GOLDEN ASTER SCRUB NATURE PRESERVE

LAND MANAGEMENT AND LAND USE PLAN

1.0 GENERAL INFORMATION

1.1 Location of the Golden Aster Scrub Nature Preserve

The Golden Aster Scrub Nature Preserve is located in southern Hillsborough County, in Sections 1, 2, and 12, of Township 31 South, Range 19 East. The site lies adjacent to the western right-of-way of I-75 and north of Big Bend Road (SR 672) near Apollo Beach, Florida. The Bullfrog Creek Scrub Preserve lies south of the Golden Aster Scrub Nature Preserve, and the Kitchen Nature Preserve lies to the northwest. Electrical transmission corridors traverse the Preserve north to south, as well as along the southern tip. The CSX Transportation System, Inc. railroad forms the western boundary. The Preserve is accessed from a gate on the end of East Bay Road and consists of 1161.75 acres of land and 29.65 acres of open water. Surrounding land use includes low to medium density residential areas, agriculture, and institutional with the location of Eisenhower Junior High and East Bay High School on the southern boundary on the Preserve. A Hillsborough County maintenance unit is also found on the southern boundary. Figure 1 provides a location map of the Golden Aster Scrub Nature Preserve, as well as other public lands in the vicinity. Appendix A provides the legal description, lease agreement with the Conservation and Recreational Lands Program (CARL), easements, and other legal documents for the Preserve.

1.2 History and Objectives of the Preserve

The Golden Aster Scrub Nature Preserve has been used for open cattle grazing for the last 70 years. Figure 2 provides an aerial photograph of the site taken in 1938. During the construction of I-75 in the 1980s, a portion of the site was used for an asphalt manufacturing plant. In addition, an extraction operation was active at that time, providing fill dirt for the construction of the highway. The extraction operation left two lakes on the site, and the asphalt plant site, although removed, has left a disturbed area vegetated with opportunistic species. The lands that now comprise the Golden Aster Scrub Nature Preserve were purchased by Hillsborough County from the Emil C. Marquardt, Jr. land trust on May 26, 1995. The County then sold most of the site to the Preservation 2000/CARL Program of the State of Florida (Hillsborough County, 2007). The County is now leasing and managing the Preserve. This plan is a revision to the 1997 Land Management Plan, as mandated in the State Statutes.

FIGURE 1 LOCATION MAP

FIGURE 2 HISTORICAL AERIAL PHOTO

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 ten different classifications of soils found in the Golden Aster Scrub Nature Preserve. Table 1 lists the soils and the surface area they cover within the Preserve. Figure 3 highlights the ten soil types and shows their distribution throughout the Preserve. Also on Table 1 and in Figure 3 are the two lakes/borrow pits on the Preserve; these areas are listed as open water in Table 1 and as Water (99) on Figure 3.

Table 1
Golden Aster Scrub Nature Preserve
Soils Distribution

Map Number	Soil Type	Acreage
3	Archbold fine sand	111.74
5	Basinger, Holopaw, and Samsula soils	55.60
15	Felda fine sand	20.43
27	Malabar fine sand	63.67
29	Myakka fine sand	654.72
41	Pomello fine sand	82.94
46	St. Johns fine sand	37.79
52	Smyrna fine sand	36.74
56	Urban land	0.18
57	Wabasso fine sand	97.95
99	Open water	29.65
	Total Acreage	**1191.40**

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

2.1.2 Soils Description

Archbold fine sand (3). This soil type is nearly level and moderately well drained. It is found on low ridges in pine flatwoods. The natural vegetation on this soil consists of a sand pine overstory and saw palmetto, prickly pear, and pineland three awn as ground cover. This soil type makes up nearly 10% of the total surface soil area, and is found in two locations creating a long ridge through the center of the Preserve.

Basinger, Holopaw, Samsula soils (5). This soil type makes up nearly 5% of the total surface soil cover and is found in fifteen small depressions scattered throughout the Preserve. This soil complex supports freshwater marsh areas.

FIGURE 3 SOILS

Felda fine sand (15). Felda fine sand is nearly level and poorly drained. It makes up only 1.72% of the surface soils. This soil is found in three areas in the western portion of 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.

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 5.3% of the total surface soils in the Preserve, and are found in three areas in the western portion and one larger area near the southeastern corner of the eastern portion.

Myakka fine sand (29). This soil type comprises approximately 54.98% of the surface soils within the Preserve and is the most prevalent soil type present. It comprises the majority of the eastern portion and the eastern half of the western portion of the Preserve. A small area of this soil is also found in the northwestern corner of the western portion. 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.

Pomello fine sand (41). This soil is nearly level and found on low ridges in the flatwoods. The natural vegetation includes saw palmetto, runner oak, pines, scrub live oak, blue jack oaks, and grasses. This soil is found in five different areas within the Preserve and comprises almost 7% of the total surface soils.

St. John fine sand (46). This soil is nearly level and poorly drained and is found on low-lying plains in the flatwoods. The vegetation usually found on undisturbed sites includes flatwoods species such as longleaf and slash pines, saw palmetto, wax myrtle, gallberry, running oak, and pine land three awn. This soil type comprises only 3.17% of the total soil surface and is found in four locations in the eastern portion of the Preserve.

Smyrna fine sand (52). This soil classification provides 3.08% of the surface soils in the Preserve. This soil type is found on broad low-lying, convex swells in drier flatwoods communities. Three areas of this soil type are located in the northwestern corner of the eastern portion of the Preserve. The native vegetation would typically include longleaf and slash pine, gallberry, running oak, saw palmetto, wax myrtle, and other species common to pine flatwoods.

Urban land (56). The urban land is an area of fill, located in the southern tip of the southern portion of the Preserve. This small (<0.01%) area is likely a remnant of fill from the development of the adjacent parcel. Vegetation on this soil includes non-native, opportunistic species.

Wabasso fine sand (57). This soil type comprises 8.22% of the Preserve and is located in the western half of the western portion of the Preserve. This nearly level, poorly

drained soil supports flatwoods vegetation such as longleaf, slash pine, and cabbage palm with an understory of palmetto.

