conserved and protected to the greatest extent possible.

5. Water quality monitoring in Blackwater Creek will continue as long as the Stream Water Watch Program is active.
6. Staff will continue to map invasive species locations, and inventory and monitor listed species.
7. Funding or assistance will be sought to conduct a cultural resources survey in the Preserve.
8. Conservation Services staff will continue to pursue alternative sources of funding for management programs.
9. Continue cattle agreement to ensure additional on-site security and management assistance by lessee.

The Blackwater Creek Nature Preserve assists Hillsborough County in implementing the goals, objectives and policies of the Recreation and Open Space (ROSE), Future Land Use (FLUE), and Conservation and Aquifer Recharge (CARE) elements of the County's Plan (<http://www.theplanningcommission.org/hillsborough/comprehensiveplan>).

The preservation of wildlife habitats and the development of public recreation and environmental conservation activities on the Preserve will help to accomplish or further enhance the following plan goals and objectives:

- Preserve, conserve, restore, and appropriately manage the natural resources of Hillsborough County to maintain or enhance environmental quality for present and future generations (CARE Goal).
- Maintain or improve the ecological integrity of natural lakes, ponds, and streams, and provide for multiple uses such that existing water quality, fisheries habitat, scenic and recreational opportunities, and other natural and community benefits can be maintained, improved and where feasible, restored (CARE Objective 6).
- Maintain populations of threatened and endangered species and species of special concern occurring in Hillsborough County; and where feasible and appropriate, increase the abundance and distribution of such species (CARE Objective 14).
- Correct existing deficiencies and prevent future inadequacies to an efficient system of open space, park, and recreational facilities proportionately distributed to meet the needs of the populations.
- Improve public access to parks and recreational facilities and waterfront lands, including beaches and shores (ROSE Objective 2, Policies 2.2, 2.8).
- Increase the provision, protection, and enhancement of open spaces by public agencies and private enterprises (ROSE Objective 3, Policy 3.8).
- Implement an aquatic plan to utilize water resources for active and passive recreational activities (ROSE Objective 10, Policy 10.1).
- Continue to implement a program to allow appropriate utilization and protection of natural resources (ROSE Objective 11, Policy 11.2).
- Consider the needs of existing urban and suburban areas and newly developing urban areas when providing and programming needed public facilities (FLUE Policy D-6.3).

- Meet the standards for county parks and recreational facilities as specified in the Capital Improvements Element (CIE Policy 1.C.1.f).

The Blackwater Creek Nature Preserve will be identified in all literature and advertising as acquired with funds from the “Florida Communities Trust” and operated as a natural conservation and outdoor passive recreation area.

Any proposed modifications of the Blackwater Creek Nature Preserve Land Management Plan or any site alterations or physical improvements that are not addressed in the FCT-approved Land Management Plan requires prior FCT review and approval.

1.5 Adjacent Land Uses and Potential Conflicts

Adjacent land uses include pending residential development, agriculture, and publically owned lands. The pending residential development includes the former Thomas Ranch, now known as Hickory Hill Development Corporation. This land is located north and west of the Preserve. Hillsborough County has attempted to purchase this property but as yet has not been successful (see Figure 1 for approved lands). Publically owned lands include the Cone Ranch wellfield (Figure 1), which is owned and operated by the Hillsborough County Utilities Department and presently leased for agriculture. Over the past 20 years, staff from the Parks, Recreation and Conservation Department has coordinated with the lessees as well as Hillsborough County’s Real Estate Department to ensure that activities at the Cone Ranch do not negatively impact the Preserve.

The Florida Department of Transportation (FDOT) owns rights-of-way through the Preserve. The only pending road project in the area, the proposed widening of SR 39, is currently on hold. There are two FDOT borrow pits, one near Tollar Road and one further south which were likely used for fill during the construction of the nearby bridge on SR 39. These borrow pits have revegetated and are now viable freshwater marshes. FDOT may require additional fill for the roadway base when construction is initiated. It is not known at this time whether additional fill will be required from these borrow pits when the road is widened. Information regarding the rights-of-way is provided in Appendix A.

1.6 Public Involvement

No public meetings are planned at this time, but would be conducted in the event that there is any major land use change proposed for the Preserve. Staff from the Hillsborough River State Park will be given a copy of the Blackwater Creek Nature Preserve Land Management Plan because of their proximity to and location downstream of the Preserve, and staff continues to participate in the land management plan updates for the State Park. The Hillsborough County City-County Planning Commission will review the Blackwater Creek Nature Preserve Land Management Plan for compliance with the County’s comprehensive plan.

If there are any proposed modifications of the Management Plan and/or undertaking any site alterations or physical improvements that are not addressed in the approved Management Plan, the County will submit the changes to FCT for review and approval.

2.0 NATURAL RESOURCES

2.1 Soil Resources

2.1.1 Soils Distribution

According to the United States Department of Agriculture/Natural Resource Conservation Service (formerly Soil Conservation Service) Soil Survey of Hillsborough County (USDA 1989), there are fourteen different classifications of soils found in the Blackwater Creek Nature Preserve. Table 1 lists the soils and the surface area they cover within the Preserve. Figure 3 highlights the fourteen soil types and shows their distribution throughout the Preserve.

Table 1 Blackwater Creek Nature Preserve Soils Distribution		
Map Number	Soil Type	Acreage
5	Basinger, Holopaw, and Samsula soils	224.44
10	Chobee loamy fine sand	0.19
12	Chobee sandy loam, frequently flooded	158.60
13	Eaton fine sand	44.32
14	Eaton mucky sand, depressional	6.38
15	Felda fine sand	42.43
17	Floridana fine sand	10.99
21	Immokalee fine sand	72.86
27	Malabar fine sand	211.94
29	Myakka fine sand	924.54
57	Wabasso fine sand	263.73
59	Winder fine sand	43.70
60	Winder fine sand, frequently flooded	7.16
61	Zolfo fine sand	2.75
	Total Acreage	2014.03

USDA Natural Resource Conservation Service, Soil Survey Graphic (SSURGO) Database for Hillsborough County, Florida, 2004.

FIGURE 3 SOILS

2.1.2 Soils Description

Basinger, Holopaw, Samsula soils (5). This soil type makes up 11.14% of the total surface soil cover and is found in forty-four locations scattered throughout the Preserve. This soil complex supports small cypress domes, freshwater marshes, and wet prairie communities. Native vegetation on undisturbed sites includes cypress in the canopy, with saw grass, panicum, bluestem, and maidencane in the understory.

Chobee loamy fine sand (10). The Chobee fine sand makes up only 0.01% of the surface soil in the Preserve, and is found in only one location on the southeastern boundary. Undisturbed soils of this type would support cypress, cabbage palms, slash pine, and Carolina willow. Understory species include buttonbush, maidencane, and Jamaica saw grass.

Chobee sandy loam, frequently flooded (12). This soil makes up 7.87% of the surface soils and is found along the main stem of Blackwater Creek. The natural vegetation found on undisturbed areas of this soil includes bald cypress, sweet gum, willow, red maple, and cabbage palm. Understory species include buttonbush, smartweed, sedges, buttonbush, maidencane, and Jamaica saw grass.

Eaton fine sand (13). Only 2.20% of the surface soils are characterized as Eaton fine sand and it is found in only seven locations scattered in the eastern half of the Preserve. This soil occurs in sloughs within flatwoods and would normally support longleaf and slash pine, sweet gum, and cabbage palm, with gallberry and panicum in the understory.

Eaton mucky sand, depressional (14). This nearly level, poorly drained soil is found in depressions in flatwoods. On the Preserve, this soil type comprises only 0.32% of the surface soils, and it is found in only one location near the eastern boundary. Under normal conditions, the soil supports cypress and sweet gum, with sand cordgrass, maidencane, bluestem, and wax myrtle as an understory.

Felda fine sand (15). Felda fine sand is nearly level and poorly drained, and makes up only 2.11% of the surface soils of the Preserve. This soil is found in seven small areas throughout the Preserve. The natural vegetation on this soil includes canopy species such as cabbage palm and slash pine, and understory species such as saw palmetto and wax myrtle.

Floridana fine sand (17). This soil is nearly level and poorly drained and is commonly found in sloughs and swales in pine flatwoods. The natural vegetation in these areas consists of cabbage palms and slash pine, with bluestem and maidencane in the understory. This soil makes up only 0.55% of the total surface soils and it is located in one small area in the southeastern corner of the Preserve.

Immokalee fine sand (21). This soil is nearly level and poorly drained and is typically found in the flatwoods. The soil normally supports typical flatwoods vegetation such as

longleaf and slash pine in the canopy, with lopsided Indian grass, gallberry, saw palmetto, pineland three-awn and wax myrtle in the understory. This soil type is located in four small areas scattered throughout the Preserve. Immokalee fine sand comprises 3.62% of the total surface soils.

Malabar fine sand (27). The Malabar fine sand soils are usually found in depressions within pine flatwoods. The native vegetation on this soil type includes cabbage palm, longleaf pine, slash pine, saw palmetto, and wax myrtle. Malabar fine sands comprise 10.52% of the total surface soils in the Preserve, found in twenty-three very small areas scattered throughout.

Myakka fine sand (29). This soil type comprises the majority of the Preserve with approximately 45.91% of the surface soils. This soil is found in fourteen areas scattered throughout the Preserve. This soil type is nearly level and poorly drained, and supports pine flatwoods with longleaf and slash pine in the canopy and saw palmetto, gallberry, running oak, and wax myrtle in the understory.

Wabasso fine sand (57). This soil type comprises 13.09% of the Preserve and is located in ten small sites, scattered throughout. This nearly level, poorly drained soil supports flatwoods vegetation such as longleaf, slash pine, and cabbage palm with an understory of palmetto.

