Logan Woods Preserve

1st DRAFT

Land Management Plan

Managed by:

Conservation Collier Program

Collier County

February 2008 –February 2018 (10 yr plan)

Prepared by:

Collier County Facilities Management Department

February 2008

Logan Woods Preserve
Land Management Plan Executive Summary

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

Property included in this Plan: "Logan Woods Preserve"

Preserve consists of 2 adjoining parcels in Section 16; Township 49; Range 26.

Folio Number	Brief Legal Description*
38391080002	GOLDEN GATE EST UNIT 34 S 150FT OF TR 16 OR 1389 PG 1728
38391000008	GOLDEN GATE EST UNIT 34 TR 15

*** Full legal description provided in Appendix 1**

Acreage Breakdown: Does not include the County's Transportation Department ROW Easement

General Vegetative Communities	Acreage
Wetlands	1.5
Uplands	4.4
TOTAL	**5.9**

Management Responsibilities:

Agency: Collier County - Conservation Collier Program

Designated Land Use: Conservation and natural resource-based recreation

Unique Features: Green space in an urbanized area

Management Goals:

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

Goal 2: Develop a baseline monitoring program

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 and

Goal 7: Provide a plan for security and disaster preparedness

Public Involvement: Public meeting(s) to be held in the spring of 2008 with residents and businesses from surrounding lands including the Logan Woods Home Owners Association.

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1.0 Introduction

The Logan Woods Preserve is a natural area within the urban boundary of Collier County, Florida. The property is made up of two parcels which total 7.49 acres in size, out of which the County Transportation Department has partnered with Conservation Collier to buy road easements in the amount of 1.80 acres, leaving a total of 5.69 acres for conservation. Extensive exotic removal was completed on the property in 2007 and the remaining vegetative community consists of Pine, Cypress and Cabbage palm.

A site assessment to determine compliance with Conservation Collier's initial screening criteria was conducted in August 21, 2003 and the Conservation Collier Program purchased the property on October 14, 2005. Previously known as the "McIntosh Trust" property, for the previous owners, it was renamed Logan Woods Preserve in November 2006. The County holds fee simple title to the Logan Woods Preserve. The Conservation Collier program manages these lands under authority granted by the Conservation Collier Ordinance 2002-63 as amended (available from www.municode.com). Initial acquisition activities are summarized in Table 1.

Table 1: Acquisition History and Status of Logan Woods Preserve

Year	Benchmark
2000	Environmental Assessment Report done by Southern Biomes, Inc. (for prior owners)
2003	Property nominated to the Program Initial Site Assessment by Conservation Collier Staff
2003	Approval of Initial Criteria Screening Report by the Conservation Collier Land Acquisition Advisory Committee (CCLAAC)
2003	Property Ranked by CCLAAC and BCC as a B list property- purchase on hold for one year
2004	Property re-evaluated and re-ranked
2005	Property moved to A-list by BCC
2005	Phase I Environmental Assessment Conducted by ASCgeosciences for Collier County
2005	Approved for purchase by the Board of County Commissioners (BCC)
2005	Developed Interim Management Plan
2006	BCC approved the Interim Management Plan
2006	McIntosh Trust property renamed ***Logan Woods Preserve***
2007	Conducted Initial exotic plant treatment and removal- (grant funded)
2008	Completed Final Management Plan

According to the Southern Biomes Report dated April 14, 2000, the preserve consists of 1.5 acres of wetland habitats and approximately 4.4 acres of upland habitat. To keep the acreage mentioned in this plan consistent, the total preserve acreage will be referred to at 5.69 acres for the remainder of this plan. Conservation, restoration and natural resource-based recreation as defined by Sec. 54-275 (Ord. No. 02-63, § 5, 12-3-02) are the designated uses of this property. 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 Logan Woods Preserve and it 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 environmentally sensitive conservation lands within Collier County, Florida. Properties must support at least two of the following criteria to qualify for further consideration: rare habitat, aquifer recharge, flood control, water quality protection, and listed species habitat. The Collier County Board of County Commissioners (BCC) appointed a Conservation Collier Land Acquisition Advisory Committee (CCLAAC) 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.

After a property is acquired, The Lands Evaluation and Management Subcommittee review management plans produced by staff before the entire CCLAAC is able to review the plan. After approval by the CCLAAC, the management plan goes before the BCC for final approval.

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 Board of County Commissioners of Collier County established the Conservation Collier program to implement the program and to manage acquired lands. As such, Conservation Collier holds management authority for the Logan Woods Preserve.

1.2 Purpose and Scope of Plan

The purpose of the plan is to provide management direction for Logan Woods 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 preserve and/or restore 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 Logan Woods Preserve

Logan Woods Preserve is located within the urban boundary of Collier County and consists of two (2) parcels located at the NW corner of the intersection of Pine Ridge Road and Logan Blvd. in Section 16 Township 49 Range 26, in Collier County, Florida. The total acreage of these undeveloped parcels is 7.49 acres, out of which the County Transportation Department has partnered with Conservation Collier to buy road easements in the amount of 1.80 acres, leaving a total of 5.69 acres for conservation (Figure 1; legal description in Appendix 1).

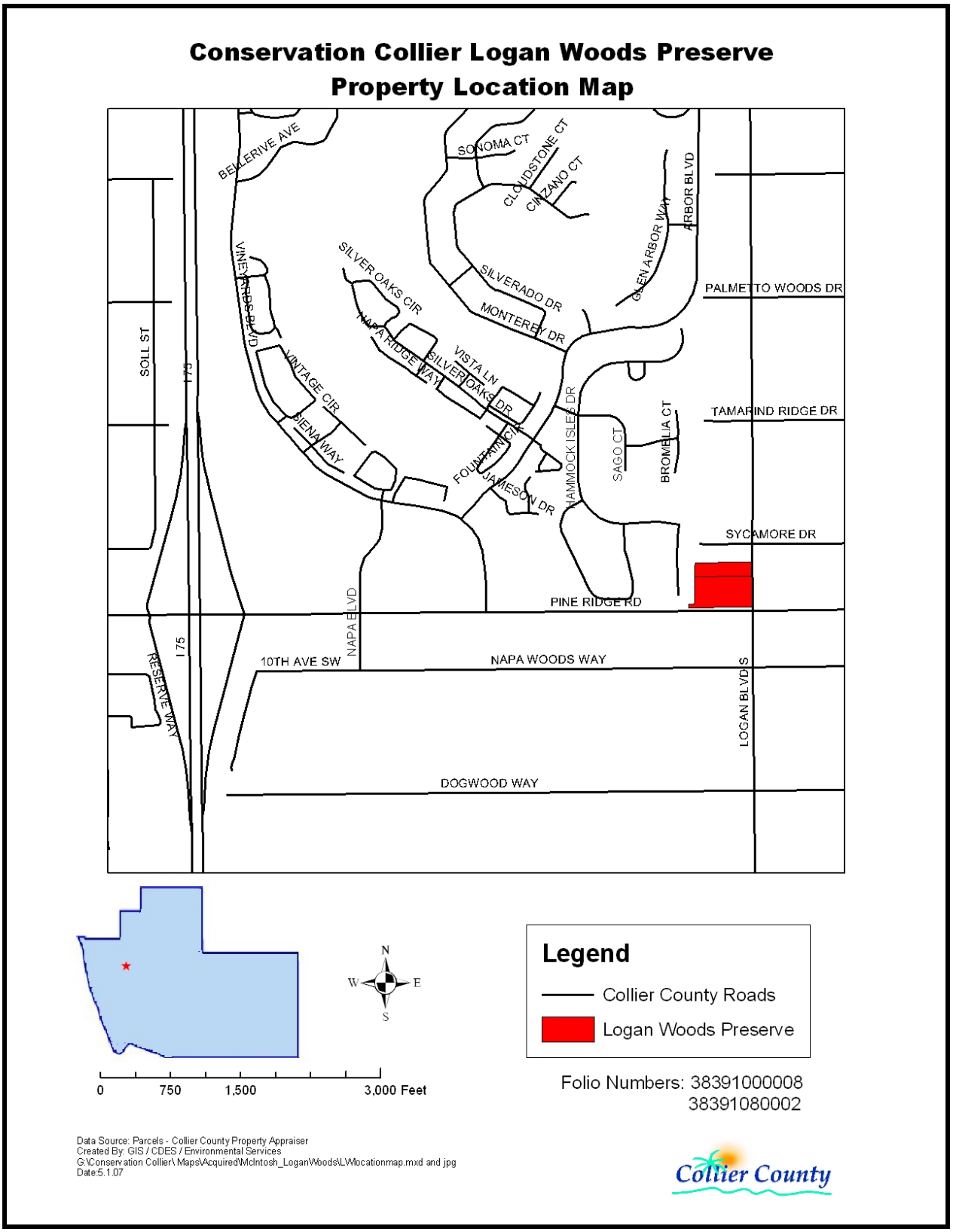

Figure 1. General Location of Logan Woods Preserve

1.4 Regional Significance of the Logan Woods Preserve

To date, approximately 64% (more than 867,000 acres) of Collier County is protected within in conservation areas (Figure 2) and managed by private organizations and by local, state and federal agencies. Collier County's Conservation Collier Program manages the 5.69-acre Logan Woods Preserve. Although this preserve is relatively small, it provides green space at a very busy intersection and will serve as a neighborhood preserve. Specific information on the uplands found on the Logan Woods Preserve may be found in section 2.3 (Natural Plant Communities) of this document. A general view of the Logan Woods Preserve is provided in Figure 3.

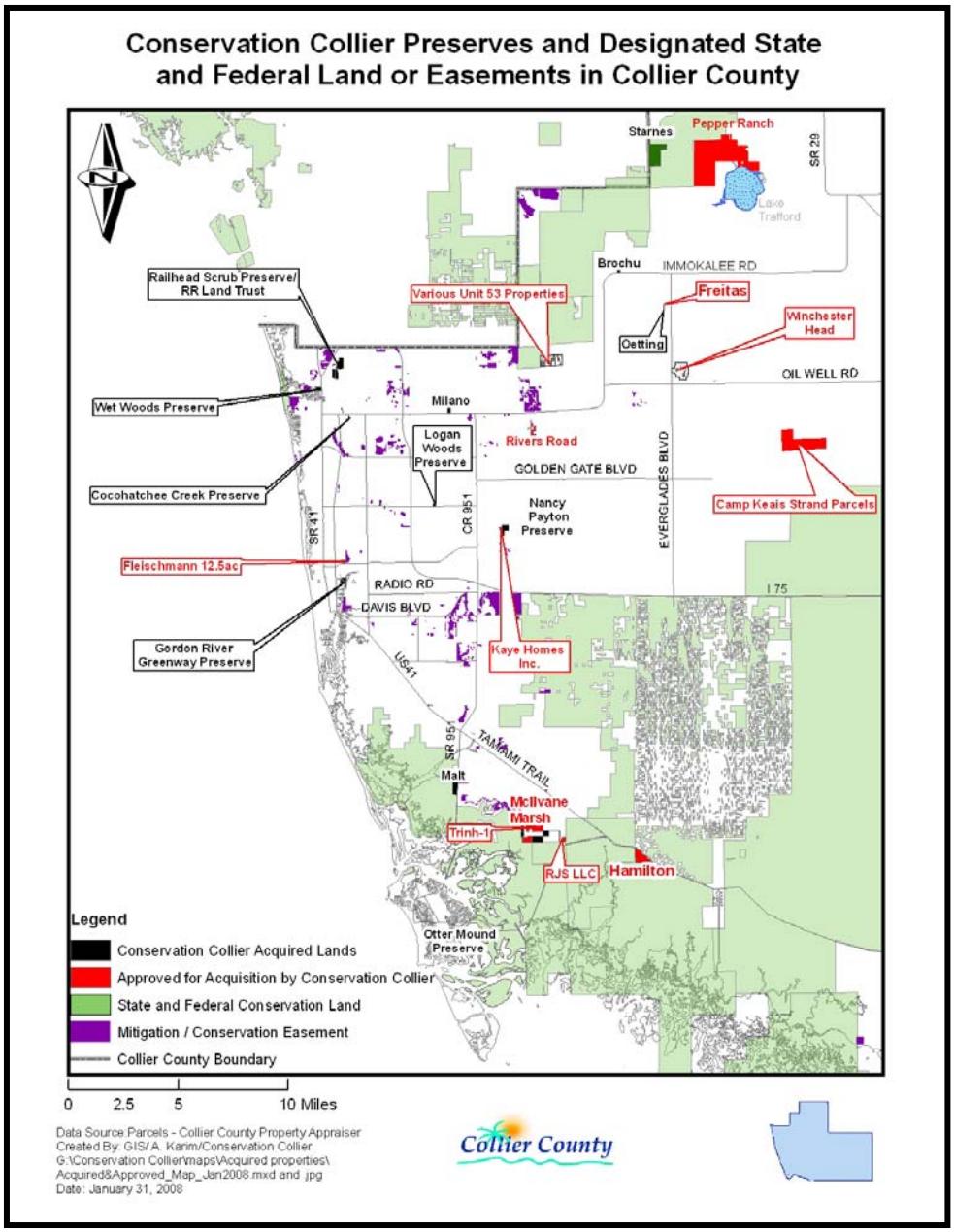

Figure 2: Conservation Collier Preserves and Designated State and Federal Land or Conservation Easements Existing in Collier County, Florida.

