Alligator Flag Preserve

(FKA Milano Preserve)

Land Management Plan

Managed by: Conservation Collier Program

Collier County, Florida

April 2009 – April 2019 (10-yr plan)

Revised October 2009 (name change)

Prepared by:

Conservation Collier Staff;

Collier County Facilities Management Department

Alligator Flag Preserve

Land Management Plan Executive Summary

Lead Agency: Collier County Board of County Commissioners, Conservation Collier Program

Property included in this Plan: "Alligator Flag Preserve" 18.46-acres. Preserve consists of two adjoining parcels of 9.23-acres each in Section 21, Township 48, and Range 26 of Collier County, Florida.

Folio Number	Legal Description
00186320002	21 48 26 W ½ OF W ½ OF SE ¼ OF SE ¼ , LESS R/W 9.23 AC
00186280003	21 48 26 E ½ OF W ½ OF SE ¼ OF SE ¼, LESS R/W 9.23 AC OR 519 PG 467

Management Responsibilities:

Agency: Collier County - Conservation Collier Program

Designated Land Use: Conservation and natural resource based recreation

Unique Features: cypress-pine-cabbage palm, cypress and pine flatwoods communities; four listed plant species recorded to date; preserve is within the Corkscrew Swamp Sanctuary Wood Stork Core Foraging Area

Management Goals:

Goal 1: Eliminate or significantly reduce human impacts to indigenous flora and fauna

Goal 2: Develop a baseline monitoring report

Goal 3: Remove or control populations of invasive, exotic or problematic flora and fauna

Goal 4: Determine if prescribed fire and/or mechanical treatments are feasible to decrease woody invasion resulting from past fire exclusion; if so proceed

Goal 5: Restore and maintain native habitats

Goal 6: Develop a plan for public use

Goal 7: Facilitate uses of the site for educational purposes

Goal 8: Provide a plan for security and disaster preparedness

Public Involvement: Public meeting held in January 2009 with residents and businesses from surrounding lands including staff from the Laurel Oak Elementary and Gulf Coast High Schools.

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1.0 Introduction

The Alligator Flag Preserve is an 18.46-acre natural area within the boundary of Collier County, Florida. Native plant communities within the preserve include cypress-pine-cabbage palm, cypress and pine flatwoods.

A site assessment to determine compliance with Conservation Collier's initial screening criteria was conducted in February 2005 and the Conservation Collier Program purchased the property on July 28, 2006. The County holds a fee simple title to the Alligator Flag Preserve. The Conservation Collier program manages these lands under authority granted by Conservation Collier Ordinance 2002-63 as amended (2007-65; available from www.municode.com). Initial acquisition activities are summarized in table 1.

Table 1: Acquisition History and Status of Alligator Flag Preserve

Year	Benchmark
2005	Property nominated to the Conservation Collier Program
2005	Initial Criteria Screening Report accepted by the Conservation Collier Land Acquisition Advisory Committee
2006	Purchase approved by the Board of County Commissioners (BCC) and lands purchased
2006	Interim Management Plan completed and approved by BCC
2009	Final Management Plan completed

Conservation, restoration and natural resource-based recreation are the designated uses of this preserve. Management activities allowed include those necessary to preserve, restore, secure and maintain this environmentally sensitive land for the benefit of present and future generations. Public use of the site must be consistent with these management goals.

This is the Final Management Plan for the Alligator Flag Preserve. This 10-year management plan will be submitted to the Collier County Board of County Commissioners (BCC) for its approval. When approved, this plan will replace the Interim Management Plan.

1.1 Conservation Collier: Land Acquisition Program and Management Authority

The Conservation Collier program was originally approved by voters in November 2002 and subsequently confirmed in the November 2006 ballot referendum. Both voter-approved referendums enable the program to acquire, preserve, restore, and maintain vital and significant threatened natural lands, forest, upland and wetland communities located in Collier County, Florida (Ordinance 2002-63, as amended). Properties must support at least two of the following qualities to qualify for consideration: rare habitat, aquifer recharge, flood control, water quality protection, and listed species habitat. The BCC appointed a Land Acquisition Advisory Committee to consider any selected or nominated properties that an owner has indicated a willingness to sell. The committee recommends property purchases for final approval by the BCC.

Lands acquired with Conservation Collier funds are titled to "COLLIER COUNTY, a political subdivision of the State of Florida, by and through its Conservation Collier program." The BCC established the Conservation Collier program to implement the program and to manage acquired lands. As such, Conservation Collier holds management authority for the Alligator Flag Preserve.

1.2 Purpose and Scope of Plan

The purpose of the plan is to provide management direction for Alligator Flag Preserve by identifying the goals and objectives necessary to eliminate or minimize any threats to the resources and integrity of the preserve. This text is a working document that establishes the foundation of the ten-year plan by identifying the appropriate management techniques necessary to restore and preserve the resource.

This plan will balance resource restoration and protection with natural resource-based recreational and educational use while looking at restoration needs, listed species protection and maintenance of the site free of invasive, exotic plant and animal species. This plan is divided into sections that incorporate an introduction, descriptions of the natural and cultural resources, projected uses of the property, management issues, and goals and objectives.

1.3 Location of the Alligator Flag Preserve

Alligator Flag Preserve is located approximately 2.10 miles east of Interstate 75 (I-75) between Preserve Lane and Preserve Circle on the north side of Immokalee Road (Figure 1). The Alligator Flag Preserve is in northwest Collier County in Section 21, Township 48 and Range 26.

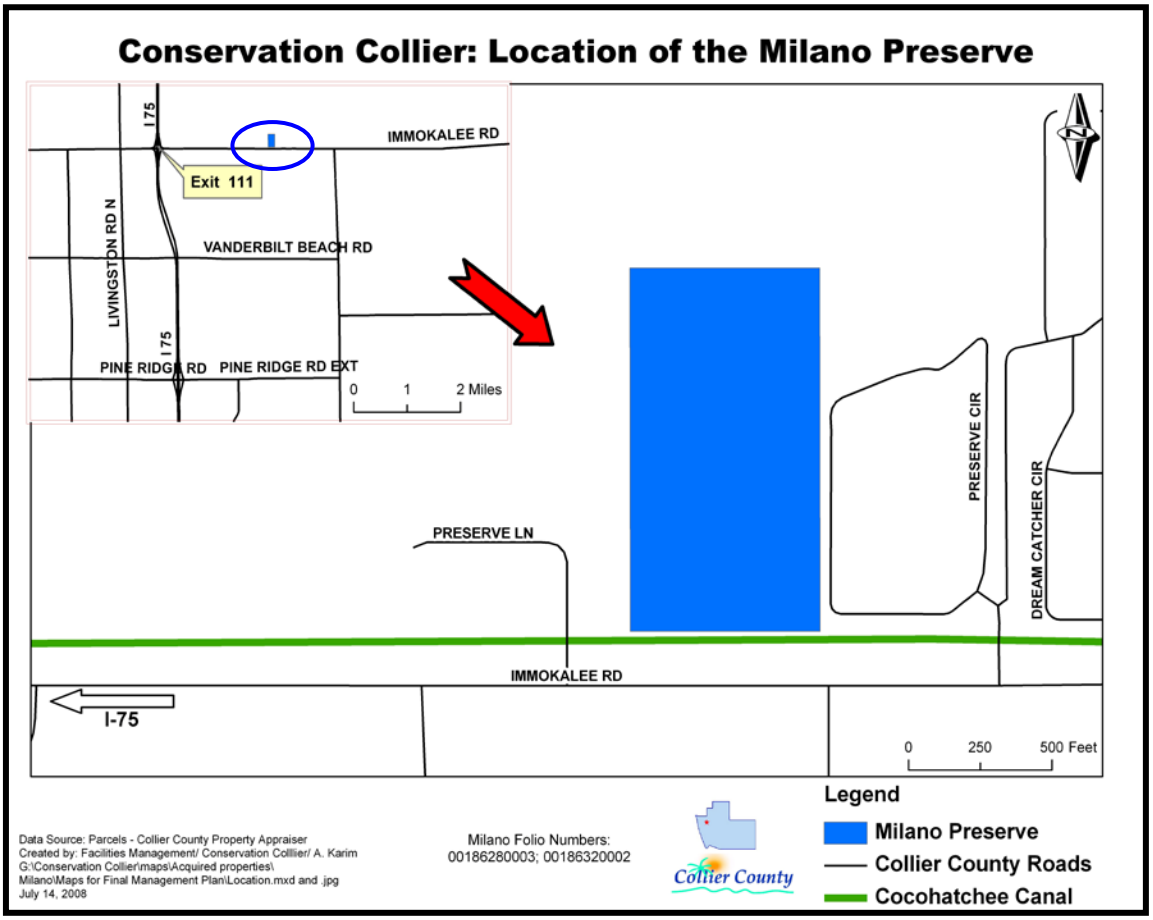


Figure 1: General Location of Alligator Flag Preserve.

1.4 Regional Significance of the Alligator Flag Preserve

Ecosystem services such as the protection of water resources, flood control, maintenance of nutrient cycles, preservation of biological diversity, carbon sequestration, and the availability of recreational lands are imperative for the well-being of the citizens of Collier County and may be achieved through the preservation of natural areas. As of April 2008, approximately 66% (over 860,000 acres) of all lands in Collier County were protected in conservation areas (Figure 2) and managed by private, local, state and federal agencies (FNAI 2008). Collier County's Conservation Collier Program manages the 18.46-acre Alligator Flag Preserve; it contains cypress, cypress-pine-cabbage palm and pine flatwood communities. Specific information on the plant communities found on the Alligator Flag Preserve may be found in section 2.3 (Natural Plant Communities) of this document.

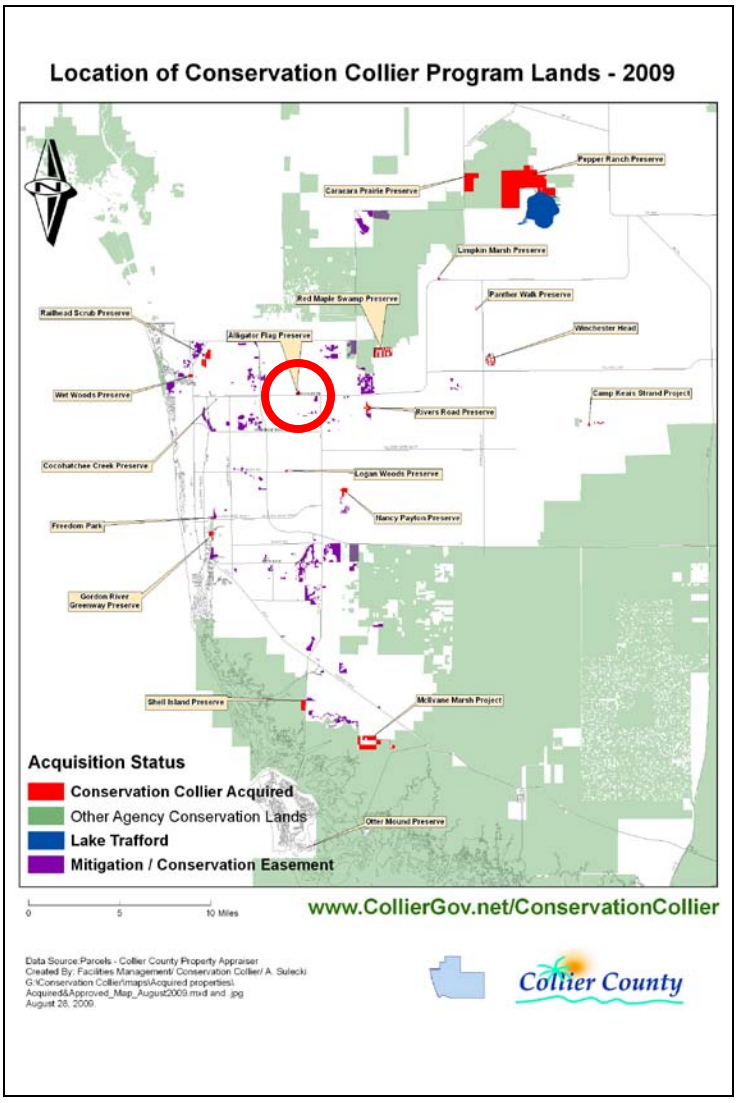


Figure 2: Conserved Lands in Collier County, Florida Including Lands Owned by Conservation Collier.

1.5 Nearby Public Lands and Designated Water Resources

Currently, the closest preserved, natural areas to the Alligator Flag Preserve are the adjoining conservation easements to the north and west managed by Olde Cypress. Other preserves, in order of increasing distance, are provided in table 2. Figure 3 shows the locations of these preserves.

Table 2: Public Lands Located near the Alligator Flag Preserve

Name	Approximate Distance (miles)	Direction	Type
Olde Cypress Conservation Area	0.00 (adjoining)	N & NW	Private
Corkscrew Regional Ecosystem Watershed	3.60	NE	State
Rivers Road Project	3.62	E/SE	Conservation Collier
Logan Woods Preserve	4.20	S	Conservation Collier
Cocohatchee Creek Preserve	4.45	W	Conservation Collier
Unit 53 Acquisition Boundary	4.50	NE	Conservation Collier
Railhead Scrub Preserve	5.15	W/NW	Conservation Collier
Nancy Payton Preserve	5.60	S/SE	Conservation Collier
Wet Woods Preserve	5.80	W/NW	Conservation Collier
Delnor-Wiggins Pass State Park	7.15	W	State
Barefoot Beach Preserve	7.40	W/NW	County

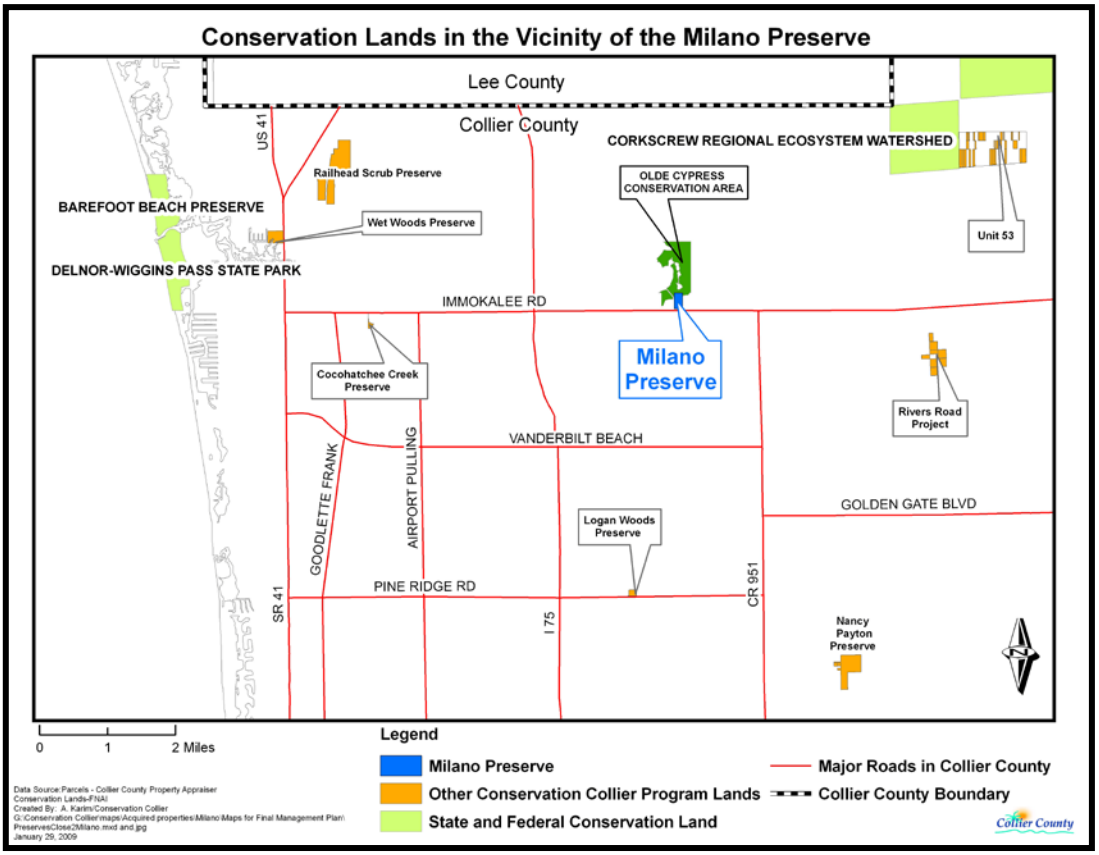


Figure 3: Preserves and Protected Lands in the Vicinity of Alligator Flag Preserve

1.6 Public Involvement

Neighborhood involvement will be sought through direct mailing notices for public meetings to residents, other preserve managers and businesses within 1,500 feet of the preserve boundaries. Official public notices will be posted on the County website. Staff will seek to coordinate management actions, such as exotic removal and prescribed fires with owners of adjoining lands.

Staff will also work together with the adjacent Homeowners Association of the Fairway Preserve Condominiums, commercial property owners to the west and Olde Cypress to coordinate management activities (e.g., exotic plant removal/treatment) and public access efforts.

2.0 Natural Resources

2.1 Physiography

Alligator Flag Preserve lies within the Floridian section of the Coastal Plain. The Coastal Plain extends from New Jersey to Texas and was formed mainly from sedimentary rocks deposited in marine environments (USGS 2004).