Winder fine sand (59). This is another nearly level, poorly drained soil found in sloughs in the flatwoods. Natural vegetation on these soils consists of live oak, slash pine, and cabbage palm. The understory consists of saw palmetto, wax myrtle, and pineland three-awn. This soil comprises 2.17% of the Preserve, and it is located in six small areas scattered throughout.

Winder fine sand, frequently flooded (60). This soil type comprises only 0.36% of the total surface soils in the Preserve and is located in one small area in the northeastern quarter of the property. This soil type typically supports Carolina willow, red maple, cabbage palm and sweet gum, as well as buttonbush, saw grass, smartweed, and sedges in the understory.

Zolfo fine sand (61). This soil classification comprises only 0.14% of the surface soils within the Preserve and is found in one small area within the northeastern quarter of the site. Under natural conditions, this soil type supports xeric oak, pine, saw palmetto, and other species found in oak scrub vegetative associations.

2.1.3 Soils Management Measures

Management measures for the Preserve include protecting the natural vegetation to prevent soil erosion, preventing off-road vehicles from accessing the Preserve, and maintaining the trail system and fire breaks. The goals and objectives of the management plan will preserve the integrity of the native soils by preserving the native

vegetation communities on the Preserve and by taking action to prevent erosion. There are no facilities or actions proposed in this ten-year plan that would require impacts to soils with the exception of the maintenance of the existing fire breaks. Any future management measures not included in this plan that require earthwork will implement Best Management Practices prior to construction to preserve the character of the ecosystems (http://www.na.fs.fed.us/spfo/pubs/n_resource/wetlands/index.htm). There are no known oil, gas, phosphate or other mineral resources on the Preserve.

2.2 Natural Communities

2.2.1 Mapping Process

The discussion of ecological communities describes the seven distinct vegetation associations on the Blackwater Creek Nature Preserve. The vegetation community areas were provided by the Hillsborough County Parks, Recreation, and Conservation Department, Conservation Services staff. The system employed in this plan of classifying the natural communities was developed by the Florida Natural Areas Inventory (FNAI). The premise of this system is that physical factors such as geology, climate, soils, hydrology, and fire determine the species composition of an area and that areas which are similar with respect to these factors will tend to have natural communities with similar species compositions.

Appendix B provides a list of the plant species found to date on the Blackwater Creek Nature Preserve. The seven vegetation communities identified are listed in Table 2 with the total area that each community occupies within the Preserve.

Table 2 Blackwater Creek Nature Preserve Natural Vegetation Communities		
Vegetation Community	Acres	%
Palmetto prairie	568.84	28.2
Riverine swamp	259.31	12.9
Pine flatwoods	555.03	27.6
Cypress swamp	209.98	10.4
Improved pasture	180.45	9.0
Oak hammock	189.22	9.4
Wet prairie/freshwater marsh	51.20	2.5
Total acres	2014.03	100.0

2.2.2 Vegetation Community Descriptions

The following paragraphs describe the seven distinct communities and Figure 4 shows their estimated extent and location within the Preserve. As stated previously, the

mapping was completed with limited ground truthing and the locations of the plant communities and descriptions of the vegetative cover are approximations. As part of the 10-year management process, the Conservation Services Section will continue ground-truthing and refining the delineation of plant community types, as well as continue to update the flora and fauna species lists.

Saw palmetto prairie. The palmetto prairie community provides the majority of the land cover on the Preserve, with 28.2% of the total area. The majority of the pines were logged out, and others have been lost to wildfires and lightning strikes, but some long leaf pines are regenerating in a few areas.



This photo shows the large expanse of saw palmetto prairie on the site. The prairie is maintained by frequent fires.

Management measures for saw palmetto prairie. Research scientists and land managers recommend that the pine/palmetto and the palmetto/gallberry/hardwood areas be treated with mechanical means and possibly chemical application, as well as frequent prescribed burns and protection of the hydrology of the community (<http://www.ces.fau.edu/fdpc/proceedings.php>). Other management measures include the continuation of site security to limit illegal off-road vehicles, and other forms of vandalism.

Pine flatwoods. The nearly level pine flatwoods areas are burned on a 2 to 3 year cycle which maintains an open canopy of longleaf and slash pine. The understory varies in composition depending on the timing and intensity of the last fire. Some areas support a dense understory of saw palmetto, gallberry, wax myrtle, wiregrass, and broomsedge. More xeric areas contain sand live oak, paw paw, shiny blueberry, while more mesic flatwoods are characterized by hat pins, gallberry, and St. Johns wort. Saplings of pines are recruiting along with dense stands of palmetto, broomsedge, and winged sumac. The pine flatwoods are found throughout the Preserve, and encompass 27.6% of the total land cover.

Figure 4 Natural communities



The area shown in the photo to the left depicts the pine flatwoods on the Preserve. Staff has suggested that this area could be investigated as a potential red-cockaded woodpecker introduction site. Very specific management efforts would be required for this option.

Management measures for pine flatwoods. The proper management of pine flatwoods includes such measures as conducting prescribed burns every two to four years (Myers *et al.*, 1990), controlling exotic vegetation, and preventing impacts to the soil and native vegetation. Minor changes in the flat topography can have significant impacts to the character of the habitat by changing drainage patterns. Other management measures include roller chopping, prescribed burns to reduce wildfires, preventing off-road vehicle impacts, and other forms of vandalism.

Oak hammock. There are two oak hammock areas located in the northeastern corner and one small area in the southeastern corner of the Preserve, and these three areas combine to comprise 9.4 % of the total land cover. These areas are characterized by a dense canopy of live oak draped in Spanish moss, and a thick carpet of leaf litter in the understory. Lower species diversity is present in the deep shade.

Management measures for oak hammock. These areas may have occurred as a result of historic fire suppression. Current management in effect include the maintenance of exotic vegetation, prevention of off-road vehicles and other forms of vandalism.

Wet prairie/freshwater marsh. There are over thirty wet prairie/freshwater marsh areas scattered throughout the Preserve, providing about 2.5% of the total land cover. The wetlands range from one so small it is barely visible on aerial photography to large systems several acres in size. The vegetation in these wetlands varies as well. Those wetlands with a shorter hydroperiod and a shallow water depth support pipe wort, marsh penny wort, smart weed, broomsedge, and soft rush. Deeper wetlands support pickerelweed, duck potato, soft rush, and spike rush. Both wetland types are often surrounded by a shrub perimeter, with species such as wax myrtle, button bush, and Carolina willow.

Two borrow pits excavated a long time ago by the FDOT are present in the northeastern corner of the Preserve and are shown on Figure 3. These areas have developed a dense cover of soft rush and other native species to the extent that they are difficult to identify as man-made. For this reason, these areas have been included in this category.



There are many small marsh/wet prairie areas in the Preserve. These provide important habitat for wading birds and other wildlife.

Management measures for wet prairie/freshwater marsh. These wetland areas usually burn every 2 to 4 years (FNAI, 1990); without occasional fires these wetlands would become shrub swamps with Carolina willow and buttonbush becoming established in the central portions. Other management measures include the maintenance of exotic vegetation, maintaining hydrology, and the prevention of off road vehicle impacts.



This cypress swamp is located in a depression within pine flatwoods. Other cypress forests on the Preserve appear as “domes” within the palmetto prairie.

Cypress swamp. The cypress swamp communities include strands, sloughs and domes, and are found throughout the Preserve, comprising approximately 10.4% of the total land cover. These communities are characterized by a canopy dominated by bald cypress with occasional cabbage palms or laurel oak. The composition and density of ground cover species is dependent upon the canopy closure, and species present include soft rush, water penny wort, lizard's tail, water hyssop, hornwort, blue flag iris, day flower, and a variety of ferns. Some of the more mesic cypress swamp areas also support laurel oak, button bush, and wax myrtle.

Management measures for cypress swamp. The management of the cypress swamps includes preventing the infestation of exotic vegetation and maintaining the hydrology. Exotic species of special concern to cypress swamps are old world climbing fern, air potato, and skunk vine. Maintaining the hydrology is important not only to support the chemical and physical processes of the ecosystem, but to support the physical properties of the soil that sustains the ecosystem.

Riverine swamp hammock. The Blackwater Creek swamp hammock bisects the east-central portion of the Preserve. This community comprises 12.9% of the total land cover and is the most diverse in the Preserve. Canopy species include bald cypress, cabbage palm, American elm, pop ash, black gum, water oak, laurel oak, water hickory, red maple, and hackberry. A shrub layer includes saplings of canopy trees as well as button bush, bumelia, swamp dogwood, shiny lyonia, wax myrtle, and wild coffee. Ground cover species includes a variety of ferns, spoon flower, lizard's tail, day flower, star rush, wild petunia, and water grass.



This photo shows Blackwater Creek within the riverine swamp hammock community. The creek is channelized within the first 1600 feet west of SR 39, but the natural streambed is preserved for the remainder of the creek within the Preserve.

Management measures for riverine swamp hammock. This type of community is prone to infestations of air potato, old world climbing fern, and other noxious vines, so maintenance of exotics is an important issue. Feral hogs are especially damaging in

these wetland communities because they create soil disturbances that easily erode during strong flows and high water events, so control of these species is important. Wildfire in these areas during times of drought can be devastating and create such extensive damage from which it may take decades to recover.



The improved pasture areas (in the Acquisition of Convenience area) are fenced so that the lessee can prevent overgrazing in the FCT natural areas and more easily attend to the needs of his cattle. The natural areas are accessible by the cattle, but their access is limited.

