Lee County Board Of County Commissioners **Blue Sheet No. 20061320**

Agenda Item Summary

1. ACTION REQUESTED/PURPOSE:

Approve the Hickory Swamp Preserve (HSP) Land Stewardship Plan.

2. WHAT ACTION ACCOMPLISHES:

Approving of the HSP Plan establishes guidelines for restoration and public use facilities at HSP.

3. MANAGEMENT RECOMMENDATION: Approve the plan so Land Stewardship staff can begin implementation.

4. Departmental Category: II C11B		**5. Meeting Date:** OCT 17 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 August 10, 2006, accepting the Hickory Swamp Preserve Land Stewardship Plan.

The plan was available for public review on the internet, as well as at the Riverdale Branch Library. A public meeting was held September 18, 2006 with nineteen neighbors and other interested parties attending. Attached is a summary of all verbal comments received with responses by staff.

10. Review for Scheduling:

Department Director	Purchasing or Contracts	Human Resources	Other	County Attorney	Budget Services				County Manager/P.W. Director
				10/2/06	Analyst 10/2/06	Risk 10/2/06	Grants 10/4/06	Mgr. 10/2/06	

11. Commission Action:

_____ **Approved**
_____ **Deferred**
_____ **Denied**
_____ **Other**

RECEIVED BY COUNTY ADMIN: 10/2/06 10:25 AM

COUNTY ADMIN FORWARDED TO: 10/4/06 - P.Lee. 10:30

Rec. by CoAtty Date: 10/2/06 Time: 9:05 AM Forwarded To: Cnty Admin 10/2/06 10:15 am

Summary of Public Comments Received on the Hickory Swamp Preserve Land Stewardship Plan

The second draft of the **Hickory Swamp Preserve (HSP) Land Stewardship Plan** was available for public comment from August 28 - September 18, 2006. The plan was made available to the public through the Parks and Recreation website and at the Riverdale Branch Library. Citizens were informed of the plan through a combination of public service announcements on television, articles in both the Lehigh News Star and the News Press, a legal advertisement in the News Press, and a mailing sent to over 220 residents in the surrounding Buckingham Community.

A public meeting was held on September 18, 2006, at 5:00 P.M. at the Buckingham Community Center. A brief presentation was provided and included background on the Preserve, proposed management activities and a timeline to complete these activities. Lee County Parks and Recreation staff received a couple of written responses during the public comment period in addition to verbal comments during the meeting. In the following, the issues raised during the public comment period are summarized. Copies of all original comments are included with this document.

Any questions on this summary should be directed to:

Cathy Olson
Land Stewardship Supervisor
Conservation 20/20
Lee County Parks & Recreation
3410 Palm Beach Boulevard
Ft. Myers, FL 33916
colson@leegov.com

Public Meeting Minutes for Review of the draft Land Stewardship Plan for Hickory Swamp Preserve

Monday, September 18, 2006, 5:00 pm, Buckingham Community Center
Staff members present: Sherry Furnari, Laura Wewerka, Cathy Olson (Conservation 20/20)

19 community members present, including a media reporter

Laura Wewerka gave a presentation on the Preserve and what is proposed for the site.

Floor open for questions:

Is it accessible now?
Laura Wewerka - Yes, but the pedestrian gate is locked because of an active cattle lease, but it is ending this month.

Mr. Parker (Cattle Licensee) – They (cattle) are off the property now.

What happens if you are walking through and a boar attacks?
I imagine that the County has liability insurance, but over 90% of our area has hogs and we've not had any reports of people being injured. They usually run away from people. Just walk the other way.

Are there any lights (street lights for parking)?
No, it will only be open dawn until dusk, like all of our preserves.

We are concerned that it will increase the traffic on the road.
No study exists saying this.
There is already increased traffic and speeding on this road.
The road has posted speed limit signs. Call the Sheriff's department. It's not likely to increase the traffic going to this preserve because of the limited parking. There is only going to be room for 2-3 vehicles.

Did you get a general consensus about limiting parking from neighbors?
That's what the meeting is for.

Any study with aircraft in the area with regards to wildlife impact?
Not that I know of.

For parking, it would be good to have a gate on Peace Road before a gate entering the preserve and close it at night. This will prevent kids from partying.
Sherry has already given our neighbor, Mr. Parker, our C20/20 Rangers cell phone numbers. Since they have come on, they have resolved a lot of our issues in other problem areas of the county.

Do you have an agenda for property to be acquired?
It's a nomination process.

It there a chance to get other adjacent acreage acquired? There's an eagle's nest on the corner of the property to the west.
Yes, it needs to be nominated to the program.

How soon can we volunteer?
We can set something up when it gets a little nicer. Please take one of my business cards and contact me, if you are interested in volunteering.

Hickory Swamp Preserve
Public Meeting
Sign – In Sheet
September 18, 2006

Name	Phone Number	Email	How heard about meeting
John Harlow	239-690-1461	jmlow@earthlink.net	News Star
MARY HARLOW	239-690-1461	" "	" "
ROBIN GARDNER	6937937		MAILING
Bill + Betsy Burdette	694-4738	~~B Burdette~~ Betsy@Burdetteinc.com	MAIL
Victoria Comiscotto	693-6458		News press
Kara Alfaro	694 8500	kara@elatanatives.com	
Rusty Parker	694-2567		MAILING
Jerry Sanders	694-8220		
Gloria Vernay	694-8878	ghvcountrylady@AOL.com	email
T Barrett	694-0419	tbarrett@SanibelFire.com	email
G L Brandt	694-6680	gordon@glbrandt.net	Email
Silvia Guzman	344-4717		News Press / News Star
RICHARD + PEGGY SCHMIDT	694-2245	SCHMIDT_RICHPEG@EARTHLINK.NET	MAILING
David Derek Burr	6942102	snook@4@earthlink.net	email
Shane Parker	694-2247	sparker@hendryfla.net	News press
KRISTINE BARRETT	6940419	D7nes@msn.com	mailing

Conservation 20/20 Land Stewardship Plan
Comment Card

Comments: I am in favor of the proposed plan for Hickory Swamp Preserve!

Name (optional): Mary Haslam Affiliation (optional):

Conservation 20/20 Land Stewardship Plan
Comment Card

Comments:

(1) No ATV's / Motorcycles (Because they will tear up wetlands.)

(2) No ~~[illegible]~~ large parking lots. Small in nature would be nice

(3) Parking should be fenced / gated after hours to prevent illegal activity

Name (optional): Shane Parker Affiliation (optional):

Conservation 20/20 Land Stewardship Plan
Comment Card

Comments:
Pay for parking
Name (optional): Affiliation (optional):
Kristine Barrett

Conservation 20/20 Land Stewardship Plan
Comment Card

Comments:
Great job -
We're concerned about parking for vehicles. I was hoping you'd consider buying the property across the street so folks could park there & walk across.
Name (optional): Affiliation (optional):

1

Conservation 20/20 Land Stewardship Plan
Comment Card

Comments:
Can we try to purchase add'l adjoining acreage to the Nursery Farms off Peace Road to add to the West and to the east of the preserve property is available.
Name (optional): Gloria Thrasy — Affiliation (optional): Native Plant Society

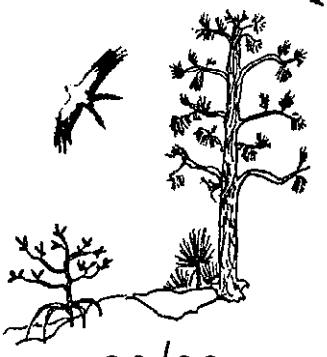
Hickory Swamp Preserve

Land Stewardship Plan

13320 Peace Road
Fort Myers, FL 33905

2nd DRAFT - September 2006

CONSERVATION



20/20
LAND PROGRAM

Commission for Accreditation of Park and Recreation Agencies
CAPRA
ACCREDITED

Discover
LEE COUNTY
Parks & Recreation

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 for their assistance in the development of this document: Roger Clark, Cathy Olson and other Lee County staff for carefully reviewing the Hickory Swamp Preserve (HSP) Land Stewardship Plan and providing constructive criticism; members of Management Sub-Committee of the Conservation Lands Acquisition and Stewardship Advisory Committee for providing suggestions regarding land stewardship issues and the formatting of the plan; Lee County Natural Resources staff for providing valuable information concerning regional and on-site water resources; Lee County Parks and Recreation staff for providing the plan on the Lee Parks website for public review and printing assistance; Lee County Riverdale Branch Library staff for making the plan available for public review and the Buckingham Community Center staff for providing a meeting space for public comments.

Sherry Furnari
Laura Wewerka
Lynne Boyd
Shelby Evans

Table of Contents

List of Exhibits

List of Acronyms

ATV	all terrain vehicle
C20/20	Conservation 20/20
DHR	Division of Historical Resources
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
HSP	Hickory Swamp Preserve
IRC	Institute for Regional Conservation
LCDP	Lee County Division of Planning
LCNR	Lee County Division of Natural Resources
LCPR	Lee County Department of Parks and Recreation
LDOT	Lee County Department of Transportation
LSOM	Land Stewardship Operations Manual
LWCR	Lower West Coast Region
MU	management units
NWI	National Wetlands Inventory
PARI	Piper Archaeological Research, Inc.
SFWMD	South Florida Water Management District
TSA	tropical soda apple
USACOE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

Vision Statement

It is the vision of the Lee County Department of Parks and Recreation and the Conservation 20/20 Program to conserve, protect and restore Hickory Swamp Preserve to a productive, functional and viable ecosystem. The Preserve contains a small portion of the seasonal upstream headwaters of the Orange River. The primary stewardship objectives for Hickory Swamp Preserve will be maintaining the upland ecosystems with prescribed fire and removing invasive exotic plants and animals. The Preserve will be essentially free of exotic pest plants and the improved pasture will be restored to pine flatwoods community. Ultimately, the objectives for the stewardship of this Preserve will enhance and protect hydrologic features and thus improve wildlife habitat and water quality reaching the Orange River and eventually the Caloosahatchee River. The Preserve will provide a "sense of place" for the community due to its rural setting and diverse natural communities.

I. EXECUTIVE SUMMARY

Hickory Swamp Preserve is located at 13320 Peace Road, Fort Myers, Florida in eastern Lee County within Section 8, Township 44 South, Range 26 East in an area commonly referred to as Buckingham. The Preserve is located less than one mile southwest of the Buckingham Community Center. The 66.5-acre Preserve, nomination 73, was purchased through Conservation 20/20 (C20/20) in December 1999 for $467,000. The Conservation 20/20 Program was established in 1996 after Lee County voters approved a referendum that increased property taxes by up to 0.5 mil for the purpose of purchasing and protecting environmentally sensitive lands.

The land where Hickory Swamp Preserve (HSP) is located today contains Tamiami Formation sediments created during the Pliocene Epoch between 5.3 and 1.8 million years ago. The Tamiami Formation contains a mix of fine to coarse-grained sand, sandy clay, fossiliferous sand and fossiliferous limestone. Phosphate is present throughout as are fossils, particularly barnacles, mollusks, corals, sea urchins, and smaller marine life. The Gulf Coastal Lowlands are found in northwest Lee County as well as most of Charlotte and Sarasota Counties to the north. This region is characterized as a gently southwestward sloping plain composed of deposited sediments. The natural elevations at HSP range from eighteen feet at the southeast corner and slope in a general northwesterly direction towards the Orange River to six feet.

Four different soil types occur at Hickory Swamp Preserve. A common relationship for all of these soil types is that their slopes range from 0-2%. All soil types are nearly level and poorly drained with moderate to rapid permeability at the surface. Covering nearly half of the Preserve, Copeland Sandy Loam is the most common soil type, which is found in freshwater wetland areas containing cypress and other hardwood species scattered throughout the Preserve. Oldsmar Sand is found on over one-third of the Preserve and is present in south Florida flatwoods type communities within central and southern portions of the Preserve.

