Lee County Board Of County Commissioners
Agenda Item Summary

Blue Sheet No. 20060598

1. ACTION REQUESTED/PURPOSE:

Approve the Gator Hole Preserve (GHP) Land Stewardship Plan.

2. WHAT ACTION ACCOMPLISHES:

Approving of the GHP Plan establishes guidelines for restoration activities at the Preserve.

3. MANAGEMENT RECOMMENDATION:

Approve the plan so Land Stewardship staff can begin implementation.

4. Departmental Category: C11A		**5. Meeting Date:** 05-30-2006
6. Agenda:	**7. Requirement/Purpose:** *(specify)*	**8. Request Initiated:**
x **Consent**	___ **Statute**	**Commissioner**
___ **Administrative**	x **Ordinance** Lee Plan	**Department** Parks & Recreation
___ **Appeals**	___ **Admin. Code**	**Division**
___ **Public**	___ **Other**	**By: John Yarbrough, Director**
___ **Walk-On**		

9. Background:

A Land Stewardship Plan is necessary for appropriate and planned restoration, management and public use facility development of any Conservation 20/20 Preserve. The CLASAC (Conservation Lands Acquisition and Stewardship Advisory Committee) unanimously passed a motion on April 13, 2006, accepting the Gator Hole Preserve Land Stewardship Plan.

The plan was available for public review on the internet, as well as at the South County Regional Library. A public meeting was held May 2, 2006.

10. Review for Scheduling:

Department Director	Purchasing or Contracts	Human Resources	Other	County Attorney	Budget Services				County Manager/P.W. Director
					Analyst	Risk	Grants	Mgr.	
CCW 5/17/06				5/17/06		5/18	5/18/06	5/18/06	

11. Commission Action:

___Approved
___Deferred
___Denied
___Other

RECEIVED BY COUNTY ADMIN: 5-17-06 1:05 5/18/06 11:30

Rec. by CoAtty Date: 5/17/06 Time: 8:50 Am Forwarded To: 10:45 Am 5/17/06

Gator Hole Preserve
Land Stewardship Plan

14291 Corkscrew Road
Estero, FL 33928

DRAFT - May 2006

CONSERVATION

20/20
LAND PROGRAM

Prepared by the Land Stewardship Section
Lee County Department of Parks and Recreation

Approved by the Lee County Board of County Commissioners:
(Date)

Acknowledgements

We would like to thank the following individuals, in addition to Lee County Land Stewardship Staff, for their assistance in the development of this document: Michael Weston (Division of Forestry), Betsie Hiatt (Department of Transportation) and Brian Fagan (Division of Natural Resources). Members of the Management Sub-Committee of the Conservation Lands Acquisition and Stewardship Advisory Committee were also helpful in providing valuable suggestions for this plan.

Sherry Furnari
Laura Wewerka

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LIST OF ACRONYMS

ATV	all terrain vehicle
BA	basal area
C20/20	Conservation 20/20
CLASAC	Conservation Lands and Stewardship Advisory Committee
CREW	Corkscrew Regional Ecosystem Watershed
DRGR	density reduction groundwater resource
ERW	Estero River Watershed
ESA	Environmental Site Assessment
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDNR	Florida Department of Natural Resources
FDOF	Florida Division of Forestry
FDOT	Florida Department of Transportation
FLEPPC	Florida Exotic Pest Plant Council
FLUCCS	Florida Land Use, Cover and Forms Classification System
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
GHP	Gator Hole Preserve
IPD	Industrial Planned Development
IRC	Institute for Regional Conservation
LDOT	Lee County Department of Transportation
LSOM	Land Stewardship Operations Manual
MAP	Management Action Plan
MU	Management Units
SFWMD	South Florida Water Management District
USACOE	U.S. Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	U.S. Fish and Wildlife Service

Vision Statement

It is the vision of the Lee County Parks and Recreation Department and the Conservation 20/20 Program to conserve, protect and restore Gator Hole Preserve to a productive, functional and viable ecosystem. The flatwoods and cypress heads will no longer have dense stands of melaleuca and other invasive exotic plants. The freshwater wetland communities will continue to recharge the underground aquifers and provide valuable habitat and foraging opportunities for wildlife. The berms and ditches from the fallow agricultural field will be restored to enhance the transitional plant communities with increased hydrologic functionality and improved wildlife habitat. Maintaining the upland ecosystems with prescribed fire and controlling all invasive exotic plants will become ultimate objectives for the management of this Preserve.

I. EXECUTIVE SUMMARY

Gator Hole Preserve (GHP) is located in southeastern Lee County on the north side of Corkscrew Road, 0.8 miles west of Alico Road and 3.8 miles east of I-75. The 175 acre Preserve was acquired in 2000 through the Conservation 20/20 (C20/20) Program for $3,000,000. The Conservation 20/20 Program was established in 1996 after Lee County voters approved a referendum that increased property taxes by up to .5 mil for the purpose of purchasing and protecting environmentally sensitive lands.

The Gulf of Mexico and Caribbean Sea influence the climate of GHP creating mild, sub-tropical conditions. Average annual rainfall is almost 58"; slightly lower than the County's average (65") the majority falling between June and September. Four tropical cyclones passed over the Preserve during 2004-2005, the most damage occurring during Hurricane Wilma in 2005, which brought down numerous trees on the existing management trails and fence lines.

Geologically, the Preserve contains Tertiary-Quaternary Sediments created during the Pleistocene Epoch between 1.8 million to 10,000 years ago. This period is also known as the Ice Age, where huge ice sheets formed across Canada and the northern United States. Natural elevations at GHP range from 22' at the north end and slope in a general southwesterly direction to 17-18'. Five different soil types are found at the Preserve. All of the soil types are nearly level and poorly drained with severe limitations for recreation and local roads. For this reason, Land Stewardship staff will limit vehicular access to the Preserve for major restoration activities. Fifty-one percent of the soils are characteristic of south Florida flatwoods and 49% sloughs and ponds. The Preserve lies within the Estero River Watershed and is considered to be a recharge area for the sandstone aquifer, an important source of drinking water for Lee County.

Gator Hole Preserve consists primarily of mesic flatwoods (72%); other natural plant communities include dome swamp, wet flatwoods, depression marsh and wet prairie. There are also disturbed communities related to historical farming on the Preserve. Fire will be a critical management tool for the Preserve with the dominance of flatwoods. Over 150 plant and 70 animal species have been documented at the Preserve. This includes exotic and listed species. Approximately one third of the plant species are listed by either the State, Florida Natural Areas Inventory or the Institute of Regional Conservation. Listed wildlife documented at the Preserve includes eastern indigo snakes, white ibis, roseate spoonbills and wood storks. Historical records of Big Cypress fox squirrels, gopher tortoises and Florida black bear exist, although no signs were discovered during field work for this plan. The Preserve lies along the edge of a 60,000-acre wildlife corridor that includes Flint Pen Strand, Imperial Marsh and Corkscrew Regional Ecosystem Watershed lands. The seasonal wetlands, surrounded by intact upland communities are of particular importance to amphibians and wading birds residing at the Preserve.

Historically, GHP was farmed in the southwest corner between 1958 and 1966. Except for several primitive jeep trails and some logging activities, the site remained undeveloped.

A portion of the Preserve lies within a wellfield protection zone. Staff will need to use caution to ensure that management activities that use various chemicals and petroleum products comply with County Ordinances protecting these areas. The southwest corner of the Preserve has been temporarily fenced off to accommodate several gopher tortoises that needed to be relocated for a Lee County Department of Transportation road widening project. Many of the restoration activities at the Preserve will be concentrated in this relocation area for the first few years with the tortoises in mind. This area is permitted by Florida Fish and Wildlife Conservation Commission to accept up to 40 tortoises. Future tortoise relocations from Lee County infrastructure projects may take place in this initial area, however staff may decide to utilize additional flatwoods communities as they are restored if it is determined that they contain more suitable conditions. South Florida Water Management District holds a conservation easement over the wet prairie, cypress domes, depression marshes and some surrounding uplands. The terms of this easement do not present any conflicts with the planned uses for the Preserve. Currently, the Future Land Use for the Preserve is "Conservation Lands" and the zoning is "Agriculture." Staff will work with the Division of Planning to change the zoning to "Environmentally Critical."

The goal of this land stewardship plan is to identify Preserve resources, develop strategies to protect these resources and implement restoration activities to restore GHP to a productive, functional and viable ecosystem while insuring the Preserve will be managed in accordance with Lee County Parks and Recreation's Land Stewardship Operations Manual. Restoration and management activities at GHP will focus on control of invasive exotic plant and animal species, restoring hydrologic components, maintaining upland ecosystems with prescribed fire and brush reduction and enhancing wildlife habitat. A Management Action Plan that outlines restoration and stewardship goals has been developed. This plan outlines these goals and strategies, explains how to accomplish these goals, and provides a timetable for completion. This land stewardship plan will be revised in ten years.

II. INTRODUCTION

Gator Hole Preserve (GHP) was acquired as a single parcel in February 2000 through Lee County's Conservation 20/20 (C20/20) program for 3 million dollars. The Preserve totals 175 acres and is located on the north side of Corkscrew Road (Figures 1 and 2). The primary plant community found at the Preserve is flatwoods, mainly mesic with small patches of wet flatwoods. Additional plant communities include two small dome swamps (one of which had a resident

alligator that the Preserve was named after) and a former agricultural field that is undergoing ecological succession into flatwoods or wet prairie communities.

Historic aerials (Figures 3-5) show human influences since the 1940's with Corkscrew Road as the only visible feature along the southern edge of the Preserve. By the late 1950's, an agricultural field was in place at the southwestern portion of the Preserve and extended off the property to the west. By the mid-1960's, the agricultural fields were abandoned and vegetation began to grow sporadically in several patches. During the 1980's, besides vegetation growth, the only other notable change was the jagged trail created around the periphery of GHP. During the 1990's, as vegetation continued to grow rapidly on the Preserve, land use activities surrounding it accelerated as the agricultural fields were converted into large-scale mining operations that now encircle GHP. Besides the internal impacts associated with agricultural berms and ditches, the external influences greatly affect the Preserve's hydrological elements.

Land stewardship challenges for the site include invasive exotic plant control, modifications to the berms and ditches to improve hydrologic sheetflow and water storage for residents in the community, reintroduction of fire and in some portions of the preserve, mechanical thinning of pines and the reduction of dense shrubby mid-story. At this time, there are no public recreation amenities proposed at the Preserve, since it was believed that Flint Pen Strand, a County Preserve, was going to become a large regional park and is within 2 miles of the Preserve. However, Lee County Department of Transportation is exploring the possibility of using all or part of "Section 33," the County owned portion of Flint Pen Strand, for panther mitigation. Dependant upon the decision by Lee County, GHP may be considered as a site for a future Regional Park.

The purpose of this stewardship plan is to define conservation goals for GHP that will address the above concerns. It will serve as a guide for the Lee County Department of Parks and Recreation to use best management practices to ensure proper stewardship and protection of the Preserve. A significant amount of field surveys were conducted along with reviewing scientific literature and historical records to understand how the Preserve functions in the ecosystem, what wildlife and plants are found within its boundaries and how it has been impacted by people. This allows the plan to serve the purpose as a reference guide for those interested in learning more about the Preserve and some of the land stewardship efforts in Lee County.

Figure 1: Location Map

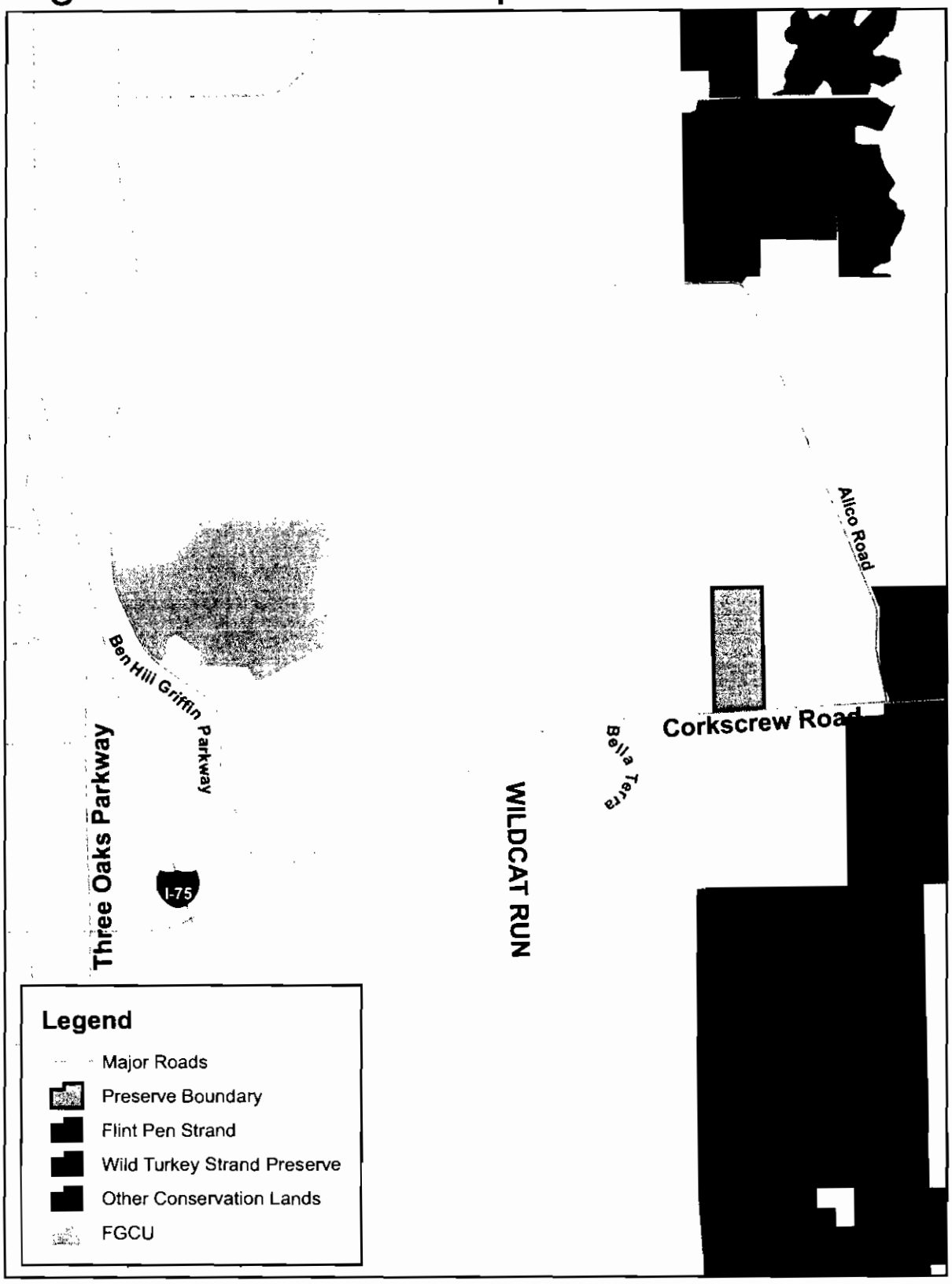
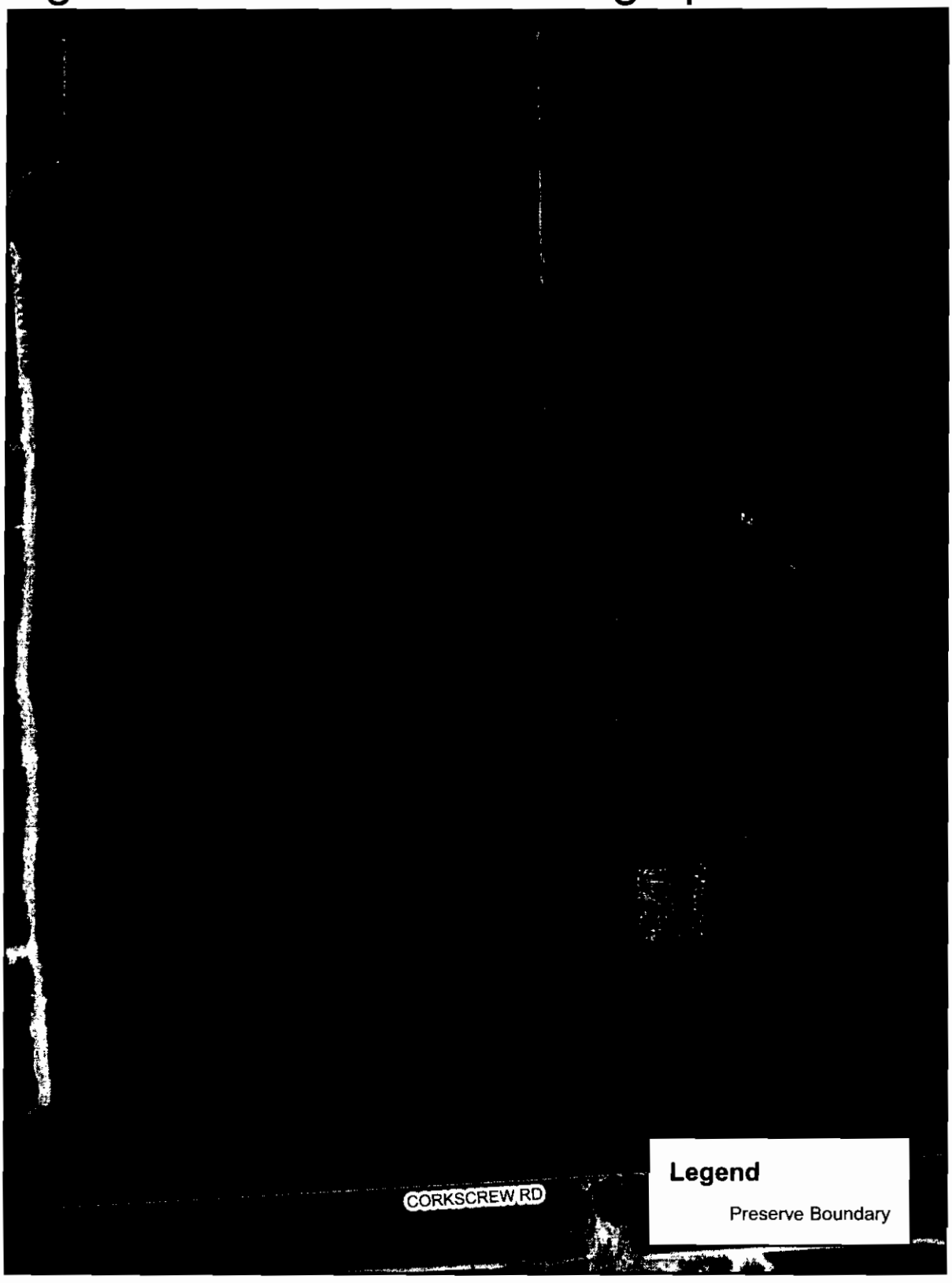


Figure 2: 2005 Aerial Photograph



N

Gator Hole Preserve

0 212.5 425 850 1,275 1,700 Feet

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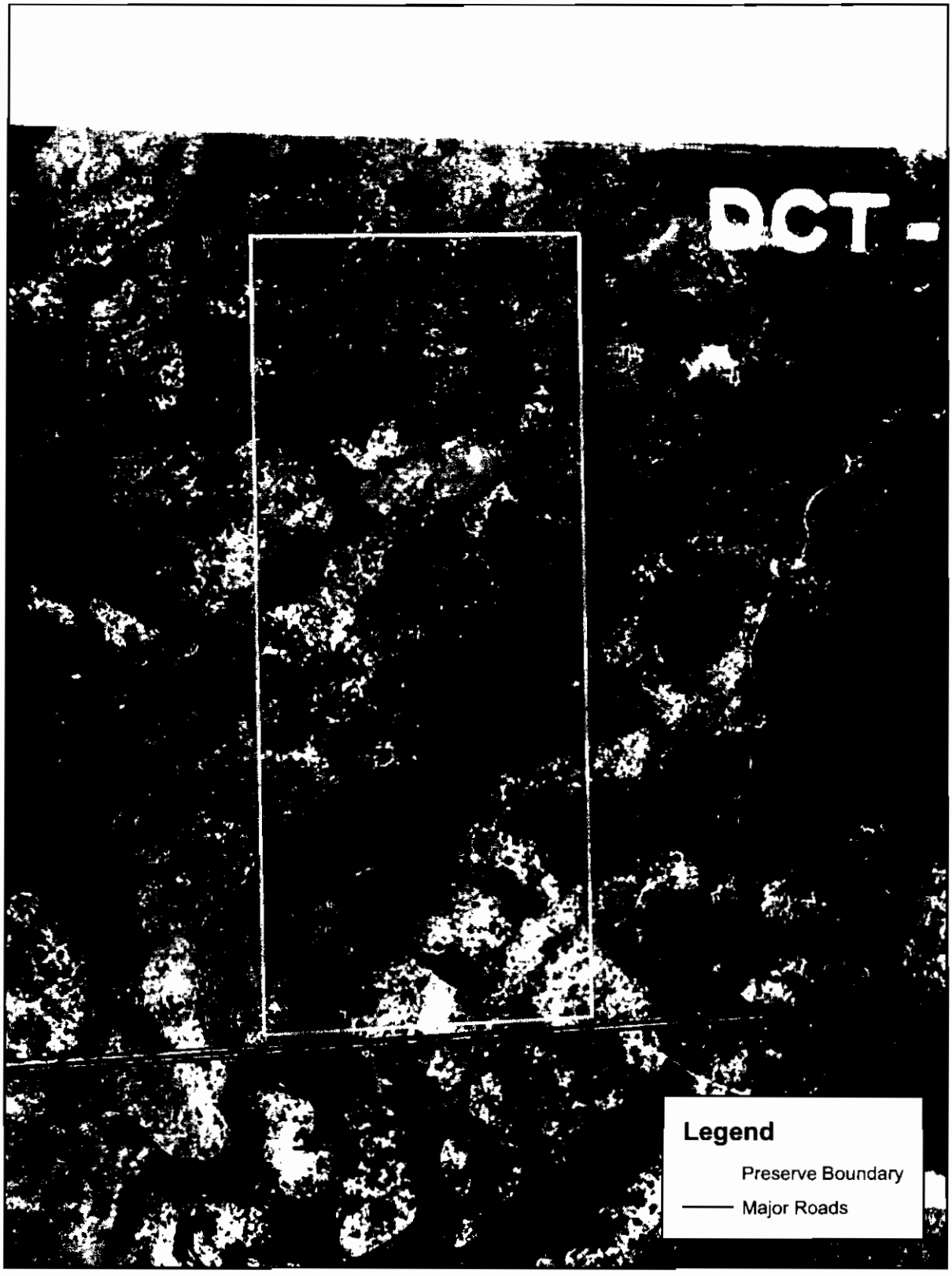
Map Prepared on: 2/21/06 by sfurnari@leegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes

Figure 3: Historical Aerial - 1944



N

Gator Hole Preserve

0 305 610 1,220 1,830 2,440 Feet

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Map Prepared on 01/24/06 by sfurnari@icegov.com

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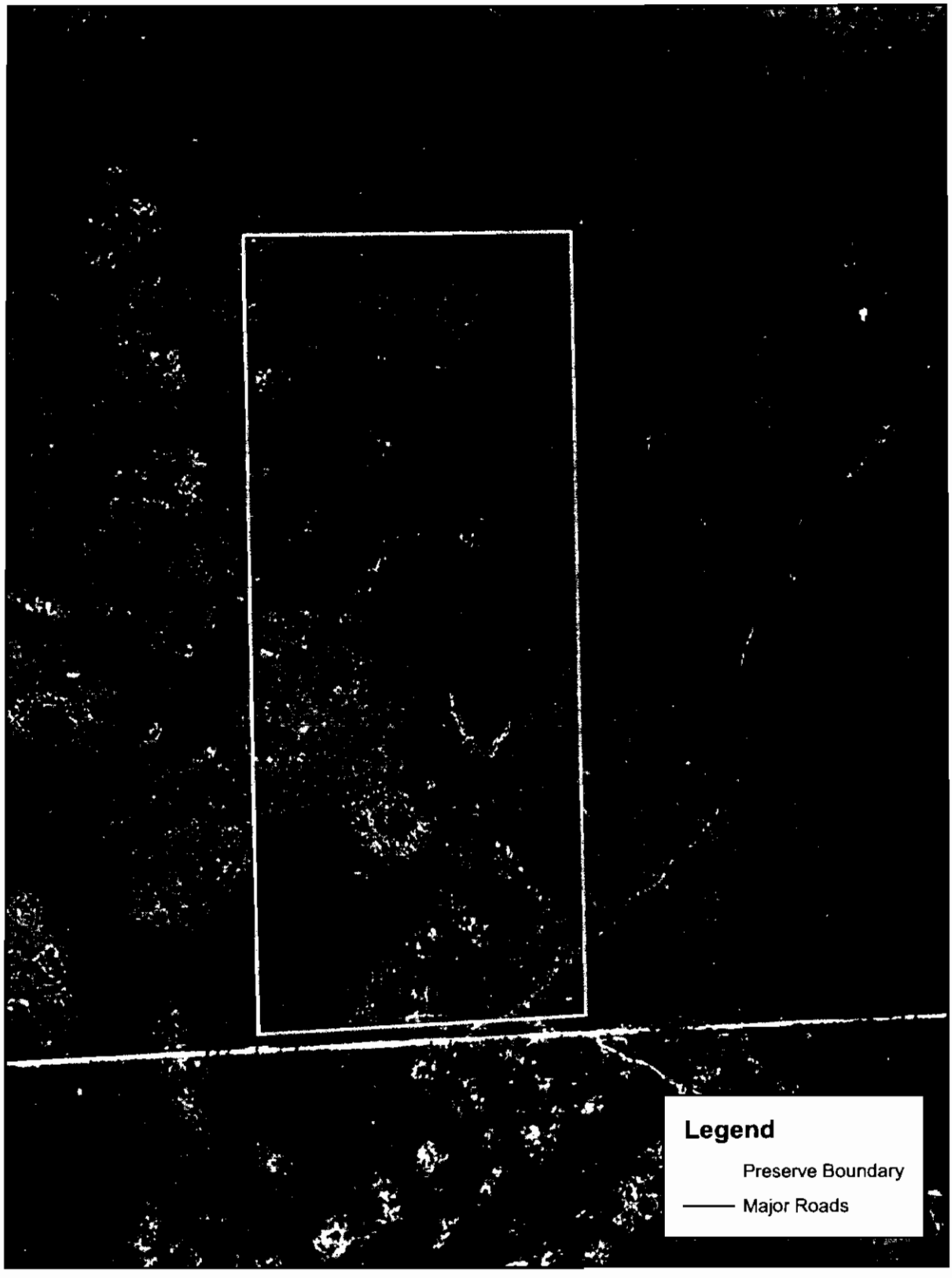
Figure 4: Historical Aerial - 1953



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Gator Hole Preserve

0 295 590 1,180 1,770 2,360 Feet

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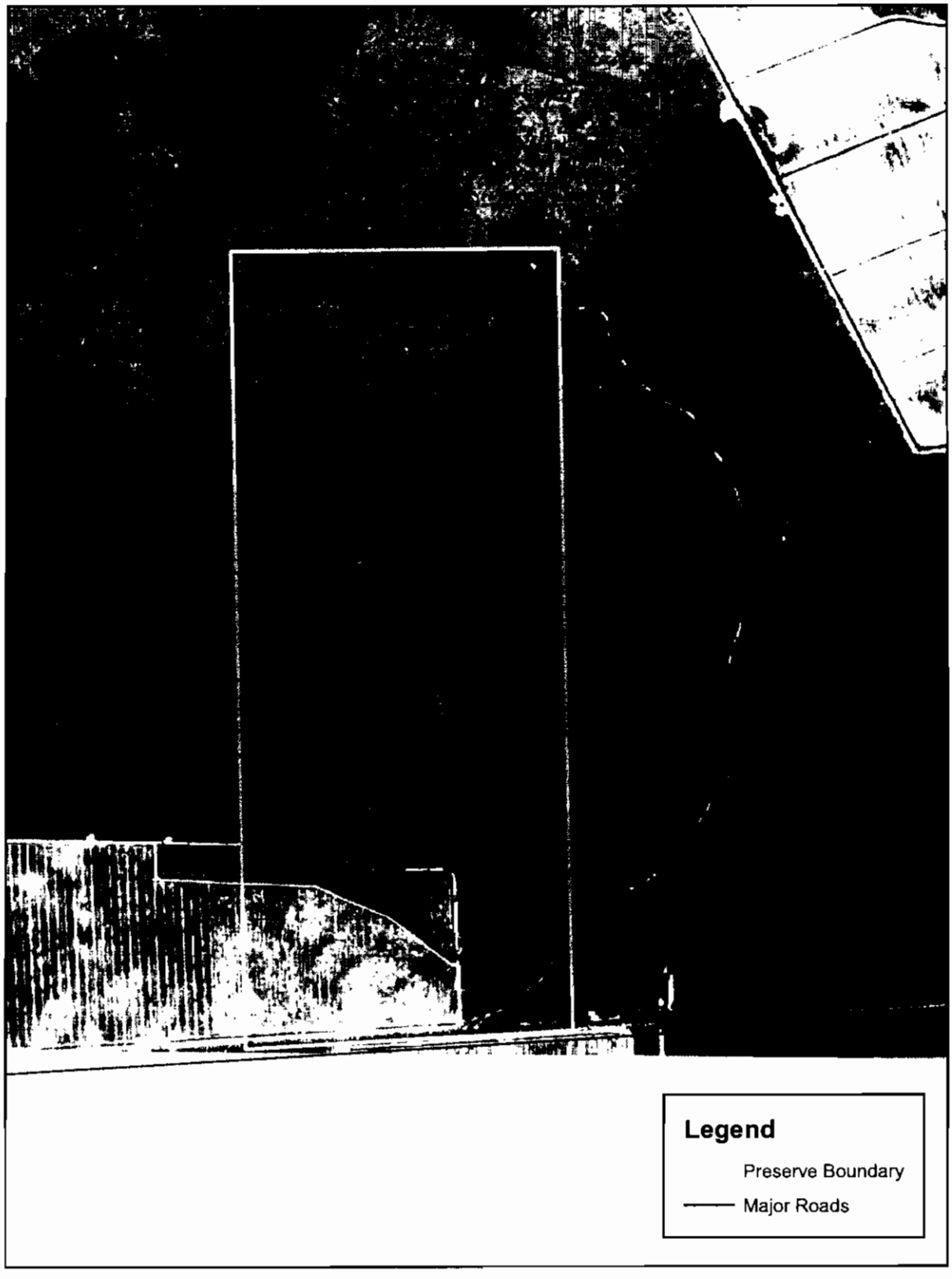
Map Prepared on 01/24/06 by sfurnari@leegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes

Figure 5: Historical Aerial - 1958



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Gator Hole Preserve

0 295 590 1,180 1,770 2,360 Feet

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Map Prepared on: 01/24/06 by sfurman@leegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes

III. LOCATION AND SITE DESCRIPTION

Gator Hole Preserve is located at 14291 Corkscrew Road, Fort Myers, in southeastern Lee County. GHP is on the north side of Corkscrew Road, 3.8 miles east of Interstate 75 and .8 miles west of Alico Road. It is in the western half of Section 21, Township 46 South, Range 26 East. The site is surrounded by mining activities to the north, east and south and vacant land, to be developed soon as single family homes, to the west.

The primary community found at the Preserve is flatwoods, mainly mesic with small patches of wet flatwoods. There are also two small dome swamps and a former agricultural field that is undergoing ecological succession into flatwoods and wet prairie communities. Ditches and berms, as well as invasive exotic plants have disturbed much of the Preserve, however 58% of the site has undergone initial invasive exotic plant removal.