Improved pasture. There are two areas of improved pasture totaling 9.0% of the total land cover on the Preserve. One large pasture area is located in the southeastern portion of the Preserve and is not part of the FCT portion of the property. This large pasture area has been used to graze cattle for over twenty years. The pastures support bahia grass and native herbaceous species and is managed for cattle and wildlife species that require open areas.

Management measures for improved pasture. The cattle lessee manages the pasture according to provisions in the cattle management plan prepared by the Natural Resource Conservation Service. The current plan is available as Appendix C.

Management measures for all vegetation communities. In order to properly manage the vegetation communities, it is necessary to conduct periodic surveys to determine the content and health of these communities. The Conservation Services staff conducts surveys and photo-monitoring of the vegetation annually at minimum, to determine what listed plant species are present, and if the current management efforts are adequate for the preservation, restoration, or protection of the listed species or plant community. In order to comply with the conditions of the FCT Grant Award Agreement, the long-term monitoring, protection and long term viability of the individual communities is essential.

The Conservation Services staff is committed to continuing the monitoring, including photo-monitoring, of natural communities into the future.

2.3 Water Resources

2.3.1 Aquatic Preserves and Outstanding Florida Waters

There are no Aquatic Preserves within or in the vicinity of the Blackwater Creek Nature Preserve. Blackwater Creek is a major tributary to the Hillsborough River, which was designated as an Outstanding Florida Water (OFW) in 1995 from Fletcher Avenue to the river's origin in the Green Swamp, including Blackwater Creek. (<http://www.dep.state.fl.us/water/wqssp/ofwqa.htm>) The OFW designation ensures that no water quality degradation will be allowed, and all stormwater discharges must meet certain water quality standards. Blackwater Creek joins the Hillsborough River north of Lake Thonotosassa.

2.3.2 Water Quality

The recorded Grant Award Agreement (Appendix A) states in V.6, that "The water quality in Blackwater Creek shall be protected and the natural hydrology shall be preserved, and where applicable, restored to a natural hydrological regime." The Blackwater Creek Nature Preserve lies within the Upper Hillsborough River Watershed, and has a 17 mile reach within the County. This watershed spans approximately 153 square miles in Hillsborough County, and contains 1 named lake and 15 named rivers, streams and canals. The average daily flow in Blackwater Creek is 54 million gallons per day (Hillsborough County, 1997).



The map to the left shows the majority of the Hillsborough River Watershed. Blackwater Creek is located in the Upper Hillsborough River Watershed. The map was taken from the Hillsborough County Water Atlas located on line. (<http://maps.watertlas.usf.edu/hillsborough/index.asp?waterbodyid=12>)

Blackwater Creek is described as an impaired water body by the Florida Department of Environmental Protection. Because of concern for water quality in the creek Conservation Services staff established a water monitoring station on the west boundary of the preserve in 1998 and monitors the creek monthly through the Hillsborough County Stream-Waterwatch Program. Water quality results are compared to an Environmental

Protection Commission sampling station at the creek and SR 39 to determine whether on site activities such as cattle grazing are degrading water quality in the creek. Water quality parameters being measured by staff include air temperature, water temperature, dissolved oxygen, pH, water clarity, total nitrogen, phosphorus, fecal coliform and enterococci. Results of the monitoring have been made available in annual stewardship reports and are also available for perusal as data or in graphic form online at <http://www.hillsborough.wateratlas.usf.edu/DataDownload/GraphData.aspx>.

Hillsborough County remains committed to hydrological improvements in the watershed, particularly when there is potential to improve conditions in Blackwater Creek. In 1999 the Hillsborough County Public Works Section partnered with the Southwest Florida Water Management District to create a 400-acre wetland restoration project in the Cone Ranch southeast of the Blackwater Creek Preserve (Turbiville, Personal Communication, 2009). A ditch block was installed within the project area, and water was re-routed through a number of created herbaceous wetlands (see blue shading in the Cone Ranch in Figure 1, located just south of Blackwater Creek, for location). The project enabled large scale wetland rehydration and habitat improvement of cypress domes and freshwater marshes, and provides water treatment to Tiger, Itchepakesassa, and Blackwater Creeks. District staff observed or documented a great deal of wildlife utilization of the area as a result of the project, including bald eagle, Sherman's fox squirrel, sandhill crane, American alligator, several hundred white and glossy ibis, great blue heron, great egret, cattle egret, snowy egret, osprey, hawks, white-tailed deer, and fox. Much of the Cone Ranch, as shown in Figure 1, has been nominated to the ELAP program and three of the perimeter areas are now protected.

In addition, a 2004 coliform study done by the Department of Environmental Protection on Blackwater Creek established the maximum allowable loadings to Blackwater Creek that would "restore the waterbody so it meets the applicable water quality criteria for fecal and total coliform bacteria (Tyler and Petrus, 2004)." The study recommends an implementation plan for all affected parties, and the recommendation has been incorporated into this plan (see recommendation below as well as Section 8).

An abandoned cattle dipping vat is located in the eastern section of the Preserve near SR 39, as stated in the environmental audit for the Weiss parcel (HAS, 1997). The presence of the dipping vat indicates the potential for groundwater contamination with arsenic, DDT, and/or Toxaphene. This area is isolated from the general public, and the remediation of the vat will eventually need to be addressed by the Department of Transportation when Highway 39 is widened.

2.3.3 Water Resource Management Measures

As stated in the original management plan, the County remains committed to protecting the water quality of Blackwater Creek and preserving the natural hydrology on site. The County continues to keep FCT updated on the status of water-related issues that could directly impact the hydrology of the creek.

Management measures required with respect to maintaining or improving the water quality in the vicinity of the Preserve would be to:

- control exotic vegetation with an approved herbicide used according to the label, or use biocontrol agents if available,
- avoid soil disturbances to prevent erosion and subsequent turbidity and sedimentation in surface waters,
- prevent cattle from getting into the creek,
- prevent overgrazing of vegetation,
- remove trash from the creek
- always implement best management practices during any construction or other disturbance of the soils or vegetation,
- remediation of cattle dipping vat,
- Continue agreement with the Southwest Florida Water Management District to monitor on site wells and partner with the District's SWIM program should opportunities arise to improve hydrological conditions in Blackwater Creek.
- Participate with other landowners or stakeholders if any plans to implement water quality standards in the creek are implemented.

2.4 Fish and Wildlife Resources

2.4.1 Existing Conditions

The Blackwater Creek Nature Preserve provides a broad expanse of contiguous habitat, including forested wetlands, marshes, prairies, and pine flatwoods within northern Hillsborough County. According to the previous land management plan (Hillsborough County, 1997), there are likely 23 amphibian species, 52 reptile species, 159 bird species, and 42 mammal species potentially present within the Preserve, based on literature research and on the known character and extent of the available habitat and other factors (Hillsborough County, 1997). A list of the flora and fauna known to occur on the Blackwater Creek Nature Preserve is provided as Appendix B.

2.4.2 Management Measures for Fish and Wildlife

Formal surveys which include trapping and tagging are recommended to identify the wildlife resources on the site. These surveys should be conducted seasonally to include the use of the site by migrant species and those species only active on a seasonal basis to provide a truly comprehensive list of the species present. Surveys should include herpetofaunal drift fencing or pitfall arrays, small mammal trapping, and conducting pedestrian transects throughout the Preserve, sampling all habitat types. GPS should be used to mark the locations of important populations. Hillsborough County coordinates extensively with the Florida Fish and Wildlife Conservation Commission regarding the management of specific listed species.

Informal plant and animal surveys have been conducted on the Preserve by staff and volunteers since its purchase over ten years ago. The surveys were combined to produce a preliminary species survey which is provided in Appendix B. The informal surveys will continue in perpetuity and as new species are observed, the list will be updated.

The main management measures for the protection and conservation of wildlife on the Preserve are the prescribed burn program to enhance and manage the habitat, and the control of nuisance exotic vegetation and animals. These management measures are conducted in the Preserve on an as-needed basis, and as prioritized by the Conservation Services staff. Other measures include maintaining site security to prevent trespassing, poaching, dumping, arson, and other illegal activities.

Additional management measures for fish and wildlife include maintaining or improving wildlife corridors inside and outside the Preserve. The Hillsborough Greenways Committee studied the status of wildlife corridors with respect to gaps and barriers and prepared list of gaps and barrier sites to improve. State Road 39 was determined to be one of the top ten man-made barriers within the County, affecting wildlife movement on the Blackwater Creek Nature Preserve. The study results are provided in Appendix B (Hillsborough County, 2006).

2.5 Special Status Species

Information regarding the special status species on Blackwater Creek Nature Preserve was obtained from the Conservation Services staff, local experts, and relevant literature. State and/or federally listed plant and animal species observed on the Preserve include those listed in Table 3 (Florida Fish and Wildlife Conservation Commission, 2008).

The individual habitat needs for each species are discussed in the following paragraphs. The faunal species were noted during casual observations and not from formal surveys. Formal surveys for fauna have not been initiated yet in this Preserve, but will be implemented in the future. Future surveys should determine the locations of foraging, roosting, and nesting areas of the protected species.

The knowledge gained in the surveys will allow the planning for future facilities in areas that won't disturb the protected species. ELAPP policies regarding the management of special status species are provided in Appendix D.