2.1.1 Topography and Geomorphology

The site is located in the Southwestern Slope region of the South Florida Water Management District. According to the Bonita Springs, Florida USGS Topographic Map, the topography of the area is relatively level with an average elevation of five feet above sea level and slopes gently westward toward the Gulf of Mexico. Surface water percolates directly into the uncovered ground or it collects in natural depressions and man made ponds on adjacent properties.

2.1.2 Geology

The geology of northern Collier County, where the Alligator Flag Preserve is located, is characterized by complex sequences of interbeded sands, clays, and limestone. Closest to the surface is the Holocene aged Pamlico Sand Formation, approximately ten feet thick and composed primarily of unconsolidated quartz sand and some silt. The Pamlico Sand unconformably overlies the Pleistocene aged Fort Thompson and Caloosahatchee Formations, which vary from a few feet to more than twenty feet in thickness and are characterized by shelly and sandy limestone with vugs and solution cavities (Miller 1986).

Below the Fort Thompson and Caloosahatchee Formations are the Ochopee and Buckingham Members of the Pliocene aged Tamiami Formation, which are at least 200 feet thick in the surrounding areas (Oaks & Dunbar 1974). The Ochopee Limestone unconformably overlies the Buckingham Limestone and/or the equivalent Cape Coral Clay. This unconformity marks the bottom of the surficial aquifer separating it from the brackish underlying aquifer below. Then the Hawthorn Formation, rich in phosphate and other heavy minerals (Scott 1988), overlies the Oligocene age Suwannee Limestone and Eocene age Ocala Limestone that form the Floridan Aquifer System in Southwestern Florida. The Alligator Flag Preserve is located within the Southwestern Slope. Geologically, this is the dominant feature of Collier County (Campbell 1990). Figure 4 provides a current aerial view of the Alligator Flag Preserve including the delineation of the two parcels that make up the preserve.

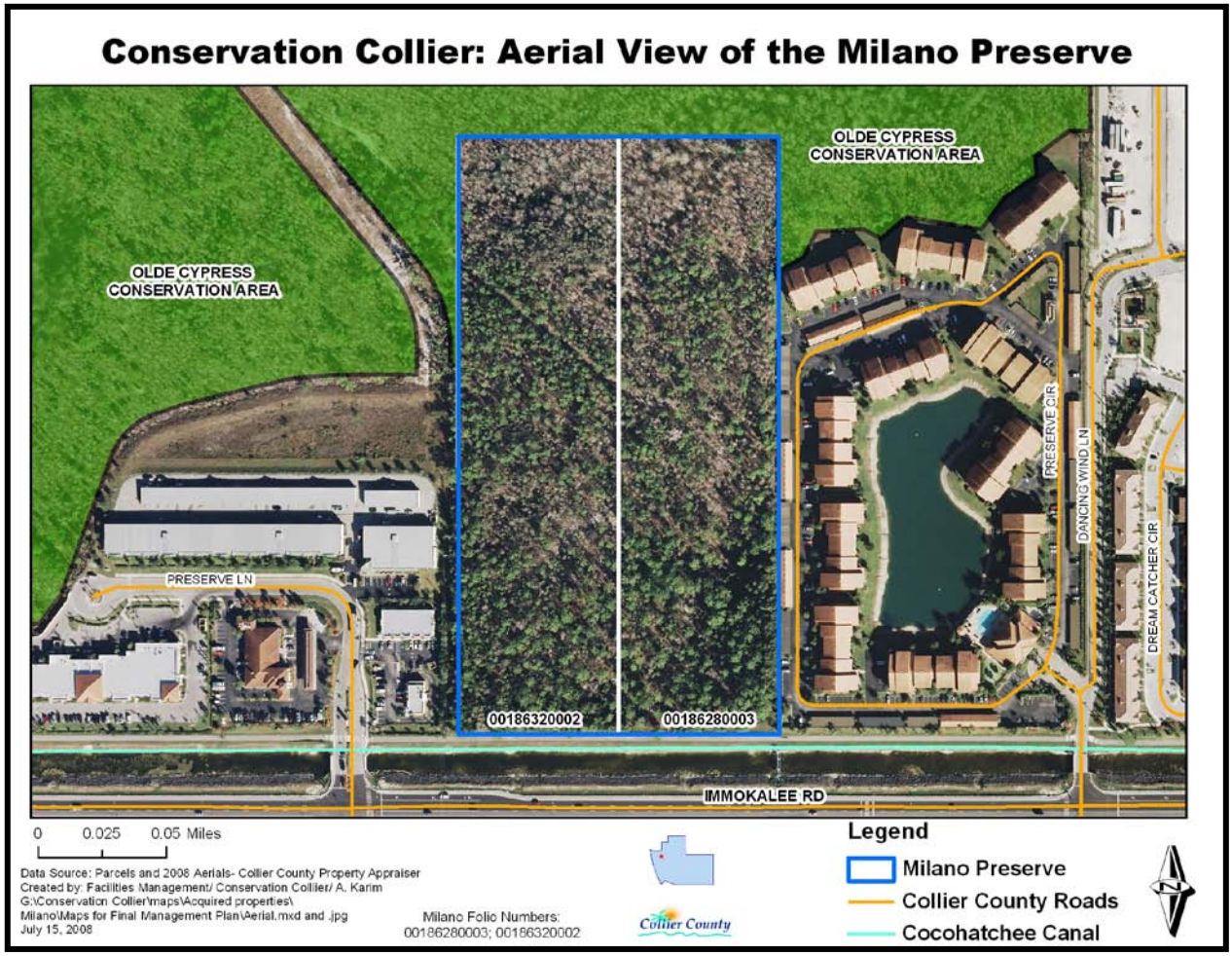


Figure 4: Aerial View of the Alligator Flag Preserve Showing Delineation of Parcels

2.1.3 Soils

Mapped soils on this parcel were identified as Boca, riviera, limestone substratum & Copeland fine sands, Oldsmar fine sand, Holopaw fine sand and Basinger fine sand (Figure 5).

Boca, riviera, limestone substratum & Copeland fine sands underlies 46% of the Alligator Flag Preserveand is a wetland soil association found in depressional areas typical of cypress swamps and marshes. Under natural conditions, these soils are ponded for 6 months of the year. Natural vegetation consists mostly of cypress, pickerelweed, rushes, Alligator Flag PreserveFlag Preserve flag, sawgrass and willow (Liudahl et al. 1990).

Oldsmar fine sand underlies 30% of the Alligator Flag Preserveand is the only non-hydric soil mapped on this Conservation Collier property. Oldsmar fine sand is a nearly level and poorly drained soil found in pine flatwoods. During extended dry periods, the water table may recede to a depth of 40+ inches, but under natural conditions, the seasonal high water table is between a depth of 6-18 inches. Flora typically associated with this soil type includes: South Florida slash pine, cabbage palm, saw palmetto and wax myrtle (Liudahl et al. 1990).

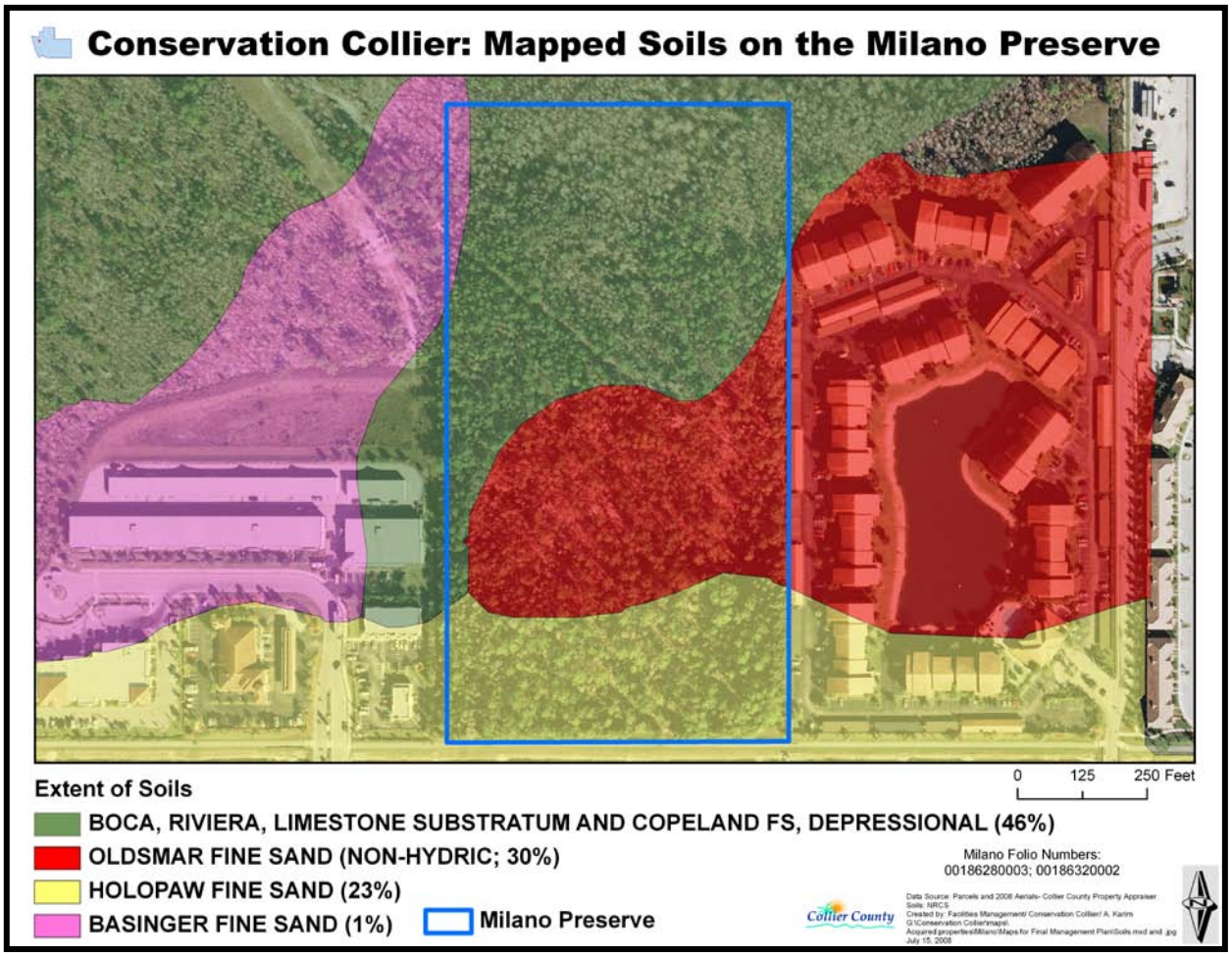


Figure 5: Soil Units on the Alligator Flag Preserve

The hydric Holopaw fine sand underlies 23% of the Alligator Flag Preserve. This nearly level, poorly drained soil is found in sloughs and poorly defined drainage ways. The permeability of water through this soil is moderate to moderately slow and, under natural conditions, the seasonal high water table is within a depth of 12 inches for three to six months. Water recedes to a depth of 40+ inches during extended dry periods and, during times of high rainfall, the soil may be covered with slowly moving water for approximately seven days. Flora typically associated with this soil type includes South Florida Slash Pine, cypress, cabbage palm, saw palmetto and wax myrtle (Liudahl et al. 1990).

Basinger fine sand underlies 1% of the Alligator Flag Preserve and is a hydric, nearly level, poorly drained soil found in sloughs and poorly defined drainage ways. The permeability of water through this soil is rapid and, under natural conditions, the seasonal high water table is within a depth of 12 inches for three to six months. Water recedes to a depth of 40+ inches during extended dry periods and, during times of high rainfall, the soil may be covered with slowly moving water for approximately seven days. Flora typically associated with this soil type includes South Florida Slash Pine, cypress, cabbage palm, saw palmetto and wax myrtle (Liudahl et al. 1990).

2.1.4 Hydrology/Water Management

Near the surface, the aquifer is highly permeable and the groundwater flows toward the west. However, permeability decreases downward from a porous limestone into poorly indurated sandstone cemented by micrite. The aquifer grades from freshwater downward into brackish water due to the proximity of the Gulf of Mexico to the west and the brackish water in the intermediate aquifer made primarily of Miocene aged sediments. Below that, the Hawthorne formation typically marks the upper boundary of the Floridian aquifer, which is contained within the underlying Oligocene age Suwannee Limestone (Lodge 2005).

A berm runs along the southern boundary of the Alligator Flag Preserve just north of the Cocohatchee Canal. This berm prevents water from flowing southward consequently holding water on the preserve for an artificially long period during the wet season.

The Surficial Aquifer is an aquifer close to the surface and unconfined, typically associated with the groundwater table. This aquifer is generally limited to smaller uses such as household or small agricultural uses. The Lower Tamiami aquifer is below this aquifer and is recognized as being useful for long-term water needs. According to the South Florida Water Management District's (SFWMD) technical publication 95-02 (Fairbank & Hohner 1995), the Surficial Aquifer recharge capacity on the Alligator Flag Preserve is moderate at 43 to 56 inches annually. The Lower Tamiami Aquifer recharge capacity on the preserve is relatively low at 7 to 14 inches annually.

2.2 Climate

The Alligator Flag Preserve is located in an area of Florida where humid subtropical and tropical savanna climatic patterns overlap, with temperatures moderated by winds from the Gulf of Mexico and the Atlantic Ocean. Sharply delineated wet and dry seasons and average monthly temperatures greater than 64º Fahrenheit characterize a tropical savanna climate. Monthly rainfalls may exceed ten inches during the wet season. On the other hand, humid subtropical climates typically show less extreme rainfall fluctuations between wet and dry seasons and average monthly temperatures is less than 64º Fahrenheit in some months.

The average annual temperature for the coastal portion of Collier County is approximately 75º Fahrenheit. The warmest months are usually July and August. The humidity is high during these months but frequent afternoon thunderstorms prevent excessively high temperatures.

Two-thirds of the annual rainfall occurs in the wet season from May to October. Thunderstorms are frequent during the wet season, occurring every two out of three days between June and September. Rainfall records for the area indicate that there is not significant variation in the annual rainfall throughout much of the county; however, large variations often occur during a single year. The Atlantic hurricane season extends from June through November with peak activity occurring in September and October when ocean temperatures are highest.

2.3 Natural Plant Communities

A plant community refers to the suite of floristic species that form the natural vegetation of any place. In addition to anthropogenic influences, the combination of factors such as geology, topography, hydrology, underlying soils and climate determine the types of plants found in an

area. These plants, in turn determine the animal species that may be found there. The description or classifications of these floral communities differ by agency and are based on an agency's goals and objectives for identifying plant communities. As some categorizations are broad (e.g., forest) while others are specific (e.g., mesic pine flatwoods), determining how each organization classifies a community may be difficult. The South Florida Vegetation Classification Scheme Crosswalks (Gilbert 2005) provides a way to decipher the classifications of plant communities across agencies. Appendix 1 provides the categorization of the plant communities observed on the Alligator Flag Preserve based on the South Florida Vegetation Classification Scheme Crosswalks; classifications from the Florida Natural Areas Inventory (FNAI) are also included in this appendix.

The Florida Land Use, Land Cover Classification System (FLUCCS) created by the Southwest Florida Water Management District in 1995 classifies plant communities and provides GIS layers for users to overlay on property boundaries and aerial images to better determine the plant communities found there. The FLUCCS designates three plant communities on the preserve: Pine Flatwoods – Melaleuca Infested (FLUCCS 4119), Cypress – Melaleuca Infested (FLUCCS 6218), and Forested Mixed Wetlands (FLUCCS 630). Wilson Miller updated the FLUCCS data layer in 2001. These data also indicate that there are three plant communities on the preserve, however, the Pine Flatwood community is not identified, instead a Cypress (FLUCCS 621) community is identified in addition to the Cypress- Melaleuca Infested community. Table 3 summarizes the plant communities mapped for the Alligator Flag Preserve in 1995 and 2001; it shows the differences in the location and extent of land cover designations. Figure 6 visually represents these land cover designations from 1995 and 2001. Given that the FLUCCS layers were generated at a scale of 1:24,000 and created by different entities at different times, the change in the types and extent of plant communities between the map layers may indicate a change in hydrology within the preserve or natural discrepancy generated when different entities perform the same task. It is unlikely that these data were ground-truthed by the Water Management District or Wilson Miller specifically on the Alligator Flag Preserve, however; both layers seem to be fairly accurate in other parts of the County.

Table 3: Extent of Florida Land Use, Land Cover Classification System Designations from 1995 and 2001 on the Alligator Flag Preserve

FLUCCS CODE	Mapped Plant Community	1995	2001
4119	Pine Flatwoods – Melaleuca Infested	45%	0%
621	Cypress	0%	12%
6218	Cypress – Melaleuca Infested	43%	84%
630	Forested Mixed Wetlands	12%	4%

During site visits to the Alligator Flag Preserve, staff observed Cypress-Pine-Cabbage Palm (FLUCCS 624), Cypress and Pine Flatwoods (FLUCCS 411) communities. These communities were in varying states of exotic vegetation infestation. Additionally, a monoculture of Australian pines (*Casuarina* spp.; FLUCCS 4370) was observed in the southeastern portion of the property. Johnson Engineering ecologists conducting a preliminary wetlands and wildlife assessment of the site in August 2004 reported observing similar vegetative communities. They categorized the

communities according to the degree of exotic infestation, described the pine flatwoods as FLUCCS 4119 (disturbed) and noted that the cypress community contained scattered pine.