IV. NATURAL RESOURCES DESCRIPTION

A. Physical Resources

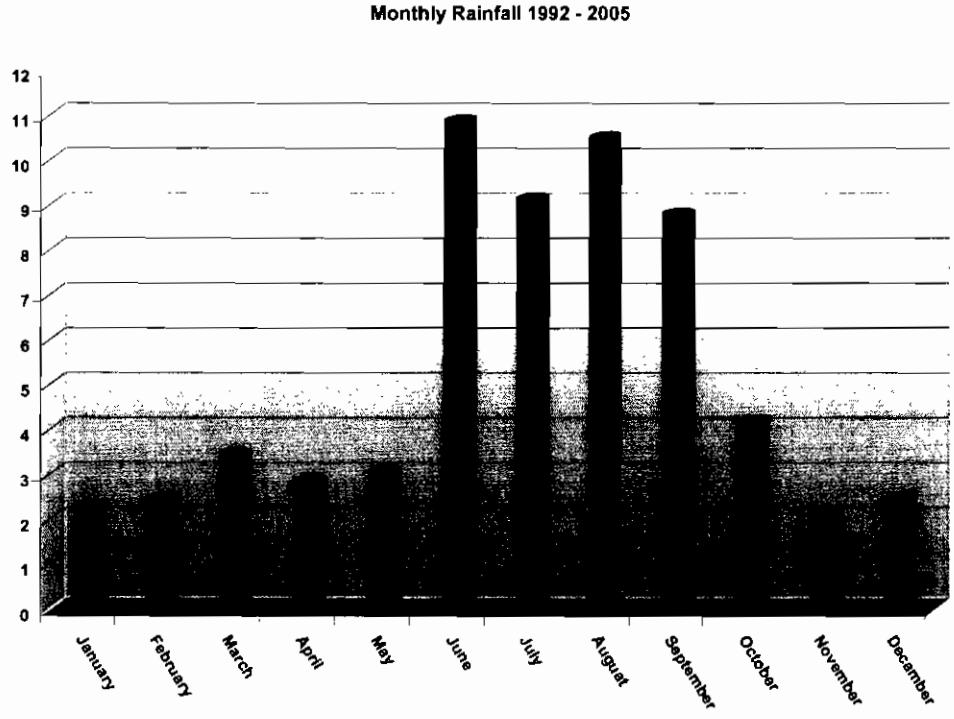
i. Climate

Southwest Florida has a humid, sub-tropical climate due to its maritime influence from the Caribbean Sea and the Gulf of Mexico. The mild temperatures encourage winter residents and tourists to visit the area. Temperate climate influences are exerted as well, with infrequent but significant freezes occurring in December and January. These freezes prevent some of the more tropical plants from becoming established and occasionally damage the subtropical vegetation. Cold fronts regularly push cool, sometimes moist weather from the southeastern U.S. to southwest Florida during the winter. These cold fronts also encourage migratory birds to utilize the Preserve as either a stop-off point on a longer voyage, or as a winter roosting and feeding area. Table 1 shows the average high and low temperatures for Fort Myers, Florida compiled by the Southeast Regional Climate Center from 1931 to 2004.

Table 1: Average High and Low Temperatures for Fort Myers, 1931 - 2004

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High temperature (°F)	74.7	76.1	79.8	84.2	88.7	90.6	91.1	91.4	89.7	85.7	80.2	76.0
Low temperature (°F)	53.5	54.7	58.4	62.4	67.5	72.4	74.1	74.5	73.9	68.3	60.4	55.1

The following graph depicts the rainfall data collected by Lee County Division of Natural Resources on a daily basis from the Corkscrew Water Plant. The gauge is located near the corner of Alico Road and Corkscrew Road, approximately 1 mile east of the Preserve. Average annual rainfall from 1992-2005 was 57.85 inches, slightly lower than the average rainfall for the entire county (64.76 inches).



Occasionally, major hurricanes pass through southwest Florida impacting natural ecosystems and man-made infrastructure. Although these effects are believed by many to be short-term, long-term consequences may result in plant canopy restructuring, invasive plant introduction and/or further dispersal and increased wildfire severity to communities from increased fuel loads (fallen and dead vegetation). The effect of hurricanes on natural systems is compounded by the already present human impacts. During 2004, three tropical systems (Charley, Frances and Jeanne) passed over Lee County bringing tropical storm force winds to the Preserve. Again in 2005, GHP was further impacted by Hurricane Wilma. As a result, several pine and melaleuca (*Melaleuca quinquenervia*) trees fell across the management trail system and perimeter fences.

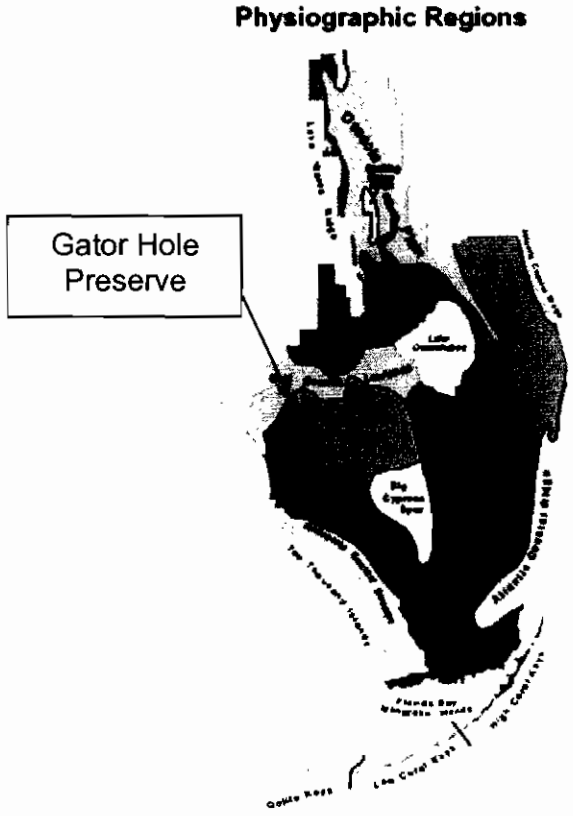
ii. Geology

For millions of years, the Florida Platform was submerged in the ocean. Sediments accumulated upon it and hardened into sedimentary rock. Thirty-five (35) million years ago, portions of Florida rose above the surface and for the next 12 million years it alternated between emersion and submergence. From 23 million years ago to the present, at least a small portion of the Florida Platform was always above the ocean surface.

Gator Hole Preserve lies within the Tertiary/Quaternary Sediments lithostratigraphic unit. Lithostratigraphic units are differentiated by the conditions under which they were formed and at what geologic time they were formed in. This unit was created during the Pleistocene Epoch between 1.8 million to 10,000 years ago. This period is also known as the Ice Age, where huge ice sheets formed across Canada and the northern United States. When these ice sheets were formed, they consumed large quantities of seawater, dropping the current sea level 300 or more feet, which greatly increased the land area of Florida. As the glaciers shrank, sea levels rose, and the Florida peninsula was again flooded. During the peak warm periods, sea level reached 150 feet above the current sea level. The waves and currents during these high sea level periods reworked the sediments and formed a series of geological units (Caloosahatchee, Ft. Thompson, Anastasia, Miami Limestone and Key Largo Limestone). Each of these geological units is characterized by its unique compositions. However, throughout much of Lee County, including the area where GHP is located, the Caloosahatchee and Fort Thompson units are somewhat indistinct and have been lumped together as undifferentiated Tertiary/Quaternary Sediments. This unit consists of a quartz sand blanket covering limestone and clay. Fossils, including mollusks and corals, are very common and usually in excellent condition (Missimer & Scott 2001).

Southwest Florida can be divided into ten major physiographic provinces (Figure 6, Map from: SFWMD 2000a). These are broad-scale subdivisions based on physical geography features such as terrain texture, rock type and geologic structure and history. Gator Hole Preserve lies within the Immokalee Rise. This region seems to have been built as a sub-marine shoal extending south from a mainland cape at the south end of the Desoto Plain. It is composed of sands in the form of relict bars and swales, which decrease in thickness to the south, east and west (SFWMD 1999b). The Immokalee Rise provides recharge to the water table and sandstone aquifers in Lee and Collier counties (SFWMD 1999b).

Figure 6: Physiographic Regions

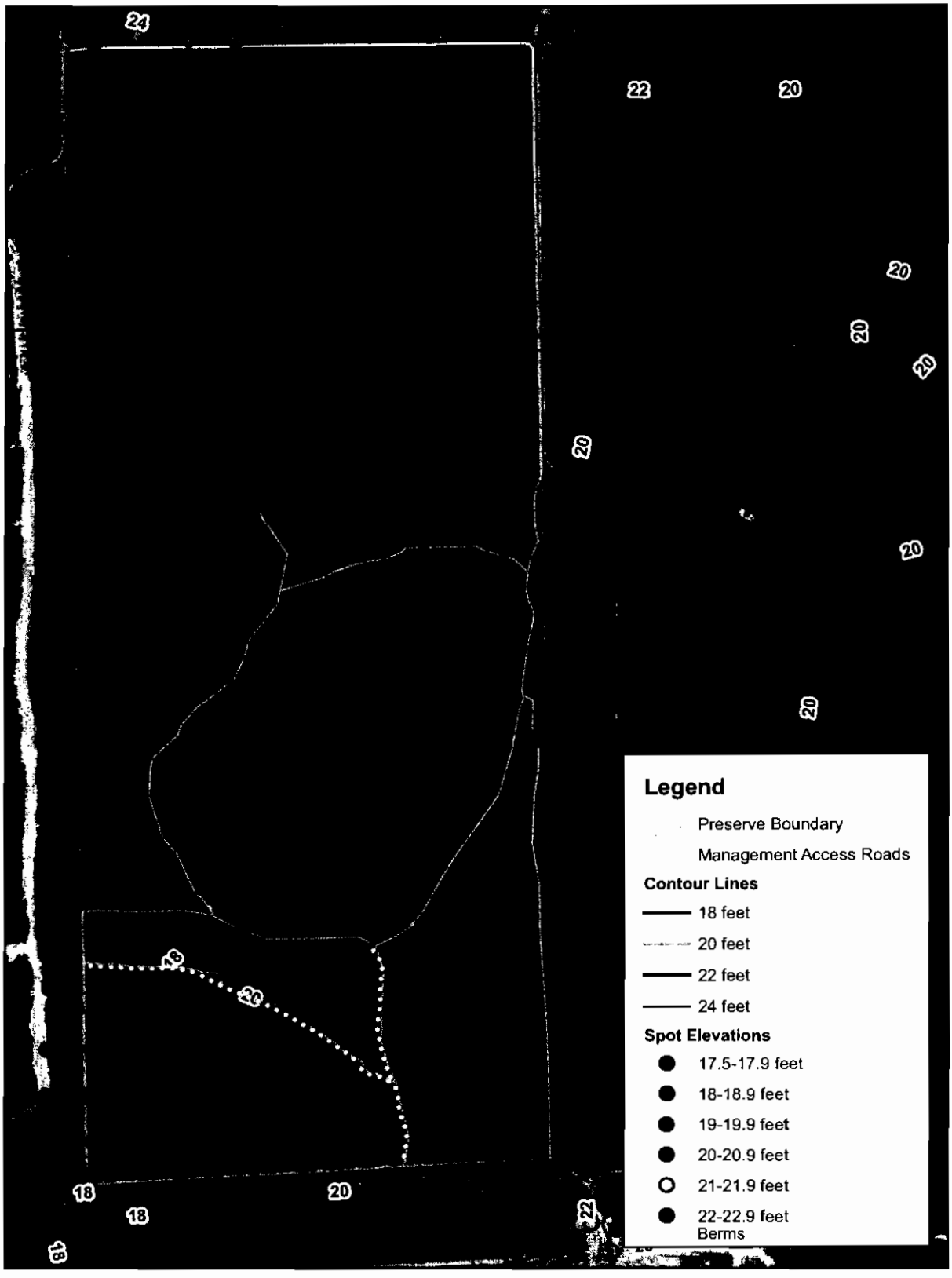


iii. Topography

Lee County is located within the Coastal Lowlands of Florida that extend around the coastal periphery of the state where elevations are generally below 100 feet (Stubbs 1940; Cooke 1945).

Natural elevations at GHP range from 22' at the north end and slope in a general southwesterly direction to 17-18' at the southwest corner of the Preserve (Figure 7). Man-made topographic features including management access roads, ditches and berms. The roads and ditches drop the elevation from a couple of inches up to approximately 2'. The average berm height is approximately 1.5'.

Figure 7: Topography



N

Gator Hole Preserve

0 225 450 900 1,350 1,800 Feet

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Map Prepared on 12/06/05 by lwewerka@leegov.com

This is not a survey. Land stewardship staff has prepared this map for initial planning purposes.

iv. Soils

The Soil Survey of Lee County, Florida (Henderson 1984) was designed for a diverse group of clients to be able to comprehend soil behavior, physical and chemical properties, land use limitations, potential impacts, and protection of the environment.

There are five (5) different soil types found at Gator Hole Preserve (Figure 8 and Table 2). A common relationship for all of these soil types is that their slopes range from 0-2%. Slope is "the inclination of the land surface from the horizon." Essentially, GHP is level. Table 2 and the descriptions below have been organized to quickly provide conservation managers with pertinent soils information for understanding restrictions and/or results regarding future land restoration and probable recreational plan limitations and expense.

There are eight (8) generalized range site categories in Lee County, three (3) of which are found on GHP. Note that these categories are not Florida Natural Areas Inventory (FNAI) natural plant community designations, but rather they are used to group soil types and where they might occur. The 3 identified on the Preserve are:

- South Florida flatwoods - Nearly level areas with scattered to numerous pine trees, saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), and other woody plants.
- Slough - Open grassland where nearly level areas act as broad natural drainage courses in the flatwoods. Potential plant community is dominated by blue maidencane (*Amphicarpum muhlenbergianum*), chalky bluestem (*Andropogon virginicus var. glaucus*), and blue joint panicum (*Panicum tenerum*).
- Freshwater marshes and ponds - Open grassland marshes or ponds (depressions) with the potential to produce significant amounts of various grasses, sedges, and rushes. Water fluctuates throughout the year.

Wetland classifications are used to identify locations that may retain water for an indeterminate amount of time.

- S-Slough (sheet flow): A broad nearly level, poorly defined drainage way that is subject to sheet-flow during the rainy season.
- P-Ponding: Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms. There are two hydrologic soil groups found on the Preserve:

- B - Soils having a moderate infiltration rate (low to moderate runoff potential) when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. Moderate rate of water transmission.
- D - Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist mainly of clays that have a high shrink-well potential, soils that have a permanent high water table, soils that have a clay pan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. Very slow rate of water transmission.

Note that some of the soil types are shown as having dual hydrologic groups, such as B/D. A B/D listing means that under natural conditions the soil belongs to D, but by artificial methods the water table can be lowered sufficiently so that the soil fits in B. The Preserve has been impacted by hydrological alterations of berms, ditches and roadways. Since there are different degrees of drainage or water table control, an onsite evaluation would be needed to determine the exact hydrologic group of the soil at each particular impacted location.

Soil permeability is defined as "the quality of the soil that enables water to move downward through the profile." Permeability is measured as the number of inches per hour that water moves downward through the soil. The water table columns indicate the amount of time water may be present at specified depth ranges. Terms describing permeability are below:

Very slow	< 0.06 inch
Slow	0.06 – 0.2 inch
Moderately slow	0.2 – 0.6 inch
Moderate	0.6 – 2.0 inches
Moderately rapid	2.0 – 6.0 inches
Rapid	6.0 – 20 inches
Very rapid	> 20 inches

At the Preserve, Hallandale Fine Sand is unique in having moderate to moderately rapid permability, while all the other soils have rapid permability.

Soils affect the type, quality and quantity of food and cover for wildlife. Wildlife diversity and abundance are also influenced by distribution of food, cover, and water. Wildlife habitat may be created or improved by planting appropriate vegetation, maintaining existing plant communities and promoting the natural establishment of desired vegetation. The soils of Lee County occur in four different habitat types:

- Openland: Cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. Wildlife attracted includes: northern bobwhite (*Colinus virginianus*), sandhill cranes (*Grus Canadensis*), hawks, various birds, and rabbits.

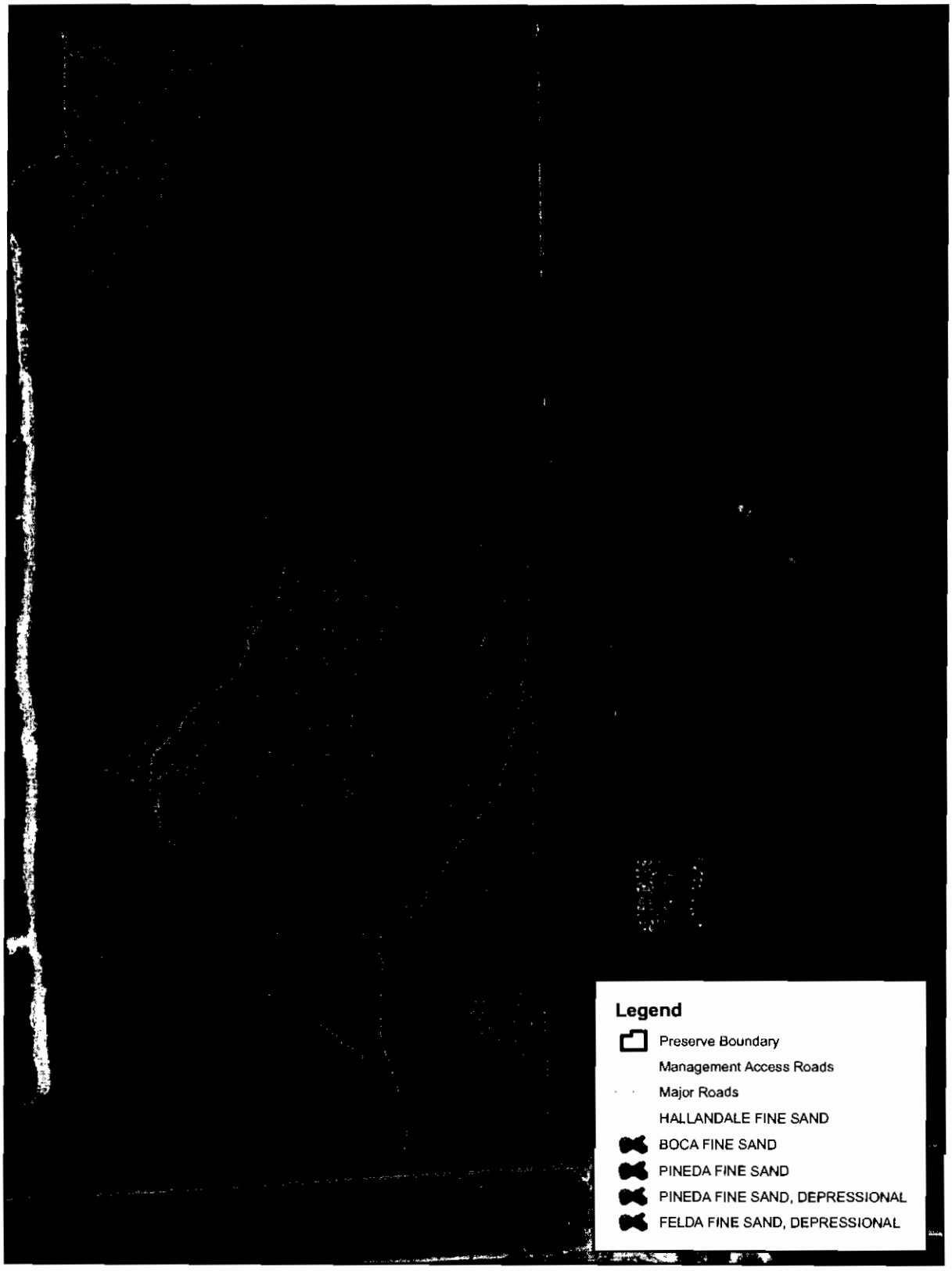
- Woodland: Deciduous plants, coniferous plants, grasses, legumes, and wild herbaceous plants. Wildlife attracted includes: wild turkeys (*Meleagris gallopavo*), thrushes, woodpeckers, squirrels, foxes, raccoons (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), snakes, frogs, and bobcats (*Lynx rufus*).
- Wetland: Open, marshy or swampy shallow water areas. Wildlife attracted includes: ducks, ibis, egrets, herons, shorebirds, snakes, frogs, alligators (*Alligator mississippiensis*), and river otters (*Lutra canadensis*).
- Rangeland: Shrubs and wild herbaceous plants. Wildlife attracted includes: white-tailed deer, northern bobwhite, opossums (*Didelphis virginiana*) and various birds.

The potential of the soil for wildlife habitat is rated as:

- Good - Easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected.
- Fair - Established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results.
- Poor - Limitations are severe as habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive.
- Very poor - Restrictions are very severe and unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.
- -- Soil was not rated.

Staff considers soil limitations that affect their suitability for recreational development. The soils within the Preserve have all been identified as having severe limitations for both of these purposes. For recreation "severe" means "that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures." In particular, paths and trails for "hiking and horseback riding should require little or no cutting and filling" plus "should not be subject to flooding more than once a year during the period of use." At this time, there recreational amenities are not proposed for GHP, but in the future these limitations will be essential for future plans. Additionally, the soils are rated as "severe" for "Local Roads," meaning that soil properties are "so unfavorable or so difficult to overcome that special design, significant increases in construction costs and possibly increased maintenance are required." No additional management roads are planned for the site and Land Stewardship staff will minimize any vehicular use on the Preserve to times when it is absolutely necessary. Examples would include prescribed burns, extensive exotic plant removal projects and tree thinning activities.

Figure 8: Soils



N

Gator Hole Preserve

0 225 450 900 1,350 1,800 Feet

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Map Prepared on 12/06/05 by lweworka@teegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes.

Table 2: Soil Types

Soil Types	Map Symbol	Total Acres	% of Preserve	Habitats (Range Site)	*Physical Attributes*							*Biological Attributes*				Limitations for Recreational Paths & Trails
					Wetland Class (1)	Hydrologic Group (2)	Surface Permeability	Subsurface Permeability	Water Table within 10" of surface	Water Table below 10-40" of surface	% Organic Matter	Potential as habitat for wildlife in–				
												Openland	Woodland	Wetland	Rangeland	
Boca Fine Sand	13	47.37	26.86	South Florida flatwoods		B/D	rapid	rapid	2-4 months	6 months	1-3%	fair	poor	fair	good	Severe: wetness, too sandy
[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Pineda Fine Sand	26	72.22	40.96	slough	S	B/D	rapid	rapid	2-4 months	> 6 months	5-8%	fair	poor	fair	–	Severe: wetness, too sandy

Color Key:

Wet

Wetter

(1) S – Slough (sheet flow): A broad nearly level, poorly defined drainage way that is subject to sheet-flow during the rainy season.
P – Ponding: Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

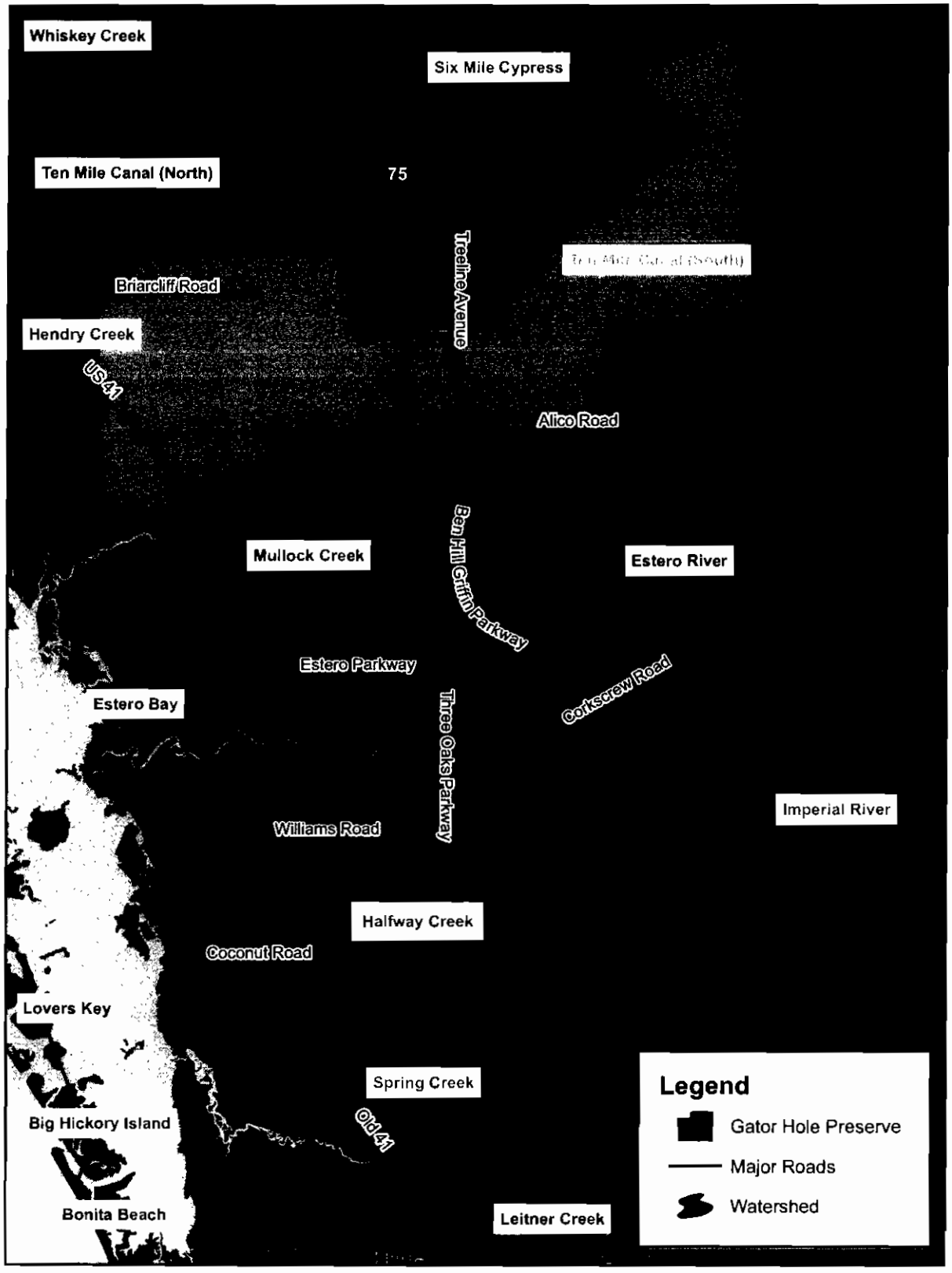
(2) * Water table is above the surface of soil
B – Soils having a moderate infiltration rate (low to moderate runoff potential) when thoroughly wet.
D – Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.

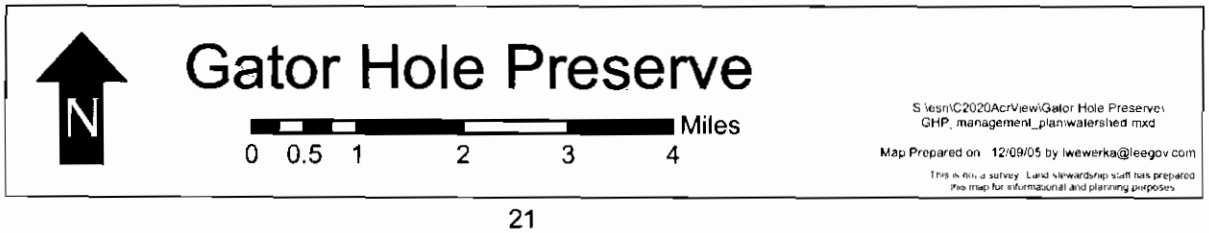
v. Hydrologic Components and Watershed

Gator Hole Preserve is within the north-central portion of the South Florida Water Management District's (SFWMD) Lower West Coast Region. GHP falls within the Everglades West Coast Basin, in the 288 square mile Estero Bay Planning Unit, in which interior portions contain hydric pine flatwoods that have significant ecological and hydrological value (FDEP 2003). The Preserve lies within the Estero River Watershed (ERW), which covers approximately 66 square-miles (Figure 9). ERW is approximately 15 miles long by 4 miles wide. Rainfall flows from S.R. 82 on the northeast boundary in a general southwest direction to the Estero River and eventually into Estero Bay. The primary focus of Lee County's Surface Water Master Plan concerned the downstream (west of Interstate 75) portions of the watershed, particularly the Estero River and adjacent lands and the protected State lands, further to the west. However, the report did discuss the entire watershed's function as a recharge area for the sandstone aquifer, a primary source of drinking water in Lee County. With the escalating development in the Corkscrew Road area, natural areas like GHP will be increasingly important for recharge of the aquifer. An additional general recommendation for ERW is to maintain or improve the groundwater levels. Removal of the thick melaleuca stands will assist in this goal.

There are several hydrological alterations that affect the Preserve's hydroperiod and southwesterly sheet flow across the property, primarily ditches and berms associated with the previous agricultural activities. There is an additional ditch, on the southeast portion of the Preserve, which cuts through the flatwoods. Staff recommends as a future goal, to fill or plug these existing ditches. This will allow for the natural sheetflow across the Preserve to be restored. However, this restoration work will need to be delayed until the gopher tortoises, relocated in the southwest portion of the Preserve, (see Internal Influences section) have had adequate time to disperse and become established in the adjacent flatwoods. Brush reduction, invasive exotic plant removal and a return of the prescribed fire regime should all be implemented before hydrologic activities begin. Stewardship staff also recommends slowly phasing the ditch restoration work to give the tortoises additional time to adjust to the changes in this area if they have not left the area before work is scheduled to begin.

Figure 9: Watersheds





B. Biological Resources

i. Ecosystem Function

Pine flatwoods serve as important habitat for a variety of birds, small mammals, reptiles and amphibians and some large mammals including white-tailed deer. Although many have not been documented at the Preserve, there are a number of rare wildlife species that primarily occur in the flatwoods. There are also numerous rare plants, including some endemic species, which are found exclusively in pine flatwoods. During a severe flood, the flatwoods serve as a water storage area to help protect adjacent landowners from flooding (Tiner 1998). Fire is an important part of pine flatwoods. Florida has more thunderstorm days per year than anywhere else in the country and, in turn, one of the highest frequencies of lightning strikes of any region in the United States. Fire shapes ecosystem processes in the flatwoods including creation of soil conditions suitable for germination of seeds of some species, turnover of litter, humus and nutrients, reduction of competition from hardwoods and increasing the hardiness of some species (Myers and Ewel 1990). Following exotic plant removal, fire will be a critical management tool at GHP.

Less than 10% of GHP contains cypress wetlands. These forested wetlands are productive ecosystems, which is related to hydrologic conditions. Healthy cypress communities capable of sustainable reproduction occur in depressions with a hydroperiod of approximately 250-290 days and maximum water levels of one to two feet (Duever et al. 1986). The lower hydroperiod and water level ranges produce smaller cypress and the upper ranges produce larger ones. There is some debate in the scientific community whether these two extremes represent two species of cypress (pond cypress (*Taxodium ascendens*) are small and bald cypress (*Taxodium distichum*) are large) or whether they represent the same species growing under different conditions.

The cypress trees mainly occur in domes in the central areas of the Preserve. The cypress domes, or heads, are depressions in which the largest cypress trees occur in the center and get progressively smaller from the center. Water drains only through the water table. The conditions for growth (long hydroperiod) are much better in the center as opposed to the edges due to more organic soils. The larger cypress trees populate the lower areas with longer hydroperiods. In the areas where the water is too deep for cypress, treeless ponds occur within the domes, supporting a myriad of plants and wildlife.

Animals count on the health and long-term viability of the cypress communities for nesting, breeding and feeding. The Florida cottonmouth (*Agkistrodon piscivorus conanti*) will climb upon mats of debris in the swamp ferns for sunning

platforms. Yellow-crowned night herons (*Nyctanassa violacea*) build their nests in the trees and white ibis (*Eudocimus albus*) and great egrets (*Ardea alba*) roost in the canopy. To sustain the health of the cypress communities, water quality and quantity must be protected and improved.

Although cypress wetlands and wet flatwoods communities at the Preserve have been or may continue to be hydrologically impacted by adjacent development (i.e. mining, roadways, residential communities, utility water wells) and exotic plant infestation, they still provide habitat and foraging opportunities for some species including alligators, frogs, osprey (*Pandion haliaetus*), belted kingfishers (*Ceryle alcyon*) and a variety of water birds. As restoration occurs, these communities will provide more opportunities for additional species.

ii. Natural Plant Communities

Gator Hole Preserve consists of eight plant communities, the majority of which consist of mesic flatwoods, disturbed fallow crop land and dome swamps. Historically, GHP contained additional wetland ecosystems that have been dramatically impacted by surrounding land uses and have changed as a result of drier conditions. Figure 10 shows the plant communities found at GHP. More detailed maps (Figures 19 & 20), illustrating density of pines and recommended exotic plant removal techniques can be found in the Management Action Plan. Most plant communities are defined using the Guide to the Natural Communities of Florida (1990) prepared by FNAI and the Florida Department of Natural Resources (FDNR), while others that have undergone extensive disturbance are described using terms that best describe the disturbed communities through a combination of classifications used by the Florida Land Use, Cover and Forms Classification System (FLUCCS) (FDOT 1999) and Land Stewardship staff on-site observation. The following are descriptions of the dominant plants and characteristic animals found within each community. A list of plant species identified during site inspections to GHP can be found in Appendix A. This list will be updated seasonally to identify plants in their inflorescence phase.