The Preserve contains five plant communities including mesic hammock, mesic flatwoods, hydric hammock, depression marsh, and disturbed lands. Included within the boundaries of the Preserve are two unnamed seasonal tributaries. Hickory Swamp Preserve is also home to variety of animal species including warblers, woodpeckers, feral hogs, squirrels, snakes, and gopher tortoises.

The Preserve lies within the Orange River Watershed, which covers a surface area of approximately 77 square-miles. Besides the drainage canal bordering the Preserve's southern boundary and several cow wells on the Preserve, there don't appear to be any other hydrological impacts that have altered sheetflow across the Preserve. Seasonally, the wetland areas become saturated and

water flows into the small tributaries, heading north into the Orange River and eventually leading out into the Caloosahatchee River.

Historically, areas on Hickory Swamp Preserve once represented the rustic setting of an old rural Florida community: dirt roads leading to a small homestead with cattle and citrus trees. Many long-time residents of the Buckingham community recognize and appreciate the value of being within a county designated Rural Community Preserve location, which offers some protection with development restrictions.

According to interpretations based on aerial photography dating back to 1944, there are several visible features such as an existing dirt road (Peace Road) that runs along the northern boundary, a citrus grove in the Preserve's northern areas, several other dirt trails and a couple of cleared areas which were probably used for cattle grazing operations. Sometime between 1958 and 1966, a homestead and barn were constructed in the northeast corner of the site. Additional changes adjacent to the Preserve include the ditch along the southern boundary and paving of Peace Road. In 1999, the old homestead along with its' smaller structures and most of the debris were removed from the site before C20/20 purchased the property.

Natural trends and disturbances influencing native communities and stewardship at HSP include hurricanes, occasional freezes and the cycling of wet and dry seasons. Since the C20/20 Program purchased the property, several hurricanes passed through in 2004 and Wilma in 2005 breaking off large limbs and/or knocking over several large oak trees and other hardwood tree species, particularly water hickory and laurel oak.

Since the Preserve is relatively small, staff does not recommend any additional recreational activities beyond hiking, bird watching, nature photography and nature study that are allowed at all Conservation 20/20 Preserves. Other nearby Lee County Parks and Recreation facilities include the Orange River Canoe and Kayak Launch Site and the Buckingham Community Center both of which are less than one mile northeast of HSP. The proposed nature trails at HSP will be marked and will total a length of 1.2 miles. A sign will be posted at the pedestrian entrance providing an illustration of the trail system, instructions on how to download a trail map from the LCPR website (for future use) and a phone number for those without internet access.

The goal of this land stewardship plan is to identify Preserve resources, develop strategies to protect those resources and implement restoration activities to restore HSP to a productive, functional and viable ecosystem while insuring that the Preserve will be managed in accordance with Lee County Parks and Recreation's Land Stewardship Operations Manual. Restoration and management activities at HSP will focus on maintaining upland ecosystems with prescribed fire, controlling invasive exotic plant and animal species, enhancing

hydrologic features and wildlife habitat, and creating public access for resource-based recreational opportunities. 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 (2016).

II. INTRODUCTION

Hickory Swamp Preserve (HSP) was acquired as a single parcel in December 1999 through Lee County's Conservation 20/20 (C20/20) Program. It is approximately 66.5 acres in size and is located in Ft. Myers along Peace Road in eastern Lee County in an area commonly referred to as Buckingham. The Preserve consists of five plant communities and includes some of the small seasonal tributaries leading to the Orange River. The dominant plant communities are mesic hammock, disturbed lands and mesic flatwoods.

Historic aerial photography from 1944-1958 (Figures 10-12) shows evidence of human influences on and adjacent to HSP. Peace Road was a dirt trail that ran along the northern boundary, while small citrus groves appeared in the Preserve's northern areas. A couple of cleared locations were maintained for cattle grazing operations, which continue to this day. Sometime between 1958 and 1966, a homestead and barn were constructed. A large canal, adjacent to the southern boundary of HSP, was created for draining nearby areas and roadways. The old homestead and the associated smaller structures and most of the debris were removed from the site in 1999 before the C20/20 Program acquired the property.

Land stewardship activities for the site include invasive exotic plant and animal control, ending the cattle lease, brush reduction (hurricane debris buildup), prescribed fire in fire dependant communities, fence replacement, enhancing hydrologic features and wildlife habitat, debris removal, and creating public access. The proposed public recreation amenities include a new trailhead, a trail map on the Preserve's informational sign, and over one mile of hiking trails.

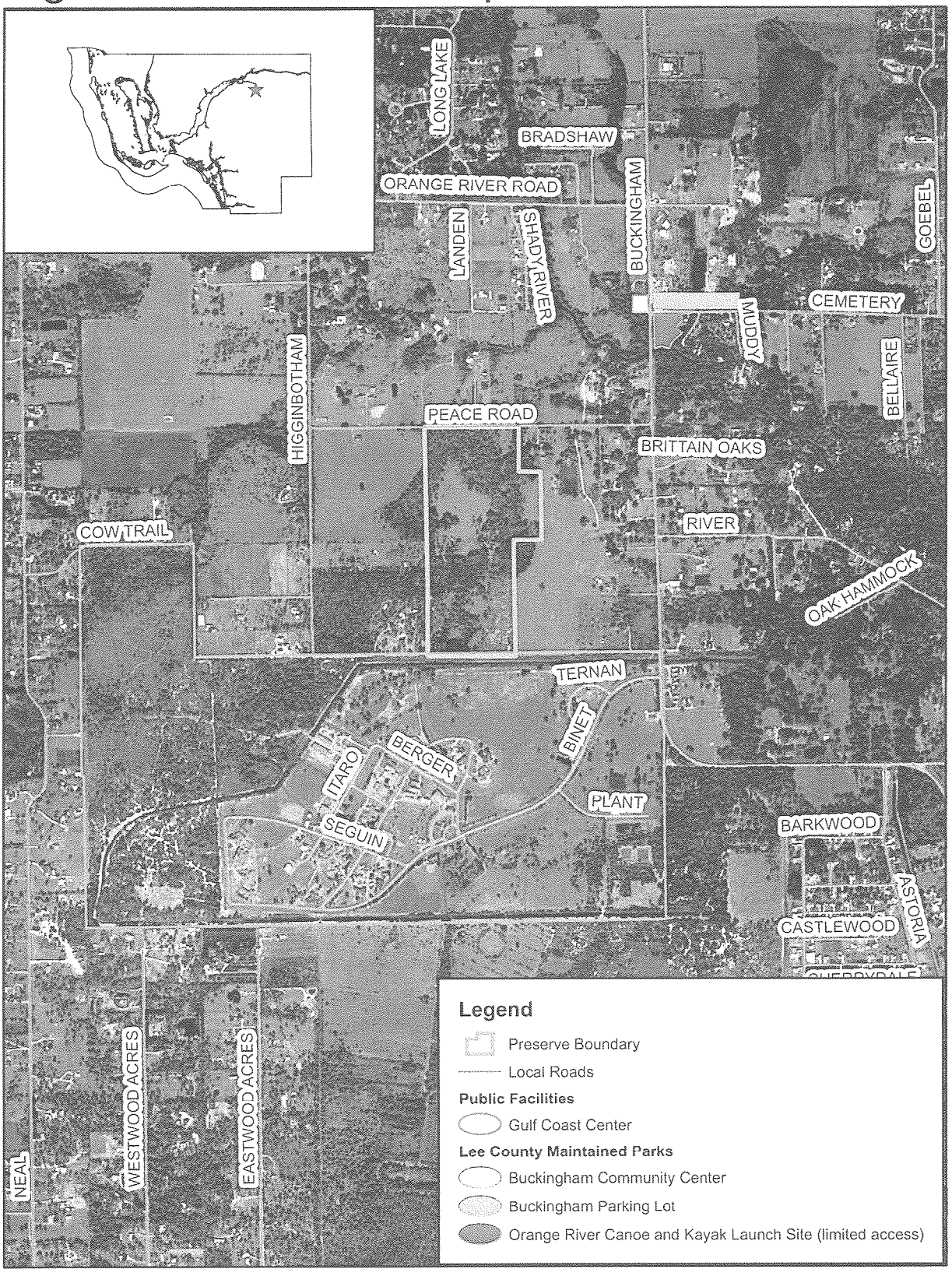
The purpose of this stewardship plan is to define conservation goals for HSP that will address the above concerns. It will serve as a guide for the Lee County Department of Parks and Recreation to use best management practices to ensure proper stewardship and protection of the Preserve. A significant number 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.

III. LOCATION AND SITE DESCRIPTION

Hickory Swamp Preserve is located at 13320 Peace Road, Fort Myers, in eastern Lee County, in an area commonly referred to as Buckingham. HSP is west of Buckingham Road and on the south side of Peace Road (Figure 1). It is in a central portion of Section 08, Township 44 South, Range 26 East. The Preserve is located less than 1 mile southwest of the Buckingham Community Center. The 66.5 acre site is surrounded by agricultural lands to the north, east and west and the state operated Gulf Coast Center to the south.

The primary natural plant communities found at the Preserve are mesic and hydric hammocks and mesic flatwoods. There are also two depression marshes and a several disturbed areas including improved pasture. Impacts from cattle operations have disturbed much of the Preserve; however 100% of the site has undergone initial invasive exotic plant removal efforts. Figure 2 identifies the boundaries of HSP in a 2005 aerial photograph.