Given the discrepancy between the 1995 and 2001 FLUCCS digital layers (as they pertain to the Alligator Flag Preserve) and the removal of exotic vegetation since the acquisition of the property in July 2006, staff created a new digital layer showing the location and extent of the native plant communities currently found on the preserve (Sept. 2008; Figure 7). Because the removal of invasive, exotic plants began in April 2008, this new layer does not reference any areas as infested with exotic plant species except for the stand of Australian pines in the southeastern portion of the preserve. Specific information on the invasive, exotic species present on the preserve is provided in section 2.6.1 of this document.

The vegetation classification scheme of the Florida Natural Areas Inventory (FNAI) and the Florida Department of Natural Resources (FDNR) (1990) are presented in table 4. This table is based on the plant communities observed on the Alligator Flag Preserve. The following subsections (2.3.1, 2.3.2, 2.3.3 and 2.3.4) provide information about the plant communities observed on the preserve.

Table 4: Summary of Natural Communities on the Alligator Flag Preserve

FNAI Natural Community Type	Global Rank	State Rank	Comments
Strand Swamp	G4	S4	Also called Flowing Water Swamps and Cypress communities
Wet Flatlands	G4	S4	Also called Cypress-Pine-Cabbage Palm communities and Hydric Pine Flatwoods
Mesic Flatwoods	G4	S4	Also called Pine Flatwoods

G4: Apparently secure globally (may be rare in parts of range); **S4:** Apparently secure in Florida (may be rare in parts of range).

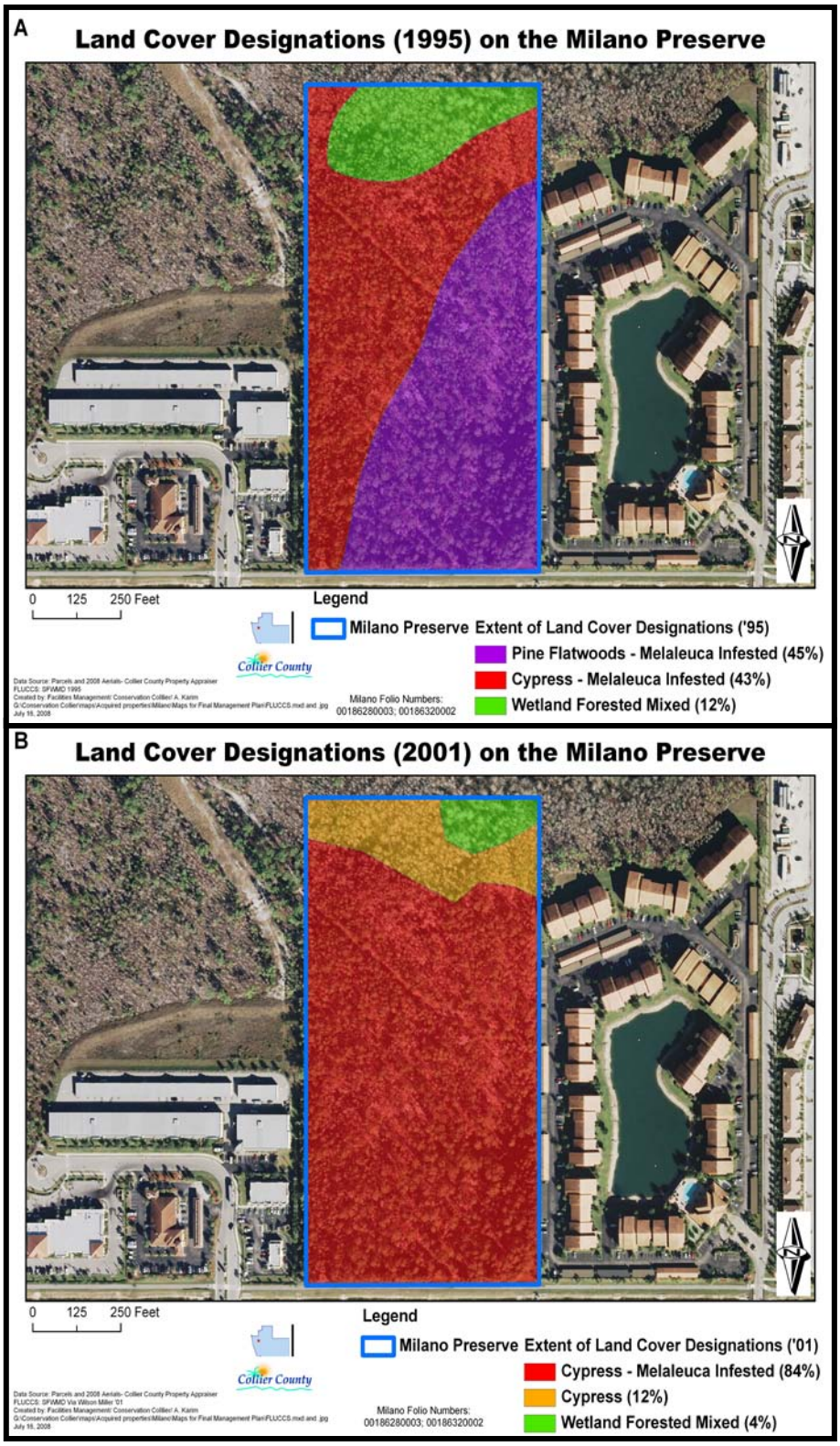


Figure 6: Distribution of Natural Communities on the Alligator Flag PreserveA) 1995 FLUCCS Layer, B) 2001 FLUCCS Layer

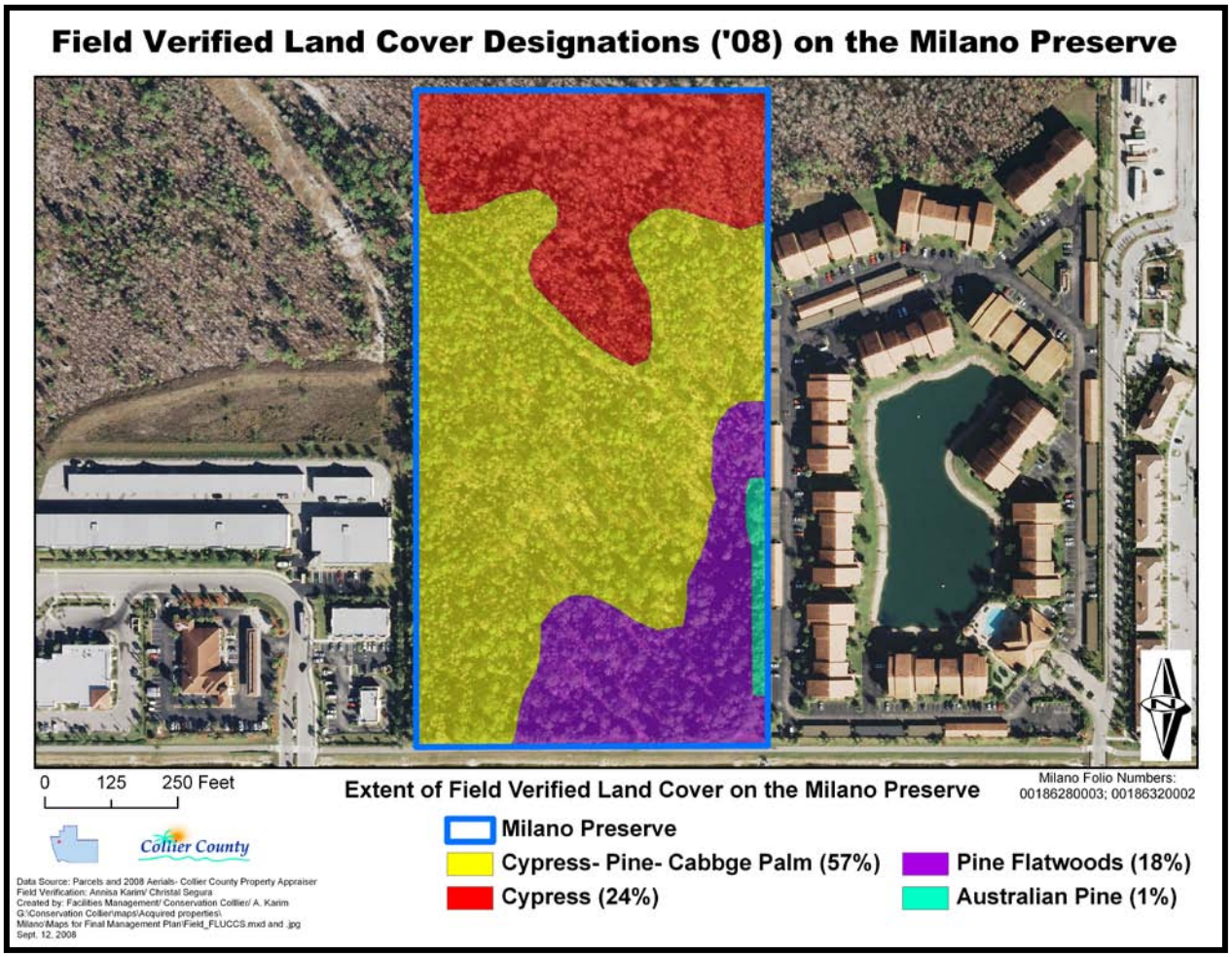


Figure 7: Extent of Plant Communities Currently Found on the Alligator Flag Preserve.

2.3.1 Wetlands: Cypress-Pine-Cabbage Palm

A cypress-pine-cabbage palm community comprises approximately 57% of the Alligator Flag Preserve and is located primarily in the center portions of the preserve. This community dominates the western boundary of the preserve and occupies a little over two thirds of the eastern boundary (Figure 7).

Also known as wet flatwoods, low flatwoods, hydric flatwoods (FNAI & FDNR 1990) and hydric pine flatwoods (USFWS 1999*b*) the cypress-pine-cabbage palm community typically includes a canopy of cypress, pine (*Pinus* spp.) and/or cabbage palm (*Sabal palmetto*) in combinations in which none of the species achieves dominance. This assemblage forms a transition between hydric sites (e.g., cypress communities) and moist upland sites (e.g., mesic pine flatwoods). This ecotonal community is unique to South Florida and functions as both a wetland and upland at different times of the year. As such, both hydrology in the wet season and fire in the dry season drive this dynamic system. As a result, this community is typically dominated by a slash pine (*Pinus elliottii* var. *densa*) overstory with a wetland plant understory. The wetland understory can be any, or a variety, of wetland plant community types ranging from wet prairie to hatrack cypress. Hydric pine flatwoods are distinct from mesic and xeric pine flatwoods in the absence of understory dominance by saw palmetto (*Serenoa repens*) and more

xeric species such as pennyroyal (*Piloblephis rigida*), pawpaw (*Asimina* spp.), and prickly pear (*Opuntia* spp.). The berm that runs along the southern boundary of the Alligator Flag Preserve, just north of the Cocohatchee Canal, prevents water from flowing southward consequently holding water on the preserve for an artificially long period of time during the wet season.

Cypress-Pine-Cabbage Palm Community within the Alligator Flag Preserve. Photo by Annisa Karim

The cypress-pine-cabbage palm community provides important forested habitat for a number of species often found in wetlands and uplands. Wildlife species that utilize this habitat include: the Florida black bear (*Ursus americanus floridanus*), Florida panther, wood stork, red-cockaded woodpecker (*Picoides borealis*), Everglades snail kite (*Rostrhamus sociabilis plumbeus*), the recently de-listed bald eagle, eastern indigo snake, gopher tortoise (*Gopherus polyphemus*), Big Cypress fox squirrel (*Sciurus niger avicennia*), Bachman's sparrow (*Aimophila aestivalis*), bobcat (*Lynx rufus*), swallow-tailed kite (*Elanoides forficatus*), Florida weasel (*Mustela frenata peninsulae*), limpkin (*Aramus guarauna*), northern harrier (*Circus cyaneus*), southeastern kestrel (*Falco sparverius paulus*), eastern American kestrel (*F. s. sparverius*) and the Florida sandhill crane (*Grus canadensis pratensis*). Additionally, this community provides essential habitat to the breeding life cycle of aquatic and wetland-dependent animals, and a major forest cover for cover-dependent species. Hydric pine flatwoods provide aquatic habitat for both young and adult amphibians and adult tree frog climbing areas. Hydric flatwoods serve as wading bird foraging areas, black bear foraging, denning, and travelways, and essential red-cockaded woodpecker foraging and nesting habitat (USFWS 1999*b*).

Since the cypress-pine-cabbage palm community comprises a majority of the preserve, all soils identified on the preserve (Boca, riviera, limestone substratum & Copeland fine sands, Oldsmar fine sand, Holopaw fine sand and Basinger fine sand) are found within this community.

2.3.2 Wetlands: Cypress

A Cypress community dominates approximately 24% of the northern portion of the Alligator Flag Preserve. One hundred percent of the northern boundary of the preserve contains this plant community (Figure 7).

Also known as flowing water swamps (Gilbert 2005), cypress stands, stringers and strand swamps (FNAI & FDNR 1990), these forested cypress communities are shallow, seasonally inundated and commonly found along and within drainage channels (USFWS 1999*a*). Deeper parts of this community may be characterized as a cypress slough. The hydrology of an area drives the formation of cypress communities (Sullivan 1994). Additionally, light surface fires every 30 to 200 years are essential to the maintenance of these communities. Without these fires, invasion by hardwoods and peat accumulation would degrade this community.

The canopy of the cypress community within the Alligator Flag Preserve is dominated by cypress (*Taxodium* sp.) and contains popash (*Fraxinus caroliniana*), strangler fig (*Ficus aurea*) and red maple (*Acer rubrum*). The midstory contains swamp dogwood (*Cornus foemina*), wax myrtle (*Myrica cerifera*), buttonbush (*Cephalanthus occidentalis*). Groundcover species include Alligator Flag PreserveFlag Preserve flag (*Thalia geniculata*), swamp fern (*Blechnum serrulatum*) and false nettle (*Boehmeria cylindrica*).

Cypress Community within the Alligator Flag Preserve.
Photo by Christal Segura

In a landscape context, the presence of highly functioning cypress communities within a matrix of other types of wetland and upland communities is imperative for many species of wildlife, including listed species. Listed species that benefit with the presence of the cypress community on the Alligator Flag Preserveinclude the Florida panther (*Puma concolor coryi*), wood stork (*Mycteria americana*), Kirtland's warbler (*Dendroica kirtlandii*), and eastern indigo snake (*Drymarchon corais couperi*). The recently de-listed bald eagle (*Haliaeetus leucocephalus*) is also a species that benefits from the presence of cypress communities (USFWS 1999*a*).

The berm that runs along the southern boundary of the Alligator Flag Preserve, just north of the Cocohatchee Canal, prevents water from flowing southward consequently holding water on the preserve for an artificially long period of time during the wet season. This results in deeper water in the cypress area than is normally seen in other naturally functioning cypress areas. The cypress community within the preserve is underlain with depressional Boca, riviera, limestone substratum & Copeland fine sands and Basinger fine sand.

2.3.3 Uplands: Pine Flatwoods

A Pine Flatwood community dominates approximately 18% of the Alligator Flag Preserve. This plant community is located in the southeastern portion of the property and comprises over 50% of the southern boundary (Figure 7).

Pine flatwoods are one of the most wide-ranging terrestrial plant communities in Florida and consequently one of the most influenced by anthropogenic activities (Abrahamson & Hartnett 1990). Fire strongly influences the community structure and composition of these communities.

The term pine flatwoods is a general categorization of areas that are dominated by various species of pine (*Pinus* spp.) trees. Pine flatwoods may be found in mesic flatlands where the landscape is made up of flat, moderately well drained sandy substrates with a mixture of organic material, often with an underlying hard pan layer. An open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs characterize natural, mesic flatwoods that have been burned regularly (FNAI & FDNR 1990). The USDA Soil Conservation Service classification system refers to these areas as South Florida flatwoods. South Florida flatwoods are typically savannas, a type of plant community intermediate between forest and grassland.

Mesic pine flatwoods are also called mesic flatwoods, pine savanna, cabbage palm savanna, and pine barrens. Oldsmar fine sand and Holopaw fine sand underlies this part of the preserve. The berm that runs along the southern boundary of the Alligator Flag Preserve, just north of the Cocohatchee Canal, prevents water from flowing southward consequently holding water on the preserve for an artificially long period during the wet season. As a result, this community holds comparably more water than other naturally functioning mesic pine flatwoods. Common mesic pine flatwood species such as saw palmetto, wax myrtle (*Myrica cerifera*), cabbage palm and saffron plum (*Sideroxylon celastrinum*) are found in this portion of the preserve. Additionally, species usually found in wet areas such as sawgrass (*Cladium jamaicense)*, swamp fern (*Blechnum serrulatum)* and wiregrass (*Aristida stricta* var. *beyrichiana*) are found in the pine flatwood portion of the Alligator Flag Preserve.

Mesic pine flatwoods within the Alligator Flag Preserve.
Photo by Christal Segura

Mesic flatwoods provide essential forested habitat for a variety of wildlife species including Neotropical migratory birds, wide-ranging large carnivores, mid-sized carnivores, ground-nesting vertebrates, tree-cavity dependent species, tree-nesting species and non-aquatic plant life. "At the current rate of habitat conversion, the mesic pine flatwoods, once the most abundant upland habitat in South Florida, is in danger of becoming one of the rarest habitats in South Florida" (USFWS 1999*c*).