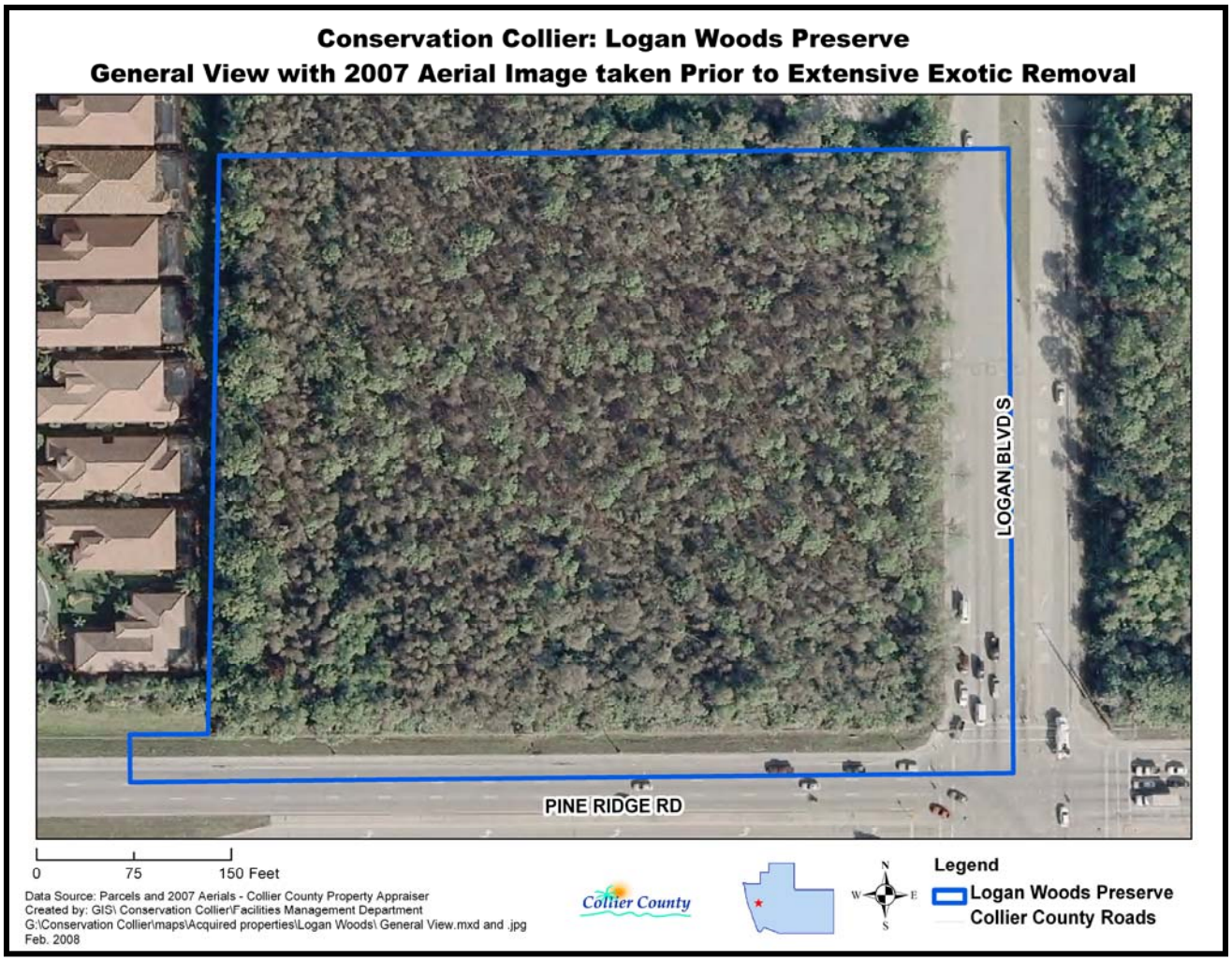

Figure 3: General View of the Logan Woods Preserve (2007 aerial image before extensive exotic removal; 2008 aerial image will be added to plan as soon as it becomes available)

1.5 Nearby Public Lands and Designated Water Resources

The closest preserved, natural area to Logan Woods Preserve is the Nancy Payton Preserve - a Conservation Collier Program property approximately three (3) miles to the southeast. Other preserves, in order of increasing distance, are provided in Table 2. Figure 4 shows the locations of these preserves.

Table 2: Public Lands Located near the Logan Woods Preserve

Name	Distance (miles)	Direction	Type
Nancy Payton Preserve	3	SE	Conservation Collier
Milano Property	4.2	NW	Conservation Collier
Gordon River Greenway Preserve	5	SW	ConservationCollier
Cocohatchee Creek Preserve	5.4	NW	Conservation Collier
Picayune Strand State Forest	6	SE	State

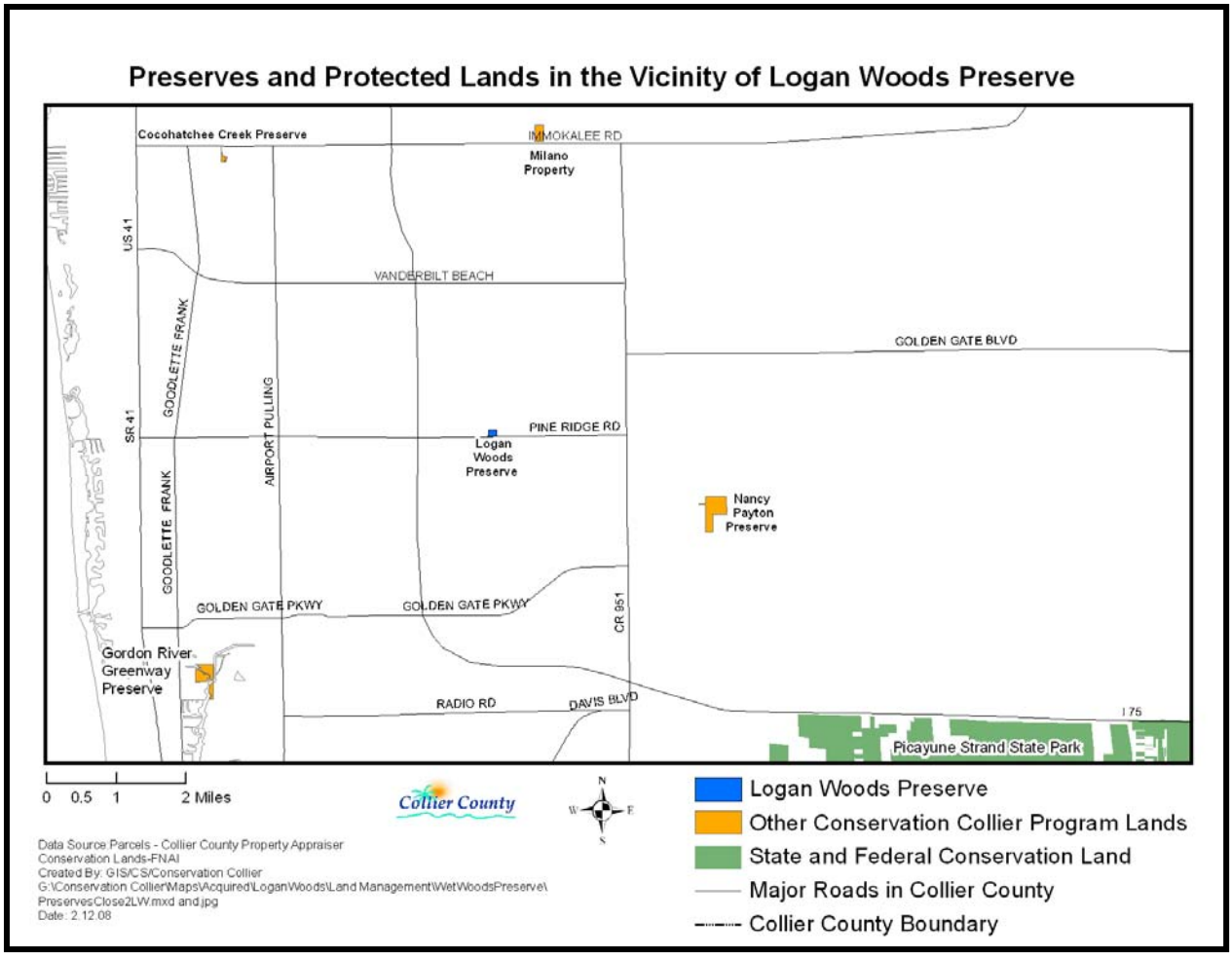

Figure 4. Preserves and Protected Lands in the Vicinity of Logan Woods Preserve

1.6 Public Involvement

Neighborhood involvement will be sought through direct mailing notices for public meetings to residents and businesses within the surrounding area and to owners of properties that border the preserve; official public notices will be posted on the County website. Staff will seek volunteers for projects such as exotic removal, trail creation and replanting through neighbors, local Boy and Girl Scout troops and with the Logan Woods Homeowners Association.

2.0 Natural Resources

2.1 Physiography

Logan Woods 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 topography of the area is relatively level with a land surface elevation of approximately 13 feet (4 meters) above mean sea level. The property lies within the USGS Topographic Quadrangle Map for Bell Meade NW Florida. Surface water percolates directly into the uncovered ground or it collects in natural depressions and man made ponds on adjacent properties. Surface water appears to be controlled by topography and drainage. Ground water flow in the surficial aquifer system generally mirrors surface topography and would appear to be flowing to the west/southwest in this general area, however surrounding water bodies may have an influence on the ground flow direction (ASGgeosciences 2005). Collier County lies within the southern or Distal Physiographic Zone. The portion Collier County, where the Logan Woods Preserve is located in the Southwestern Slope. It is between the Gulf of Mexico and the western edges of the Immokalee Rise and the Big Cypress Spur (Liudahl et al. 1990).

2.1.2 Soils

According to Liudahl et al. (1990), soils mapped at the Logan Woods Preserve are entirely Pineda Fine Sand, Limestone Substratum (See Figure 5). This hydric, nearly level, poorly drained soil is typically found in sloughs and drainage ways. Limestone bedrock is located at a depth of about 55 inches. Natural vegetation includes Slash pine, wax myrtle, and grasses. The permeability of this soil type is slow and the available water capacity is low. Areas underlain with Pineda Fine Sand, Limestone Substratum can be flooded during periods of high rainfall, but typically, the water table is within a depth of 12 inches for 3 to 6 months of the year. The water table can recede to a depth of more than 40 inches during dry times.

2.1.3 Hydrology/Water Management

The hydrology of the site has been altered significantly since the early 1980's when Pine Ridge Road was constructed. The property was cut off from natural water flows with the construction of the surrounding roads (i.e., Sycamore Drive to the north, Logan Blvd. to the east and Pine Ridge Road to the south). There is a drainage ditch to the south of the property that captures the rainwater runoff off Pine Ridge Road and the property and there is also an old minor swale/berm that exists on the western side of the property and runs north and south. Water tends to pool up on the western side of the swale.

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 continue to reduce the extent of the preserve that floods during the summer months and reduce the period of time the preserve wetlands are flooded during the year.

Figure 5: Soil map of the Logan Woods Preserve

2.2 Climate

The Logan Woods 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 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 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 plant species that form the natural vegetation of any place. In addition to anthropogenic influence, 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 in an area.

The Florida Land Use, Land Cover Classification System (FLUCCS) GIS layer provided by South Florida Water Management District notes only one plant community on the preserve: Upland Hardwood Forests-Melaleuca Infested (FLUCCS code 424; Figure 6). Additionally, the whole site is mapped as having hydric soils (Liudahl et al. 1990). In April 2000, Southern Biomes conducted a site visit and determined that the Logan Woods Preserve consists of approximately 4.4 acres of upland habitat and approximately 1.5 acres of wetland habitat. When Conservation Collier acquired the parcel, approximately 90% of the property was infested with Melaleuca (*Melaleuca quinquinervia*). The Florida Natural Areas Inventory (FNAI) staff visited this site in 2006; they recorded the amount of exotic cover present and noted the location(s) via a Global Positioning System (GPS) devise (Figure 7). Subsequently, Melaleuca and other invasive, exotic plant species were removed from the preserve in May 2007.

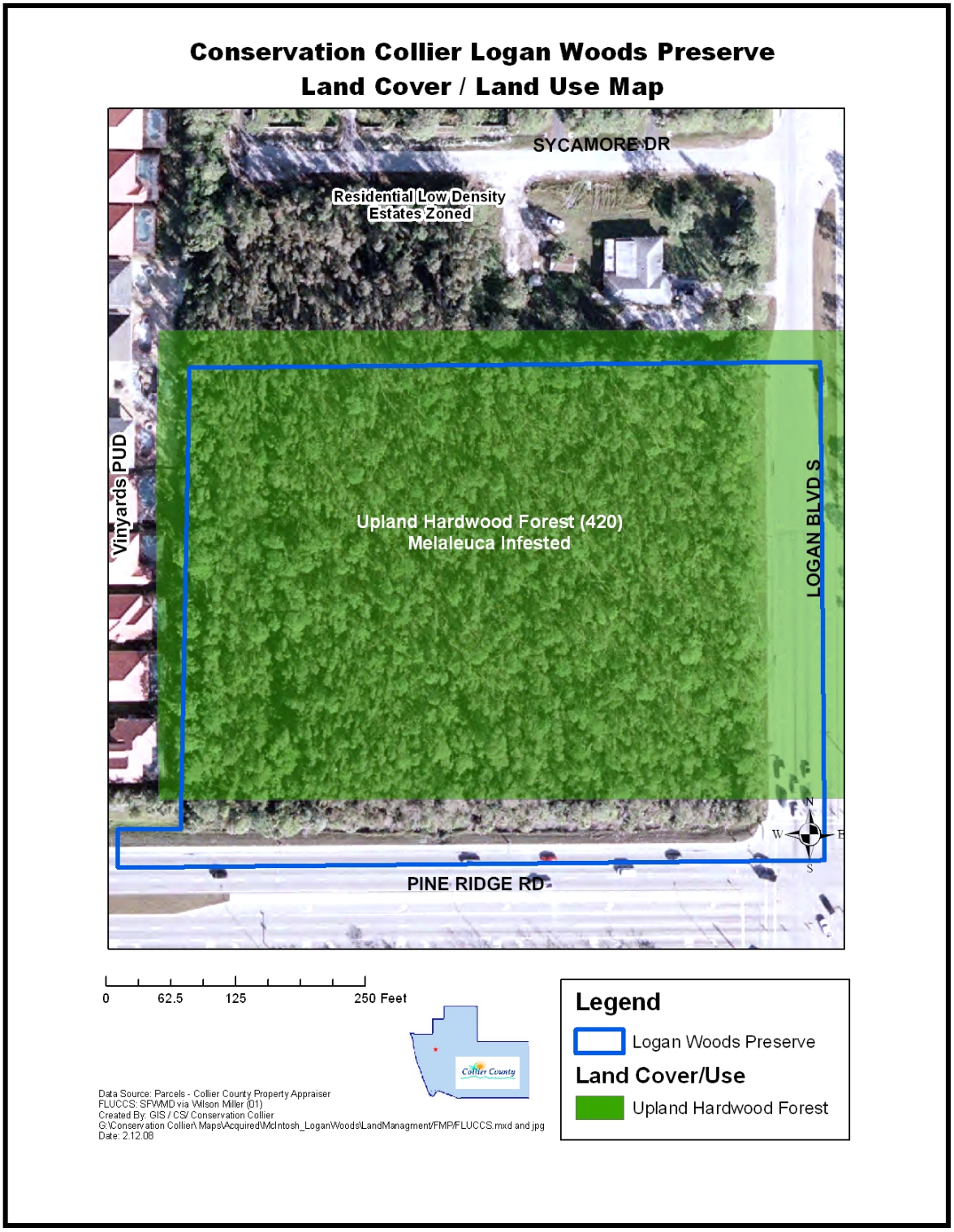

Figure 6: Distribution of Main Natural Communities (based on SFWMD FLUCCS Codes) in Logan Woods Preserve