Figure 1: Location Map



N
W E
S

Hickory Swamp Preserve

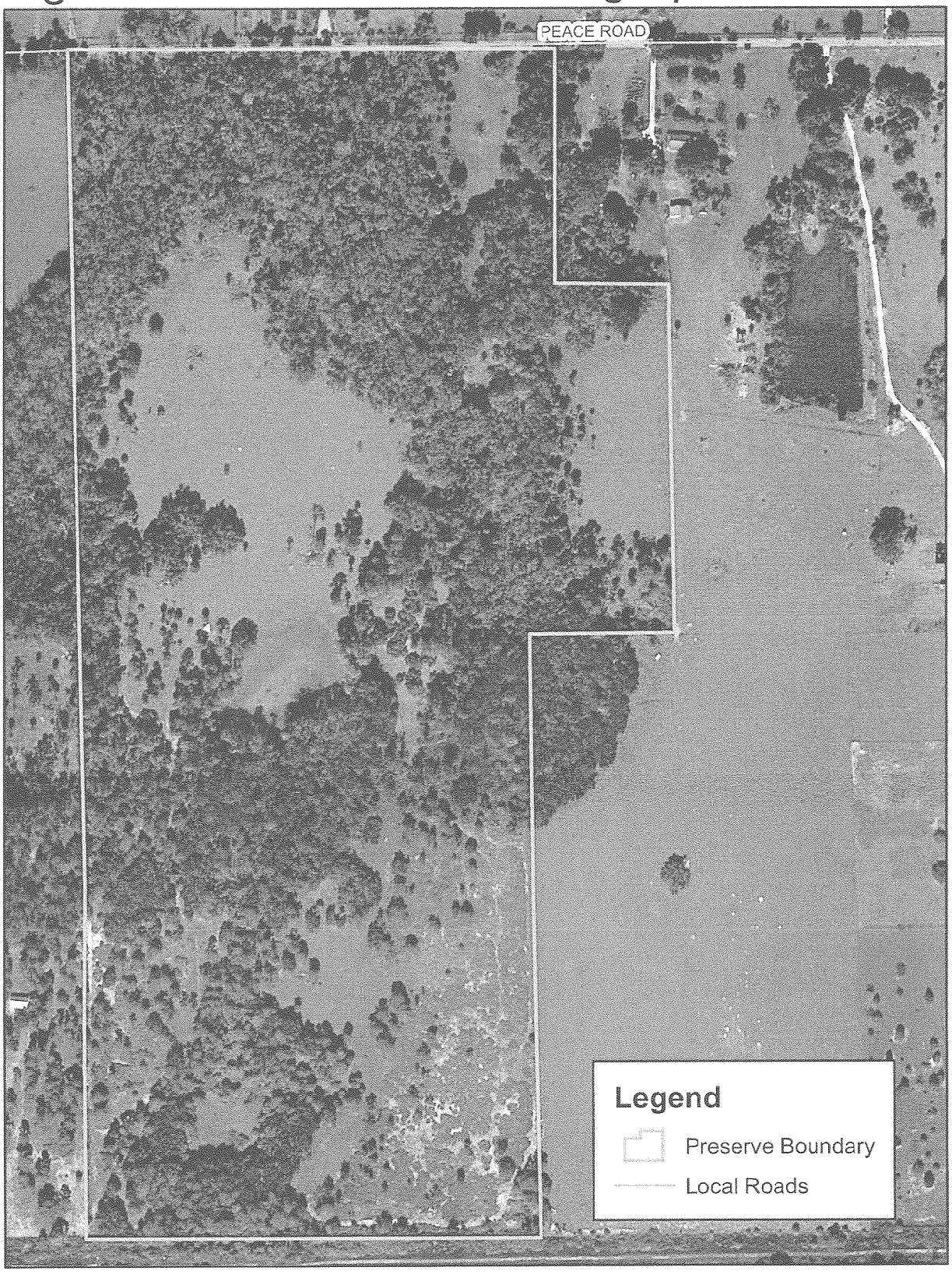
0 0.15 0.3 0.6 Miles

S:\esri\C2020 ArcView\Hickory Swamp Preserve\HSP_ManagementPlan\HSP_location.mxd

Map Prepared On: 06/23/06 by sfurman@leegov.com

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

Figure 2: 2005 Aerial Photograph



IV. NATURAL RESOURCES DESCRIPTION

A. Physical Resources

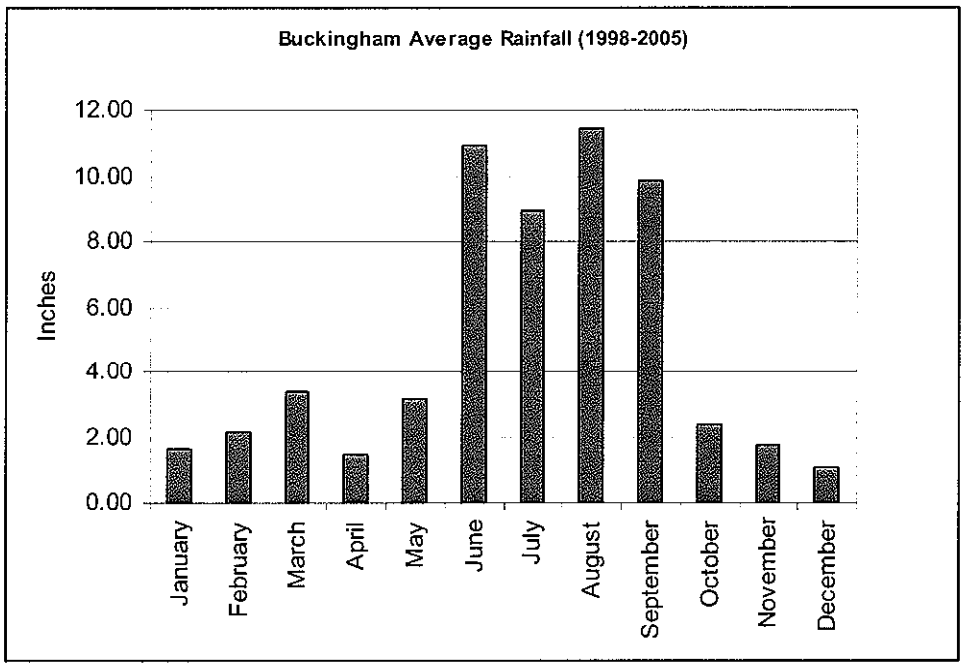
i. Climate

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 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 January 1931 to September 2005.

Table 1: Average High and Low Temperatures for Fort Myers, 1931 - 2005

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
High temperature (°F)	74.7	76.1	79.8	84.2	88.6	90.5	91.2	91.4	89.7	85.7	80.2	75.9
Low temperature (°F)	53.5	54.7	58.4	62.4	67.5	72.4	74.2	74.5	73.9	68.3	60.5	55.1

The following chart depicts the rainfall data collected by Lee County Division of Natural Resources (LCNR) on a daily basis from the Waste to Energy Plant rain gauge, located on Buckingham Road near the intersection of S.R. 82, approximately 3 miles southwest of Hickory Swamp Preserve. Average annual rainfall from 1998 through 2005 was 53.0 inches, lower than the average annual 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 non-native plant introduction and/or further dispersal, and increased wildfire severity to communities from increased fuel loads (dead vegetation). The effect of hurricanes on natural systems is compounded by the already present anthropogenic impacts. During 2004, Hurricane Charley brought tropical storm force winds and Hurricanes Frances and Jeanne brought hurricane force winds across the Preserve (Appendix A). In October 2005, Hurricane Wilma also passed through the area with hurricane force winds across the county. A number of large oaks on HSP suffered damage, primarily in northern portions of the property.

ii. Geology

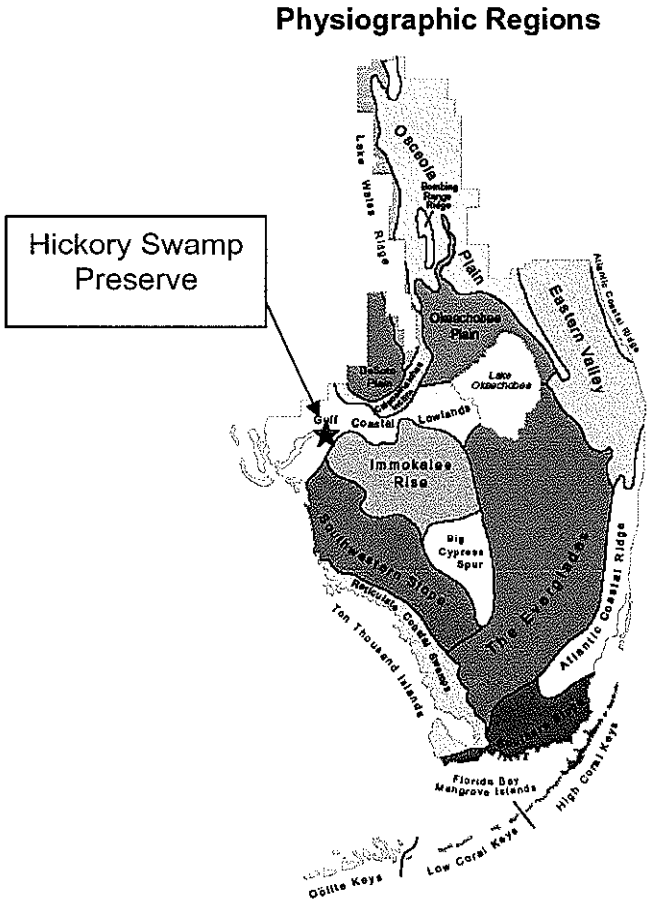
For millions of years, the Florida Platform was submerged in the ocean. Sediments accumulated upon it and hardened into sedimentary rock. Thirty-five million years ago, portions of Florida rose above the surface and for the next 12 million years it alternated between emersion and submergence. From 23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

Hickory Swamp Preserve lies in the Tamiami Formation lithostratigraphic unit. Lithostratigraphic units are differentiated by the conditions under which they were formed and the specific interval of geologic time. The Tamiami Formation was

created during the Pliocene Epoch between 5.3 and 1.8 million years ago. The Tamiami Formation contains a mix of fine to coarse-grained sand, sandy clay, fossiliferous sand and fossiliferous limestone. Phosphate is present throughout as are fossils, particularly barnacles, mollusks, corals, sea urchins, and smaller marine life.

Southwest Florida can be divided into ten major physiographic provinces (Figure 3, Map from: SFWMDb 2000). These are broad-scale subdivisions based on physical geography features such as terrain texture, rock type and geologic structure and history. Hickory Swamp Preserve lies within the Gulf Coastal Lowlands. The Gulf Coastal Lowlands are found in northwest Lee County as well as most of Charlotte and Sarasota Counties to the north. This region is characterized as a gently southwestward sloping plain composed of deposited sediments. These sediments are aligned parallel to the coastline, which indicates they were formed by marine forces.

Figure 3: Physiographic Regions

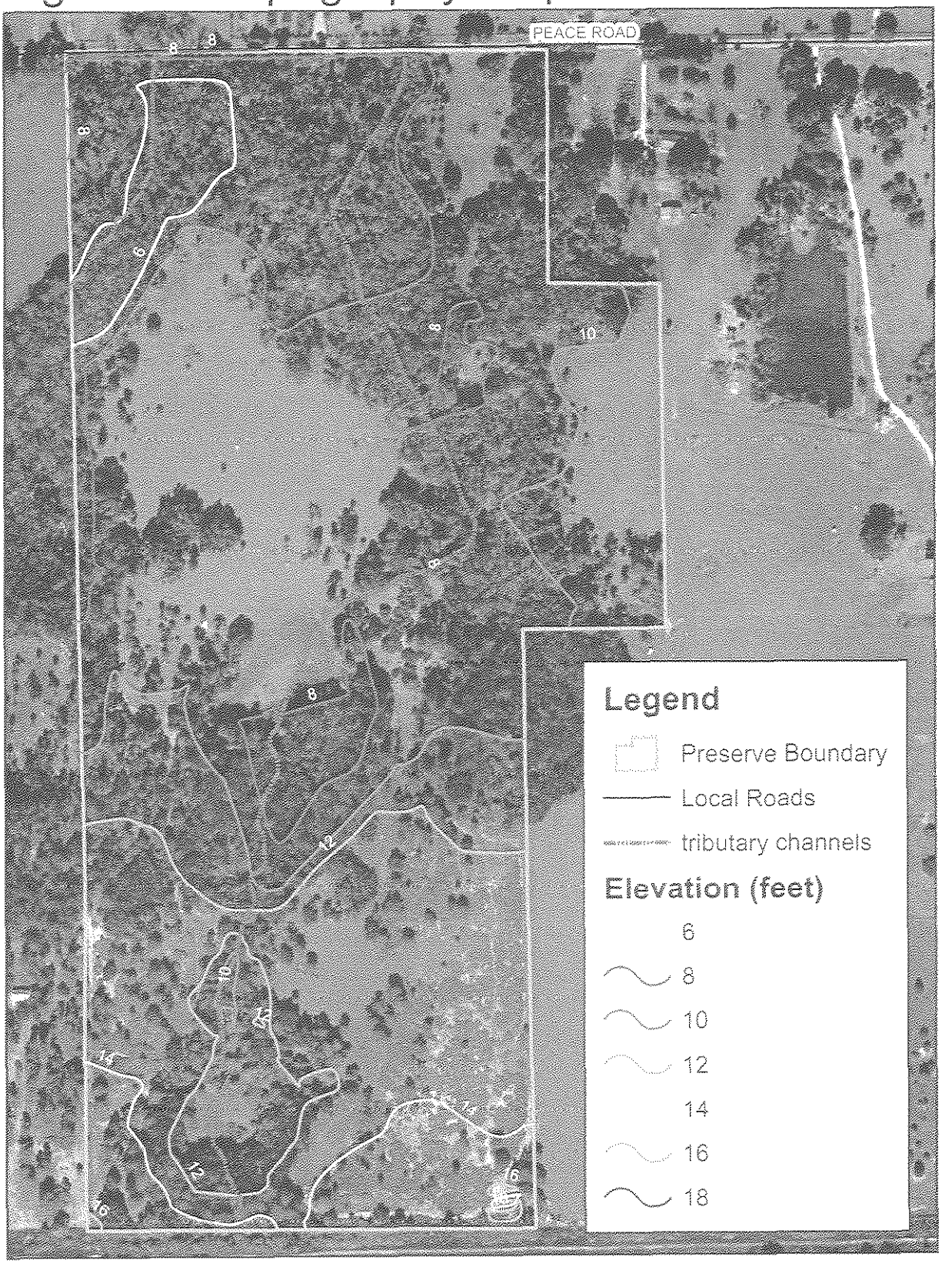


iii. Topography

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 HSP range from 18 feet at the southeast corner and slope in a general northwesterly direction towards the Orange River to 6 feet (Figure 4). The contour lines correspond closely with the plant communities found at the Preserve.