2.3.4 Uplands: Australian Pine

A stand of invasive, exotic Australian pines comprises approximately 1% of the Alligator Flag Preserve and its description is included in this section (2.3 Natural Plant Communities) to provide a comprehensive assessment of the entire Alligator Flag Preserve. Invasive, exotic species are discussed in more detail in section 2.6 (Invasive, Non-native and Problem Species) of this document. The Australian pine monoculture is located in the southeastern portion of the property on the eastern edge of the pine flatwood community. Australian pines comprise the canopy and there are no midstory or understory plant species. The smaller Australian pines were removed in late April 2008 and the larger trees are scheduled to be removed in 2009. Figure 7 reflects the extent of this community after the smaller trees were removed.

2.4 Native Plant and Animal Species

A cypress-pine-cabbage palm community comprises the majority (57%) of the 18.46-acre Alligator Flag Preserve. Smaller areas of the preserve are comprised of cypress (24%) and pine flatwoods (18%) communities; a small stand of Australian pines (1%) also exists on the preserve. This section discusses the flora and fauna found within these plant communities. The next section (2.5) discusses all listed species in greater detail.

2.4.1 Plant Species

To date, 63 plant species have been recorded on the preserve (Appendix 2). Conservation Collier staff conducted a preliminary floristic inventory in August and September 2008. Another survey will be conducted in late fall 2009 and the final list will be added to this plan. Of these 63 species, 55 (87%) are native - of which, four are listed by the State of Florida (two are listed as endangered; one is listed as threatened; one is listed as commercially exploited).

2.4.2 Animal Species

Due to the dearth of specific surveys for the occurrence of animal species (in contrast to plants) and the lack of on-site staffing, little is recorded for actual occurrences of animals at the Alligator Flag Preserve. Occurrences of fauna at the preserve are based on direct visual and aural observations by staff during site visits or evidence of activity such as spoor, scat, or burrows, and from the site information available in documents such as the site's initial criteria screening report, the property's interim management plan and anecdotal information from persons with knowledge of the site. Table 5 provides a comprehensive list of animals, both native and non-native, recorded on the Alligator Flag Preserve thus far.

Table 5: Faunal Species Recorded on the Milano Preserve

Common Name	Scientific Name
American Robin	*Turdus migratorius*
Blue-gray Gnatcatcher	*Polioptila caerulea*
Blue Jay	*Cyanocitta cristata*
Cedar Waxwing	*Bombycilla cedrorum*
Common Ground-Dove	*Columbina passerina*
Great Crested Flycatcher	*Myiarchus crinitus*
Great Egret	*Ardea alba*
Mourning Dove	*Zenaida macroura*
Northern Mockingbird	*Mimus polyglottos*
Prothonotary Warbler	*Protonotaria citrea*
Red-bellied Woodpecker	*Melanerpes carolinus*
Red-shouldered Hawk	*Buteo lineatus*
White-eyed Vireo	*Vireo griseus*
Florida Black Bear	*Ursus americanus floridanus*
Racoon	*Procyon lotor*
Brown anole [a]	*Anolis sagrei*
Bluestripe Ribbon snake	*Thamnophis sauritus nitae*
Monarch butterfly	*Danaus plexippus*
Gulf Fritillary butterfly	*Agraulis vanillae*
Zebra Longwing butterfly	*Heliconius charitonius*
Florida Ivory millipede	*Chicobolus spinigerus*
Crab-like Spiny Orbweaver spider	*Gasteracantha cancriformis*
Red imported fire ant [a]	*Solenopsis invicta*

[a] *Non-native species* *list revised March 2009*

The Florida Breeding Bird Atlas (FFWCC 2003) lists 49 avian species that have been recorded as confirmed, probable, or possible breeding in the vicinity of the site (Table 6). The Breeding Bird Atlas documents breeding distributions of all bird species in Florida between 1986 and 1991. Some of these species may breed at the Alligator Flag Preserve.

Other wildlife species that have not yet been recorded undoubtedly occur at the Alligator Flag Preserve. During migration periods, transient bird species would be expected to utilize this area for short periods of time. The developed character of the adjacent areas may inhibit transient use by many mammal, reptile, and amphibian species, thus limiting the utilization of the preserve to resident individuals or inhibiting the dispersal of many species to and from the preserve.

Table 6: Breeding Bird Species Recorded in the Corkscrew SW Quadrangle Encompassing the Alligator Flag Preserve

Common Name	Scientific Name	Common Name	Scientific Name
Green Heron	*Butorides virescens*	Red-cockaded Woodpecker	*Picoides borealis*
Yellow-crowned Night-Heron	*Nyctanassa violacea*	Northern Flicker	*Colaptes auratus*
Wood Duck	*Aix sponsa*	Pileated Woodpecker	*Dryocopus pileatus*
Mottled Duck	*Anas fulvigula*	Great Crested Flycatcher	*Myiarchus crinitus*
Swallow-tailed Kite	*Elanoides forficatus*	Loggerhead Shrike	*Lanius ludovicianus*
Red-shouldered Hawk	*Buteo lineatus*	White-eyed Vireo	*Vireo griseus*
Northern Bobwhite	*Colinus virginianus*	Blue Jay	*Cyanocitta cristata*
King Rail	*Rallus elegans*	Fish Crow	*Corvus ossifragus*
Common Moorhen	*Gallinula chloropus*	Purple Martin	*Progne subis*
Limpkin	*Aramus guarauna*	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Killdeer	*Charadrius vociferus*	Tufted Titmouse	*Baeolophis bicolor*
Mourning Dove	*Zenaida macroura*	Carolina Wren	*Thryothorus ludovicianus*
Common Ground-Dove	*Columbina passerina*	Blue-gray Gnatcatcher	*Polioptilia caerulea*
*Rose-ringed Parakeet	*Psittacula krameri*	Northern Mockingbird	*Mimus polyglottos*
Yellow-billed Cuckoo	*Coccyzus americanus*	Brown Thrasher	*Toxostoma rufum*
Barn Owl	*Tyto alba*	Northern Parula	*Parula americana*
Eastern Screech-Owl	*Megascops asio*	Pine Warbler	*Dendroica pinus*
Great Horned Owl	*Bubo virginianus*	Prairie Warbler	*Dendroica discolor*
Barred Owl	*Strix varia*	Common Yellowthroat	*Geothlypis trichas*
Common Nighthawk	*Chordeiles minor*	Eastern Towhee	*Pipilo erythrophthalmus*
Chuck-will's-widow	*Caprimulgus carolinensis*	Northern Cardinal	*Cardinalis cardinalis*
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Red-winged Blackbird	*Agelaius phoeniceus*
Red-bellied Woodpecker	*Melanerpes carolinus*	Eastern Meadowlark	*Sturnella magna*
Downy Woodpecker	*Picoides pubescens*	Common Grackle	*Quiscalus quiscula*
**** = non-native species***		Boat-tailed Grackle	*Quiscalus major*

2.5 Listed Species

Official lists of rare and endangered species are produced at the federal level by the United States Fish and Wildlife Service and the National Marine Fisheries Service and at the State level by the Florida Fish and Wildlife Conservation Commission and the Florida Department of Agriculture and Consumer Services. FNAI produces a list of rare and endangered species, and maintains a database of occurrences of these species in Florida. The Institute for Regional Conservation (IRC) also ranks native plant species by conservation status in the 10-county area of South Florida. The following subsections (2.5.1 and 2.5.2) discuss the listed, rare and protected plant and animal species found within and close to the Alligator Flag Preserve in detail.

2.5.1 Listed Plant Species

The Florida State Statute titled "Preservation of native flora of Florida" (Statute 581.185) provides the following definitions:

- Endangered plants means species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the federal Endangered Species Act of 1973, as amended, Pub. L. No. 93-205 (87 Stat. 884).
- Threatened plants means species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.
- Commercially exploited plants means species native to the state, which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

There are four (4) plant species at Alligator Flag Preserve that are listed by the Florida Department of Agriculture and Consumer Services (FDACS), two (2) as endangered, one (1) as threatened, and one (1) as commercially exploited (Table 7). A brief description of these species and their status is included in the following paragraphs.

Table 7: Listed Plant Species Detected at the Alligator Flag Preserve

Common Name(s)	Scientific Name	State
Stiff-leaved wild-pine, Cardinal airplant	*Tillandsia fasciculata*	E
Fuzzywuzzy airplant, Hoary airplant	*Tillandsia pruinosa*	E
Reflexed wild-pine, Northern needleleaf	*Tillandsia balbisiana*	T
Royal fern	*Osmunda regalis* var. *spectabilis*	C

T: Threatened; E: Endangered; C: Commercially Exploited

Three of the four listed plant species found on the Alligator Flag Preserve are classified as bromeliads. Bromeliads are members of the pineapple family (Bromeliaceae). While some of these species may be found growing terrestrially, most native bromeliads found in Florida are found growing attached to tree trunks and branches and may therefore be referred to as epiphytes (a plant that lives upon other plants; from Greek "epi" = upon "phyte" = plant). The leaves and/or roots of these airplants (depending on the species) absorb the water and nutrients they need from the air and from the rain that falls through the canopy of the tree on which they are found. Since epiphytes use their roots only to anchor themselves to another plant, they are considered non-parasitic. Even though the three listed bromeliad species found on the Alligator

Flag Preserve are fairly common in the state, they are listed due to illegal collecting and the destruction of the habitats in which they are found. Additionally, infestation by the introduced Mexican bromeliad weevil (*Metamasius callizona*) has been implicated in the decline of many airplant populations around the state. Currently, there are no control measures in place however, close research and monitoring is taking place.

Stiff-leaved Wild Pine (*Tillandsia fasciculata*), is also known as cardinal airplant and common wild pine. *T. fasciculata* is listed as an endangered plant by the State of Florida and has been in 24 counties throughout Florida (Wunderlin & Hansen 2008). This epiphyte was frequently found in South Florida before the introduction of the Mexican bromeliad weevil. Today, it may be found in hammocks, cypress swamps and pinelands.

Tillandsia fasciculata;
Photo by Annisa Karim

View of *T. fasciculata* with water in the "tank".
Photo by Annisa Karim

Like most of the other bromeliads in Florida, this species is often referred to as a "tank" bromeliad because the leaf axils and central stems form a "tank" or reservoir at the base of the plant. These reservoirs capture and hold water, dead and decaying plant matter (leaves, seeds twigs, etc.), and dead and drowning non-aquatic insects; these trapped items provide nutrients for the plant (Larson et al. 2006).

Reflexed wild pine (*Tillandsia balbisiana*) is an epiphytic, "tank" bromeliad and is listed as a threatened plant by the State of Florida. Wunderlin and Hansen reported this species in 22 counties throughout Florida as of 2008 (Wunderlin & Hansen 2008). Reflexed wild pine is an occasional species in South Florida and is usually found in scrub, pinelands, strand swamps, hammocks, mangrove swamps and on shell ridges/mounds.

Tillandsia balbisiana
Photo by Annisa Karim

Royal fern (*Osmunda regalis* var. *spectabilis*) is not in danger of being extirpated in Florida because of habitat loss, habitat fragmentation or attack by an exotic, invasive pest, but because of commercial exploitation. According to Nelson (2000), the fibers from the stem of royal fern have been used as a growing medium to grow orchids as well as to make ropes and nets. Additionally, this species is believed to have medicinal benefits; other parts of the plant

may have been used to treat wounds and broken bones, relieve sprains and to help alleviate coughs and diarrhea. In Florida, this species is found in hydric areas such as wet flatwoods, cypress swamps,

floodplains, stream banks and bogs.

Osmunda regalis var. *spectabilis*
Photo by Annisa Karim

FNAI maintains a database of occurrences of rare, threatened, and endangered species in Florida. An element is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature. An element occurrence is a single, extant habitat that sustains or otherwise contributes to the survival of a population or a distinct, self-sustaining example of a particular element.

These element occurrence data are built into biodiversity matrices. Each matrix encompasses one (1) square mile and includes all species and natural communities tracked by FNAI, including all federal listed species. The FNAI report for the matrix in which the Alligator Flag Preserve is located identifies three likely elements and 18 potential elements. Of the three likely elements, one has been observed on the preserve, namely mesic pine flatwoods (described in section 2.3.3 of this document). None of the 18 potential elements reported by FNAI have been detected within the preserve. Appendix 3 provides the FNAI Managed Area Tracking Record and Element Occurrence Summary as well as the Biodiversity Matrix Report. Global and state rankings are provided for each species as well as their federal and state status.

2.5.2 Listed Animal Species

While no listed wildlife species have been observed on the Alligator Flag Preserve, according to a 2004 Preliminary Wetlands and Wildlife Assessment prepared by Johnson Engineering, the property is within the Corkscrew Swamp Sanctuary Wood Stork Core Foraging Area (18.6 miles), a documented wood stork rookery. The report also states that research of SFWMD Permit 11-01232-S indicated that "The Woodlands" (the adjacent Olde Cypress preserve property) at one time supported a viable population of Big Cypress fox squirrels and provided some nesting and foraging habitat for listed wading birds.

The wood stork (*Mycteria americana*)

The Florida Fish and Wildlife Conservation Commission (FFWCC) and by the United States Fish and Wildlife Service (USFWS) list the wood stork as an endangered species. Also known as the wood ibis or flint head, this species is one of the largest wading birds found in Florida and the only stork in the United States. The wood stork is a tactile feeder and may be found in fresh,

brackish, and saltwater habitats. Because of its dependence on naturally functioning hydrologic systems, the National Audubon Society refers to this wading bird as the "barometer of the Everglades". For this reason, the wood stork is an excellent environmental indicator of wetland health (Mazziotti 2002).

The Big Cypress fox squirrel (*Sciurus niger avicennia*)

Also known as the mangrove fox squirrel, the FFWCC lists this species as threatened in Florida. While the species is widespread in eastern and central North America, the subspecies is endemic to southwestern Florida – specifically in the Immokalee Rise, Big Cypress Swamp, and Devil's Garden area in Collier County. Some areas of this range have become vacated, while many other suitable areas are being altered or becoming isolated through development. The subspecies uses most types of forest occurring in its range. However, dense interiors of mixed cypress-hardwood strands seem to be avoided by Big Cypress fox squirrels due dense populations of gray squirrels (*Sciurus carolinensis*) occupying these areas. Big Cypress fox squirrels have been reported in cypress swamp, pine flatwood, tropical hammock, hardwood hammock, mangrove swamp, and suburban habitats including golf courses, and residential areas in native vegetation. Big Cypress fox squirrel densities appear to be quite low, and on this basis the subspecies can be considered inherently rare (Humphrey & Jodice 1992).

Three wildlife species were reported as likely to occur (rare species likely to occur on the site based on suitable habitat and/or known occurrences in the vicinity) and eleven species were reported as potential occurrences (site lies within the known or predicted range of species) within FNAI's Biodiversity Matrix for the Alligator Flag Preserve. Appendix 3 provides the FNAI Managed Area Tracking Record and Element Occurrence Summary as well as the Biodiversity Matrix Report. Global and state rankings are provided for each species as well as their federal and state status.

2.6 Invasive, Non-native and Problem Species

In an ecological context, an invasive species is one that is aggressive in growth and expansion of range and tends to dominate others; its establishment and dominance can cause widespread harm to an ecological system by altering the species composition, susceptibility to fire and hydrology of an area. Non-indigenous species (i.e., non-native or exotic species) are those that have been introduced purposefully or accidentally to an area outside their normal range. The characteristics of some of these species (high rate of growth/reproduction, no natural predators, easily dispersed, able to out-compete native species) make them invasive. Some indigenous species (a species whose natural range included Florida at the time of European contact circa 1500 AD or a species that has naturally expanded or changed its range to include Florida) may also become invasive. Invasions by native and non-native species often follow an alteration to ecosystem function, disruption of the food web, large-scale fragmentation of an ecosystem and/or disturbance (e.g., clearing, fire, drought, etc) of an area. While some native species may become invasive, the establishment and dominance of non-native species is of particular concern. The exotic plant and animal species documented within the preserve and those that have a potential to occur within the preserve are discussed in the following sections.

2.6.1 Invasive and Problem Plant Species

The Florida Exotic Pest Plant Council (FLEPPC) maintains a list of exotic plants that have been documented to (1) have adverse effects on Florida's biodiversity and plant communities, (2) cause habitat loss due to infestations and (3) impact endangered species via habitat loss and alteration. To date, eight non-indigenous plant species have been detected within Alligator Flag Preserve (Table 8), accounting for 13% of the plant species recorded there. Of the eight exotic species, six are listed by FLEPPC (five Category I and one Category II). FLEPPC defines Category I plants as those that alter native plant communities by displacing native species, change community structures or ecological functions, or hybridize with natives. Category II plants have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. These definitions do not rely on the economic severity or geographic range of the problem, but rather on the documented ecological damage caused by these plants (FLEPPC 2007).