Table 3
Special Status Species Observed in the
Blackwater Creek Nature Preserve

Species		Ranking	
Common Name	Scientific Name	FED (3)	STATE (1,2)
Birds			
Snowy Egret	<i>Egretta thula</i>		SSC
Little Blue Heron	<i>Egretta caerulea</i>		SSC
Tricolored Heron	<i>Egretta tricolor</i>		SSC
White Ibis	<i>Eudocimus albus</i>		SSC
SE American Kestrel	<i>Falco sparverius paulus</i>		T
Florida Sandhill Crane	<i>Grus canadensis pratensis</i>		T
Wood Stork	<i>Mycteria americana</i>	E	E
Mammals			
Sherman's fox squirrel	<i>Sciurus niger shermani</i>		SSC
Reptiles and Amphibians			
American alligator	<i>Alligator mississippiensis</i>	SAT	SSC
Eastern indigo snake	<i>Drymarchon corais couperi</i>	T	T
Gopher tortoise	<i>Gopherus polyphemus</i>		T
Plants			
Catesby's lily	<i>Lilium catesbaei</i>		T
Angular fruit milk vine	<i>Matelea gonocarpus</i>		T
Giant air plant	<i>Tillandsia utriculata</i>		E
Treat's zephyrlily	<i>Zephyranthes atamasco var. treatiae</i>		T

Notes:

- 1) <http://fac.dos.state.fl.us/>
- 2) http://www.fl-dof.com/forest_management/plant_conserve_list.html
- 3) <http://www.fws.gov/endangered/wildlife.html>

2.5.1 Descriptions of Special Status Species

Snowy Egret. The Snowy Egret nests in both inland and coastal wetlands, often in mangroves or willows, but also in cypress, buttonbush and Brazilian pepper. Nesting occurs over shallow water or on islands separated from the mainland by broad expanses of open water. They forage almost anywhere the water is shallow and calm, and their diet consists of small fish, frogs, small rodents, prawns, crayfish, grasshoppers, worms, and a variety of other aquatic invertebrates. The Snowy Egret is declining due predominantly to the loss of nesting and foraging habitats (Rodgers *et al.*, 1996).



Management measures for the Snowy Egret. The Blackwater Creek Nature Preserve provides foraging habitat for the Snowy Egret but it is not known if this species nests on site. This species prefers to nest on islands over a broad expanse of open water to reduce nest predation (Rodgers *et al.*, 1996), but nesting within floodplains is not uncommon. Management of the habitat includes the preservation of existing wetlands on site, control of exotic species, especially in wetlands, and limiting human interference. All of these management measures are currently being addressed and will continue in perpetuity.

Little Blue Heron. Little Blue Herons require shallow freshwater, brackish or saltwater habitats for foraging. Their diet consists of fish, amphibians, and invertebrates, but nesting herons need freshwater fish for their young. Their numbers have been steadily declining due to the loss of foraging habitat as more and more wetlands are drained or altered. Also contributing to their decline is exposure to pesticides and heavy metal contamination, and the alteration of wetland hydrocycles (Rodgers *et al.*, 1996).



Management measures for the Little Blue Heron. The Blackwater Creek Nature Preserve provides foraging, and roosting habitat for the Little Blue Heron, but it is not known if this species is nesting on the site. This species, as well as the other wading bird species listed below prefer to nest on islands surrounded by a broad expanse of open water to reduce nest predation. Management of foraging habitat includes the preservation of wetlands on site, control of exotic species, and limiting human interference. All of these management measures are currently being addressed and will continue in perpetuity.

Tricolored Heron. The Tricolored Heron prefers mangrove islands for their nesting colonies, but can also be found nesting in Carolina willow in freshwater wetlands. Other less frequent nesting trees include Australian pine, cypress, Brazilian pepper, and saltbush. Almost all nesting areas are over standing water or on islands. The tricolored herons forage in almost any shallow wetland and on the edges of ponds and lakes. Their diet is similar to that of the snowy egret, but small fish are their most preferred food. These birds are declining due to the loss of nesting and feeding habitat, and due to disturbance during breeding (Rodgers *et al.*, 1996).

Management measures for the Tricolored Heron. As with the birds listed previously, the Preserve provides foraging and roosting habitat for the Tricolored Heron, but no known nesting habitat. The management measures listed for the previous species also apply to the Tricolored Heron.

White Ibis. The White Ibis has been observed on numerous occasions foraging on the Preserve for insects, crayfish, and small amphibian and reptiles. Ibis will also eat fish when abundant. There are no known nesting colonies of white ibis on the Preserve.

Nesting Ibis require freshwater foraging areas because their fledglings cannot tolerate salt and will decline and die if salt is ingested (Rodgers *et al.*, 1996). White Ibis are very vulnerable to disturbance and one episode of human impact on a nesting colony can result in massive mortality of young birds (Rodgers *et al.*, 1996).

Management measures for White Ibis. The shallow wetland areas in the Preserve are essential foraging areas for the white ibis, especially during the breeding season. These wetlands support fish populations which are concentrated during the dry season when the water recedes. The White Ibis and other wading birds forage on the fish and expend less energy for the effort. A benefit of the cattle grazing on the Preserve is that pasture areas are kept open thereby preserving additional foraging areas for these birds.

Management measures for this species should include keeping feral dogs and cats out of the Preserve, maintaining water quality to support fish populations, controlling exotic vegetation, and preserving the natural vegetation on the site. All these measures are currently in place and will be provided in perpetuity.

Southeastern American Kestrel. The kestrel is an inhabitant of open spaces where they feed on insects, small rodents, and reptiles. While the northern races are abundant and are frequently observed in central Florida as migrants and winter residents, the locally breeding sub-species has undergone recent statewide population declines and is currently listed as threatened, and considered to be very rare in Florida (Rodgers *et al.*, 1996).

Management measures for Southeastern American Kestrel. The primary reason for the decline of this bird is the loss of nesting habitat. They prefer to nest in longleaf pine snags in open areas with low herbaceous cover. Prescribed burns are also recommended to keep habitat open.

Florida Sandhill Crane. Sandhill cranes require freshwater marshes for nesting, specifically herbaceous wetlands of a minimum of 0.5 acre. The numerous depression wetlands on the Preserve support vegetation suitable for nesting, and nesting Florida sandhill cranes have been documented on the site. The flatwoods and other open, low-lying uplands provide excellent foraging habitat for the cranes. These cranes feed mainly on seeds and berries but have also been known to eat insects, invertebrates and small vertebrates. Florida Sandhill Cranes begin nesting in late winter or early spring and fledge in the late summer (http://www.myfwc.com/WILDLIFEHABITATS/BirdSpecies_SandhillCrane.htm).



Management measures for the Florida Sandhill Crane. The greatest threats to sandhill cranes are loss or degradation of habitat and human interference. The habitat in the Preserve is conserved in perpetuity but this does not prevent the potential for human

interference. The Sandhill Crane is becoming more accustomed to human activity in the vicinity of active nests, but management activities such as prescribed burns and nuisance vegetation control should be timed to avoid disturbance around active nests during nesting season.

Wood Stork. Wood storks are birds of freshwater and brackish wetlands, primarily nesting in cypress or mangrove swamps. They feed in freshwater marshes, narrow tidal creeks, or flooded tidal pools. Wood Storks use a specialized feeding behavior called tactolocation, or grope feeding. A foraging Wood Stork wades through the water with its beak immersed and partially open. When it touches a prey item, a wood stork snaps its mandibles shut, raises its head, and swallows what it has caught. Storks will often stir the water with their feet, a behavior which appears to startle hiding prey. Tactolocation allows storks to feed at night and use water that is turbid or densely vegetated. However, the prey must be concentrated in relatively high densities for Wood Storks to forage effectively (<http://www.fws.gov/verobeach/images/pdflibrary/wost.pdf>). Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels. The Wood Stork has been observed foraging in the shallow wetlands on the Preserve.

Management measures for the Wood Stork. The Blackwater Creek Nature Preserve provides foraging and roosting habitat for the Wood Stork, but no known nesting habitat. Management of foraging habitat includes the preservation of existing natural wetlands on site, control of exotic species, especially in wetlands, and limiting human interference. All of these management measures are currently being addressed and will continue in perpetuity.

American alligator. Alligators have been reported as present in the Preserve by hikers and other visitors over the years. It is not known how many alligators are present at this time. The American alligator is the largest reptile in North America. The alligator can be distinguished from the endangered American crocodile by its short, rounded snout and darker color. Adult alligators can reach 18 feet in length, but the average length and weight is 13 feet and 450 to 600 pounds. An alligator's tail accounts for half the length. Male alligators are generally larger than females. Alligators can be found in rivers, swamps, marshes, bogs, lakes, ponds, creeks, canals, and bayous. They can tolerate some salt water (Moler, 1992).

Alligators eat just about anything, including lizards, fish, snakes, turtles, small mammals, birds, crustaceans, and even small alligators. They hunt for prey underwater and often swallow their meal whole. Alligators that have been fed by humans lose their fear and become a potential hazard, which usually results in the destruction of the "nuisance" alligator.

Management measures for the American alligator. Protecting the alligators on the Preserve will require protection from poaching, avoiding impacts to water quality, preventing significant fluctuations in water elevation, protecting nest sites and young, and

preventing human interference. Alligators which have lost their fear of humans and are considered a nuisance will be removed by the Florida Fish and Wildlife Conservation Commission.



Gopher tortoise. The gopher tortoise lives in extensive subterranean burrows in dry upland habitats such as longleaf pine sandhill, xeric oak hammocks, scrub, pine flatwoods, dry prairies, and coastal dunes. Tortoises can also live in man-made environments, such as pastures, old fields, and grassy roadsides. To be suitable for gopher tortoises, the habitat must have well-drained sandy soils for digging burrows, herbaceous food plants, and open sunny areas for nesting and basking. Periodic natural fires play an important role in

maintaining tortoise habitat by opening up the canopy and promoting growth of herbaceous food plants (Moler, 1992).

Gopher tortoise burrows remain at a fairly constant temperature and humidity level year-round, thus providing shelter for the tortoise during periods of extreme temperatures, drought, and fire. Tortoise burrows also afford refuge to other animals including listed species such as the eastern indigo snake, Florida pine snake, gopher frog, Florida mouse, and gopher cricket (Moler, 1992).