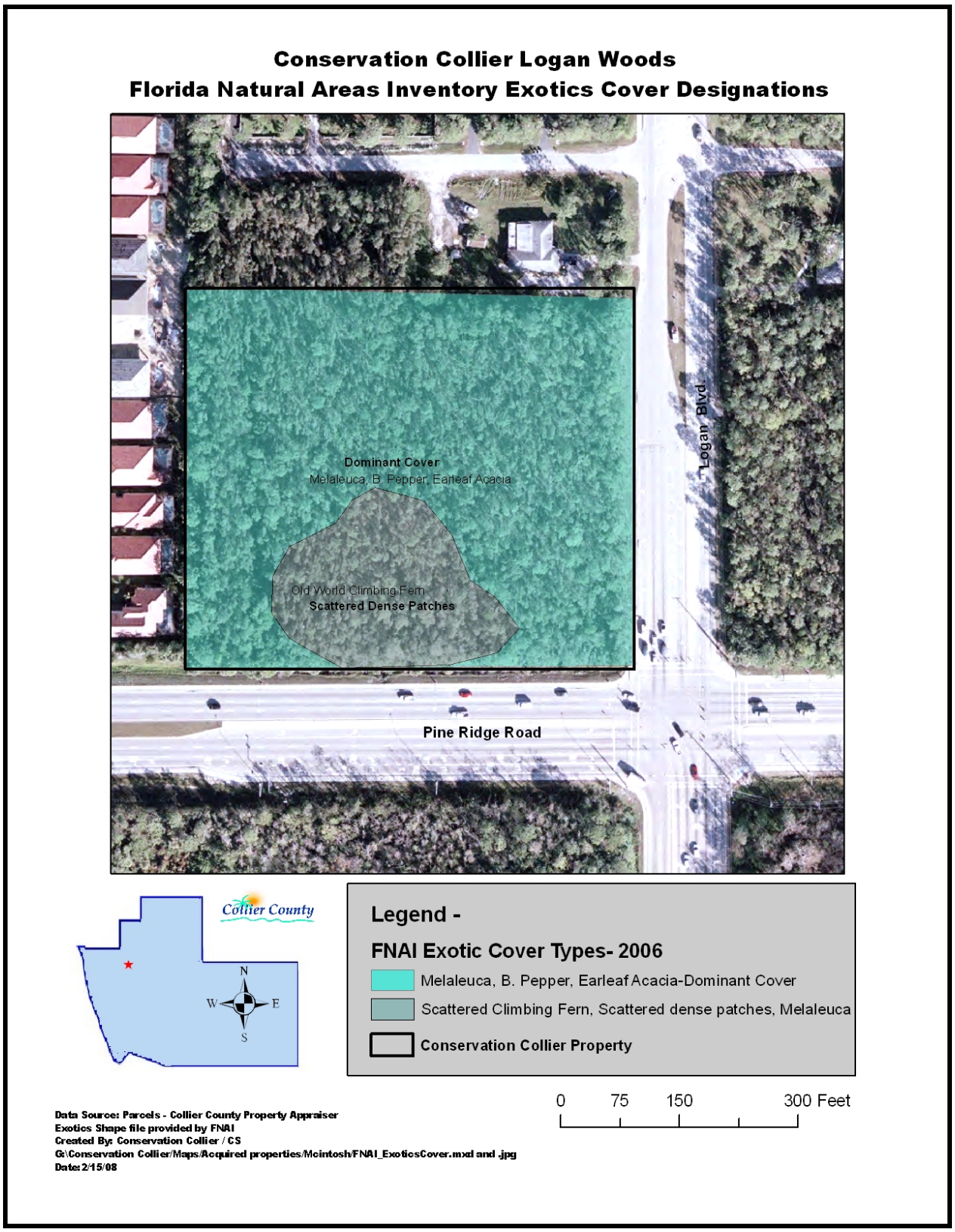

Figure 7: Logan Woods Florida Natural Areas Inventory Exotics Cover Designations

2.3.1 Uplands: Upland Hardwood Forests

As mentioned in the previous section, Logan Woods Preserve was primarily dominated by the invasive, exotic Melaleuca at the time of acquisition; the native plant community mapped on the preserve is an upland hardwood forest – Melaleuca infested. As such, the following section will describe the native species commonly found in this community; section 3.4 and 4.4 of this management plan (Goals for the 10-year period 2008-2018) will discuss methodologies to control/eradicate Melaleuca and other problematic, floristic species on the preserve.

Upland hardwood forests in south Florida are also known as upland mixed forests, prairie hammocks, xeric hammocks, hydric hammocks (FNAI & FDNR 1990) and mesic temperate hammocks (USFWS 1999). This plant community is often characterized by hardwood species such as live oak (*Quercus virginiana*) and cabbage palms (*Sabal palmetto)* that form a closed canopy. Other trees found in these communities include temperate species such as water oak (*Quercus nigra*), laurel oak (*Q. laurifolia*), hackberry (*Celtis laevigata*) and red maple (*Acer rubrum*). The high amounts of shade and leaf litter provided by the canopy keeps the soils relatively moist. Consequently, the midstories and groundcovers are species-poor. The frequency of epiphytes is usually higher than other herbaceous plants (USFWS 1999).

The closed canopy and abundant hardwood mast provided by this plant community attracts a number of wildlife species seeking food, cover, roosting, and nesting sites. Additionally, these areas are ideal stopover areas for migratory passerines. Since these communities occur on relatively well-drained sites, they are also attractive for human habitation and recreational uses. These anthropogenic uses have increased the number of invasive plant and animal species in these areas and have resulted in degraded hardwood forests throughout the state (USFWS 1999).

The Logan Woods Preserve is mapped as an Upland Hardwood Forest – Melaleuca Infested, however, this is **inconsistent** with what is currently present on site. Conservation Collier Staff have consistently observed a Cypress – Pine - Cabbage Palm community during site visits. Therefore, a description of the latter plant community is provided in the following section.

2.3.2 Uplands: Cypress – Pine – Cabbage Palm

As the name suggests, the Cypress- Pine-Cabbage Palm Community is composed of a mixture of Cypress, Pine and Cabbage Palm Canopy trees – none of which are dominate. This community is often the transition zone between moist upland and hydric sites. As such, some of the flora and fauna associated with moist upland and hydric sites are also found in this type of community.

In 2003, Conservation Collier Staff noted two, native canopy species: cypress (*Taxodium distichum*) and slash pine (*Pinus elliottii var. densa*). Native, midstory species included myrsine (*Myrsine floridana),* willow *(Salix sp.),* and buckthorn *(Bumelia sp.).* Native groundcover included swamp fern *(Blechnum serulatum),* giant hatpins (Eriocaulaceae sp.), yellow-eyed grass (*Xyris caroliniana*), various wetland grasses and forbs. Since non-indigenous plants previously invaded a majority of the site, the species composition of this community should increase with continued restoration efforts.

A parcel on the southeast corner of Pine Ridge Road and Logan Blvd was nominated during Conservation Collier's 5th Acquisition Cycle. Like the Logan Woods Preserve, this parcel (Folio 38390920008) was mapped as an Upland Hardwood Forest but during site visits to the property, staff consistently noted a Cypress- Pine-Cabbage Palm Community. Additionally, a majority of this parcel (approx. 85%) was mapped as containing Pineda Fine Sand, Limestone Substratum soils while the entire the Logan Woods Preserve was mapped as containing this soil. Due to the proximity of this parcel to the Logan Woods Preserve, the similar plant community noted there and the soils found on the parcel - it is appropriate to look at the plant species identified there to gain some insight on what may be reasonably found/planted on the Logan Woods Preserve during and after restoration efforts take place. The native canopy species identified on the parcel on the southeast corner of Pine Ridge Road and Logan Blvd consisted of a mix of pond and bald cypress (*Taxodium ascendens and T. distichum*), cabbage palm (*Sabal palmetto*), slash pine (*Pinus elliottii*), bay (*Persea* sp.) and laurel oak (*Quercus laurifolia*). Native midstory species included: marlberry (*Ardisia escallonioides*), myrsine (*Myrsine floridana*), wild coffee (*Psychotria nervosa and P. sulzneri*), beautyberry (*Callicarpa americana*), buttonbush (*Cephalanthus occidentalis*), saw palmetto (*Serenoa repens*), golden polypody (*Phlebodium aureum*) and dahoon holly (*Ilex cassine*). Native ground cover species observed were: swamp fern (*Blechnum serrulatum*), frog-fruit (*Phyla nodiflora*), pepper vine (*Ampelopsis arborea*), Virginia chain fern (*Woodwardia virginica*), spider-lily (*Hymenocallis* sp.), bracken fern (*Pteridium aquilinum*), poison ivy (*Toxicodendron radicans*), muscadine (*Vitis rotundifolia*), smilax (*Smilax* sp.), and Virginia creeper (*Parthenocissus quinquefolia*).

2.4 Native Plant and Animal Species

Indigenous or native species are those whose natural ranges included Florida at the time of European contact (circa 1500 AD). Additionally, species that have naturally expanded or changed their ranges to include Florida are considered native. Florida represents a relatively broad geographic range; some species, which may be native to the northern part of the state, may not be native to the southern part and visa versa. Similarly, species exist that are native to coastal areas but not to inland areas and visa versa. Therefore, for the purposes of this management plan, species deemed to be native are those that are not only indigenous to Florida, but also to Collier County. These species will be discussed in the following sections.

2.4.1 Plant Species

To date, Conservation Collier staff has identified 52 plant species at the preserve (Appendix 2). Another plant survey will be conducted in late summer of 2008 and the final list will be added to this plan. Of these 52 species, 40 (77%) are native to the site and 12 (23%) are exotic. Of the 12 exotic species, 10 are listed by the Florida Exotic Pest Plant Council (8 Category I species and 2 Category II species).

2.4.2 Animal Species

Little is recorded for actual occurrences of animals at the preserve. Occurrences of fauna at the preserve are based on direct visual and aural observations by staff during site visits of animals 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;
- anecdotal information from persons with knowledge of the site.

Mammal species known to occur or individuals and/or evidence of activity directly observed within the preserve include: Virginia opossum (*Didelphis virginiana*), nine-banded armadillo (*Dasypus novemcinctus*), marsh rabbit (*Sylvilagus palustris*), and raccoon (*Procyon lotor*).

Reptile and amphibian species observed at the preserve include: the brown anole (*Anolis sagrei*), the southern black racer (*Coluber constrictor priapus*). Invertebrates observed include the following butterfly species: the gulf fritillary (*Agraulis vanillae*), the zebra long wing (*Heliconius charitonius*), and the cloudless sulphur (*Phoebis sennae*).

Several bird species have been observed by staff to be perching, foraging, or exhibiting nesting behavior at the preserve (Table 3).

Table 3: Bird Species Recorded at the Logan Woods Preserve

Common Name	Scientific Name	Common Name	Scientific Name
Pileated Woodpecker	*Dryocopus pileatus*	Blue Jay	*Cyanocitta cristata*
Red-shouldered Hawk	*Buteo lineatus*	Blue-gray Gnatcatcher	*Polioptila caerulea*
Black Vulture	*Coragyps atratus*	Yellow-rumped Warbler	*Dendroica coronata*
Mourning Dove	*Zenaidura macroura*	Palm Warbler	*Dendroica palmarum*
Red-bellied Woodpecker	*Melanerpes carolinus*	Northern Cardinal	*Cardinalis cardinalis*
Gray Catbird	*Dumetella carolinensis*	Common ground dove	*Columbina passerina*
Northern Mockingbird	*Mimus polyglottos*		

The Florida Breeding Bird Atlas lists 49 bird species that have been recorded as confirmed, probable, or possible breeding in the vicinity of the site (in the Belle Meade NW USGS quadrangle) that may be present at The Logan Woods Preserve (Table 4). 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 Logan Woods Preserve.