Mesic Flatwoods Community – 125.8 acres, 72% coverage

The majority of the Preserve contains mesic flatwoods community. Synonyms for this plant community include pine flatwoods and pine savannahs. Mesic flatwoods occur on relatively flat, moderately to poorly drained soils. Standing water is common for brief periods during the rainy season. Mesic flatwoods are characterized as having an open canopy with widely spaced pine trees and a dense ground cover of herbs and shrubs. Typical plants growing in these communities at GHP include south Florida slash pine (*Pinus elliottii var. densa*), saw palmetto, chalky bluestem, melaleuca, crowpoison (*Nothoscordum bivalve*), and tall elephantsfoot (*Elephantopus elatus*). The pine density of this plant

community varies dramatically from very sparse to an almost completely closed in canopy.

Animals that have been documented utilizing mesic flatwoods at the Preserve include the red-bellied woodpecker (*Melanerpes carolinus*), pine warbler (*Dendroica pinus*), hispid cotton rat (*Sigmodon hispidus*), and black racer (*Coluber constrictor priapus*).

Historically, natural fire probably burned in these communities every 1-8 years (FNAI 1990). Without frequent fires mesic flatwoods will succeed into hardwood-dominated forests whose closed canopy will gradually eliminate the groundcover of herbs and shrubs. On the other hand, too frequent or too hot fires would eliminate pine recruitment and eventually transform the mesic flatwoods into palmetto prairie. Some locations of the mesic flatwoods community were wet flatwoods until the hydroperiods became altered.

Mesic Flatwoods – Melaleuca Community – 6.5 acres, 4% coverage

These thick melaleuca monocultures are in disturbed patches. Wildlife found in these stands includes the melaleuca psyllid (*Boreioglycaspis melaleucae*) and melaleuca weevil (*Oxyops vitiosa*).

Fallow Crop Land Communities – 24.2 acres, 12.5% coverage

Fallow crop land is defined by FLUCCS as previously harvested agricultural land that is not currently in crop production. A 24-acre portion of the southwest area was previously used for row crops and has been impacted by these activities. The hydrologic features and plant succession have been changed by water pooling in the swales or diverted into ditches. While it does contain some characteristics of several plant communities, it cannot be considered a natural plant community due to these disturbances. Over 40 years have past since the field was used for growing vegetables and it is transitioning into the following defined communities:

Fallow Crop Land – Wet Flatwoods – 14.4 acres, 8% coverage

This community is characterized by a mosaic of open areas with patches of Brazilian pepper (*Schinus terebinthifolius*), laurel oak (*Quercus laurifolia*), slash pine, and wax myrtle (*Myrica cerifera*). Ground cover includes grasses and sedge species that include common bushy bluestem (*Andropogon glomeratus var. pumilus*), starrush whitetop (*Rhynchospora colorata*), and Caesarweed (*Urena lobata*).

Fallow Crop Land – Mesic Flatwoods – 5.0 acres, 3% coverage

The eastern portion has an open canopy with widely spaced slash pine trees and a dense ground cover of herbs and shrubs. Typical plants growing in this area at GHP include south Florida slash pine, saw palmetto, cabbage palm (*Sabal palmetto*), wax myrtle, Caesarweed, and Guinea grass (*Panicum maximum*), usually along disturbed edges.

Birds found in this community include blue jay (*Cyanocitta cristata*), blue-gray gnatcatcher (*Polioptila caerulea*), and palm warblers (*Dendroica palmarum*).

Fallow Crop Land – Wet Prairie – 4.2 acres, 2% coverage

The central portion of the fallow field is transitioning into a wet prairie community. With additional management activities such as removal of berms and ditches to increase the hydroperiod and fire to remove invading wax myrtle and laurel oaks, this area can become a healthy wet prairie that consists of a treeless plain with a ground cover of grasses and herbs. Like the depression marshes, wet prairies are fire dependant communities. Typically these areas will burn every 2-4 years and will become invaded with wax myrtle and other trees and shrubs during longer fire intervals.

Typical plants growing in this area at GHP include various grasses, swamp sawgrass (*Cladium mariscoides*), starrush whitetop, St. John's-wort (*Hypericum spp.*), beakrushes (*Rhynchospora spp.*), and nut-rushes (*Scleria spp.*).

Fallow Crop Land – Melaleuca – .6 acres, <.5% coverage

A northern patch of the fallow field is densely populated with melaleuca trees and should transition into a wet flatwoods community after exotic plant removal work. Typical plants noted in this area include melaleuca, slash pine, cabbage palm, and wax myrtle.

Dome Swamp Community – 7.4 acres, 4% coverage

There are two dome swamp communities located in a central portion of the Preserve. Dome swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because larger trees growing in the center and smaller trees growing on the periphery. Typical plants found in these communities include bald cypress, pond cypress, pond apple (*Annona glarbra*), golden polypody (*Phlebodium aureum*), Virginia chain fern (*Woodwardia virginica*), and resurrection fern (*Pleopeltis polypodioides*).

Typical animals include green treefrog (*Hyla cinerea*), wood stork (*Mycteria americana*), and peninsula cooter (*Pseudemys floridana peninsularis*). Exotic plants include Brazilian pepper and melaleuca and coverage varies from 5% in portions of the domes where exotics removal has already occurred to 20% in remaining portions of the domes.

Wet Flatwoods Community – 5.3 acres, 3% coverage

Remnant patches of wet flatwoods are scattered throughout the Preserve. Wet flatwoods occur on relatively flat, poorly drained terrain and water frequently stands on the surface for 1 or more months of the year. Many plants here are under the stress of water saturation during the wet season and under the stress of dehydration during the dry season (FNAI 1990). Wet flatwoods, or hydric flatwoods, at GHP show some variation of tree and shrub density. In addition to south Florida slash pines, some of the more common plants documented in these communities include wax myrtle, coastalplain St. John's-wort (*Hypericum brachyphyllum*), and Elliott's yelloweyed grass (*Xyris elliottii*). The most northwestern area was categorized under this plant community, although it contains some cypress trees. Because GHP has undergone hydrological modifications, this category could altogether disappear with any additional water removal activities.

Animals documented utilizing this plant community at GHP include red-shouldered hawks (*Buteo lineatus*), blue-gray gnatcatchers and squirrel treefrogs (*Hyla squirella*).

Natural fire regimes for this plant community range from every 3-10 years. Without a regular fire, wet flatwoods will succeed into hardwood-dominated forests whose closed canopy would gradually eliminate the groundcover herbs and shrubs. Lack of fire will allow pine needle drape and the height of flammable understory shrubs to increase, which will increase the probability of a catastrophic canopy fire.

Depression Marsh Community – 2.6 acres, 1.5% coverage

Synonyms for this community include isolated wetland, ephemeral pond and seasonal marsh. This community typically consists of open, treeless areas with vegetation that is often growing in concentric bands. Hydrologic conditions vary, with most depression marshes drying in most years. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year. Typical plants here include alligatorflag (*Thalia geniculata*), coastalplain willow (*Salix caroliniana*), and pickerelweed (*Pontederia cordata*). A wide variety of grasses, sedges and other herbaceous plants occur within this community.

Exotic species such as West Indian marsh grass (*Hymenachne amplexicaulis)* and Brazilian pepper are present here.

Animals documented utilizing this community include the great egret, great blue heron (*Ardea herodias*), pig frog (*Rana grylio*), and American alligator. Gator Hole Preserve's name was derived from the sighting of an alligator in this plant community.

Depression marshes are extremely important in providing breeding and foraging habitat for a variety of wildlife including amphibians. Because of their temporary nature, few large predatory fish occur in these wetlands, which would feed heavily on the tadpoles. Since this community typically dries down in most years, the aquatic animals become quite concentrated and are an excellent food source for birds and other wildlife.

Fire is important to maintaining this community by restricting the invasion of shrubs and trees, which would eventually reduce the hydroperiod through evapotranspiration and increased biomass as well as shading out the wetland. A typical burn regime for this plant community would be to burn the surrounding uplands every 1-3 years, allowing fire to actually burn through the wetland every third burn, but since this community is within a dome swamp it should only be burned occasionally when there is standing water in the cypress area.

Berm - Upland – 1.6 acres, 1% coverage

Typically, spoil areas contain the material dug from borrow areas, ditches, canals, roadways, etc. These berms were originally created from the spoil soils of ditches adjacent to the fallow crop lands in southern portions of the Preserve.

Since these elevated berms were created during the mid-1950's, much of this disturbed community is dominated by mature plants associated with upland communities. Plants on the northern berm include slash pines, cabbage palms, wax myrtle, and Brazilian pepper, while the southern berm primarily has small shrubs and grasses.

Wet Prairie Community – 1.4 acres, 1% coverage

Synonyms for this community include sand marsh and savannah. There are two small remnant wet prairies that have received initial exotic plant removal work targeting the melaleuca trees. Both are located along the fenced eastern boundary line adjacent to an existing power line and improved (elevated) dirt road for mining operations. A healthy wet prairie consists of a treeless plain with a ground cover of grasses and herbs including maidencane (*Panicum hemitomon*), knotted spikerush (*Eleocharis interstincta*), starrush whitetop and grassy arrowhead (*Sagittaria graminea*).

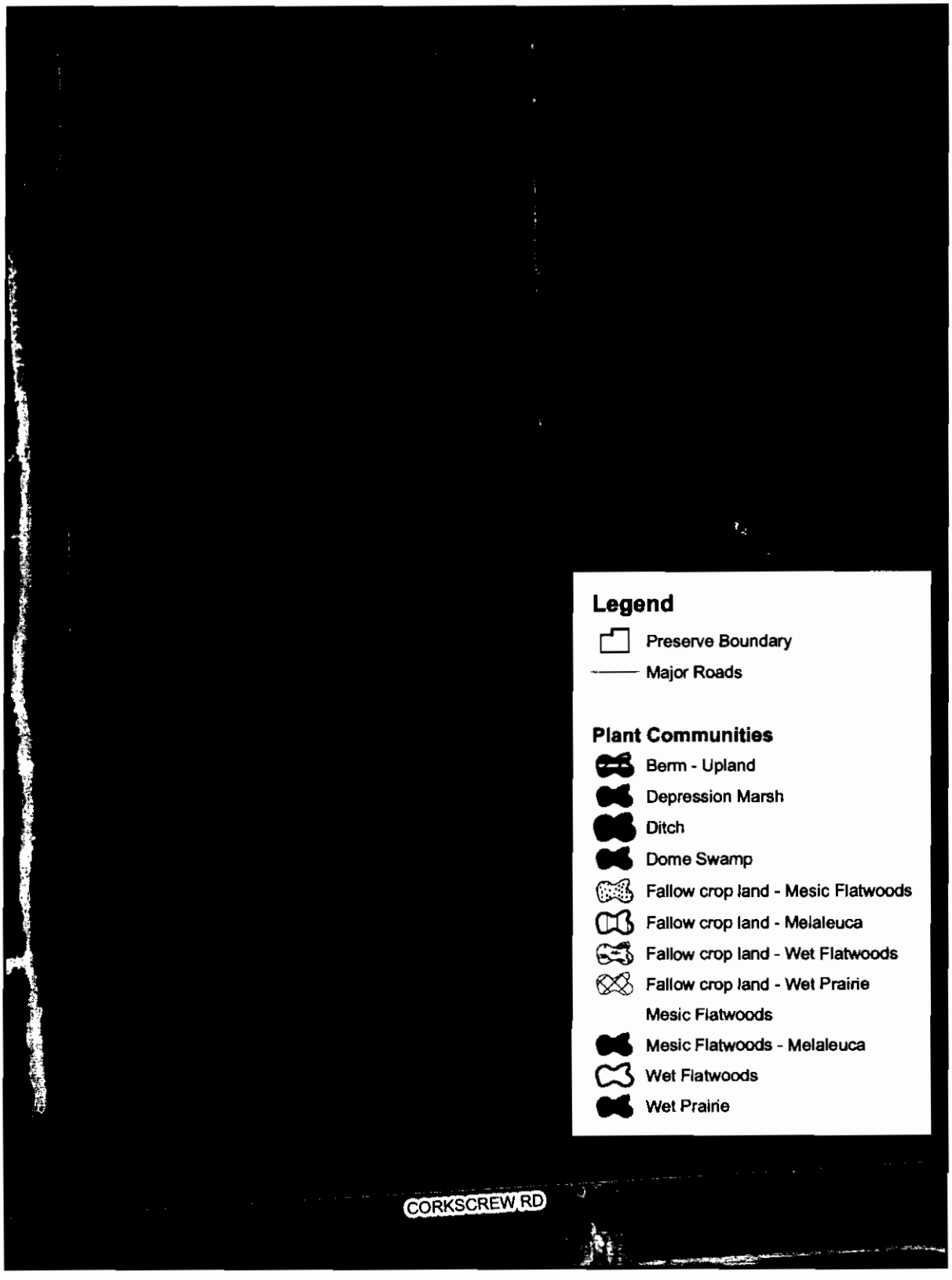
Wildlife documented at GHP includes oak toad (*Bufo quercicus*), eastern phoebe (*Sayornis phoebe*) and gray catbird (*Dumetella carolinensis*).

Like the depression marshes, wet prairies are fire dependant communities. Typically these areas will burn every 2-4 years and will become invaded with wax myrtle and other trees and shrubs during longer fire intervals.

Ditch – .2 acres, .5% coverage

The existing ditches are connected with the berms from the fallow crop land and an old trail in the southeastern portion of the Preserve. The types of plants found in these areas vary depending on the water width, depth and rate of flow. They include smartweed, Brazilian pepper, maidencane, various grasses and rushes.

Figure 10: Plant Communities



iii. Fauna

GHP has a diversity of fauna. On site, numerous listed species of special concern and a couple of threatened and endangered wildlife species have been recorded. See Appendix B for a list of wildlife documented at the Preserve. Wildlife species were recorded during numerous site inspections. Future wildlife sightings will continue to be recorded during site inspections and by Lee County Bird Patrol volunteers. There are also several exotic wildlife species that have been documented at the Preserve (Table 3). Of primary concern is the feral hog (*Sus scrofa*). Damage from the hogs, such as soil disturbance and vegetation damage, is apparent in the understory of the mesic and wet flatwoods.

Table 3: Exotic Wildlife at Gator Hole Preserve

Scientific Name	**Common Name**
Anolis sagrei	brown anole
Eleutherodactylus planirostris planirostris	greenhouse frog
Osteopilus septentrionalis	Cuban treefrog
Dasypus novemcinctus	nine-banded armadillo
Sus scrofa	feral hog

Wildlife management at the Preserve will focus on providing optimal habitat for native species. Restoration of disturbed and overgrown areas, control of invasive exotic plants and application of prescribed fire will be critical restoration components to provide habitat for wildlife. Gator Hole Preserve is part of a countywide quarterly site inspection program for all Conservation 20/20 Preserves. A copy of the site inspection form is available in the Land Stewardship Operations Manual (LSOM). These inspections allow staff to monitor for any impacts and/or changes to each preserve and include lists of all animal sightings and new plant species that are found. If, during these inspections staff finds FNAI listed species, they will be reported using the appropriate forms.

iv. Designated Species

There are a variety of designated animal and plant species (Table 4) found at Gator Hole Preserve. Although all native plant and animal species found at the Preserve have some protection due to the preservation of this property, certain species need additional attention. For stewardship purposes, all plants and animals listed by the U.S. Fish and Wildlife Service (USFWS), Florida Fish and

Wildlife Conservation Commission (FWC), Florida Department of Agriculture and Consumer Services (FDACS), the Institute for Regional Conservation (IRC) and FNAI will be given special consideration.

Typically, designated species will benefit from proper management of the biological communities in which they occur. However, some species may require additional measures to ensure their protection. Management practices likely to benefit wildlife and plants at the Preserve include exotic plant control, preventing palmetto berry poaching, prescribed burning, trash removal, wildlife monitoring, feral animal control, protecting water resources, restricting construction of maintenance trails in certain areas and enforcement of no littering, no weapons and no motorized vehicles regulations.

Table 4: Listed Species Found at GHP and Their Designated Status

Scientific Name	Common Name	USFWS	FWC	FNAI	Occurrence
REPTILES					
Alligator mississippiensis	American alligator	T (S/A)	SSC	G5/S4	confirmed
Drymarchon corais couperi	eastern indigo snake	T	T	G4T3/S3	confirmed
Gopherus polyphemus	gopher tortoise		SSC	G3/S3	confirmed
BIRDS					
Elanoides forficatus	swallow-tailed kite			G5/S2	confirmed
Eudocimus albus	white ibis		SSC	G5/S4	confirmed
Halieetus leucocephalus	bald eagle	T	T	G4/S3	expected
Mycteria americana	wood stork	E	E	G4/S2	confirmed
Platalea ajaja	roseate spoonbill		SSC	G5/S2	confirmed
Sterna maxima	royal tern			G5/S3	confirmed
MAMMALS					
Puma concolor coryi	Florida panther	E	E	G5T1/S1	expected
Sciurus niger avicennia	Big Cypress fox squirrel		T	G5T3/S3	expected
Ursus americanus floridanus	Florida black bear		T	G5T2/S2	expected

KEY

USFWS – U.S. Fish & Wildlife Service	**FNAI** – Florida Natural Areas Inventory
FWC – Florida Fish & Wildlife Conservation Commission	
	G – Global rarity of the species
E – Endangered	**S** – State rarity of the species
T – Threatened	**T** – Subspecies of special population
T S/A – Threatened due to Similarity of Appearance	
SSC – Species of Special Concern	**1** – Critically imperiled
	2 – Imperiled
	3 – Rare, restricted or otherwise vulnerable to extinction
	4 – Apparently secure
	5 – Demonstrateably secure

Table 4: Listed Species Found at GHP and Their Designated Status (continued)

Scientific Name	Common Name	USFWS	FDA	IRC	FNAI	Occurrence
PLANTS						
Ferns						
Woodwardia virginica	Virginia chain fern			R		confirmed
Nephrolepis biserrata	giant sword fern		T	R		confirmed
Osmunda regalis var. spectabilis	royal fern		CE	R		confirmed
Camphyloneurum phyllitidis	long strap fern			R		confirmed
Monocots						
Sagittaria graminea	grassy arrowhead			R		confirmed
Nothoscordum bivalve	crowpoison			CI		confirmed
Tillandsia fasciculate var. densispica	cardinal airplant		E			confirmed
Tillandsia utriculata	giant airplant		E			confirmed
Eriocaulon decangulare	tenangle pipewort			R		confirmed
Syngonanthus flavidulus	yellow hatpins			R		confirmed
Hypoxis juncea	fringed yellow stargrass			R		confirmed
Sisyrinchium angustifolium	narrowleaf blue-eyed grass			R		confirmed
Lilium catesbaei	pine lily		T	I		confirmed
Bletia purpurea	pinepink orchid		T	R		confirmed
Pteroglossaspis ecristata	giant orchid		T	I	G2/S2	confirmed
Spiranthes longilabris	longlip ladiestresses		T	I		confirmed
Spiranthes praecox	greenvein ladiestresses			CI		confirmed
Andropogon glomeratus var. glaucopsis	purple bluestem			R		confirmed
Andropogon virginicus	broomsedge bluestem			I		confirmed
Aristida purpurascens	arrowfeather threeawn			I		confirmed
Aristida spiciformis	bottlebrush threeawn			R		confirmed
Xyris elliottii	Elliott's yelloweyed grass			R		confirmed

Table 4: Listed Species Found at GHP and Their Designated Status (continued)

Scientific Name	Common Name	USFWS	FDA	IRC	FNAI	Occurrence
PLANTS						
Dicots						
Eryngium yuccifolium	button rattlesnakemaster			R		confirmed
Bigelowia nudata subsp. Australis	pineland rayless goldenrod			R		confirmed
Chaptalia tomentosa	pineland daisy			R		confirmed
Elephantopus elatus	tall elephantsfoot			R		confirmed
Erigeron vernus	early whitetop fleabane			R		confirmed
Flaveria floridana	Florida yellowtops			I		confirmed
Liatris chapmanii	Chapman's gayfeather			R		confirmed
Liatris spicata	dense gayfeather			I		confirmed
Liatris tenuifolia	shortleaf gayfeather			R		confirmed
Lygodesmia aphylla	rose-rush			R		confirmed
Rudbeckia hirta	blackeyed Susan			R		confirmed
Vernonia blodgettii	Florida ironweed			R		confirmed
Hypericum brachyphyllum	coastalplain St. John's-wort			R		confirmed
Sabatia brevifolia	shortleaf rosegentian			I		confirmed
Sabatia grandiflora	largeflower rosegentian			R		confirmed
Proserpinaca palustris	marsh mermaidweed			R		confirmed
Proserpinaca pectinata	combleaf mermaidweed			R		confirmed
Physostegia purpurea	eastern false dragonhead			I		confirmed
Piloblephis rigida	wild pennyroyal			R		confirmed
Pinguicula pumila	small butterwort			R		confirmed
Utricularia subulata	zigzag bladderwort			R		confirmed
Linum floridanum	Florida yellow flax			I		confirmed

Table 4: Listed Species Found at GHP and Their Designated Status (continued)

Scientific Name	Common Name	USFWS	FDA	IRC	FNAI	Occurrence
PLANTS						
Rhexia mariana	pale meadowbeauty			R		confirmed
Polygala lutea	orange milkwort			I		confirmed
Polygonum hydropiperoides	swamp smartweed			R		confirmed

KEY

USFWS – U.S. Fish & Wildlife Service	**FNAI** – Florida Natural Areas Inventory
FDA – Florida Department of Agriculture and Consumer Services	
	G – Global rarity of the species
E – Endangered	**S** – State rarity of the species
T – Threatened	**T** – Subspecies of special population
CE – Commercially Exploited	
	1 – Critically imperiled
IRC – Institute for Regional Conservation	**2** – Imperiled
	3 – Rare, restricted or otherwise vulnerable to extinction
CI – Critically Imperiled	**4** – Apparently secure
I – Imperiled	**5** – Demonstrateably secure
R – Rare	

Wildlife Species

The following is a brief summary of each designated wildlife species explaining why they are in decline. Unless stated otherwise, the reasons for the species decline and any management recommendations listed in this section were obtained from Hipes et al. (2001).

American Alligator

American alligators have recovered dramatically from overhunting since the 1960's and remain listed by USFWS as threatened by similarity of appearance and by FWC as species of special concern. There are even some populations large enough to support limited harvests. Pollution and destruction of wetlands are currently the main threat to this species. Another threat becoming more prevalent in the southwest Florida area is loss of habitat from the explosive residential and commercial development projects and uneducated humans either feeding alligators or feeling threatened by their presence. Many alligators are being relocated or killed by wildlife officials or authorized trappers because of their size or when they are in proximity to homes adjacent to freshwater wetland ponds.

Eastern Indigo Snake

The eastern indigo snake *(Drymarchon corais couperi)* is a large, iridescent black snake with a red, coral, or white throat (record length, 8.6 feet). This species is found in a large spectrum of communities throughout Florida and southern Georgia, often associated with gopher tortoise burrows. The eastern indigo is threatened throughout its range due to habitat loss, degradation and fragmentation. Although it is now illegal to possess this animal without the proper permits, the pet trade is another cause for decline of this species. The most common causes of mortality are human caused, either by people who kill them because they are afraid of snakes or accidental highway mortality. The indigo snake utilizes a home range of approximately 125-250 acres, and the males are territorial during the breeding season. The indigo snake feeds diurnally on fish, frogs, toads, lizards, snakes, small turtles, birds, and small mammals, often around the edge of wetlands. The eastern indigo snake breeds from November through April, then lays 5-10 eggs in May or June (USFWS 1982).

Gopher Tortoise

Gopher tortoises (*Gopherus polyphemus*) are in decline throughout their range due to loss and degradation of habitat and are state listed as a species of special concern. As a species dependant on dry, upland communities much of their habitat has been lost to urban and residential development, agriculture, citrus

groves, mining and pine plantations. Additional threats include a highly contagious respiratory disease and human consumption.

Although no formal census has been conducted, gopher tortoises are uncommon at GHP due to hydrologic conditions at the site. They have been seen occasionally on the berm/road on the eastern boundary and two burrows were found on the western portion of the Preserve. Thirty-three (33) tortoises were relocated to GHP in April 2006 (see Internal Influences for more information). Exotic plant removal and prescribed burning will benefit this species.

Swallow-tailed Kite

Swallow-tailed kites (*Elanoides forficatus*) migrate to southwest Florida from South America in late February/early March for their nesting season that lasts through late July/early September. In the early 1900's, swallow-tailed kites were confirmed as nesting in 21 states, today they only nest in 7 southeastern states. Loss of nesting sites through development and conversion to agriculture are the major threats to this species.

White Ibis

The white ibis is declining throughout their range, probably due to the reduction and degradation of wetlands as well as human disturbances to their rookeries. Invasive exotic plant removal (particularly melaleuca) will benefit this wading bird species by restoring foraging habitat.

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) numbers have steadily increased in Florida after a low of 120 active nests in 1973. Still, loss of habitat and human disturbance due to development is a primary concern for this species. At this time, bald eagles have not been spotted on the Preserve, but are known to nest in the Corkscrew wellfield less than a mile to the east of the Preserve.

Wood Stork

Wood storks are extremely sensitive to water levels in freshwater wetlands, since they require high concentrations of fish in fairly shallow water for foraging. Unnaturally high water levels during nesting seasons and extended droughts are both threats that wood storks face. Management recommendations at GHP for the protection of this species will be to protect wetland water levels, water quality, hydroperiods, and removal of the invasive exotic melaleuca trees from cypress areas.

Roseate Spoonbill

Similar to the white ibis listed above, roseate spoonbills (*Platalea ajaja*) are declining throughout their range, due to many of the same reasons as the other wading birds, which includes the reduction and degradation of wetlands and human disturbances to their rookeries.

Royal Tern

Royal terns' (*Sterna maxima*) biggest conservation challenges concern their nesting colonies, where the high concentration of these birds makes them vulnerable to single disasters. Habitat destruction, human disturbance, pollution and predators also affect them.

Royal terns are not known to nest in Lee County. Additionally, GHP does not have suitable habitat as this species prefers to nest "in dry sand, well above high-tide levels, usually on small islands" (Hipes et al. 2001). These birds may have been sighted at GHP because of the nearby mining operations (cleared of vegetation and sandy soils) and borrow pits (ponds).

Florida Panther

The Florida panther (*Puma concolor coryi)* is extirpated from most of its historic range in the southeastern United States, but exists in small populations in south Florida. The panther's decline is due mainly to loss, fragmentation, and degradation of habitat. Other habitat related threats include inbreeding, insufficient numbers of large prey, disease, and mercury and other environmental contaminants. Institutional constraints and negative public perception also threaten the future survival of the Florida panther. The large cats require extensive areas of mostly forested communities. Large wetlands that are generally inaccessible to humans are important for diurnal refuge. They will tolerate improved areas in a mosaic of natural communities.

The presence of Florida panthers has not been confirmed at GHP, but the Preserve is a Priority 2 land delineated in the Florida Panther Habitat Preservation Plan (Logan et al. 1993) issued by the Florida Panther Inter-agency Committee, consisting of four state and federal wildlife agencies (see Figure 11). To protect the possible presence of the Florida panther, management activities include preservation of the mosaic of communities throughout the Preserve. This includes control of exotic plants, protecting hydrologic features, and restoring a fire regime to the flatwoods.

Big Cypress Fox Squirrel

The Big Cypress fox squirrel (*Sciurus niger avicennia*) is in decline throughout its range primarily due to loss and degradation of habitat. Big Cypress fox squirrels

are state listed by FWC as threatened and have not been documented at Gator Hole Preserve. Although the number of this sub-species of fox squirrel in Florida is unknown, "based on the amount of known habitat loss, fox squirrel populations have undoubtedly declined by at least 85% from pre-settlement levels" (Humphrey 1992). Much of the fox squirrel's established pine-oak habitat has been converted to agriculture and development. Additionally, regular burn regimes of 2-5 years during the growing season (April-July) are critical to maintain their habitat with an open canopy with minimal understory. Exotic plant removal/control and the implementation of regular prescribed burning will improve the habitat for this species.

Florida Black Bear

This species faces numerous challenges including poaching, roadkill mortality, low reproductive rate and most importantly loss of habitat to timber harvesting, development and other uses. "Long-term conservation of the Florida black bear (*Ursus americanus floridanus*) is dependent upon preservation of large contiguous woodlands." Scientists with FWC have found the average home range for female black bears is almost 7,000 acres and males average over 42,000 acres (Humphrey 1992).

Gator Hole Preserve is not large enough to support black bears, but may be an excellent foraging site, or portion of a larger home range for black bears and they have been seen a few miles east of the Preserve. The Preserve could also serve as a safe corridor for the travel of black bears throughout a larger conservation area, if development projects do not completely encompass the area. Scientists have found that large scale winter burning reduces the diversity of food available to bears as compared to growing season burns (Humphrey 1992). Prescribed burns conducted in the late spring would not only be beneficial to bears, but to several other species listed above. Preventing palmetto berry poaching, an important food source for bears, would also benefit the species.

Plant Species

In addition to designated wildlife, Gator Hole Preserve provides habitat for several listed plant species. There are eight federal or state listed plant species at Gator Hole Preserve. The following is a brief summary of each designated plant species explaining why they are in decline, typical habitats where they are located. Management recommendations can be found towards the end of this section.

Pinepink

Pinepink (*Bletia purpurea*) is listed as a Threatened orchid by the FDA and has been found in Central and South Florida rockland pinelands and scrub communities (Brown 2002).

Pine lily

Pine (or Catesby's) lily (*Lilium catesbaei*) is listed as Threatened by FDA. There is concern that the population of this species is decreasing and is likely to become endangered in the near future. This wildflower is found in wet pine flatwoods. As a plant found in a fire dependent plant community, it generally benefits from occasional fire (Lilies 2004).

Giant sword fern

Giant sword fern (*Nephrolepis biserrata*) is another Threatened species listed by FDA and is found in swamps and hydric hammocks.

Royal fern

Royal fern *(Osmunda regalis var. spectabilis)* is listed as Commercially Exploited by FDA. It has been located in cypress-dominated communities at GHP.

Giant orchid

Giant orchid *(Pteroglossaspis ecristata)* is listed as Threatened by FDA and global & state imperiled by FNAI. It is found mostly in pine rocklands and cypress swamps, but other communities include sandhill, scrub, and pine flatwoods. The use of prescribed fire to create sunny openings and reduce competition from woody species will benefit this species (Chafin 2000).

Long-lipped Ladies'-tresses

Long-lipped ladies'-tresses (*Spiranthes longilabris*) is another Threatened species listed by FDA. It is found in moist, grassy roadsides, and pine flatwoods habitats.

Stiff-leaved wild pine

Stiff-leaved wild pine (*Tillandsia fasciculata var. densispica*) is an Endangered species listed by FDA and is also known as the cardinal airplant. It is found in hammocks, cypress swamps, and pinelands and has been documented in one location of GHP. Threats to this plant include illegal collecting, habitat destruction and the exotic Mexican bromeliad weevil (Save 2003).

Giant airplant

Giant airplant (*Tillandsia utriculata*) is another bromeliad considered to have been quite common in Florida before the arrival of the Mexican bromeliad weevil and is now listed as Endangered by FDA. Another common name for this

bromeliad is giant wild-pine. Typical communities to find this plant include hammocks and pinelands. In addition to the weevil, illegal collecting and habitat destruction threaten this species (Save 2003). Currently, scientists are researching biological control agents for the exotic weevil. Staff will follow the research developments and work with scientists in the future if it is determined that these insects are affecting epiphytes and the United States Department of Agriculture (USDA) is in need of release sites.

The majority of the designated plant species (see Table 4) were provided by IRC, which is not a regulatory agency. IRC's designation was either received from their book (Gann 2002) or Internet website (http://www.regionalconservation.org/ircs/database/search/QuickSearch.asp). However, the scientists working for this Institute have conducted a tremendous amount of field work and research documenting plants occurring in conservation areas in the 10 southernmost counties of Florida. This initial floristic inventory allowed the IRC to rank plant species to indicate how rare/common these plants are in protected areas. At GHP, numerous Rare, Imperiled, and Critically Imperiled plants occur. Rare plants are defined as being either very rare and local throughout its range in south Florida (21-100 occurrences, or less than 10,000 individuals), or found locally in a restricted range. IRC only ranks those taxa as rare with fewer than 100,000 individuals. Imperiled plants are those that are imperiled in south Florida because of rarity (6-20 occurrences, or less than 3,000 individuals) or because of vulnerability to extinction due to some natural or human factor. IRC only ranks those taxa as imperiled that have fewer than 10,000 individuals. Critically Imperiled plants are defined as being either extreme rarity (5 or fewer occurrences, or fewer than 1,000 individuals), or because of extreme vulnerability to extinction due to some natural or human factor. IRC only ranks those taxa as critically imperiled with 10,000 or fewer individuals.