In 2007, the Florida Fish and Wildlife Conservation Commission (FWC) took action to upgrade the status of gopher tortoise from “species of special concern (SSC)” to “threatened”. The species has been under siege due to the rampant development throughout the state and currently, little habitat remains for the tortoise. In addition, the SSC status allowed developers to apply for a permit to conduct an “incidental take”. This permit allowed developers to entomb or bury the tortoises alive on the site in return for making a payment to a mitigation fund. The FWC estimates that approximately 200,000 tortoises were entombed in this manner. The reclassification will provide some protection for the tortoise in that an “incidental take” will no longer be permitted.

Management measures for gopher tortoise. Management measures for the gopher tortoise include surveying and collecting GPS coordinates for all burrows. Areas where the burrows occur should be restricted against all vehicular traffic to prevent the crushing of active burrows. Prescribed burns should continue in these areas to keep the herbaceous layer fresh and low. Egg and hatchling predation should be reduced as much as possible, and if possible, should include controlling raccoon and fire ant populations on the Preserve. If suitable habitat is available, gopher tortoise relocations should be considered. The Conservation Services staff has prepared gopher tortoise relocation policies that use the guidelines established by the FWC. These policies are provided in Appendix D. The revised state management plan for gopher tortoises is available at <http://www.myfwc.com/imperiledspecies/plans.htm>.

Eastern indigo snake. The eastern indigo snake is a large, docile, non-venomous snake that has declined in numbers over the last 100 years due to the loss of habitat, pesticide use, and collection for pet trade. The snake is a commensal species with a number of burrowing animals, using their burrows for egg-laying and denning. The preferred diet of these snakes is frogs, other snakes, toads, salamanders, small mammals, and birds. The eastern indigo snake can be found in many habitat types from wetlands to xeric pinelands and scrub. (Moler, 1992)

Management measures for the Eastern indigo snake. Protection and management of the eastern indigo snake's habitat is all that is required to ensure the success of this species. Conducting the prescribed burns, controlling the exotic vegetation, maintaining the hydrology of areas in which significant populations are present, and preventing or controlling the influx of exotic animals such as feral pigs are measures that would protect the eastern indigo snake and its habitat. These are measures that the Preserve staff is currently undertaking. The USFWS recovery plan for this species is located at <http://www.fws.gov/verobeach/Programs/Recovery/vbms4.html>.

Sherman's fox squirrel. Sherman's fox squirrel is one of three subspecies of fox squirrels that occur in Florida. The Sherman's fox squirrel is found in the Florida panhandle from northern counties to the Tampa Bay area over to Lake Okeechobee. Fox squirrels south of this region are Big Cypress fox squirrels. These squirrels are larger than the common gray squirrel and are declining due to the loss of their specific habitat areas to development. These squirrels require mature, fire maintained long-leaf pine-turkey oak sandhill and flatwoods community types. Acorns from turkey oak and live oak, as well as long-leaf pine seeds are the major components of the fox squirrel diets, but they also eat fungi, other nuts, bulbs, vegetative buds, and insects. They build leaf nests in large oaks, and typically have two breeding periods per year, with only 2 to 3 young per season (Humphrey, 1992).

Management measures for the Sherman's fox squirrel. The Sherman's fox squirrel requires at least 6000 acres of heterogeneous, natural sandhill habitat to preserve a viable population (Humphrey, 1992). The habitat should be burned every two to three years to regulate the turkey oak and maintain the long- leaf pines. The population of Sherman's fox squirrel on the Preserve should be surveyed and monitored, and the area in which the squirrels are located should be protected in perpetuity.

Catesby's lily. This beautiful lily is found throughout the southeastern United States in wet pine flatwoods, savannahs and pitcher plant bogs. The large flowers appear from June to October and are red or pinkish red with maroon or magenta spots. It is adapted to frequent fires and is pollinated by the palamedes and spicebush butterflies. (http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101729)



Management measures for Catesby's lily. The most important management measures for this species are to conduct frequent fires and control the exotic plant species in its habitat (http://www.efloras.org/florataxon.aspx?flora_id=1&taxon_id=242101729). It is recommended that the populations of this species be located with GPS so that the species can be monitored.

Angular fruit milk vine. This perennial, twining vine will climb to about 40 feet when supported, but will be prostrate if no support is available. These vines are found in upland hardwood forests with laurel oak, hickory, pine and magnolia as major canopy constituents. The wooded habitats may vary from fairly moist woods to dry, open oak-hickory, or oak-pine upland forests. The flowers are pale to deep maroon or yellowish green. The most vigorous flowering populations occur where there has been a recent, canopy-opening disturbance. The vine does not flower freely where the understory and overstory is continuous (<http://www.natureserve.org/explorer>).

Management measures for the angular fruit milk vine. Management measures for the milk vine would include locating and mapping all populations of the plant and monitoring it to identify potential threats. In addition, exotic vines such as air potato, skunk vine, and other invasive species should be controlled to prevent competition for the milkvine habitat. If fires are prescribed in their habitat, woody plant material in the vicinity should be removed to prevent catastrophic fires (<http://www.natureserve.org>).

Giant air plant. The giant air plant is native to the cypress swamps, hammocks, pinelands, tree islands, sloughs, scrub, mangrove swamps, and many other similar natural habitats, both wet and dry, throughout central and southern Florida and the Keys. It is one of the largest species of bromeliads in Florida, sometimes reaching 2 or 3 feet. This species is epiphytic on tree trunks, branches, and large twigs that can support the plant's weight. This species is found in many varied natural habitats such as swamps, sloughs and cypress forests to pine flatwoods, sandhill, scrub, and oak hammocks. Threats to this species include habitat destruction, collecting, and infestation by the Mexican bromeliad weevil (*Metamasius callizona*) (<http://bromeliadbiota.ifas.ufl.edu/flbrom.htm>).

Management measures for giant air plant. This large air plant is a favorite of collectors and is in danger of being over-collected. A more serious threat is the Mexican weevil which has been observed in the vicinity, but has not yet been documented in the Preserve. The weevil has been decimating the populations of this bromeliad throughout south and central Florida, but recent efforts to develop a natural predator program for the weevil look optimistic with a new parasitic fly recently released into a Hillsborough County Park and other locations around the state. The populations of giant air plant in the Preserve should be monitored to determine if any are infested with the weevil and if so, steps should be taken to prevent it from spreading. Preventative steps could include the release of the parasitic fly and the isolation and quarantine of the infected plants (<http://bromeliadbiota.ifas.ufl.edu/flbrom.htm>).

Treat's zephyrlily. This small pink to white lily is found in the sandy-peaty soils of wet pinelands throughout Florida and Georgia. It flowers from January to April (Coile, 2003).

Management measures for Treat's zephyrlily. The continued existence of this species is dependent upon the regular fires and sufficient moisture characteristic of Florida's low pine flatwoods (Coile, 2003).

2.5.2 Management Measures for All Special Status Species



County staff has suggested that the pine flatwoods areas of the Preserve be managed with the intent for use as red-cockaded woodpecker introduction habitat. This will require a significant amount of planning and careful timing of prescribed burns, and trees appropriate for cavities with a diameter at breast height (dbh) of at least 9 inches. A copy of the Multi-Species Recovery Plan for South Florida for the red-cockaded woodpecker is provided in Appendix B. This document provides very specific recommendations regarding habitat needs for this species (<http://www.fws.gov/verobeach/images/pdflibrary/rcwo.pdf>).

Protecting wildlife corridors has been a major objective of the ELAP program, which has purchased several parcels within the watershed. The corridor at present in the vicinity of the Preserve includes the Cone Ranch Wellfield to the east and the Hillsborough River State Park and Wilderness Park to the west. The Hillsborough River Greenways Task Force has also been instrumental in protecting the river and its tributaries by obtaining the OFW status of portions of the river, and by assisting in the acquisition, protection, and conservation of natural lands in the corridor (Hillsborough County, 2001).

In order to further support the wildlife corridor, a wildlife undercrossing needs to be constructed on SR 39. This wildlife undercrossing was requested from the FDOT by the FFWCC as compensation for impacts to wildlife habitat that will occur as a result of the roadway improvements. The undercrossing will not be constructed until the road widening is implemented, but no date has been set for this to occur. This was discussed and identified as a need in the previous management plan but never implemented (Hillsborough County, 1997). The undercrossing would allow animals to safely cross under the road. This is an issue between the FDOT and the FFWCC, a regulatory agency which reviews FDOT permit applications and the managing entity of the Blackwater Creek Nature Preserve has no control over the issue.

Management measures for all protected species in the Preserve include the management of invasive vegetation and animals, the maintenance of natural hydroperiods and drainage patterns, the restriction of vehicular traffic and inappropriate recreational uses,

the apprehension and prosecution of poachers and trespassers, and periodic monitoring to assess the status of the various species. According to the brochure for the Preserve, dogs are allowed, but they must be kept on a hand-held leash at all times because of potential conflicts with cattle and wildlife. The public should be educated so that they know to avoid disturbing the flora and fauna and that their carelessness with trash, cigarettes, and other debris could contribute to the decline of these protected species. Wildlife surveys on an annual basis are recommended to determine the presence and monitor the status of the protected species on the Preserve. Future surveys should include surveys for the Florida black bear and the Florida panther, both of which have either been observed onsite or in the near vicinity. GPS tracking of burrows, nests, territories, and the location of listed plant populations is recommended for resident species or important foraging areas. As stated previously, ELAPP's specific resource management policies are provided as Appendix D.

Any element occurrences will be reported to the Florida Natural Areas Inventory on the website format (<http://fnai.org/fieldreportingforms.cfm>). An example of this form is provided in Appendix B.