Open water (99). Open water includes the two lakes in the eastern portion of the Preserve and comprises 2.49% of the total surface area. These two lakes were likely created as a result of fill extraction for the construction of I-75.

2.1.3 Soils Management Measures

Management measures for the Preserve include the protection of 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, should that occur. 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. There are no known oil, gas, phosphate or other mineral resources on the Preserve. Any future management measures not included in this plan that require earthwork will implement Best Management Practices prior to construction, as found in http://www.na.fs.fed.us/spfo/pubs/n_resource/wetlands/index.htm.

2.2 Natural Communities

2.2.1 Mapping Process

The discussion of ecological communities describes the distinct vegetation associations on the Golden Aster Scrub Nature Preserve. The vegetation community areas were estimated and then mapped by interpretation of aerial photography (2006 full color photography at a scale of 1” = 150’) with limited ground truthing, and with input from Conservation Services staff. These communities were then digitized and converted to GIS shape files to be used for planning and informative purposes. 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 Golden Aster Scrub Nature Preserve. The seven vegetation communities identified are listed in Table 2 with the total area that each community occupies within the Preserve. The open water designation includes the two borrow pits/lakes on the Preserve.

Table 2
Golden Aster Scrub Nature Preserve
Natural Vegetation Communities

Vegetation Community	Acres	%
Freshwater marsh	33.6	2.8
Hardwood swamp	12.9	1.1
Old field	17.8	1.5
Open water	30.1	2.5
Pine flatwoods	910.1	76.4
Sand pine/palmetto scrub	130.8	11.0
Scrubby flatwoods	33.4	2.8
Wet prairie	22.6	1.9
Total acres	**1191.4**	**100.0**

2.2.2 Vegetation Community Descriptions

The following paragraphs describe the lakes and 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 may continue ground-truthing and refining the delineation of plant community types, as well as continue to update the flora and fauna species lists.

Freshwater marsh. There are 26 freshwater marshes scattered throughout the Preserve, typically supporting a similar vegetative composition. A dominance of emergent aquatic vegetation such as pickerel weed, arrowhead, soft rush and grasses and sedges characterize these wetlands. These marshes provide significant wildlife habitat for numerous species (Myers ***et al.***, 1990).

Management measures for freshwater marsh. Fire plays an important role in maintaining the character of freshwater marshes. Fire limits the invasion of woody vegetation, and reduces the accumulation of peat. Fire also increases the nutrients in the soil by burning dead, undecayed vegetation matter. The natural fire cycle in freshwater marshes is one to three year intervals for shallow wetlands, and three to five years for deeper marshes. The fires usually occur in the summer when the soil moisture is high and vegetation is growing (Myers ***et al.***, 1990). In addition to prescribed burns, it is critical that improvements to the Preserve do not include activities that would change the pH of the soil and water in the natural communities.

FIGURE 4 NATURAL COMMUNITIES

The grassy area in the background of the photo is one of the many small wetland depressions in the Preserve. These areas are hydrated by surface water runoff.

The placement of a shell rock road adjacent to a wetland can have a significant impact on the vegetation caused by the leaching of the calcium and salt into the surrounding soil. And the incorrect placement of a fire lane can cause the draining or impoundment of a wetland, impacting the hydrology of the system (Bowman, 2007). Freshwater wetlands are highly susceptible to exotic plant invasions. Woody species such as melaleuca, Brazilian pepper, and primrose willow can become established quickly and have long term impacts on the character of these wetlands. The Conservation Services staff treats invasive plant species when resources and staff are available.

Hardwood swamp. There are two hardwood swamp communities on the site, totaling 12.9 acres or 1.1% of the total area of the Preserve. The two areas are located in the southern portions of the east and west sections of the Preserve and support a canopy of loblolly bay, sweet bay, red bay, red maple, and dahoon holly. Other species present in the shrub and understory include swamp azalea, Virginia willow, and a variety of ferns (Hillsborough County, 1997).

This photo shows the bay trees and perimeter vegetation of the hardwood swamp. Many of the trees in this swamp were destroyed by the arson-caused wildfire of 2006.

Management measures for hardwood swamps. The mesic fringes of hardwood swamps are prone to infestation by exotic species such as old world climbing fern, skunk vine, air potato, and other invasive vines. Once these species become established, they are hard to control. Conservation Services staff is well-educated regarding the maintenance of exotic species and makes efforts to control them when resources are available. This is not a fire-dependent community and the natural fire cycle is likely 50 to 100 years or more (Myers ***et al***., 1990). It is important to protect the vegetative character and topography of the surrounding drainage basin. These communities are usually hydrated only by rainfall and surface water runoff, so any changes in the drainage area has the potential to impact the hydroperiod of the wetland.

Old field. The old field community is located in the northern portion of the Preserve, around the northernmost lake/borrow pit. This area was previously the location of a temporary asphalt manufacturing plant during the construction of I-75 in the 1980s, but the plant has been removed, and environmental audits performed in 1995. The audits determined that there was no soil or groundwater contamination in the area where the asphalt plant was located (AT&E, 1995).

Management measures for old field. Conservation Services staff planted several species of native grasses in this area for restoration. This area is proposed for future construction of a nature center, but not likely within the next ten years (Bowman, personal communication, 2007).

Pine flatwoods is the predominant land cover in the Preserve, and it varies in character from mesic on the west side to scrubby flatwoods on the east side. These communities are burned on a regular basis to prevent the buildup of woody species.

Pine flatwoods. The pine flatwoods comprise the majority of the Preserve with over 76% cover. The mesic to wet flatwoods generally support an open canopy of longleaf pine and slash pine with an understory of saw palmetto and various grasses and other herbaceous species. The abundance of wire grass varies with the density of the saw palmetto and the canopy coverage. Cabbage palms are present in the subcanopy of the

more mesic flatwoods, and gallberry, wax myrtle, fetterbush, and St. John's wort are found in the shrub layer, when present.