Figure 4: Topography Map



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 four different soil types found at Hickory Swamp Preserve (Figure 5 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, HSP is fundamentally level. Table 2 and the descriptions below have been organized to quickly provide land stewards with pertinent soils information for understanding restrictions and/or results regarding future restoration and probable recreational plan limitations and expense.

There are eight (8) generalized range site categories in Lee County, two of which are found on HSP. Man-made areas are not included as a range site category. 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 two identified on the Preserve are:

- South Florida Flatwoods - Nearly level areas with scattered to numerous pine trees (*Pinus spp.*), saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), and other woody plants.
- 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. Only one is noted at HSP:

- 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 in several ways, including adjacent roads and ditches and cow wells. 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

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 quail (*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)*, 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 otters (*Lutra canadensis*).

- Rangeland: Shrubs and wild herbaceous plants. Wildlife attracted includes deer, quail, 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. Although the Soil Survey of Lee County has other categories under recreation, these are not under consideration for this Preserve. The soils within the Preserve have all been identified as having severe limitations. 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." All soil types at HSP are fairly sensitive and restrictive and considerations by the impacts of hiking or management trails are addressed.

Table 2: Summary of Soil Attributes

				Physical Attributes							*Biological Attributes*					
Soil Types	Map Symbol	Total Acres	% of Preserve	Habitats (Range Site)	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	Limitations for Recreational Paths & Trails
Copeland Sandy Loam, Depressional	45	30.9	46.4	freshwater marshes/ponds	P	D *	rapid		3-6 months (ponded)	3-6 months	2-6%	very poor	very poor	good	--	Severe: ponding
Hallandale Fine Sand	6	.3	0.4	south Florida flatwoods		B/D	moderate, mod rapid		1-3 months	7 months	2-5%	poor	poor	fair	poor	Severe: wetness, too sandy
Malabar Fine Sand, High	63	11.3	17.0	south Florida flatwoods		B/D	rapid	rapid		4-6 months	1-2%	fair	poor	fair	fair	Severe: wetness, too sandy
Oldsmar Sand	33	24.1	36.2	south Florida flatwoods		B/D	rapid	rapid	1-3 months	> 6 months	1-2%	fair	fair	poor	--	Severe: wetness, too sandy

Color Key:
Dry
Wet
Wetter
Wettest
Saturated

(1) 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.

Figure 5: Soils Map

v. Hydrologic Components and Watershed

Hickory Swamp Preserve is within the northwest portion of the South Florida Water Management District's (SFWMD) Lower West Coast Region (LWCR). HSP falls within the 1,400 square-mile Caloosahatchee Basin within a subset of the combined LWCR and Lower East Coast Region (SFWMDa 2000). The Preserve lies in the center of the Orange River Watershed, which covers approximately 77 square-miles (JEI 1992) (Figure 6).

There are two unnamed tributaries within the boundaries of Hickory Swamp Preserve (Figure 7). The first runs across the northwest corner and continues north off the property. The other runs the length of the Preserve from the southern boundary to the north. This one originates on the property and flows north off the property. The general flow of water on the Preserve is to the north towards the Orange River.

In 1974, the United States Fish and Wildlife Service (USFWS) directed its Office of Biological Services to conduct an inventory of the nation's wetlands. This National Wetlands Inventory (NWI) became operational in 1977. Wetlands were identified on the photography by vegetation, visible hydrologic and geographic attributes, and subsequently classified in general accordance with the Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979). Figure 7 identifies 18 acres of palustrine forested wetlands and 1.2 acres of palustrine emergent wetlands at HSP. Palustrine systems are all nontidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and in wetlands that occur in tidal areas where salinity due to ocean derived salts is below 0.5%. Forested wetlands are characterized by woody vegetation that is 6 meters (19 feet) tall or taller. These areas typically have an overstory of trees, an understory of young trees or shrubs and an herbaceous layer. The species that occur at Hickory Swamp Preserve include bald cypress (*Taxodium distichum*) with water hickory (*Carya aquatica)* and laurel oak (*Quercus laurifolia*). Emergent wetlands are characterized by erect rooted, herbaceous hydrophytes, excluding mosses and lichens that are present for most of the growing season. Species in this area at HSP include prairie iris (*Iris hexagona*), alligator flag (*Thalia geniculata*), and coastalplain willow (*Salix caroliniana*).

Figure 6: Watershed Map

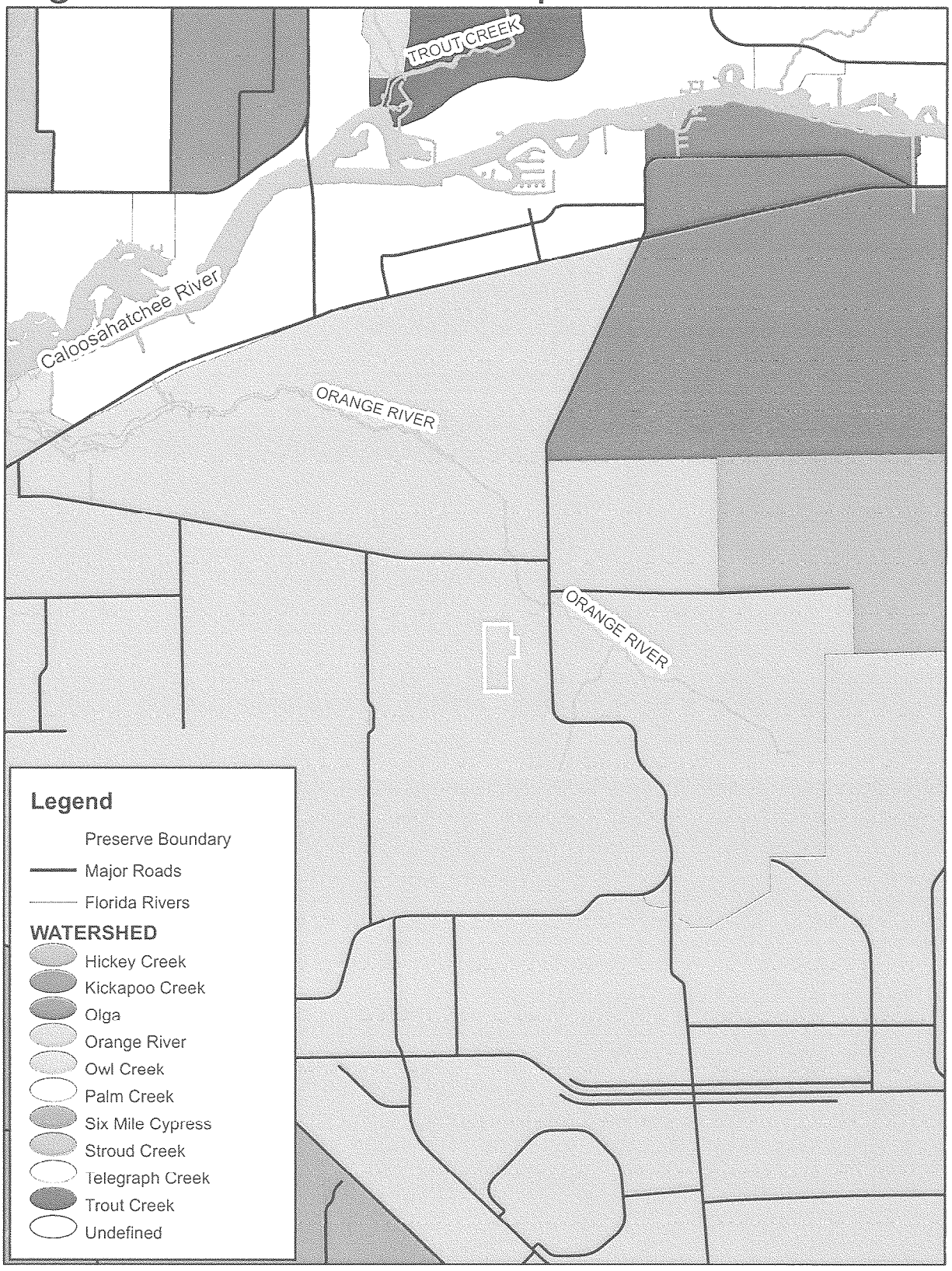
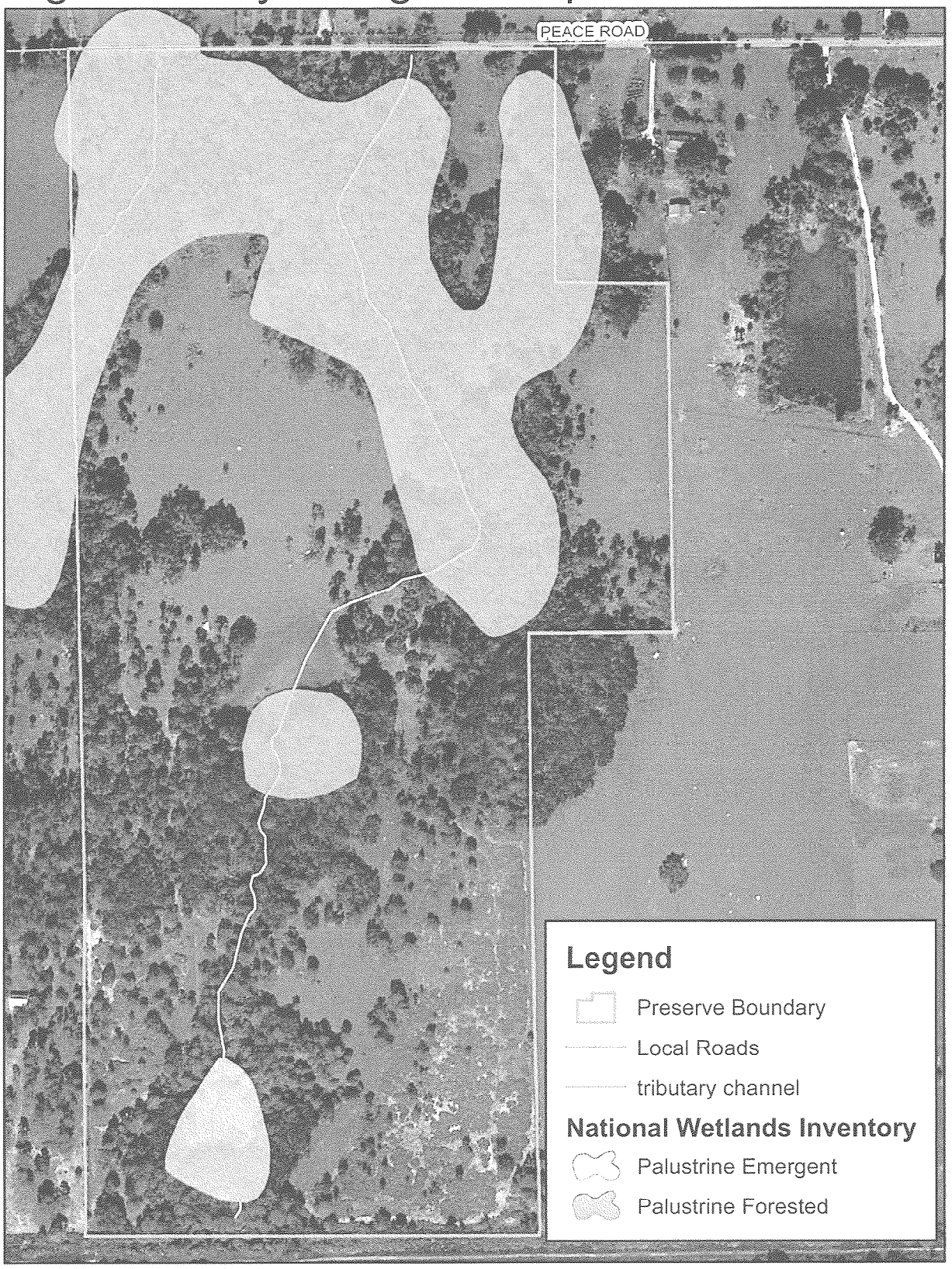