2.6 Unique Geological Features

There are several rocky outcroppings in Blackwater Creek. While not particularly unique to this area, due to the fact that many of these outcroppings were destroyed when the creek was channeled, the remaining should be protected. There are no other unique geological features.

3.0 CULTURAL RESOURCES

3.1 Definition of Terminology

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 Blackwater Creek Nature Preserve, only archaeological or historic resources are likely 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, Area of Potential Effects, 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. The significance of historic properties is assessed by the property's ability to meet the following four criteria for inclusion in the National Register of Historic Places (36CFR60.4):

- Association with events that made a substantial contribution to the patterns of our history;
- Association with the lives of persons important in our past;

- 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
- Have yielded, or may be likely to yield, information important to prehistory or history.

Properties may be eligible for the National Register of Historic Places for contribution at the national, state, or local level. In order for a structure to be listed in the National Register of Historic Places, it must possess historic integrity of those features necessary to convey its significance, such as location, designs, setting, workmanship, materials, feeling, and association in accordance with National Register guidelines.

3.2 Agency Correspondence

Richard Estabrook, formerly of the West Central Regional Public Archaeology, reviewed the records for known cultural resource sites in the vicinity and determined that while there are sites on property adjacent to the Preserve, no sites have been discovered in the Preserve to date. The sites on the adjacent properties were identified during surveys required prior to development of subdivisions or highways, and no formal surveys have been conducted on the Preserve.

3.3 Management Measures for Cultural Resources

County staff is working closely with the local Florida Public Archaeology Network (<http://www.flpublicarchaeology.org/>) to learn more about the protection and interpretation of cultural resources. Grant funding was solicited from the State Department of Historical Resources in 2007, but the funding request was not granted, and the poor economic conditions have prevented the County from reapplying to date. Looting is obviously a concern, along with possible excavation or earthwork for projects such as the creation of firebreaks and installing fencing. In addition, a road near the west side of the Preserve could be considered a historical resource and should be evaluated. This road is clearly visible in the 1938 aerial photograph, Figure 2, and is discussed in greater detail in the previous management plan for the Preserve (Hillsborough County, 1997). Best Management Practices for Protecting Archaeological Sites are provided as Appendix E, and in order to protect this area it is recommended strongly that no excavation take place on the roadbed, and that the road be considered for listing..

Any area of the Preserve proposed for development will have a cultural resources survey conducted prior to development of the area. If evidence is found to suggest an archaeological or historic resource is discovered, the Division of Historical Resources will be notified immediately. Coordination with the Division of Historical Resources will be conducted in the management and protection of cultural resources. The collection of artifacts or the disturbance of archaeological and historical sites will be prohibited unless prior authorization has been obtained from the Department of State, Division of Historical Resources. Management of any on-site cultural resources will comply with the provisions

of the Florida Historical Resources Act, specifically §267.061(2)(a) and (b), Florida Statutes.

Surveys are proposed for the Preserve as soon as funding is available, and the county will continue to monitor potential funding sources for such a survey. These surveys will be coordinated between the County and a professional cultural resources surveyor. Any significant resources will be interpreted for the public.

4.0 RECREATIONAL RESOURCES

4.1 Existing Recreational Facilities

Recreational resources in the Preserve include grassed parking areas, a walk-through gate, a walk-over to the Preserve, a bike rack, an FCT acknowledgement sign, a kiosk with maps and educational displays, a six-mile long marked hiking trail, and a picnic area near the entrance, (Figure 5).



This photograph shows the kiosk at the entrance of the Preserve off of Patrinoastro Road. The kiosk provides a map and brochures showing the amenities of the site, including the trails and vegetation types.

The parking area can accommodate approximately 20 vehicles, and is separated from the walk-through by a bollard and cable fence. The parking lot is composed of natural sand and grass and is of an adequate size to accommodate visitors to the Preserve. The parking substrate is pervious and no stormwater facilities are required or will be required for the duration of this plan. Although no stormwater facilities are planned for the Preserve, if any were to be installed in the future, they will be designed to provide recreational open space or wildlife habitat in a park-like setting.

The Preserve is open for hiking, birding, and nature study seven days a week during daylight hours. Figure 5 shows the trails, access points, and parking area for the Preserve. A brochure specific to the Preserve is posted on the County web site, at the kiosk at the entrance to the Preserve, and at all local nature centers (<http://www.hillsboroughcounty.org/parks/conservationservices/elapp.cfm>).

Figure 5 recreational resources

4.2 Proposed Recreational Facilities

The majority of the access facilities constructed within the initial phase of the management plan were limited to the Patrinostrero Road area to minimize impact to the natural areas of the Preserve. These existing facilities give the public reasonable access for observation and appreciation of the natural resources in the Preserve without causing harm to those resources. Due to the sensitive natural resources in the Preserve, further development of recreational resources is not proposed. The intent is to maintain the Preserve as a resource-based recreation area with passive uses, and continue environmental educational programming. Any educational programs that are currently conducted on the Preserve will be ongoing.

The County has committed to maintaining one acknowledgement sign which identifies the Project Site as having been purchased with funds from “Florida Communities Trust.” At the time in which a replacement sign is needed for the existing sign, the new sign shall be at least 3’ X 4’ in size, include the FCT logo and the year the Preserve was acquired.

Any proposed modifications of the Blackwater Creek Nature Preserve Land Management Plan or any site alterations or physical improvements that are not addressed in the FCT-approved Land Management Plan requires prior FCT review and approval. In the interest of keeping the Preserve as natural as possible and maintaining a pristine landscape, any utilities lines needed on the site will be buried.



The trails through the Preserve are well maintained and clearly marked.

4.3 Permits Required for Development and Maintenance of the Preserve

No development or restoration work is planned for the duration of this management plan and therefore, no permits will be required for the development or restoration projects which are not planned. If additional development or restoration work were planned, the County would apply for all the appropriate permits, including those from the Florida

Department of Environmental Protection, the Southwest Florida Water Management District, the US Army Corps of Engineers, the Environmental Protection Commission of Hillsborough County, as well as county permits for site preparation, building and operation and maintenance, etc., dependent upon what kind of development or restoration was planned at that time.

4.4 Easements, Concessions, and Leases

Existing leases in the Preserve include a cattle lease agreement, which is currently being re-bid, and a feral hog removal program, which is ongoing. The Southwest Florida Water Management District has an agreement with the County to monitor ground water levels in the Preserve, doing so through on-site wells (Appendix A).

No new easements, concessions or leases are being considered for the Preserve, other than the cattle lease. There are presently no cattle pens in the Preserve. The highest density of cattle is offsite in the non-FCT funded pasture area (Figure 1).

The County will provide FCT a 60 day prior notice and information regarding any lease of any interest, the operation of any concession, and any sale or option, the granting of any management contracts, and any use by any person other than in such person's capacity as a member of the general public and no document will be executed without the prior written approval of the FCT. The County will not execute any document without the prior written approval of the FCT.

Easements on the Preserve include three easements to the FDOT. Two of the easements are for small borrow pits in the northeastern portion of the Preserve, as shown in Figure 3, and described in Section 2.2.2 as freshwater marshes. The third easement is along SR Highway 39 adjacent to the road right-of-way. This easement is reserved for future widening of the road. Other easements were vacated upon the purchase of the Preserve by the County. These included easements for a subdivision, drainage ditches, and utilities that will no longer be needed with the preservation of the property.

There are a number of County rights-of-way along the boundaries of the Preserve could be vacated if the adjacent property owner agrees. These possibilities have been investigated in the past and should continue to be investigated in the future. Vacating unneeded rights-of-way will permit the County to provide additional security for the Preserve.

No concessions are being considered for the Preserve, and no fees are anticipated. There are no facilities or other entity on the Preserve which may generate income and none are planned for the next ten years at a minimum. If such a facility or entity existed or were ever planned on the Preserve, fees would be placed in a segregated account solely for the upkeep and maintenance of the Preserve.

The County will provide the FCT 60 day prior written notice and information regarding any lease

4.5 Greenways and Trails

Figure 6 shows existing and proposed trails throughout Hillsborough County as part of the Greenways and Trails Program. The Preserve has been incorporated in the County's Greenways network as an existing natural and recreational corridor. Please see <http://www.hillsboroughcounty.org/parks/greenways/> for additional information on Hillsborough County's greenway program.

Concerning the recreational trails, the existing hiking trail loops through the Preserve south of Blackwater Creek, while the trail on the greenways map (Figure 6) crosses the creek, loops through the Preserve north of the creek and then crosses SR 39 to the County's Cone Ranch property. The proposed trail splits in the center of the Cone Ranch property and heads north to Pasco County and south to Knights Griffith Road. This proposed trail is not likely to be implemented for the reasons stated in Section 4.2, and because it is not economically feasible.

The natural greenway corridor extends from Pasco and Polk Counties from the Green Swamp through the Cone Ranch and then west into the Blackwater Creek Nature Preserve. The corridor then continues west through private property and then again in public lands near Hillsborough River State Park, the Oakridge Equestrian Trail Preserve, and the Lower Hillsborough Wilderness Park (Figure 1). The philosophy behind the greenway was to create a connected series of protected lands to facilitate the movement of wildlife throughout the area. The County coordinates land management activities regularly with adjacent landowners, such as the Southwest Florida Water Management District. See additional information in Section 2.5.2.

5.0 RESOURCE MANAGEMENT

5.1 Site Security

The Preserve has no site security resident, but the cattle lease arrangement requires the lessee to frequently patrol the site as part of the lease agreement. Other responsibilities of the lessee are to make sure the fence is intact, signage is present, and that no inappropriate or illegal activities are occurring on the Preserve. The lessee is also required to coordinate with the Sheriff's Department and Wildlife Officers from the Florida Fish and Wildlife Conservation Commission when violations occur. In the event that the cattle lease is terminated or not renewed for any reason during the course of management, a site security resident or hired contractor will be necessary for site security detail. Additional fencing is also recommended. Many areas of perimeter fencing are aging and not placed correctly on the Preserve boundary.