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 in the character of the habitat by changing drainage patterns. Roller chopping of areas too difficult to burn, such as that near I-75, is also a habitat improvement option. Revenue can be obtained by harvesting and selling the saw palmetto berries. Other management measures include preventing wildfires, off-road vehicles, and other forms of vandalism.

Sand pine/palmetto scrub. This habitat type forms a low ridge that extends north to south in the eastern portion of the Preserve, comprising 11% of the total land cover. The white, sandy soils that support this plant community are very obvious in Figure 2. Species present in this community include sand pine and scrub oaks, with saw palmetto and wire grass in the understory.

The white sandy soil characteristic of scrub communities is evident in the foreground. Sand pines can be seen in the distance. This photo was taken on the western edge of the scrub facing east.

Management measures for sand pine/palmetto scrub. Prescribed burns are important for the maintenance of this vegetation community. The natural fire cycle is usually a catastrophic fire every 20 to 80 years or longer, which allows the sand pines to complete a life cycle (http://www.fnai.org/PDF/Natural_Communities_Guide.pdf). Given the Preserve's location adjacent to I-75 and residential areas, the concerns for safety may take precedence over the optimum management measures for this community, and more frequent burns will be implemented. Other management measures for the scrub include the control of exotic vegetation, although this is not often a problem is this community, and the strict adherence to rules regarding off-road vehicle use. The sensitive lichens and other ground cover species, and the roots of the sand pine trees are extremely susceptible to damage from vehicle and even foot traffic and subsequent soil compaction (http://www.fnai.org/PDF/Natural_Communities_Guide.pdf).

Scrubby flatwoods. The scrubby flatwoods is located in the northeast corner of the Preserve, forming the northern end of the low central ridge. This community comprises less than 3% of the total land cover and consists of a treeless prairie dominated by saw palmetto, with tarflower, gopher apple, and wiregrass in areas where the palmetto is not as dense. The majority of the trees in this area have been eliminated by arson fires, especially the fire of 2006.

This flatwoods is located north of the scrub area and differs from the scrub community by the soil type and the tree species, when present. The trees in the scrub community are predominantly sand pine, while the trees in this community include slash and longleaf pine when present.

Management measures for scrubby flatwoods. The scrubby flatwoods is a fire-dependent community with a natural fire cycle of 8 to 25 years between fires (http://www.fnai.org/PDF/Natural_Communities_Guide.pdf). Prescribed fires prevent the community from succession into hardwood hammock or xeric oak. Roller-chopping is also a valuable management tool in this habitat. The control of exotic plants and animals is important in this community. While the invasion of exotic plants in this community is not common when the native species and soils are intact, any soil disturbance will invite Brazilian pepper, chinaberry, lead tree and other nuisance species. Exotic animals frequently found in the scrubby flatwoods include the nine-banded armadillo and feral hog. The feral hog can do extensive damage to this community by destroying the vegetation and rooting up the soil making it susceptible to exotic plant infestations.

Wet prairie. The depressions are found within the flatwoods and total less than 2% of the total land area. These twelve areas are seasonally hydrated herbaceous areas dominated by grass species. They differ from the freshwater marsh areas in hydroperiod and vegetation, but some wet prairies become freshwater marsh in wet years, and some freshwater marsh areas become wet prairies in drought years. The vegetation can change over a season depending upon rainfall. The vegetation in these sandy areas includes herbaceous species common to depressions in acidic soil, such as meadow beauty, pipewort, bog buttons, hatpins, Carolina redroot, soft rush, yellow-eyed grass, sundew, St. John's wort, milkweeds, and numerous others (Hillsborough County, 1997).

Management measures for wet prairie. These ephemeral areas require little maintenance except for the occasional fire to perpetuate the habitat. They have few problems with exotic vegetation, except for cogon grass, which once established, can destroy a community like this. Feral hogs can cause serious damage to these wetland communities by rooting in the soil and creating opportunities for infestations of invasive exotic plants. In addition, the rooting can create ruts and mud holes which can impound or redirect surface water runoff in these very flat areas. Vehicles should avoid this habitat as much as possible. Even minor changes in the hydrological regime, such as creating ruts in the wet soil, can result in impacts to the vegetative character of these wetlands (http://www.fws.gov/verobeach/images/pdflibrary/marshes%20wet%20prairies.pdf).

Open water. The open water includes two lakes excavated for fill for the construction of I-75. These borrow pits have very steep side slopes and are quite deep. This makes the pits hazardous for fishing or boating due to the potential for drowning.

This photo shows the lake in the northern portion of the site, near the security residence. Fishing and boating are not allowed in these lakes because of access problems and the lack of suitable fish.

Management measures for open water. Motorized boats and swimming are incompatible uses for these lakes and are not permitted in the Preserve. Fishing is not allowed because of the potential to disturb sensitive resources around the borrow pits/lakes, such as the Florida golden aster and the foraging wading birds, ducks and other avian species that use the lake. The lakes is not used for fishing because of the presence of jewel cichlids, an aggressive tropical fish species from South Africa which make it impractical to stock the lakes with more appropriate fish without first removing all the cichlids. The lakes are used as a focal point for visitors, however, and the County has spent a significant amount of money constructing a picnic pavilion, restrooms, an informative kiosk, and these facilities are all handicap-accessible due to a paved road to the area from the parking lot. So although fishing, boating, and swimming are not allowed in the lakes for safety reasons, the lakes are still used as recreational assets.

2.3 Water Resources

2.3.1 Aquatic Preserves and Outstanding Florida Waters

The Golden Aster Scrub Nature Preserve is located four miles east of Tampa Bay but has no important aquatic resources, such as Aquatic Preserves or Outstanding Florida Waters. No water bodies on or in the vicinity of the Preserve provide significant discharge to sensitive aquatic resources.