In their book, Rare Plants of South Florida: Their History, Conservation and Restoration, the authors provide an entire chapter of recommendations to help restore south Florida's rare plant diversity. Several of these recommendations, particularly those that protect plants on the Preserve and relate to stewardship practices, will be followed. More information on the specifics techniques used will be discussed in the Management Action Plan. The following list highlights those recommendations by IRC that will be incorporated into the management of GHP:

- Restrict recreational activities such as off-road vehicle use and equestrian to avoid impacts to rare plant populations.
- Insure that park improvements and management activities do not needlessly threaten or destroy rare plant populations.
- Prevent illegal poaching of rare plants.
- Prosecute poachers to the fullest extent of the law.

- Implement an ongoing exotic pest plant control program.
- Educate exotic plant control crews about the rare plants to ensure they avoid non-target damage.
- Trap wild hogs, which can completely destroy the above ground vegetation and disturb all the soil in an area where they are feeding.
- Initiate prescribed fire in communities that are fire adapted since fire as a management tool is extremely critical for the protection of many rare plants.
- Dividing the site so the entire area is not burned during the same year will also help protect these communities.

Table 5 outlines some specific management and restoration activities at the Preserve that will be taken to protect the designated species. If additional listed species are documented on the Preserve they will be added to the lists in Appendices A or B. If either eagle or fox squirrel nests are discovered on the Preserve, a map will be created, for staff use only, to assist with planning for restoration activities.

Table 5: Management Recommendations for Designated Species

FAUNA SPECIES		Restoration Activities			Management Recommendations
Scientific Name	Common Name	Exotic Control	Hydrologic Restoration	Prescribed Fire	Mark Location
Alligator mississippiensis	American alligator	x	x		x
Gopherus polyphemus	gopher tortoise	x		x	x
Drymarchon corais couperi	eastern indigo snake	x		x	
Elanoides forficatus	swallow-tailed kite	x	x	x	x
Eudocimus albus	white ibis	x	x		
Haliaeetus leucocephalus	bald eagle	x		x	x
Mycteria americana	wood stork	x	x		
Platalea ajaja	roseate spoonbill	x	x		
Sterna maxima	royal tern	x			
Puma concolor coryi	Florida panther	x	x	x	
Sciurus niger avicennia	Big Cypress fox squirrel	x		x	x
Ursus americanus floridanus	Florida black bear	x		x	
FLORA SPECIES					
Bletia purpurea	pinepink orchid	x			**x (during invasive exotic work, park improvement development or other management activities that might impact plants)**
Lilium catesbaei	pine lily	x		x	
Nephrolepis biserrata	giant sword fern	x	x		
Osmunda regalis var. spectabilis	royal fern	x	x		
Pteroglossaspis ecristata	giant orchid	x		x	
Spiranthes longilabris	longlip ladiestresses	x		x	
Tillandsia fasciculate var. densispica	stiff-leaved wild pine	x			
Tillandsia utriculata	giant airplant	x			

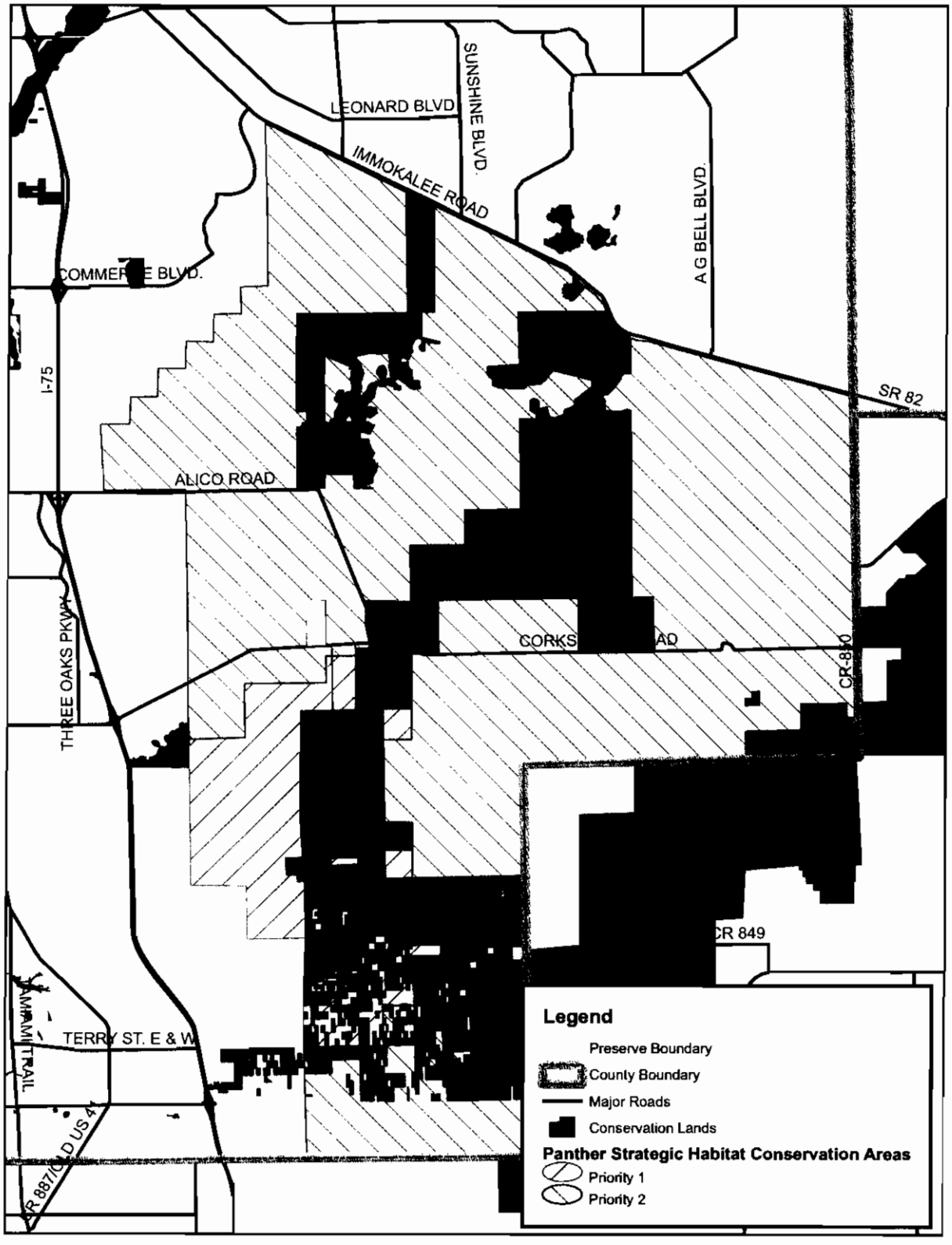
Restoration Activities:

Activities on the Preserve that will benefit and protect designated species for the long term.

Explanation of Management Recommendations:

Mark Location – location of individual plants, nest sites or burrows will be GPSed for land stewardship staff knowledge and protection during restoration activities.

Figure 11: Panther Strategic Habitat Conservation Areas



v. Biological Diversity

Many species of animals not only inhabit, but also frequently visit the Preserve. Currently 151 plant species (22 exotic) and 70 animal species (7 exotic) have been documented. Two of the exotic animal species are introduced biological control agents targeting the invasive melaleuca plant. Twelve of the 22 exotic plant species (55%) are on the Florida Exotic Pest Plant Council's 2005 List of Invasive Species (FLEPPC 2005). See appendices A and B for complete lists of plants and wildlife documented at the Preserve. There are several reasons for the high biological diversity on this site. Three remaining natural wetlands, surrounded by uplands, provide habitat for a variety of species. Two additional remnant wetland systems that have been severely impacted by adjacent land use activities, are quickly transitioning into hydric flatwoods. GHP, while only a 10-minute drive from human population centers, remains a somewhat remote retreat for animal species that are rapidly losing habitat. As the surrounding mining sites slowly transform into planned residential developments, this Preserve will become more isolated. Therefore, it would be advantageous to require future adjacent development projects to maintain sufficient wildlife conservation corridors that connect to substantial tracts of nearby conservation lands as well as buffers directly adjacent to the Preserve boundary.

Even though the Preserve itself is small, it lies near the western edge of an important wildlife corridor. This corridor consists of several tracts of conservation land managed by many governmental agencies and organizations (Figure 12). The approximate 640 acre Corkscrew Mitigation Bank is owned by the SFWMD and the approximately 7,000 acre Port Authority Imperial Marsh Preserve extends north to State Road 82. The Corkscrew Mitigation Bank is bordered to the south by the 9,000 acre Flint Pen Strand, owned by Lee County and SFWMD and managed by SFWMD and Lee County. STWMD also manages the Corkscrew Regional Ecosysstem Watershed (CREW) consisting of 13,000 acres in Lee County and extends into Collier County totaling 27,500 acres. Altogether this corridor, including Corkscrew Swamp Sanctuary and Panther Island Mitigation Bank, totals almost 60,000 acres of protected conservation land. This corridor provides good habitat for species with large home ranges such as whitetail deer, wild turkey, sandhill crane, wood stork, black bear and panther.

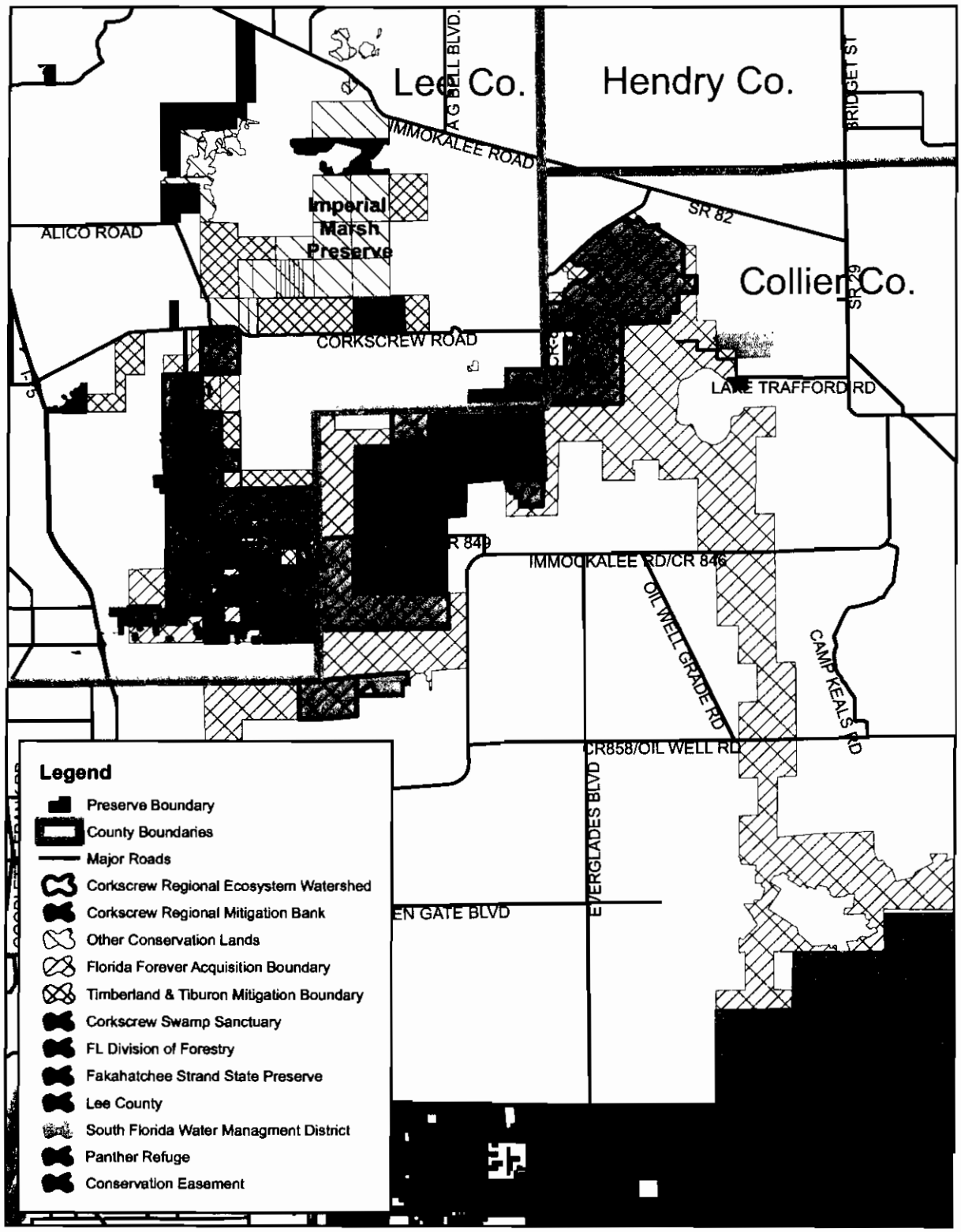
Biodiversity at Gator Hole Preserve varies by plant community, but should increase significantly after several management activities have been put into practice (i.e. invasive exotic plant removal, hydrological protection/restoration and prescribed fire). The plant communities range from mesic flatwoods, to a couple of natural ponds that always contains water. Within the mesic to hydric pine flatwoods areas melaleuca trees occur at various densities. The protection of the native plants and improvement and/or protection of hydrologic components across the landscape will enhance the overall biodiversity of the Preserve.

The Preserve attracts birds such as wood storks and white ibis to feed on congregations of fish and aquatic plants. Oak toads, eastern narrowmouth toads (*Gastrophyryne carolinensis*), barking (*Hyla gratiosa*) and squirrel treefrogs spend more time in surrounding uplands, utilizing the wetlands strictly for breeding (Jensen 2003). Additionally, barking treefrogs and oak toads breed almost exclusively in seasonal wetlands. Because of the short hydroperiod, larger predatory fish like Florida largemouth bass (*Micropterus salmoides floridanus*) and bluegill (*Lepomis macrochirus*) are unable to become established and feed on the developing tadpoles. As these temporary wetlands slowly dry, the fish, tadpoles and aquatic invertebrates become quite concentrated, providing an excellent food source for the numerous water birds that utilize the Preserve.

The integrity and diversity of GHP must be protected when and where possible. Land Stewardship staff will perform the following actions in this regard:

- Control of invasive exotic vegetation followed by annual maintenance to provide more suitable habitat for native aquatic and terrestrial species.
- Maintain boundaries with fencing and signs to eliminate illegal access to the Preserve and protect fragile ecosystems.
- Remove any debris and prevent future dumping on site.
- Improve hydrologic conditions and protect water quality from adjacent land uses.
- Implement a prescribed fire program to closely mimic the natural fire regimes for different plant communities to increase plant diversity and insure the canopies remain open.
- Control invasive exotic animal populations to reduce their impacts on the plants, native animals and soils.
- Conduct on-going species surveys through volunteers and staff to help catalogue and monitor the diversity that is present.
- Prevent palmetto berry poaching.

Figure 12: Conservation Lands & Wildlife Corridor Map



C. Cultural Resources

i. Archaeological Features

In 1987, Piper Archaeological Research, Inc. conducted an archaeological site inventory of Lee County. They were able to identify 53 additional sites increasing the total number of known archaeological sites in Lee County to 204. They also created a site predictive model and archaeological sensitivity map for the county that highlighted potential areas likely to contain additional archaeological sites. There are no known archaeological sites or potential areas predicted by the model at Gator Hole Preserve.

ii. Land Use History

Land use activities on GHP began over 100 years ago as logging of slash pine from the late nineteenth century until the 1930's virtually eliminated all virgin stands of the southern mixed forest in south Florida. This activity likely reduced slash pine densities throughout the Preserve and explains the lack of old growth pine trees found on the site. According to interpretations based on aerial photography dating back to 1944 (Figure 3), Corkscrew Road is the only visible feature along the southern edge of the Preserve. While the 1953 aerial photograph doesn't show any changes (Figure 4), the 1958 photograph (Figure 5) shows an agricultural field at the southwestern portion of the Preserve, which extends off the property to the west.

Additional activities were derived from either historical aerial photography from 1966 until 2002, historic regional facts, or from the Phase I Environmental Site Assessment (ESA) report (BCI 2000). By 1966, the agricultural fields were not being used and vegetation began to grow sporadically in several patches. An interviewee from the ESA report stated "that typically these areas were farmed for two to three years, subsequently having to lie fallow for several years due to nematode infestations of the soil." In the 1960's and 1970's, the stumps of the logged slash pines were removed from many properties in the region. This activity, referred to as stumping, was conducted to extract turpentine from the wood. Stumping created depressions in the soil, which created a microhabitat where soil moisture is higher for longer periods than adjacent habitats. For this reason different plant species are likely to occur in these depressions. Evidence of stumping is noted during the 1960's photographs and the 1968 photograph identified several new trails throughout the Preserve.

Besides vegetation growth, no other changes are notable until 1986, when jagged trails were created around the periphery of GHP. During the 1990's,

vegetation continued to grow rapidly and the trails began to fade way. Land use activities surrounding the Preserve accelerated as the agricultural fields were converted into sprawling mining operations that now encircle the Preserve. During the January 2000 ESA on-site survey, one cow was noted on the property, which revealed past uses of cattle grazing.

iii. Public Interest

Gator Hole Preserve has not received any public interest since it was first nominated to the program in 1997. At the time of purchase, the site was in the final planning stages of obtaining a development order for the Panther Trace subdivision, which has since been abandoned.

V. FACTORS INFLUENCING MANAGEMENT

A. Natural Trends and Disturbances

Natural trends and disturbances influencing native communities and stewardship at GHP include hurricanes, flooding, wildfire, occasional freezes and the cycling wet and dry seasons. Implementation of the Management Action Plan will take each of these factors and their influence on projects at the Preserve into consideration. For example, a tropical storm or hurricane could damage large amounts of vegetation. It may be necessary to remove or mulch downed vegetation following a hurricane if the debris increases the chance of negative impacts to wildlife habitat or public safety from a wildfire.

Wildfires caused by lightning strikes are natural occurrences in Florida. The Florida Division of Forestry (DOF) – Caloosahatchee District - and Lee County Department of Parks and Recreation are developing a wildland firefighting protocol for County preserves. The DOF was provided a map of the Preserve showing the locations of gates, firebreaks and water sources. The DOF will utilize existing firebreaks to contain wildfires at GHP whenever possible. No new firebreaks, such as plow lines, will be created unless there is potential for the wildfire to harm property outside the Preserve boundary and if the fire weather conditions are such that resources are available to sit and wait on site. This agreement between DOF and the County will protect GHP from the potential damage associated with emergency firefighting equipment. Land Stewardship staff will lead periodic site visits in order to familiarize DOF with GHP and current management efforts. A comprehensive C20/20 fire plan, to be completed in the spring of 2006, will help decrease the impact of catastrophic wildfires on the Preserve and neighboring lands. Fire lines on the perimeter of the Preserve, as well as those created once burn units are established, will be kept clear of debris

and disked or mowed a minimum of once a year during the onset of the dry (wildfire) season.

Management (invasive, exotic plant control, prescribed burning, etc.) of GHP is influenced by seasonal hydroperiods. The LSOM's exotic plant prescription form will be used to define the conditions for control activities. Care shall be taken to prevent herbicide from running off during a typical summer thunderstorm so as not to affect non-target plants. Only herbicides approved for aquatic application will be used for treatment of vegetation in standing water or where flooding may occur. The use of heavy equipment will be limited to the dry season for the majority of the site. The timing of prescribed burns will also be influenced by seasonal rain, weather and wind patterns.

B. Internal Influences

There are several internal influences that have impacted GHP. Most are either gradual changes that occurred over time or changes as a result of different management activities. See Figure 13 for approximate location of some of these features.

Lack of fire or the utilization of other management techniques for brush control have allowed the saw palmetto to grow much higher than normal, over 8 feet in some areas. Additionally, both the palmetto and slash pine density is much thicker than in a natural, fire maintained flatwoods community, creating areas with very little plant diversity, and therefore less valuable habitat for wildlife. A combination of both mechanical techniques and prescribed fires will be essential for long-term sustainability of these fire-dependant communities by creating a mosaic of both open and more covered areas.

Many invasive exotic plants (primarily melaleuca and Brazilian pepper) disrupt the functionality and limit the biodiversity of the Preserve. Initial exotic plant removal efforts along with follow-up maintenance will greatly enhance the natural plant communities and wildlife habitats.

There are portions of the Preserve where melaleuca trees were removed and left to rot on the ground. The majority of these trees are scattered throughout the mesic flatwoods community. However, there are some areas, especially between the two cypress domes, where the slash is the only groundcover and thick grapevine (*Vitis rotundifolia)* intertwines between the logs. The slash in these areas will continue to slowly decompose, but currently are quite difficult to cross on foot. Any prescribed burning will need to avoid these areas for both the safety of Land Stewardship staff and to avoid catching these areas on fire, which would likely smolder for days. Staff further recommends that when heavy equipment is on site for other restoration projects, that the contractors be consulted about either piling and burning this slash or mulching it in place.

Several ditches were dug in association with the row crops and roads on the southern portion of GHP. They restrict or prevent natural sheet flow from occurring and also affect on-site water table levels. Although it will not be possible to rehydrate the Preserve to its historic function as part of a flowway to an extensive wetlands system, (Figures 3 – 5), plugging or filling the ditches to reduce drainage will be an important stewardship goal.

In addition to the ditches, there is some concern of possible soil and ground water contamination from the previous agricultural activities. During BCI Engineers & Scientists, Inc's Phase I ESA, no records for chemical or petroleum produce use, storage, mixing or disposal were found. BCI recommended a Phase II ESA be conducted with soil samples collected according to the Environmental Protection Agency Methods (BCI, 2000). Since the fields have not been utilized since 1966 and there is no evidence of contamination, Land Stewardship staff has decided to forgo testing at this time. However, this decision may change in the future if any evidence appears.

There are two abandoned wells located in the southern portion of the Preserve (Figure 13). Staff from the Division of Natural Resources checked the wells, found them to be shallow water table wells and felt that no action was needed at this time (Fagan 2006).

The southeast portion of the Preserve lies within the wellfield protection zone for Lee County's Corkscrew Water Treatment Facility (Figure 14). Staff will need to be cautious with restoration work that takes place in this area and further details about the regulations protecting these zones can be found in the Other Legal Constraints section.

There is some large debris scattered throughout the site that will need to be removed. Specifically, a deer stand, hog trap and drift fencing that stretches along the entire western boundary of the Preserve (Figure 13) will all be removed.

Exotic animals can have a detrimental effect on native flora and fauna. For example, feral hogs consume ground-nesting bird eggs and disturb soil and sensitive vegetation during rutting activities, which can provide optimal substrate for invasive exotic plant growth. Exotic fish and amphibians can compete with native fauna for habitat and food. A range of removal methods will be considered for problematic invasive exotic animals found on the Preserve.

Finally, in cooperation with Lee County Department of Transportation (LDOT), 33 tortoises were relocated to the Preserve in April 2006. Staff has prepared a plan for both stewardship activities and monitoring in their relocation area (Appendix C). Stewardship activities for GHP will be conducted with consideration to these tortoises, particularly when utilizing heavy equipment. Heavy equipment

Heavy equipment operators will be instructed to stay 30 feet away from burrows in compliance with state guidelines. If necessary, burrows will be flagged to warn operators of their location. Brush management activities, such as roller chopping will be conducted during cold weather, when the tortoises are most likely to be underground. It is possible that additional tortoises will need to be relocated for future County infrastructure projects. Stewardship staff has prepared the Management Action Plan (MAP) with this in mind and hopes to partner with other County departments to restore the upland areas of the Preserve to be more suitable habitat for future tortoise relocations.

Figure 13: Locations of Internal Influences

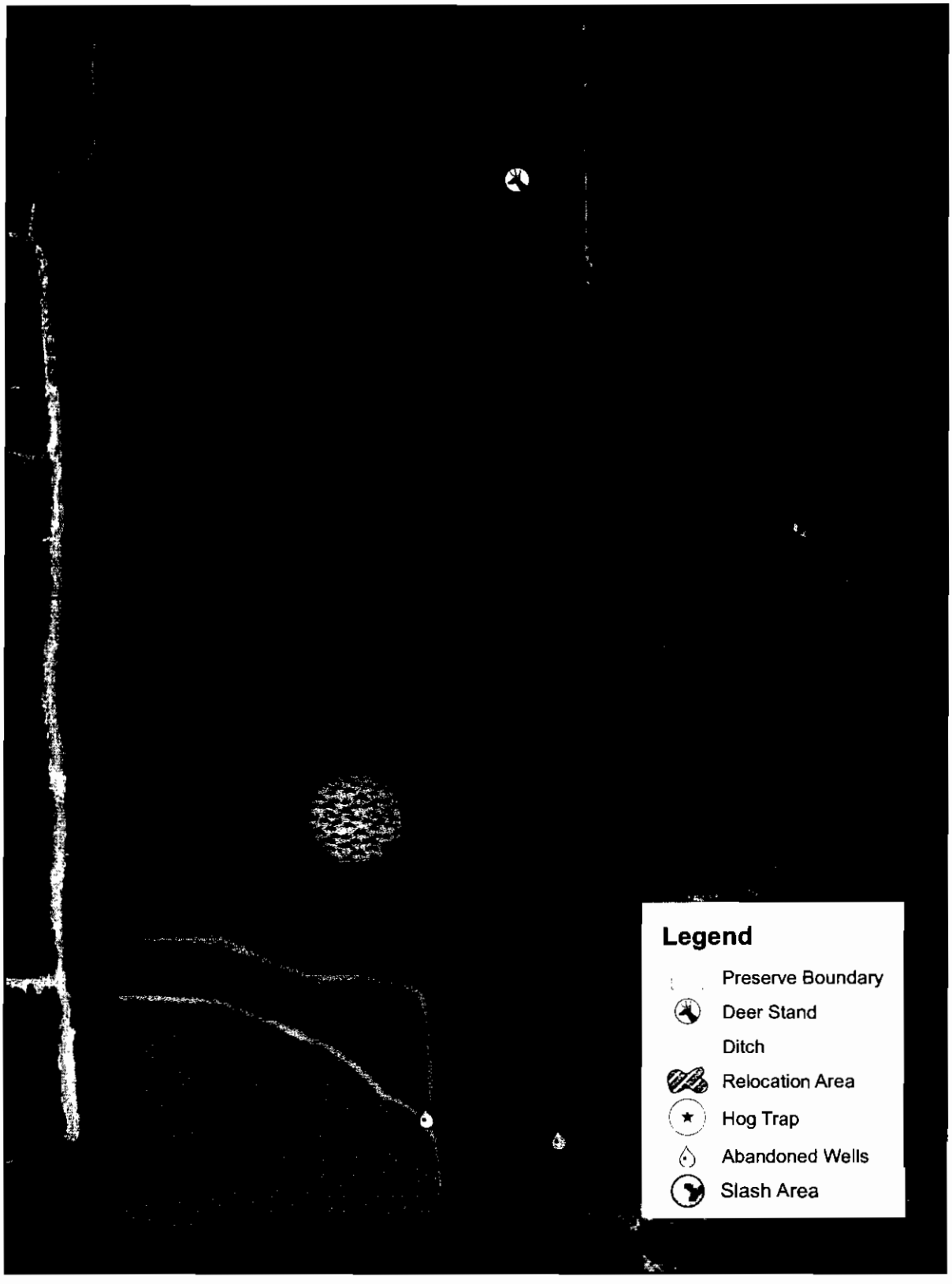
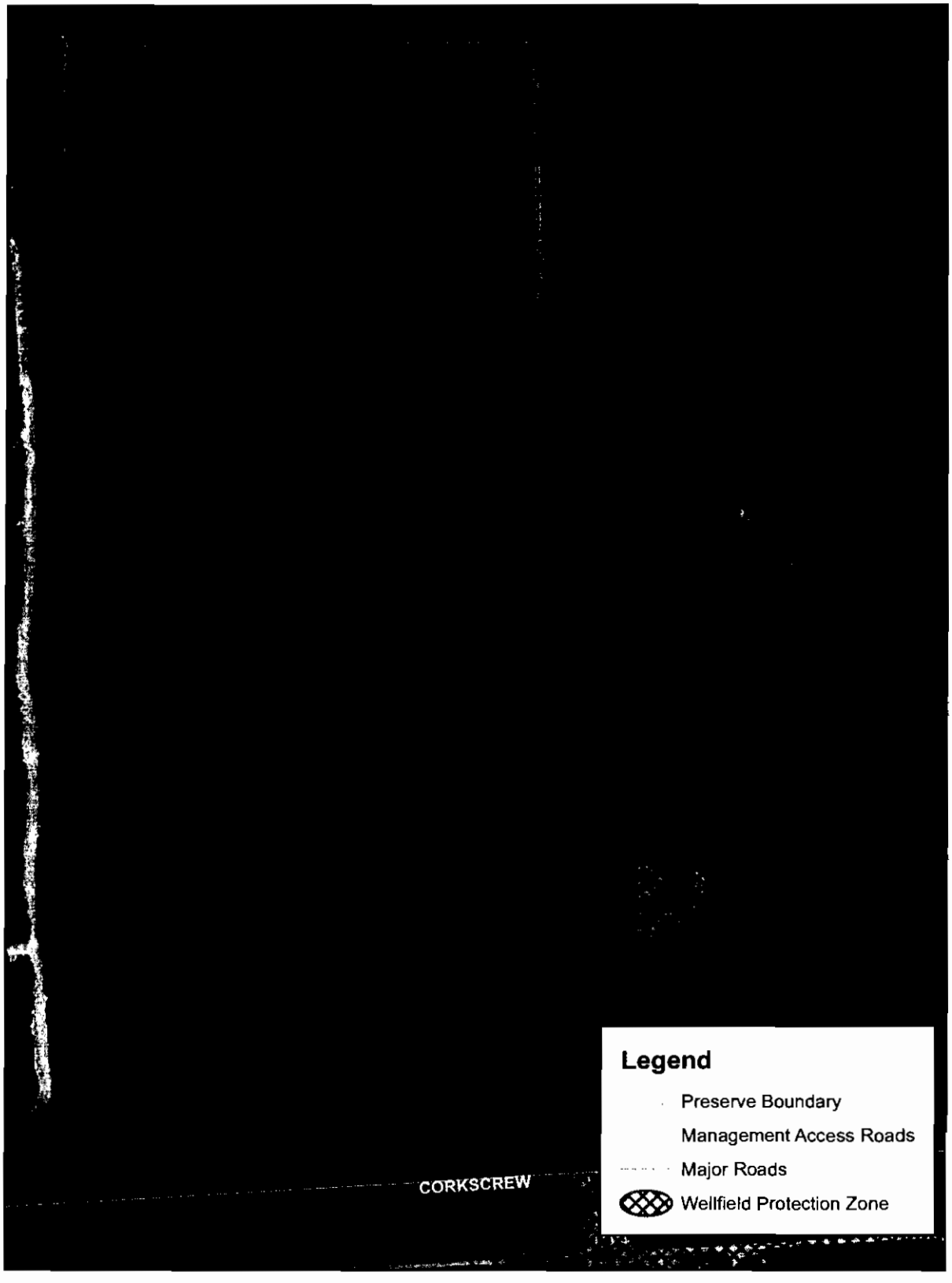


Figure 14: Wellfield Protection Zones



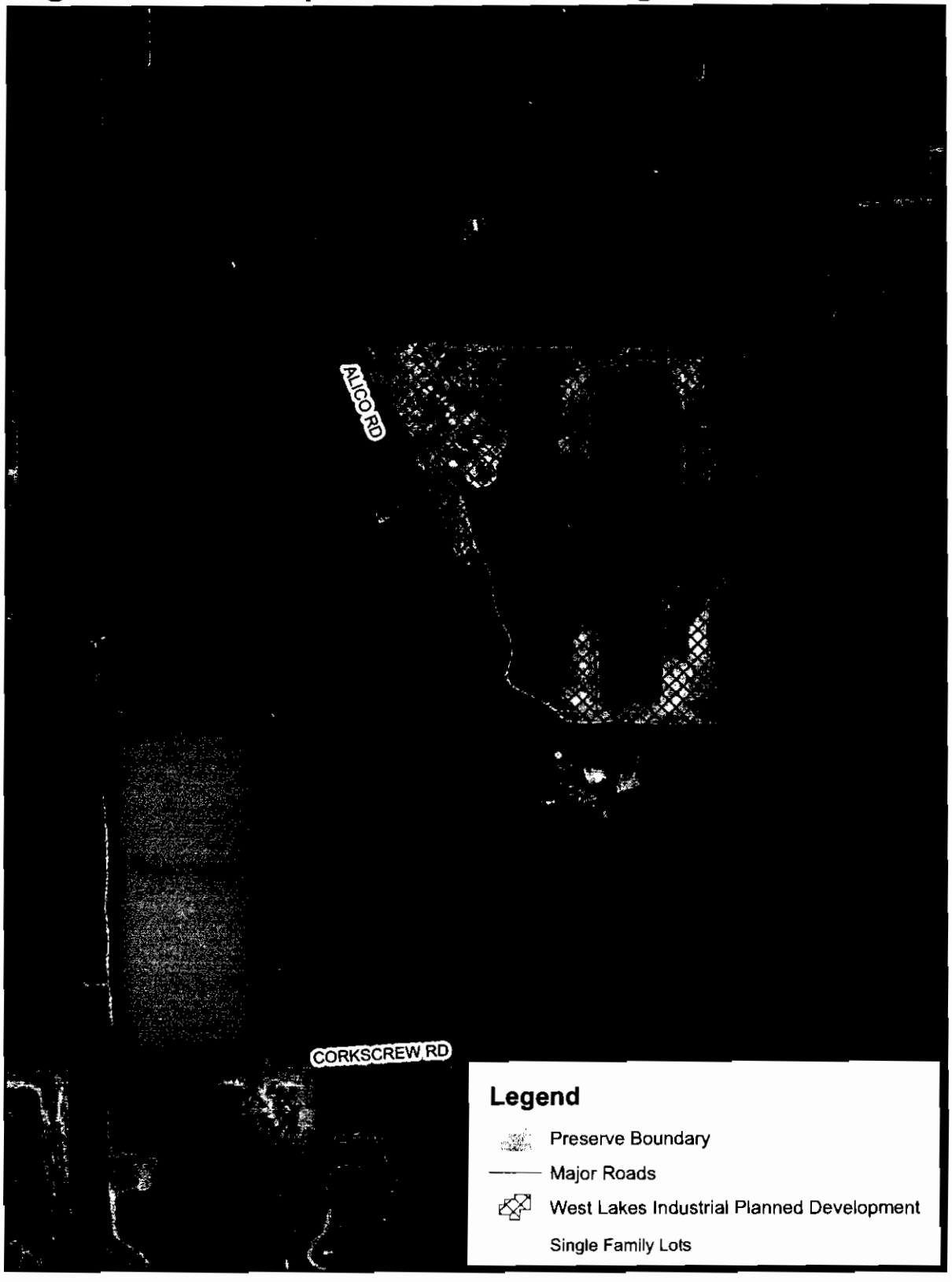
C. External Influences

GHP is located within the Southeast Lee County Community, an area designated by the Lee County BOCC as one of the 22 planning communities designed to capture the unique character of this area of the county. "This community consists of public facilities, mining operations, agricultural uses, and very large lot residential home sites" (Lee Plan 2004). The Future Land Use categories for properties directly adjoining the Preserve are wetlands and density reduction groundwater resource (DRGR), which only allows 1 development unit for every 10 acres (refer to Figure 16). Development projects that occur in or near natural freshwater wetlands and DRGR areas are a major concern within the county's aquifer recharge areas. Accordingly upholding these restrictive land use categories ought to protect GHP's water quality and quantity features. Nevertheless, there is an approved development order for single-family lots on the property to the west. To the north and east, the proposed West Lakes Industrial Planned Development (IPD) combines four existing mines and adds agriculturally zoned land to the project (Figure 15). This IPD has a 100-foot wide replanted area adjacent to the Preserve.