FIGURE 6
Greenways and trails

Recent security problems on the Preserve include illegal access through cut or damaged fences, and illegal hunting and discharging of firearms. Bike riding and horseback riding are prohibited in the Preserve due to the sensitivity of the habitat and potential impacts to the cattle. Figure 5 shows the access gates for the Preserve. These gates remain locked and the boundary is posted against trespassing and hunting.

5.2 Exotic Species Management

Exotic, "alien" or "non-native" species refer to plants, animals, fungi or other organisms that have been accidentally or purposefully introduced to an area outside of their origin. Exotic species can come from another continent, another part of a country or even from another watershed. Organisms evolve with other species that moderate their population (for example, plant pests and diseases). When an organism is taken out of its original environment and placed in another, species that help keep it in check may not be a part of this new environment (<http://mdc.mo.gov/nathis/exotic/>).

5.2.1 Invasive Exotic Plants

Common invasive exotic plants known to occur in the Blackwater Creek Nature Preserve are water hyacinth, Brazilian pepper, alligator weed, chinaberry tree, primrose willow, two-leafed nightshade, tropical soda apple, lantana, Asian sword fern, Caesar's weed, Japanese, wild taro, hydrilla, cogon grass, Chinese tallow, camphor tree, skunk vine, and Mexican petunia, but with a few exceptions, these species are generally under control. Conservation Services staff have observed water hyacinth within the wetlands in the Preserve, specifically in the wetlands on the north side of the creek and within some wetlands in the Acquisition of Convenience (Weekes, 2008).

Figure 7 shows the GPS-referenced locations of the worst infestations of these species. New species and new infestations can occur frequently and the staff surveys the Preserve on a regular basis to prevent new infestations from becoming established. Sites are treated on an as needed basis, prioritized by the staff according to resources available. Exotic plants can be treated by mechanical, physical, chemical or biological methods or combinations of one or more of these methods. Mechanical treatments include the cutting or pulling of the vegetation and often is followed by the use of chemical spraying. Physical treatments include the use of prescribed fire or water impoundment to kill or at least slow the spread of the exotic plants.

Chemical treatments are the most widely used and usually most effective methodology. This involves the use of herbicidal sprays, typically applied from back pack sprayers.

Biological controls are the slowest methodology of treatment, but when implemented properly, can be the most effective over the long term. Biological control involves the introduction of a natural predator or pathogen that destroys the exotic species. Biological treatment requires long years of testing to ensure that the introduced control does not create problems in the environment.



A Conservation Services staff member applies herbicide to the base of a Chinese tallow tree in the Preserve.



The mesic hardwood forested area on the south side of the creek near SR 39 is proposed for restoration. Major pest plants present in this area include skunk vine, Caesar weed, cogon grass and Mexican petunia.

Treatment methodologies for exotic plant species are continually changing as new herbicides and biological controls are developed. There are numerous references available for types of chemical herbicide application and biological treatment and the science is changing all the time. The Conservation Services Team is committed to using the latest technology and the safest methodology available to reduce existing infestations. Some resources on line include:

Center for Aquatic and Invasive Plants Web site <http://plants.ifas.ufl.edu>.

Florida Exotic Pest Plant Council Web site <http://fleppc.org>.

[Identification and Biology of Non-Native Plants in Florida's Natural Areas](#). K.A. Langeland and K. Craddock Burks. 165 pp. 1998. IFAS Publication SP 257.

[Control of Non-Native Plants in Natural Areas of Florida](#). K.A. Langeland and R.K. Stocker. 34 pp. 2001. IFAS Publication SP 242.

[Help Protect Florida's Natural Areas from Non-Native Invasive Plants](#). K.A. Langeland. 1999. IFAS Circular 1204.

The most effective method for the treatment of exotic plant infestations is prevention. This will require periodic monitoring of vulnerable areas in the Preserve and maintenance of all occurrences while they are in the early stage of development. County staff uses the latest edition of the list of invasive exotic plant species, prepared by the Florida Exotic Pest Plant Council (FLEPPC). The Hillsborough County Invasive Species Task Force is a multi-agency partnership which removes invasive plants on public lands and works to educate the public on the existence and harm caused by invasive plants and animals. More detailed information regarding the task force can be found at <http://www.hillsboroughcounty.org/parks/conservationservices/invasive.cfm>. The task for brochure and the FLEPPC list of exotic plants is provided as Appendix F.

5.2.2 Invasive Exotic Animals

The exotic animals observed on the Preserve to date are feral pigs, European starling, nine-banded armadillo, channeled apple snails, and the Cuban anole. Periodic monitoring to determine the presence of nuisance species is recommended so that removal action may be taken before feral animals breed on site and become a serious problem. Monitoring can be conducted during routine maintenance events, such as mowing, maintaining firebreaks, and exotic vegetation maintenance and during native wildlife surveys. Hillsborough County policy is to remove invasive exotic animals which become problematic to the preservation of native plants and animals on Preserve lands (Appendix D).

Feral hogs are especially destructive to natural areas in that they root up the soil when foraging. This disturbance may cause erosion problems and facilitates the introduction of exotic vegetation. Feral hogs also can be dangerous and have been known to attack people. County policy is to remove feral hogs from preserves and a feral hog program is ongoing. Additional information regarding feral hogs is provided in Appendix F – Exotic Species Information.

The channeled apple snail has been observed in Blackwater Creek and other wetlands in the Preserve (Weekes, 2008). These exotic snails are from South America and have been a problem in Florida since the late 1970s. They will eat almost any aquatic plants and are impacting wildlife habitat throughout the state, and competing with the native Florida snail. No effective chemical treatment has been identified to date. The FFWCC is requesting that infestations of the snail be reported. See the website: http://www.myfwc.com/docs/WildlifeHabitats/FWC_applesnails_FLMS_handout.pdf.

5.3 Prescribed Burns

5.3.1 The importance of fire

The Preserve has had an active prescribed burn program for over 20 years (Ham, Personal Communication, 2008). Prescribed fire is a land management tool used to restore and maintain fire-dependent ecosystems, enhance forest health, improve wildlife habitat, and prevent dangerous, uncontrolled wildfire by reducing hazardous fuels. Fire promotes healthy ecosystems by clearing out competing vegetation, cycling nutrients into the soil, providing food for wildlife, and stimulating fire-dependent plants to germinate, grow, and produce seed (http://www.fs.fed.us/fire/fireuse/rxfire/rx_index.html). Concerns regarding smoke created by prescribed fire are a priority, especially considering the residential areas around the Preserve.

One of the greatest benefits of prescribed fire is that it reduces "fuels" such as the underbrush, branches, pine needles, leaves, and dead plant debris that have built up on the forest floor over time. If fuels are not reduced every few years, wildfires can become intense, hot, and destructive (http://www.fs.fed.us/fire/fireuse/rxfire/rx_index.html).

Because of Florida's long history of lightning fires, many of the state's natural systems are adapted to fire and depend on periodic fire to remain healthy. Prescribed burning is a vital tool for managing pine flatwoods, pine sandhills, and sand pine/oak scrub found in the region. These natural systems shelter many threatened and endangered plant and animal species that rely on fire to survive, such as Florida black bear, Florida scrub-jay, eastern indigo snake, gopher tortoise, and scrub holly. When fire is suppressed in these areas, some plant and animal populations decline and eventually disappear (Myers *et al.*, 1990).

Because natural fires can no longer move across the landscape as they did historically, prescribed fire at appropriate intervals is necessary to maintain these unique natural communities. For example, prescribed fire reduces the height of scrub vegetation to a level that is suitable for the Florida scrub jay and opens up sandy areas which allows the jays to store their acorns. Fire also generates fresh seeds, fruits, and native plant growth, providing food for these rare species (Myers *et al.*, 1990).

Many people have expressed concern about the safety of wild animals during prescribed fires. Most wild animals migrate to safety during the relatively slow-moving prescribed

fires. Some animals take refuge by moving to unburned or previously burned areas. Small animals seek shelter under logs, in old trees, and in burrows like those of the gopher tortoise. Few animals are killed by fire, especially during the growing season when it's warm and most animals are active. Mammals are rarely killed, and ground nesting birds build new nests and benefit from increased numbers of insects after the fire (Myers *et al.*, 1990).

Prescribed fire is also beneficial to the people of Florida. It reduces the severity of wildfires and provides improved wildlife habitat, forest, and grazing land. As Florida's population continues to grow, more and more areas will be developed that will require fire protection services. Prescribed fire is a safe and effective land management tool for reducing the severity of wildfires (Myers *et al.*, 1990).



This photo depicts a prescribed burn during the summer of 2006.

The Blackwater Creek Nature Preserve has experienced many wildfires. Two large wildfires occurred in 2001 during an extended drought. The locations of these fires are shown on Figure 7. The northern fire occurred as a result of fires on the private property adjacent to the western boundary. Another wildfire, possibly started by lightning, occurred south of the creek in May, 2001.

5.3.2 Management Measures for Fire

Prescribed fires are conducted on County lands as resources become available and when climate conditions are appropriate. Preparation for burns includes the preparation of a burn plan, creation of fire lanes, surveying pre-burn site conditions, and notifying adjacent landowners who may be affected by the burn. Some of these responsibilities are shared by the Conservation and Regional Parks staff and some occur with the assistance of the State of Florida Division of Forestry, or specialized contractors.