Table 4: Breeding Bird Species Recorded in the Belle Meade NW Quadrangle Encompassing the Logan Woods Preserve (* = non-indigenous)			
Common Name	**Scientific Name**	**Common Name**	**Scientific Name**
Green Heron	*Butorides striatus*	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*
Bald Eagle	*Haliaeetus leucocephalus*	White-eyed Vireo	*Vireo griseus*
Red-shouldered Hawk	*Buteo lineatus*	Blue Jay	*Cyanocitta cristata*
Red-tailed Hawk	*Buteo jamaicensis*	American Crow	*Corvus brachyrhynchos*
Northern Bobwhite	*Colinus virginianus*	Fish Crow	*Corvus ossifragus*
Common Moorhen	*Gallinula chloropus*	Purple Martin	*Progne subis*
Killdeer	*Charadrius vociferus*	Tufted Titmouse	*Parus bicolor*
Least Tern	*Sterna antillarum*	Brown-headed Nuthatch	*Sitta pusilla*
Mourning Dove	*Zenaida macroura*	Carolina Wren	*Thryothorus ludovicianus*
Common ground dove	*Columbina passerina*	Eastern Bluebird	*Sialia sialis*
Eastern Screech-Owl	*Otus asio*	Northern Mockingbird	*Mimus polyglottos*
Great Horned Owl	*Bubo virginianus*	Brown Thrasher	*Toxostoma rufum*
Burrowing Owl	*Athene cunicularia*	*European Starling	*Sturnus vulgaris*
Barred Owl	*Strix varia*	Pine Warbler	*Dendroica pinus*
Common Nighthawk	*Chordeiles minor*	Eastern Towhee	*Pipilo erythrophthalmus*
Chuck-will's-widow	*Caprimulgus carolinensis*	Northern Cardinal	*Cardinalis cardinalis*
Chimney Swift	*Chaetura pelagica*	Red-winged Blackbird	*Agelaius phoeniceus*
Ruby-throated Hummingbird	*Archilochus colubris*	Eastern Meadowlark	*Sturnella magna*
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Common Grackle	*Quiscalus quiscula*
Red-bellied Woodpecker	*Melanerpes carolinus*	Boat-tailed Grackle	*Quiscalus major*
Downy Woodpecker	*Picoides pubescens*	*House Sparrow	*Passer domesticus*
Red-cockaded Woodpecker	*Picoides borealis*		

Source: Florida Breeding Bird Atlas, www.wildflorida.org/bba

2.5 Listed Species

Indigenous species that have been recognized to be vulnerable to extinction to varying degrees are called listed species. The Florida Fish and Wildlife Conservation Commission and the Florida Department of Agriculture and Consumer Services produce official lists of rare and endangered species at the state level; the United States Fish and Wildlife Service and the National Marine Fisheries Service produce official lists of rare and endangered at the federal level. 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 Logan Woods Preserve.

2.5.1 Listed Plant Species

There are three (4) listed plant species at Logan Woods Preserve that are listed by the Florida Department of Agriculture and Consumer Services (FDACS), three (3) are Endangered and one (1) is Threatened (Table 5). There are no animal species listed as Endangered or Threatened by the United States Fish and Wildlife Service within Logan Woods. A brief description of these species and their status is included in the following paragraphs.

Table 5: Listed Plant Species Detected at the Logan Woods Preserve

Scientific Name	Common Name(s)	State Status
Tillandsia balbisiana	Reflexed wild-pine, Northern needleleaf	T
Tillandsia fasciculata var. *densispica*	Stiff-leaved wild-pine, Cardinal airplant	E
Tillandsia pruinosa	Fuzzywuzzy airplant	E
Eugenia rhombea	Red stopper	E

E: Endangered, T: Threatened,

The Cardinal Airplant, also known as the Common Wild Pine or Stiff-leaved Wild Pine (*Tillandsia fasciculata*), is an epiphytic bromeliad recognized by many common names and is listed as an endangered plant by the State of Florida. Wunderlin and Hansen reported this species in 24 counties throughout Florida as of 2004 (Wunderlin & Hansen 2004). 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).

Cardinal Airplant
Photo by Rodger L. Hammer
Courtesy of the Institute for Regional Conservation

The Reflexed wild pine (*Tillandsia balbisiana*) is also a fairly common epiphyte in South Florida. This species prefers moist forests and swamps and are state listed as threatened.

Reflexed Wild Pine
Photo by Melissa E. Abdo Courtesy

The Fuzzywuzzy airplant (*Tillandsia pruinosa*) is listed as an endangered plant by the State of Florida. Collier County is the only county within the state of Florida where this species has been confirmed to exist (Wunderlin & Hansen 2004). The epiphyte is less than 6 inches tall and usually solitary. This airplant is generally found in isolated habitats.

Even though the three Tillandsia species listed above are fairly common in the State, they are listed due to illegal collecting and the destruction of the habitats in which they are found. Infestation by the introduced Mexican bromeliad weevil (*Metamasius callizona*) has been implicated in the decline of many epiphytic air plant populations around the state. Currently there are no control measures in place however, close research and monitoring is taking place.

The Red Stopper (*Eugenia rhombea*) is listed as an endangered plant by the State of Florida. Collier County. Wunderlin and Hansen (2004) report it in only two counties throughout the state: Miami-Dade and Monroe County. While they do not report this species in Collier County, staff has identified this species on another parcel nominated during Conservation Collier's 5th Acquisition Cycle (Folio number 41507480001 – "Blake" parcel).

FNAI maintains a database of occurrences of rare, threatened, and endangered species in Florida. 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 Logan Woods Preserve site is located within FNAI's Biodiversity Matrix Unit 40541. Appendix 3 provides the official 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. There were no plant species listed as "likely" to occur on site (rare species likely to occur in this matrix based on suitable habitat and/or known occurrences in the vicinity). None of the plant species reported by FNAI as "potential" listed species have been detected within the Preserve. Six (6) plant species were reported within this Biodiversity Matrix as "potential" occurrences (site lies within the known or predicted range of species) including the Nodding pinweed (*Lechea cernua*) and the Celestial lily (*Nemastylis floridana*).

2.5.2 Listed Animal Species

No listed wildlife species have been observed onsite or immediately adjacent to the site. However**,** within FNAI's Biodiversity Matrix 40541, in which the preserve lies, the Wood stork (*Mycteria Americana)* was recorded as "likely" to occur (rare species likely to occur in this matrix based on suitable habitat and/or known occurrences in the vicinity). Eleven (11) species were reported within FNAI's Biodiversity Matrix as potential occurrences (site lies within the known or predicted range of species) however, none of these species have been detected on site. These include the Eastern indigo snake (*Drymarchon couperi*), the Gopher frog (*Rana capito*), the Gopher tortoise (*Gopherus polyphemus*), the Red-cockaded woodpecker (*Picoides borealis*), and the Florida bonneted bat (*Eumpos floridanus*) (See Appendix 3).

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 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 (a.k.a. non-native species, exotic species) species are those that have been purposefully or accidentally introduced 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. While some native species may become invasive, the establishment and dominance of non-native species is of particular concern.

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 losses due to infestations and (3) impact endangered species via habitat loss and alteration. Twelve (12) invasive exotic plant species have been identified on the preserve, 10 of these are listed by FLEPPC (8 Category I species and 2 Category II 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. While only two invasive non-indigenous animal species have been documented within the Preserve, other species also have a potential to occur in Logan Woods and will be discussed in section 2.6.2.

2.6.1 Invasive and Problem Plant Species

To date, twelve (12) introduced plant species have been found at the Logan Woods Preserve accounting for 23% of the plant species recorded there. Eight (8) of the exotic, invasive species are considered Category I species by FLEPPC and two (2) are listed as Category II (Table 6). 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 on the documented ecological damage caused (FLEPPC 2007).

The most problematic exotic, invasive plant species at Logan Woods Preserve was and continues to be Melaleuca. Old world climbing fern (*Lygodium microphyllum)* was also found to be spreading throughout southern portion of the preserve. Other invasive species listed in table 6 have been found throughout the preserve.

In May 2007, all exotic, invasive species received initial treatment. The majority of the removal project was funded by the DEP Bureau of Invasive Plant Management. Since then, maintenance continues to ensure that the site remains free of exotics. The details of the project will be summarized in Section 3.4 and 4.4, of this document.

Table 6: Invasive Plant Species at Logan Woods Preserve		
Scientific Name	**Common Name(s)**	**FLEPPC Category**
Acacia auriculiformis	Earleaf Acacia	I
Dioscorea bulbifera	Air-potato	I
Lygodium microphyllum	Old World Climbing Fern	I
Melaleuca quinquenervia	Melaleuca, Punk Tree, Paper Bark	I
Rhodomyrtus tomentosa	Downy Rose Myrtle	I
Schinus terebinthifolius	Brazilian Pepper	I
Syzygium cumini	Java Plum, Jambolan	I
Cupaniopsis anacardioides	Carrotwood	I
Urena lobata	Caesar's Weed	II
Tradescantia spathacea	Oyster Plant	II

Under certain conditions, especially following soil disturbance or drainage, some native plant species can become invasive. Currently, there are no native plant species at Logan Woods Preserve that represent a management problem. However, close monitoring will be done each year to ensure that cabbage palm trees (*Sabal palmetto*) and muscadine grape vine (*Vitis rotundifolia*) do not start to become problematic. If this occurs, steps will be taken to contain these invasive species such as cutting back or treating vines and reducing the numbers of the cabbage seedlings.

2.6.2 Invasive and Problem Animal Species

Two (2) non-indigenous, invasive animal species have been documented on the Preserve: the red imported fire ant (*Solenopsis invicta*) and the brown Anole (*Anolis sagrei*). Based on the natural communities found within the preserve, its proximity to residential areas and its general geographic location, several more species (native and non-native) have the potential to impact the Logan Woods 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 Logan Woods Preserve

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 Logan Woods 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 & Guiliano 2006). RIFAs have a number of impacts on wildlife. They have eliminated many areas of native ant populations through competition and predation and have eradicated food

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

sources utilized by some wildlife species. Ground-nesting wildlife is especially susceptible to RIFA. Within the Logan Woods Preserve, RIFAs have the potential to affect ground-nesting birds; small mammals; reptiles such as gopher tortoise, 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.

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

Brown Anole (*Anolis sagrei*): documented within the Logan Woods Preserve

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; in Florida; 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 (*Anolis 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.

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

Osteopilus septentrionalis, an invasive, exotic reptile that has the potential to occur at the Logan Woods Preserve. Photo courtesy of the USGS.

Cuban tree frog (*Osteopilus septentrionalis*): undocumented within the Logan Woods Preserve

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 Logan Woods 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

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 to introduce the exotic species 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 will 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 Logan Woods 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.

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

Feral domestic cat *(Felis catus):* undocumented within the Logan Woods 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 Logan Woods Preserve, there exists a high probability of their future presence on the preserve due to the proximity of Logan Woods 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 and Current Use

Aerial photography taken in 1940, 1962, 1985, 1994 and recent physical visits to the site show that development has never occurred on the site. These aerial photographs are available in the public records at the Collier County Property Appraisers Office, online from the State University System of Florida website, and at the USDA Natural Resources Conservation Service Office located in Immokalee, FL. A 1962 aerial is shown in Figure 8 to display what the area looked like prior to major development. A Phase I Environmental Site Assessment was conducted on the site by ASCgeosciences dated August 2005, before the property was purchased by the Conservation Collier Program. This report, available as County public record, both confirmed the above comments and revealed that no evidence of recognized adverse environmental conditions exist on the property.

In 2007, prior to initial exotic removal, County staff discovered (15) 5 gallon barrels of used motor oil and other miscellaneous debris on the property, just over the northern property line. The Pollution Control Department was notified and an investigation took place. Since then the barrels were removed, all contaminated soil was removed by County staff and the oil was disposed of properly by the adjacent land owners. The disposal of the debris and oil was paid for by the adjacent land owners.

3.2 Cultural, Historical and Archeological Resource Protection

The Logan Woods 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).

1962 Aerial-

The land appears lightly wooded with no surrounding development. Agriculture activity to the north.

(shape of Logan Woods Preserve property placed on aerial image by County staff and is only an estimate of location and size)

Figure 8: Historical Aerial Photograph courtesy of the State of Florida University System of Florida website

3.3 Current Adjacent Land Uses

The Logan Woods Preserve property is currently surrounded by development. To the north is a single family home located on an Estates zoned lot. The western half of this private parcel is not developed; Sycamore Drive is located to the north of this private property.

To the west of the Logan Woods Preserve is a gated community called the Vineyards. Pine Ridge Road is immediately adjacent to the south of the preserve and Logan Blvd. is immediately adjacent to the east. Across these main roads are additional estates zoned properties of which some remain undeveloped (Figure 9).