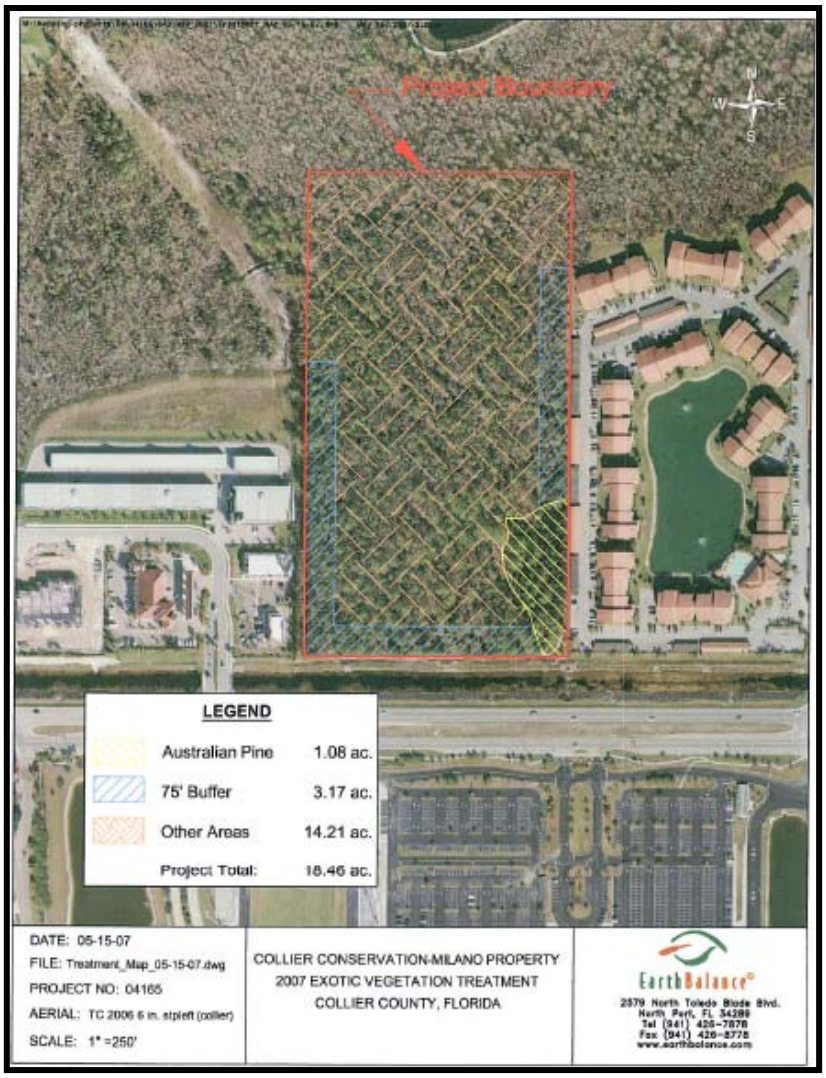
Table 8: Invasive Plant Species at Alligator Flag Preserve

Scientific Name	Common Names	FLEPPC Category
Acacia auriculiformis	Earleaf acacia	I
Casuarina sp.	Australian pine	I
Cupaniopsis anacardioides	Carrotwood	I
Melaleuca quinquenervia	Punk tree, Melaleuca, Paper bark	I
Schinus terebinthifolius	Brazilian pepper	I
Urena lobata	Caesarweed	II
Emilia fosbergii	Florida tassleflower	
Spermacoce verticillata	Shrubby false buttonweed	

As of the acquisition of the Alligator Flag Preserve by the Conservation Collier program on July 28, 2006, the most problematic exotic, invasive plant species were melaleuca (*Melaleuca quinquenervia*), Australian pine and earleaf acacia (*Acacia auriculiformis*). A Collier County approved contractor, started the initial treatment of these exotics on April 28, 2008. The following paragraphs outline the methods they used to chemically treat these exotics dependent on the species and location of treatment.

For the 75-foot perimeter buffer (3.17 acres; Figure 8), all woody invasive species, primarily melaleuca and earleaf acacia, were manually cut and the stem removed from the buffer. The cut stems were stacked within the interior of the property, but outside of the perimeter buffer. The remaining stumps were treated with a dye-laced herbicide. All saplings (<3 feet tall) and herbaceous, invasive species were killed-in-place (KIP) with a dye-laced herbicide.

In the interior of the property (14.21 acres; Figure 8), field crews used the frill-and-girdle (KIP) method for large trees [>4 inches DBH (diameter at breast height)] and small trees (<4 inches DBH) were cut and stacked within the interior of the property. The material was stacked in a "log cabin" formation with each "cabin" being spaced at least 50-75 feet apart. All trees frilled-and-girdled and any remaining stumps were treated with a dye-laced herbicide. All saplings (<3 feet tall) and herbaceous invasive species were killed-in-place with a dye-laced herbicide.



The smaller Australian pine trees in the southeast corner (1.08 acres; Figure 8) were cut by chainsaw. All remaining stumps were treated with a dye-laced herbicide. The larger Australian pine trees remaining on site are located on the extreme eastern edge of the Australian pine area. These trees are large (>4 inches DBH) and will be removed in early 2009.

Figure 8: Initial Exotic Vegetation Treatment Map for the Alligator Flag Preserve.

2.6.2 Invasive and Problem Animal Species

Although Florida does not have an official exotic, invasive animal species list, at least 400 exotic fish and wildlife animal species have been reported in Florida, and approximately 125 species are established.

Two non-indigenous, invasive animal species have been documented on the preserve: red imported fire ants (*Solenopsis invicta*) and brown anoles (*Anolis sagrei*). Based on the natural communities found within the preserve, proximity to residential areas and geographic location, several more species (native and non-native) have the potential to impact the Alligator Flag Preserve to varying degrees. Brief descriptions of documented and undocumented but potentially problematic species are provided in the following paragraphs.

Red imported fire ant (*Solenopsis invicta*): documented within the Alligator Flag Preserve

Solenopsis invicta, an invasive, non-indigenous arthropod documented within the Milano Preserve. Photo courtesy of the USDA.

These social insects were introduced into the U.S. from Brazil into either Mobile, Alabama or Pensacola, Florida between 1933 and 1945 (Collins & Scheffrahn 2005) and have been detected in the Alligator Flag Preserve. Red imported fire ants (RIFA) have been documented to cause harm to humans and wildlife as well as economic harm (Stimac & Alves 1994; Collins & Scheffrahn 2005; Willcox & Giuliano, 2006). RIFAs are omnivorous, but they prefer insects as their primary food source (Willcox & Giuliano 2006). RIFAs have a number of impacts on wildlife; in many areas, they have eliminated native ant populations through competition and predation and have eradicated food sources utilized by some wildlife species. Ground-nesting wildlife is especially susceptible to RIFAs. Within the Alligator Flag Preserve, RIFAs have the potential to affect ground-nesting birds; small mammals; reptiles, native lizard and snake species, and native invertebrates (Willcox & Giuliano 2006). Additionally, members of the public that come into contact with RIFAs may be harmed if stung. Many people have anaphylactic reactions to the toxins released from RIFA stings.

Brown Anole (*Anolis sagrei*): documented within the Alligator Flag Preserve

Anolis sagrei, an invasive, exotic reptile documented in the Alligator Flag Preserve. Photo courtesy of the USGS.

Also known as the Cuban anole, the brown anole is native to Cuba, the Bahamas, and neighboring islands (Schwartz & Henderson 1991). Like other anoles from the islands, this species is a small, tropical, diurnal, arboreal, territorial, and insectivorous lizard (Campbell 2001). The brown anole was first documented in the Florida Keys in the late 1800s (Lee 1985) and has since spread throughout Florida, into Georgia and into two other southeastern states (Campbell 1996). The brown anole is a habitat generalist and generally prefers the fairly open areas of disturbed sites. It feeds on a wide variety of insects, amphipods, and isopods. Brown anoles also prey on other small vertebrates including the hatchlings of the native green anole (*A. carolinensiis;* Campbell 2000).

Anolis carolinensiis, an ***indigenous*** reptile documented in the Alligator Flag Preserve. Photo courtesy of the USGS.

Campbell (2000) showed that, in the absence of the exotic brown anoles, native green anoles occupy perches from ground to the canopy of vegetation. However, in the presence of the exotic anole, native anoles move higher in trees, occupying only the trunk and crown of trees. Dietary overlap is high between both species, but the overall affects of the brown anole on the green anole are still undetermined.

Coyote (*Canis latrans*): undocumented within the Alligator Flag Preserve

Coyotes were introduced in very small numbers to Florida during the 1920's for sport hunting with domestic dogs. This introduction did not lead to the establishment of coyote populations in Florida. Concurrently, these canids expanded their range eastward across the United States and Canada as a result of nonspecific needs in habitat and food, decreased competition from other predators, large litter sizes and anthropogenic changes to the landscape. Since many species naturally expand or change their home ranges in response to climate and resource availability, the coyote may be considered native to Florida. This crepuscular (active mostly at dawn and dusk) species is elusive and may travel individually or in groups of two or three (Coates et al. 1998). Coyotes commonly enlarge burrows made by other animals such as armadillos or gopher tortoises to use as dens or use dense vegetation for cover. Coyotes may have a negative influence on indigenous wildlife as direct predators or as potential competitors with predators that may occur at the preserve such as foxes (*Urocyon cinereoargenteus)* or bobcats (*Lynx rufus floridanus)***;** however, this species may prove beneficial in controlling potential problem species such as feral cats.

Cuban tree frog (*Osteopilus septentrionalis*): undocumented within the Alligator Flag Preserve

Osteopilus septentrionalis, an invasive, exotic amphibian that has the potential to occur at the Alligator Flag Preserve. Photo courtesy of the USGS.

Like the Cuban anole, the Cuban tree frog is native to Cuba, the Bahamas, and neighboring islands. The first Cuban tree frogs probably arrived in the Florida Keys as stowaways in shipping crates originating from the Caribbean in the 1920's. Today, they have established breeding populations as far north as Cedar Key on Florida's Gulf Coast, Jacksonville on the Atlantic Coast, and Gainesville in north-central Florida. These hylids are the largest tree frog found in Florida and because of their ability to invade natural areas and prey on native invertebrates and small vertebrates (including native tree frogs) they are considered an invasive species. Additionally, the tadpoles of this species inhibit the growth and development of the tadpoles of the native southern toad (*Bufo terrestris*) and green tree frog (*Hyla cinerea*). Cuban tree frogs thrive in residential and natural areas such as pine forests, hardwood hammocks, and swamps. In residential settings, they are most commonly found on and around homes and buildings, and in gardens and landscape plants. They are known to get into transformer boxes and electrical switches causing power outages (Johnson 2007). Due to the natural communities that are found within the Alligator Flag Preserve and its proximity to residential areas, this species has the potential of occurring in the preserve.

Giant Marine Toad or Cane Toad (*Bufo marinus*): undocumented within the Preserve

Bufo marinus, an invasive, exotic amphibian that has the potential to occur at the Alligator Flag Preserve. Photo courtesy of the USGS.

Bufo terrestris, a native toad that looks similar to the exotic, invasive cane toad. Photo courtesy of the USGS.

The cane toad is a tropical species native to the Amazon basin in South America, and its range extends through Central America to extreme southern Texas along the Rio Grande River. They are used as a control agent for insects that damage sugarcane and consequently, are one of the most introduced amphibian species in the world. In 1936, an attempt was made to introduce this species into Palm Beach County, FL. This attempt failed as did two subsequent efforts. Ironically, in 1955, an accidental release by an importer at the Miami International Airport in Miami-Dade County, FL proved successful. They have since been deemed an invasive species in Florida and are currently found in urban areas of south and central Florida, and are rapidly expanding northward (Brandt & Mazziotti 2005). Many of this species' characteristics enable it to do well in south Florida. Beetles, bees, ants, winged termites, crickets and bugs are a large part of the diet of the adult marine toad. Additionally, they consume arthropods, mollusks, small vertebrates, plant matter, pet food, carrion, household scraps, marine snails, smaller toads and native frogs, small snakes, and even small mammals. Marine toads are prolific breeders and females can lay tens of thousands of eggs in a single breeding season. They prefer forested areas with semi permanent water nearby (Churchill 2003). The cane toad looks very similar to the native, southern toad, but there are some distinct differences. The most obvious difference is adult body size (length of body not counting the legs). Adult marine toads can reach lengths of 6 -9 inches while the native southern toads only reach a length of 3.6 inches. Like other true toads, both possess poisonous, parotid glands. The ***parotid glands*** of the cane toad are angled downward behind their head to their shoulders. The southern toad has a kidney-shaped parotid gland behind each eye positioned close to the spine. The southern toad also possesses ***cranial crests*** that start between the eyes and often end in big knobs. While the parotid glands of all toads contain bufotoxins (poisonous, milky fluids exuded as a defense mechanism), the chemicals released by the exotic, cane toad are much more harmful to wildlife, pets and people (Brandt & Mazziotti 2005). Due to the natural communities that are found within the Alligator Flag Preserve and its proximity to residential areas, this species has the potential of occurring within the preserve. Adjoining residents of the preserve should be encouraged to keep pet food and water containers indoors or empty at night.

Feral domestic cat *(Felis catus):* undocumented within the Alligator Flag Preserve

Domestic cats originated from an ancestral wild species, the European and African wildcat (*Felis silvestris*). Humans facilitated the global distribution of cats due to their highly efficient predatory skills. Egyptians took cats with them on shipping vessels to keep rodent populations down, and they likely introduced domestic cats to Europe. Subsequently the expansion of the Roman Empire and European missionary missions facilitated the spread of domestic cats into Asia and beyond (Masterson 2007). Today, the impact of feral cats on wildlife is difficult to quantify; however, literature (FFWCC 2001; Karim 2007; Masterson 2007) strongly indicates that they are a significant factor in the mortality of small mammals, birds (including migratory birds), reptiles, and amphibians in Florida. Because free-ranging cats often receive food from humans, they may reach abnormally high numbers. An increase in the population of feral cats may lead to increased predation rates on native wildlife. While no cats have yet been observed on the Alligator Flag Preserve, there exists a high probability of their future presence on the preserve due to the proximity of Milano to human residential areas. Adjoining residents of the preserve should be encouraged to keep their cats indoors and staff should monitor the preserve for the presence of feral cats.

3.0 Previous and Current Use of the Preserve; Adjacent Land Uses

3.1 Previous Use of the Preserve and Adjoining Lands

Aerial photographs taken in 1973 (Figure 9) and 1996 (Figure 10) accompanied by more recent visits to the site show that development has never occurred on the site. Digital images were downloaded from the Florida Department of Transportation's Aerial Photo Look Up System (2008) and georeferenced in ArcMap 9.2 by Conservation Collier Staff.

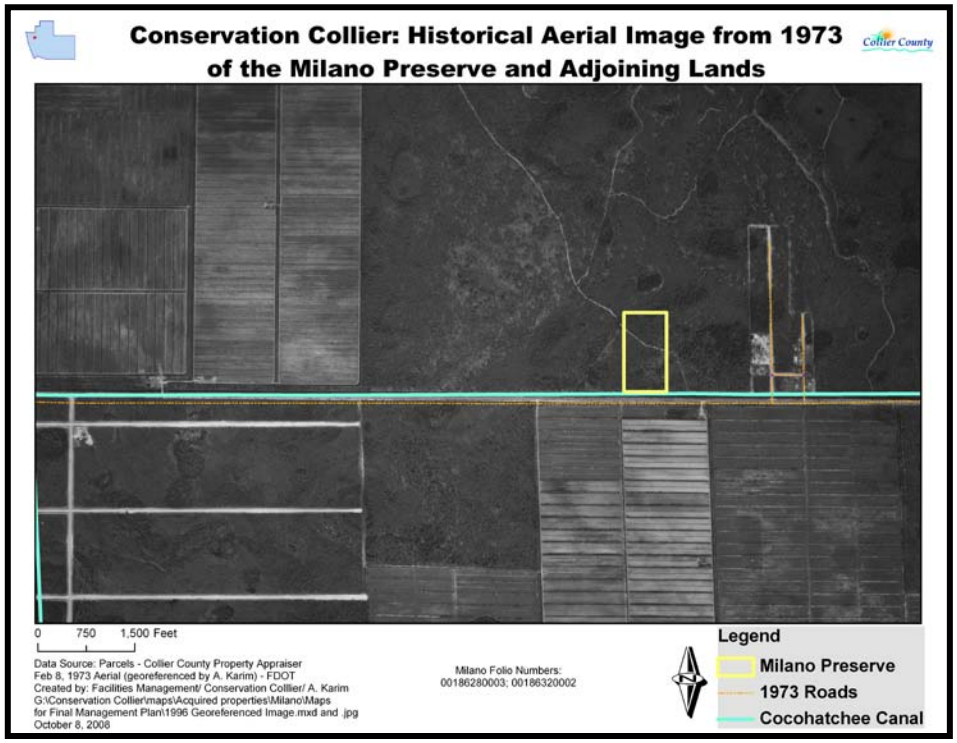


Figure 9: Historical Aerial Photograph from 1973 of the Alligator Flag Preserve and Adjoining Lands

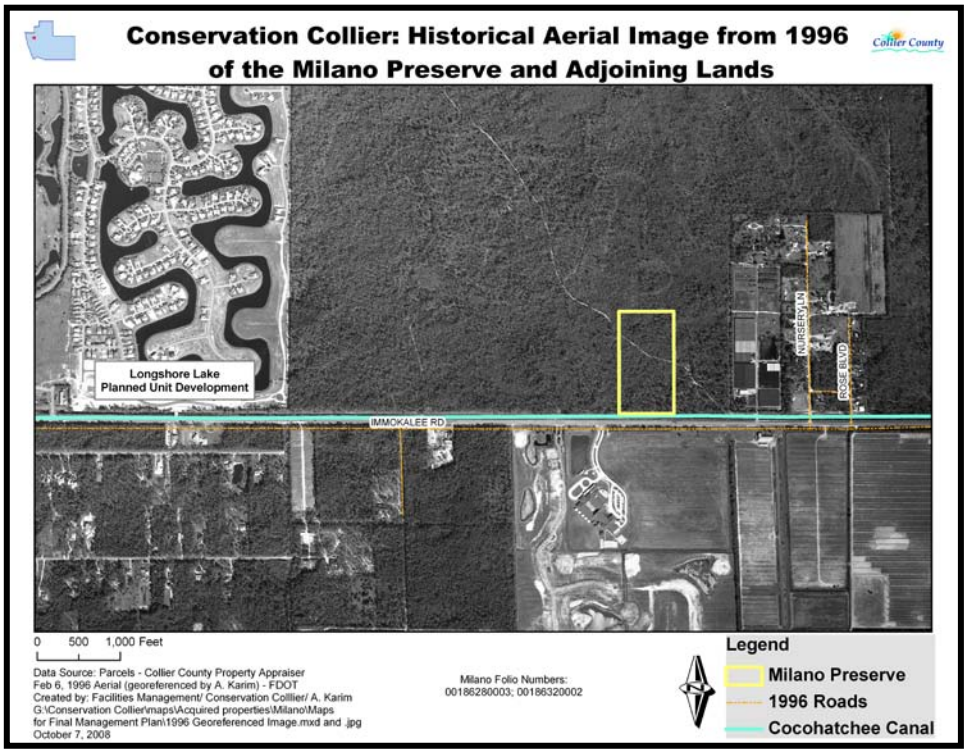


Figure 10: Historical Aerial Photograph from 1996 of the Alligator Flag Preserve and Adjoining Lands

3.2 Current Land Uses

Currently, there is no sanctioned public use of the Alligator Flag Preserve. Conservation, restoration and natural resource-based recreation are the designated uses of this preserve. Management activities allowed include those necessary to preserve, restore, secure and maintain this environmentally sensitive land for the benefit of present and future generations. Public use of the site must be consistent with these management goals and will be discussed in section 4.4 of this document.