Figure 7: Hydrologic Components



B. Biological Resources

i. Ecosystem Function

The wetlands of south Florida are important to people and to a variety of wildlife. Nearly 30% of HSP is considered jurisdictional wetlands. There are two well-defined depression marshes that provide a place for birds to feed and for fish and frogs to live and breed. Marshes can also improve water quality. Seasonal changes profoundly affect the hydrological conditions on natural lands like HSP. During the late spring and summer months, the rain begins to fall and the wetlands fill to capacity. Fish populations begin to increase in number and biomass. In the fall when the rains end, the water recedes and the fish are concentrated in the shallow wetlands. The wading birds then come in to feast which in turn aids the remaining fish by decreasing the density and increasing the availability of dissolved oxygen. The depression marshes are also important to some species of wading birds for their nesting success. For example, the white ibis (*Eudocimus albus)* chooses nesting sites near marshes that have appropriate drying conditions. Some herons and wood storks (*Mycteria americana*) need specific falling water conditions over a prolonged four-month nesting season. The faster the marsh dries, the sooner nesting starts. If the water level rises, then nesting success declines (Myers and Ewel 1990). This drying period is not only important to the fauna but also to the flora. Most aquatic plants cannot germinate under water and require a drying phase.

Hickory Swamp Preserve protects a portion of one of the tributary branches that leads into the Orange River. Some of the seasonal headwaters of the Orange River originate in the Preserve, eventually spilling from the depression ponds, then flowing into channels that meander through the Preserve for nearly ¾ of a mile before reaching the lower branches of the Orange River and emptying into the Caloosahatchee River.

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). On-going exotic plant retreatment efforts and prescribed fire will continue to be critical management tools at HSP.

ii. Natural Plant Communities

Hickory Swamp Preserve consists of five plant communities, the majority of which consist of mesic hammock and disturbed lands. Thus far, HSP's wetland ecosystems have not been greatly impacted by surrounding land uses. Figure 8 shows the plant communities found at HSP. Most plant communities are defined using the Guide to the Natural Communities of Florida (1990) prepared by FNAI and the former Florida Department of Natural Resources (FDNR), while others that have undergone 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 HSP can be found in Appendix B. This list will be updated seasonally to identify plants in their inflorescence phase.

Mesic Hammock Community – 25.5 acres, 38.3% coverage

The majority of the Preserve contains mesic hammock. It is a hardwood forest community of open or closed canopy dominated by laurel oak, live oak (*Quercus virginiana*), with cabbage palm (*Sabal palmetto*) often present in the canopy and subcanopy. Epiphytes are often found and the shrubby understory may be dense or open, tall or short and is composed of saw palmetto, beautyberry (*Callicarpa americana*), coralbean (*Erythrina herbacea*), and wax myrtle (*Myrica cerifera*), with additional tropical shrubs, such as wild coffee (*Psychotria nervosa*) in the south. Soils are sand mixed with organic matter and are normally dry underfoot. Mesic hammock usually occurs as fringes or small patches on the borders of rivers, swamps, marshes, and large lakes (FNAI 2005).

Animals that have been documented utilizing mesic hammock at the Preserve include the barred owl (*Strix varia*), blue-gray gnatcatcher (*Poloiptila caerulea*), and black racer (*Coluber constrictor priapus*).

Disturbed – Residential (#110), Abandoned Groves (#224), Improved Pasture (#211), & Roads and Highways (#814) – 18.1 acres, 27.2% coverage

Over one-quarter of the Preserve contains disturbed lands that served several purposes over the years. Approximately, one-half an acre of the Preserve is within the Peace Road roadway easement and contains two culverts leading

under the road. During the 1930 to early 1940's, there were several small citrus groves in the northern area of the Preserve. Several areas of the Preserve were cleared and managed for cattle grazing for many decades. A homestead site was occupied in the northeast portion of the Preserve for over 40 years until it was demolished in October 1999. Typical plants growing in these relatively open and disturbed areas include tropical soda apple (TSA) (*Solanum viarum*), a variety of grasses and sedges, remnant citrus trees, caesarweed (*Urena lobata*), and scattered saw palmetto.

Wildlife documented utilizing the disturbed areas at the Preserve include black vulture (*Coragyps atratus*), gopher tortoise (*Gopherus polyphemus*), coyote (*Canis latrans*), and eastern phoebe (*Sayornis phoebe*). Two exotic snail species, giant ram's horn snail (*Marisa cornuarietis*) and channeled apple snail (*Pomaceae canaliculata*), were noted at the mouth of the northern culverts. Staff will need to remove these snails to decrease the chance of further dispersal into the depression marshes.

Mesic Flatwoods Community – 13.7 acres, 20.6% coverage

One-fifth of the Preserve contains mesic flatwoods communities. 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 HSP include south Florida slash pine (*Pinus elliottii* var. *densa*), saw palmetto, wax myrtle, and tall elephantsfoot (*Elephantopus elatus*). The pine density of this plant community varies dramatically from a very sparse open canopy to an almost completely closed canopy.

Animals that have been documented utilizing mesic flatwoods at the Preserve include the red-bellied woodpecker (*Melanerpes carolinus*), pine warbler (*Dendroica pinus*), blue-headed vireo (*Vireo solitarius*), and gopher tortoise.

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 with a closed canopy that 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.

Hydric Hammock Community – 7.4 acres, 11.1% coverage

There is an area within the northwestern corner that is characteristic of a hydric hammock community. It is a well-developed hardwood and cabbage palm forest

with a variable understory dominated by palmettos and ferns. Plants found in this community at HSP include southern magnolia (*Magnolia grandiflora*), downy maiden fern (*Thelypteris dentate*), cabbage palm, water hickory, bald cypress, and myrsine (*Rapanea punctata*).

Hydric hammocks are generally saturated, although only inundated for short periods following heavy rains. The typical hydroperiod is seldom over 60 days per year. Because of their generally saturated soils and the sparse herbaceous cover, hydric hammocks rarely burn.

Normal hydrological regime must be maintained in a hydric hammocks. If the water table is lowered, hydric hammocks will gradually change to mesic conditions. If the hammock is flooded, many trees will die and eventually be replaced by more hydrophytic species. Animals noted include Florida brown snake (*Storeria victa*), magnolia warbler (*Dendroica magnolia*), and green anole (*Anolis carolinensis*).

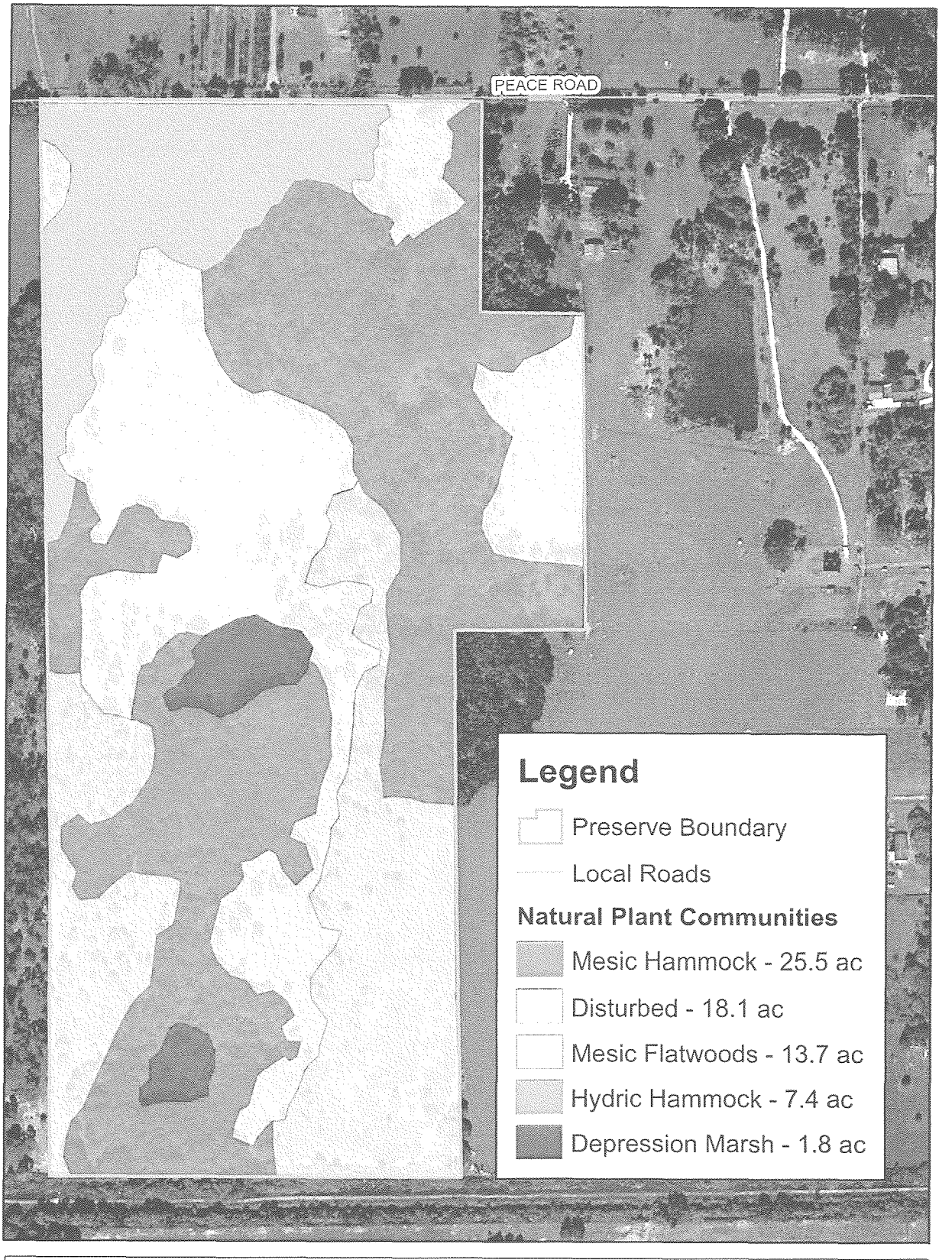
Depression Marsh Community – 1.8 acres, 2.7% coverage

Synonyms for this community include isolated wetland, flatwoods pond, St. John's wort pond, pineland depression, 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, coastalplain willow, duck potato (*Sagittaria latifolia*), and prairie iris. A wide variety of grasses, sedges and other herbaceous plants occur within this community. Animals documented utilizing this community include the wood stork, great blue heron (*Ardea herodias*), and green treefrog (*Hyla cinerea*).