A second external influence is the sporadic illegal public use of the Preserve, including littering, saw palmetto berry picking, and tampering with the maintenance gate lock. These problems will likely be reduced with the addition of two C20/20 Rangers who are able to make additional patrols to GHP. Protecting the boundaries from dumping, hunting and vehicular access will always be a priority for the Preserve.

A third external influence is the potential for Corkscrew Road to expand into a 4-laned major highway in the future with a 100' road right-of-way along the southern boundary of GHP. According to a LDOT Major Road Improvements map (http://lee-county.com/publicworks/pdf/Planning/Maps/CIP_Map1005.pdf) there are plans to widen Corkscrew Road to 4-lanes to end just west of the Preserve. This project is expected to begin construction in 2006. A future roadway expansion may increase the traffic and resulting noise to the Preserve, as well as amplify the amount of trash and pollution that already affects the southern edge of GHP.

Figure 15: Proposed Surrouding Developments



D. Legal Obligations and Constraints

i. Permitting

Land stewardship activities at Gator Hole Preserve may involve obtaining permits from several regulatory agencies. Any proposed hydrologic improvements to the site may require obtaining permits from the Florida Department of Environmental Protection (FDEP), the U.S. Army Corps of Engineers (USACOE) and SFWMD. Obtaining a DOF burn permit will be necessary for conducting prescribed burns in the flatwoods and gopher tortoise relocation areas. Permits from the FWC have been obtained for the current planned gopher tortoise relocation, and will be required for any future relocations. Responsibility for obtaining these permits, ensuring that any relocation follows the conditions of the permit and providing funding for all costs incurred will be entirely upon the public entity that is in need of conducting the relocation.

ii. Other Legal Constraints

The Lee County Wellfield Protection Ordinance, 95-01 establishes protection for the "existing public potable water supply wells from the potentially irreversible and adverse effects of bacterial and chemical contamination from abandoned wells and to control the storage, handling and use of hazardous or toxins substances within certain distance from wellfields." This ordinance applies to all abandoned wells and areas surrounding a wellfield and designated as wellfield protection zones.

Gator Hole Preserve has two abandoned wells (see Hydrologic Components and Watershed). Under Section 14-215 of this ordinance, "The division will initiate a program that will result in the plugging of any wells that have been abandoned and that lie within the ten-year travel time (a theoretical time required by pollutants to travel from one point to another) of any well or wellfield Protection zone as well as the Mid-Hawthorne Aquifer System." Staff did meet with a representative from the Division of Natural Resources (see Internal Influences section) about the wells. If in the future staff from the Division of Natural Resources determines that the wells should be plugged Land Stewardship staff will cooperate with the effort.

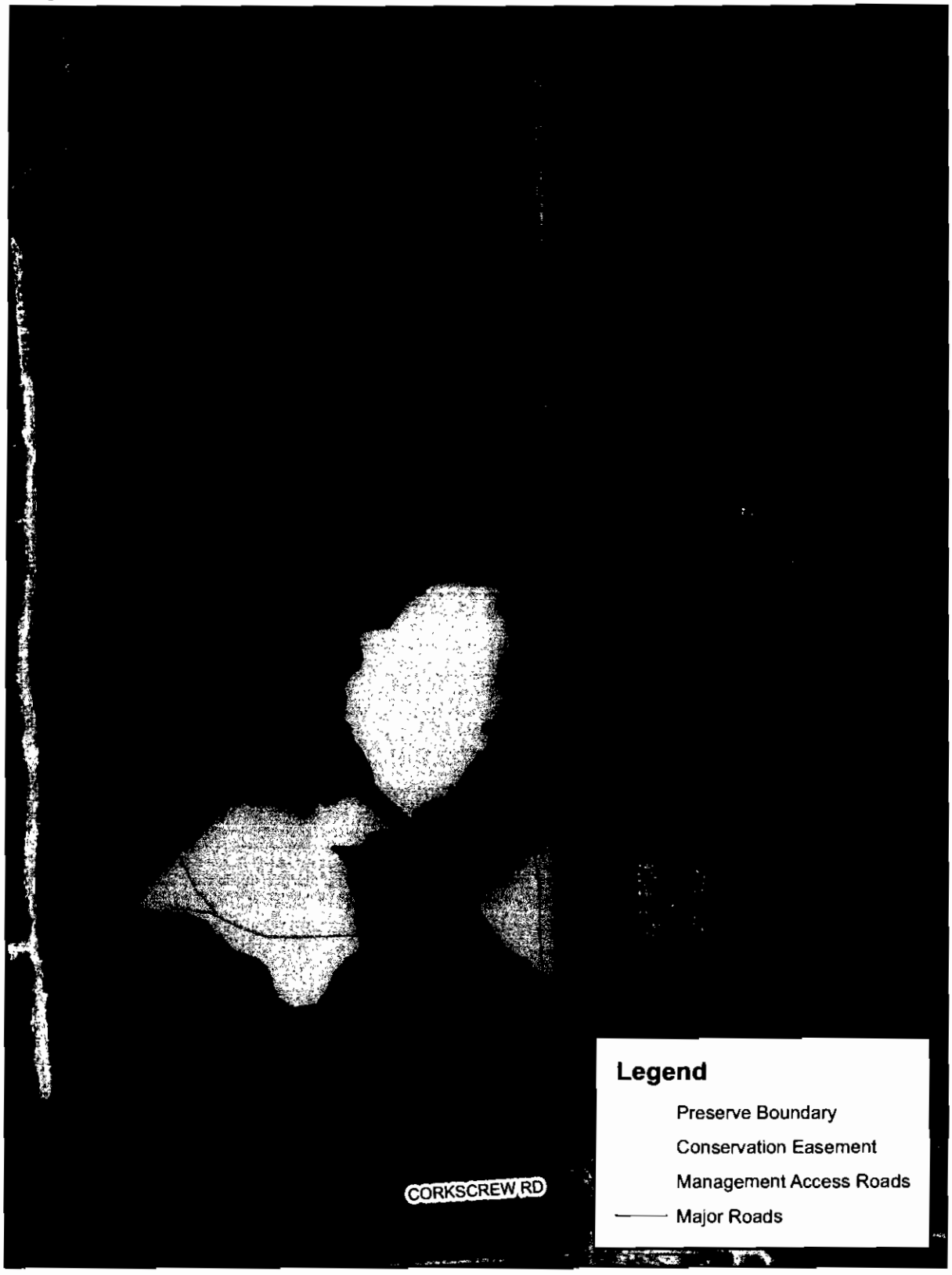
In addition to the abandoned wells, a small portion of GHP lies within the Wellfield Protection Zone 4 (Figure 14). Section 14-213 of Ordinance 95-01 delineates the specific regulated substances that are only to be used in limited quantities, if at all, in these protection zones and cannot be stored within these zones. It is unlikely that any of these chemicals (restricted-use pesticides, petroleum-based products, etc.) would be used for Stewardship Activities at the Preserve. However, the Ordinance does provide a special exemption for the

application of herbicides in recreation and aquatic weed control activities as long as certain guidelines (Section 14-209b) are followed. In addition, contractors will be advised of the protection zone and will not be allowed to store any regulated substances (which includes petroleum based products) in the area.

A Conservation Easement (Appendix D) of approximately 20.5 acres was granted to the South Florida Water Management District by Richard K. Bennett, previous owner, on October 10th, 1997. This easement consists of three separate wetland communities of the Preserve (Figure 15) and the surrounding upland buffers. The purpose of the easement is to retain and maintain both the land and water areas in their natural, vegetative, hydrologic and scenic condition and to retain such areas as suitable habitat for fish, plants and wildlife.

Prohibited activities include items such as building roads and other structures, removing native plants and any activities that might interfere with drainage, water conservation and fish and wildlife habitat preservation. A complete list is provided on pages 2-3 of the easement document. There are no conflicts with the easement and the restoration activities planned for the Preserve.

Figure 16: Conservation Easement



iii. Relationship to Other Plans

The Lee Plan, Lee County's comprehensive plan, is designed to depict Lee County as it will appear in the year 2020. Several themes have been identified as having "great importance as Lee County approaches the planning horizon." These themes are:

- The growth patterns of the County will continue to be dictated by the Future Land Use map.
- The continued protection of the County's natural resource base.
- The diversification of the County's traditional economic base.
- The expansion of cultural, educational and recreational opportunities.
- A significant expansion in the County's physical and social infrastructure.

The entire Lee Plan can be found on the Internet at: http://www.lee-county.com/dcd1/Leeplan /Leeplan.pdf. The four chapters that affect the management of GHP are **Chapter II – Future Land Use, Chapter IV – Community Facilities and Services**, and **Chapter VII – Conservation and Coastal Management**.

Chapter II, Policy 1.4.6 states that Conservation Lands include uplands and wetlands that are owned and used for long-range conservation purposes. Upland and wetland conservation lands will be shown as separate categories on the FLUM. Upland conservation lands will be subject to the provisions of this policy. Wetland conservation lands will be subject to the provisions of both the Wetlands category described in Objective 1.5 and the Conservation Lands category described in this policy. The most stringent provisions of either category will apply to wetland conservation lands. Conservation lands will include all public lands required to be used for conservation purposes by some type of legal mechanism such as statutory requirements, funding and/or grant conditions, and mitigation preserve areas required for land development approvals. Conservation Lands may include such uses as wildlife preserves; wetland and upland mitigation areas and banks; natural resource based parks; ancillary uses for environmental research and education, historic and cultural preservation, and natural resource based parks (such as signage, trailhead facilities, caretaker quarters, interpretive kiosks, research centers, and quarters and other associated support services); and water conservation lands such as aquifer recharge areas, flow ways, flood prone areas, and well fields. Conservation 20/20 lands designated as conservation are also subject to more stringent use provisions of the 2020 Program or the 2020 ordinances. (Added by Ordinance No. 98-09, Amended by Ordinance No. 02-02)

Chapter IV, Policy 59.1.5 provides the county will, through appropriate land use and engineering regulations, continue to control the introduction of obstructions or impediments within floodways. (Amended by Ordinance No. 94-30, 00-22)

Chapter IV, Policy 59.1.6 provides that the county will, through appropriate regulations, continue to provide standards for construction of artificial drainage ways compatible with natural flow ways and otherwise provide for the reduction of the risk of flood damage to new development. (Amended by Ordinance No. 94-30, 00-22)

Chapter VII, Objective 104.1: ENVIRONMENTALLY CRITICAL AREAS provides that within the coastal planning area, the county will manage and regulate, on an ongoing basis, environmentally critical areas to conserve and enhance their natural functions. Environmentally critical areas include wetlands (as defined in Goal 114) and Rare and Unique upland habitats. Rare and Unique upland habitats include, but are not limited to: sand scrub (320); coastal scrub (322); those pine flatwoods (411) which can be categorized as "mature" due to the absence of severe impacts caused by logging, drainage, and exotic infestation; slash pine/midstory oak (412); tropical hardwood (426); live oak hammock (427); and cabbage palm hammock (428). The numbered references are to the Florida Land Use Cover and Forms Classification System Level III (FDOT 1985). (See also Policy 113.1.4.) The digitization of the 1989 baseline coastal vegetation mapping (including wetlands and rare and unique uplands, as defined above) will be completed by 1996. (Amended by Ordinance No. 94-30, 00-22)

Chapter VII, Goal 107: RESOURCE PROTECTION provides to manage the county's wetland and upland ecosystems so as to maintain and enhance native habitats, floral and faunal species diversity, water quality, and natural surface water characteristics. **Objective 107.1: RESOURCE MANAGEMENT PLAN** provides the county will continue to implement a resource management program that ensures the long-term protection and enhancement of the natural upland and wetland habitats through the retention of interconnected, functioning, and maintainable hydroecological systems where the remaining wetlands and uplands function as a productive unit resembling the original landscape. (Amended by Ordinance No. 94-30, 00-22) Under **Policy 107.1.1.4e** the county (or other appropriate agency) will prepare a management plan for each acquired site for the long term maintenance and enhancement of its health and environmental integrity.

Chapter VII, Objective 107.3: WILDLIFE provides the county will maintain and enhance the fish and wildlife diversity and distribution within Lee County for the benefit of a balanced ecological system. (Amended by Ordinance No. 94-30) **Policy 107.3.1:** encourages upland preservation in and around preserved wetlands to provide habitat diversity, enhance edge effect, and promote wildlife conservation. Initiating a prescribed fire regime and removing invasive exotics will follow this policy.

Chapter VII, Objective 107.4: ENDANGERED AND THREATENED SPECIES IN GENERAL provides Lee County will continue to protect habitats of endangered and threatened species and species of special concern in order to maintain or enhance existing population numbers and distributions of listed species. **Policy 107.4.1** states to identify, inventory, and protect flora and fauna indicated as endangered, threatened, or species of special concern in the "Official Lists of Endangered and Potentially Endangered Fauna and Flora of Florida," FWC, as periodically updated. Lee County's Protected Species regulations will be enforced to protect habitat of those listed species found in Lee County that are vulnerable to development.

Chapter VII, OBJECTIVE 107.8: GOPHER TORTOISES provides that Lee County will protect gopher tortoises through the enforcement of the protected species regulations. **POLICY 107.8.1:** states the County's policy is to protect gopher tortoise burrows wherever they are found.

Chapter VII, OBJECTIVE 107.10: WOODSTORK, POLICY 107.10.1: provides that Land Stewardship staff will continue to document wood stork utilization of the Preserve and ensure that the GHP management plan follows USFWS "Habitat Management Guidelines for the Wood Stork in the Southeast Region." according to **POLICY 107.10.2**.

Chapter VII, OBJECTIVE 107.11: FLORIDA PANTHER AND BLACK BEAR. provides that Land Stewardship staff will maintain and update data on sightings and habitat for the black bear and Florida panther. Staff will continue to support expansion of land acquisition for areas connecting the Corkscrew Regional Ecosystem Watershed, a nearby greenway connecting priority panther habitat. Where appropriate, GHP's habitat restoration projects will include plant species that provide forage for the prey of the Florida panther and forage for the black bear due to its proximity to these frequented panther habitat locations.

Chapter VII, Goal 114: WETLANDS provides that the county maintains and enforces a regulatory program for development in wetlands that is cost-effective, complements federal and state permitting processes, and protects the fragile ecological characteristics of wetland systems. (Amended by Ordinance No. 94-30) **Objective 114.1** provides that the natural functions of wetlands and wetland systems will be protected and conserved through the enforcement of the county's wetland protection regulations and the goals, objectives, and policies in this plan. "Wetlands" include all of those lands, whether shown on the Future Land Use Map or not, that are identified as wetlands in accordance with F.S. 373.019(17) through the use of the unified state delineation methodology described in FAC Chapter 17-340, as ratified and amended by F.S. 373.4211. (Amended by Ordinance No. 94-30, 00-22).

In 2004, LDOT hired Ray Ashton of Ashton, Ashton & Associates, Inc. to prepare a Preliminary Gopher Tortoise Management Plan (Ashton 2004) for Gator Hole

Preserve. The Gator Hole Gopher Tortoise Plan (Appendix C) was developed in consideration of the recommendations in this document.

E. Management Constraints

The principle stewardship constraints for GHP include limited funding, the brief dry season for stewardship activities and conducting land stewardship activities, especially prescribed burning as urbanization surrounds the Preserve. Although C20/20 has a management fund, it is inadequate to fulfill the restoration activities for this and the other preserves. Efforts to obtain additional funding through grants and/or monies budgeted for mitigation of County infrastructure projects will be pursued. These funds will be used to supplement the operations budget to meet the restoration goals in a timely manner.

The majority of GHP has standing water for 6-8 months of the year. January though April are typically the driest months. Stewardship activities will typically need to be conducted in these months. If access is necessary for management when water levels are high, vehicles such as all terrain vehicles (ATVs) will be used if necessary, otherwise staff will travel on foot.

As residential housing is built around the Preserve, staff will contact adjacent neighbors by direct mailing or through a contact with a neighborhood association when significant management activities are going to take place. A welcome letter will be sent to the new residents to introduce them to the Preserve as well as the C20/20 program.

F. Public Access and Resource-Based Recreation

The majority of the historic recreation that occurred at GHP has been from unlawful trespassers. In decades past, the Preserve was utilized for agricultural farming and the associated fencing prevented most of the general public from entering. Since Lee County has purchased the Preserve, some new fencing with an associated lock and gate were installed. However, evidence of both hunting and saw palmetto berry picking has been documented. The Parks and Recreation Ordinance, 02-12 (http://www.lee-county.com/ordinances/PDF/2002/02-12.pdf) prohibits both of these activities.

Currently, GHP is classified as a Category 4 Resource Protection & Restoration Preserve. As with all designated Category 4 preserves, "if there is a public interest, staff may provide guided field trips when there are no safety concerns and it is compatible with protecting the animals and plant communities found at the specific preserve."

In March 2006 LCDOT approached LCPR about conducting panther mitigation at Section 33 of the Flint Pen Strand. The initial plans was for Section 33 to become a regional park were to offer several miles of hiking trails, possible eco-lodge and other recreational amenities would be offered. If it is determined that Section 33 will be used for mitigation, GHP may be considered as a site for a future regional park.

Land Stewardship staff recommends GHP could be considered an alternative site, with several stipulations.

1. The preliminary restoration work would need to be completed.
2. The relocated gopher tortoises have had a minimum of one year to move into the enhanced habitat, east of their initial relocation site.
3. The entrance driveway will be placed along the western boundary line instead of the current management entrance to avoid impacting the movements of the gopher tortoises.
4. The parking area will be placed at the disturbed fallow crop land heavily infested with melaleuca to maximize the amount of upland habitat available for the relocated gopher tortoises and other wildlife.
5. Because of the Preserve's limited size, hydrologic conditions and sensitive soils, recreational amenities would be restricted to 2-3 miles of hiking trails and wetland areas would need to have boardwalks.

If it is decided that GHP will not be suitable as a regional park, public recreation amenities will not be proposed in the near future so that it can continue to be a gopher tortoise relocation site for LDOT (see Relationship to Other Plans section). Staff prefers to minimize disturbance to the relocation areas, particularly the temporary fencing and soil mounds. Additionally, the Preserve is relatively small and restoration activities over the next several years will not be conducive to recreation and/or public safety at the Preserve. Finally, there are other resource based recreational opportunities in close proximity. The CREW Land and Water Trust has property located 10 miles east of GHP with five miles of hiking trails through three native plant communities.

G. Acquisition

Gator Hole Preserve was purchased through C20/20 in February 2000 for $3,000,000 after being nominated to the program in the fall of 1997.

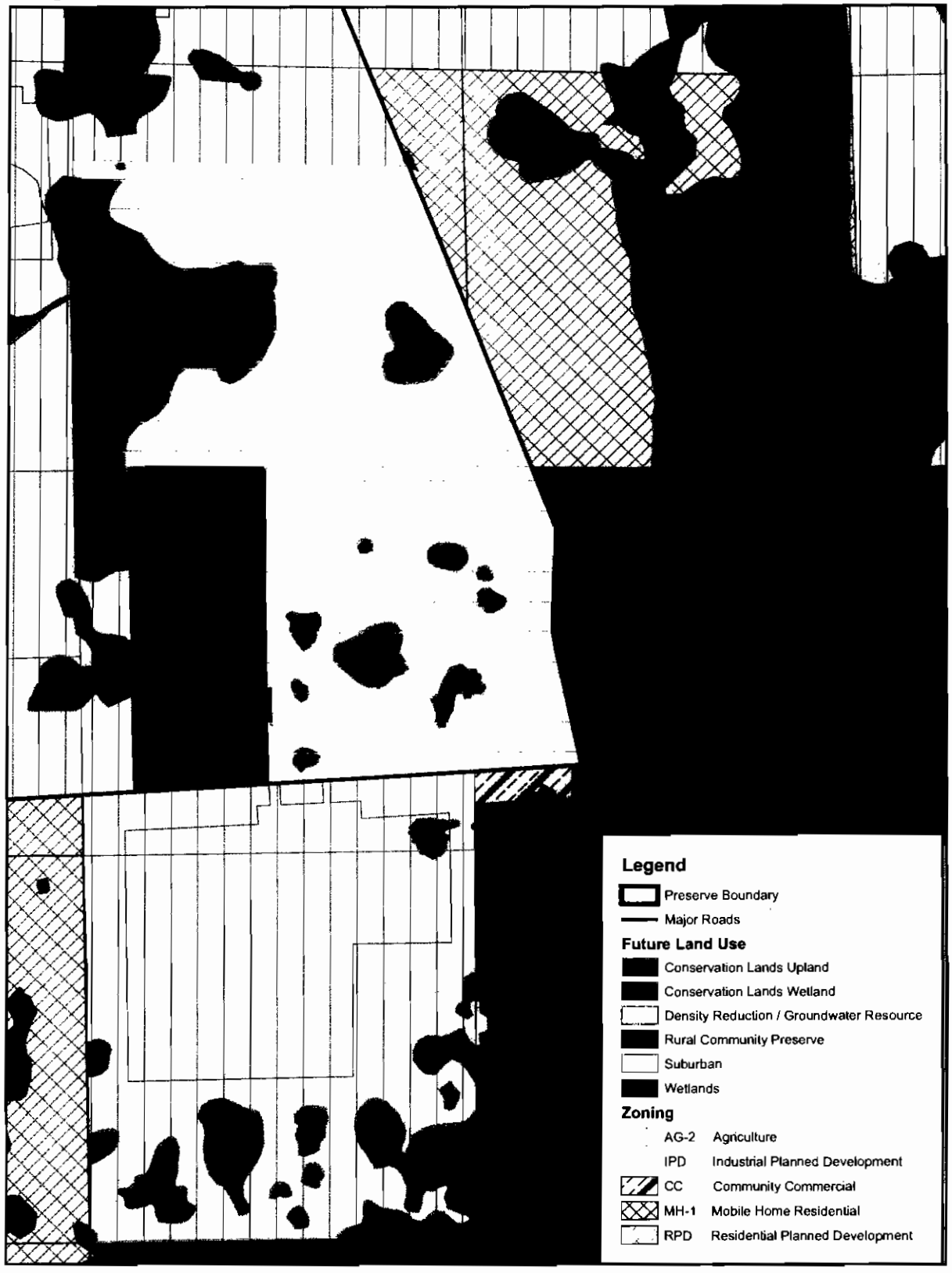
The future land use category for the Preserve is "Conservation Lands," further sub-categorized as 156-acres of "Uplands" and 19-acres of "Wetlands." GHP is zoned as agriculture "Ag-2" on all 175-acres (Figure 16). The STRAP numbers for the property are 21-46-26-00-00001.1000 and 21-46-26-00-00001.1010.

Land Stewardship staff will work to change to this designation to "Environmentally Critical"

Several parcels adjacent to GHP were nominated to the C20/20 Program, but were subsequently withdrawn (Figure 17). A 75-acre property (2 parcels) along the western boundary of the Preserve, nomination 114, was nominated to the C20/20 Program in 1999. It was withdrawn in the summer of 2001 because the BOCC voted to cease negotiations on this parcel. An additional 378-acre property, afterwards reduced to 126-acre parcel, adjacent to the eastern boundary of the Preserve, nomination 135, was also nominated to the C20/20 Program in 1999. It was withdrawn by Conservation Lands and Stewardship Advisory Committee (CLASAC) in the spring of 2000 because of a pending litigation between the lessee and the owner and a pending right of first refusal agreement with another party.

During the summer of 2005, a more recent nomination to the C20/20 Program was a 12-acre parcel, southeast of the Preserve, nomination 289. It was withdrawn in the fall of 2005 because the Division of County Lands and the landowner were not able to reach an agreement on the price.

Figure 17: Future Land Use & Zoning



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Gator Hole Preserve

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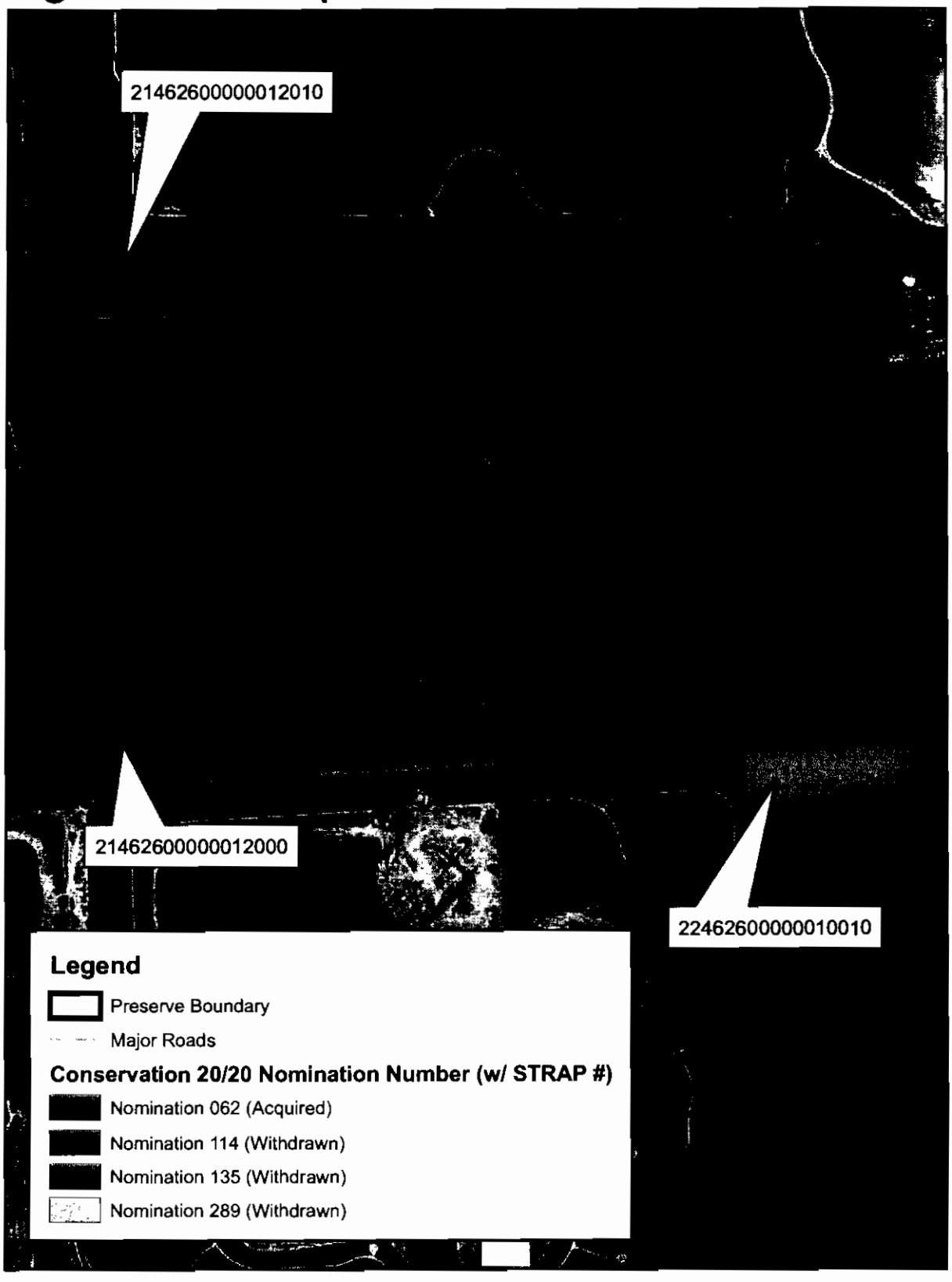
Map Prepared on: 11/04/05 by sfurnari@leegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes

Figure 18: Acquisition and Nominations



VI. MANAGEMENT ACTION PLAN

A. Management Unit Descriptions

Gator Hole Preserve has been divided into seven (7) Management Units (MU) to better organize and achieve management goals. Figure 18 delineates the units that were created primarily based on existing management trails.

- Management Unit 1

  Management Unit 1 is 29.4 acres and is located on the north boundary of the Preserve. This unit consists of mesic flatwoods and the majority is heavily impacted by melaleuca. The southern boundary of this unit consists of a remnant trail (no longer drivable) and the southern boundary of the area that has less than 50% exotic plant coverage. Stewardship activities will focus on exotic plant removal, debris removal and prescribed fire.

- Management Unit 2

  Management Unit 2 is 46.2 acres in the northern portion of the Preserve. This unit is bordered by MU 1 to the north and existing management roads to the south. This unit primarily contains mesic flatwoods with two small wet flatwoods communities. The majority of this unit has not had exotic plant removal conducted and is heavily impacted by melaleuca. Stewardship activities will focus on exotic plant removal, debris removal, prescribed fire and fuel reduction/tree thinning.

- Management Unit 3

  Management Unit 3 is 19 acres and is located on the west boundary in the central portion of the Preserve. This unit's other boundaries consist of existing access trails. This unit primarily contains mesic flatwoods combined with a small patch of wet flatwoods in the northwest corner. Approximately 75% of the unit has already had initial exotic plant removal conducted. Stewardship activities will focus on exotic plant removal, debris removal, prescribed fire and tree thinning.

