Panther Walk Preserve Land Management Plan

Managed by: Conservation Collier Program

Collier County, Florida

September 2010 – September 2020 (10-yr plan)

Prepared by:

Conservation Collier Staff

Collier County Facilities Management Department

Panther Walk Preserve

Land Management Plan Executive Summary

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

Property included in this Plan: "Panther Walk Preserve" 4.54 acres. The Preserve consists of three adjoining parcels each in Section 31, Township 47, and Range 28 East of Collier County, Florida.

LEGAL

THE EAST 75 FEET OF THE EAST 150 FEET OF TRACT NO. 84, GOLDEN GATE ESTATES UNIT NO. 42, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 7, AT PAGE 27, INCLUSIVE, OF THE PUBLIC RECORDS OF COLLIER COUNTY, FLORIDA. PROPERTY TAX IDENTIFICATION NUMBER: 38847040004

AND

THE WEST 75 FEET OF THE EAST 150 FEET OF TRACT NO. 84, GOLDEN GATE ESTATES UNIT NO. 42, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 7, AT PAGE 27, INCLUSIVE, OF THE PUBLIC RECORDS OF COLLIER COUNTY, FLORIDA. PROPERTY TAX IDENTIFICATION NUMBER: 38847080006

AND

THE EAST ONE HUNDRED FIFTY (150') FEET OF TRACT NO. 85, GOLDEN GATE ESTATES UNIT NO. 42, ACCORDING TO THE PLAT THEREOF, AS RECORDED IN PLAT BOOK 7, AT PAGE 27, INCLUSIVE, OF THE PUBLIC RECORDS OF COLLIER COUNTY, FLORIDA.
PROPERTY TAX IDENTIFICATION NUMBER: 38847240008

Management Responsibilities:

Agency: Collier County - Conservation Collier Program

Designated Land Use: Conservation and natural resource based recreation

Unique Features: Plant communities consist of high quality cypress wetlands with listed plant species recorded to date.

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: Restore and maintain native habitats

Goal 5: Develop a plan for public use

Goal 6: Facilitate uses of the site for educational purposes

Goal 7: Provide a plan for security and disaster preparedness

Public Involvement: A public meeting was held in the summer of 2010 and residents and neighbors from surrounding lands were invited to review the Final Management Plan. Staff will also coordinate educational activities with the Estates Elementary School.

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1.0 Introduction

The Panther Walk Preserve is a 4.54-acre natural area located within the boundary of Collier County, Florida. The preserve is comprised of three parcels: two 1.14 acre parcels (folios: 38847080006 & 38847040004) and one 2.27 acre parcel (folio number**:** 38847240008). Native plant communities within the preserve include high quality cypress wetlands, which are part of a larger system called the Horsepen Slough Strand.

A site assessment to determine compliance with Conservation Collier's initial screening criteria on the southern 2.28 acres (formerly known as the Oetting properties) was conducted in March 2006 and the parcels were purchased on June 11, 2007. The northern 2.27 acres (formerly known as the Freitas property) were evaluated in October 2007 and the parcel was purchased on July 14, 2008. In 2009, the adjacent Estates Elementary School held a preserve naming contest and the winning name of "Panther Walk Preserve" was chosen by student Jocelyn Rosario and was approved by the County as the official preserve name. Collier County holds a fee simple title to all three parcels that make up the Panther Walk 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 Panther Walk Preserve

Year	Benchmark for southern 2.28 acres (formerly known as the Oetting properties)
2005	Southern 2.28 acres nominated
2006	Initial Criteria Screening Report accepted by the Conservation Collier Land Acquisition Advisory Committee
2007	Purchase approved by the Board of County Commissioners and subsequently purchased June 11, 2007
2007	Interim Management Plan completed and approved by the Board of County Commissioners
Year	**Benchmark for northern 2.27 acres (formerly known as the Freitas property)**
2007	Northern 2.27 acres nominated
2007	Initial Criteria Screening Report for northern 2.27 acres accepted by the Conservation Collier Land Acquisition Advisory Committee
2008	Purchase approved by the Board of County Commissioners and subsequently purchased July 14, 2008
2008	Interim Management Plan for southern 2.28 acres revised to include northern 2.27 and approved by the Board of County Commissioners
Year	**Benchmark for entire Preserve**
2009	Estates Elementary School named preserve "Panther Walk Preserve"
2010	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 Panther Walk 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 for the benefit of present and future generations (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 Panther Walk Preserve.

1.2 Purpose and Scope of Plan

The purpose of the plan is to provide management direction for Panther Walk 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 Panther Walk Preserve

Panther Walk Preserve is located at 2845 60th Ave. N.E. in the Northern Golden Gate Estates Unit 42. It is west of Everglades Blvd., and extends between 60th Ave and 62nd Ave NE (Figure 1). The preserve is in northern Collier County, Florida in Section 31, Township 47, and Range 28.

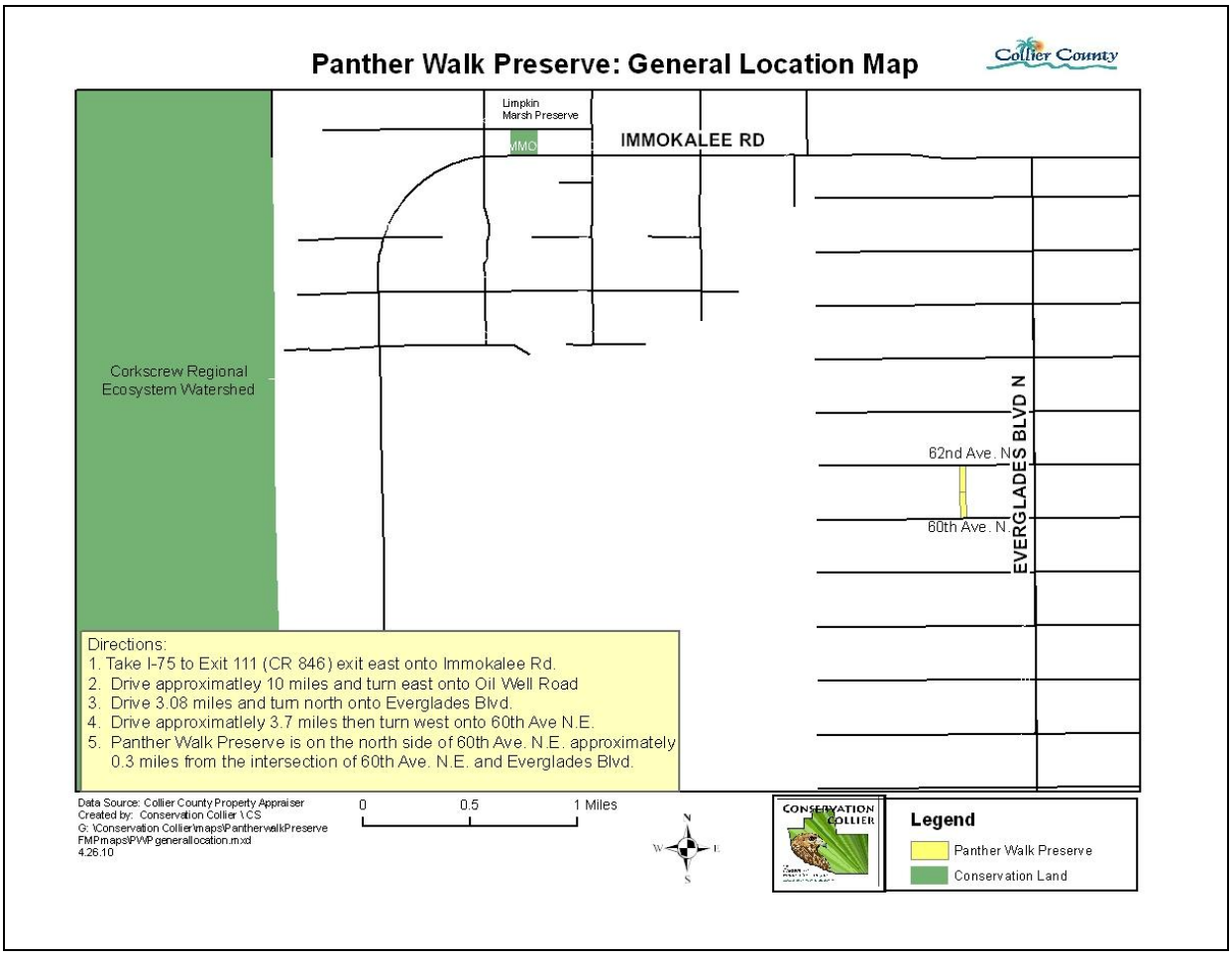

Figure 1: General Location of Panther Walk Preserve.

1.4 Regional Significance of the Panther Walk 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 December 2009, approximately 67% (over 868,040 acres) of all lands in Collier County were protected in conservation areas (Figure 2) and managed by private, local, state and federal agencies (FNAI 2009). Collier County's Conservation Collier Program manages the 4.54-acre Panther Walk Preserve; it contains high quality cypress wetlands and is part of a larger slough system called the Horsepen Slough. Specific information on the plant communities found on the Panther Walk Preserve may be found in section 2.3 (Natural Plant Communities) of this document. An aerial view of the Panther Walk Preserve is displayed in Figure 3.