The Olde Cypress Planned Unit Development (PUD) adjoins the Alligator Flag Preserve to the west, north and east. This PUD contains residential, commercial and conservation lands; specifically, a cypress slough under preservation is located to the northwest, north and northeast, the Fairway Preserve Condominiums are to the east and commercial lands and a drainage tract for the PUD are to the west of the Alligator Flag Preserve. Areas not contained within the PUD include a greenway trail, the Cocohatchee Canal and Immokalee Road (from north to south) to the south of the preserve and Laurel Oaks Elementary School and Gulf Coast High School on the south side of Immokalee Road (Figure 11).

The proposed Terafina, Parklands and Mirasol PUDs are located to the north and east of the Olde Cypress PUD and the Alligator Flag Preserve. Existing and proposed preserves for these PUDs contiguous with the Alligator Flag Preserve are illustrated in Appendix 4.

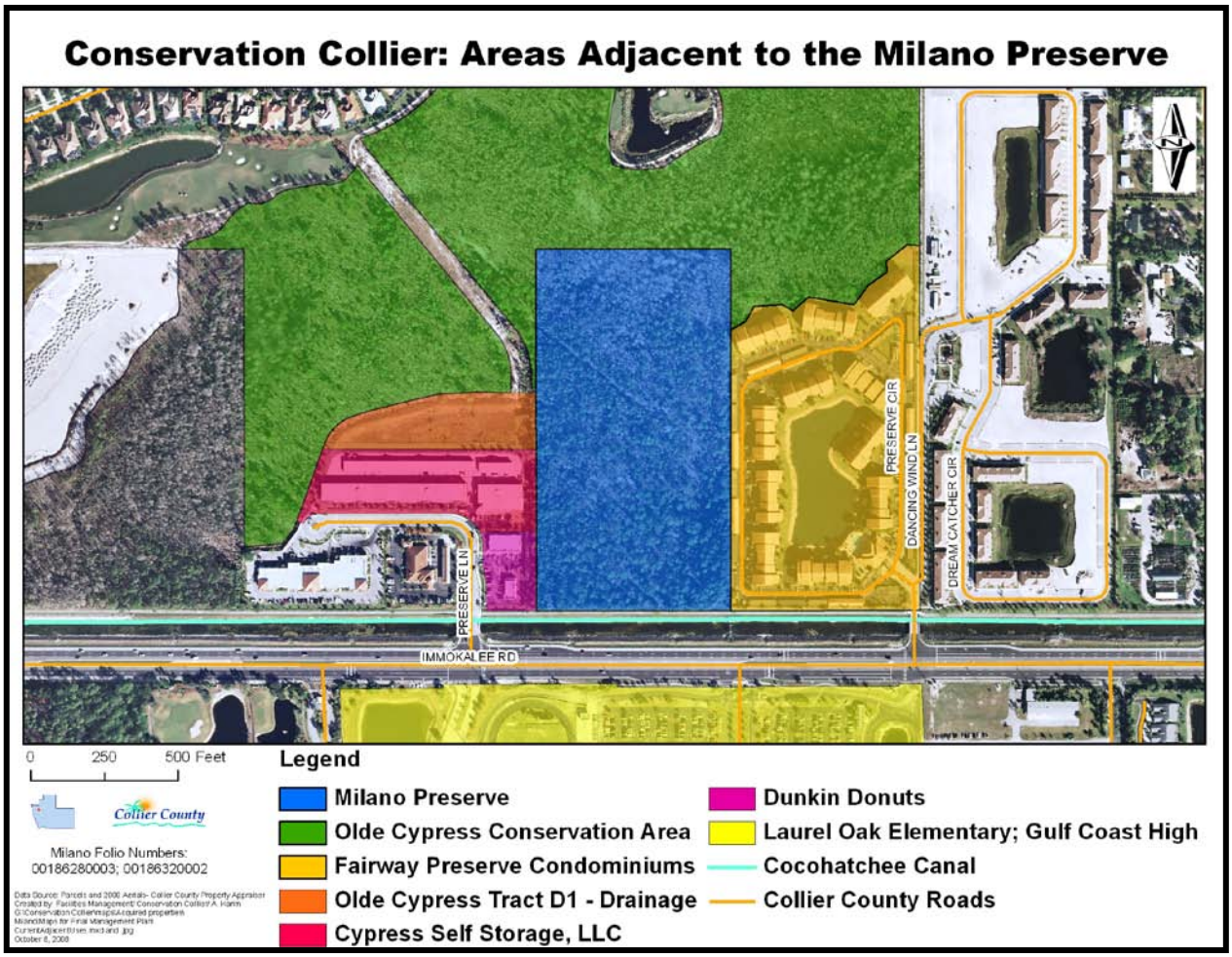


Figure 11: Areas Adjacent to the Alligator Flag Preserve

3.3 Cultural, Historical and Archeological Resource Protection

The Alligator Flag Preserve is not within an area of historical and archaeological probability, and no historical or archaeological sites appear to be present on the property. The County will notify the Division of Historical Resources immediately if evidence is found to suggest any archaeological or historic resources are discovered. If such resources are identified on-site, staff shall cordon off the area, and a professional survey and assessment shall be instituted. The archaeologist shall prepare a report outlining results of the assessments and issue recommendations to County staff about management of any sites discovered, per provisions of the Land Development Code Section 2.2.25. This report shall be sent to the Division of Historical Resources. The County shall cooperate fully with direction from the Division of Historical Resources on the protection and management of archaeological and historical resources. The management of these resources will comply with the provisions of Chapter 267, Florida Statutes, specifically Sections 267.061 2 (a) and (b).

3.4 Major Accomplishments during Previous Years

Since the acquisition of the Alligator Flag Preserve in July 2006, major accomplishments have been achieved (Table 9). Conservation Collier staff explored options of funding exotic removal through grants from the Department of Environmental Protection before contracting this service out. The invasive, exotic removal project was implemented throughout the site while staff concurrently established photo-monitoring points to better aid in the long-term management of the preserve. Subsequently, the Collier County Sheriff's work weekenders removed large amounts of debris. Given the discrepancy between the 1995 and 2001 FLUCCS digital layers (as they pertain to the Alligator Flag Preserve) and the removal of exotic vegetation since the acquisition of the property in July 2006, staff created a new digital layer showing the location and extent of the native plant communities currently found on the preserve.

Table 9: Major Accomplishments since the Acquisition of the Alligator Flag Preserve

Accomplishment	Year(s)
Established photo monitoring points	2008
Removed and treated the invasive, exotic plants species on the Preserve	2008
Sherriff Dept.weekenders removed large amounts of miscellaneous debris from site	2008
Created an accurate FLUCCS Map of the Preserve	2008

4.0 Future Use of the Alligator Flag Preserve including Management Issues, Goals and Objectives

This section describes the main management issues, goals, and objectives for the Alligator Flag Preserve as well as the overall management framework. Central to the management of the Preserve is the mission of the Conservation Collier Program, and the goals and objectives set forth in this management plan.

4.1 Management Plan Framework

Each property purchased by Conservation Collier shall have its own management plan. At the time the Alligator Flag Preserve as purchased, the Conservation Collier Ordinance required that an "Interim" Management Plan be developed within 60 days of closing. Interim plans include basic items such as removal of invasive exotics and trash, establishing site security, developing management partnerships and planning for public access. The interim plan for this site was officially approved in October 2006. The ordinance then requires a "Final" ten-year management plan be developed within two years; the first draft of this management plan was submitted to the Lands Evaluation and Management Subcommittee in October 2008. Once approved, the property management plan must be reviewed every five years. Final management plans, however, are considered living documents and can be updated at any time. Review of all management plans start in the Lands Evaluation and Management subcommittee and must be approved by both the CCLAAC and the Collier County BCC.

4.1.1 Preserve Manager: Contact Information

The site manager for Alligator Flag Preserve will be a designated Collier County Environmental Specialist who may be contacted through electronic mail: ConservationCollier@Colliergov.net.

4.2 Planned Uses and Assessment of their Impacts

Future planned use will be consistent with the primary goals of conservation, preservation, restoration and maintenance of the resource. Official public use of the site may not be possible until safe public access trails can be created. However, citizens that desire to visit the site prior to opening may do so by signing a waiver that will allow them access at their own risk and releases the liability of the County until safe access is established. Details of planned uses for the Alligator Flag Preserve and an assessment of their potential impacts are provided in the following sections.

4.2.1 Identification of Public Uses Consistent with Preservation, Enhancement, Restoration, Conservation and Maintenance of the Resources

The Conservation Collier Ordinance 2002-63 constrains the use of this property to "primary objectives of managing and preserving natural resource values and providing appropriate natural resource-based recreational & educational opportunities." Natural resource-based recreation shall mean all forms of uses, which are consistent with the goals of this program, and are compatible with the specific parcel. Such uses may include, but are not limited to hiking, nature photography, bird watching, kayaking, canoeing, swimming, hunting and fishing (Ord. No. 02-63, as amended§ 5, 12-3-02). Additionally, no dumping, use of unauthorized vehicles, or removal or destruction of natural or historical/archaeological resources will be permitted within the preserve. The goal is to allow limited, non-destructive public access to native plant communities and animal species. Currently, the preserve rules are those identified in Collier County Ordinance 76-48 (available from www.municode.com), as amended.

The following are ***consistent*** uses for this particular site: hiking, nature photography and bird watching. ***Inconsistent*** uses include swimming, kayaking / canoeing, fishing, hunting and off road vehicle use (ORV).

In addition, there are no existing easements, concessions, or leases at the Alligator Flag Preserve. In accordance with the management goals of the preserve, no future easements, concessions, or leases are appropriate in association with this site, other than conservation related easements.

4.3 Desired Future Conditions

This section includes a description of the proposed future conditions for the site's natural areas. Management techniques to achieve these conditions are outlined in section 4.4.

After managers complete recommended management actions, Alligator Flag Preserve will consist of cypress-pine-cabbage palm, cypress and pine flatwoods; these communities will have a similar structure and composition to those that existed before non-indigenous people settled the region and before the exclusion of fire. With the exception of a boardwalk, the site will be vegetated with appropriate native flora that will provide suitable cover for a variety of wildlife species.

4.4 Goals for the 10 year period 2008-2018

A set of goals and objectives for Alligator Flag Preserve were developed in conjunction with the drafting of this Management Plan. The goals and objectives in this plan are tailored specifically for Alligator Flag Preserve based on the purposes for which the lands were acquired, the condition of the resources present, and the management issues for the property. On-site managers should be familiar with this entire Management Plan. Goals and objectives from the interim management plan for the Alligator Flag Preserve were reviewed to determine whether they should be included in this plan. The goals and objectives presented here reflect programmatic goals and ideas of Conservation Collier personnel in charge of managing and protecting the area. These goals shall not be modified, but specific application of management techniques may take into consideration input by user groups and other stakeholders from outside the program, accommodating user needs and desires where practicable and where overarching management goals are not violated.

Management issues are discussed below in separate sections. Within each section, approaches for dealing with these issues are described. The ability to implement the specific goals and objectives identified in this plan is dependent upon the availability of funding sources. The following goals have been identified for Alligator Flag Preserve:

Goal 1: Eliminate or significantly reduce human impacts to indigenous flora and fauna

Goal 2: Develop a baseline monitoring report

Goal 3: Remove or control populations of invasive, exotic or problematic flora and fauna to restore and maintain natural habitats

Goal 4: Determine if prescribed fire and/or mechanical treatments are feasible to decrease woody invasion resulting from past fire exclusion if so proceed

Goal 5: Restore native vegetation

Goal 6: Develop a plan for public use

Goal 7: Facilitate uses of the site for educational purposes

Goal 8: Provide a plan for security and disaster preparedness

GOAL 1: *ELIMINATE OR SIGNIFICANTLY REDUCE HUMAN IMPACTS TO INDIGENOUS FLORA AND FAUNA*

Action Item 1.1 Install a fence and access gate around the perimeter of the Alligator Flag Preserve if needed.

Presently, staff does not recommend a fence around the property but if trespassing, chronic dumping or other security issues arise, a field fence, four feet in height, will be installed along the boundaries of the property where these issues occur. If this fence is installed, one or more gate(s), 12 feet in width and four feet in height will be installed (if needed) along the fence-

line to allow access to the Alligator Flag Preserve by authorized County staff and the fire department.

Action Item 1.2 Install signs encouraging people to stay on any future public access trails situated on the preserve.

Action Item 1.3 Identify locations of rare and listed native plant species.

The location of these species will be identified using a global positioning system (GPS) device and mapped to allow staff to monitor them. Public trails will be constructed to avoid areas where rare and listed species exist.

Action Item 1.4 Enforce regulations prohibiting trash in or near the preserve.

Staff will monitor the trails on a regular basis and if excessive dumping or littering start to occur, enforcement actions will be sought through the County Sheriff's Department.

Action Item 1.5 Identify actual and potential locations of resident animal life and take steps such as locating visitor amenities away from animal nesting sites.

Action Item 1.6 Avoid non-target damage to native plants and animals, especially rare species, during invasive, exotic plant treatments.

If the use of herbicides is appropriate during the removal of invasive, exotic plant species, decisions on the types of herbicides utilized will be made on the best information available at the time of exotic removal. Staff has prohibited the use of herbicides containing Imazapyr (e.g., Arsenal) due to reports that these herbicides have potentially caused a great deal of non-target damage throughout the state. Licensed County or State contractors have been (and will be) monitored closely to ensure the proper herbicide applications are being utilized while treating the site. In addition, close attention will be paid to identify listed epiphytes (Table 7) that may be attached to invasive trees being cut down or removed. Plants of these species will be relocated prior to removal. Special attention will be given to avoid damage to native species in the vicinity of exotic removal activities. Hand pulling of exotic seedlings will be done when possible.

Action Item 1.7 Note and research all site development occurring adjacent to Alligator Flag Preserve to determine that the proper site development permits have been obtained and that the site development complies with the permits.

Activities on adjacent lands may have an impact on the indigenous plant and animal life on the Alligator Flag Preserve. As such, all existing local, state, and federal regulations should be strictly followed and enforced during any site development adjacent to the preserve. It shall be the responsibility of the developer to establish erosion control measures and vegetation protection measures (i.e., protective fencing or barriers). If any site developer working in areas adjacent to the preserve does not take the necessary control measures,

construction shall be immediately halted until control measures are put into place and mitigation and/or remediation will be the sole responsibility of the developer.

GOAL 2: *DEVELOP A BASELINE MONITORING REPORT*

Action Item 2.1 Establish a long-term biological monitoring program and conduct additional wildlife surveys.

Long-term management of the preserve should be based on biological data. Changes following baseline conditions should be assessed as negative or positive, and management strategies changed appropriately. This section discusses information needs and long-term monitoring needs.

Conservation Collier staff has conducted a floristic inventory of the Alligator Flag Preserve; these findings will comprise the baseline floristic data on which future actions will be based. The site should be inspected by Conservation Collier Staff at least twice a year and thoroughly inventoried at regular intervals (ca. 5-10 years) to detect new invasions (by natives or exotics) and extinctions. Areas undergoing extreme restoration should be assessed more frequently. While some wildlife data has been collected, additional baseline data should be collected, especially on invertebrates, small mammals, reptiles, and amphibians. The site manager may contract this work out or enlist the assistance of local educators to coordinate student research projects. Wildlife sampling, like plant sampling, on non-listed species only, should take place at regular intervals (ca. 5-10 years) to detect long-term trends.

Currently, six (6) photo points have been established throughout the preserve (Figure 11). Locations of photo points have been recorded with a GPS and all photographs taken at these locations have been taken at a standard height and angle of view. During photo documentations, one photo is taken in each of the cardinal directions (north, east, south and west) and a 360-degree panoramic photo is taken. These photos will help to monitor exotic removal and native plant recruitment over time. If necessary, more photo points will be established to aid in management decision activities. Future photo points will include photos taken with a vegetation profile board to aid in the determination of what (if any) changes occur over time.