- Management Unit 4

  Management Unit 4 is 35.8 acres and is located in the central portion of the Preserve. This unit is bordered by an existing management access trail on all sides. Mesic flatwoods, wet flatwoods, dome swamp and depression marsh communities are all found in this unit. Exotic plants

have been treated on 90% of this unit. Stewardship activities will focus on exotic plant removal, tree thinning and prescribed fire.

- Management Unit 5

  Management Unit 5 is 18.8 acres and is located in the southeast corner of the Preserve. The other boundaries of this unit consist of existing management access trails. This unit contains mesic flatwoods and wet prairie. Exotic plants have been treated on 90% of this unit. It is the only MU with a portion that lies within the Wellfield Protection Zone. This MU contains one of the two abandoned wells. Stewardship activities will focus on exotic plant removal, tree thinning and prescribed fire.

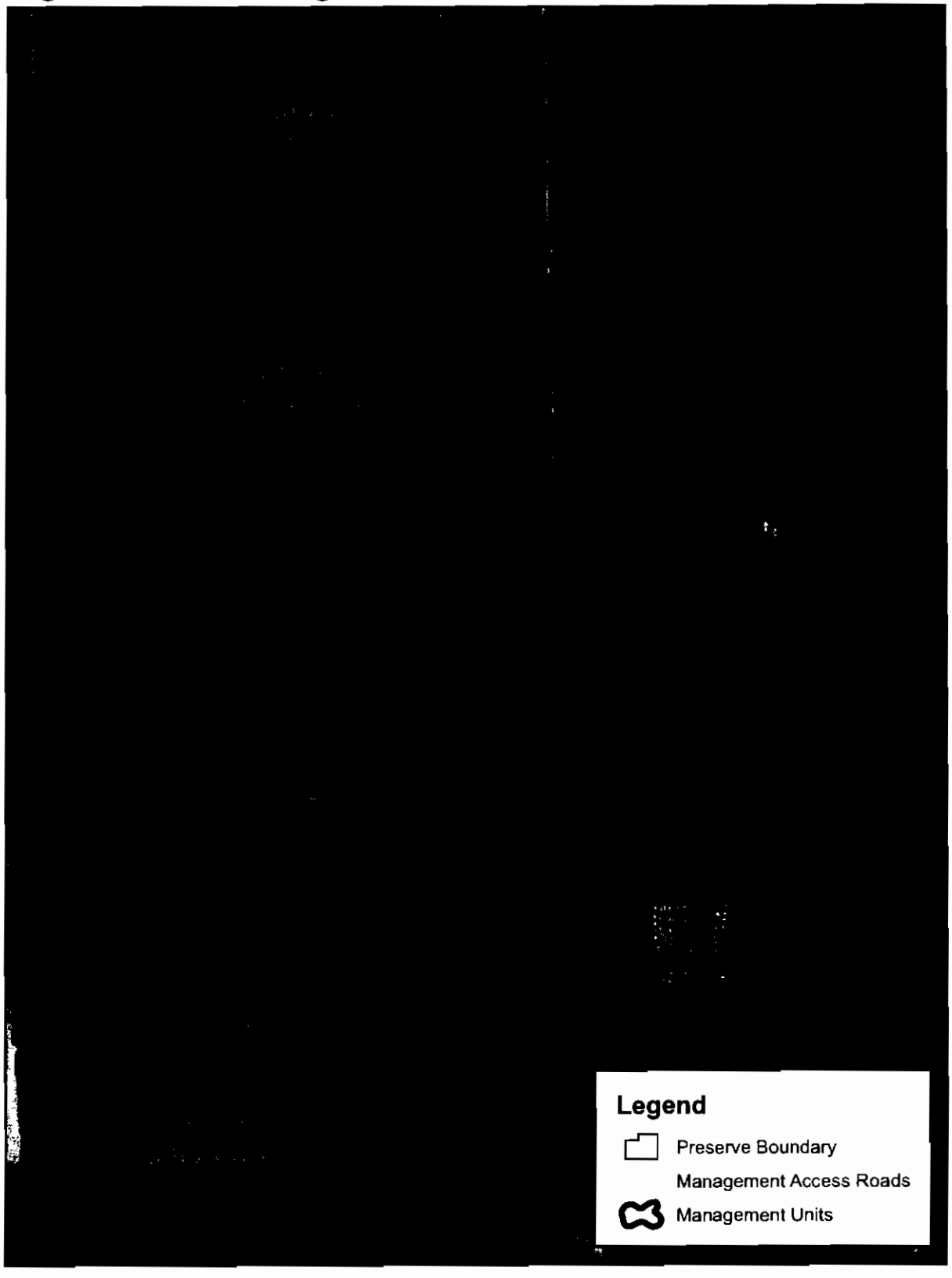
- Management Unit 6

  Management Unit 6 is 7.1 acres and is located in the southern portion of the Preserve. This unit is bordered by the Preserve boundary on the west, and existing management access roads the other 3 sides. This unit is fallow cropland that has succeeded into wet and mesic flatwoods, heavily impacted by melaleuca. The north and east boundaries are ditched with their associated berms. Stewardship activities will focus on exotic plant removal, hydrological restoration, prescribed fire and debris removal.

- Management Unit 7

  Management Unit 7 is 18.6 acres located in the southwestern corner of the Preserve. The remaining boundaries are existing management trails. Like MU 6, this unit consists of fallow crop land that has succeeded into mesic or wet flatwoods or wet prairie, depending on the elevation. The north and east boundaries are ditched and have associated berms. This unit is where the gopher tortoises were initially relocated in April 2006. It also has had initial exotic plant removal and was previously burned in November 2003. This unit contains the other abandoned well. Stewardship activities will focus for the short term on maintaining the area for the tortoises (Appendix C). Additional hydrological restoration will take place as a long term goal.

Figure 19: Management Units



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Gator Hole Preserve

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Map Prepared on 2/20/06 by lwewerka@leegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes.

B. Goals and Strategies

While the following are our long-term goals for the Preserve, funding is currently not available to conduct all of these activities. Grants and/or monies budgeted for mitigation of any governmental infrastructure projects in Lee County will be used to supplement our operations budget to meet our goals in a timely manner.

Natural Resource Management

- ✓ Exotic plant control and maintenance
- ✓ Hydrologic restoration
- ✓ Prescribed fire management
- ✓ Tree thinning
- ✓ Mechanical brush reduction
- ✓ Monitor and protect listed species
- ✓ Exotic animal removal

Tortoise Relocation

- ✓ Gopher Tortoise Management Plan

Overall Protection

- ✓ Debris removal and prevention of dumping
- ✓ Boundary & Preserve sign installation
- ✓ Change zoning category to Environmentally Critical

The following is a description of how each of these goals will be carried out, the success criteria used to measure accomplishment of each goal and a projected timetable outlining when and in which units each activity will take place.

Natural Resource Management

Exotic plant control and maintenance

The most current Florida Exotic Pest Plant Council's List of Invasive Species will be consulted in determining the invasive exotic plants to be controlled in each management unit. The goal is to remove/control these exotic species, followed with semi-annual or as needed treatments of resprouts and new seedlings. This goal will bring the entire Preserve to a maintenance level, defined as less than 5% invasive exotic plant coverage.

In April 2001, an invasive exotic plant removal project began at GHP to prepare the gopher tortoise relocation site and removing of melaleuca trees from some additional southern areas of the Preserve. Figure 19 identifies the recommended exotic plant removal techniques for GHP. The 91 acre area that was treated

nearly 5 years ago will only require follow up hand crew retreatment efforts, heavy equipment work will only be required on 74 acres, and initial hand crew efforts will be needed on 10 acres. As with the initial exotic plant control effort and prior to each invasive exotic plant control project at GHP, a Prescription Form (located in the LSOM) will be filled out by Land Stewardship staff, reviewed by the contractor(s) and filed appropriately. All contractors involved in these projects will be required to fill out the Daily Report Control Form (located in the LSOM) and will be filed appropriately by staff.

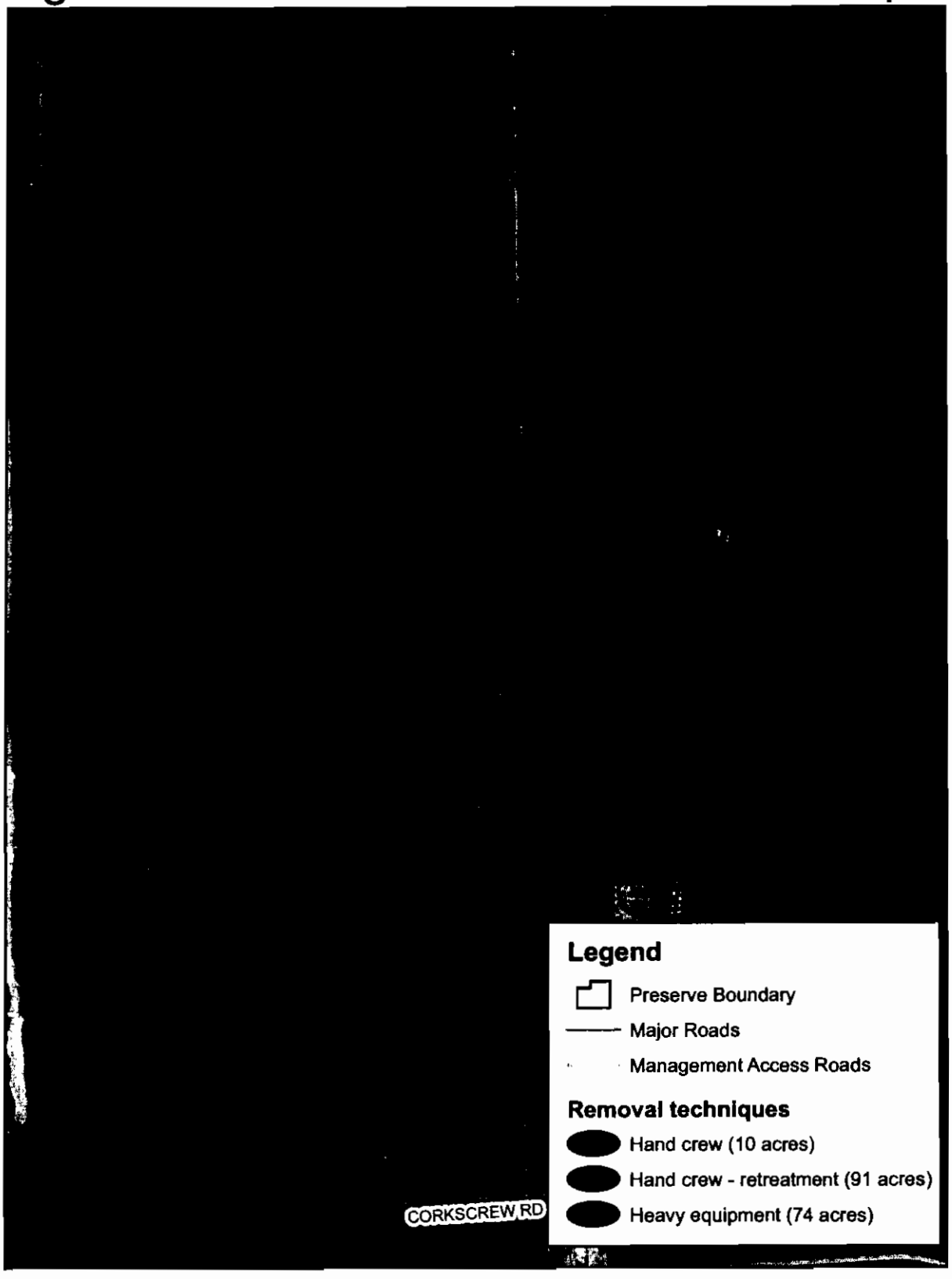
- Upland areas with light to moderate infestations:
  In areas where invasive plants are sporadic and below 50% of the vegetation cover, hand removal will be utilized for control. Specific methodology will depend on stem size, plant type and season, but generally the stem will be cut near the ground and the stump will be sprayed with appropriate herbicide, or a foliar application made to the entire plant (particularly with grasses and broadleaf plants). Hand pulling will be utilized when possible with appropriate species in order to minimize herbicide use. Some locations may receive basal bark treatment, for example small clusters of Brazilian pepper. Cut stems may be piled to facilitate future burning, chipping or removal from site. No replanting will be needed due to significant presence of native vegetation and the native seed bank.

- Other upland areas with moderate to heavy infestations:
  In areas where the exotics occur as monotypic stands or are higher than 50% of the vegetation cover the use of heavy equipment will be utilized in appropriate communities and during suitable season. Heavy equipment and appropriate season will be chosen so that soil disturbance and compaction are minimized. Mulching equipment will be used in the majority of these areas. Follow-up treatment will consist of an application of an appropriate herbicide mixture to the foliage of any resprouts or seedlings. The vegetative debris will then be stacked and burned in the adjacent flatwoods. Land Stewardship staff will evaluate the need for replanting on a case-by-case basis.

- Wetlands with light to moderate infestations:
  Hand crews will need to hike in on foot and either foliar, girdle, or cut-stump treat the exotics with the appropriate herbicide. Follow-up treatments will be conducted on an annual basis.

- Wetlands with heavy infestations:
  At suitable locations, some lightweight equipment may be utilized during dry, winter periods or hand crews will need to hike in on foot and either foliar, girdle, or cut-stump treat the exotics with the appropriate herbicide. Follow-up treatments will need to be conducted on an annual basis.
  Where feasible or necessary, biomass may be removed from wetland sites to be piled & burned and/or mulched.

Figure 20: Exotic Plant Removal Techniques



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Gator Hole Preserve

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Map Prepared on 02/15/06 by sfurnari@lcegov.com

This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes

Hydrologic restoration

The ditches and berms that border the fallow agricultural fields (northern and eastern boundary) impede the seasonal natural sheet flow. If feasible, the existing vegetation within the ditches or on the berms will be cleared and piled for burning. Some areas may only require leveling of spoil to plug portions of the ditches and allow water to flow southward into the developing wet prairie community. Not only will this improve the natural sheet flow, but it will also allow for more natural percolation of some of the water into the ground as well as filter the water as it flows through the vegetation. Staff will survey the berms for tortoise burrows and if found, the berm will not be removed in that area.

Since the fallow crop land was abandoned long ago, time and environmental elements have aided in diminishing the furrow rows to nominal levels. After an initial exotic plant removal effort nearly 5 years ago, many of the trees, shrubs and grasses are native; therefore staff does not recommend re-grading (re-disturbing) this area. It is expected that allowing supplementary sheet flow into the centralized area will continue to level out remaining rows. Where staff deems necessary, a tractor with front-end loader can level out any high mounds within the eastern transitioning upland areas.

Small, isolated wetlands may be created in areas where there is not enough fill present. Filling these small ditches with existing spoil is not expected to create flooding problems outside the Preserve boundaries since these internal impacts are minimal in size. Staff will coordinate with SFWMD and FDEP representatives to ensure that environmental permits are not needed.

Prescribed fire management

In November 2003, a prescribed fire was conducted in Management Unit 7 to prepare the area for the gopher tortoise relocation project. The prescribed fire program will continue to be implemented to closely mimic the natural fire regimes for the different plant communities to increase plant diversity and insure the canopies remain open. Once additional restoration projects are completed in management units that contain fire dependent communities, the prescribed fire management program will be implemented after the creation of appropriate fire lines/breaks. The timing of prescribed burning will be influenced by seasonal rain, listed species requirements and wind patterns. The Conservation 20/20 Burn Team Coordinator is coordinating with the DOF and FWC to finalize the County-wide Fire Management Plan that will apply to all Land Stewardship Preserves.

Pine tree thinning

The following recommendations for some of the pine flatwoods areas at Gator Hole Preserve were made utilizing the standards and recommendations by Butch Mallett, Senior Forester, Florida DOF for Estero Bay State Buffer Preserve in 2002.

Healthy flatwoods communities are characterized by open, uneven-aged pine stands that allow a considerable amount of sunlight to reach the forest floor. The sunlight allows for a ground cover of a mixture of grasses, herbaceous plants, scattered saw palmetto and dried pine needles that allow low intensity lightning started fires. Fire would burn through the dried grasses and needles to expose bare mineral soil. The bare ground, combined with light shading from the scattered pines was ideal for the germination of pine trees, wiregrass and many other flatwoods plants.

At GHP, there are two sections of pine trees and saw palmetto that currently have an unnaturally thick canopy and/or understory and very little germination of young pines (Figure 20). These heavily vegetated areas have occurred through lack of fire or other disturbances and totals approximately 26 acres. Land Stewardship staff measured the basal area (BA) of the pines in these areas and determined that they ranged between 70-120 square feet per acre. The pines will be reduced to between 40-60 BA, which will allow for enough pine needles to carry a fire while providing increased sunlight for plant diversity on the forest floor. The reduction of slash pine densities will achieve the desired habitat results and diminish the possibility of crown fires during a wildfire or prescribed fire.

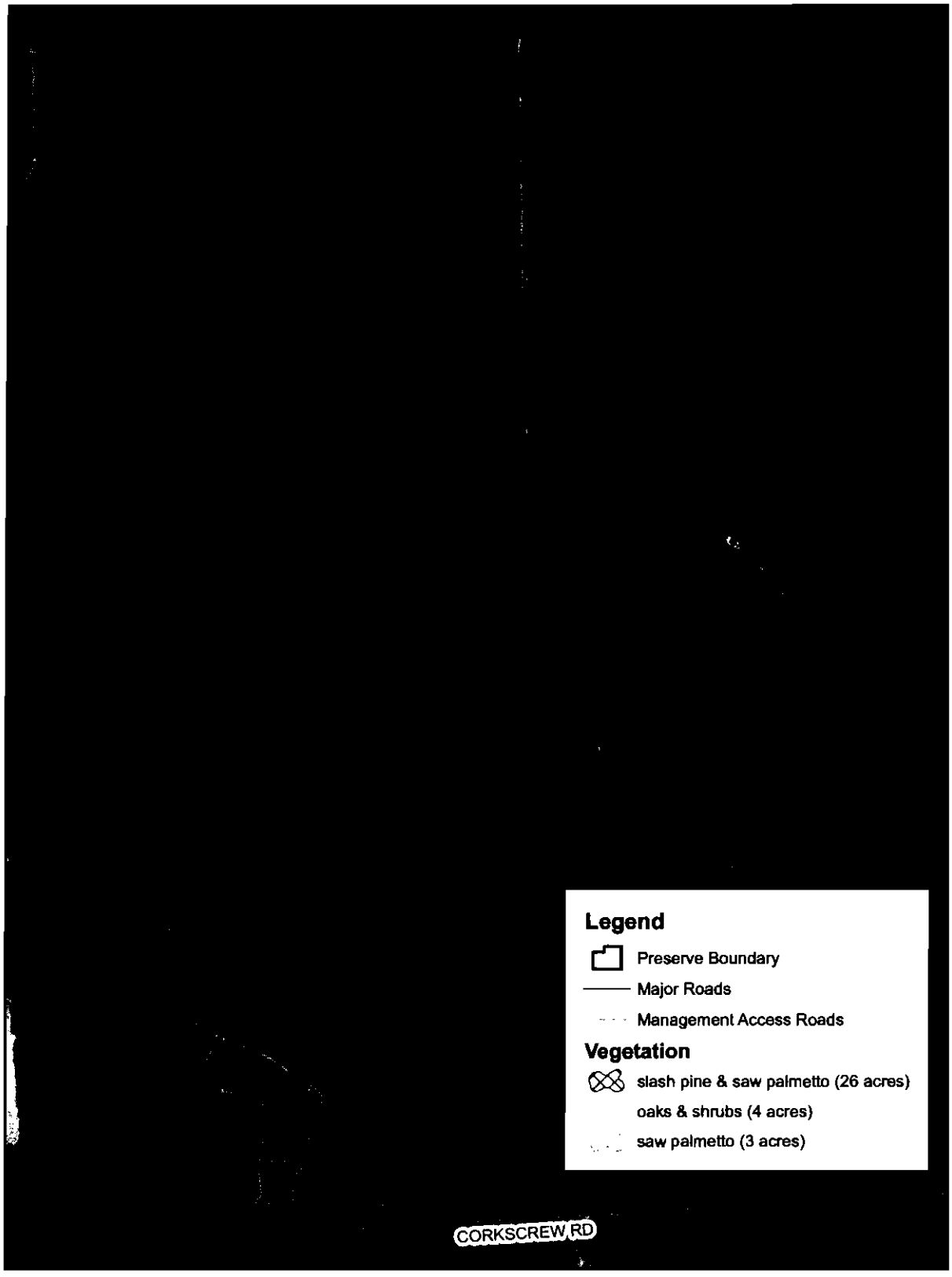
Staff will seek assistance through DOF for tree selection, keeping in mind that the goal of the thinning is ecological and not economic based. Many, but not all of the weak and diseased trees will be removed, since snags can serve as valuable wildlife habitat. Additional thinning will take place in clusters, to create openings for new pines and other plants to germinate. Staff will explore the possibility of selling the pines to a contractor to be used for fence posts and/or mulch. Proceeds from any timber sales will be placed in the C20/20 management budget.

Mechanical brush reduction

Before prescribed fire is conducted in the pine flatwoods of the Preserve, fuel loads need to be reduced mechanically. Several areas of the Preserve have thick patches of saw palmettos reaching over 10 feet in height. Areas not receiving pine tree thinning activities will need to be treated mechanically with either a hydroaxe, rollerchopper or brown tree cutter to improve wildlife habitat, plant diversity and lessen the probability of pine tree crown scorching or

death from an intense fire. The dense saw palmetto area covers 4 acres. Additional brush reduction is needed in the gopher tortoise relocation area to enhance their new habitat by removing smaller oaks and shrubs. This small area covers approximately 3 acres. Both of these areas are noted in Figure 21.

Figure 21: Vegetation Reduction Areas



N

Gator Hole Preserve

0 220 440 880 1,320 1,760 Feet

S:\esri\C2020AcrView\Gator Hole Preserve\GHP_management_plan\vegetation_reduction.mxd
Map Prepared on 02/17/06 by sfurnari@leegov.com
This is not a survey. Land stewardship staff has prepared this map for informational and planning purposes

Monitor and protect listed species

As discussed in the Designated Species section, there are several listed species that have been documented utilizing the Preserve. For the most part, these species will benefit from restoration activities, such as hydrologic improvements and the removal of invasive exotic plants. During restoration activities, efforts will be made to minimize any negative impact to listed species.

GHP is part of a countywide quarterly site inspection program conducted for all Conservation 20/20 Preserves. A copy of the site inspection form is available in the Land Stewardship Operations Manual. These inspections allow staff to monitor for any impacts and/or changes to each preserve and includes lists of all animal sightings and new plant species that are found. If, during these inspections, staff finds FNAI listed species, they will be reported using the appropriate forms.

Exotic animal removal

The species Land Stewardship staff is primarily concerned with is feral hogs. Currently, the only acceptable method of hog removal on Conservation 20/20 Preserves is trapping. Removing all hogs is an unreasonable goal; therefore a control program will need to be continuous on a long-term basis. A hog trapping effort was initiated 3.5 years ago for one-month in which 5 hogs were caught. This program, or another hog removal method, needs to revisit GHP.

Staff will investigate the feasibility to control other exotic species listed in Table 3. If practical, a methodology will be established and implemented.

Tortoise Relocation

Gopher Tortoise Management Plan

The gopher tortoise relocation project has begun in the southwest portion of the Preserve, in which preliminary fencing was set up that restricts them to a small area. Refer to Appendix C for detailed information regarding additional land stewardship activities for this listed species.

Overall Protection

Debris removal and prevent dumping

Debris removal will be an ongoing project at GHP. During quarterly site inspections, small objects that are encountered will be removed. Conservation 20/20 Rangers will also assist with removing small items when they are on patrol

at the Preserve. Except for management units 4 and 5, there is existing debris that will need to be removed with the help of several staff members.

Land Stewardship staff recognizes that new debris may be dumped in the Preserve periodically and depending on the nature of this debris it will be dealt with accordingly.

Boundary & Preserve sign installation

Boundary signs have been installed to further protect and delineate the Preserve. Missing or damaged signs will be replaced. C20/20 Rangers will check for boundary signs during the patrols and replace them immediately if possible or report the problem to the C20/20 Supervisor. Boundary signs will be placed every 200-300' along roadsides and 500' elsewhere. A 2' x 3' sign will be installed at the Corkscrew Road maintenance gate that will inform the public of the Preserve's name, acquisition information, public use category, LCPR website address and contact information.

Change zoning category

Staff will coordinate with Lee County Division of Planning staff to discuss the zoning of GHP. The zoning will be changed to "Environmentally Critical" from "Agriculture."

The following "Prioritized Projected Timetable for Implementation" is based on obtaining necessary funding for numerous land stewardship projects. Implementation of these goals may be delayed due to changes in staff, extreme weather conditions or a change in priorities on properties managed by Lee County.

VII. PROJECTED TIMETABLE FOR IMPLEMENTATION

Prioritized Projected Timetable for Implementation of the Management Action Plan (Mar 2006 – Jan 2011)

[illegible]	[illegible]	[illegible]	[illegible]	Oct-[illegible]	Dec-[illegible]	Jan-07	[illegible]	Jun-[illegible]	[illegible]	Oct-[illegible]	Dec-[illegible]	Jan-[illegible]	[illegible]	Jun-[illegible]	[illegible]	Oct-[illegible]	Dec-[illegible]	Jan-[illegible]	[illegible]	Oct-[illegible]	Jan-[illegible]	Jun-[illegible]	Oct-[illegible]	[illegible]
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[illegible]																								
[illegible]												3,5,6												1,2,4
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[illegible]						2-5, 7																		
[illegible]												[illegible]												1,2,3
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[illegible]											x	→	→	→	→	→	→	→	→	→	→	→	→	
[illegible]					x						x						x				x			
Tortoise Relocation																								
[illegible]	x	x	x		x		x	x	x		x		x	[illegible]										
[illegible]		x	x		x		x	x	x		x		x											
[illegible]		x	x		x		x	x	x		x		x	x	x		x		x					
[illegible]				x						x						x				x			x	
[illegible]												3,5,6												
Overall Protection																								
Install preserve sign				x																				
Large debris removal projects					x																			x
Change Zoning categories								x																

★ = all areas previously treated including DOC work conducted in 2001

This Timetable for Implementation is based on obtaining necessary funding for numerous land stewardship projects.

Implementation of these goals may also be delayed due to changes in staff, extreme weather conditions or a change in priorities on properties managed by Lee County.

VIII. FINANCIAL CONSIDERATIONS

There is a management fund established in perpetuity for all Conservation 20/20 preserves. Monies from this fund will be available for all aspects of restoration projects and management in perpetuity. However, monies will be supplemented through grants from agencies such as NRCS, FDEP and USFWS as well as pursuing mitigation opportunities from Lee County and other public entities. Projected costs and funding sources are listed in Appendix E.

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X. APPENDICES

Appendix A: Plant Sightings

Appendix B: Wildlife Sightings

Appendix C: Gopher Tortoise Management Plan

Appendix D: Conservation Easement

Appendix E: Projected Costs and Funding Sources

Appendix A: Plant Sightings

Appendix A: Plant Sightings at Gator Hole Preserve

Scientific and Common names for this list were obtained from Wunderlin & Hansen 2003.

Scientific Name	Common Name	native/exotic	EPPC
Family: Blechnaceae (mid-sorus fern)			
Blechnum serrulatum	swamp fern	native	
Woodwardia virginica	Virginia chain fern	native	
Family: Dennstaedtiaceae (cuplet fern)			
Pteridium aquilinum var. *caudatum*	lacy bracken fern	native	
Family: Nephrolepidaceae (sword fern)			
Nephrolepis biserrata	giant sword fern	native	
Nephrolepis exaltata	sword fern	native	
Family: Osmundaceae (royal fern)			
Osmunda regalis var. spectabilis	royal fern	native	
Family: Polypodiaceae (polypody)50			
Campyloneurum phyllitidis	long strap fern	native	
Phlebodium aureum	golden polypody	native	
Pleopeltis polypodioides var. michauxiana	resurrection fern	native	
Family: Thelpteridaceae (marsh fern)			
Thelypteris kunthii	southern shield fern	native	
Family: Vittariaceae (shoestring fern)			
Vittaria lineata	shoestring fern	native	
Family: Cupressaceae (cedar)			
Taxodium ascendens	pond cypress	native	
Taxodium distichum	bald cypress	native	
Family: Pinaceae (pine)			
Pinus elliottii	south Florida slash pine	native	
Family: Alismataceae (water plantain)			
Sagittaria graminea	grassy arrowhead	native	
Sagittaria lancifolia subsp. Lancifolia	bulltongue arrowhead	native	
Family: Alliaceae (garlic)			
Nothoscordum bivalve	crowpoison	native	
Family: Apiaceae (carrot)			
Eryngium yuccifolium	button rattlesnakemaster	native	
Family: Arecaceae (palm)			
Serenoa palmetto	cabbage palm	native	
Serenoa repens	saw palmetto	native	
Family: Bromeliaceae (pineapple)			
Tillandsia fasciculata var. densispica	stiff-leaved wild pine,cardinal airplant	native	
Tillandsia recurvata	ball-moss	native	
Tillandsia setacea	southern needleleaf	native	
Tillandsia usneoides	Spanish-moss	native	
Tillandsia utriculata	giant wild-pine, giant airplant	native	
Family: Cyperaceae (sedge)			
Carex tribuloides	blunt broom sedge	native	
Cladium mariscoides	swamp sawgrass	native	
Rhynchospora colorata	starrush whitetop	native	
Eleocharis interstincta	knotted spikerush	native	
Fuirena scirpoidea	southern umbrellasedge	native	
Rynchospora microcarpa	southern beakrush	native	
Rynchospora spp.	beakrush	native	
Scleria spp.	nut rush	native	

Appendix A: Plant Sightings at Gator Hole Preserve (continued)

Scientific Name	Common Name	native/exotic	EPPC
Family: Dioscoreaceae (yam)			
Dioscorea bulbifera	air potato	exotic	I
Family: Eriocaulaceae (pipewort)			
Eriocaulon decangulare	ten-angled pipewort	native	
Syngonanthus flavidulus	yellow hatpins	native	
Family: Haemodoraceae (bloodwort)			
Lachnanthes caroliana	redroot	native	
Family: Hypoxidaceae (yellow stargrass)			
Hypoxis juncea	fringed yellow stargrass	native	
Family: Iridaceae (iris)			
Sisyrinchium angustifolium	narrowleaf blue-eyed grass	native	
Family: Juncaceae (rush)			
Juncus megacephalus	bighead rush	native	
Family: Liliaceae (lily)			
Lilium catesbaei	pine lily	native	
Family: Marantaceae (arrowroot)			
Thalia geniculata	alligatorflag, fireflag	native	
Family: Orchidaceae (orchid)			
Bletia purpurea	pinepink	native	
Eulophia alta	wild coco	native	
Habenaria floribunda	toothpedal false reinorchid	native	
Pteroglossaspis ecristata	giant orchid	native	
Spiranthes longilabris	longlip ladiestresses	native	
Spiranthes praecox	greenvein ladiestresses	native	
Family: Poaceae (grass)			
Andropogon virginicus	chalky bluestem	native	
Andropogon glomeratus var. glaucopsis	purple bluestem	native	
Andropogon glomeratus var. pumilus	common bushy bluestem	native	
Aristida purpurascens	arrowfeather threeawn	native	
Aristida spiciformis	bottlebrush threeawn	native	
Aristida stricta	wiregrass	native	
Hymenachne amplexicaulis	West Indian marsh grass	exotic	I
Panicum hemitomon	maidencane	native	
Panicum maximum	Guinea grass	exotic	I
Setaria parviflora	yellow bristlegrass	native	
Family: Pontederiaceae (pickerelweed)			
Pontederia cordata	pickerelweed	native	
Family: Xyridaceae (yelloweyed grass)			
Xyris elliottii	Elliott's yelloweyed grass	native	
Family: Amaranthaceae (amaranth)			
Alternanthera sessilis	sessile joyweed	exotic	
Family: Anacariaceae (cashew)			
Toxicodendron radicans	poison ivy	native	
Schinus terebinthifolius	Brazilian pepper	exotic	I
Family: Annonaceae (custard-apple)			
Annona glarbra	pond apple	native	
Asimina reticulata	netted pawpaw	native	
Family: Apiaceae (carrot)			
Oxypolis filiformis subsp. Filiformis	water cowbane	native	