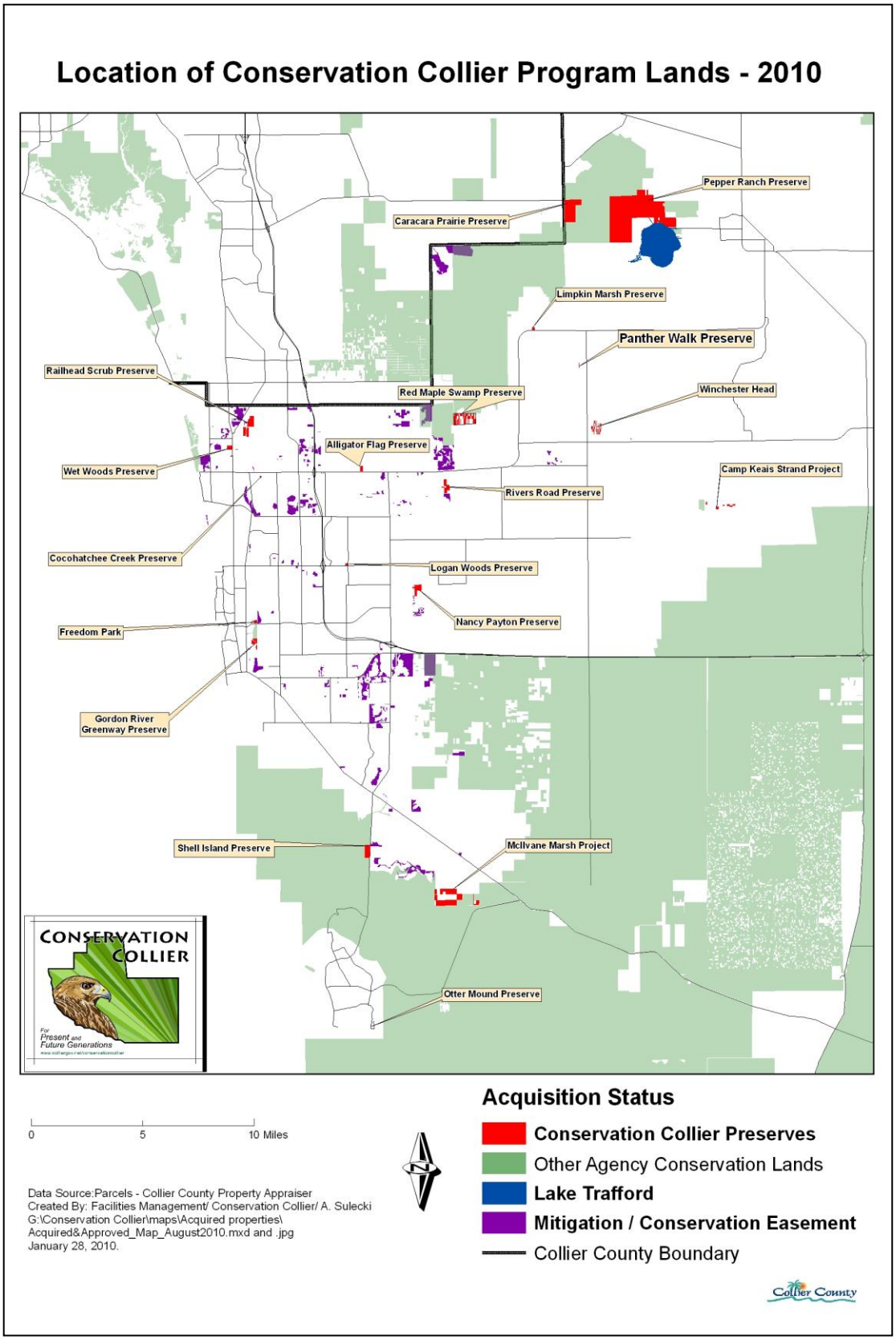

Figure 2: Conserved Lands in Collier County, Florida Including Lands Owned by Conservation Collier.

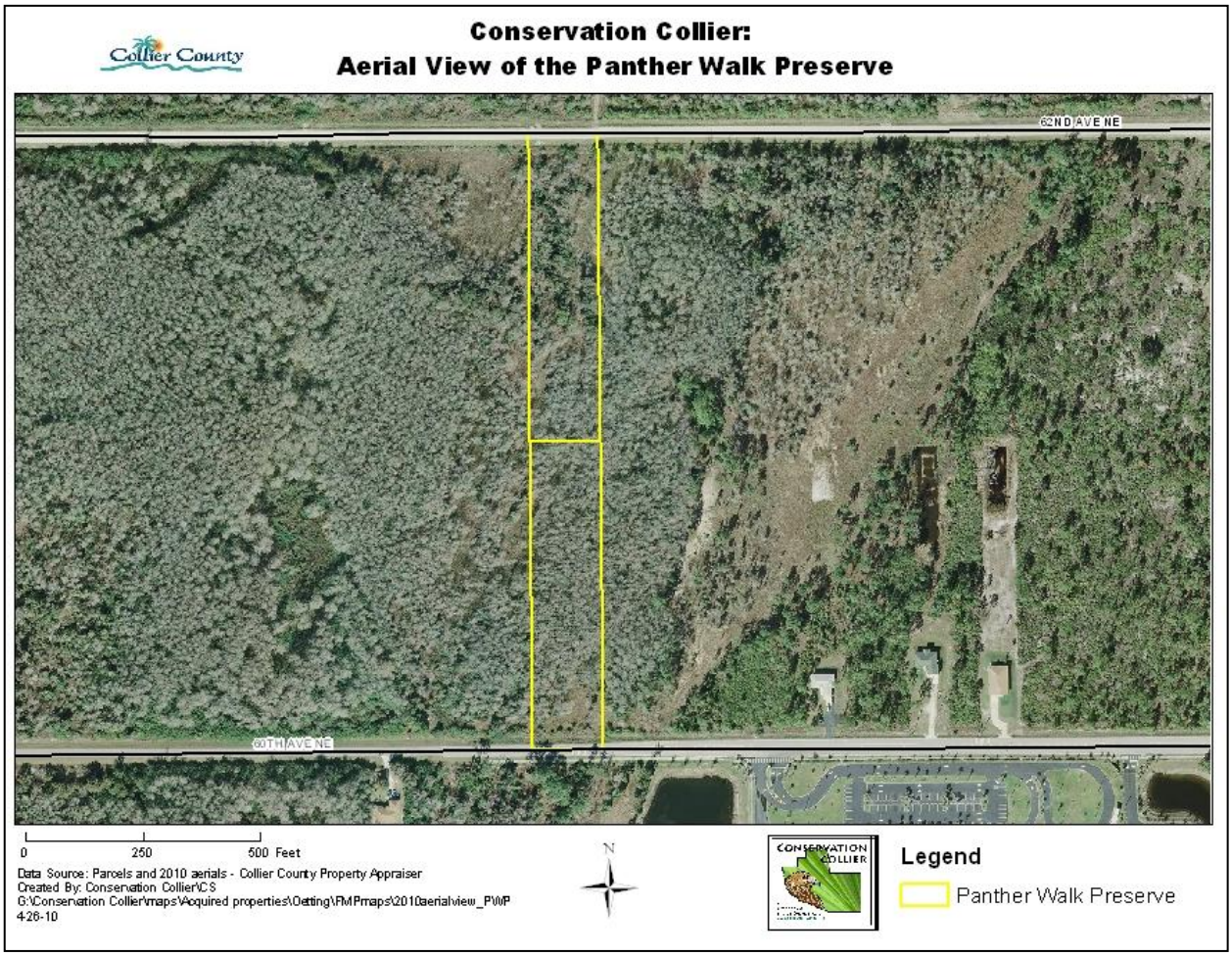

Figure 3: Aerial View of the Panther Walk Preserve Showing Delineation of Parcels

1.5 Nearby Public Lands and Designated Water Resources

Currently, the largest preserved, natural area in the vicinity of the Panther Walk Preserve is the Corkscrew Regional Ecosystem Watershed, which includes the Corkscrew Swamp Sanctuary. These lands encompass more than 42,000 acres in size and are located just over 3 miles to the west, northwest and just over 5 miles to the north of the Panther Walk Preserve. These areas are held in both public and private conservation status and include the headwaters for Collier County's drinking water supplies. Other preserves, in order of increasing distance, are provided in Table 2. Figure 4 shows the locations of these nearby preserves.