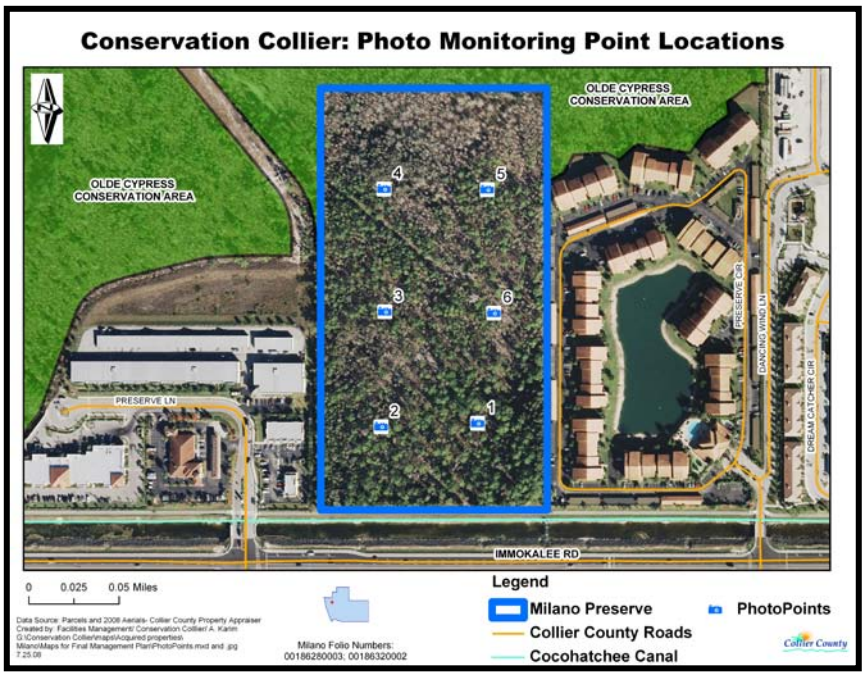


Figure 11: Photo Point Locations within the Alligator Flag Preserve

GOAL 3: *REMOVE OR CONTROL POPULATIONS OF INVASIVE, EXOTIC OR PROBLEMATIC FLORA AND FAUNA TO RESTORE AND MAINTAIN NATURAL HABITATS*

Action Item 3.1 Acquire services of licensed and qualified contractor(s) for the removal of invasive, exotic or problematic plant species.

The following (Table 10) describes recommended controls (Langeland & Stocker 2001) of the Category I, invasive, exotic plant species recorded to date on the Alligator Flag Preserve. These recommended control methods may be altered by site managers dependent on new information and products available on the control of these species.

Table 10: Invasive, Exotic Plant Species Control Plan for the Alligator Flag Preserve FLEPPC Category I species [a]

Scientific Name	Common Name(s)	Recommended Control(s)[b]
Acacia auriculiformis	earleaf acacia	Hand pull seedlings or basal bark application of 10% Garlon 4 or cut-stump treatment with 50% Garlon 3A.
Casuarina sp.	Australian pine	Basal bark treatment with 10% Garlon 4 is very effective, as is a cut-stump treatment with 50% Garlon 3A or 10% Garlon 4. When basal bark treatment is used on trees greater than 1 foot in diameter it may be necessary to slough off loose bark in the application area to prevent the bark from trapping the herbicide. Broadcut or 4-6 lb Velpar ULW may be used when appropriate.
Cupaniopsis anacardioides	carrotwood	Hand pull seedlings or basal bark application of 100% Pathfinder II, or 10%-20% Garlon 4 diluted with oil; or cut stump application of 10% Garlon 3A, 100% Brush-B-Gon, 100% Roundup Pro, 100% Rodeo, or equivalent glyphosate containing product, or 100% Pathfinder II.
Melaleuca quinquenervia	melaleuca, punk tree, paper bark	For seedlings and saplings: (1) hand pull, being sure not to break plant off of root system and remove or place in piles to help reduce the chance that they will re-root or; (2) Treat with foliar, low volume spot application of 5% Rodeo. For mature trees: (1) Fell large trees with chain saw leaving a level surface, or fell small trees with machete and treat with triclopyr or glyphosate products according to frill and girdle directions on SLN. Use aquatic versions where standing water is present. Monitor for resprouting and retreat as necessary. (3) Mature trees are very difficult to control with foliar applications.
Schinus terebinthifolius	Brazilian pepper	Hand pull seedlings or cut-stump treatment with 50% Garlon 3A, 10% Garlon 4 or a basal bark application of 10% Garlon 4. Foliar application of Garlon 4, Garlon 3A, Roundup Pro, Roundup Super Concentrate, or Rodeo, according label directions may be used where appropriate. Glyphosate products are less effective when used alone in spring and early summer. Use Rodeo where plants are growing in aquatic sites.

[a] **FLEPPC 2007: Category I plants** are those that alter native plant communities by displacing native species, change community structures or ecological functions, or hybridize with natives.
[b] Langeland & Stocker 2001

ACTION ITEM 3.2 **Acquire services of licensed or qualified contractor(s) for the removal of invasive, exotic or problematic animal species.**

To date, two (2) introduced animal species have been documented on the Alligator Flag Preserve, the RIFA and the brown anole. It is doubtful that the total eradication of these species can be achieved. However, staff and/or contractors should take measures to remove RIFA populations close to or on public access trails.

If feral cat colonies are found near the preserve, the elements that sustain the undesirable population(s) should be identified and efforts made to ask property owners to eliminate them (i.e., refuse bins, dumpsters, and supplementary feeding by humans). If any feral cats remain, they will be trapped and taken to Collier County Domestic Animal Services.

ACTION ITEM 3.2 **Coordinate the control of invasive plant and animal populations with the Olde Cypress PUD preserve management entity.**

GOAL 4: *UTILIZE PRESCRIBED FIRE AND/OR MECHANICAL TREATMENTS TO DECREASE WOODY INVASION RESULTING FROM PAST FIRE EXCLUSION.*

Action Item 4.1 Develop a prescribed fire or mechanical treatment plan to mimic natural fires within the Preserve.

Much of Collier County is comprised of plants that are dependent on fire to maintain species composition and diversity. These species are the same ones that are prone to lightning strike wildfires, and the controlled reduction of those fuels will prevent catastrophic wildfire damage. Prescribed fires: reduce fuel loads and consequently decrease the threat of wildfires; create open areas for wildlife to travel within; stimulate food and seed production; recycle nutrients; alter the composition and density of forested areas; and aid in the control of invasive plant species.

The structure and composition of the ***mesic pine flatwood*** community is dependent on periodic fires. Fire probably occurred every 1 to 8 years during pre-Columbian times. A majority of the flora and fauna found within this community are adapted to periodic fires; several species depend on fire for their continued existence. Without relatively frequent fires, mesic pine flatwoods succeed into hardwood-dominated forests whose closed canopy can essentially eliminate herbaceous groundcover and shrubs. Additionally, the dense layer of litter that accumulates on unburned sites can eliminate the reproduction of pine trees that require a mineral soil substrate for proper germination (FFWCC 2002).

Fire is the ideal ecological tool for achieving a sustainable mesic pine flatwood community. However, due to the proximity of the Alligator Flag Preserve to Immokalee Road, residential and commercial areas and the size of the parcel, alternate manual or mechanical treatments will be investigated in lieu of managing the lands through the use of fire.

Action Item 4.2 If fire is deemed appropriate, delineate fire management and rescue access routes, and provide this information to the police department and emergency services.

If fire is deemed an appropriate management tool on the Alligator Flag Preserve, the fire plan and access routes to and within the preserve will be provided to the police department and emergency services.

GOAL 5: *RESTORE NATIVE VEGETATION*

Action Item 5.1 Maintain a revised GIS map and description of FNAI natural communities and disturbed areas on the property.

Maintaining updated maps will help to guide restoration efforts

Action Item 5.2 Plant native plant species in their appropriate habitats

Periods following exotic removal and prescribed fire (or mechanical treatment) are essential to the recruitment of native plants. If native plant recruitment is not sufficient from the surrounding, intact seed source, efforts will be made to plant indigenous flora in appropriate habitats. Natural area restoration of Alligator Flag Preserve should include only site-specific native plant material that has been determined to be non-problematic at the site and whenever possible, site-specific seed sources should be utilized. In addition, hardwoods that may invade the natural areas (mesic pine flatwood area) should not be planted.

GOAL 6: *DEVELOP A PLAN FOR PUBLIC USE*

Action Item 6.1 Develop access and required facilities for intended public uses

A parking lot will not be constructed on site due to the amount of wetlands present and the lack of vehicular access. The greenway trail just south of the property (north of the Cocohatchee Canal and Immokalee Road) will serve as the path along which the public may gain access to the southern portion of the preserve on foot or by bicycle. Conservation Collier staff has developed a conceptual site plan (Figure 12) incorporating a raised boardwalk and a seasonal trail. The planned trail system will be approximately 1170 linear feet (LF) long and the materials used will be based on funding sources available. The following paragraphs describe the components of the trail system and the ideal lengths (option one) of each section.

Option One

- ***The raised boardwalk*** measuring approximately 650 feet in length shall adhere to guidelines and standards set forth by the Americans with Disabilities Act (ADA). As permitting for the boardwalk goes forward, a review of ADA compliance should be done by the County. The elevation of the boardwalk would allow for fluctuation of water levels and the movement of small animals. The entrance of the boardwalk would be located approximately 370 feet east of Preserve Lane. As depicted in the conceptual site plan, the entrance of the boardwalk would house an interpretive sign. This sign would provide general information about Conservation Collier and the characteristics of the Alligator Flag Preserve. The southern portion of the walkway would be installed along the transition zone between the cypress-pine-

cabbage palm and pine flatwoods communities; this placement along the ecotone will theoretically allow visitors the best opportunity to view the plants and animals of both communities. An interpretive sign would be placed along this portion of the boardwalk to give specific information about the plant communities and associated animals that may be seen form this portion of the boardwalk. The walkway would then continue northward through the cypress-pine-cabbage palm community and end at a platform. The route of the boardwalk was approximated from a 2008 aerial image to take advantage of areas where impacts to the community would be minimized. An engineering firm would be contracted to plan the design of the boardwalk and would be requested to do so in the least impactful way possible. The consulting, planning and permitting would be very expensive as well as the costs to build a boardwalk. This process will also be very time consuming. It is estimated that at least a year will be needed to complete the planning and permitting process. Grants will be applied for in the lag time to assist in the costs associated with this option.

- ***The optional seasonal walking trail*** measuring approximately 520 feet in length would be installed dependent on the costs associated with the project and the status of the budget after the construction of the boardwalk. This trail (closed to public access during times of high water) would begin at the platform and allow visitors to access the cypress area of the preserve. The route of the trail was approximated from a 2008 aerial image to take advantage of areas where impacts to the plant community would be minimized. The northern portion of this walking trail would take advantage of an existing trail running northwest to southeast on the property. As depicted in the conceptual site plan, a directional sign and trail markers will be strategically placed to help visitors stay on this trail. Additionally, an interpretive sign will be placed near the end of this trail.

- ***Platform and associated components:*** As depicted in the conceptual site plan, the platform would be located at the terminus of the boardwalk. The platform would be ADA compliant and include a bench and interpretive sign. It would be accessible from the south via the proposed boardwalk and would allow visitors access to the seasonal walking trail via a gate and stairs. The gate would be locked during times of high water.

Option Two

- If a boardwalk proves to be cost prohibitive (no grant funding available), a seasonal walking trail only may be provided. The path of this trail would mimic the entire trail system illustrated in Figure 12. Educational signage would be installed and would be removed and replaced before and after each rainy season. As the name suggests, this trail would only be open to the public during the dry season. This trail would be closed by staff during the wet season.

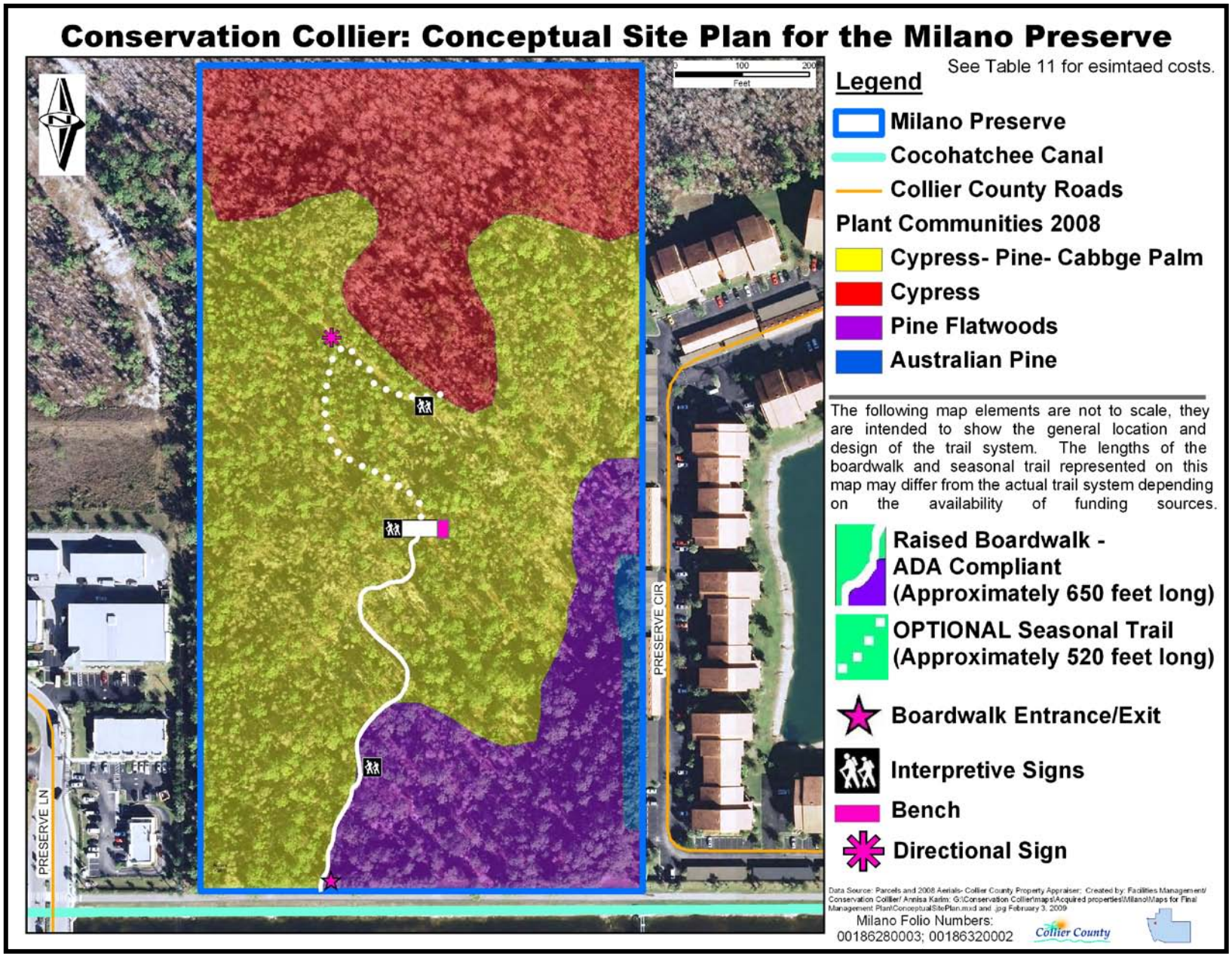


Figure 12: Alligator Flag Preserve Conceptual Master Plan

GOAL 7: *FACILITATE USES OF THE SITE FOR EDUCATIONAL PURPOSES*

Actions Item 7.1 Develop interpretive signage to educate preserve visitors.

Once a trail system is complete, site specific signage will be developed to educate visitors on plant identification and general ecosystem information. A large sign with a map of the preserve will be installed at the boardwalk or trail entrance and smaller, more site specific interpretive signs, will be placed along the boardwalk or seasonal trail.

Action Item 7.2 Provide preserve brochures in rainproof box on site.

A brochure outlining the native plant communities and wildlife present at the preserve will be created by County staff and kept in rainproof boxes near the preserve entrance. The preserve manager will inspect these boxes monthly and refill as necessary.

GOAL 8*: PROVIDE A PLAN FOR SECURITY AND DISASTER PREPAREDNESS*

Action Item 8.1 Discourage any visitation to the park at night.

A sign designating park hours as 8:00 am to dusk will be installed at the entrance to the preserve and adjacent landowners will be given an emergency phone number if they detect human activity on the preserve after hours. If problems arise, the Collier County Sheriff's Office will be contacted to patrol the area and site on a routine basis.

Action Item 8.2 Enforce regulations prohibiting trash and landscape debris dumping in or near the preserve.

Currently, there is no vehicular access and dumping is not a problem. Monthly inspections will determine if dumping becomes a problem. Staff will work with the Collier County Sheriff's Office to address dumping if it becomes a problem.

Action Item 8.3 Survey trees along the trail and the perimeter of the property annually for damage

Staff will utilize the services of a certified arborist to determine diseased, weak, or damaged trees/limbs surrounding the trails and kiosks that should be removed for safety reasons and prior to hurricane season. This activity is intended to reduce the risk of visitor injury.

Action Item 8.4 Visit preserve within 48 hours after a storm event to assess damage.

Staff will take photos of damage and fill out appropriate Collier County Risk Management Department forms. If damage is extensive, the preserve will be closed until public safety hazards are cleared.

Action Item 8.5 Promptly clear storm debris from preserve.