2.3.2 Water Quality

The Golden Aster Scrub Nature Preserve lies within the Bullfrog Creek/Wolf Branch Creek Watershed. Hillsborough County contracted a consulting firm to prepare a watershed management plan for Bullfrog/Wolf Branch Creeks watershed. In 2000, the consultant presented their findings and made 21 unspecific recommendations to improve water quality (http://www.hillsborough.wateratlas.usf.edu/watershed/). None of the recommendations will affect the Preserve and the habitat it provides. The watershed drains 69.1 square miles in Hillsborough County and contains 2 named lakes and ponds and 3 named rivers, streams and canals. Water quality is considered generally good (48%) and the trend is fairly stable. Only 17% of the watershed is considered wetlands. Over the last ten years, three years showed more than average rainfall; in 1997, 2002, and 2005.

2.3.3 Water Resource Management Measures

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,
- preserve or restore vegetation around the perimeter of the borrow pits/lakes to act as buffers against surface water impacts,
- always implement best management practices during any construction or other disturbance of the soils or vegetation.
- protect the water quality in the lakes and wetlands on site and protect the lakes from inappropriate uses which would degrade the water quality, and
- protect water quality in the creek in the northwest corner of the Preserve in its flow off-site.

2.4 Fish and Wildlife Resources

2.4.1 Existing Conditions

The Golden Aster Scrub Nature Preserve provides some of the last remaining habitat for scrub jays and the Florida golden aster in the County. The mosaic of scrub and other xeric communities with pine flatwoods and freshwater marsh communities provide habitat for numerous species, including endemic animals. The lack of human intrusion and the strategic management efforts further enhance the habitat. In addition to the listed species, the Preserve is known to provide habitat for 78 bird species, 10 mammals, 8 amphibians, 16 reptiles, and 8 invertebrate species. These are the species that have been observed on site as of February 15, 2008, and a list identifying these species is provided in Appendix B.

2.4.2 Management Measures for Fish and Wildlife

Plant and animal surveys have been conducted on the Preserve by staff and volunteers since its purchase over ten years ago and comprehensive lists of these species are provided in Appendix B. These surveys will continue in perpetuity and as new species are observed, the list will be updated. Formal surveys have been conducted to determine the success of the habitat restoration efforts, such as the prescribed burns and the roller-chopping. While the majority of the surveys are focused on the listed species, information obtained during the surveys is applied to the other inhabitants of the habitats.

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, and other illegal activities.

2.5 Special Status Species

Information regarding the special status species on Golden Aster Scrub 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. The individual habitat needs for each species are discussed in the following paragraphs. These species were noted during casual observations, as well as from formal surveys. Formal surveys have been used to determine the locations of foraging, roosting, and nesting areas of the protected species, and this information is entered into a data base to facilitate the management of the species. ELAPP policies regarding the management of special status species are provided in Appendix C.

Table 3
Special Status Species Observed in the
Golden Aster Scrub Nature Preserve

Species		Ranking	
Common Name	**Scientific Name**	**FED (3)**	**STATE (1,2)**
Birds			
Snowy egret	***Egretta thula***		SSC
White ibis	***Eudocimus albus***		SSC
SE American kestrel	***Falco sparverius paulus***		T
Florida sandhill crane	***Grus canadensis pratensis***		T
Southern bald eagle	***Haliaeetus leucocephalus***		T
Wood stork	***Mycteria americana***	E	E
Florida scrub-jay	***Aphelocoma coerulescens***	T	T
Reptiles and Amphibians			
American alligator	***Alligator mississippiensis***	SAT	SSC
Eastern indigo snake	***Drymarchon corais couperi***	T	T
Gopher tortoise	***Gopherus polyphemus***		T
Plants			
Curtiss' milkweed	***Asclepias curtissii***		E
Florida golden aster	***Chrysopsis floridana***	E	E
Nodding pinweed	***Lechea cernua***		T
Giant orchid	***Pteroglossapsis ecristata***		T
Giant air plant	***Tillandsia utriculata***		E
Red-margin zephyr lily	***Zephyranthes simpsonii***		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 Golden Aster Scrub Nature Preserve provides foraging habitat for the snowy egret, but no nesting habitat. This

species prefers to nest on islands over a broad expanse of open water to reduce nest predation (Rodgers ***et al.***, 1996). Management of foraging 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.

White ibis. The white ibis has been observed foraging on the Preserve for insects, crayfish, and small amphibian and reptiles. Ibis will also eat fish when abundant. 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).

Some of the state's most important nesting sites for white ibis are located northwest of the Golden Aster Scrub Nature Preserve near the mouth of the Alafia River. This nesting colony has supported as many as 17,000 nesting pairs during wet years, but the populations fluctuate with the climate and disturbance. 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 freshwater marsh and wet prairies on 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.

Other 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, preserving the natural vegetation on the site, preserving the natural topography and drainage patterns, and limiting human interference. 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, but electrical transmission corridors such as those on the Preserve are quite popular. The Preserve staff has installed nest boxes in the Preserve to try to encourage a breeding population. 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.

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.

Southern bald eagle. Bald eagles have been observed flying over the Golden Aster Scrub Nature Preserve, and although there are no known nests in the Preserve, there are at least three nests in the vicinity according to FFWCC most recent data (2007) (http://myfwc.com/eagle/eaglenests/Default.asp). Most eagles nest near open water so future nesting pairs on the Preserve are a possibility. The main component of the eagle diet is fish; but small birds compose approximately 20% (Rodgers ***et al.***, 1996). The main factors threatening the survival of the bald eagle are habitat loss and human disturbance.

Management measures for the bald eagle. The habitat on the Preserve is protected in perpetuity, should the bald eagle ever nest there. Prescribed fires and control of exotic vegetation will prevent the degradation of potential habitat and provide nesting opportunities for the future. The USFWS recovery plan for the bald eagle is available at http://www.fws.gov/verobeach/Programs/Recovery/vbms4.html

As per 50 Code of Federal Regulations 17, the Federal Government has elected to delist the bald eagle in the lower 48 states, effective August 8, 2007. The FFWCC has also delisted the bald eagle, with an estimated 1,133 nesting pairs in the state of Florida. The bald eagle population has increased in the last forty years from around 500 nesting pairs to approximately 10,000 nesting pairs presently found in the lower 48 states. The eagle is still federally protected by the Migratory Bird Act and the Bald and Golden Eagle Act. The USFWS has prepared the National Bald Eagle Guidelines (USFWS, 2007) with the following intentions:

- To publicize the provisions of the Eagle Act that continue to protect bald eagles, in order to reduce the possibility that people will violate the law,
- Advise landowners, land managers, and the general public of the potential for various human activities to disturb bald eagles, and

- Encourage additional nonbinding land management practices that benefit bald eagles.