Appendix A: Plant Sightings at Gator Hole Preserve (continued)

Scientific Name	Common Name	native/exotic	EPPC
Family: Aquifoliaceae (holly)			
Ilex cassine var. *cassine*	dahoon	native	
Ilex glabra	gallberry	native	
Family: Asteraceae (aster)			
Baccharis glomeruliflora	silverling	native	
Baccharis halimifolia	saltbush, groundsel tree	native	
Bidens alba	beggarticks	native	
Chaptalia tomentosa	pineland daisy	native	
Cirsium horridulum	purple thistle	native	
Cirsium nuttallii	Nuttall's thistle	native	
Conoclinium coelestinum	blue mistflower	native	
Coreopsis leavenworthii	Leavenworth's tickseed	native	
Elephantopus elatus	tall elephantsfoot	native	
Emilia fosbergii	Florida tasselflower	exotic	
Erechtites hieraciifolius	fireweed	native	
Erigeron quercifolius	oakleaf fleabane	native	
Erigeron vernus	early whitetop fleabane	native	
Eupatorium capillifolium	dogfennel	native	
Euthamia graminifolia	flattop goldenrod	native	
Flaveria floridana	Florida yellowtop	native	
Hieracium megacephalon	coastalplain hawkweed	native	
Liatris chapmanii	Chapman's gayfeather	native	
Liatris spicata	dense gayfeather	native	
Liatris tenuifolia	shortleaf gayfeather	native	
Lygodesmia aphylla	rose-rush	native	
Mikania scandens	climbing hempvine	native	
Pityopsis graminifolia	narrowleaf silkgrass	native	
Pluchea odorata	sweetscent	native	
Pluchea rosea	rosy camphorweed	native	
Pterocaulon pycnostachyum	blackroot	native	
Rudbeckia hirta	blackeyed Susan	native	
Solidago sphacelata	false goldenrod	native	
Sphagneticola trilobata	creeping oxeye (wedelia)	exotic	II
Symphyotrichum carolinianum	climbing aster	native	
Vernonia blodgettii	Florida ironweed	native	
Family: Boraginaceae (borage)			
Heliotropium polyphyllum	pineland heliotrope	native	
Family: Campanulaceae (bellflower)			
Lobelia glandulosa	glade lobelia	native	
Family: Chrysobalanaceae (coco plum)			
Licania michauxii	gopher apple	native	
Family: Clusiaceae (mangosteen)			
Hypericum brachyphyllum	coastalplain St. John's-wort	native	
Hypericum cistifolium	roundpod St. John's-wort	native	
Hypericum hypericoides	St. Andrew's-cross	native	
Hypericum tetrapetalum	fourpetal St. John's-wort	native	
Family: Convolvulaceae (morning-glory)			
Ipomoea hederacea	ivyleaf morning-glory	exotic	
Ipomoea indica	oceanblue morning-glory	native	

Appendix A: Plant Sightings at Gator Hole Preserve (continued)

Scientific Name	Common Name	native/exotic	EPPC
Family: Droseraceae (sundew)			
Drosera capillaris	pink sundew	native	
Family: Ericaceae (heath)			
Lyonia fruticosa	coastalplain staggerbush	native	
Family: Euphorbiaceae (spurge)			
Ricinus communis	castorbean	exotic	
Family: Fabaceae (pea)			
Abrus precatorius	rosary pea	exotic	I
Acacia auriculiformis	earleaf acacia	exotic	I
Crotalaria spectabilis	showy rattlebox	exotic	
Leucaena leucocephala	white leadtree	exotic	II
Senna alata	candlestick plant	exotic	
Family: Fagaceae (oak)			
Quercus laurifolia	laurel oak	native	
Family: Gentianaceae (gentian)			
Sabatia brevifolia	shortleaf rosegentian	native	
Sabatia grandiflora	largeflower rosegentian	native	
Sabatia stellaris	rose-of-plymouth	native	
Family: Haloragaceae (watermilfoil)			
Proserpinaca palustris	marsh mermaidweed	native	
Proserpinaca pectinata	combleaf mermaidweed	native	
Family: Lamiaceae (mint)			
Hyptis alata	musky mint	native	
Physostegia purpurea	eastern false dragonhead	native	
Piloblephis rigida	wild pennyroyal	native	
Family: Lauraceae (laurel)			
Cassytha filiformis	love vine	native	
Persea palustris	swamp bay	native	
Family: Lentibulariaceae (bladderwort)			
Pinguicula pumila	small butterwort	native	
Utricularia subulata	zigzag bladderwort	native	
Family: Linaceae (flax)			
Linum floridanum	Florida yellow flax	native	
Family: Malvaceae (mallow)			
Melochia corchorifolia	chocolateweed	exotic	
Urena lobata	Caesarweed	exotic	II
Family: Meliaceae (mahogany)			
Melia azedarach	Chinaberrytree	exotic	II
Family: Moraceae (mulberry)			
Ficus aurea	Florida strangler fig	native	
Family: Myricaceae (bayberry)			
Myrica cerifera	wax myrtle	native	
Family: Myrsinaceae (myrsine)			
Rapanea punctata	myrsine	native	
Family: Myrtaceae (myrtle)			
Melaleuca quinquenervia	punktree	exotic	I
Rhodomyrtus tomentosa	downy rose-myrtle	exotic	I

Appendix A: Plant Sightings at Gator Hole Preserve (continued)

Scientific Name	Common Name	native/exotic	EPPC
Family: Onagraceae (eveningprimrose)			
Ludwigia microcarpa	smallfruit primrosewillow	native	
Ludwigia peruviana	Peruvian primrosewillow	exotic	
Ludwigia repens	creeping primrosewillow	native	
Family: Phytolaccaceae (pokeweed)			
Phytolacca americana	American pokeweed	native	
Family: Polygonaceae (buckwheat)			
Polygonum hydropiperoides	swamp smartweed	native	
Family: Polygalaceae (milkwort)			
Polygala lutea	orange milkwort	native	
Polygala grandiflora	showy milkwort	native	
Family: Rubiaceae (madder)			
Richardia brasiliensis	tropical Mexican clover	exotic	
Spermacoce verticillata	shrubby false buttonweed	exotic	
Family: Salicaceae (willow)			
Salix caroliniana	coastalplain willow	native	
Family: Sapindaceae (soapberry)			
Acer rubrum	red maple	native	
Family: Sapotaceae (sapodilla)			
Sideroxylon salicifolium	white bully	native	
Family: Solanaceae (nightshade)			
Physalis walteri	Walter's groundcherry	native	
Solanum americanum	American black nightshade	native	
Family: Turneraceae (turnera)			
Piriqueta cistoides subsp. caroliniana	pitted stripeseed	native	
Family: Urticaceae (nettle)			
Boehmeria cylindrica	false nettle	native	
Family: Veronicaceae (speedwell)			
Scoparia dulcis	licoriceweed	native	
Family: Violaceae (violet)			
Viola lanceolata	bog white violet	native	
Family: Vitaceae (grape)			
Parthenocissus quinquefolia	Virginia-creeper, woodbine	native	
Vitis cinerea var. floridana	Florida grape	native	
Vitis rotundifolia	muscadine, muscadine grape	native	

Florida EPPC Status

I = species that are invading and disrupting native plant communities

II = species that have shown a potential to disrupt native plant communities

Appendix B: Wildlife Sightings

Appendix B: Wildlife Sightings at Gator Hole Preserve

Scientific Name	Common Name	Designated Status	
		FWC	FWS
Birds			
Family: Anhingidae (anhingas)			
Anhinga anhinga	anhinga		
Family: Ardeidae (herons, egrets, bitterns)			
Ardea herodius	great blue heron		
Ardea alba	great egret		
Family: Threskiornithidae (ibises and spoonbills)			
Eudocimus albus	white ibis	SSC	
Platalea ajaia	roseate spoonbill	SSC	
Family: Ciconiidae (storks)			
Mycteria americana	wood stork	E	E
Family: Cathartidae (new world vultures)			
Cathartes aura	turkey vulture		
Coragyps atratus	black vulture		
Family: Accipitridae (hawks, kites, accipiters, harriers, and eagles)			
Elanoides forficatus	swallow-tailed kite		
Subfamily: Buteoninae (buzzard hawks)			
Accipiter cooperii	Cooper's hawk		
Buteo jamaicensis	red-tailed hawk		
Buteo lineatus	red-shouldered hawk		
Family: Pandionidae (ospreys)			
Pandion haliaetus	osprey		
Family: Falconidae (falcons)			
Falco sparverius	American kestrel		
Family: Laridae (terns and skimmers)			
Sterna maxima	royal tern		
Family: Columbidae (pigeons and doves)			
Zenaida macroura	mourning dove		
Columbina passerina	common ground-dove		
Family: Alcedinidae (kingfishers)			
Ceryle alcyon	belted kingfisher		
Family: Picidae (woodpeckers)			
Dryocopus pileatus	pileated woodpecker		
Melanerpes carolinus	red-bellied woodpecker		
Picoides pubescens	downy woodpecker		
Picoides villosus	hairy woodpecker		
Sphyrapicus varius	yellow-bellied sapsucker		
Family: Troglodytidae (wrens)			
Thryothorus ludovicianus	Carolina wren		
Family: Tyrannidae (tryant flycatchers)			
Sayornis phoebe	eastern phoebe		
Family: Hirundinidae (swallows)			
Tachycineta bicolor	tree swallow		
Family: Sylviidae (gnatcatchers)			
Polioptila caerulea	blue-gray gnatcatcher		
Family: Turdidae (thrushes)			
Turdus migratorius	American robin		

Appendix B: Wildlife Sightings at Gator Hole Preserve (continued)

Scientific Name	Common Name	Designated Status	
		FWC	FWS
Birds (continued)			
Family: Mimidae (mockingbirds and thrashers)			
Dumetella carolinensis	gray catbird		
Mimus polyglottos	northern mockingbird		
Toxostoma rufum	brown thrasher		
Family: Corvidae (crows, jays, etc.)			
Cyanocitta cristata	blue jay		
Family: Vireonidae (vireos)			
Vireo griseus	white-eyed vireo		
Vireo solitarius	blue-headed vireo		
Family: Parulidae (wood-warblers)			
Dendroica coronata	yellow-rumped warbler		
Dendroica palmarum	palm warbler		
Dendroica pinus	pine warbler		
Geothlypis trichas	common yellowthroat		
Mniotilta varia	black-and-white warbler		
Seiurus aurocapillus	ovenbird		
Family: Cardinalidae (cardinals)			
Cardinalis cardinalis	northern cardinal		
Family: Emberizidae (sparrows and towhees)			
Pipilo erythrophthalmus	eastern towhee		
Family: Icteridae (blackbirds, orioles, etc.)			
Agelaius phoeniceus	red-winged blackbird		
Quiscalus quiscauls	common grackle		
Amphibians			
Family: Leptodactylidae (tropical frogs)			
Eleutherodactylus planirostris planirostris	greenhouse frog *		
Family: Bufonidae (toads)			
Bufo quercicus	oak toad		
Family: Hylidae (treefrogs)			
Hyla cinerea	green treefrog		
Hyla squirella	squirrel treefrog		
Osteopilus septentrionalis	cuban treefrog *		
Family: Ranidae (true frogs)			
Rana grylio	pig frog		
Reptiles			
Family: Alligatoridae (alligator)			
Alligator mississippiensis	American alligator	SSC	T
Family: Kinosternidae (mud and musk turtles)			
Kinosternon baurii	striped mud turtle		
Family: Emydidae (box and water turtles)			
Pseudemys floridana peninsularis	peninsula cooter		
Family: Testudinidae (gopher tortoises)			
Gopherus polyphemus	gopher tortoise	SSC	
Family: Polychridae (anoles)			
Anolis sagrei	brown anole *		

Appendix B: Wildlife Sightings at Gator Hole Preserve (continued)

Scientific Name	Common Name	Designated Status	
		FWC	FWS
Reptiles (continued)			
Family: Colubridae (colubrids)			
Coluber constrictor priapus	black racer		
Drymarchon corais couperi	indigo snake	T	T
Mammals			
Family: Canidae (wolves, coyotes and foxes)			
Urocyon cinereoargenteus	common gray fox		
Family: Cervidae (deer)			
Odocoileus virginianus	white-tailed deer		
Family: Dasypodidae (armadillos)			
Dasypus novemcinctus	nine-banded armadillo *		
Family: Didelphidae (opossums)			
Didelphis virginiana	Virginia opossum		
Family: Felidae (cats)			
Lynx rufus	bobcat		
Family: Leporidae (rabbits and hares)			
Sylvilagus floridanus	eastern cottontail		
Family: Muridae (mice and rats)			
Sigmodon hispidus	hispid cotton rat		
Family: Procyonidae (raccoons)			
Procyon lotor	raccoon		
Family: Suidae (pigs and worthogs)			
Sus scrofa	feral hog *		
Insects and Spiders			
Family: Curculionidae (weevils)			
Oxyops vitiosa	melaleuca weevil *		
Family: Psyllidae (psyllids)			
Boreioglycaspis melaleucae	melaleuca psyllid *		
Butterflies			
Family: Heliconiidae			
Subfamily: Heliconiinae (longwings and fritillaries)			
Heliconius charitonius	zebra longwing		
Family: Nymphalidae (fritillaries and orange patterend butterflies)			
Junonia evarete	Florida buckeye		
Agraulis vanillae	gulf fritillary		

KEY:

FWC= Florida Fish & Wildlife Conservation Commission
FWS= U.S. Fish & Wildlife Service

E= Endangered
T= Threatened
SSC= Species of Special Concern

*** = Non-native**

Appendix C: Gopher Tortoise Management Plan

Appendix C

Gopher Tortoise Management Plan
Gator Hole Preserve (site #62)
Management Unit 7

In May 2004, Ray and Pat Ashton wrote a preliminary management plan for Gator Hole Preserve. This Gopher Tortoise Management Plan is a synopsis of the information provided (on file at Lee County Parks and Recreation, Terry Park), along with information gained after conducting field work for the Land Stewardship Plan for GHP.

Objective:

To maintain or improve Management Unit (MU) 7 for the gopher tortoises (*Gopherus polyphemus)* that are being relocated to the site from a Lee County DOT (LDOT) infrastructure project.

Location and Site Description:

Section: 21 Township: 46S Range: 26E

Total Acreage of MU: 18.6 acres:

- 3.1 – fallow cropland/mesic flatwoods
- .7 – upland berm
- 10.4 – fallow cropland/wet flatwoods
- 4.1 – fallow cropland/wet prairie

Management Goals:

1. Finish preparing site for gopher tortoise arrival.
2. Maintain secure perimeter around MU 7.
3. Maintain adequate forage for tortoises.
4. Monitor relocated tortoise population.
5. Increase area for tortoises to additional portions of Preserve.

Action Plan:

1. Complete preparation work for tortoises:

   - 10 soil mounds were installed in August, 2005 by LDOT according to the Management Plan developed by Ray Ashton. Although located and mapped with Global Positioning System (GPS) technology when installed, the vegetation covering the mounds makes them very difficult to locate now. All mounds will be permanently marked with a brightly colored post so that staff can monitor whether any are utilized by the tortoises.
   - Starter burrows will be dug into the soil mounds and the berm on the north boundary of MU 7.
   - A final check of the fencing that surrounds relocation area to make sure there are no holes or other problems.

2. Maintain secure perimeter:

   - Weekly visits to relocation site for first month by Conservation 20/20 staff to check and repair any breaches in the fencing.
   - After the first month, the fencing will be examined during quarterly site inspections, unless there have been issues with the fencing that merit more frequent visits.
   - Conservation 20/20 Rangers and Lee County Bird Patrol volunteers will be alerted of the relocation and asked to check the fencing when they are on site for regular patrols/monitoring. Any fencing problems will be reported to Land Stewardship staff.

3. Maintain forage:

   During fall 2003 – winter 2004, 106 plant species (83%) potential tortoise forage plants, were documented. Annual plant diversity was recommended to be between 198-225 species, with 80-90% forage plants. Although only 106 plant species were recorded, the survey was only conducted twice and was not a complete annual survey. Eight transects were established during this monitoring.

   - A yearly sweep of MU 7 will be conducted to eliminate invasive exotic plants.
   - Prescribed fire on a 3-5 year rotation (last burn November 2003).
   - Mechanical brush reduction or mowing every other year during the winter when tortoises are least likely to be active.
   - The fire and mowing intervals may be adjusted as necessary to maintain a goal of 40% canopy cover in the mesic flatwoods habitat

and 25% brush cover (with no more than half of that 25% saw palmetto).

- Permanently GPS the vegetation transects.
- During quarterly site inspections, vegetation will be documented within the mesic flatwoods portion of MU 7. An entire, informal plant survey will be conducted during the late spring/early summer. As long as the plant diversity stays within the range listed above (min. 198 species), no additional monitoring will be conducted.
- If the diversity drops at least 25% below the recommended range and at least one prescribed fire and/or mechanical treatment does not improve the plant forage for the following year, more intense monitoring, utilizing the transects and other management techniques will take place.

4. Monitor tortoises:
   - Tortoises relocated to GHP will be permanently marked by the consultant, using Cagle's marking system. Records will be maintained in a database by C20/20 Land Stewardship staff.
   - During quarterly site inspections, or other times that staff is at GHP, tortoises observed will be checked for any visible health problems and the consultant will be alerted to any problems.
   - Any dead tortoises will be noted and looked for signs of animal predation. If predation appears to be a significant problem, a trapping program will take place.
   - Any burrows seen will be GPS'ed and each October a burrow survey will be conducted in the mesic flatwoods and berm portions of MU 7. All burrows will be mapped for comparison purposes.

5. Increase tortoise area:

   After a minimum of two years, staff hopes to remove the interior fencing from MU 7. Before this can occur, staff recommends the following actions:

   - Additional hog fencing (or similar) attached to the existing perimeter fence, 18-24 inches both above and below the ground.
   - Mechanical brush reduction and pine tree thinning of MU 5.
   - Initial exotic plant treatment of MU 6.

Appendix D: Conservation Easement

55.50 - R
.70 - DS
56.20

4263377

OR2881 P60810

DEED OF CONSERVATION EASEMENT

THIS DEED OF CONSERVATION EASEMENT is given this 10th day of October, 1997, by Richard K. Bennett, as Trustee of Corkscrew East and Corkscrew West Land Trusts, 865 Fifth Avenue South, Naples, FL 34102 ("Grantor") to the South Florida Water Management District ("Grantee"). As used herein, the term Grantor shall include any and all heirs, successors or assigns of the Grantor, and all subsequent owners of the "Property" (as hereinafter defined) and the term Grantee shall include any successor or assignee of Grantee.

WITNESSETH

WHEREAS, the Grantor is the owner of certain lands situated in Lee County, Florida, and more specifically described in Exhibit "A" attached hereto and incorporated herein by reference ("Property"); and

WHEREAS, the Grantor desires to construct Panther Trace ("Project") at a site in Lee County, which is subject to the regulatory jurisdiction of South Florida Water Management District ("District"); and

WHEREAS, District Permit No. 36-03235-P ("Permit") authorizes certain activities which affect surface waters in or of the State of Florida; and

WHEREAS, this Permit requires that the Grantor preserve and/or mitigate wetlands under the District's jurisdiction; and

WHEREAS, the Grantor has developed and proposed as part of the permit conditions a conservation tract and maintenance buffer ("Conservation Area") involving preservation of certain wetland and/or upland systems on the Property which is more specifically described in Exhibit "B" attached hereto and incorporated herein by reference; and

WHEREAS, the Grantor, in consideration of the consent granted by the Permit, is agreeable to granting and securing to the Grantee a perpetual conservation easement as defined in Section 704.06, Florida Statutes (1995), over the Property.

NOW, THEREFORE, in consideration of the issuance of the Permit to construct and operate the permitted activity, and as an inducement to Grantee in issuing the Permit, together with other good and valuable consideration, the adequacy and receipt of which is hereby acknowledged, Grantor hereby grants, creates and establishes a perpetual conservation easement for and in favor of the Grantee upon the Conservation Area which shall run with the land and be binding upon the Grantor, and shall remain in full force and effect forever.

The scope, nature, and character of this conservation easement shall be as follows:

Documentary Tax Pd. $ .70
$ ——— Intangible Tax Pd.
CHARLIE GREEN, CLERK, LEE COUNTY
By Judy Sherwood Deputy Clerk

1. It is the purpose of this conservation easement to retain land or water areas predominantly in their natural, vegetative, hydrologic, scenic, open, agricultural or wooded condition and to retain such areas as suitable habitat for fish, plants or wildlife. Those wetland and/or upland areas included in the Conservation Area which are to be enhanced or created pursuant ot the Permit shall be retained and maintained in the enhanced or created conditions required by the Permit.

To carry out this purpose, the following rights are conveyed to Grantee by this easement:

a. To enter upon the Conservation Area via the internal road system of the Property at reasonable times with any necessary equipment or vehicles to enforce the rights herein granted in a manner that will not unreasonably interfere with the use and quiet enjoyment of the Property by Grantor at the time of such entry; and

b. To enjoin any activity on or use of the Conservation Area that is inconsistent with this grant of easement and to enforce the restoration of such areas or features of the Conservation Area that may be damaged by any inconsistent activity or use.

2. Except for restoration, creation, enhancement, maintenance and monitoring activities, or surface water management improvements, which are permitted or required by the Permit, the following activities are prohibited in or on the Conservation Area:

a. Construction or placing of buildings, roads, signs, billboards or other advertising, utilities, or other structures on or above the ground;

b. Dumping or placing of soil or other substance or material as landfill, or dumping or placing of trash, waste, or unsightly or offensive materials;

c. Removal or destruction of trees, shrubs, or other vegetation, except for the removal of exotic vegetation in accordance with a District approved maintenance plan;

d. Excavation, dredging, or removal of loam, peat, gravel, soil, rock or other material substance in such manner as to affect the surface.

e. Surface use except for purposes that permit the land or water area to remain in its natural condition;

f. Activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation including, but not limited to, ditching, diking and fencing;

g. Acts or uses detrimental to such aforementioned retention of land or water areas;

h. Acts or uses within Grantor's regulatory jurisdiction which are detrimental to the preservation of any features or aspects of the Conservation Area having historical or archaeological significance.

3. Grantor reserves all rights as owner of the Conservation Area, including the right to engage in uses of the Conservation Area that are not prohibited herein and which are not inconsistent with any District Rule, criteria, permit and the intent and purposes of this Conservation Easement. Passive recreational activities which are not contrary to the purpose of this conservation easement may be permitted within the Conservation Area upon written approval by the District. The Grantor may conduct limited land clearing for the purpose of constructing such pervious facilities as docks, boardwalks, or mulched walking trails. Grantor shall submit plans for the construction of proposed facilities to the District for approval prior to construction. Grantor shall minimize and avoid, to the fullest extent possible, impact to any wetland or upland buffer areas within the Conservation Area. Any such work shall be subject to all applicable federal, state or local permitting requirements.

4. No right of access by the general public to any portion of the Property is conveyed by this conservation easement.

5. Grantee shall not be responsible for any costs or liabilities related to the operation, upkeep, or maintenance of the Property.

6. Grantor shall pay any and all real property taxes and assessments levied by competent authority on the Property.

7. Any costs incurred in enforcing, judicially or otherwise, the terms, provisions and restrictions of this conservation easement shall be borne by and recoverable against the non-prevailing party in such proceedings.

8. Enforcement of the terms, provisions and restrictions of this conservation easement shall be at the reasonable discretion of Grantee, and any forbearance on behalf of Grantee to exercise its rights hereunder in the event of any breach hereof by Grantor shall not be deemed or construed to be a waiver of Grantee's rights hereunder.

9. Grantee will hold this conservation easement exclusively for conservation purposes. Grantee will not assign its rights and obligations under this conservation easement except to another organization qualified to hold such interests under the applicable state laws.

10. If any provision of this conservation easement or the application thereof to any person or circumstances is found to be invalid, the remainder of the provisions of this conservation easement shall not be affected thereby, as long as the purpose of the conservation easement is preserved.

11. All notices, consents, approvals or other communications hereunder shall be in writing and shall be deemed properly given if sent by United States certified mail, return receipt requested, addressed to the appropriate party or successor-in-interest.

12. The terms, conditions, restrictions and purpose of this conservation easement shall be inserted by Grantor in any subsequent deed or other legal instrument by which Grantor divests itself of any interest in the Property. Any future holder of the Grantor's interest in the Property shall be notified in writing by Grantor of this conservation easement.

13. This conservation easement may be amended, altered, released or revoked only by written agreement between the parties hereto or their heirs, assigns or successors-in-interest, which shall be filed in the public records in Lee County.

TO HAVE AND TO HOLD unto Grantor forever. The covenants, terms, conditions, restrictions and purpose imposed with this conservation easement shall be binding upon Grantor, and shall continue as a servitude running in perpetuity with the Property.

Grantor hereby covenants with said Grantee that Grantor is lawfully seized of said Property in fee simple, that the Property is free and clear of all encumbrances, that Grantor has good right and lawful authority to convey this conservation easement, and that it hereby fully warrants and defends the title to the conservation easement hereby conveyed against the lawful claims of all persons whomsoever.

IN WITNESS WHEREOF, the undersigned has hereunto set its authorized hand this 10th day of October, 1997.

Signed, sealed and delivered in our presence as witnesses:

Erika Ziegler-Robinson

Erika Ziegler-Robinson

Print/Type Name of Witness

Barbara J. Hipsley

Barbara J. Hipsley

Print/Type Name of Witness

Richard K. Bennett, as Trustee of Corkscrew East/West Land Trusts

By: Richard K. Bennett

Richard K. Bennett, Esquire

Legal Form Approved
SFWMD Office of Counsel
By _____ Date 8/25/97

STATE OF FLORIDA)

COUNTY OF COLLIER)

THE FOREGOING INSTRUMENT was acknowledged before me this 10th day of October, 1997, by **RICHARD K. BENNETT**, who is personally known to me or who has produced _____ as identification, acknowledging that the above and foregoing is true and correct and that it was executed freely and voluntarily for the purposes expressed therein.

Barbara J. Hipsley

Barbara J. Hipsley, Notary Public
Commission Expiration Date: _____
Commission No: _____

Barbara J. Hipsley
MY COMMISSION # CC525631 EXPIRES
January 21, 2000
BONDED THRU TROY FAIN INSURANCE, INC.

OR2881 PG0814

DESCRIPTION OF RECORD:

(O. R. 2044 PAGE 2257 & O. R. 2083 PAGE 820)

A TRACT OR PARCEL OF LAND SITUATED IN THE STATE OF FLORIDA, COUNTY OF LEE, BEING A PART OF THE WEST ONE HALF (W. 1/2) OF SECTION 21, TOWNSHIP 46 SOUTH, RANGE 26 EAST, AND FURTHER BONDED AND DESCRIBED AS FOLLOWS:

STARTING AT A CONCRETE POST MARKING THE NORTHWEST CORNER OF SAID SECTION 21: THENCE N. 89°16'29.5" E. ALONG THE NORTH LINE OF SAID SECTION 21 FOR 1627.01 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL: THENCE CONTINUE N. 89°16'29.5" E. ALONG SAID NORTH LINE FOR 881.89 FEET; THENCE S. 01°16'47.5" E. PARALLEL WITH THE WEST LINE OF SAID SECTION 21 FOR 4278.166 FEET TO AN INTERSECTION WITH THE NORTHERLY RIGHT-OF-WAY LINE OF CORKSCREW ROAD (100.00 FEET WIDE); THENCE S. 86°25'00" W. ALONG SAID RIGHT-OF-WAY LINE FOR 882.56 FEET; THENCE N. 01°16'47.5" W. PARALLEL WITH SAID WEST LINE OF SAID SECTION 21 FOR 4322.18 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS: 87.05 ACRES MORE OR LESS.

AND

A TRACT OR PARCEL OF LAND SITUATED IN THE STATE OF FLORIDA, COUNTY OF LEE, BEING A PART OF THE WEST ONE HALF (W. 1/2) OF SECTION 21, TOWNSHIP 46 SOUTH, RANGE 26 EAST, AND FURTHER BONDED AND DESCRIBED AS FOLLOWS:

STARTING AT A CONCRETE POST MARKING THE NORTHWEST CORNER OF SAID SECTION 21; THENCE N. 89°16'29.5" E. ALONG THE NORTH LINE OF SAID SECTION 21 FOR 745.115 FEET TO THE POINT OF BEGINNING OF THE HEREIN DESCRIBED PARCEL: THENCE CONTINUE N. 89°16'29.5" E. ALONG SAID NORTH LINE FOR 881.89 FEET; THENCE S. 01°16'47.5" E. PARALLEL WITH THE WEST LINE OF SAID SECTION 21 FOR 4322.18 FEET TO AN INTERSECTION WITH THE NORTHERLY RIGHT-OF-WAY LINE OF CORKSCREW ROAD (100.00 FEET WIDE); THENCE S. 86°25'00" W. ALONG SAID RIGHT-OF-WAY LINE FOR 882.56 FEET; THENCE N. 01°16'47.5" W. PARALLEL WITH SAID WEST LINE OF SAID SECTION 21 FOR 4366.19 FEET TO THE POINT OF BEGINNING.

SAID PARCEL CONTAINS: 87.95 ACRES MORE OR LESS.

Exhibit "A"

K&T SURVEY GROUP, INC.
LAND SURVEYORS & MAPPERS

2726 Swamp Cabbage Court
Fort Myers, Florida 33901
Phone (941) 274-0991
Fax (941) 274-0992

OR2881 PG0816

DESCRIPTION OF A WETLAND EASEMENT
LYING IN SECTION 21, T-46-S, R-26-E,
LEE COUNTY, FLORIDA.

(WETLAND EASEMENT)

A WETLAND EASEMENT SITUATED IN THE STATE OF FLORIDA, COUNTY OF LEE, LYING IN SECTION 21, TOWNSHIP 46 SOUTH, RANGE 26 EAST, BEING FURTHER DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 21; THENCE N.89°23'44"E., ALONG THE NORTH LINE OF SAID SECTION 21 FOR 2508.90 FEET; THENCE S.01°09'13"E., FOR 3063.87 FEET TO THE POINT OF BEGINNING; THENCE S.01°09'13"E., FOR 516.16 FEET; THENCE N.68°55'43"W., FOR 77.02 FEET; THENCE N.54°04'07"W., FOR 53.22 FEET; THENCE N.48°59'32"W., FOR 42.46 FEET; THENCE N.48°59'32"W., FOR 4.14 FEET; THENCE N.56°19'26"W., FOR 56.82 FEET; THENCE N.34°08'48"W., FOR 45.19 FEET; THENCE N.33°01'03"W., FOR 47.39 FEET; THENCE N.28°52'43"W., FOR 38.99 FEET; THENCE N.37°07'34"W., FOR 38.03 FEET; THENCE N.04°03'17"E., FOR 34.18 FEET; THENCE N.35°17'50"E., FOR 30.87 FEET; THENCE N.37°21'31"E., FOR 29.38 FEET; THENCE N.63°50'51"E., FOR 35.04 FEET; THENCE N.84°11'52"E., FOR 26.13 FEET; THENCE N.50°26'01"E., FOR 32.75 FEET; THENCE N.53°43'56"E., FOR 13.72 FEET; THENCE N.08°43'28"W., FOR 18.79 FEET; THENCE N.22°53'08"E., FOR 32.35 FEET; THENCE N.50°33'09"E., FOR 38.10 FEET; THENCE N.64°59'47"E., FOR 30.93 FEET; THENCE N.63°52'12"E., FOR 35.06 FEET; THENCE N.65°23'57"E., FOR 54.43 FEET TO THE POINT OF BEGINNING.

PARCEL CONTAINS 91751 SQUARE FEET OR 2.11 ACRES, MORE OR LESS.

BEARINGS ARE BASED ON SAID NORTH LINE OF SECTION 21 AS BEARING N.89°23'44"E.