If necessary, a Collier County emergency debris removal contractor will be contracted as soon as possible after the storm to schedule clean-up. Removal of debris and damaged or downed trees along the trail system may be needed. Downed trees and limbs that do not appear to be a public safety hazard will be cleared at the discretion of the Preserve Manager. As much hurricane debris as possible will be chipped and retained on-site – to be used as mulch for the trail.

4.5 Establish an Operational Plan for the Alligator Flag Preserve

This section provides management recommendations for operation of the Alligator Flag Preserve. It discusses maintenance and budgeting needs, the possibilities for contracting the restoration activities, coordination, and other management issues.

4.5.1 Maintenance

The primary maintenance activities for the preserve will include control of dumping and littering within and around the preserve and trail. Particularly important are the security measures to keep intruders out and the signage and fencing (if installed) in good conditions. Signs that effectively convey the desired message provide an opportunity for increasing environmental education and awareness.

4.5.2 Estimated Annual Costs and Funding Sources

Preliminary budget estimates for Alligator Flag Preserve include cost breakdowns associated with resource restoration and management. The funding source identified for the restoration and management activities is the Conservation Collier Program Management Trust Fund. Grants will be sought to supplement existing management funds and specifically for the costs associated with the potential construction of the boardwalk. Staff will also utilize the Collier County Sheriff's Department weekenders program for certain labor projects and may also separately involve the County Scout programs for trail creation and enhancement.

The budget in table 11 represents the actual and unmet budgetary needs for managing the lands and resources of the preserve for the next ten years. The table shows the activities planned and the initial and annual cost estimate of each activity. This budget was developed using data from Conservation Collier and other cooperating entities, and is based on actual costs for land management activities, equipment purchase and maintenance, and for development of fixed capital facilities. The budget considers available funding and is consistent with the direction necessary to achieve the goals and objectives for Alligator Flag Preserve.

Table 11: Estimated Annual Land Management Budget

Table 11: Estimated Annual Land Management Budget (Amounts in $; see assumptions for cost estimates on next page)													
Item	**QTY**	**Cost ($)**	**2008-09**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**Total**
Facilities Development													
Boardwalk [1]	0 LF - 650 LF	$0 - $585,000		$0 - $200,000	$0 - $385,000								**$0 - $585,000**
Trails [2]	520 LF - 1170 LF	$650 - $4,410				$650 - $1,470			$650 - $1,470			$650 - $1,470	**$1,950 - $4,410**
Entry Gates [3]	1	$1,000					$1,000						**$1,000**
Fence (4' field fence) western boundary [4]	1230 LF	$6,273					$6,273						**$6,273**
Interior interpretive signs [5]	3	$500			$1,500								**$1,500**
Plant signs	30	$10			$300								**$300**
Entry signage (set) [6]	1	$2,250			$2,250								**$2,250**
Directional sign	1	$100				$100							**$100**
Bench, Garbage can, Bike Rack	1 of each	$1,250			$1,250								**$1,250**
Restoration/Monitoring		t.b.d.											**t.b.d.**
Establish photo points	recurring	n/a											**$0**
Remove exotics [8]	18.46 acres		$33,800	$1,850	$1,850	$1,850	$1,850	$1,850	$1,850	$1,850	$1,850	$1,850	**$50,450**
Native Plant Restoration [9]	t.b.d.	t.b.d.											
Regular Maintenance													
Reduce Fuel Loads [10]	2	$2,000		$2,000					$2,000				**$4,000**
General Facilities Maintenance [11]	8	$720			$720	$720	$720	$720	$720	$720	$720	$720	**$5,760**
Brochures [12]						$300	$100	$100	$300	$100	$100	$100	**$1,100**
Grand Total			**$33,800**	**$3,850 - $203,850**	**$7,870 - $392,870**	**$3,620 - $4,440**	**$9,943**	**$2,670**	**$5,520 - $6,340**	**$2,670**	**$2,670**	**$3,320 - $4,140**	**$75,933 - $663,393**

Assumptions for Cost Estimates:

The total estimated costs for the Alligator Flag Preserve from 2008 to 2018 range from $73,833 to $661,253. This range of estimated costs is based primarily on the materials used to construct the trail system. See explanations that follow.

1 & 2. The planned trail system (Figure 12) will be approximately 1170 linear feet (LF) long and the materials used will be based on funding sources available.

The ideal length of an ADA compliant, raised boardwalk would be 650 LF at $585/LF = $380,250 (rounded to $385,000). Unit price includes required materials, labor and equipment as follows. Permitting, Planning and design is estimated to cost $200,000.

The ideal length of a mulched (seasonal) trail would be 520 LF. Mulch calculated for a trail 5 feet wide piled 3 inches thick = 2600 square feet to be covered. 325 bags of mulch at $2.00 per bag = $650. Trails can be made through volunteer labor, boy scout or through the use of the Sheriff's weekender groups.

The actual cost of the trail system may be estimated using the following formula:

[($200,000 + $585x) + $2(0.625y)]

where x = the length (LF) of the raised boardwalk and y = the length (LF) of the mulch trail. **If the mulch does not stay in place after the first installation due to standing water levels in the wet season, we will discontinue future installments and mow the trail during dry season. We may also explore mulching the melaleuca piles on site for use on the trails instead of bringing new mulch in.**

3. Entry Gates: 1 gate at $2,000.00 each (if deemed necessary)

4. Fence: Field Fence estimated at $5.10 a foot for 1230 LF (if deemed necessary)

5. Interpretive signs: 3 interpretative signs (4'x6') at $500 each

6. Entry signage: 1 road sign indicating entrance to the preserve ($250 each) and 1 welcome sign (8'x6') estimated at $2,000

7. Bench estimated at $600; **trash can** estimated at $400

8. Removal of Exotics: $26,000 paid to contactor; $7,751.96 will be paid upon removal of Australian Pines; maintenance costs will be $1,850 per event- for 2009 and 2010 two events per year will take place. From 2011 on - one event will take place per year

9. Native Plant Restoration: t.b.d.

10. Reduce fuel loads: reduction of dense fuels - $2000 every 5 years

11. General Maintenance: includes garbage can maintenance approx. $720/year ($60/month)

12. Brochures: $300 per year every third year; $100 per year for all other years

4.5.3 Potential for Contracting Restoration and Management Activities by Private Vendors

A significant number of Alligator Flag Preserve management operations and restoration activities can be considered for outsourcing. Restoration and management activities that can be considered for outsourcing to private entities are listed in table 12.

Table 12: Potential Contracting for Restoration and Management Activities

Activity	Approved	Conditional	Rejected
Prescribed fire and/ or mechanical treatment application	X		
Minor fireline installation	X		
Fireline, fence, and trail maintenance	X		
Fence installation	X		
Plant and wildlife inventory and monitoring		X	
Listed species mapping and needs assessment		X	
Restore/enhance encroachment and ruderal areas		X	
Reduce exotic species	X		
Literature development and printing		X	
Interpretive signs development and installation		X	
Trail and boardwalk installation	X		
Law enforcement and patrol	X		

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Appendix 1. Vegetation Scheme Crosswalks/ Florida Natural Areas Inventory Plant Community Classifications

South Florida Vegetation Classification Scheme Crosswalks for Plant Communities Observed on the Milano Preserve								
EVSC^		**FFWCC^**	**FLGAP^**		**FLUCCS^**		**MSRP^**	**FNAI***
ID	*Name*	*Name*	*ID*	*Name*	*ID*	*Name*	*Name*	*Name*
FS	Swamp forest	Bottomland Hardwood Forest	17	Swamp Forest Ecological Complex	624	Cypress - pine - cabbage palm	Pond Swamps	Wet Flatwoods Freshwater Tidal Swamp
FSc FSd FSCpi SVC SVCd SVCpi	Cypress strands Cypress domes/heads Cypress-pines Cypress savanna Dwarf cypress Cypress with pine	Freshwater Marsh Cypress Swamp	18 53	Cypress Forest Compositional Group Dwarf Cypress Prairie	621	Cypress	Freshwater Marshes Flowing Water Swamps Pond Swamps	Marl Prairie Floodplain Swamp Freshwater Tidal Swamp Slough Strand Swamp Basin Swamp Dome Swamp
F SV SVPI SVx	Forest Savanna Pine savanna Slash pine mixed with palms	Dry Prairie Pineland	13 16 25 29	South Florida Slash Pine Forest Mesic-Hydric Pine Forest Compositional Group South Florida Slash Pine Woodland Dry Prairie Ecological Complex	411	Pine flatwoods	Pine Rocklands Mesic Pine Flatwoods Dry Prairie Cutthroat Grass Communities	Pine Rockland Mesic Flatwoods Scrubby Flatwoods Wet Flatwoods

^ Crosswalks for 5 vegetation classification schemes used in south Florida: 1. Everglades Vegetation Classification System (EVSC, South Florida National Parks), 2. Florida Fish and Wildlife Conservation Commission (FFWCC), 3. Florida Gap Analysis Project (FLGAP, US Geological Survey), 4. Florida Land Use and Cover Classification System (FLUCCS, Florida Department of Transportation and Water Management Districts), 5. Multi-Species Recovery Project (MSRP, US Fish and Wildlife Service). Source: Gilbert 2005

* Classification of plant communities based on the Natural Communities Guide developed by Florida Natural Areas Inventory (FNAI)

Appendix 2. Preliminary Floristic Inventory of the Alligator Flag Preserve.

Milano Preserve: Preliminary Plant List			
Flora recorded by: Christal Segura, Annisa Karim, Dr. George Wilder			
Scientific Name	**Common Name(s)**	**State[b]**	**FLEPPC[c]**
Acacia auriculiformis[a]	Earleaf acacia		I
Acer rubrum	Red maple		
Ambrosia artemisiifolia	Common ragweed		
Amphicarpum muhlenbergianum	Blue maidencane		
Andropogon glomeratus	Bushy bluestem		
Annona glabra	Pond apple		
Aristida stricta var. *beyrichiana*	Wiregrass		
Baccharis halimifolia	Saltbush, Groundsel tree, Sea-myrtle		
Bidens alba	Beggarticks, Romerillo		
Blechnum serrulatum	Swamp fern, Toothed midsorus fern		
Boehmeria cylindrica	False nettle, Bog hemp		
Cassytha filiformis	Lovevine, Devil's gut		
Casuarina sp.[a]	Australian pine		I
Centella asiatica	Spadeleaf		
Cephalanthus occidentalis	Common buttonbush		
Chrysobalanus icaco	Coco plum		
Cladium jamaicense	Sawgrass, Jamaica swamp sawgrass		
Coreopsis leavenworthii	Leavenworth's tickseed		
Cornus foemina	Swamp dogwood, Stiff dogwood		
Cupaniopsis anacardioides[a]	Carrotwood		I
Cyperus haspan	Haspan flatsedge		
Cyperus ligularis	Swamp flatsedge		
Diospyros virginiana	Common persimmon		
Emilia fosbergii[a]	Florida tassleflower		
Encyclia tampensis	Butterfly orchid		
Eupatorium capillifolium	Dog-fennel		
Eustachys petraea	Common fingergrass, Pinewoods fingergrass		
Ficus aurea	Strangler fig, Golden fig		
Fuirena scirpoidea	Southern umbrella sedge		
Fraxinus caroliniana	Carolina ash, Water ash, Pop ash		
Fuirena spp.	Umbrella sedge		
Gamochaeta antillana	Caribbean purple everlasting		
Heliotropium polyphyllum	Pineland heliotrope		
Ilex cassine	Dahoon holly, Dahoon		
Linaria canadensis	Canadian toadflax		
Melaleuca quinquenervia[a]	Punk tree, Melaleuca, Paper bark		I
Mikania scandens	Climbing hempvine		
Myrica cerifera	Wax myrtle, Southern bayberry		
Nymphoides aquatica	Big floatingheart, Banana lily		
Osmunda regalis var. *spectabilis*	Royal fern	C	
Oxalis spp.	Wood Sorrel		
Panicum hemitomon	Maidencane		

Appendix 2 (continued). Preliminary Floristic Inventory of the Alligator Flag Preserve.

Milano Preserve: Preliminary Plant List Flora recorded by: Christal Segura, Annisa Karim, Dr. George Wilder			
Paspalum monostachyum	Gulfdune paspalum		
Parietaria floridana	Florida pellitory		
Persea borbonia	Red bay		
Phlebodium aureum	Golden polypody		
Phyla nodiflora	Turkey tangle fogfruit, Capeweed		
Pinus elliottii var. densa	South Florida slash pine		
Piriqueta cistoides	Pitted stripeseed		
Pluchea baccharis	Rosy camphorweed		
Psilotum nudum	Wisk fern		
Polygala violacea	Showy milkwort		
Rapanea punctata	Myrsine, Colicwood		
Rhynchospora inundata	Narrowfruit horned beaksedge; Inundated beak-rush		
Rubus trivialis	Sothern dewberry		
Sabal palmetto	Cabbage palm		
Sagittaria latifolia	Broadleaf arrowhead, Common arrowhead, duck potato		
Sarcostemma clausum	Whtie twinevine		
Serenoa repens	Saw palmetto		
Shinus terebinthofolious [a]	Brazillian pepper		I
Sideroxylon celastrinum	Saffron plum, Bumelia		
Smilax auriculata	Earleaf greenbrier		
Spermacoce verticillata [a]	Shrubby false buttonweed		
Taxodium spp.	Cypress		
Thalia geniculata	Alligatorflag, Fireflag		
Thelypteris spp.	Shield fern		
Tillandsia balbisiana	Reflexed wild-pine, Northern needleleaf	T	
Tillandsia fasciculata	Stiff-leaved wild-pine, Cardinal airplant	E	
Tillandsia usneoides	Spanish-moss		
Tillandsia paucifolia	Potbelly airplant		
Tillandsia recurvata	Ballmoss		
Tillandsia setacea	southern needleleaf		
Toxicodendron radicans	Eastern poison-ivy		
Urena lobata [a]	Caesarweed		II
Vicia acutifolia	Fourleaf vetch		
Viola lanceolata	Bog white violet		
Vitis rotundifolia	Muscadine, Muscadine grape		

[a] *Non-native species that may or may not have FLEPPC designations* *list revised March 2009*

[b] *State listed species: T = Threatened; E = Endangered; C = Commercially Exploited*

[c] *Florida Exotic Pest Plant Council (FLEPPC) 2007 designations*

I: *Invasive, exotics that are altering native plant communities by displacing native species, changing structures or ecological functions, or hybridizing with natives.*

II*: Invasive, exotics that have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species.*

Appendix 3. Florida Natural Areas Inventory Report for the Alligator Flag Preserve

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
850-681-9364 fax
www.fnai.org

Florida Natural Areas Inventory
Biodiversity Matrix Query Results
UNOFFICIAL REPORT
Created 9/25/2008
(Contact FNAI Data Services Coordinator for an official **Standard Data Report**)

NOTE: The Biodiversity Matrix includes only rare species and natural communities tracked by FNAI.

Report for 1 Matrix Unit: 40546

Descriptions

DOCUMENTED - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit.

DOCUMENTED-HISTORIC - There is a documented occurrence in the FNAI database of the species or community within this Matrix Unit; however the occurrence has not been observed/reported within the last twenty years.

LIKELY - The species or community is *known* to occur in this vicinity, and is considered likely within this Matrix Unit because:

1. documented occurrence overlaps this and adjacent Matrix Units, but the documentation isn't precise enough to indicate which of those Units the species or community is actually located in; *or*
2. there is a documented occurrence in the vicinity and there is suitable habitat for that species or community within this Matrix Unit.

POTENTIAL - This Matrix Unit lies within the known or predicted range of the species or community based on expert knowledge and environmental variables such as climate, soils, topography, and landcover.

Matrix Unit ID: 40546
0 **Documented** Elements Found
0 **Documented-Historic** Elements Found

3 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	LE
Puma concolor coryi Florida Panther	G5T1	S1	LE	LE

Matrix Unit ID: 40546
18 **Potential** Elements for Matrix Unit 40546

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Andropogon arctatus Pine-woods Bluestem	G3	S3	N	LT
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	LS

Appendix 3 (continued). Florida Natural Areas Inventory Report for the Alligator Flag Preserve

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Corynorhinus rafinesquii Rafinesque's Big-eared Bat	G3G4	S2	N	N
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	LT
Elytraria caroliniensis var. angustifolia Narrow-leaved Carolina Scalystem	G4T2	S2	N	N
Eumops floridanus Florida bonneted bat	G1	S1	N	LE
Gopherus polyphemus Gopher Tortoise	G3	S3	N	LT
Lechea cernua Nodding Pinweed	G3	S3	N	LT
Linum carteri var. smallii Small's flax	G2T2	S2	N	LE
Mustela frenata peninsulae Florida Long-tailed Weasel	G5T3	S3	N	N
Nemastylis floridana Celestial Lily	G2	S2	N	LE
Picoides borealis Red-cockaded Woodpecker	G3	S2	LE	LS
Polyrrhiza lindenii Ghost Orchid	G2G4	S2	N	LE
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	LT
Rostrhamus sociabilis plumbeus Snail Kite	G4G5T3Q	S2	LE	LE
Sceloporus woodi Florida Scrub Lizard	G3	S3	N	N
Sciurus niger avicennia Mangrove Fox Squirrel	G5T2	S2	N	LT
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	LT*

Appendix 4. Existing and Proposed Preserves on the Terafina, Parklands and Mirasol Planned Unit Developments. The Alligator Flag Preserveis outlined in red.