Depression marshes occurring as isolated wetlands within larger upland ecosystems are of critical importance to many animals. They provide 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.

Figure 8: Natural Plant Communities



iii. Fauna

Several wildlife species designated as species of special concern, threatened and endangered have been recorded onsite (Appendix C). Wildlife species were recorded during numerous site evaluations and inspections and will continue to be recorded during future quarterly site inspections. Several exotic wildlife species 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 damage to vegetation, is apparent in the understory of the mesic hammocks and flatwoods.

The second exotic animal group of concern is invasive snails. The giant ram's horn snail was introduced into the U.S. to control weeds and water hyacinth (*Eichhornia crassipes)* by eating their roots and also to eat other snails that may possibly spread disease to humans (Williams 2005). It is not known if these snails will destroy native plant populations and/or compete with native snails. On the other hand, the channeled apple snail will "eat virtually all types of aquatic plants; reproduce rapidly, repeatedly, and profusely; there are few predators in Florida; and threaten native species (habitat alteration, competition, aquatic plant eradication). The channeled apple snails are much larger than native apple snails and can lay more eggs than native apple snails. They can lay up to 1,000 tiny pink eggs at a time on plant stems, docks, seawalls, etc." (FDEP 2006).

Table 3: Exotic Wildlife at Hickory Swamp Preserve

Scientific Name	Common Name
Anolis sagrei	brown anole
Eleutherodactylus planirostris planirostris	greenhouse frog
Osteopilus septentrionalis	Cuban treefrog
Canis latrans	coyote
Dasypus novemcinctus	nine-banded armadillo
Sus scrofa	feral hog
Marisa cornuarietis	giant ram's horn snail
Pomaceae canaliculata	channeled apple snail
Gratiana bolivian	Super beetle

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 animals and application of prescribed fire will be critical restoration components to provide habitat for wildlife. Hickory Swamp

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 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.

iv. Designated Species

There are a variety of designated animal and plant species (Table 4) found at Hickory Swamp 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 United States 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 Florida Natural Areas Inventory (FNAI) will be given special consideration.

Typically, designated species will benefit from proper stewardship of the biological communities in which they occur. However, some species may require additional measures to ensure their protection. Practices likely to benefit wildlife and plants at the Preserve include exotic plant control, preventing palmetto berry picking, prescribed burning, trash removal, wildlife monitoring, feral and exotic 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 Wildlife and Plant Species Found at HSP and Their Designated Status

Scientific Name	Common Name	USFWS	FWC	FNAI	Occurrence
REPTILES					
Drymarchon corais couperi	eastern indigo snake	T	T	G4T3/S3	expected
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	confirmed
Mycteria americana	wood stork	E	E	G4/S2	confirmed

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 Wildlife and Plant Species Found at HSP and Their Designated Status

Scientific Name	Common Name	USFWS	FDA	IRC	FNAI	Occurrence
PLANTS						
Monocots						
Yucca filamentosa	Adam's needle			I		confirmed
Zephyranthes simpsonii	redmargin zephyrlily		T	I	G2G3	confirmed
Tillandsia balbisiana	northern needleleaf		T			confirmed
Tillandsia fasciculate var. *densispica*	cardinal airplant		E			confirmed
Tillandsia utriculata	giant airplant		E			confirmed
Hypoxis wrightii	bristleseed yellow stargrass			I		confirmed
Iris hexagona	prairie iris			I		confirmed
Encyclia tampensis	Florida butterfly orchid		CE			confirmed
Schizachyrium scoparium	little bluestem			I		confirmed
Smilax bona-nox	saw greenbrier			R		confirmed
Dicots						
Elytraria caroliniensis var. *angustifolia*	Carolina scalystem			R	G4T2/ S2	confirmed
Viburnum obovatum	Walter's viburnum			I		confirmed
Carphephorus corymbosus	Florida paintbrush			R		confirmed
Elephantopus elatus	tall elephantsfoot			R		confirmed
Cardamine pensylvanica	Pennsylvania bittercress			R		confirmed
Campanula floridana	Florida bellflower			I		confirmed
Lobelia feayana	bay lobelia			I		confirmed
Helianthemum corymbosum	pinebarren frostweed			R		confirmed
Ipomoea imperati	beach morning-glory			I		confirmed
Carya aquatica	water hickory			I		confirmed
Sida abutifolia	spreading fanpetals			I		confirmed

Morus rubra	red mulberry			R		confirmed
Forestiera segregata	Florida swampprivet				G4T2/ S2	confirmed
Fraxinus caroliniana	pop ash			R		confirmed
Ludwigia maritima	seaside primrosewillow			R		confirmed
Polygonum hydropiperoides	swamp smartweed			R		confirmed
Diodia virginiana	Virginia buttonweed			R		confirmed
Hamelia patens	firebush			R		confirmed
Spermacoce prostrata	prostrate false buttonwood			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).

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 induced, 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. Although HSP is not large enough to support an entire home range, a portion of a home range may include HSP. 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). The eastern indigo snake has not been observed on HSP, but is expected to be in the area.

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 occur primarily in the southern portions of the Preserve in the pine flatwoods. 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 including Florida. Loss of nesting sites through development and conversion to agriculture are the major threats to this species.

White Ibis

The white ibis (*Eudocimus albus*) is declining throughout its range, probably due to the reduction and degradation of wetlands as well as human disturbances to their rookeries. Invasive exotic plant removal and watershed enhancement 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. No known nests occur on HSP.

Wood Stork

Wood storks (*Mycteria americana*) 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 HSP for the protection of this species will be to protect wetland water levels, water quality, hydroperiods, and removal of the invasive exotic plants from wetland areas.

Plant Species

In addition to designated wildlife, Hickory Swamp Preserve provides habitat for several listed plant species. Five state listed plant species, twenty-five IRC designated species and three FNAI designated species have been identified at HSP thus far. The following is a brief summary of each state listed plant species explaining reasons for their decline and typical communities in which they can be found. Management recommendations can be found towards the end of this section.

Redmargin zephyrlily

Redmargin zephyrlily (*Zephyranthes simpsonii*) is a Threatened species listed by FDA and is also known as Simpson's zephyrlily. Other organizations listing this plant are FNAI and IRC. Zephyrlilies' habit of blooming shortly after spring and summer rains gave rise to the better known name rain-lily; however, it flowers in response to fire rather than rain (Hammer 2002). Holding true to its nature, this

plant was noted within a couple of weeks after a prescribed fire in a pine flatwoods community at HSP.

Northern needleleaf

The northern needleleaf (*Tillandsia balbisiana*) is listed by FDA as a Threatened species that is occasionally found in a variety of communities including pinelands, hammocks and mangroves. Threats to this species include the exotic Mexican bromeliad weevil (*Metamasius callizana*) and habitat destruction (Save 2003).

During exotic plant removal or construction of any public use areas, staff will survey the area before work commences to look for and mark, if necessary, areas to avoid. Plants growing on invasive exotic vegetation to be destroyed will be relocated on-site if economically feasible. Currently, scientists are researching biological control agents for the exotic Mexican bromeliad weevil. Staff will keep current with the research developments and work with scientists in the future if it is determined that the weevils are affecting epiphytes and the United States Department of Agriculture (USDA) is in need of release sites.

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 at HSP. 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).

Florida butterfly orchid

Although locally abundant (Brown 2002), the Florida butterfly orchid (*Encyclia tampensis*) is designated as Commercially Exploited by the FDA. A plant that is designated as "Commercially Exploited" is considered to be threatened by commercial use.

The majority of the designated plant species listed in Table 4 are identified by IRC, which is not a regulatory agency. IRC designations were either received

from their book (Gann 2002) or Internet website (http://www.regionalconservation.org/ircs/database/search/QuickSearch.asp). 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 HSP, thirteen Rare and eleven Imperiled plants have been identified. 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.

In the book, Rare Plants of South Florida: Their History, Conservation and Restoration (Gann 2002), 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 HSP:

- Restrict recreational activities such as off-road vehicle and equestrian use to avoid impacts to rare plant populations.
- Ensure 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 specific management and restoration activities at the Preserve that will protect the designated species. If additional designated species are documented on the Preserve they will be added to the lists in Appendices B or C. If eagle 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 Protection	Prescribed Fire	Mark Location
Drymarchon corais couperi	eastern indigo snake	x		x	
Gopherus polyphemus	gopher tortoise	x		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		
FLORA SPECIES					
Zephyranthes simpsonii	redmargin zephyrlily	x		x	
Tillandsia balbisiana	northern needleleaf	x			
Tillandsia fasciculate var. *densispica*	stiff-leaved wild pine	x			
Tillandsia utriculata	giant airplant	x			
Encyclia tampensis	Florida butterfly orchid	x	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 recorded using a GPS for Land Stewardship staff knowledge and protection during restoration activities.

v. Biological Diversity

Many species of animals not only inhabit, but also frequently visit the Preserve. Currently 171 plant species (40 exotic) and 74 animal species (9 exotic) have been documented. Seventeen of the 40 exotic plant species (43%) are on the Florida Exotic Pest Plant Council's 2005 List of Invasive Species (FLEPPC 2005). See Appendices B and C for complete lists of plants and wildlife documented at the Preserve. The natural wetlands, surrounded by uplands, provide habitat for a variety of species and explain the high biodiversity observed.

Biodiversity at Hickory Swamp Preserve varies by plant community, but may continue to increase with on-going stewardship activities (i.e. invasive exotic plant removal, prescribed fire) and eventual removal of the cattle. Undisturbed natural plant communities range from mesic flatwoods on the dry end, to a couple of ephemeral ponds that seasonally contain water. 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 including wood storks and white ibis which feed on congregations of fish and aquatic invertebrates. Oak toads (*Bufo quercicus*), eastern narrowmouth toads (*Gastrophyryne carolinensis*), barking (*Hyla gratiosa*) and squirrel treefrogs (*Hyla squirella*) spend more time in surrounding uplands, utilizing the wetlands strictly for breeding (Jensen 2003). 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 HSP 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 debris and prevent dumping on site.
- Improve hydrologic conditions and protect water quality from adjacent land uses.
- Maintain on-going prescribed fire program to closely mimic the natural fire regimes for different plant communities to increase plant diversity and ensure the canopies remain open.

- Control invasive exotic animal populations, where feasible, to reduce their impacts on the plants, native animals and soils.
- Conduct on-going species surveys utilizing volunteers and staff to help catalogue and monitor the diversity that is present.
- End long-term cattle lease.