Table 2: Public Lands Located near the Panther Walk Preserve			
Name	**Approximate Distance (miles)**	**Direction**	**Type**
Winchester Head (Boundary)	**2.4**	**SE**	**Conservation Collier**
Limpkin Marsh Preserve	**2.6**	**NW**	**Conservation Collier**
Corkscrew Regional Ecosystem Watershed	**3.2**	**W**	**State**
Corkscrew Swamp Sanctuary	**3.3**	**NW**	**Private**
Unit 53 (Boundary)	**5.1**	**SW**	**Conservation Collier**
Corkscrew Regional Ecosystem Watershed	**5.3**	**N**	**State**
Pepper Ranch Preserve	**6.2**	**NE**	**Conservation Collier**
Caracara Prairie Preserve	**6.3**	**N**	**Conservation Collier**
Alligator Flag Preserve	**10.6**	**SW**	**Conservation Collier**

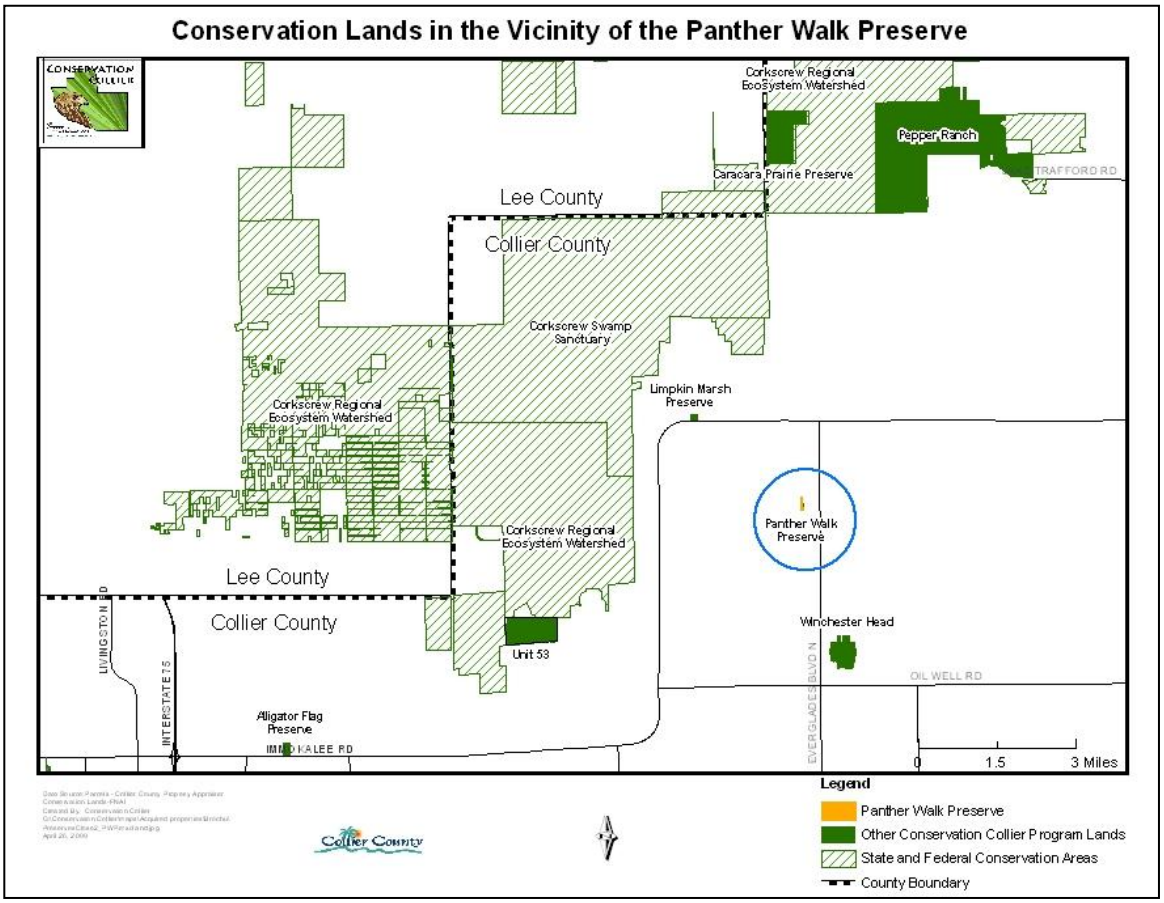

Figure 4: Preserves and Protected Lands in the Vicinity of Panther Walk Preserve

1.6 Public Involvement

Neighborhood involvement will be sought through direct mailing notices for public meetings to residents and other preserve managers within 2,000 feet of the preserve boundaries. Official public notices will be posted on the County website. A public meeting was held in September 2010 to give the public the opportunity to comment on this management plan.

2.0 Natural Resources

2.1 Physiography

Panther Walk 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. The Light Detection and Ranging (LIDAR) data layer provided by the U.S. Geological Survey, National Wetlands Research Center is a remote sensing system used to collect topographic data. This LIDAR layer has identified the Panther Walk Preserve to be at an elevation of 19 – 20 ft NAVD (North America Vertical Datum). The land then slopes south westward toward the Gulf of Mexico.

2.1.2 Soils

Mapped soils on this parcel were identified as Riviera Limestone Substratum, Copeland fine sands and Malabar fine Sands. Figure 5 is a digital representation of the County Soil Survey maps published by the United States Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) as the Soil Service Geographic (SSURGO) data set.

Riviera Limestone Substratum, Copeland fine sands underly approximately 85% of the Panther Walk Preserve. This nearly level, poorly drained hydric soil occupies the northern and central portion of the preserve and is commonly associated with sloughs and cypress swamps. Typical vegetation includes cypress (*Taxodium* spp.), red maple (*Acer rubrum)* ferns and other wetland plants. The observed vegetation corresponded with mapped soils.

Malabar fine sand underlies approximately 15% of the preserve along the southern border. Malabar fine sand is a nearly level, hydric soil associated with sloughs and poorly defined drainage ways. The typical vegetation for this soil type consists of pine (*Pinus elliotii*), cypress, cabbage palm (*Sabal palmetto*), saw palmetto (*Serenoa repens*), wax myrtle (*Myrica cerifera*) and native grasses. The observed vegetation did not correspond with mapped soils as there were no pine trees or wax myrtle present.

For both soil types under natural conditions, the seasonal high water table is within a depth of 12 inches for 3-6 months. During other months the depth is below 12 inches and recedes to a depth of more than 40 inches during extended dry periods. During periods of heavy rainfall soils are covered by shallow, slowly moving water for about 7 days (Liudahl et al. 1990).