The USFWS National Bald Eagle Guidelines can be found at http://www.fws.gov/migratorybirds/issues/BaldEagle/NationalBaldEagleManagementGuidelines.pdf. The FFWCC is preparing the final draft of their Bald Eagle Management Plan. The state plan may be found at http://myfwc.com/imperiledspecies/plans/Draft-Bald-Eagle.pdf. While the USFWS treats each case separately, the state agency requires a minimum buffer of 330 feet during the nesting season, depending upon the activity.

Wood stork. The wood stork has been observed foraging in the shallow wetlands on the Preserve, but no rookeries are known to occur on the site or in the vicinity. 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 (USFWS, 2004). Particularly attractive feeding sites are depressions in marshes or swamps where fish become concentrated during periods of falling water levels.

Management measures for the wood stork. The Golden Aster Scrub Nature Preserve provides foraging and roosting habitat for the wood stork, as well as marginal 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.

Florida scrub-jay. The Florida scrub-jay has very specific habitat requirements, and this has exacerbated the decline of this species. Optimal Florida scrub-jay habitat is dominated by shrubby scrub live oaks, myrtle oaks, or scrub oaks from 3 to 10 feet tall, covering 50-90% of the area. They also require bare ground or sparse vegetation less than 6 inches tall covering 10 to 50% of the area, and scattered trees with no more than 20% canopy cover. The Preserve provides approximately 180 acres of scrub habitat (Hillsborough County, 1997), and efforts to improve and maintain this habitat for the jays are ongoing.

Roller-chopping is a management measure used in areas that may be difficult to burn. The chopping thins out the undergrowth and makes the habitat more suitable for scrub jays.

Management measures for the Florida scrub-jay. In 2001 a contractor was hired to survey and band the Florida scrub-jays on the Preserve. The banding effort was successful and monitoring has continued. Two Florida scrub-jays were observed during four days of monitoring in March, 2007, and they appeared to be a mated pair. Monitoring was also conducted in October of 2007 and no Florida scrub-jays were observed or responded to a recording specifically designed for surveying Florida scrub-jays. The territories of all Florida scrub-jay families have been mapped and located with GPS for future reference, and the banding will continue indefinitely to determine the success of the habitat management, which will also continue in perpetuity. Habitat management measures conducted to date include prescribed burns and roller-chopping to enhance and improve the habitat for these birds, and monitoring the habitat to determine the success of the management effort. If it is determined that the habitat may support additional birds, a catch and release program may be considered to strengthen the gene pool. The Florida scrub-jay Habitat Restoration Plan is located in Appendix C.

American alligator. A small alligator was reported to be present in the large borrow pit/lake in the southern portion of the Preserve in 1995 (Hillsborough County, 1997). It is not known if the alligator is still present or if additional alligators are now present. 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, 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.

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 prescribed burns, controlling the exotic vegetation, and preventing or controlling the influx of exotic animals such as feral pigs and tegu lizards are measures that would protect the eastern indigo snake and its habitat. Feral hogs destroy the vegetation and alter habitat, and tegu are burrowing lizards known to feed on eggs and small vertebrate species. These are measures that the Conservation Services staff is currently undertaking. The U.S. Fish and Wildlife Service recovery plan for the eastern indigo snake is located at http://www.fws.gov/verobeach/Programs/Recovery/vbms4.html

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. Burrows have been observed in the sand pine scrub/palmetto prairie area in the central portion of the eastern section of the Preserve.

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.

This summer the Florida Fish and Wildlife Conservation Commission took action to upgrade the status of gopher tortoise from "species of special concern" to "threatened". The species has been under siege due to the rampant development throughout the state and currently, little habitat remains for the tortoise. 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 collecting GPS coordinates for all burrows and monitoring the population. 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. The Conservation Services staff has prepared gopher tortoise relocation policies that use the guidelines established by the Florida Fish and Wildlife Conservation Commission (FFWCC). These policies are provided in Appendix C. The new state management plan for gopher tortoises is available at http://www.myfwc.com/imperiledspecies/plans.htm.

Curtiss milkweed. This perennial plant is an endemic of the scrub areas of central peninsular Florida. It thrives on the bleached, excessively drained sandy soils along with Chapman and myrtle oaks, and other scrub species. The plants grow individually, widely spaced so that an acre of scrub may have only one plant (http://zipcodezoo.com/Plants/A/Asclepias_curtissii.asp#Physical).

Management measures for Curtiss' milkweed. The main reason for the decline of this species is habitat loss. The scrub areas where this species is found have been turned into citrus groves or developed into subdivisions with the exception of a few areas that have been preserved. In the Preserve, known populations should be located and mapped with GPS and photo-monitored to determine the success of management measures. Management measures to protect this species on the Preserve include conducting prescribed fires, controlling exotic plants and animals, and discouraging and prosecuting collectors.

Florida golden aster. The Florida golden aster is a perennial herb which resembles many other asters in Florida with the exception of the densely haired leaves. The wooly, almost white appearance of the leaves makes this yellow-flowered species stand out among the many other aster species in the area. The aster is endemic to the Florida scrub and is known to only a few sites in the central Florida area, and the Golden Aster Scrub Nature Preserve was purchased essentially for the preservation and enhancement of the Florida golden aster population.

Management measures for Florida golden aster. The Florida golden aster requires the well-drained, sandy soils of sand pine scrub, and seems to prefer disturbed soils, such as those excavated by gopher tortoises or armadillos. Fire is an important management tool to ensure that sites remain open and sunny for the asters. Invasive plant species are a serious threat to the Florida golden aster, particularly cogon grass. Cogon grass spreads vegetatively and can aggressively crowd the aster out of its native habitat. In addition, cogon develops a large amount of biomass which burn significantly hotter than a fire would under normal circumstances (USFWS, 1999). The hotter fires will destroy the Florida golden aster and its seed reserve (http://www.fws.gov/verobeach/images/pdfLibrary/chfl.PDF).