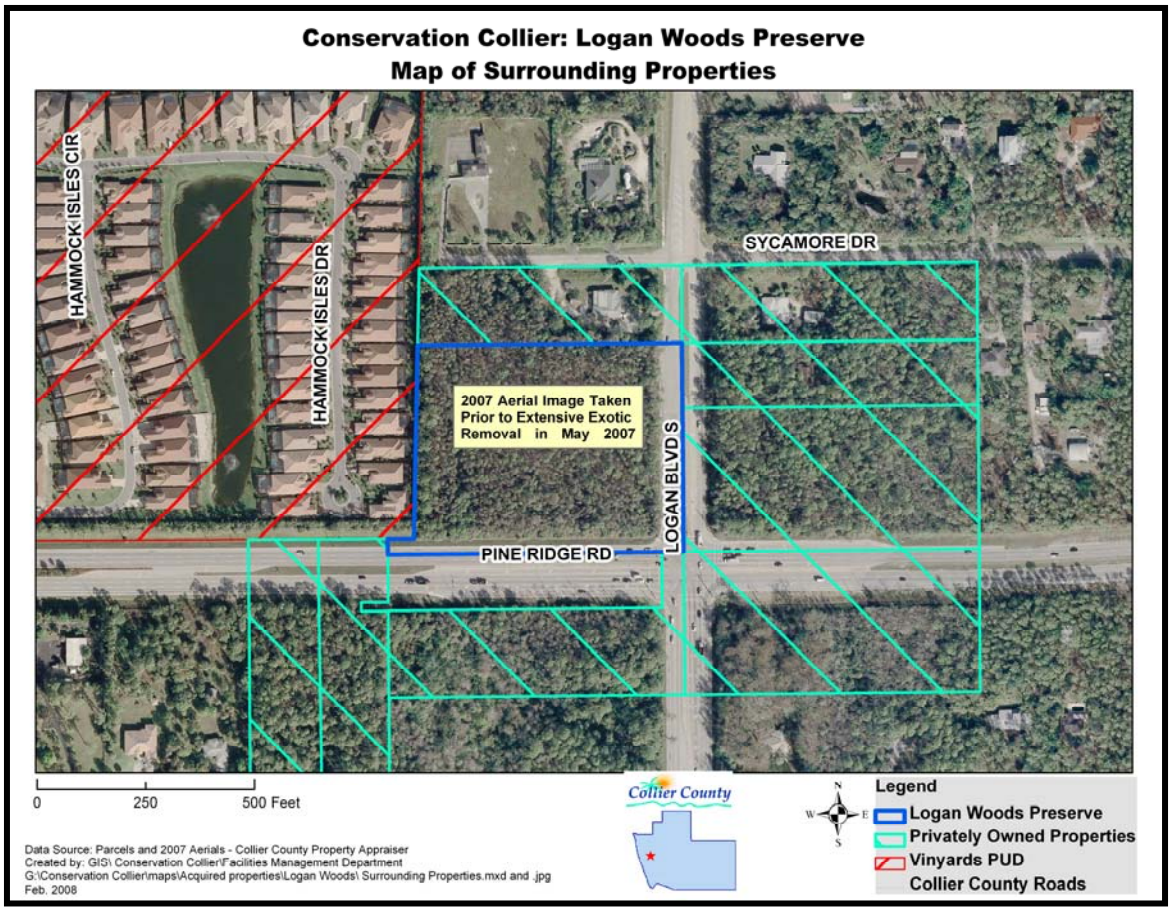

Figure 9: Areas Contiguous to the Logan Woods Preserve

3.4 Major Accomplishments during Previous Years

Since the acquisition of the Logan Woods Preserve in August 2005, key accomplishments have been achieved (Table 7). The program received a grant award from the Department of Environmental Protection's (DEP) Bureau of Invasive Plant Management (BIPM) for the removal of the invasive, exotics on the property. Since the Melaleuca was so dense, DEP agreed the most efficient way to eradicate the species was by mechanical means. Staff utilized a State approved contractor to mobilize a piece of machinery to the site called a Brontasaurus. This large, tracked excavator with a long arm attached to a mowing head, mowed the dense stands of Melaleuca down to the ground resulting in fine pieces of mulch. In the ecologically sensitive areas that line Logan Woods and Pine Ridge Road, an additional contractor was used by the County to remove exotics by hand. Care was taken to preserve as much of the native vegetation as possible. DEP paid a total of $38,000 for the mechanical removal portion and the County paid $9,200 for the hand removal. All of the melaleuca trees were successfully mowed and the mulch was spread out throughout the property. Re-treatments have occurred every four months since the initial event to treat any new seedling growth and will continue every six months until all plants are in maintenance condition. Very few exotic seedlings have been growing back; this may be a result of the mulch layer left, however, many native plants have recovered in great numbers such as swamp ferns, cabbage palms, and beauty berry.

Conservation Collier Staff also coordinated with the USDA TAME Melaleuca Program (The Areawide Management and Evaluation of Melaleuca through the United States Department of

Agriculture and the University of Florida Extension Service) to fund the exotic removal on the undeveloped portion of the adjacent private lot, which was also heavily infested with Melaleuca (Figure 10). Staff received permission from the neighboring property owner to conduct the project on his property. The project took place simultaneously with the removal on the adjoining Logan Woods Preserve. County staff received bids from County and State approved contractors, obtained agency permits and facilitated the project on behalf of TAME. The contractors removed a portion of Melaleuca by mechanical means, killed a portion in place and removed the remainder by hand. Two different herbicide treatment methods were used for public demonstration including cut stump treatment and frill and girdle treatment. Some debris was completely removed from the site, some was mulched and left around the perimeter and the remainder was stacked in log cabin style piles on site for demonstration. A public event was held on August 25, 2007 to educate the neighbors and other members of the public about the need for exotic removal/ eradication and about the different methods that can be used. In addition to providing an educational demonstration of Melaleuca removal on the adjoining privately owned parcel, the project eliminated the Melaleuca seed source from the adjacent property. TAME funded a total of $11,570 and the County paid $275 for the TAME event permits. All the melaleuca on the private lot were successfully eradicated. One follow-up treatment was conducted by a contractor following the initial treatment at no cost.

Table 7: Major Accomplishments Since the Acquisition of the Logan Woods Preserve

Accomplishment	Year(s)
Acquired grant from the Bureau of Invasive Plant Management (BIPM)(FDEP) for the initial removal and treatment of invasive, exotic plant species	2007
Removed and treated the invasive exotic plants species from site- (implemented the BIPM Grant)	2007
Removed and treated invasive, exotic Melaleuca trees from adjacent, privately owned property with funds from the USDA's TAME Project	2007
Fence was installed along the northern property line	2008

In January 2008, a fence was installed along the northern property line. A six-foot high, wooden privacy fence was built along the eastern half of the northern boundary and a field fence was installed along the western half. This privacy fence provided a definite boundary between the preserve and the developed portion of the neighboring property. This will cut down on potential encroachments and dumping, and will provide the preserve guests and the neighbors privacy and security. The field fence was chosen for the western half of the boundary to cut down on cost and to allow wildlife to move under and through the contiguous wooded areas.

Six-foot high, wood privacy fence along the eastern half of the northern boundary of the Logan Woods Preserve. Photo by Christal Segura

Field Fence along the western half of the northern boundary of the Logan Woods Preserve (looking east from the adjacent property). Photo by Christal Segura

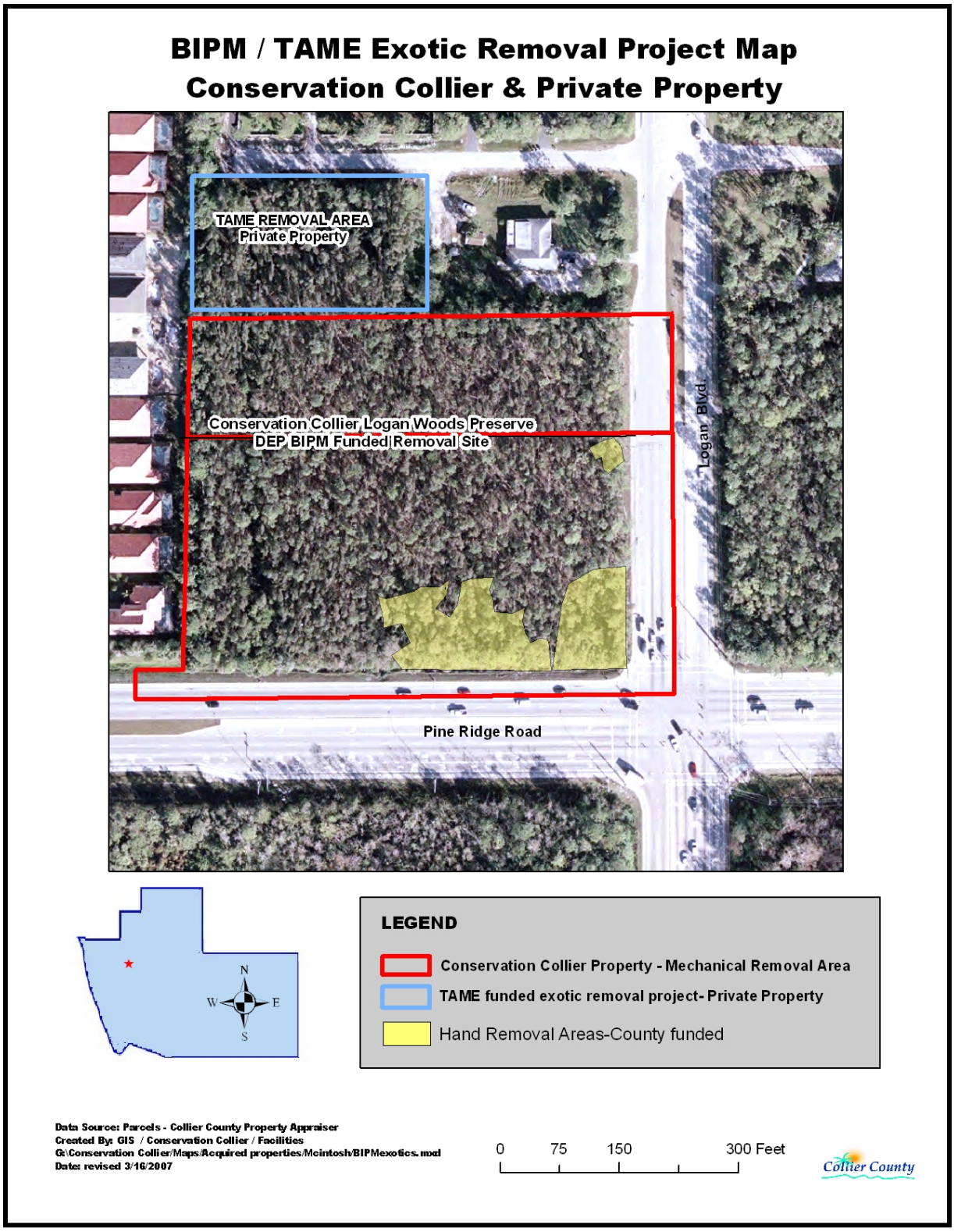

Figure 10. Exotic Removal Partnership Areas

4.0 Future Use of the Logan Woods Preserve including Management Issues, Goals and Objectives

This section describes the main management issues, goals, and objectives for Logan Woods 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 property 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 this site was officially approved in January 2006. The ordinance then requires a "Final" management plan be developed within two years. Subsequently, the property management plan must be updated 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 Board of County Commisioners.

4.1.1 Preserve Manager: Contact Information

The Site Manager for Logan Woods Preserve will be a designated Collier County Environmental Specialist who can 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, can do so by signing a waiver which 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 Logan Woods Preserve and an assessment of their potential impacts are provided in the following sections.

4.2.1 Identification of Public Uses Consistent with Preservation, Restoration, and Conservation 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, § 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. An ordinance specifically for "Preserves" is in the process of being drafted by the County's Parks and Recreation Department and Conservation Collier; it is expected to be completed and presented to the Board of County Commissioners for approval late 2008 or early 2009.

Of the uses listed above, the following are appropriate for this particular site: hiking, picnicking, nature photography, and bird watching. Bike riding is also a possibility.

In addition, there are no existing concessions, or leases at the Logan Woods Preserve. The County's Transportation Department owns a Right of Way (ROW) easement on the eastern and southern portions of the preserve totaling 1.80 acres leaving a total of 5.69 acres for conservation. In accordance with the management goals of the preserve, no additional 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.

Conservation Collier staff have noted a significant change in the hydrology of the preserve since its nomination to the program in 2003. Currently, the western and northern areas of Collier County are in a severe drought status, while the rest of Collier County remains in a moderate drought status (NOAA/NWS 2008). While these drought conditions remain, the succession of the plant community is difficult to predict. However, after managers complete recommended management actions, Logan Woods Preserve will *likely* consist of a Cypress-Pine-Cabbage Palm Community. With the exception of a paved trail and mulched trails, the site will stay naturally vegetated with appropriate native flora that will provide suitable cover and for a variety of wildlife species.

- ***Cypress- Pine-Cabbage Palm Community*** will be comprised of native canopy species such as: cypress, slash pine, cabbage palm, bay and laurel oak. Native midstory species will include: myrsine, willow, buckthorn, marlberry, wild coffee, saw palmetto, beautyberry, buttonbush, salt bush (*Baccharis halimifolia*) golden polypody and dahoon holly. The understory will be comprised of swamp fern, giant hatpins, yellow-eyed grass, fringed yellow-eyed grass (*Xyris fimbriata*), Southern dewberry *(Rubus trivialis*), catbriair (*Smilax* sp.), chain fern, spider-lily, poison ivy, muscadine, Virginia creeper, a wide variety of grasses (*Agrostis, Andropogon, Aristida, Dichanthelium, Eragrostis,* and *Panicum* spp., *etc*.), composites (*Aster, Chrysopsis, Emilia, Eupatorium, Liatris,* and *Solidago* spp., *etc.*). A current list of plants identified within the preserve may be found in Appendix 2.

4.4 Goals for the 10-year period 2008-2018

A set of goals and objectives for Logan Woods Preserve were developed in conjunction with the drafting of this Management Plan. The goals and objectives in this plan are tailored specifically for Logan Woods 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 Logan Woods 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 resources. The following goals have been identified for Logan Woods Preserve:

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

Goal 2: Develop a baseline monitoring program

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 and

Goal 7: Provide a plan for security and disaster preparedness

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

In addition to the chain-link fence on the western border of the preserve and the recently installed fence on the northern border of the preserve, the following actions will be performed:

Action Item 1.1 Install signs encouraging people to stay on any future public access trails situated on the Logan Woods Preserve.

Action Item 1.2 Identify locations of rare and listed native plant species.

These species will be located and recorded with a GPS device; they will be mapped to allow staff to monitor them. Trails will be constructed to avoid areas where rare and listed species exist.

Action Item 1.3 Enforce regulations prohibiting trash or dumping in 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 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.

Licensed County or State contractors will be monitored closely to ensure the proper herbicide applications are being utilized while treating the site. From 2008 on, staff will prohibit the use of Imazapyr containing herbicides such as Arsenal on the preserve. This type of herbicide has potentially caused a great deal of non-target damage throughout the state. Also, close attention will be taken to look for *Tillandsia* sp. (listed in Table 6) that may be attached to invasive trees being cut down or removed. Plants of these species should be relocated prior to removal.

Action Item 1.6 Note and research all site development occurring adjacent to Logan Woods 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 Logan Woods 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 PROGRAM*

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.

A floristic survey was conducted by Conservation Collier staff. This 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, should take place at regular intervals (ca. 5-10 years) to detect long-term trends.

To date, three (3) photo points have been established in and across from 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. One (1) photo point was established within the boundaries of the preserve. During photo documentations of this point, one photo is taken in each of the cardinal directions (north, east, south and west) and a 360-degree panoramic photo is taken. One (1) photo point was established on the eastern side of Logan Blvd across from the preserve. During photo documentations of this point, a 180-degree panoramic photo is taken from south to north. The third photo point is located on the southern side of Pine Ridge Road across from the preserve. During photo documentations of this point, a 180-degree panoramic photo is taken from west to east. 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. Appendix 5 shows before and after photos from these photo points.