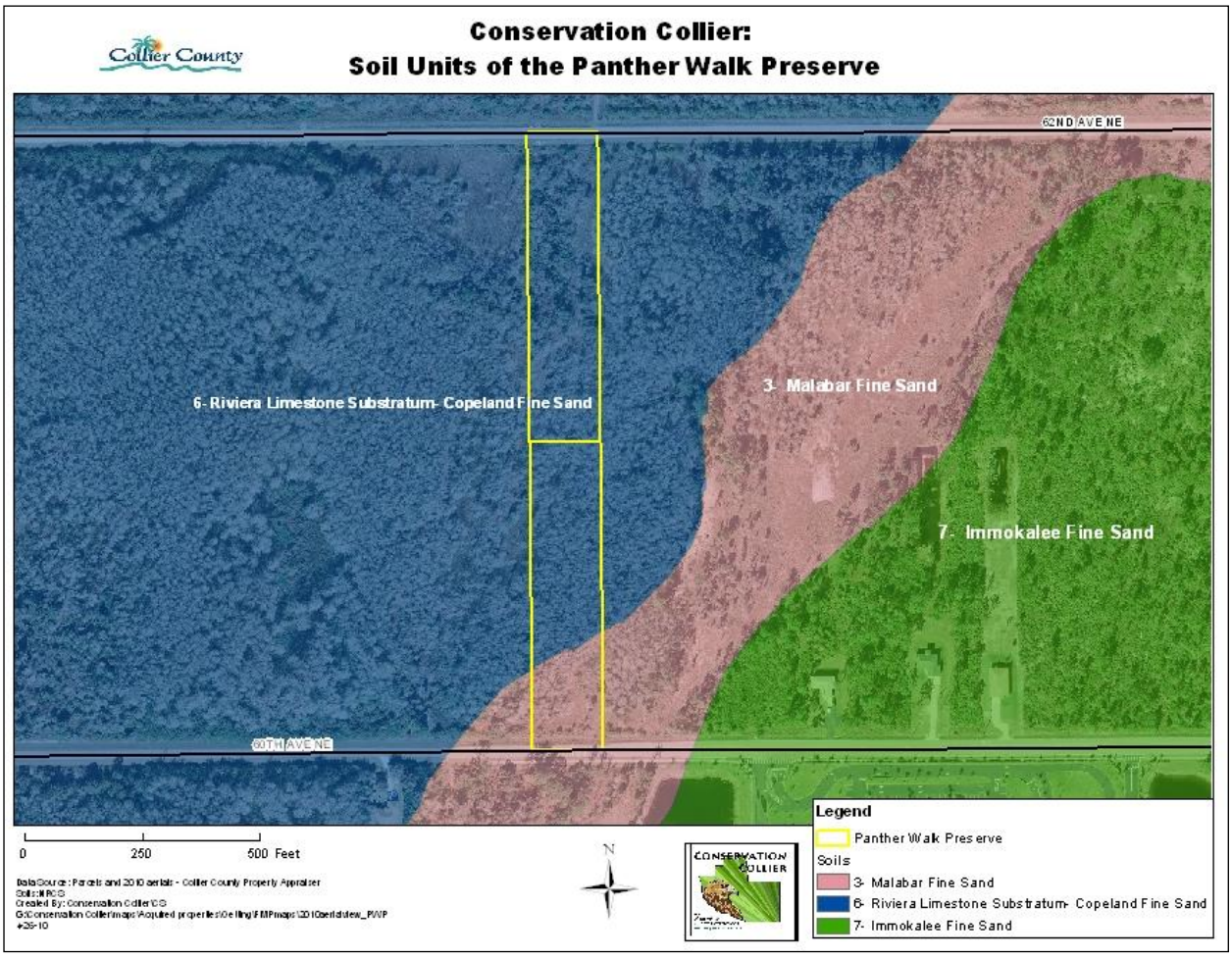

Figure 5: Soil Units on the Panther Walk Preserve and Surrounding Area

2.1.3 Hydrology/Water Management

The Panther Walk Preserve is located on the periphery of the Corkscrew Regional Ecosystem watershed, referred to in section 1.5, preserving these lands may provide for a minimal delay in runoff of storm water. The preserve may also provide marginal water storage for large storm events.

The preserve is on the eastern fringe of the Horsepen Strand Slough. Historic overland flow patterns in the area used to be from the northeast to southwest. However, the roadways, roadside swales and the SFWMD canals have altered this flow. When the water flows though the preserve it encounters the ditch along the north side of 60th Ave. N.E. The water is then forced to flow to the east or west depending on the elevation of the downstream receiving waters. It may flow south over the roadway when we get an above average rainy season, sheet flow begins and the stage of the surface water exceeds the elevation of 60th Ave NE.

A little over two-thirds of a mile to the west is the upper reach of the Golden Gate Main Canal. Flow in the roadside swale may be west to this canal, then south. There is some higher ground between the western edge of the strand and this canal so surface water elevation would have to rise high enough before flow would be pushed in this direction.

About one and one-third miles to the east is the Faka Union Canal. Flows intercepted by the roadside swale could move to the east and into this canal, then south if downstream stages will allow. Also, flow in the roadside swale would have to move west to east through pipes under Everglades Blvd. (Kurtz 2010).

The aquifer below ground is highly permeable 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 Floridan aquifer, which is contained within the underlying Oligocene age Suwannee Limestone (Lodge 2005).

Groundwater levels have gone down during the recent decades due to drainage on a regional scale and water management for development purposes. This trend may be very difficult to control and will gradually reduce the extent of the preserve that floods during the summer months and ultimately reduce the hydroperiod of the wetlands within the preserve.

The Surficial Aquifer is unconfined and is 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 the Surficial 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 recharge capacity for the Surficial Aquifer on the Panther Walk 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.

The Collier Soil & Water Conservation District is currently conducting a study with goals to restore the flow back in the natural direction within the extents of the slough. Many cross culverts under the east-west roads would be necessary and private property would have to either be purchased or protected in some way. Phase 2 of the study is planned to begin soon (Kurtz 2010)

2.2 Climate

The Panther Walk 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 Collier County is approximately 74º 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

The term "plant community" refers to the suite of floristic species that form the natural (i.e., native) 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 Florida Land Use, Land Cover Classification System (FLUCCS) created by the Southwest Florida Water Management District in 1995 classifies plant communities and provides digital Geographical Information System (GIS) layers for users to overlay on property boundaries and aerial images to determine the plant communities found there. The FLUCCS designates one plant community on the preserve: Cypress Swamp/Cypress Wetland (Figure 6).

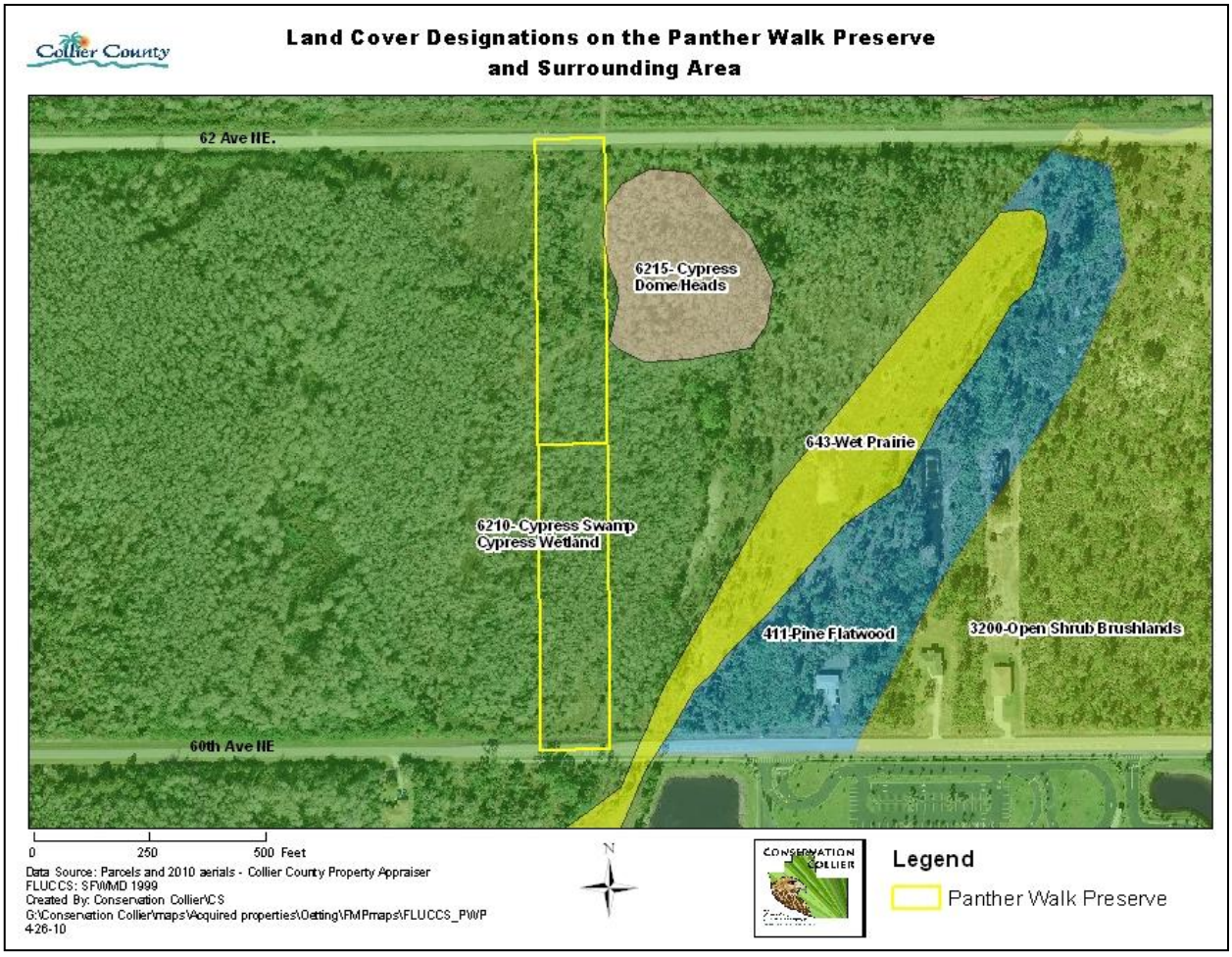

Figure 6: Extent of Plant Communities Currently Found on the Panther Walk Preserve.

The following subsection (2.3.1) provides information about the plant community observed on the preserve.

2.3.1 Strand Swamp/ Cypress Swamp / Cypress Wetland

The vegetation classification scheme of the Florida Natural Areas Inventory (FNAI) and the Florida Department of Natural Resources (1990) designates the plant community found within the preserve as a strand swamp. FNAI classifies strand swamps globally as G2 communities indicating that they are "imperiled globally because of rarity or because of some factor(s) making it very vulnerable to extinction throughout its range". Within Florida, FNAI ranks strand swamps as S2 communities defining them as "imperiled in state because of rarity; because of some factor(s) making it very vulnerable to extinction throughout it range". The FLUCCS structure classifies the plant community within the Panther Walk Preserve as a cypress swamp/cypress wetland and does not rank its status globally or within the state. Hereafter, this management plan will refer to the preserve as containing a cypress swamp/ cypress wetland.