Conservation Services conducts regular prescribed burns on the Preserve and monitors and treats infestations of invasive plant species in order to protect the Florida golden aster. It is recommended that the GPS locations of each Florida golden aster population be periodically photo-documented to determine the success of the habitat maintenance and restoration. The USFWS recovery plan for this species is available at (http://www.fws.gov/verobeach/images/pdfLibrary/chfl.PDF).

Nodding pinweed. Nodding pinweed is another plant endemic to scrub habitat. It is a small perennial herb species, branched at the base, with small, hirsute, alternative leaves and numerous small flowers, blooming in June and July. This fire-dependent species requires open, well-drained, sandy soils to survive. This species is found in scrub sites on both the east and west coasts of central Florida.

Management measures for nodding pinweed. As with the other scrub species described in this plan, the nodding pinweed requires fires to maintain the open habitat, and can succumb to encroachment by invasive exotic vegetation such as cogon grass. Conservation Services conducts regular prescribed burns on the Preserve and monitors and treats infestations of invasive plant species in order to protect the nodding pinweed. It is recommended that GPS locations be identified for each population and photo-documentation be maintained to determine the success of the habitat maintenance and restoration.

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 (Larson et al., 2004). 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://edis.ifas.ufl.edu/UW205).

This bromeliad was once common in central Florida, but due to collectors and land developers, and now a noxious alien weevil, it is now endangered.

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 on the Golden Aster Scrub Nature 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 (see Appendix F). 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.

Red margin zephyr lily. The red-margin or Simpson's' zephyr lily is a member of the lily family and it is identified by its white flowers with pink or purplish tints, appearing in February through April. The zephyr lily grows in low, mesic pine flatwoods and savannas and at the margins of wet hammocks. It actually thrives in areas that are periodically mowed, which apparently reduces the competition from other plants (http://www.doacs.state.fl.us/pi/enpp/botany/botcirc/Botcirc20.htm).

Management measures for the red-margin zephyr lily. This species' adaptability to mowing or grazing have allowed it to survive this far, but the conversion of flatwoods to subdivisions is rapidly eliminating the zephyr lily. On the Preserve, management measures such as conducting prescribed burns, roller-chopping, preserving existing drainage patterns, and controlling exotic plant and animal species will perpetuate this species.

2.5.2 Management Measures for All Special Status Species

Management measures for all protected species in the Preserve include the management of exotic 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. If pets are allowed in the Preserve, they should be kept on a hand-held leash at all times. The public should be educated so that they know to avoid disturbing these species 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. 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 C.

In addition to the protection of the existing species, the site should be evaluated as a relocation area for other listed species such as gopher tortoises or scrub jays. Habitat management should reflect the future conditions needed to support the species proposed for relocation.

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 Golden Aster Scrub 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

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3.3 Management Measures for Cultural Resources

Given the low probability of potential archaeological or historical sites, and the fact that no construction or other potential disturbance of the native soil is likely to occur on the site, no survey was recommended by Mr. Tesar. However, Mr. Tesar also states that all management activities should be conducted with an awareness of the potential for discovery and should be monitored by the Preserve staff. No construction or other disturbance such as the removal of exotic vegetation should be undertaken without monitoring and all finds should be reported to the state agency.

Mr. Richard Estabrook of the West Central Regional Public Archaeology Center at the Museum of Science & Industry (MOSI) reviewed the records for known cultural resource sites in the vicinity and determined that the presence of sites on adjacent property was an indication that other sites may be present on the Preserve. Additional surveys may be required for the site if significant earthwork is required in conjunction with other projects. These surveys will be coordinated with the county parks department and a professional surveyor.

The Park 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. Looting is obviously a concern, along with possible excavation or earthwork for projects such as the creation of firebreaks. Best Management Practices for Protecting Archaeological Sites are provided as Appendix D.

4.0 RECREATIONAL RESOURCES

4.1 Existing Recreational Facilities

Recreational resources on the Preserve include a parking area, kiosk, marked hiking trails, picnic pavilion with tables, and composting toilet. Figure 5 shows the location of these facilities. The Preserve is open for hiking, birding and nature study seven days a week during daylight hours. Due to the sensitive natural resources on the site, no additional resources have been developed. Guided interpretive tours are available upon request for school groups during the Great American Teach-In such as the East Bay High School on the southern boundary of the Preserve. Boating and fishing are not allowed in the borrow pits because of safety concerns and lack of appropriate facilities and access.

This attractive picnic pavilion overlooks the lake in the northern portion of the Preserve, near the site security residence.

4.2 Proposed Recreational Facilities

A nature center is proposed for development on the site of the former asphalt plant, if funding becomes available. The nature center would be incorporated into the interpretative program. No other facilities are proposed at this time.

Figure 5 – Recreation resources

The entrance to the Preserve offers ample parking and a walk through gate to accommodate hikers. Brochures are available at the kiosk which provide a map of the Preserve and a description of the habitats.

4.3 Greenways and Trails

The proposed South Coast Greenway will run through the center of the Golden Aster Scrub Nature Preserve, in the north-south electrical transmission corridor. This paved, multi-use trail will traverse the southern portion of the county, extending from McKay Bay to River Bend Ranch north of the Little Manatee River, using existing roads, the TECO electrical transmission corridor, and proposed bike trails. The implementation of this project will effectively bisect the Preserve, limiting the ability of animals to access the habitat in the western portion without the risk of predation or human impact. Prior to construction of the trail, the boundaries of the Preserve will need to be fenced along the corridor to prevent open access to the natural areas and to prevent cattle from entering. Walk-through gates or walk-over features will be installed to accommodate the existing hiking trail which bisects the transmission corridor in two areas. Figure 6 shows the Golden Aster Nature Preserve in relation to the proposed trails throughout Hillsborough County, including the South Coast Greenway, and excerpts of the Hillsborough Greenways Master Plan, as it pertains to the Preserve are provided in Appendix E (http://www.hillsboroughcounty.org/parks/greenways/). The Hillsborough County South County Recreational Corridor Plan is also a part of this proposed project (http://www.hillsboroughcounty.org/parks/planninganddesign/southcounty.cfm).