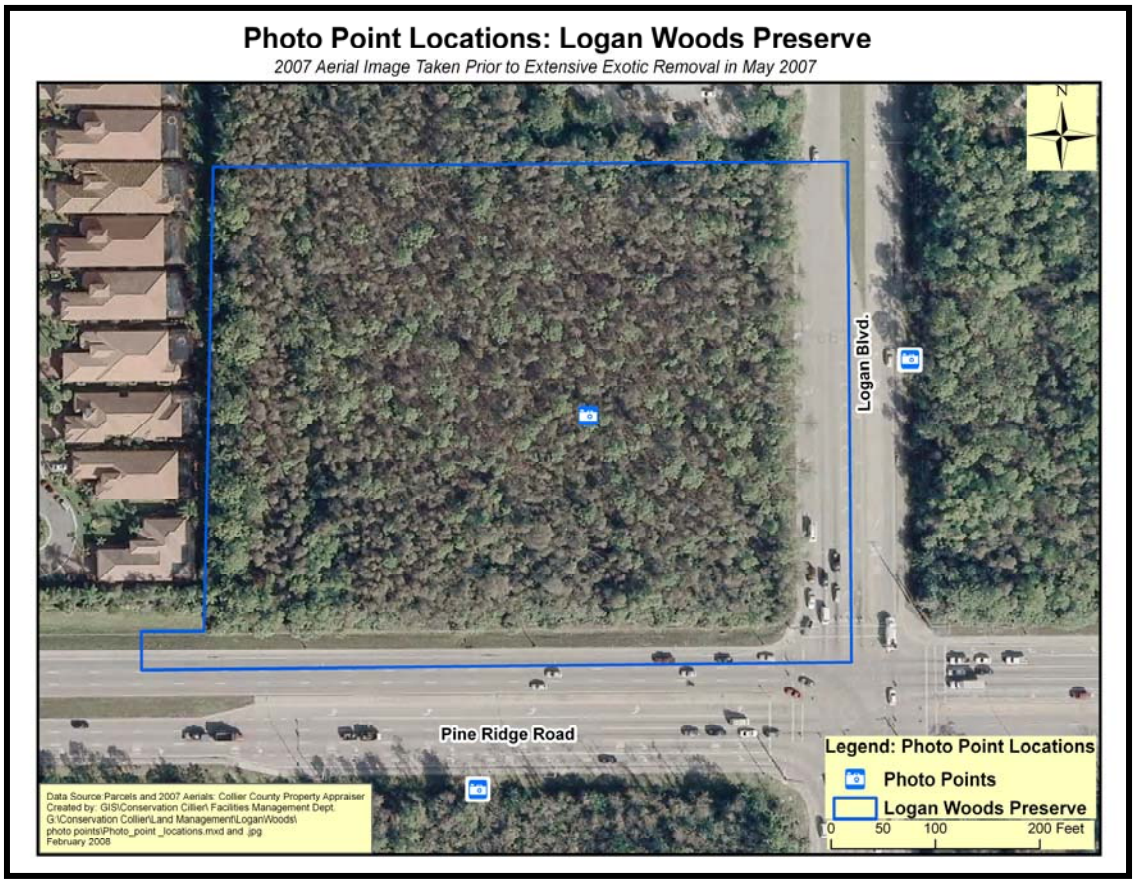

Figure 11: Photo Point Locations at Conservation Collier's Logan Woods Preserve

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.

Initial exotic removal was conduced in May 2007 and since then, follow-up treatments have been occurring every 3 months and will conclude in May 2008. Bi- annual re-treatment events will then start in October 2008 for two years and will finally be reduced to once a year in perpetuity.

The following (Table 8) describes recommended controls of the majority of the Category I, invasive, exotics by Langeland and Stocker (2001) as well as staff recommendations. These recommended control methods may be altered by site managers dependent on new information and products available on the control of these species. Staff has added to the table the hand pulling of small seedlings to avoid the overuse of herbicides. Appendix 4 provides a table of the description/biology of these plants from Langeland and Stocker (2001).

Table 8: Invasive, Exotic Plant Species Control Plan for the Logan Woods Preserve: Category I species

Scientific Name	Common Name(s)	Recommended Control(s)
Acacia auriculiformis	Earleaf acacia	Hand pull seedlings, Basal bark application of 10% Garlon 4 or cut-stump treatment with 50% Garlon 3A.
Dioscorea bulbifera	Air-potato	A basal stem application of Garlon 4 is recommended although cut-stem treatments with 50% Garlon 3A or 10% Garlon 4 are also effective. If bulbils are present on vines, a basal bark treatment should be used because it will translocate into the bulbils. Collect bulbils from the ground and remove from site. Apply 10% Garlon 4 to stems emerging from tubers. Hand pulling followed by treatment of re-sprouts has also been effective. Foliar applications of Garlon 1%-2% 3A has been effective. Several applications throughout the growing season may be necessary.
Lygodium microphyllum	Old world climbing fern	The most serious natural area weed in Florida. Control immediately upon sighting. Thoroughly spray foliage to wet with 1.25% Garlon 4 (4 pt per acre), 0.6% Roundup Pro (maximum 5 pt/acre), or 1.0%-3.0% Rodeo (maximum 7 pt per acre). Only Rodeo can be used if plants are growing in aquatic sites. The poodle cut method may also be used for plants growing high into trees- cut vines and treat lower portions. Do not apply when plants are under environmental stress.
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 or aquatic Garlon (renovate) 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.

Table 8: Invasive, Exotic Plant Species Control Plan for the Logan Woods Preserve: Category I species (continued)		
Scientific Name	**Common Name(s)**	**Recommended Control(s)**
Rhodomyrtus tomentosa	Downy rose myrtle	Hand pull seedlings, basal bark application of 10%-20% Garlon 4 or Foliar of 6qt per acre of Vanquish (dicamba)
Cupaniopsis anacardioides	Carrotwood	Hand pull seedlings, 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.
Schinus terebinthifolius	Brazilian pepper	Hand pull seedlings. 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.
Syzygium cumini	Java plum, Jambolan	Mature trees may take up to 9 months to die. Cut-stump treatment with 50% Garlon 3A or 10% Garlon 4, or use a basal bark treatment with 10% Garlon 4.
Tradescantia spathacea	Oyster plant	Hand pull and remove from site.
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.

Vines - particularly muscadine (*Vitis rotundifolia)* - may become abundant after mechanical treatments or exotic plant removal. This native vine, already present in low densities, can become invasive after disturbances - forming dense colonies, killing hardwoods and palms, climbing into canopy species, and persisting for years. *Vitis* sp. should be controlled by cutting and foliar treat with herbicides if its populations start to take over.

<u>Action Item 3.2</u> 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 Logan Woods Preserve the Red Imported Fire Ant (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.

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

Action Item 4.2 Plant additional native plant species in their appropriate habitats

Periods following exotic removal 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 Logan Woods 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. Planting should occur in early June of each year at the start of rainy season. Recommended date to start replanting is June of 2009. This will be contracted out or volunteer work days will be held to involved neighbors and scout groups. Grants may be sought to assist in funding depending on cost.

GOAL 5: *DEVELOP A PLAN FOR PUBLIC USE*

Action Item 5.1 Develop Access and Required Facilities for Intended Public Uses

A parking lot is not planned to be constructed on the site due to the amount of wetlands present, and to the small size of the site. Parking for the site is available along Sycamore Drive to the north of the site and many neighbors may walk or bike to the site. Three options are listed below that would facilitate public access. Potential access features are depicted in the conceptual level master plan (Figure 12). All paved trails and access points on to the preserve will adhere to guidelines and standards set forth by the Americans with Disabilities Act (ADA). The mulch trails will not be ADA approved.

- **Option 1:** A trailhead into the preserve may be created off the sidewalk bordering Logan Blvd. The trailhead will be made of concrete and an interpretive sign will be located just west of the ROW easement. This trail will arch in a southwesterly direction and end at the border of the ROW easement on the southern side of the preserve; an interpretive sign will be placed here. Additionally, two (2) small mulched trails will branch off from this main, concrete trail. These smaller, mulched trails will lead to interpretive signs, and benches and or picnic tables. A picnic table (ADA approved) will be placed approximately 230 feet from the trailhead off the Logan Blvd. sidewalk. The plans for the concrete trail would be reviewed and approved by the County engineering department to determine the grade and if culverts need to be installed. Permits would also need to be obtained by the South Florida Water Management District and possibly the Army Corp. of Engineers.
    - proposed concrete trail: approximately 640 feet long.
    - mulched trails: approximately 365 feet long (each)

- **Option 2:** The premise of this option is the same as that of option 1. The main difference is in the shape of the paved trail. The option 2 concrete trail will incorporate a few turns. This will increase the length (and cost) of the path but may be a safer option if bicycle riders and people walking through are to share the same path. The turns in the paved trail will help to limit the speed of bicyclists.
  - proposed concrete trail: approximately 760 feet long
  - mulched trail on the western side of paved trail: approximately 365 feet long
  - mulched trail on the eastern side of paved trail: approximately 230 feet long

- **Option 3:** Connect the concrete trail to the sidewalk on Pine Ridge Road via a footbridge or raised pathway with a culvert. This footbridge would traverse the ROW easement and would be built to allow people access over the ditch that runs along the southern border of the property. While this option would allow people an additional access point to the preserve, a footbridge would add considerable cost to the trail system and would eventually have to be removed when the County's Transportation Department utilizes the ROW easement.
  - footbridge: approximately 25 feet long

- **Option 4**: Construct a walking trail made of compacted limestone shell materials that would also be accessible by wheelchair (compliant with American Disabilities Act). This trail would curve and extend to the center of the preserve from Logan Blvd. with two mulched trails extending off of the end point. This crushed shell would allow water to permeate through. This type of trail would may not be as friendly for biking but may be more ecologically friendly than a concrete trail.

Conservation Collier Cocohatchee Creek Preserve- limestone shell ADA trail. Photo by Alex Sulecki

- **Option 5:** No concrete trails, development or major improvements. If the neighborhood doesn't feel that the site will be utilized, there is an option to save the development money to develop sites of larger acreage in more isolated locations. Mulched trails only could be maintained.

An engineering firm would be contracted to plan the design an type of major trail and would be requested to do so in the least impactful way possible. The consulting, planning and permitting would be expensive as well as the costs associated with installing a paved trail and potentially a footbridge. This process may also be time consuming.

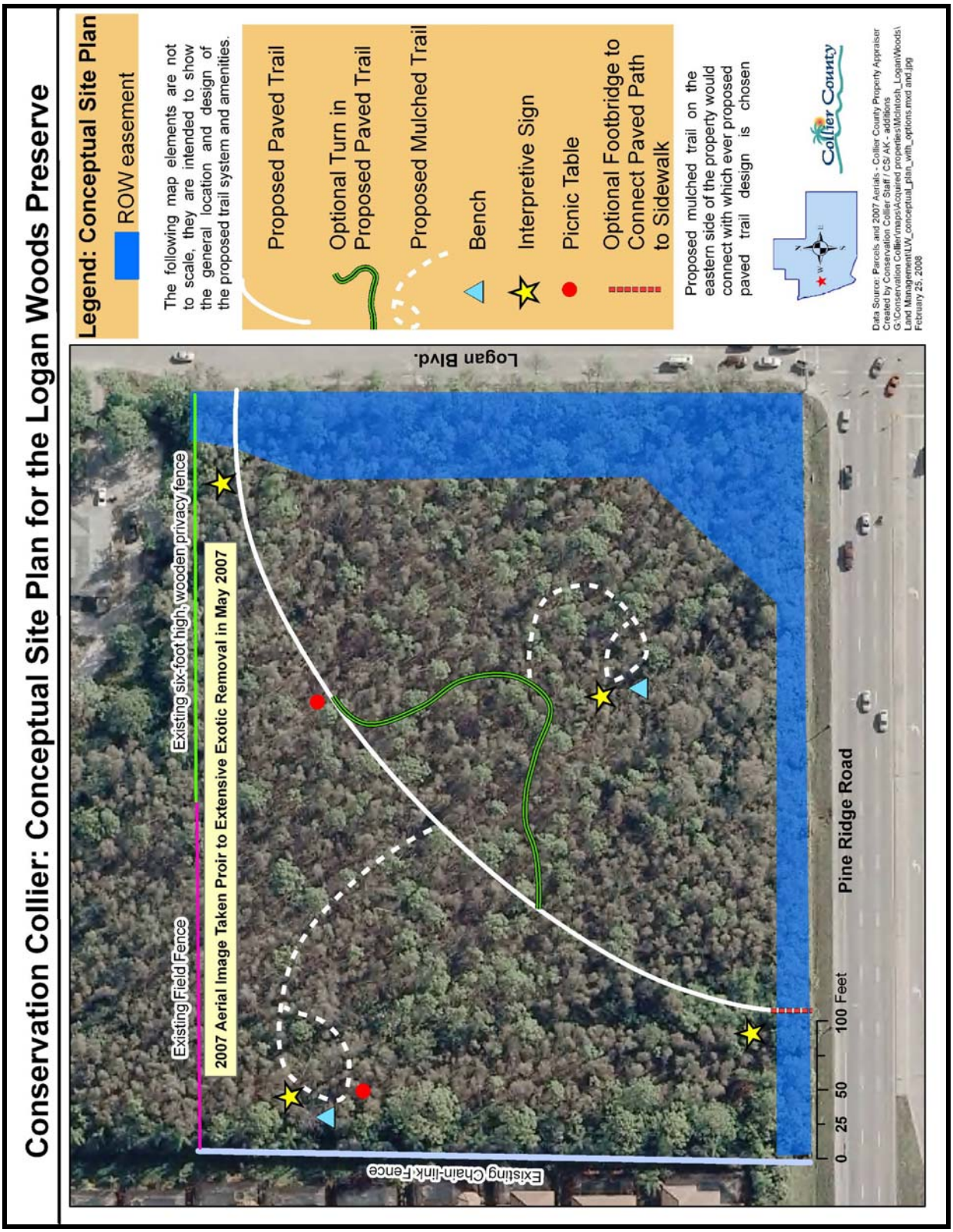

Figure 12. Logan Woods Preserve Conceptual Master Plan

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 and ecosystem information. A specific sign will be made about invasive exotics with before and after photos to show how the site was transformed. Kiosks or large signs with a map of the trails will be installed at each trailhead.