K&T SURVEY GROUP, INC. July 23, 1997

KENNETH E. TRASK
PROFESSIONAL LAND SURVEYOR
FLORIDA CERTIFICATE NO. 4684

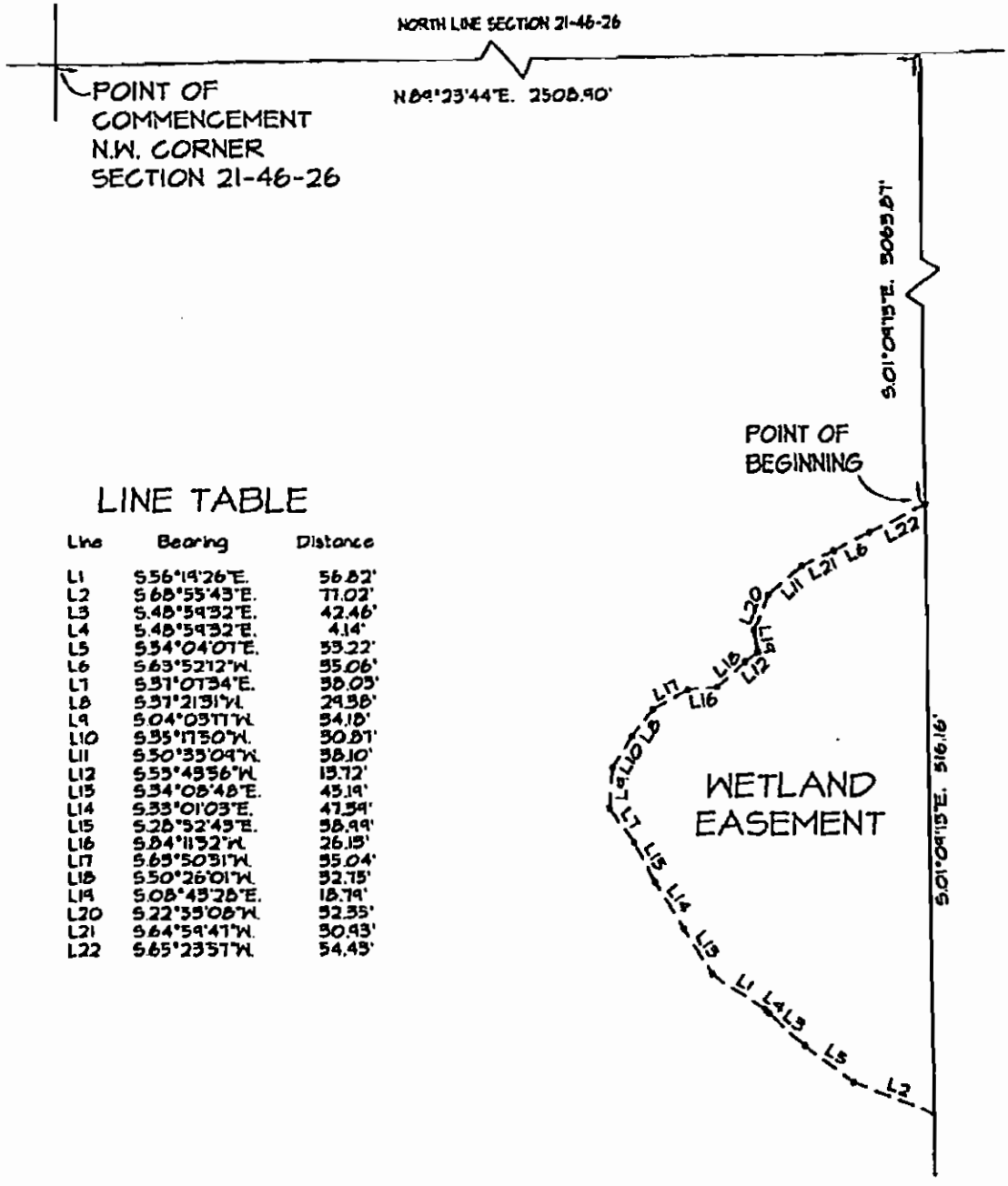
\4508WM.doc

SKETCH TO ACCOMPANY DESCRIPTION

1" = 150'

N

OR2881 PG0817



LINE TABLE

Line	Bearing	Distance
L1	S.56°19'26"E.	56.82'
L2	S.68°55'43"E.	71.02'
L3	S.48°59'32"E.	42.46'
L4	S.48°59'32"E.	4.14'
L5	S.34°04'07"E.	33.22'
L6	S.63°52'12"W.	55.06'
L7	S.31°07'34"E.	30.03'
L8	S.31°21'31"W.	29.38'
L9	S.04°05'11"W.	54.18'
L10	S.35°17'50"W.	30.81'
L11	S.50°35'09"W.	38.10'
L12	S.55°45'56"W.	19.72'
L13	S.34°08'48"E.	45.19'
L14	S.33°01'03"E.	47.59'
L15	S.28°52'43"E.	58.99'
L16	S.84°11'52"W.	26.15'
L17	S.69°50'31"W.	55.04'
L18	S.50°26'01"W.	52.75'
L19	S.08°45'28"E.	18.79'
L20	S.22°55'08"W.	52.35'
L21	S.64°59'41"W.	30.93'
L22	S.65°23'57"W.	54.45'

K&T SURVEY GROUP, INC.
LAND SURVEYORS & MAPPERS
FLORIDA LICENSED BUSINESS #6468

2726 SWAMP CABBAGE COURT
FORT MYERS, FLORIDA 33901
PHONE (941) 274-0991
FAX (941) 274-0992

Exhibit "B"
Page 2 of 6
Wetland E

**** THIS IS NOT A SURVEY ****

7-23-97

KENNETH E. TRASK DATE
PROFESSIONAL LAND SURVEYOR
FLORIDA CERTIFICATE NO. 4684

K&T SURVEY GROUP, INC.
LAND SURVEYORS & MAPPERS

2726 Swamp Cabbage Court
Fort Myers, Florida 33901
Phone (941) 274-0991
Fax (941) 274-0992

OR2881 PG0818

DESCRIPTION OF A WETLAND EASEMENT
LYING IN SECTION 21, T-46-S, R-26-E,
LEE COUNTY, FLORIDA.

(WETLAND EASEMENT)

A WETLAND EASEMENT SITUATED IN THE STATE OF FLORIDA, COUNTY OF LEE, LYING IN SECTION 21, TOWNSHIP 46 SOUTH, RANGE 26 EAST, BEING FURTHER DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 21; THENCE N.89°23'44"E., ALONG THE NORTH LINE OF SAID SECTION 21 FOR 2508.90 FEET; THENCE S.01°09'13"E., FOR 2494.70 FEET; THENCE S.88°50'48"W., FOR 183.69 FEET TO THE POINT OF BEGINNING; THENCE S.31°42'09"W., FOR 34.92 FEET; THENCE S.13°42'24"W., FOR 27.00 FEET; THENCE S.17°30'47"W., FOR 28.10 FEET; THENCE S.62°25'14"W., FOR 52.95 FEET; THENCE S.37°25'22"W., FOR 18.35 FEET; THENCE S.12°44'39"W., FOR 18.75 FEET; THENCE S.72°29'13"E., FOR 43.31 FEET; THENCE S.26°26'18"W., FOR 70.16 FEET; THENCE S.88°51'49"W., FOR 21.18 FEET; THENCE S.26°40'07"W., FOR 20.20 FEET; THENCE S.29°05'02"W., FOR 32.24 FEET; THENCE S.40°47'02"W., FOR 40.83 FEET; THENCE S.29°44'58"W., FOR 68.55 FEET; THENCE N.51°25'17"W., FOR 24.89 FEET; THENCE S.06°06'55"W., FOR 21.97 FEET; THENCE S.30°34'30"W., FOR 39.35 FEET; THENCE S.88°39'05"W., FOR 39.93 FEET; THENCE S.56°10'15"W., FOR 22.68 FEET; THENCE S.74°54'03"W., FOR 25.87 FEET; THENCE S.28°37'17"W., FOR 18.43 FEET; THENCE S.62°35'34"W., FOR 27.72 FEET; THENCE S.10°50'01"W., FOR 34.81 FEET; THENCE N.46°21'34"W., FOR 188.85 FEET; THENCE N.13°22'50"W., FOR 17.90 FEET; THENCE N.08°29'06"W., FOR 35.88 FEET; THENCE N.24°02'38"W., FOR 34.86 FEET; THENCE N.26°12'23"W., FOR 56.73 FEET; THENCE N.43°16'12"W., FOR 35.71 FEET; THENCE N.22°02'01"W., FOR 44.15 FEET; THENCE N.07°14'09"W., FOR 26.27 FEET; THENCE N.42°51'43"W., FOR 40.83 FEET; THENCE N.12°07'28"E., FOR 62.26 FEET; THENCE N.09°22'46"W., FOR 61.07 FEET; THENCE N.33°04'32"E., FOR 59.05 FEET; THENCE N.52°03'54"E., FOR 39.40 FEET; THENCE N.09°52'09"E., FOR 41.65 FEET; THENCE N.14°38'45"W., FOR 63.51 FEET; THENCE N.08°29'54"E., FOR 19.65 FEET; THENCE N.54°47'13"E., FOR 19.65 FEET; THENCE N.77°55'52"E., FOR 74.94 FEET; THENCE S.84°01'53"E., FOR 19.56 FEET; THENCE N.36°34'46"E., FOR 74.63 FEET; THENCE N.32°49'32"E., FOR 62.22 FEET; THENCE S.44°26'32"E., FOR 15.73 FEET; THENCE N.12°57'39"E., FOR 23.26 FEET; THENCE N.54°50'27"E., FOR 12.69 FEET; THENCE N.89°22'44"E., FOR 23.84 FEET; THENCE N.36°52'46"E., FOR 25.09 FEET; THENCE N.54°45'08"E., FOR 42.65 FEET; THENCE N.87°50'06"E., FOR 76.15 FEET; THENCE S.75°10'02"E., FOR 74.89 FEET; THENCE N.82°21'37"E., FOR 55.24 FEET; THENCE S.65°27'32"E., FOR 49.83 FEET; THENCE S.24°32'28"W., FOR 66.28 FEET; THENCE S.64°34'06"E., FOR 28.14 FEET; THENCE S.21°02'36"E., FOR 52.85 FEET; THENCE S.21°01'34"E., FOR 37.73 FEET; THENCE S.05°26'56"E., FOR 72.99 FEET; THENCE S.64°51'00"W., FOR 39.66 FEET; THENCE S.22°13'39"W., FOR 12.06 FEET; THENCE S.19°00'14"W., FOR 33.27 FEET; THENCE S.01°48'16"W., FOR 33.81 FEET; THENCE S.15°13'10"W., FOR 40.59 FEET; THENCE S.28°21'45"E., FOR 7.79 FEET; THENCE S.52°25'09"E., FOR 51.30 FEET TO THE POINT OF BEGINNING.

PARCEL CONTAINS 381382 SQUARE FEET OR 8.76 ACRES, MORE OR LESS.

BEARINGS ARE BASED ON SAID NORTH LINE OF SECTION 21 AS BEARING N.89°23'44"E.

K&T SURVEY GROUP, INC.

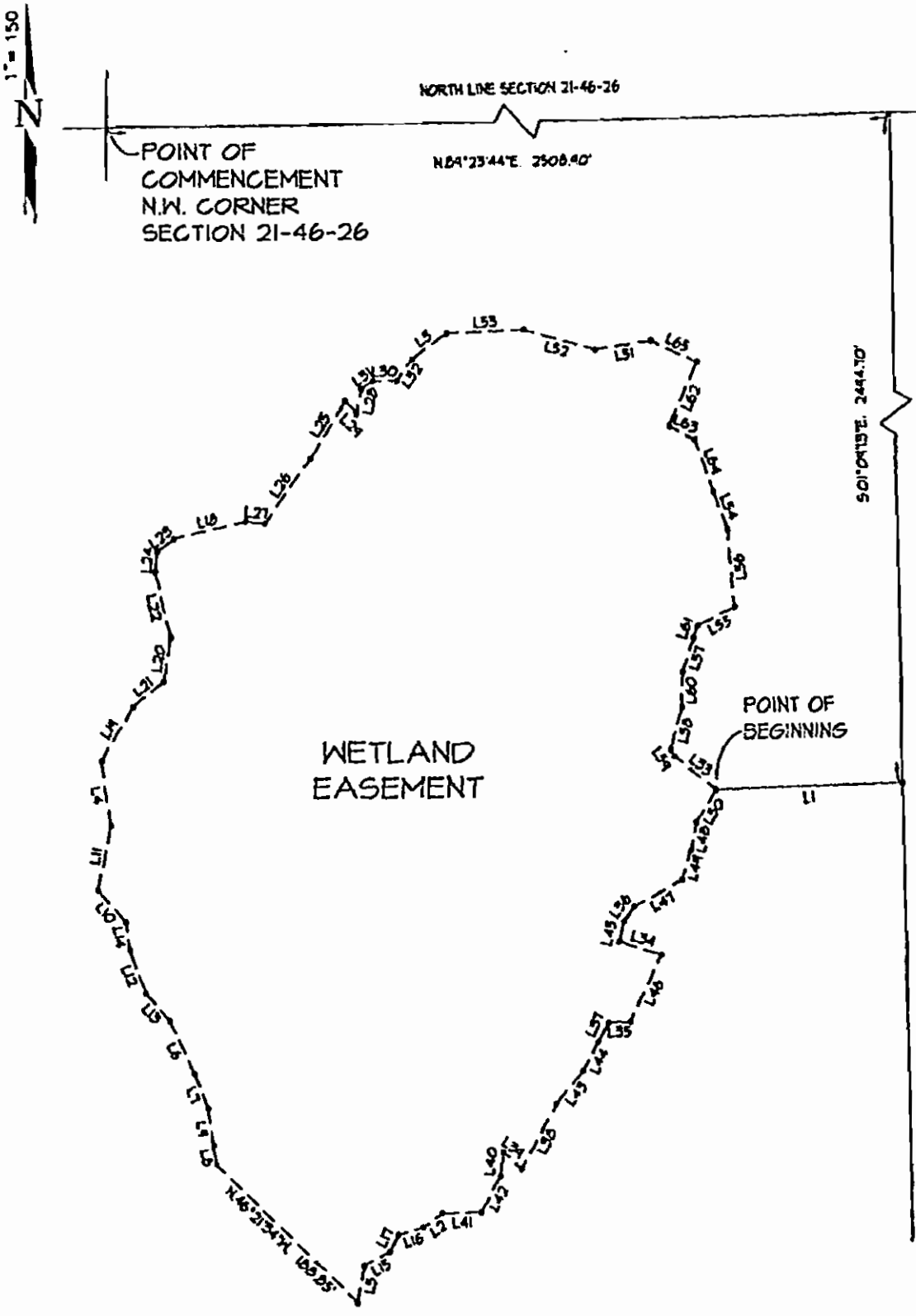
July 23, 1997

KENNETH E. TRASK
PROFESSIONAL LAND SURVEYOR
FLORIDA CERTIFICATE NO. 4684

Exhibit "B"
Page 3 of 6
Wetland B (East)

\4506Wl.doc

SKETCH TO ACCOMPANY DESCRIPTION



LINE TABLE

Line	Bearing	Distance
L1	S.88°30'48"W.	169.69'
L2	S.56°10'15"W.	22.68'
L3	N.54°45'08"E.	42.65'
L4	N.01°22'48"W.	61.01'
L5	S.10°30'01"W.	34.81'
L6	N.26°12'23"W.	56.13'
L7	N.24°02'38"W.	54.86'
L8	N.13°22'50"W.	11.90'
L9	N.08°29'06"W.	35.88'
L10	N.42°51'43"W.	40.83'
L11	N.12°01'28"E.	62.26'
L12	N.22°02'01"W.	44.15'
L13	N.43°16'12"W.	33.11'
L14	N.01°14'09"W.	26.21'
L15	S.62°33'34"W.	27.72'
L16	S.14°54'03"W.	25.81'
L17	S.28°37'11"W.	18.45'
L18	N.71°33'32"E.	14.44'
L19	N.33°04'32"E.	54.05'
L20	N.09°52'09"E.	41.65'
L21	N.52°03'54"E.	54.40'
L22	N.14°38'45"W.	69.51'
L23	N.34°41'13"E.	14.65'
L24	N.08°29'54"E.	14.65'
L25	N.32°44'32"E.	62.22'
L26	N.36°54'46"E.	74.63'
L27	S.84°01'33"E.	14.56'
L28	N.12°57'34"E.	23.26'
L29	S.44°26'32"E.	15.13'
L30	N.84°27'44"E.	29.84'
L31	N.54°50'21"E.	12.64'
L32	N.56°52'46"E.	25.09'
L33	S.32°25'04"E.	51.50'
L34	S.72°24'13"E.	43.51'
L35	S.88°51'49"W.	21.16'
L36	S.51°25'22"W.	16.35'
L37	S.26°40'01"W.	20.20'
L38	S.29°44'58"W.	68.55'
L39	N.51°25'17"W.	24.84'
L40	S.06°06'55"W.	21.91'
L41	S.88°34'05"W.	34.93'
L42	S.30°54'30"W.	54.35'
L43	S.40°47'02"W.	40.83'
L44	S.29°05'02"W.	32.24'
L45	S.12°44'34"W.	18.75'
L46	S.26°26'18"W.	70.16'
L47	S.62°25'14"W.	52.45'
L48	S.13°42'24"W.	27.00'
L49	S.11°30'41"W.	28.10'
L50	S.31°42'09"W.	34.92'
L51	S.82°21'51"W.	55.24'
L52	N.75°10'02"W.	14.84'
L53	N.81°50'06"E.	16.15'
L54	S.21°01'34"E.	51.13'
L55	S.64°51'00"W.	39.66'
L56	S.05°26'56"E.	72.99'
L57	S.14°00'14"W.	33.27'
L58	S.15°15'10"W.	40.54'
L59	S.28°21'45"E.	7.74'
L60	S.01°48'16"W.	33.81'
L61	S.22°13'34"W.	12.08'
L62	S.24°32'28"W.	66.28'
L63	S.64°34'06"E.	28.14'
L64	S.21°02'36"E.	52.83'
L65	S.65°27'32"E.	49.83'

K&T SURVEY GROUP, INC.
LAND SURVEYORS & MAPPERS
FLORIDA LICENSED BUSINESS #6468

2726 SWAMP CABBAGE COURT
FORT MYERS, FLORIDA 33901
PHONE (941) 274-0991
FAX (941) 274-0992

Exhibit "B"
Page 4 of 6
Wetland B (East)

**** THIS IS NOT A SURVEY ****

Kenneth E. Trask 7-23-97

KENNETH E. TRASK DATE
PROFESSIONAL LAND SURVEYOR
FLORIDA CERTIFICATE NO. 4684

K&T SURVEY GROUP, INC.
LAND SURVEYORS & MAPPERS

2726 Swamp Cabbage Court
Fort Myers, Florida 33901
Phone (941) 274-0991
Fax (941) 274-0992

OR2881 PG0820

DESCRIPTION OF A WETLAND EASEMENT
LYING IN SECTION 21, T-46-S, R-26-E,
LEE COUNTY, FLORIDA.

(WETLAND EASEMENT)

A WETLAND EASEMENT SITUATED IN THE STATE OF FLORIDA, COUNTY OF LEE, LYING IN SECTION 21, TOWNSHIP 46 SOUTH, RANGE 26 EAST, BEING FURTHER DESCRIBED AS FOLLOWS:
COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 21; THENCE N.89°23'44"E., ALONG THE NORTH LINE OF SAID SECTION 21 FOR 745.13 FEET; THENCE S.01°09'13"E., FOR 3355.80 FEET; THENCE N.88°50'48"E., FOR 478.12 FEET TO THE POINT OF BEGINNING; THENCE N.66°33'12"W., FOR 87.61 FEET; THENCE N.88°51'08"W., FOR 55.19 FEET; THENCE N.88°36'16"W., FOR 79.76 FEET; THENCE N.88°47'29"W., FOR 79.24 FEET; THENCE N.25°28'55"E., FOR 89.63 FEET; THENCE N.62°03'08"E., FOR 46.46 FEET; THENCE N.38°41'09"E., FOR 55.17 FEET; THENCE N.38°41'09"E., FOR 15.36 FEET; THENCE N.37°49'46"E., FOR 68.39 FEET; THENCE N.59°11'28"E., FOR 71.38 FEET; THENCE N.48°16'18"E., FOR 45.29 FEET; THENCE N.08°13'04"E., FOR 26.18 FEET; THENCE N.48°23'35"E., FOR 76.66 FEET; THENCE N.52°50'03"E., FOR 84.23 FEET; THENCE N.66°47'53"E., FOR 15.91 FEET; THENCE N.43°38'26"E., FOR 37.91 FEET; THENCE S.46°21'34"E., FOR 16.22 FEET; THENCE S.49°34'08"E., FOR 29.22 FEET; THENCE S.76°09'30"E., FOR 18.53 FEET; THENCE N.86°19'43"E., FOR 56.88 FEET; THENCE S.71°36'26"E., FOR 43.61 FEET; THENCE S.77°51'20"E., FOR 41.52 FEET; THENCE S.43°10'56"E., FOR 47.27 FEET; THENCE N.67°46'17"E., FOR 31.31 FEET; THENCE N.43°23'52"E., FOR 23.50 FEET; THENCE N.11°05'01"E., FOR 42.62 FEET; THENCE S.73°13'33"E., FOR 52.52 FEET; THENCE N.81°36'55"E., FOR 18.65 FEET; THENCE N.01°55'45"E., FOR 8.06 FEET; THENCE N.64°38'08"E., FOR 27.37 FEET; THENCE N.69°53'41"E., FOR 14.31 FEET; THENCE N.31°03'48"E., FOR 38.22 FEET; THENCE S.46°21'34"E., FOR 218.95 FEET; THENCE S.81°01'40"W., FOR 84.02 FEET; THENCE S.30°14'56"W., FOR 10.81 FEET; THENCE S.31°21'59"W., FOR 49.92 FEET; THENCE S.86°24'43"W., FOR 67.09 FEET; THENCE N.84°07'39"W., FOR 32.09 FEET; THENCE N.88°31'05"W., FOR 11.83 FEET; THENCE S.32°34'09"W., FOR 7.71 FEET; THENCE S.05°26'13"W., FOR 5.98 FEET; THENCE S.52°49'12"E., 9 FOR 38.89 FEET; THENCE S.31°31'23"E., FOR 39.22 FEET; THENCE S.21°53'56"E., FOR 33.18 FEET; THENCE S.07°10'09"W., FOR 30.83 FEET; THENCE S.14°06'43"E., FOR 28.48 FEET; THENCE S.30°15'33"E., FOR 16.72 FEET; THENCE S.33°43'47"E., FOR 27.05 FEET; THENCE S.12°18'12"E., FOR 32.05 FEET; THENCE S.08°11'17"W., FOR 51.33 FEET; THENCE S.15°02'01"E., FOR 61.29 FEET; THENCE S.02°53'03"W., FOR 21.42 FEET; THENCE S.11°21'13"E., FOR 26.28 FEET; THENCE S.25°53'04"W., FOR 22.73 FEET; THENCE S.52°55'20"W., FOR 59.79 FEET; THENCE S.37°59'06"W., FOR 32.83 FEET; THENCE S.47°09'39"W., FOR 27.58 FEET; THENCE S.18°02'54"W., FOR 13.22 FEET; THENCE S.18°02'54"W., FOR 22.91 FEET; THENCE S.27°22'39"W., FOR 53.37 FEET; THENCE S.36°21'45"W., FOR 51.78 FEET; THENCE S.81°11'26"W., FOR 91.15 FEET; THENCE N.53°43'59"W., FOR 66.16 FEET; THENCE N.25°09'36"W., FOR 37.40 FEET; THENCE N.15°08'15"W., FOR 65.01 FEET; THENCE N.38°05'53"W., FOR 66.05 FEET; THENCE N.69°12'06"W., FOR 107.03 FEET; THENCE N.40°26'52"W., FOR 69.57 FEET; THENCE N.68°26'09"W., FOR 23.08 FEET; THENCE N.38°44'29"W., FOR 39.82 FEET; THENCE N.16°23'19"E., FOR 7.53 FEET; THENCE N.43°24'41"W., FOR 8.79 FEET TO THE POINT OF BEGINNING.

PARCEL CONTAINS 416220 SQUARE FEET OR 9.56 ACRES, MORE OR LESS.

BEARINGS ARE BASED ON SAID NORTH LINE OF SECTION 21 AS BEARING N.89°23'44"E.

K&T SURVEY GROUP, INC.

July 23, 1997

Kenneth E. Trask

KENNETH E. TRASK
PROFESSIONAL LAND SURVEYOR
FLORIDA CERTIFICATE NO. 4684

Exhibit "B"
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Wetland B (West)

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SKETCH TO ACCOMPANY DESCRIPTION

OR2881 PG0821

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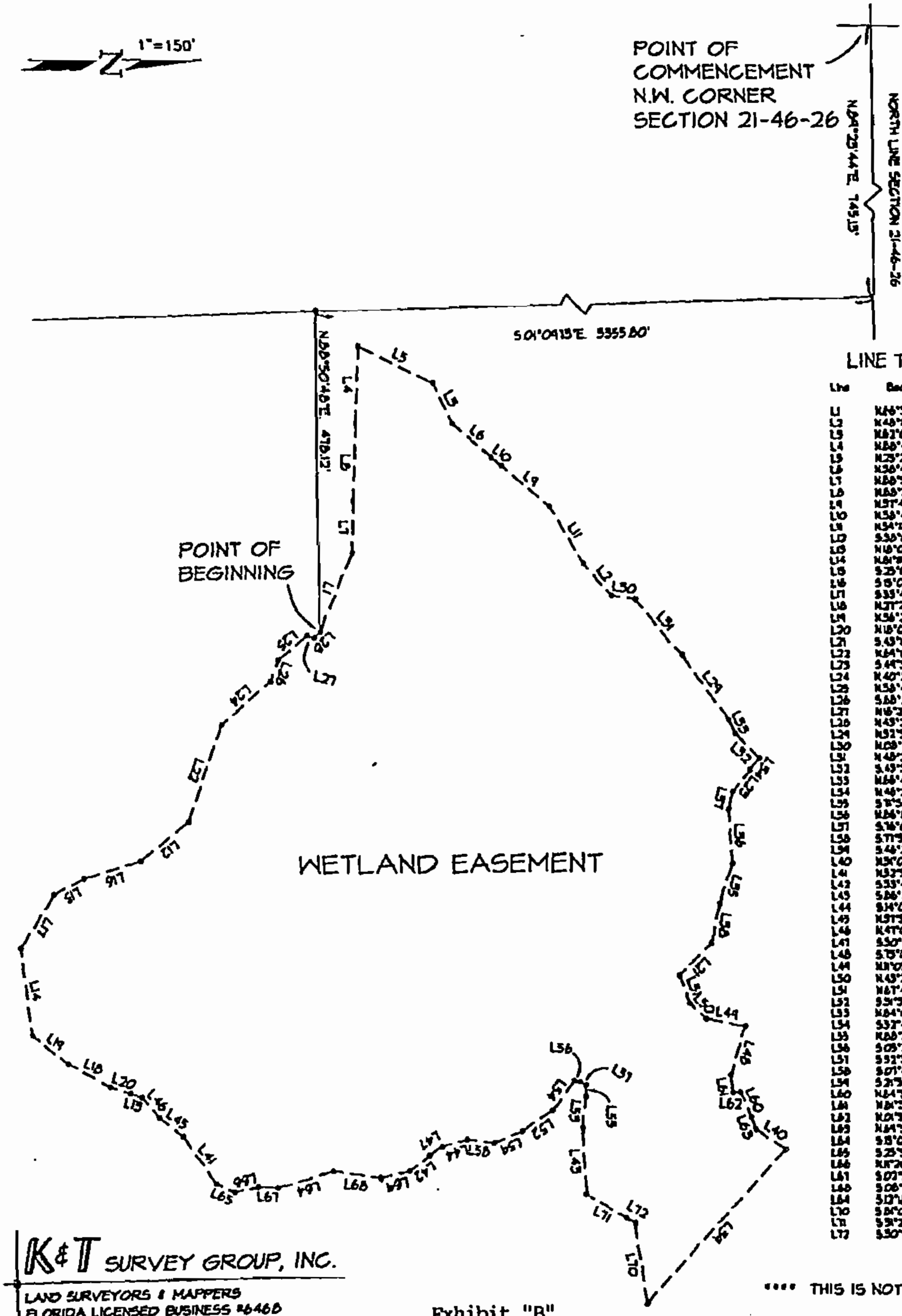
CHARLIE GREEN LEE CTY.FL



LINE TABLE

Line	Bearing	Distance
L1	N46°33'12"W	81.81'
L2	N48°16'15"E	43.24'
L3	N82°03'08"E	46.46'
L4	N88°47'21"W	79.24'
L5	N25°28'55"E	84.63'
L6	N36°41'07"E	35.17'
L7	N88°51'08"W	35.19'
L8	N88°36'16"W	74.16'
L9	N57°47'46"E	60.54'
L10	N36°41'07"E	13.36'
L11	N54°17'28"E	71.36'
L12	S30°05'33"E	64.05'
L13	N16°02'54"E	13.27'
L14	N81°17'28"E	41.15'
L15	S25°04'36"E	51.40'
L16	S15°08'13"E	65.01'
L17	S35°43'54"E	64.16'
L18	N37°22'54"E	33.57'
L19	N56°21'43"E	51.18'
L20	N16°02'54"E	22.41'
L21	S43°10'36"E	41.37'
L22	N64°13'06"W	101.05'
L23	S44°34'08"E	24.22'
L24	N40°26'52"W	64.57'
L25	N38°44'29"W	54.82'
L26	S88°26'01"E	23.08'
L27	N16°25'14"E	7.33'
L28	N43°24'47"W	8.74'
L29	N32°50'03"E	64.25'
L30	N09°15'04"E	28.18'
L31	N48°25'35"E	16.66'
L32	S43°36'28"W	51.41'
L33	N86°47'33"E	6.41'
L34	N46°21'54"W	16.27'
L35	S15°36'26"E	43.61'
L36	N86°19'43"E	56.80'
L37	S16°01'30"E	10.55'
L38	S17°51'20"E	41.57'
L39	S44°21'54"E	29.95'
L40	N51°03'48"E	30.27'
L41	N32°55'20"E	54.14'
L42	S33°43'47"E	27.05'
L43	S86°24'43"W	61.04'
L44	S14°08'43"E	28.48'
L45	N51°54'08"E	57.65'
L46	N47°04'54"E	27.58'
L47	S50°18'53"E	16.12'
L48	S15°03'55"E	32.57'
L49	N11°05'01"E	42.87'
L50	N43°25'32"E	23.50'
L51	N67°46'17"E	31.31'
L52	S51°51'25"E	34.22'
L53	N84°07'54"W	32.04'
L54	S37°41'12"E	53.84'
L55	N88°31'05"W	11.05'
L56	S05°26'13"W	3.45'
L57	S52°34'04"W	1.11'
L58	S01°10'04"W	30.85'
L59	S21°55'56"E	53.10'
L60	N84°58'06"E	21.57'
L61	N81°26'55"E	16.65'
L62	N01°35'43"E	8.06'
L63	N84°55'41"E	14.31'
L64	S15°02'01"E	64.24'
L65	S25°55'04"W	22.13'
L66	N17°21'15"W	26.28'
L67	S07°55'05"W	21.47'
L68	S06°11'11"W	31.93'
L69	S17°18'12"E	32.05'
L70	S81°07'40"W	84.02'
L71	S51°21'54"W	44.47'
L72	S50°14'56"W	10.84'

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Exhibit "B"
Page 6 of 6
Wetland B (West)

**** THIS IS NOT A SURVEY ****

Kenneth E. Trask 7-23-97

KENNETH E. TRASK DATE
PROFESSIONAL LAND SURVEYOR
FLORIDA CERTIFICATE NO. 4584

Appendix E: Projected Costs and Funding Sources

Appendix E - Projected Costs and Funding Sources Table

Resource Enhancement and Protection

Item	Possible Funding Source	Estimated Costs
Invasive exotic plant control	USFWS, DEP-BIPM, mitigation, C20/20	$296,000
Remove berm vegetation	Lee County DOT, C20/20, DOF, NRCS, mitigation	$5,000
Level berms and replant (*if necessary*)		$82,000
Install fire breaks		$9,000
Pine tree thinning		$4,000
Rollerchopping		$2,000
Cap abandoned wells		$30,000
Feral hog trapping		$750
total		$428,750

Overall Protection

Item	Possible Funding Source	Estimated Costs
Large debris removal	C20/20	$500
Preserve & Boundary signs		$400
Gopher tortoise fencing	LDOT, C20/20	$50,000
total		$50,900

TOTAL COST ESTIMATE **$479,650**

Site Management and Maintenance

Item	Possible Funding Source	Estimated Costs
Exotic Plant Control	C20/20	$20,000
Prescribed Fire Regime	LC P&R, C20/20	In-house
Assorted Repairs		$500

Yearly Maintenance Estimate **$20,500**

All costs are rough estimates based on information currently available. Every effort will be made to not exceed this budget by more than 10%.