Cypress Swamp Community within the Panther Walk Preserve. Photo taken by C. Segura

A cypress swamp / cypress wetland (FLUCCS CODE 6210) comprises 100% of the Panther Walk Preserve (Figure 6). Cypress swamps are considered freshwater, forested wetlands and are sometimes called strand swamps. They are a shallow, usually elongated depression or channel situated in a trough within a flat limestone plain, and dominated primarily by bald cypress (*Taxodium distichum*). Smaller strand swamps and shallow edges may instead contain pond cypress (*T. ascendens*). The variable woody understory contains a mixture of temperate and tropical elements, mainly red maple, pond apple (*Annona glabra*), swamp laurel oak (*Quercus laurifolia*), cabbage palm, strangler fig (*Ficus aurea*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), coastalplain willow (*Salix caroliniana*), wax myrtle, myrsine (*Rapanea punctata*), and common buttonbush (*Cephalanthus occidentalis*). Vines such as eastern poison ivy (*Toxicodendron radicans*) and white twinevine (*Sarcostemma clausum*) are common. The warm, humid climate in strand swamps make them ideal habitats for epiphytic orchids and bromeliads. While the greatest diversity of these epiphytes may be found within the deeper sloughs, several are common throughout the strand swamp. These include a variety of air-plants (*Tillandsia* spp.), particularly the common wild-pine (*Tillandsia fasciculata*), which are often abundant (FNAI 2010).

2.4 Native Plant and Animal Species

The 4.54-acre Panther Walk Preserve contains 100% Cypress Wetlands. This section discusses the flora and fauna found within this plant community. The next section (2.5) discusses all listed species in greater detail.

2.4.1 Plant Species

To date, 64 plant species have been recorded on the preserve (Appendix 1). Conservation Collier staff conducted floristic inventories in 2006, 2007 and June 2010. Another survey will be conducted in late fall 2010 and the final list will be added to this plan. Of these 64 plant species, 61 (96%) are native - of which, two are protected by the State of Florida (one is listed as endangered; one is listed as threatened).

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 Panther Walk 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 3 provides a comprehensive list of animals, both native and non-native, recorded on the Panther Walk Preserve thus far.

Table 3: Faunal Species Recorded on the Panther Walk Preserve

Common Name	Scientific Name
Zebra Longwing butterfly	*Heliconius charitonius*
Red imported fire ant [a]	*Solenopsis invicta*
apple snail	*Pomacea paludosa*
nine-banded armadillo	*Dasypus novemcinctus*
Brown anole [a]	*Anolis sagrei*
BIRDS	
Red-shouldered Hawk	*Buteo lineatus*
Mourning Dove	*Zenaida macroura*
Common Ground-Dove	*Columbina passerina*
Red-bellied Woodpecker	*Melanerpes carolinus*
Tree Swallow	*Tachycineta bicolor*
Gray catbird	*Dumetella carolinensis*
Turkey vulture	*Cathartes aura*
Blue-gray gnatcatcher	*Polioptila caerulea*
Yellow-rumped warbler	*Dendroica coronata*
Downy woodpecker	*Picoides pubescens*
Northern cardinal	*Cardinalis cardinalis*
Blue jay	*Cyanocitta cristata*
Northern mockingbird	*Mimus polyglottos*
[a]*Non-native species*	

Other wildlife species other than those recorded undoubtedly occur at the Panther Walk Preserve. During migration periods, transient bird species would be expected to utilize this area for short periods of time. The undeveloped character of the adjacent areas and the presence of conservation lands that are being maintained in their natural states may enhance use of the preserve by many mammal, reptile, and amphibian species.

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 Panther Walk 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.

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

Table 4: Listed Plant Species Detected at the Panther Walk Preserve

Common Name(s)	Scientific Name	State Status
Stiff-leaved wild-pine, Cardinal airplant	*Tillandsia fasciculata*	E
Reflexed wild-pine, Northern needleleaf	*Tillandsia balbisiana*	T

E: Endangered; **T:** Threatened

Both listed plant species found on the Panther Walk 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 two listed bromeliad species found on the Panther Walk Preserve are 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.

View of *T. fasciculata* at the Panther Walk Preserve.
Photo by C.Segura

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

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 Panther Walk Preserve is located identifies five (5) likely elements and seventeen (17) potential elements. None of these "likely" or "potential" elements reported by FNAI have been detected within the preserve to date. Appendix 2 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

No listed wildlife species have been observed onsite or immediately adjacent to the preserve. However**,** FNAI lists the following animal species as "likely" to occur (rare species likely to occur in the following matrices – 44265 and 44266 - based on suitable habitat and/or known occurrences in the vicinity): Florida sandhill crane (*Grus canadensis pratensis*), wood stork (*Mycteria americana*), Florida panther (*Puma concolor coryi*) and mangrove fox squirrel (*Scurius niger avicennia*) (Appendix 2).

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, three (3) non-indigenous plant species have been detected within Panther Walk Preserve (Table 5), accounting for 4% of the plant species recorded there. Of the three exotic species, all are listed by FLEPPC (Two 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 5: Invasive Plant Species within the Panther Walk Preserve		
Scientific Name	**Common Name(s)**	**FLEPPC[a]**
Schinus terebinthifolius	Brazilian pepper	I
Solanum viarum	Tropical soda apple	I
Urena lobata	Caesar's weed	II

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

I: *Invasive, exotics that are altering native plant communities by displacing native species, changing community 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.*

As of the acquisition of the first portion of Panther Walk Preserve by the Conservation Collier program on June 11, 2007 the most problematic exotic, invasive plant species were and continue to be Brazilian pepper (*Schinus terebinthifolius*) and Ceasar's weed (*Urena lobata*). The control/ removal of invasive, exotic species are discussed in detail in section 4 of this document.

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 ant (*Solenopsis invicta*), and brown anole (*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 affect the Panther Walk 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 Panther Walk Preserve

Solenopsis invicta, an invasive, non-indigenous arthropod documented within the Panther Walk 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 Panther Walk 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 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 Panther Walk 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 may 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 Panther Walk Preserve

Anolis sagrei, an invasive, exotic reptile documented in the Panther Walk 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). 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).

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.

Feral pig *(Sus scrofa):* documented within the Panther Walk Preserve

Hogs were first brought to Florida in the mid 1500's to provision settlements of early explorers. Their high rate of reproduction and their ability to adapt to Florida's natural areas has led them to populate every county in the state. Today, Florida is second only to Texas in its feral hog population (Giuliano & Tanner 2005*a*; 2005*b*). While feral pigs are able to survive in a variety of habitats, they prefer large forested areas interspersed with marshes, hammocks, ponds, and drainages; cover in the form of dense brush; and limited human disturbance (Giuliano & Tanner 2005*b*). Dense cover is used as bedding areas and provides protection from predators and hunters. Feral pigs are omnivorous, opportunistic feeders consuming grasses, forbs, and woody plant stems, roots, tubers, leaves, seeds, fruits, fungi, and a variety of animals including worms, insects, crustaceans, mollusks, fish, small birds, mammals, reptiles, amphibians, and carrion. Their propensity for digging for foods below the surface of the ground (rooting) destabilizes the soil surface, resulting in erosion and exotic plant establishment. Additionally, this behavior uproots or weakens native vegetation (Giuliano & Tanner 2005*a*; 2005*b*). Due to the natural communities that are found within the preserve, this species has the potential to thrive within the boundaries. As these animals are highly visible outside of natural plant communities, adjoining residents of the preserve may be useful in the early detection of this nuisance animal.

Cuban tree frog (*Osteopilus septentrionalis*): undocumented within the Panther Walk Preserve

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

Like the Cuban anole, the Cuban tree frog is native to Cuba, the Bahamas, and neighboring islands. 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 (Johnson 2007). Due to the natural communities that are found within the Panther Walk 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 Panther Walk Preserve. 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. 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). 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). Due to the natural communities that are found within the Panther Walk Preserve and its proximity to residential areas, this species has the potential of occurring within the preserve. Nearby 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 Panther Walk 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. 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 Panther Walk Preserve, there exists a high probability of their future presence on the preserve due to the proximity of Panther Walk 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 Conditions of the Preserve; Current Use of the Preserve and Adjacent Land Uses

3.1 Previous Conditions of the Preserve

Aerial photographs taken in 1973 (Figure 7) and researching aerial photos of later years show that development has likely never occurred on the site. Digital images were downloaded from the Florida Department of Transportation's Aerial Photo Look Up System (2010) and geo-referenced in ArcMap 9.3 by Conservation Collier Staff. The aerial image from 1973 shows that the land that the preserve exists on now has virtually remained the same for the last 37 years.