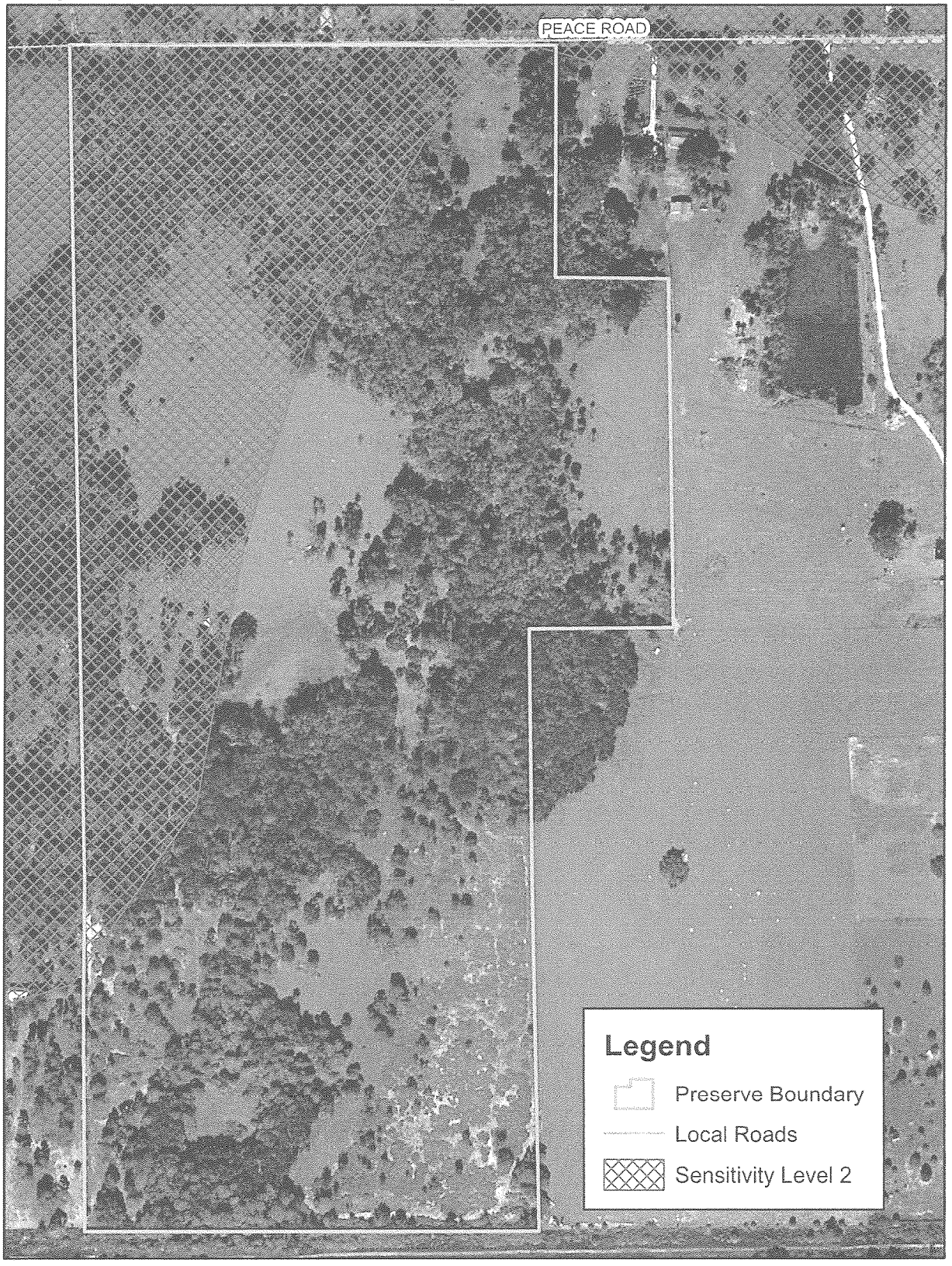
C. Cultural Resources

i. Archaeological Features

In 1987, Piper Archaeological Research, Inc. (PARI) conducted an archaeological site inventory of Lee County. They were able to identify an additional 53 sites increasing the total number of known archaeological sites in Lee County to 204. PARI created a site predictive model and archaeological sensitivity map for the county that highlighted potential areas likely to contain additional archaeological sites. Approximately thirty percent of Hickory Swamp Preserve lies within the study's "Sensitivity Level 2" area (Figure 9). The study defines this level as "areas that contain known archaeological sites that have not been assessed for significance and/or conform to the site predictive model in such a way that there is a high likelihood that unrecorded sites of potential significance are present. If these areas are to be impacted, then they should be subjected to a cultural resource assessment survey by a qualified professional archaeologist in order to 1) determine the presence of any archaeological sites in the impact area and/or 2) assess the significance of these sites" (Austin 1987).

There have already been some soil disturbance at HSP in areas that were prepared for citrus and cattle grazing or where an old homestead and barn once occurred. These disturbances have occurred primarily within north central region of the site, including areas within the Sensitivity Level 2 category. A professional archaeologist will be hired to conduct a survey of the area to be impacted if restoration projects require any major soil disturbance. If evidence of shell middens or other artifacts are found in the area, the state of Florida's Division of Historical Resources (DHR) will be immediately contacted and protection procedures will comply with the provision of Chapter 267, Florida Statutes, Sections 267.061 2(a) and (b). Collection of artifacts and/or any disturbance of the archaeological site will be prohibited unless prior authorization has been obtained from the DHR. Any potential site will be managed in coordination with recommendations from the DHR and, if necessary, the site will be kept confidential with periodic monitoring for impacts. If any significant archaeological resources are found and confidentiality is not found to be necessary, they may be incorporated into a public education program.

Figure 9: Archaeological Features Map



ii. Land Use History

Historically, the area that is now Hickory Swamp Preserve represented the rustic setting of a rural Florida community: dirt roads which led to a small homestead where cattle and citrus were raised. Many long-time residents of the Buckingham community recognize and appreciate the value of being within a county designated Rural Community Preserve, which offers some additional protection with development restrictions.

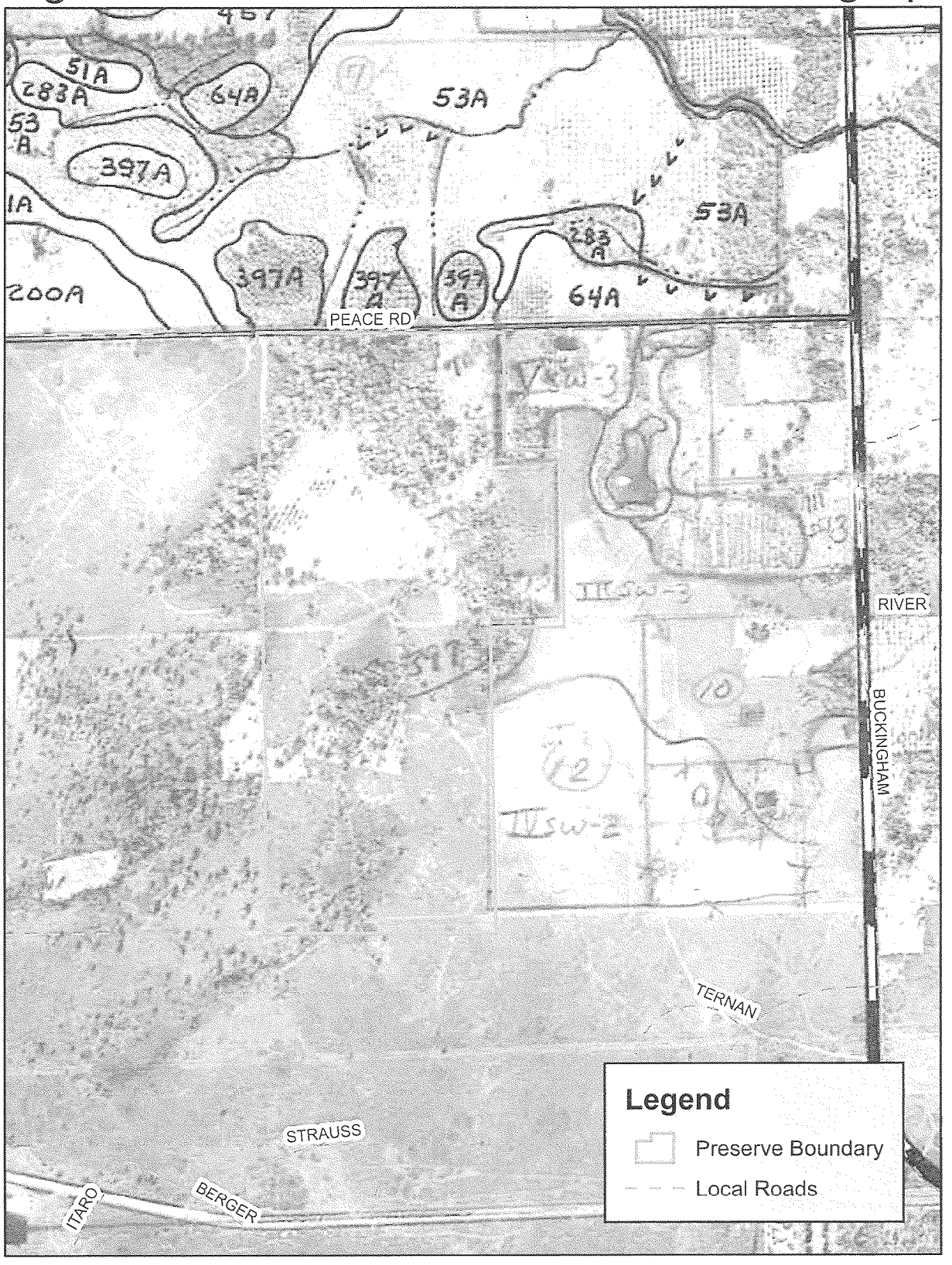
According to interpretation of 1944 aerial photography (Figure 10), features such as a dirt road (Peace Road) along the northern boundary, a citrus grove in the Preserve's northern area, several other dirt trails and several improved pastures probably used for cattle grazing are visible. While the 1953 aerial photograph doesn't show any additional changes (Figure 11), the 1958 photograph (Figure 12) shows a notable reduction in citrus trees.

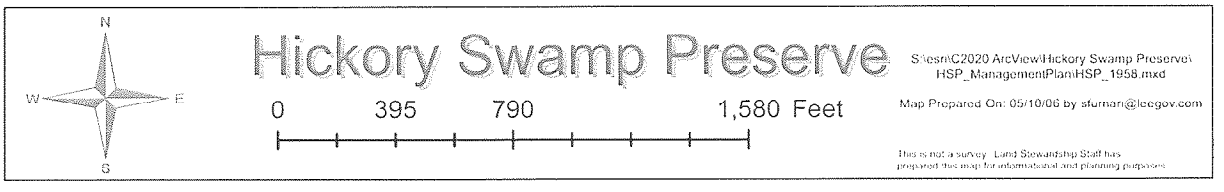
Additional activities were derived from either historical aerial photography from 1966 until 1999 or from the Phase I Environmental Site Assessment (ESA) report (WRS 1999). Sometime between 1958 and 1966, a homestead and barn were constructed in the northeast corner of the site. Additional changes adjacent to the Preserve include construction of a ditch along the southern boundary and paving of Peace Road. In 1972, what appears to be a cow well is visible in the southeastern corner. Except for a couple of small structures built next to the residence during the 1970's, no additional changes are apparent except vegetation growing throughout many areas of HSP. The residence, pole barn (that was used as a hog pen), two 1,000 gallon aboveground fuel tanks, and latrine were removed from site during October and/or November 1999 (WRS 1999 and pers. comm.). The only items remaining were the abandoned wells, some debris and a few citrus trees.

Figure 10: 1944 Historical Aerial Photograph

Figure 11: 1953 Historical Aerial Photograph

Figure 12: 1958 Historical Aerial Photograph





iii. Public Interest

Hickory Swamp Preserve was purchased for its environmentally sensitive and diverse plant communities and for the protection of the Orange River watershed. Staff has received one public user request since it was nominated to the program in 1997. In the spring of 2006, after an article ran in the local newspaper directing the public to visit several natural areas with flora in bloom, one woman called expressing an interest to visit the beautiful prairie iris in bloom at one of the Preserve's wetlands.