Regional experts and existing literature recommend that the pine/palmetto and the palmetto/gallberry areas be treated with roller-chopping, hardwood reduction, and possibly chemical means not only to maintain the habitat but to facilitate prescribed fire applications in an increasingly urban environment. Other management measures include the removal of old spoil berms around the perimeter of the Preserve (thus widen firelane width), continuation of the prescribed burn program with emphasis on a short burn rotation, and summer burning when possible. The burn zones established for the Preserve are shown in Figure 7. A sample burn plan is included as Appendix G.

Part of the management measures for prescribed burning is to increase public awareness regarding the benefits of prescribed fire to wildlife and to the general public. The Conservation Services staff annually participates in the Great American Teach-In in area schools and leads on-site field trips in the Preserve. The County also provides lectures and brochures to public meetings and conferences and staff contributes to websites regarding prescribed burning. Additional information is available to the public on the Parks, Recreation and Conservation Department website regarding prescribed burns (<http://www.hillsboroughcounty.org/parks/resources/publications/prescribedfireinformation.pdf>)

5.4 Maintenance Needs

Maintenance activities that are required for the upkeep of the Preserve include:

Mowing	Fence repair
Posting boundaries	Road repair
Removing exotics	Maintaining locks and gates
Disking firelanes	

The maintenance responsibilities are undertaken by the Conservation Services staff with assistance from Hillsborough County Regional Parks staff, and in the case of this Preserve, the cattle lessee. There is no dedicated permanent volunteer and rotating staff will work with volunteers when time permits.

6.0 HABITAT RESTORATION

The habitat restoration needs in the Preserve consist of restoration of two distinct areas involving natural revegetation, invasive plant control, and/or planting. Please note that the acreage figures for numbers 1 and 2 below have been updated from the Grant Award Agreement and original management plan, which originally calculated 100 acres for the pine flatwoods and 3 acres for riverine hammock. These figures have been changed to 23.5 acres and 26 acres respectively.

Figure 7 – Burn Plan

1. Natural revegetation of the understory pine flatwoods vegetation in the 23.5 acre semi-improved pasture. This pasture is located in the northeast corner of the Preserve (burn zone 20 in Figure 7); restoration plans were outlined in the original management plan (Hillsborough County, 1997) to remove cattle and permit natural recolonization. Active replanting and bahia sod removal is to occur if and only if the passive method is unsuccessful. As noted in past stewardship reports, the area has successfully recruited many native pine flatwoods species. However, monitoring of the area continues to occur to ensure the long-term success of the recruitment.
2. The 26-acre area south of the creek and immediately west of SR 39 (burn zone 12 in Figure 7) needs invasive vegetation control and replanting. This area was designated as “degraded wetland communities” in the 1997 management plan, to be returned to riverine swamp and hammock (Hillsborough County, 1997). Staff conducted several trash cleanups, invasive species control efforts, and derelict fence removal workdays during the first years of County management. However, additional invasive species control and trash removal needs to be done. When this is completed, the area will be replanted with native transitional and wetland species, particularly understory grasses and shrubs that are commercially available and appropriate for the area.
3. Wiregrass planting in areas where it may be desirable to reestablish or any other supplemental native plantings are to be encouraged throughout the Preserve, if necessary.

7.0 COMPLIANCE

7.1 ELAPP Policies and Ordinances

On January 7, 1987, the Board of County Commissioners approved an Environmentally Sensitive Land Ordinance (Ordinance No. 87-1) that took effect upon the passage of a referendum on March 3, 1987. The voters of Hillsborough County passed the Environmentally Sensitive Lands Referendum by a three to two margin, providing for a one-quarter mil tax over a four-year period to purchase sensitive land in Hillsborough County. The tax was projected to raise approximately twenty-one million dollars in revenues over a four-year period for the purchase or protection of these lands.

In June 1990, Ordinance No. 90-19 was approved providing for the issuance of general obligation bonds not to exceed \$100 million and the levy of ad valorem taxes not to exceed a quarter of a mill in any one year for a period not to exceed 20 years for the purpose of acquiring, preserving, protecting, managing and restoring environmentally sensitive lands, beaches and beach access, parks and recreational lands.

In 2008, a third referendum was approved by an overwhelming show of support from voters in the County. Almost 80% of all votes cast in the County voted for the extension

of the ELAPP program for another thirty years. The referendum, Ordinance No. 08-16, will provide \$200 million for the ELAPP program starting in 2011.

The Environmental Lands Acquisition and Protection Program (ELAPP) was established for the purpose of acquiring, preserving, and protecting endangered and environmentally sensitive lands, beaches, parks, and recreational lands in Hillsborough County. The purpose of acquiring such lands will be for resource protection; however, all lands shall be open for public use and enjoyment to the extent that the County finds such use compatible with the preservation and protection of these lands (Hillsborough County Parks, Recreation and Conservation Department and Hillsborough County Real Estate Department 2006). The Environmentally Sensitive Land Ordinances are provided as Appendix H.

In 2008, Parks ordinance 97-14 was repealed and replaced with Ordinance No. 08-17 to provide additional protection to the park and conservation lands of Hillsborough County. This ordinance provides regulations that conformed to those of the state and federal government with respect to public lands, and is provided in its entirety in Appendix H.

7.2 Compliance with Comprehensive Plans

The Blackwater Creek Nature Preserve assists Hillsborough County in implementing the goals, objectives and policies of the Conservation and Aquifer Recharge Element, Future Land Use Element, and Recreation and Open Space Element of the County's Comprehensive Plan. The preservation of wildlife habitats and the development of public recreation and environmental conservation activities on the Preserve will help to accomplish or further enhance the goals and objectives described in Section 8.0. A copy of the relevant elements of the County's Comprehensive Plan is included as Appendix I. The county's Comprehensive Plan may be viewed in its entirety at <http://www.theplanningcommission.org/hillsborough/comprehensiveplan>.

8.0 SUMMARY OF MANAGEMENT GOALS AND OBJECTIVES

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 2009 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. 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. Due to the new Ordinance, future funding sources for the program will be decided during 2009. 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.

The estimated costs to support the proposed management goals and objectives for the next ten years are listed in Table 4 below. These items are not in any prioritized order, but it is likely that the treatment of exotic vegetation and the prescribed burn program will continue to take precedence over the other objectives.

TABLE 4 PROPOSED MANAGEMENT GOALS AND OBJECTIVES FOR BLACKWATER CREEK NATURE PRESERVE		
OBJECTIVE	SCHEDULE	ESTIMATED COST
Restoration	Ongoing	TBD
Rollerchopping and/or mowing	Ongoing	TBD
Invasive species control	Ongoing	TBD
Prescribed burns and maintenance of firelanes	Ongoing	\$80,000.00
Maintenance (road, fence repair, walkover, temporary fencing, etc.)	Ongoing	\$7,000.00
Fence installation	Ongoing	\$20,000.00
Cultural resource survey	2019	TBD
Ecological studies, including water monitoring	Ongoing	TBD
	Total	\$107,000.00

The goals and objectives of the Preserve are listed below, not necessarily in a prioritized manner.

Goal #1: Continue to Protect and Manage All Listed Species Populations.

Management activities will continue to protect the habitat of the gopher tortoise, wood stork, and other listed species.

Goal #2: Continue to Conduct Prescribed Burns.

Continue to conduct prescribed burns in pine flatwoods and continue with other vegetation management measures such as roller-chopping, if necessary to improve habitat conditions and reduce fuel loads for prescribed burns. Create or widen fire lanes along perimeter of Preserve.

Goal #3: Continue to Control Invasive Exotic Plants and Animals in the Preserve.

Continue to map and survey for invasive plant species, monitoring populations using GPS.

Goal #4. Continue Wildlife Surveys. Continue wildlife survey work in the Preserve, with emphasis on listed species. Continue to map locations of listed species using GPS, and implement management strategies for protection of these species.

Goal #5. Continue Environmental Education Efforts in the Preserve. Continue environmental education interactions by providing guided tours to select groups. Keep the preserve open to the public as much as possible while preserving the integrity of the habitat and protection of wildlife populations.

Goal #6. Continue Site Security Efforts. Continue site security efforts, continue perimeter fencing, and update posted signage around perimeter. Coordinate with the Sheriff's Department to control poaching, dumping, and other illegal activities.

Goal #7. Seek Continued Funding. Supplement existing budget with outside sources of funds to cover shortcomings. Grant opportunities will continue to be pursued aggressively. FCT will be advised of any additional funding awarded and no conditions of additional funding shall conflict with the specific conditions of the FCT grant award agreement.

Goal #8. Continue Water Monitoring and participate in any local effort among landowners to improve water quality in Blackwater Creek. Water monitoring for the Stream Water Watch Program will continue for the life of the program.

Goal #9. Continue with Habitat Restoration. The two habitats referenced in the management plan will be restored.

Goal #10. Continue Cultural Resource Survey. Continue to coordinate with the Florida Public Archaeology Network and have the road on the west side of the Preserve evaluated.

Goal #11. Continue Photo-monitoring Program. Continue to conduct photo-monitoring of natural systems, restoration areas, listed species populations, and other important features on the Preserve. These photos should be included in the annual stewardship reports to the FCT.

Goal #12. Continue To Provide FCT With Annual Stewardship Reports. The County will prepare and submit an Annual Stewardship Report, due on July 30TH of each year, which evaluates the implementation of the Management Plan.

Goal #13. Continue to vacate unneeded Right-of-Ways and Easements if the Opportunity Arises.

As stated in Sections 1.4, and 4.2, any proposed modifications of the Blackwater Creek Nature Preserve Land Management Plan or any site alterations or physical improvements that are not addressed in the FCT-approved Land Management Plan requires prior FCT review and approval.

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