Figure 6 – Greenways and trails

5.0 RESOURCE MANAGEMENT

5.1 Site Security

The Preserve currently has a site security resident living in a mobile home near the northern borrow pit. The responsibilities of this resident are to make sure the fence is intact, signage is present, and that no inappropriate or illegal activities are occurring on the Preserve. The site security agreement is provided in Appendix A with the other legal documents. Current problems on the Preserve include illegal access through cut or damaged fences, illegal harvesting of saw palmetto fruits, vagrant camps, illegal dumping and arson. The southern boundary adjacent to the schools has been a chronic problem with cutting fences and illegal activities such as unauthorized camping and parties. The saw palmetto fruit harvesting has led to thirty arrests in the recent past. The electrical transmission corridors through the Preserve make the site more vulnerable to illegal activities by facilitating access.

The Preserve lies in unincorporated Hillsborough County and is therefore within the jurisdiction of the County Sheriff's Department. The site security resident reports infractions to the Sheriff. Figure 5 shows the access gate for the Preserve. The gate remains locked and is posted against trespassing and hunting. Additional security recommendations include screening the security residence with native shrubs and trees, continue to enlist the staff of the County Sheriff's Office to patrol on a regular basis, and install new perimeter fencing along the Preserve boundaries. This last recommendation will be especially important if the cattle leases in the utility corridor are terminated.

5.2 Exotic Species Management

5.2.1 Invasive Exotic Plants

The predominant invasive exotic plants known to exist on the Golden Aster Scrub Nature Preserve are Brazilian pepper, Japanese and old world climbing ferns, lead tree, camphor tree, Caesar weed, skunk vine, tropical soda apple, cogon grass, Guinea grass, torpedo grass, paragrass, and Australian pine, but these species are generally under control. 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. It is important for staff to gather GPS data regarding the location and extent of each infestation to monitor the success of the treatments and to determine if new infestations are occurring.

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 applied from back pack sprayers or even from helicopters. 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.

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.

5.2.2 Invasive Exotic Animals

The exotic animals observed on the Preserve to date are the jeweled cichlid fish, feral pig, domestic cat, nine-banded armadillo, and the Cuban tree frog. 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.

Feral hogs are especially destructive to natural areas in that they root up the soil causing potential erosion problems and introducing exotic vegetation. Feral hogs also can be dangerous and have been known to attack people. Hillsborough County has contracted

a professional trapper who is actively removing the animals. Additional information regarding feral hogs is provided in Appendix F – Exotic Species Information. Feral cats are humanely trapped by staff and taken to the County's Animal Control Services. The cichlid fish is an aggressive species that will need to be removed from the lakes if native fish are to be stocked. Fish shocking is conducted by contractors and can remove all fish from water bodies. Rotenone also can be used to kill all existing fish in order to add new native species.

This is a photo of the Mexican bromeliad weevil taken by the University of Florida Institute for Food and Agricultural Sciences (IFAS). They are currently testing a biological control for this weevil, in hopes of stopping the destruction of native and horticulturally important bromeliads.

One unusual pest that has recently been found in the vicinity of the Preserve is the Mexican bromeliad weevil (***Metamasius callizona)***. This weevil was inadvertently imported to south Florida in 1989 and has since spread as far north as Hillsborough, Orange, and Brevard counties. The weevil destroys native bromeliads such as ***Tillandsia utriculata,*** killing them outright. Recently, scientists at the University of Florida released a parasitic fly (discovered in Honduras) in several test areas to determine its efficacy in the control of the weevil. If this fly appears to be safe to use in natural areas, it will be released throughout Florida in an effort to control the weevil. In the meantime, the Florida Council of Bromeliad Societies has initiated a program to collect and preserve seeds of the bromeliads, especially the rare species, in an effort to prevent the extirpation of these unique and important plants. An article regarding the release is provided in Appendix F.

5.3 Prescribed Burns

5.3.1 The importance of fire

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 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, due to the major highway forming the eastern boundary, and the recent development of subdivisions nearby.

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 sand hills, 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 kept out of 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 preventing wildfires (Myers ***et al***., 1990).

5.3.2 Management Measures for Fire

Prescribed fires are conducted on County-managed 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 homeowners that may be affected by the burn. Some of these responsibilities will be 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. The burn units established for the Preserve are shown in Figure 7. A sample burn plan is included as Appendix G.

This photo was taken by Bill Carlisle during a prescribed burn on the Preserve. When the burns are conducted properly there are significant benefits to the habitat. Wildfires are often dangerous and very damaging to the habitat.

Also included on Figure 7 are areas that have been burned by wildfires in the recent past. These areas burned as an act of arson and trees were lost as a result of the fires.

The most important recommendation for this section is to continue to conduct the roller-chopping of the pine flatwoods habitat, with priority given to the burn units adjacent to I-75 (units 6, 14, and 17). The unit in the southeastern portion of the Preserve, labeled XX in Figure 7, should also be roller-chopped to reduce fuel loads. In addition, if funds are available, the fire lanes along the Preserve boundary should be widened.

This photo was taken during a prescribed fire in the southern portion of the Preserve. These low, fast-burning fires are ideal for habitat rejuvenation.

Figure 7 – Burn units and wildfires

6.0 HABITAT RESTORATION

Habitat restoration in the form of management activities such as prescribed burns, exotic vegetation control, and roller-chopping overgrown habitat were implemented upon purchase of the property in 1995. These activities were implemented to improve the condition of the scrub jay habitat. Scrub jays need low, shrubby vegetation, preferably oaks, and open, sandy spaces for courtship and storing acorns. The roller chopping opens the habitat and allows other scrub vegetation to germinate. A grant from the Pinellas County Environmental Fund (No. 2002-0005-011) provided funding for much of the restoration. A copy of the final report regarding this restoration is provided in Appendix C – Resource Management Policies.