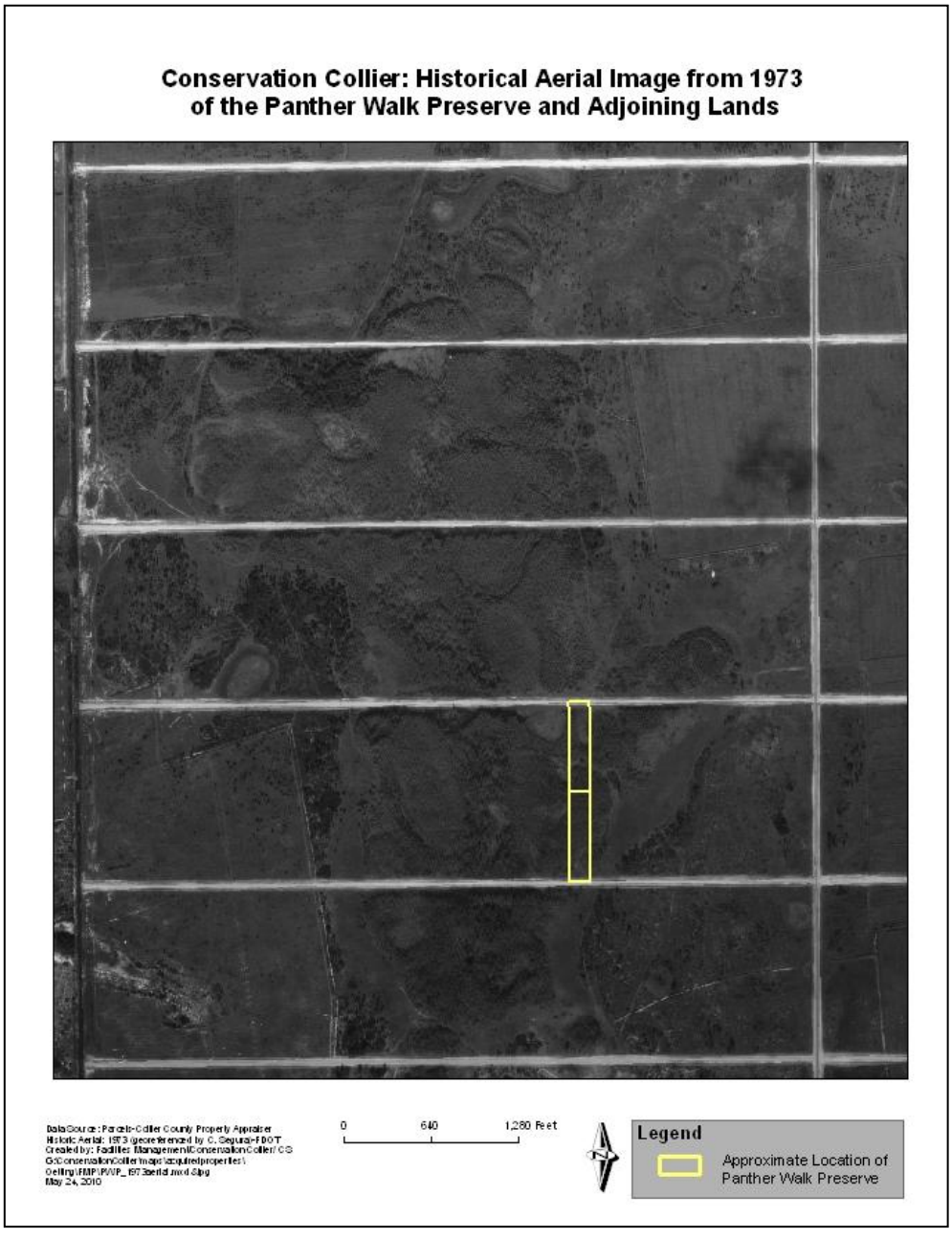

Figure 7: Historical Aerial Photograph from 1973 of the Panther Walk Preserve

3.2 Current Use of the Preserve and Adjacent Land Uses

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. Once the preserve trail is created, the public will be able to hike through the preserve.

The Panther Walk Preserve is bordered on the north by 62nd Ave. NE and to the south by 60th Ave NE. Estates Elementary School is located to the southeast across 60th Ave. NE. Vacant undeveloped parcels border the preserve on the east and west. The property is in Unit 42 and is zoned Estates single family residential. The previous owner had development permits denied for this property in 2005 by the State of Florida due to presence of "wetlands of high quality and function" which were part of a "unique cypress system". Further to the west are 4 sections of agriculturally zoned lands with a conditional use permit for earth mining (Figure 8).

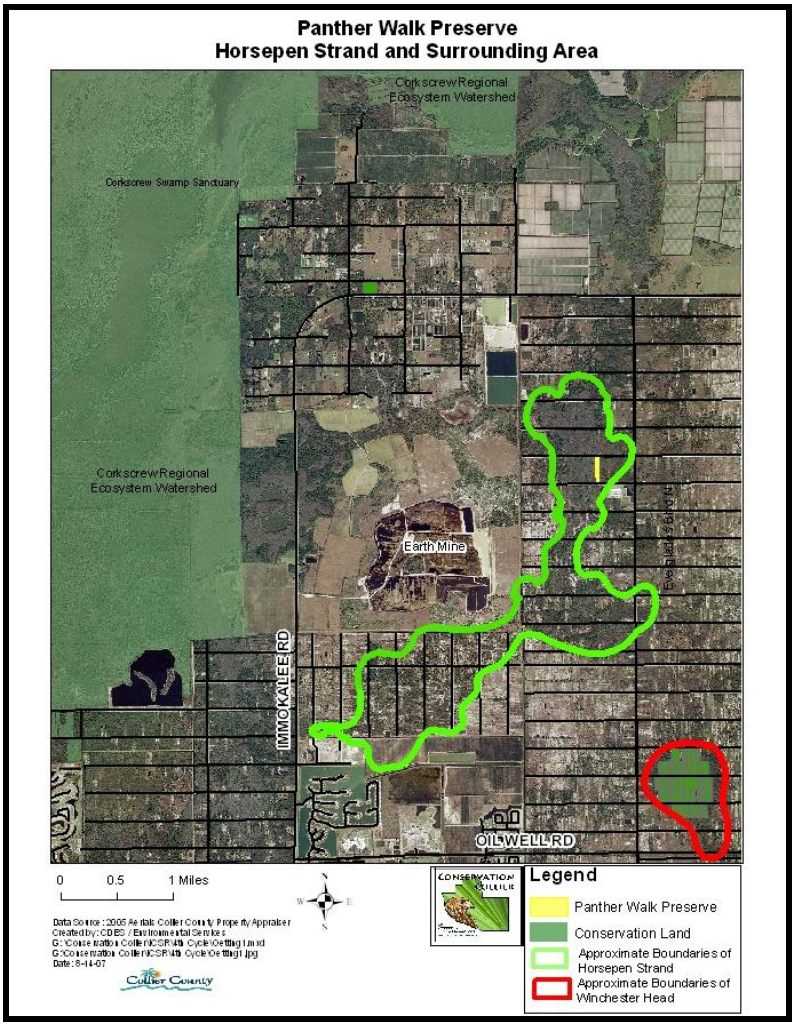

Figure 8: Horsepen Strand Slough and Areas Adjacent to the Panther Walk Preserve

3.3 Cultural, Historical and Archeological Resource Protection

The Panther Walk 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 Management Activities during Previous Years

Since the acquisition of the first portion of the Panther Walk Preserve in July 2007, staff has accomplished a number of management activities aimed at creating baseline data for the preserve and identifying areas of invasive plant infestations (Table 6). Staff conducted floristic inventories and established photo-monitoring points to better aid in the long-term management of the preserve.

Table 6: Management Activities Since the Acquisition of the Panther Walk Preserve

Accomplishment	Year(s)
Conducted floristic inventories	2006, 2007, 2010
Established photo monitoring points	2010
Exotic Plant Removal and Treatment	2008, 2010

4.0 Future Use of the Panther Walk Preserve including Management Issues, Goals and Objectives

This section describes the main management issues, goals, and objectives for the Panther Walk 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 southern portion of the Panther Walk Preserve was 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 the two southern parcels was officially approved in 2007 and the interim management plan

for the northern parcel was completed in 2008. The ordinance then requires a "Final" ten-year management plan be developed within two years. Subsequently, the property management plan must then 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 Conservation Collier Land Acquisition Advisory Committee and the Collier County BCC.

4.1.1 Preserve Manager: Contact Information

The site manager for Panther Walk 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 will 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 Panther Walk 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.

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

In addition, there are no existing easements, concessions, or leases on the Panther Walk 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, Panther Walk Preserve will consist of invasive, exotic free cypress wetland. With the exception of a seasonal hiking trail, the site will be vegetated with appropriate native flora that will provide suitable cover for a variety of wildlife species.

Increasing the acreage of the preserve will greatly enhance the quality of the preserve. Efforts will continue to expand the size of the preserve to the east and west. While acquisitions funds are available, letters will be sent to the adjacent landowners on a yearly basis to inform them of Conservation Collier's interest in the purchase of their property.

4.4 Goals for the 10 year period 2010-2020

A set of goals and objectives for Panther Walk Preserve were developed in conjunction with the drafting of this Management Plan. The goals and objectives in this plan are tailored specifically for Panther Walk 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 Panther Walk 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 staffing and funding sources. The following goals have been identified for Panther Walk 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: Restore native vegetation

Goal 5: Develop a plan for public use

Goal 6: Facilitate uses of the site for educational purposes

Goal 7: 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 signs encouraging people to stay on public access trails situated within the preserve.

The entrance sign along 60th Ave NE already requests that visitors stay on designated trails. Another will installed along 62nd Ave NE if needed.