Action Item 6.2 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. It will also provide education about invasive exotics. A rainproof box will be installed near the preserve entrance(s). The box will be inspected monthly by the Preserve Manager and refilled as necessary.

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

Action Item 7.1 Discourage visitation to the park at night.

A sign designating park hours as dawn 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 on a routine basis.

Action Item 7.2 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. There are also some Melaleuca trees that were killed in place on the private property adjacent to the preserve. The property owner has given us permission to cut down any of the dead trees that may start to lean towards the preserve or the Vineyards community that could potentially damage either fence.

Action Item 7.3 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 7.4 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. The trees that may have fallen into the road ways or adjacent sidewalks will be the responsibility of the Transportation Department as they own the easement. 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 Logan Woods Preserve

This section provides management recommendations for operation of the Logan Woods 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 maintaining the trail, fence and signage and to control dumping and littering within and around the preserve. The mulched portions of the trail will be replenished every few years as the mulch breaks down. The Sheriffs weekender crews can be utilized to lay mulch and to pick up debris within the preserve and along the two main roadways.

4.5.2 Estimated Annual Costs and Funding Sources

Preliminary budget estimates for Logan Woods 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. Table 10 shows the activities planned for the next ten years and the initial and annual cost estimate of each activity. Private and public organizations may also provide funding for specific projects.

Funding already secured for management activities at Logan Woods Preserve include a grant from the Florida DEP Bureau of Invasive Plant Management ($38,000) to conduct the initial exotic removal and/or treatment. Additional grants will be sought to supplement existing management funding to possibly fund trail and/or boardwalk construction and signage. Staff will also utilize the Collier County Sheriffs Department weekenders program for certain labor projects and may also involve the County Scout programs for trail creation and enhancement.

The budget in table 9 represents the actual and unmet budgetary needs for managing the lands and resources of the preserve. 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 below considers available funding and is consistent with the direction necessary to achieve the goals and objectives for Logan Woods Preserve.

Table 9: Estimated Annual Land Management Budget (Amounts in $)													
			YEARS										
Item	**QTY**	**Cost ($)**	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	**Total**
Paved Trail (LF) [1/]	640-760	21,504-25,536		21,504-25,536									21,504-25,536
Mulched Trails (LF) [2/]	595-730				750-918			750-918			750-918		$2,250-2,754
Footbridge	1	20,000		20,000									$20,000
Survey and Fence (550 LF) [4/]		6,145	6,145										$5,395
Interior signage: Interpretative [5/]	4	500		2,000									$2,000
Small signs	5	100		500									$500
Plant signs	25	50		1,250									$2,500
Entry signage (set) [6/]	1	2,500		2,500									$2,500
Benches (2), table (1) & trashcans (3) [7/]	6	500-1000		3,700									$3,700
Kiosk [8/]	1	10,000		10,000									$10,000
Bike Rack [9/]	1	$200		$200									$200
									Table continues on next page….				

Table 9: Estimated Annual Land Management Budget (Amounts in $)													
			YEARS										
Item	**QTY**	**Cost ($)**	2007-08	2008-09	2009-10	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	**Total**
Exotic Removal (events)[10/]			(38,000) $16,100	$3,700	3,700	1,850	1,850	1,850	1,850	1,850	1,850	1,850	$30,900
Native Plant Restoration (will seek grants)[10/]					10,000		5,000						$15,000
General Facilities Maintenance (month/yr) [11/]	6	200					200	200	200	200	200	200	$1,200
Brochures[12/]							300	300	300	300	300	300	$1,800
Grand Total			22,245	65,354-69,386	14,450-14,618	1,850	7,350	4,950-5,118	2,350	2,350	4,950-5,118	2,350	119,449-123,985

(Assumptions for cost estimates on following page)

Assumptions for Cost Estimates:

1. Paved Trails: option #1-640 LF (5 feet wide) at $33.60 per linear foot

   option #2- 760 LF (5 feet wide) at 33.60 per linear feet

2. Mulched Trails: option #1- 595 LF 5 feet wide at 3 inches deep @2.00 per bag Cost=$750.00 option #2- 730 LF 5 feet wide at 3 inches deep @2.00 per bag

   Cost= $918.00 Mulched trails can be made through the use of volunteers or the Sherriffs Department Weekender Crews

3. Footbridge-(optional) to connect paved trail to Pine Ridge Road sidewalk

   Cost would include engineering and permitting fees and cost for materials estimated total cost $20,000 (will get more firm costs for final version of plan if subcommittee requests)

4. Survey and Fence: installed in January 2008- 280 feet of 6 foot wood stockade and 270 feet of field fence. Survey of northern property line- $750- Total cost $6,145

5. Interior signage: 4 interpretative signs (4'x6') at $500 each; 5 small signs at $100 each; and 25 plant signs at $50 each

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

7. Tables, benches & trash cans: Estimated costs- $1,000 for an ADA picnic table, $600 per bench (2), and $500 per trash can including dome tops Total= $3,700

8. Kiosk: Consider a 240 SF at $62.5/SF

9. Removal of Exotics: (38,000) received through grant funding, retreatment will cost $1,850 per event, 2 events a year for two years then one event per year thereafter

10. Native Plant Restoration : will get more firm costs for final plan

11. General Maintenance: Estimated at $200 per month after it opens to public

12. Brochures: 300 per year in printing costs

4.5.3 Potential for Contracting Restoration and Management Activities by Private Vendors

A significant number of Logan Woods 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 10.

Table 10: Potential Contracting for Restoration and Management Activities

Activity	Approved	Conditional	Rejected
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/or boardwalk installation	X		
Law enforcement and patrol	X		

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Appendix 1. Deed and Legal Description of the Property

L3

CONSERVATION COLLIER
Property Identification Number: 38391000008 & 38391080002

3717208 OR: 3911 PG: 3610
RECORDED in OFFICIAL RECORDS of COLLIER COUNTY, FL
10/14/2005 at 08:31AM DWIGHT E. BROCK, CLERK
CONS 711983.00
REC FEE 27.00
DOC-.70 4984.00
COPIES 3.00

Prepared by:
Ellen T. Chadwell, Esquire
Office of the County Attorney
3301 East Tamiami Trail
Naples, Florida 34112
(941) 774-8400

Retn:
REAL ESTATE SERVICES
EXT 8917/CINDY
INTER OFFICE

WARRANTY DEED

THIS WARRANTY DEED is made this 23rd day of September, 2005, by **ROSS W. MCINTOSH, AS TRUSTEE UNDER THE PRL NORTHWEST LAND TRUST AGREEMENT DATED APRIL 1, 1986**, whose address is 720 Goodlette Road North, Suite 303, Naples, FL 34102-5656, (hereinafter referred to as "Grantor"), to **COLLIER COUNTY**, a political subdivision of the State of Florida, its successors and assigns, whose post office address is 3301 Tamiami Trail East, Naples, Florida, 34112 (hereinafter referred to as "Grantee").

(Wherever used herein the terms "Grantor" and "Grantee" include all the parties to this instrument and their respective heirs, legal representatives, successors and assigns.)

WITNESSETH: That the Grantor, for and in consideration of the sum of Ten Dollars ($10.00) and other valuable consideration, receipt whereof is hereby acknowledged, hereby grants, bargains, sells, aliens, remises, releases, conveys and confirms unto the Grantee, all that certain land situate in Collier County, Florida, to wit:

See Attached Exhibit "A" which is incorporated herein by reference.

Subject to easements, restrictions, and reservations of record.

THIS IS NOT HOMESTEAD PROPERTY.

TOGETHER with all the tenements, hereditaments and appurtenances thereto belonging or in anywise appertaining.

TO HAVE AND TO HOLD the same in fee simple forever.

AND the Grantor hereby covenants with said Grantee that the Grantor is lawfully seized of said land in fee simple; that the Grantor has good right and lawful authority to sell and convey said land; that the Grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances except as noted above.

IN WITNESS WHEREOF, the said Grantor has signed and sealed these presents the day and year first above written.

Pamela S. Hough
(Signature)

Pamela S. Hough
(Printed Name)

Suzanne Howard
(Signature)

Suzanne Howard
(Printed Name)

BY: Ross W. McIntosh, Trustee
ROSS W. MCINTOSH, as Trustee under the PRL Northwest Land Trust Agreement dated April 1, 1986

THIS CONVEYANCE ACCEPTED BY THE BOARD OF COUNTY COMMISSIONERS, COLLIER COUNTY, FLORIDA, PURSUANT TO AGENDA, DATED: 9/13/05 ITEM NO. 16A(17)

OR: 3911 PG: 3611

STATE OF FLORIDA
COUNTY OF COLLIER

The foregoing Warranty Deed was acknowledged before me this 23rd day of SEPTEMBER, 2005 by Ross w. McIntosh, as Trustee under the PRL Northwest Land Trust Agreement dated April 1, 1986, who is personally known to me or who has produced _____ as identification.

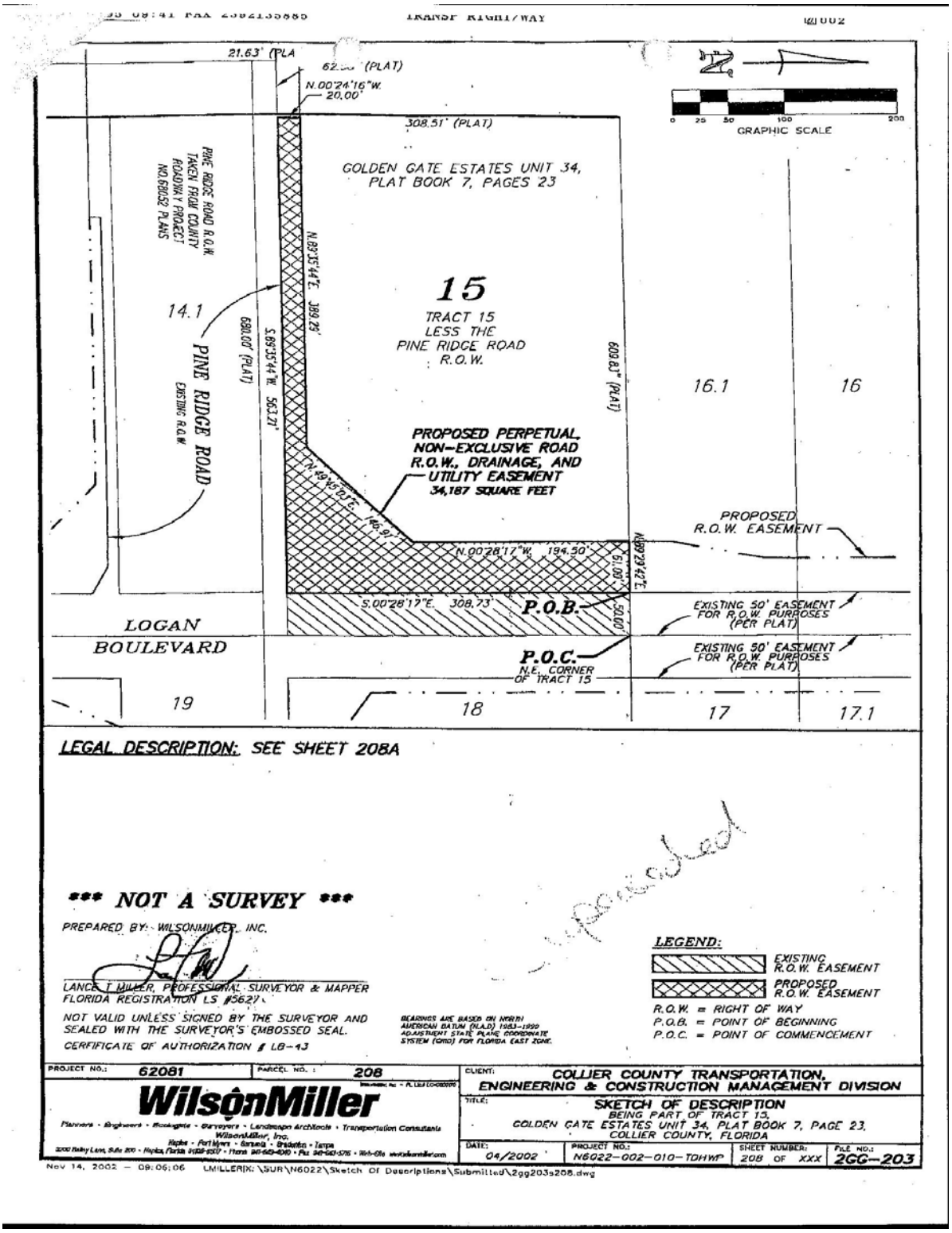
(affix notarial seal)

Suzanne Howard
(Signature of Notary Public)

SUZANNE HOWARD
MY COMMISSION # DD 254804
EXPIRES: November 6, 2007
Bonded Thru Notary Public Underwriters

SUZANNE HOWARD
(Print Name of Notary Public)
NOTARY PUBLIC
Serial/Commission #: _____
My Commission Expires: 11/06/2007

Approved as to form & legal sufficiency
Assistant County Attorney
Ellen T. Chadwell