This photo shows the dramatic difference between the roller-chopped habitat and the overgrown scrub.

This photo shows an active prescribed burn in Burn Unit #14, adjacent to the I-75 corridor. Burning in this area also reduces the severity of wildfires.

In addition to the scrub jay habitat restoration, the area where the asphalt plant originally stood was planted with a variety of native grasses. Trees were planted on the banks of the small borrow pit. Longleaf pines may be planted in an area that was damaged by the catastrophic arson fire of 2006 if it appears that the trees are not recruiting in this area.

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, another ordinance was approved (Ordinance No. 90-19) providing (among other things) 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.

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, 2005). The Environmentally Sensitive Land Ordinance is provided as Appendix H.

In 1997, the Parks ordinance (78-8) was repealed and replaced with Ordinance 97-14 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. This ordinance is provided in its entirety in Appendix H.

7.2 Compliance with Comprehensive Plans

The Golden Aster Scrub Nature Preserve will assist 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. Copies of the relevant elements of the County's Comprehensive Plan are included as Appendix I.

7.3 Proposed Expansion Opportunities

The development of this portion of Hillsborough County into residential subdivisions has been rampant for several years, and as a consequence there are few natural areas left for ELAPP to acquire in the vicinity of the Golden Aster Scrub Nature Preserve. Two areas are still available, as shown in Figure 8, on the west and northern boundaries. The areas on the western boundary are actually four parcels that belong to a single entity and are currently used as active fish farms. The fish farms would require extensive, and expensive, earthwork in order to restore a natural habitat, but this could be accomplished as a mitigation site for either a public agency or a private developer. The second area is a parcel of land on the northern boundary that currently serves as a buffer against the high density residential development north of the parcel. The parcel was range land and is still relatively intact. It supports numerous freshwater marsh wetlands and pine flatwoods habitat similar to that on the Golden Aster Scrub Nature Preserve. This land is currently owned by a development consortium that purchased it for $10,549,000 in 2004.

A land link has been nominated for purchase that would connect the Golden Aster Nature Preserve to the Kitchen Nature Preserve to the west. According to the 2006 ELAPP annual report (Hillsborough County, 2007), the site is still under consideration for purchase. The location of this site is approximated on Figure 8.

8.0 SUMMARY OF MANAGEMENT GOALS AND OBJECTIVES

Hillsborough County has a centralized management operation for all natural preserve lands which have been acquired by the ELAP program. With the exception of the capital improvement projects, such as fencing, road construction, site security residences, etc., site management expenses are not budgeted on a site specific basis. The program is funded to cover capital equipment, personnel, and operating expenses for the Regional Parks and Conservation Services section of the Hillsborough County Parks, Recreation, and Conservation Department.

The Conservation Services section budget derives funds from several sources, but primarily from the revenue set aside for the ELAP Program by the voter approved referenda, which stipulated that 2% of all proceeds, whether Ad Valorem or Bond generated, could be available for site management. This amount does not generate sufficient funding to support the current management program. Additional funds for personnel are provided by the Phosphate Severance Taxes, since some lands acquired to date have been mined for phosphate (Hillsborough County, 1997).

Figure 8

General revenue funds are also supporting existing personnel. 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 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 (Hillsborough County, 1997). The proposed budget for the next ten years is listed below. These budget items are not in any prioritized order, but it is likely that the treatment of exotic vegetation and the prescribed burn program will take precedence over the other objectives.

TABLE 4
PROPOSED MANAGEMENT GOALS AND OBJECTIVES
FOR
GOLDEN ASTER SCRUB NATURE PRESERVE

OBJECTIVE	SCHEDULE	ESTIMATED COST
Invasive species control (4 events per year for 10 years@ $500.00)	Ongoing	$20,000.00
Roller chopping and fire lane improvements	Ongoing	TBD
Clearing for new fencing	Ongoing	TBD
New fence installation and repairs to old fence	Ongoing	TBD
Landscaping to screen/enhance the site security residence.	Ongoing	TBD
Construction of a nature/resource interpretation center	Ongoing	TBD
Conduct prescribed burns (2 burns per year for 10 years@$2,000)	Ongoing	$40,000.00
Maintenance supplies (road, fence repair, temporary fencing, etc.)	Ongoing	$7,000.00
Fencing repair (in the event of recurrent vandalism)	Ongoing	$5,000.00
Ecological studies	Ongoing	$1,000.00
	Total	**$73,000.00**

The goals and objectives of the Preserve are as follows:

Goal #1 – Protect Listed Species. Continue protection and management of all listed species populations in the Preserve, including Florida golden aster Florida scrub jay, gopher tortoise, etc.,

Goal #2 – Continue Prescribed Burns. Continue to conduct prescribed burns and continue with other vegetation management measures such as roller-chopping, to improve habitat conditions and reduce fuel loads for prescribed burns. Widen fire lanes along perimeter of preserve.

Goal #3 – Continue To Control Invasive Exotic Plant And Animal Species. Continue to manage invasive exotic species in the Preserve. Continue to map and survey for

invasive plant species. There are known populations of feral hogs on the Preserve, which can be highly detrimental to native habitats.

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

Goal #5 – Continue Environmental Education Efforts in the Preserve. Continue efforts to bring environmental education to schools, with emphasis on the local schools. Keep the Preserve open to the public as much as possible while preserving the integrity of the habitat and protecting wildlife populations.

Goal #6 – Continue to Support Site Security. Continue to maintain site security by supporting an onsite resident and communicating with local law enforcement. Provide a landscaped screen for the site security residence to improve aesthetics of the Preserve.

Goal #7 – Continue to Seek Outside Funding. Seek continued funding for the management of the Golden Aster Scrub Nature Preserve and all environmental lands.

Goal #8 – Continue to Observe Conditions of the Lease. Conditions in Lease #4133 must be adhered to.

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