Action Item 1.2 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 1.3 Enforce regulations prohibiting trash in or near the preserve.

Staff will monitor the preserve on a regular basis and if excessive dumping occurs, enforcement actions will be sought through the County Sheriff's Department.

Action Item 1.4 Identify actual and potential locations of resident animal life and take steps such as locating visitor amenities away from animal nesting sites.

Action Item 1.5 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 treatment 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 will be monitored closely to ensure the proper herbicide applications are being utilized while treating the site. In addition, close attention will be taken to identify listed species (Table 5) that may be attached to invasive trees being cut down or removed. Individuals 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.

Action Item 1.6 Note, research and provide input as to all site development occurring adjacent to Panther Walk 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 Panther Walk 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.

Action Item 1.7 Create and adopt an enforceable ordinance that will prohibit hunting and other undesirable public uses that are not appropriate on the Panther Walk Preserve and other Conservation Collier Preserves.

Conservation Collier Staff will work with the County Attorney's office to either create a new preserve use ordinance for Conservation Collier Preserves or amend a current ordinance with appropriate language. This will also include a mechanism to enforce the regulations listed within the ordinance.

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 Panther Walk 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 surveys, like plant surveys, should take place at regular intervals (ca. 5-10 years) to detect long-term trends.

Currently, three (3) photo points have been established throughout the preserve (Figure 9). 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. Photos at each location will be taken every 6-12 months.

Figure 9: Photo Point Locations within the Panther Walk 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 7) describes recommended controls (Langeland & Stocker 2001) of the Category I and II invasive, exotic plant species recorded to date on the Panther Walk 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 7: Invasive, Exotic Plant Species Control Plan for the Panther Walk Preserve FLEPPC Category I species [a]		
Scientific Name	**Common Name(s)**	**Recommended Control(s)[b]**
Schinus terebinthifolius	Brazilian pepper	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.
Solanum viarum	Tropical soda apple	Foliar application of 1% Garlon 4 or 3% Roundup.
Urena lobata	Ceasar's weed	Hand pull seedlings, Foliar treatment with 2-5% Glyphosate in water can be sprayed on young plants. Its best to treat in the spring or summer prior to seed maturation.

[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 (FLEPPC 2007)

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 Panther Walk Preserve, the RIFA, and the brown anole. The total eradication of these species cannot be achieved. However, staff and/or contractors should take measures to treat RIFA populations close to or on public access trails.

Additionally, 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.

GOAL 4: *RESTORE NATIVE VEGETATION*

Action Item 4.1 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

GOAL 5: *DEVELOP A PLAN FOR PUBLIC USE*

Action Item 5.1 Develop access and required facilities for intended public uses

Depending on funding, safety issues, site security and the availability of staff, planned public use of the Panther Walk Preserve is as follows:

The seasonal hiking trail measures approximately 1,340 feet in length and will be at maximum 3 feet wide. The trail will be maintained with a weed-cutter. The route of the trail represented in Figure 10 was approximated from a 2010 aerial image. The entrance to the trail will be approximately 1,720 feet west of the intersection of Everglades Blvd. and both 60th Ave. and 62nd Ave. The trail will then meander through the center of the preserve in a north/south direction between 60th Ave to 62nd Ave NE. A permanent sign exists at the trailhead along 60th Ave. NE (See photo below). A brown and white Conservation Collier Land Sign exists at the trail entrance along 62nd Ave. NE. Once the trail is constructed, a bench will be placed in the center of the preserve along the trail. Small plant signs will also be placed along the trail to educate visitors about the species present on the preserve.

Panther Walk Preserve Trailhead Sign along 60 Ave NE.
Photo taken by C. Segura

The hiking trail will likely be submerged during the rainy, summer months and as such, the Panther Walk Preserve will be designated as a "Seasonal-Use" Preserve. The permanent sign states that the trail is seasonal and the bench and the small plant signs will be removed for the months of the year the preserve is underwater. The cost to install a raised boardwalk at this preserve is prohibitive. Staff will continue to monitor the amount of visitation the preserve receives over the next few years to determine if staff should seek grant money to help fund a raised trail.

GOAL 6: *FACILITATE USES OF THE SITE FOR EDUCATIONAL PURPOSES*

Actions Item 6.1 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. Small plant identification signs will be placed along the trail. These signs will be removed during the months that the preserve is underwater.

GOAL 7*: PROVIDE A PLAN FOR SECURITY AND DISASTER PREPAREDNESS*

Action Item 7.1 Discourage any visitation to the park at night.

The main trail head sign at the entrance to the preserve along 60nd Ave. N. E. states that the preserve is open from sunrise to sunset 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 7.2 Enforce regulations prohibiting trash and landscape debris dumping in or near the preserve.

Currently, illegal dumping is not occurring on or near the preserve. Monthly property inspections will be conducted to monitor for such activity. Staff will work with the Collier County Sheriff's Office if problems start to arise.

Action Item 7.3 Survey trees along the trail and the perimeter of the property for damage

Staff will routinely monitor the trees along the hiking trail to determine if diseased, weak, or damaged trees/limbs exist and of so remove them to reduce the risk of visitor injury.

Action Item 7.4 Visit preserve within 48 hours after a major 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 7.5 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. The preserve will be closed temporarily until the potential hazards are eliminated.

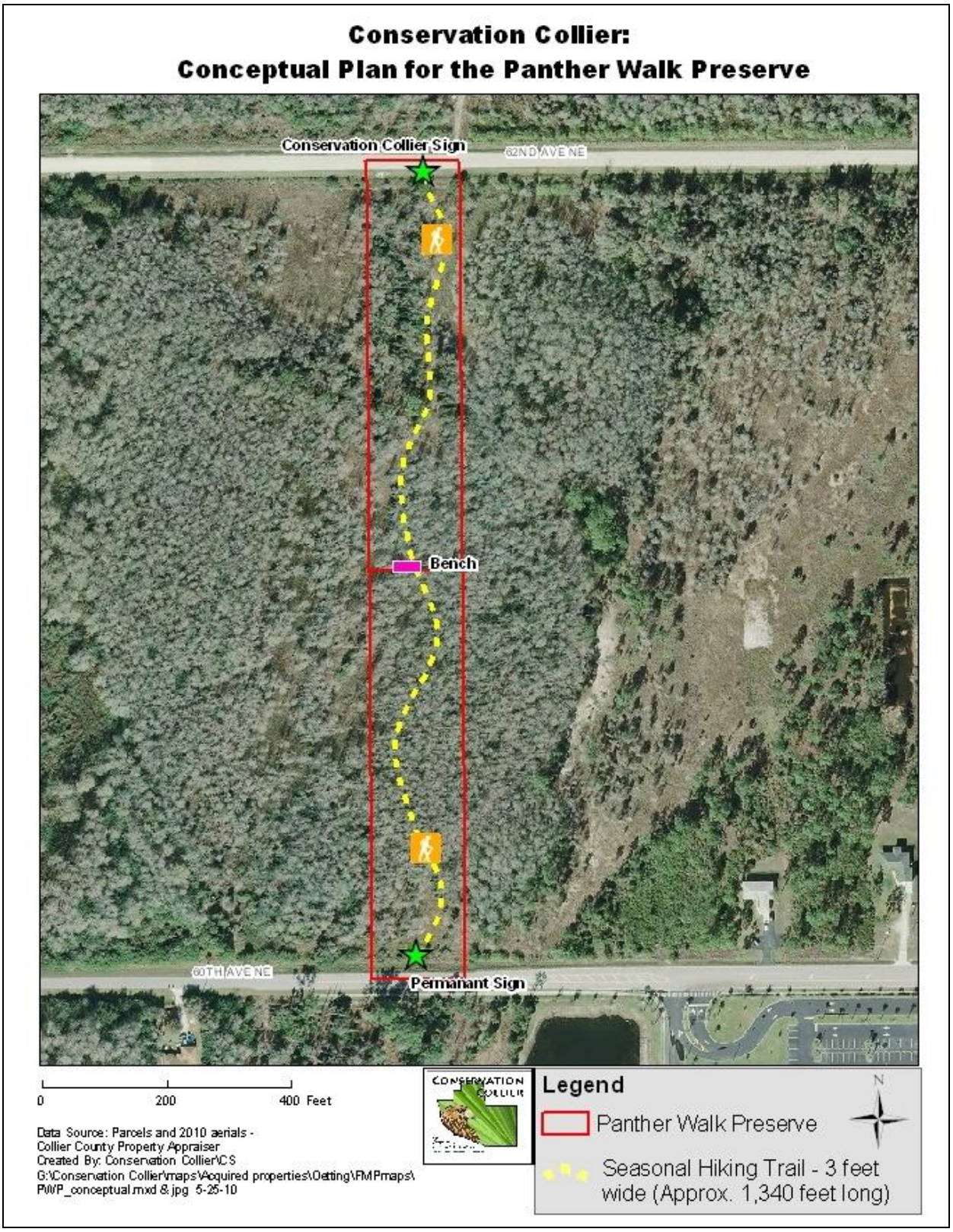

Figure 10: Panther Walk Preserve Conceptual Master Plan

4.5 Establish an Operational Plan for the Panther Walk Preserve

This section provides management recommendations for operation of the Panther Walk 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 as needed. Particularly important are the security measures to keep intruders out and the signage in good condition. 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 Panther Walk 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.