21.63' (PLA
62.00' (PLAT)
N.00°24'16"W.
20.00'
308.51' (PLAT)
GRAPHIC SCALE
0 25 50 100 200
GOLDEN GATE ESTATES UNIT 34,
PLAT BOOK 7, PAGES 23
PINE RIDGE ROAD R.O.W.
TAKEN FROM COUNTY
ROADWAY PROJECT
NO.68052 PLANS
N.89°35'44"E. 389.25'
15
TRACT 15
LESS THE
PINE RIDGE ROAD
R.O.W.
14.1
PINE RIDGE ROAD
EXISTING R.O.W.
680.00' (PLAT)
S.89°35'44"W. 563.21'
609.87' (PLAT)
16.1
16
PROPOSED PERPETUAL
NON-EXCLUSIVE ROAD
R.O.W., DRAINAGE, AND
UTILITY EASEMENT
34,187 SQUARE FEET
N.19°43'10"E. 146.91'
PROPOSED
R.O.W. EASEMENT
N.00°28'17"W. 194.50'
N.00°28'17"W. 208.47'
50.00'
S.00°28'17"E. 308.73'
P.O.B.
EXISTING 50' EASEMENT
FOR R.O.W. PURPOSES
(PER PLAT)
LOGAN
BOULEVARD
P.O.C.
N.E. CORNER
OF TRACT 15
EXISTING 50' EASEMENT
FOR R.O.W. PURPOSES
(PER PLAT)
19
18
17
17.1
LEGAL DESCRIPTION: SEE SHEET 208A
*** NOT A SURVEY ***
PREPARED BY: WILSONMILLER, INC.
LANCE T. MILLER, PROFESSIONAL SURVEYOR & MAPPER
FLORIDA REGISTRATION LS #5627
NOT VALID UNLESS SIGNED BY THE SURVEYOR AND
SEALED WITH THE SURVEYOR'S EMBOSSED SEAL.
CERTIFICATE OF AUTHORIZATION # LB-43
BEARINGS ARE BASED ON NORTH
AMERICAN DATUM (NAD) 1983-1990
ADJUSTMENT STATE PLANE COORDINATE
SYSTEM (GPS) FOR FLORIDA EAST ZONE.
LEGEND:
EXISTING
R.O.W. EASEMENT
PROPOSED
R.O.W. EASEMENT
R.O.W. = RIGHT OF WAY
P.O.B. = POINT OF BEGINNING
P.O.C. = POINT OF COMMENCEMENT
PROJECT NO.: 62081
PARCEL NO.: 208
CLIENT: COLLIER COUNTY TRANSPORTATION,
ENGINEERING & CONSTRUCTION MANAGEMENT DIVISION
WilsonMiller
Planners • Engineers • Ecologists • Surveyors • Landscape Architects • Transportation Consultants
WilsonMiller, Inc.
TITLE: SKETCH OF DESCRIPTION
BEING PART OF TRACT 15,
GOLDEN GATE ESTATES UNIT 34, PLAT BOOK 7, PAGE 23,
COLLIER COUNTY, FLORIDA
DATE: 04/2002
PROJECT NO.: N6022-002-010-TDHWP
SHEET NUMBER: 208 OF XXX
FILE NO.: 2GG-203
Nov 14, 2002 - 09:06:06 LMILLER(X:\SUR\N6022\Sketch Of Descriptions\Submitted\2gg203s208.dwg

*** OR: 3911 PG: 3612 ***

EXHIBIT "A"

PROPERTY IDENTIFICATION NUMBER: 38391000008 & 38391080002

LEGAL DESCRIPTION:

All of Tract 15, Golden Gate Estates, Unit No. 34, in accordance with and subject to the plat recorded in Plat Book 7, Page 23, Public Records of Collier County, Florida.

LESS

All that part of Tract 15, Golden Gate Estates, Unit 34, according to plat thereof recorded in Plat Book 7, Page 23, of the Public Records of Collier County, Florida, and being more particularly described as follows:

Beginning at the Northeast corner of said Tract 15;
Thence along the East line of said Tract 15 South 00°28'17" East 330.00 feet;
Thence along the South line of said Tract 15 South 89°29'42" West 680.00 feet;
Thence along the West line of said Tract 15 North 00°30'18" West 21.63 feet;
Thence along the North line of said Tract 15 North 89°32'48" East 66.80 feet;
Thence leaving said North line North 00°24'16" West 20.69 feet;
Thence North 89°35'44" East 389.28 feet;
Thence North 49°45'03" East 146.91 feet;
Thence North 00°28'17" West 194.50 feet to the North line of said Tract 15;
Thence along the North line of said Tract 15 North 89°29'42" East 111.00 feet to the Point of Beginning.

AND

South 150 feet of Tract 16, Unit 34, Golden Gate Estates, according to plat thereof recorded in Plat Book 7, Page 23, of the Public Records of Collier County, Florida.

LESS

All that part of the South 150 feet of Tract 16, Golden Gate Estates, Unit 34, according to plat thereof recorded in Plat Book 7, Page 23, of the Public Records of Collier County, Florida, and being more particularly described as follows:

Beginning at the Southeast corner of said Tract 16;
Thence along the South line of said Tract South 89°29'42" West 111.00 feet;
Thence leaving said South Tract line North 00°28'17" West 38.35 feet;
Thence North 13°01'28" East 85.70 feet;
Thence North 00°28'17" West 28.33 feet;
Thence North 89°29'42" East 91.00 feet;
Thence along the East line of said Tract 16 South 00°28'17" East 150.00 feet to the Point of Beginning.

Conservation Collier – McIntosh Trust

Appendix 2. Preliminary Plant List Compiled by Conservation Collier Staff

Scientific Name	Common Name(s)	Origin	State Status*	FNAI**	FLEPPC***
Acacia auriculiformis	Earleaf Acacia	Introduced			I
Acer rubrum	Red Maple	Native			
Ardisia escallonioides	marlberry	Native			
Baccharis halimifolia	Salt Bush	Native			
Bidens alba	spanish needle, beggars tick	Native			
Blechnum serrulatum	Swamp Fern	Native			
Centella asiatica	spadeleaf	Native			
Callicarpa americana	Beauty Berry	Native			
Cassytha filiformis	love vine, Devil's gut	Native			
Cladium jamaicense	Saw Grass	Native			
Cupaniopsis anacardioides	Carrotwood	Introduced			I
Cyperus sp.	flatsedge	Native			
Desmodium sp.	Beggars's lice	Native			
Diodia virginiana	Virginia buttonweed	Native			
Dioscorea bulbifera	Air-potato	Introduced			I
Eugenia rhombea	red stopper	Native	Endangered	G5/S1	
Ficus aurea	Strangler Fig	Native			
Gnapthalium falcatum	cudweed	Native			
Ilex cassine	Dahoon Holly	Native			
Ilex vomitoria	Dwarf youpon Holly	Native			
Lygodium microphyllum	Old World Climbing Fern	Introduced			I
Melaleuca quinquinervia	Melaleuca	Introduced			I
Mikania scandens	climbing hempvine	Native			
Momordica charantia	Balsam apple	Introduced			
Myrica cerifera	Wax Myrtle	Native			
Myrsine floridana	Myrsine	Native			
Oeceoclades maculata	monk orchid	Introduced			
Parthenocissus quinquefolia	Virginia-creeper, Woodbine	Native			
Persia borbonia	red bay	Native			
Phlebodium aureum	Golden polypody	Native			
Pinus elliottii var. densa	Slash Pine	Native			
Pluchea sp	pluchea	Native			
Pyschotria nervosa	Wild coffee	Native			
Quercus minima	dwarf live oak	Native			
Rhodomyrtus tomentosa	Downey Rosemyrtle	Introduced			I
Rubus trivialis	Southern dewberry	Native			
Sabal palmetto	Cabbage palm	Native			
Schinus terebinthifolius	Brazilian Pepper	Introduced			I
Smilax sp.	Cat Briar	Native			
Spermacoce prostrata	Prostrate false buttonweed	Native			
Syzygium cumini	Java Plum, Jambolan	Introduced			I
Taxodium distichum	Cypress	Native			
Tillandsia balbisiana	Reflexed wild-pine, Northern needleleaf	Native	Threatened		
Tillandsia fasciculata	Stiff-leaved wild-pine, Cardinal airplant	Native	Endangered		
Tillandsia pruinosa	fuzzywuzzy airplant	Native	Endangered	G4/S1	
Toxicodendron radicans	Eastern poison-ivy	Native			
Tradescantia spathacea	Oyster Plant	Introduced			II
Urena lobata	Caesar's weed	Introduced			II
Vitis rotundifolia	Muscadine grape vine	Native			
Woodwardia virginica	chain fern	Native			
Xyris caroliniana	Yellow-eyed grass	Native			
Xyris fimbriata	*Fringed yellow-eyed grass*	Native			

**** State Status: provides status of species according to the Florida Department of Agriculture and Consumer Services***

***** FNAI: provides global rank and state rank according to the Florida Natural Areas Inventory***
G4 = Apparently secure globally; G5 = Demonstrably secure globally; S1 = Critically imperiled in Florida

****** FLEEPCC: Category I or Category II invasive, exotic species according to the Florida Exotic Pest Plant Council's 2007 Invasive Plant List***

Appendix 3. FNAI Report

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

FLORIDA Natural Areas INVENTORY

Florida Natural Areas Inventory

Biodiversity Matrix Query Results

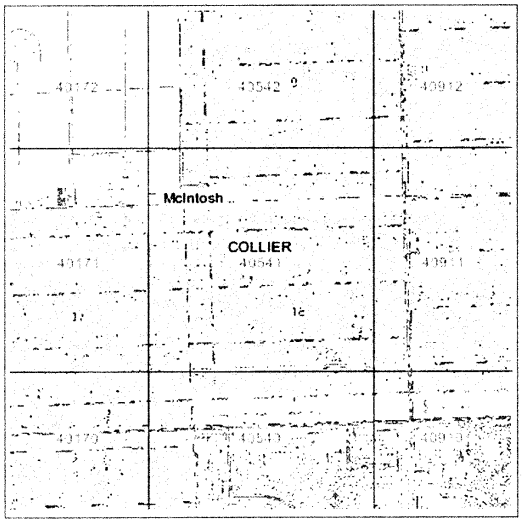
UNOFFICIAL REPORT

Created 2/15/2008

(Contact the FNAI Data Services Coordinator at 850.224.8207 for information on an official Standard Data Report)

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

Report for 1 Matrix Unit: 40541



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: 40541

0 **Documented** Elements Found

0 **Documented-Historic** Elements Found

1 **Likely** Element Found

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Mycteria americana Wood Stork	G4	S2	LE	LE

FNAI Biodiversity Matrix

Matrix Unit ID: 40541

20 **Potential** Elements for Matrix Unit 40541

Scientific and Common Names	Global Rank	State Rank	Federal Status	State Listing
Athene cunicularia floridana Florida Burrowing Owl	G4T3	S3	N	LS
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	LS
Lechea cernua Nodding Pinweed	G3	S3	N	LT
Linum carteri var. smallii Carter's Large-flowered Flax	G2T2	S2	N	LE
Mesic flatwoods	G4	S4	N	N
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
Polyrrhiza lindenii Ghost Orchid	G2G4	S2	N	LE
Puma concolor coryi Florida Panther	G5T1	S1	LE	LE
Rana capito Gopher Frog	G3	S3	N	LS
Rostrhamus sociabilis plumbeus Snail Kite	G4G5T3Q	S2	LE	LE
Roystonea elata Florida Royal Palm	G2G3	S2	N	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*

http://data.labins.org/mapping/FNAI_BioMatrix/GridSearch.cfm?sel_id=40541&extent=6... 2/15/2008

Appendix 4. Description/ Biology of Category I Invasive, Exotic Plants Found on the Logan Woods Preserve

- Description/biology of these plants from Langeland and Stocker (2001).
- 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.

Description/ Biology of Category I Invasive, Exotic Plants Found on the Logan Woods Preserve		
Scientific Name	**Common Name(s)**	**Description/ Biology**
Acacia auriculiformis	Earleaf acacia	A frequent invader of pinelands and disturbed sites.
Dioscorea bulbifera	Air-potato	heart-shaped leaves; dies back to tubers in winter in response to shortened day length, resprouts in spring from tubers; all three species produce aerial bulbils in late summer, early fall.
Lygodium microphyllum	Old world climbing fern	Fern with twining, climbing fronds, leaflets unlobed. One of the most serious natural area weed in Florida.
Melaleuca quinquenervia	Melaleuca, Punk tree, Paper bark	Tall, highly invasive tree in freshwater wetlands; extremely high seed production; seeds dispersed by wind following natural or mechanical disturbance.
Rhodomyrtus tomentosa	Downy rose myrtle	A very aggressive evergreen shrub to 6 ft tall. Identified by opposite, simple entire leaves, which are glossy green above, densely soft-hairy below, with three main veins form blade base; round, dark purple fruit with sweet aromatic flesh.
Cupaniopsis ana cardioides	Carrotwood	Invades interior of hammocks; added to Florida Noxious List in 1999; bird dispersed.
Schinus terebinthifolius	Brazilian pepper	Dioecious; female trees produce enormous quantities of bird-dispersed fruit; seed germinate readily; some people experience allergic reactions to the sap.
Syzygium cumini	Java plum, Jambolan	Large trees, bird- and mammal-dispersed fruits.
Tradescantia spathacea	Oyster plant	Succulent with sword-shaped rosettes of leaves green and bright purple leaves.
Urena lobata	Ceasar's weed	Weedy plant, bristly small seeds and spread easily by attaching to humans and animals.

Appendix 5. Before and After (Exotic Removal) Photographs Taken at the Three Photo Point Locations Established for Logan Woods Preserve.

The following photographs were taken at the photo point located within the Logan Woods Preserve.

NORTH

EAST

SOUTH

WEST

The following panoramic photographs were taken at the photo point located within the Logan Woods Preserve.

BEFORE EXOTIC REMOVAL

AFTER EXOTIC REMOVAL

The following panoramic photographs were taken at the photo point located on Pine Ridge Road across from the Logan Woods Preserve.

BEFORE EXOTIC REMOVAL

AFTER EXOTIC REMOVAL

The following panoramic photographs were taken at the photo point located on Logan Blvd. across from the Logan Woods Preserve.

BEFORE EXOTIC REMOVAL

AFTER EXOTIC REMOVAL