The budget in Table 8 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 Panther Walk Preserve.

Table 8: Estimated, Annual Land Management Budget

Table 9: Estimated Annual Land Management Budget (Amounts in $; see assumptions for cost estimates on next page)													
Item	**QTY**	**Cost ($)**	**2009-10**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2017-18**	**Total**
Facilities Development													
Trail Maintenance (1)	1,340 linear feet		$150	$150	$150	$150	$150	$150	$150	$150	$150	$150	**$1,500**
Interpretive signs (2)	1	$500		$500									**$500**
Plant signs (3)	15	$10		$150									**$150**
Entry signage (4)	1	$750	$750										**$750**
Bench (5)	1	$200		$200									**$200**
Restoration/Monitoring													
Establish photo points (6)	recurring	n/a											
Remove exotics (7)	10	$750	$750	$750	$750	$750	$750	$750	$750	$750	$750	$750	**$7,500**
Regular Maintenance													
Maintenance (8)	8	$100		$100	$100	$100	$100	$100	$100	$100	$100	$100	**$900**
Grand Total			**$1,650**	**$1,850**	**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$1,000**	**$11,500**

Assumptions for Cost Estimates:

1. **Trail maintenance:** Seasonal Trail 1,340 linear feet – will be trimmed two times a year
2. **Interpretive sign-** one removable sign may be created talking about Cypress Wetlands for educational purposes
3. **Plant signs-**small signs identifying native plants 15 @ $10 each
4. **Entry signage-**sign at trailhead already installed $750
5. **Bench:** small bench-$200 – will be removed during wet season
6. **Photo monitoring-** in house
7. **Removal of Exotics:** $750 contract for removal from outer perimeter and kill in place in interior 1x a year
8. **General Facilities** Maintenance-approx. $100 per year- this includes site inspection, sign and trail maintenance and litter pick-up in house

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Appendix 1. Preliminary Floristic Inventory of the Panther Walk Preserve.

Panther Walk Preserve: Preliminary Plant List			
Scientific Name	**Common Name(s)**	**State[b]**	**FLEPPC[c]**
Acer rubrum	red maple		
Ambrosia artemisiifolia	common ragweed		
Ampelopsis arborea	peppervine		
Aster carolinianus	climbing aster		
Baccahris hamilifolia	saltbush		
Bacopa sp.	waterhyssop		
Blechnum serrulatum	swamp fern, toothed midsorus fern		
Boehmeria cylindrica	false nettle		
Cardamine pensylvanica	bitter cress		
Cephalanthus occidentalis	common buttonbush		
Circium spp.	thistle		
Cladium jamaicense	sawgrass, Jamaica swamp sawgrass		
Coreopsis spp.	tickseed, coreopisis		
Cyperus ssp	flat sedge		
Dichromena colorata	white-top sedge		
Dichromena latifolia	giant white-top sedge		
Diodia virginiana	Virginia buttonweed		
Dryopteris ludoviciana	southern wood fern; southern shield fern		
Erigeron sp.	fleabane		
Eriocaulon decangulare	hatpins		
Eryngium yuccifolium	button rattlesnakemaster; button eryngo		
Eupatorium cappillifolium	dog fennel		
Eustachys petraea	stiffleaf finger grass		
Ficus aurea	strangler fig		
Hydrocotyle spp.	water pennywort		
Hypericum sp.	St. John's-wort		
Hyptis alata	clustered bushmint; musky mint		
Ilex cassine	dahoon holly, dahoon		
Ipomea indica	morning glory		
Ilex glabra	inkberry; gallberry		
Lachnanthes caroliniana	Carolina redroot		
Mikania scandens	climbing hempvine		
Myrica cerifera	wax myrtle, southern bayberry		
Myrsine floridana	myrsine		
Pannicum hemitomon	maidencane		
Pinus elliottii	slash pine		
Pluchea baccharis	rosy camphorweed		
Phlebodium aureum	golden polypody fern		
Physalis walteri	ground cherry		
Proserpinaca spp.	mermaid-weed		
Quercus laurifolia	laurel oak; diamond oak		

(Continued on next page)

Appendix 1 (continued). Preliminary Floristic Inventory of the Panther Walk Preserve.

Quercus elliottii	running oak		
Rapanea punctata	myrsine, colicwood		
Rhexia mariana	pale meadow beauty		
Rhynchospora sp.	beakrush		
Sabal palmetto	cabbage palm; sabal palm		
Salix caroliniana	coastal plain willow		
Sarcostemma clausum	white twinevine		
Schinus terebinthifolius[a]	Brazilian pepper		I
Serenao repens	palmetto		
Smilax auriculata	earleaf greenbrier		
Solanum viarum[a]	tropical soda apple		I
Taxodium distichum	Cypress		
Thalia geniculata	alligator flag		
Tillandsia balbisiana	reflexed wild-pine, northern needleleaf	T	
Tillandsia fasciculata	stiff-leaved wild-pine, cardinal airplant	E	
Tillandsia recurvata	ball moss		
Tillandsia setacea	southern needleleaf		
Tillandsia usneoides	Spanish-moss		
Toxicodendron radicans	eastern poison-ivy		
Urena lobata[a]	caesarweed		II
Usnea sp.	beard lichen		
Woodwardia virginica	chainfern		
Vitis rotundifolia	muscadine, muscadine grape		

list revised February 2009

[a]*Non-native species that may or may not have FLEPPC designations*

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

[c]*Florida Exotic Pest Plant Council (FLEPPC) 2009 designations*

I: *Invasive, exotics that are altering native plant communities by displacing native species, changing community 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 2. Florida Natural Areas Inventory Report for the Panther Walk Preserve

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Tallahassee, FL 32303
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www.fnai.org

FLORIDA Natural Areas INVENTORY

Florida Natural Areas Inventory

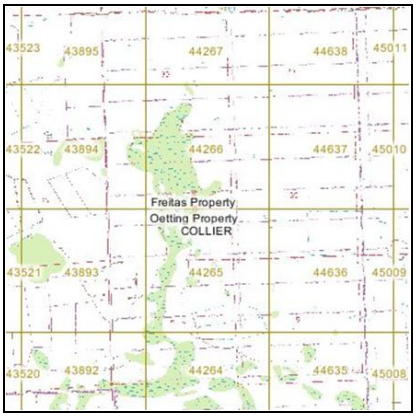
Biodiversity Matrix Query Results

UNOFFICIAL REPORT

Created 2/12/2009

(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.



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: 44265

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

5 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	LT
Mesic flatwoods	G4	S4	N	N
Mycteria americana Wood Stork	G4	S2	LE	LE
Puma concolor coryi Florida Panther	G5T1	S1	LE	LE
Sciurus niger avicennia Mangrove Fox Squirrel	G5T2	S2	N	LT

(Continued on next page)

Matrix Unit ID: 44266
0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

4 **Likely** Elements Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Grus canadensis pratensis Florida Sandhill Crane	G5T2T3	S2S3	N	LT
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 IDs: 44265 , 44266
17 **Potential** Elements Common to Any of the 2 Matrix Units

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
Calopogon multiflorus Many-flowered Grass-pink	G2G3	S2S3	N	LE
Drymarchon couperi Eastern Indigo Snake	G3	S3	LT	LT
Elytraria caroliniensis var. angustifolia Narrow-leaved Carolina Scalystem	G4T2	S2	N	N
Gopherus polyphemus Gopher Tortoise	G3	S3	N	LT
Gymnopogon chapmanianus Chapman's Skeletongrass	G3	S3	N	N
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
Nolina atopocarpa Florida Beargrass	G3	S3	N	LT
Picoides borealis Red-cockaded Woodpecker	G3	S2	LE	LS
Pteroglossaspis ecristata Giant Orchid	G2G3	S2	N	LT
Rostrhamus sociabilis plumbeus Snail Kite	G4G5T3Q	S2	LE	LE
Sciurus niger avicennia Mangrove Fox Squirrel	G5T2	S2	N	LT
Ursus americanus floridanus Florida Black Bear	G5T2	S2	N	LT*

(Continued on next page)

Disclaimer

The data maintained by the Florida Natural Areas Inventory represent the single most comprehensive source of information available on the locations of rare species and other significant ecological resources statewide. However, the data are not always based on comprehensive or site-specific field surveys. Therefore, this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. FNAI shall not be held liable for the accuracy and completeness of these data, or opinions or conclusions drawn from these data. FNAI is not inviting reliance on these data. Inventory data are designed for the purposes of conservation planning and scientific research and are not intended for use as the primary criteria for regulatory decisions.

Unofficial Report

These results are considered unofficial. FNAI offers a Standard Data Request option for those needing certifiable data.