V. FACTORS INFLUENCING MANAGEMENT

A. Natural Trends and Disturbances

Natural trends and disturbances that may influence native communities and the stewardship at HSP 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, tropical systems during 2004 and 2005 have damaged some vegetation, especially along the northern portions of HSP. 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 (FDOF) – Caloosahatchee District - and Lee County Department of Parks and Recreation (LCPR) are developing a wildland firefighting protocol for County preserves. The FDOF was provided a map of the Preserve showing the locations of gates, firebreaks and water sources. The FDOF will utilize existing firebreaks to contain wildfires at HSP 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. This agreement between FDOF and the County will protect HSP from the potential damage associated with emergency firefighting equipment. Land Stewardship staff will lead periodic site visits in order to familiarize FDOF with HSP and current management efforts. A comprehensive C20/20 fire plan, to be completed in the summer of 2006, will help decrease the impact of catastrophic wildfires on the Preserve and neighboring lands. Fire lines along the perimeter of the Preserve, where appropriate, as well as those created once burn units are established, will be kept clear of debris and disked or mowed a minimum of once each year during the onset of the dry (wildfire) season.

Stewardship (invasive, exotic plant control, prescribed burning, etc.) of HSP is influenced by seasonal hydroperiods. The LSOM's exotic plant prescription form will be used to define the conditions for control activities. 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 affected HSP. Most are either gradual changes that occurred over time or changes as a result of various stewardship activities. See Figure 13 for approximate location of all of these features.

The largest impact on the Preserve involves past and present impacts associated with cattle grazing operations. The cattle have spread several invasive exotic plants (primarily TSA and caesarweed) throughout the Preserve. The condition of the ephemeral ponds are being negatively impacted by cattle trampling and eating designated plant species (i.e. prairie iris) and degrading water quality within the ponds that eventually flow out into rivers (Orange and Caloosahatchee) to the north. There are still remnant pieces of abandoned interior cattle fencing and three cow wells distributed in several locations. Once cattle operations end, the interior fencing will be removed and cow wells refilled with the previously removed spoil soil adjacent to the pits.

Besides the maintenance gate off Peace Road, there are two other gates adjoining neighboring properties. The eastern one is for cattle movement between grazing lands and the southwestern one is a small 5' gate. After Hurricane Charley passed through and damaged fencing, the neighbor got permission from staff to install the small gate to make it easier to repair damaged fencing along the boundaries of the Preserve. Both gates will need to be either removed or locked to prevent cattle or unauthorized vehicles from traveling onto the Preserve once the cattle lease is ended and the Preserve opens up for the public to visit.

Invasive exotic plants disrupt and limit the biodiversity and ecological processes of the Preserve. Initial exotic plant removal efforts have already occurred and follow-up maintenance will greatly enhance the natural plant communities and wildlife habitats. During 2001 and 2003, a contractor treated many species of invasive exotic plants. Other issues involving plants include the damaged or overturned dead trees from the past two years of tropical systems. Northern areas of the Preserve may require some mechanical brush reduction measures to remove the build up of hazardous fuel loads and repair damaged fences.

Prescribed fire has already been implemented at this Preserve. The continued utilization of prescribed fire will be essential for long-term sustainability of these fire-dependant communities by creating a mosaic of open areas. Fire adapted designated species such as gopher tortoises and redmargin zephyrlilies have already benefited from burns accomplished to date.

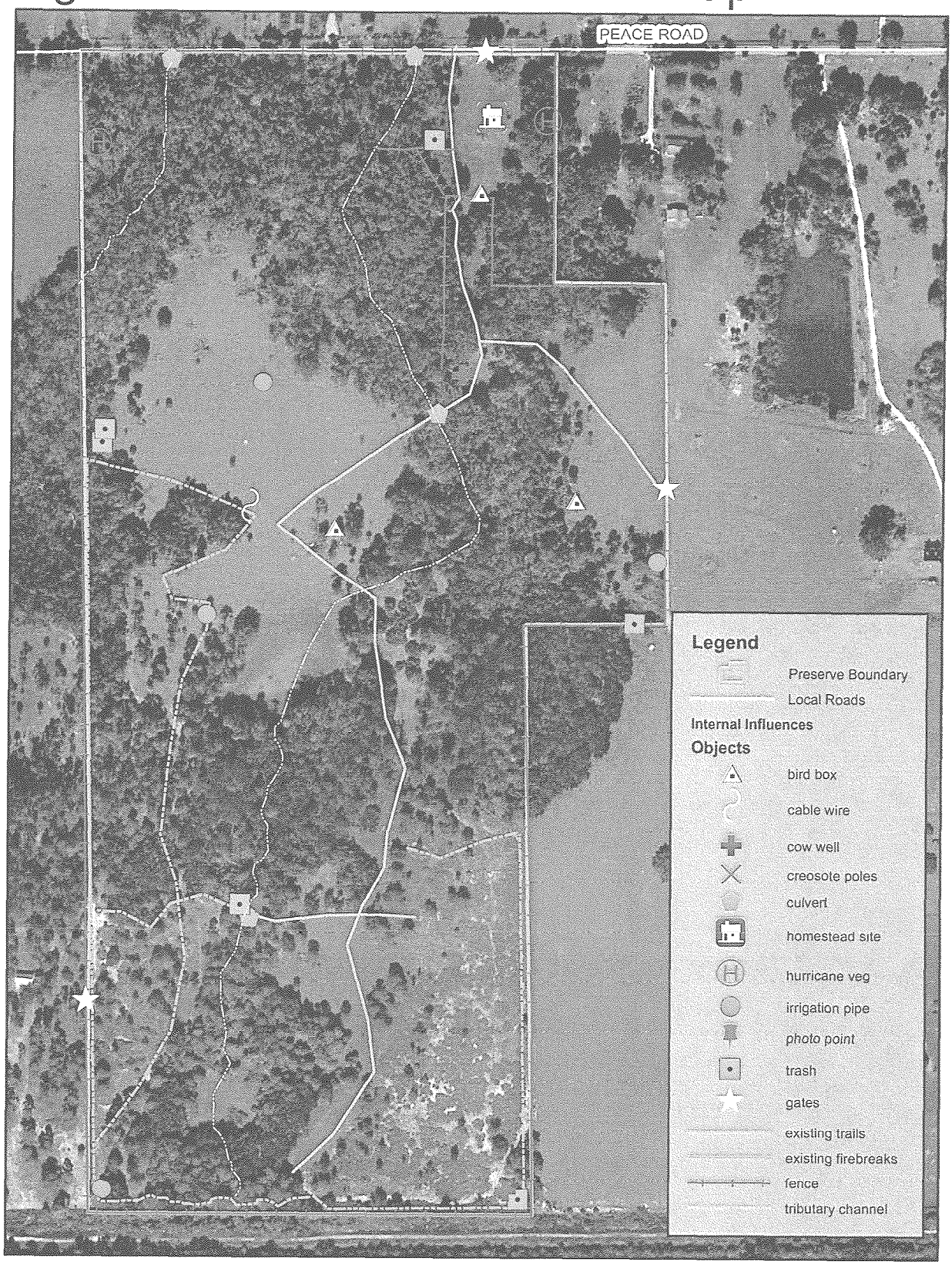
Exotic animals can have a detrimental effect on native flora and fauna. For example, feral hogs consume ground-nesting bird eggs and disturb soil and sensitive vegetation during rutting activities, which can provide optimal substrate for invasive exotic plant growth. Exotic fish and amphibians can compete with native fauna for habitat and food. Although the exotic snails were only observed at a northern culvert leading off the Preserve, the potential exists for the snails to travel south into wetland areas. A range of removal methods will be considered for problematic invasive exotic animals found on the Preserve.

There are four abandoned irrigation wells scattered throughout the Preserve. In June 2006, LCNR staff performed a quick visual inspection on most of them and found them to be shallow water table wells. In August 2006, LCNR staff evaluated the wells' depths and structural soundness to provide recommendations to Land Stewardship staff. Refer to LCNR inspection report in Appendix D.

Debris (creosote poles, thick buried cable, scrap metal, and miscellaneous trash) scattered throughout the site and will need to be removed. Additionally, small culverts (galvanized gutter and 4" clay pipes) were installed for cattle to cross over into additional pasture areas. These non-functioning culverts are located within the eastern branches of the tributary and will be removed.

Additional items on the Preserve are a part of staff monitoring effort and/or educational projects. Three years ago, four bird boxes were installed as an Eagle Scout project to provide nesting boxes for flickers (3) and wrens (1). In 2006, only three bird boxes were located; one with a missing top. Currently, birds are not utilizing these boxes because they need to be periodically cleaned and repaired. The bird boxes will be removed until an interested volunteer is found that will be able to help maintain them. A photo point monitoring station was installed in MU 4 to monitor vegetation growth after prescribed fires and as a visual tool for future environmental educational programs.

Figure 13: Internal Influences Map



C. External Influences

HSP is located within the Buckingham Community, an area designated by the Lee County Board of County Commissioners as one of the 22 planning communities where "the residents will continue to work to maintain the rural nature of this area of the county. The residents have limited the commercial activity within the community to a node focused around the intersections of Buckingham Road and Cemetery Road and Buckingham Road and Orange River Road. It is their preference that the majority of the communities commercial needs be met outside of their community. They also have concerns with any transportation projects which increase the volume of traffic through their community" (Lee Plan 2004). The Future Land Use categories for properties directly adjoining the Preserve are Rural Community Preserve, Wetlands and Public Facilities (Figure 16).

The first external influence is the sporadic illegal littering coming from vehicles traveling on Peace Road. This will be a persistent problem and staff and/or volunteers will have occasional work days to remove debris.

A second external influence, directly to the south, is a large drainage canal with utility poles. This canal was constructed prior to 1966 and it cut off the natural wetland (to the southwest) from flowing onto HSP during the wet season. Communications with LCNR about the adjacent canal indicate "that the canal system collects water from the surrounding areas and discharges into Nine Mile Run on the east side of Buckingham Road. Nine Mile Run is a smallish creek that crosses through a neighborhood where it outfalls into the Orange River." Management agencies are "interested in finding an alternate route for water from Nine Mile Run to get to the Orange River. Diverting some of the water from the north canal through this preserve might be an option" (Wooten 2006). The Gulf Coast Center which is state owned and operated by the Agency for Persons with Disabilities is south of the canal. This 505-acre Developmental Disabilities Institution has been in operation since 1960 and is scheduled for closure June 30, 2010. Half of the property has been developed with public facilities, while the other half is either undisturbed natural areas or improved pasture for cattle grazing. It is unknown what the State of Florida plans to do with the property once the facility finally closes. Lee County has expressed interest to the state in obtaining this site.

Another possible external influence is the potential for a major roadway to be constructed in the future, south of the Preserve. According to a Lee County Department of Transportation (LDOT) Major Road Improvements map (http://www.lee-county.com/publicworks/pdf/Planning/Maps/CIPMap_0406.pdf) a County Corridor Study is currently underway to examine expanding and

connecting Luckett Road from Ft. Myers through Buckingham and into Lehigh Acres.

D. Legal Obligations and Constraints

i. Permitting

Land stewardship activities at Hickory Swamp 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 South Florida Water Management District (SFWMD). The use of prescribed fire will require obtaining a DOF burn permit. Tree removal will require notification to Lee County Division of Environmental Sciences and soil disturbance within the Archaeological Sensitivity Zone will require a Certificate to Dig permit from Lee County Division of Planning (LCDP).

ii. Other Legal Constraints

There is a 25 foot road right-of-way easement on the northern boundary of the Preserve along Peace Road. The Preserve boundary includes areas north of the existing fence and a portion of the paved roadway. Approximately .5 acre of HSP lies within this 25 foot right-of-way easement.

In January 2002, a year long cattle lease agreement was drafted (Appendix E) for the entire Preserve. All Lee County cattle leases have been reorganized to expire during September of subsequent years to simplify coordination between all parties. As a consideration of the License for Cattle Grazing, this lease may be terminated with a 30-day written notice to the Licensee. The cattle are a two-fold issue for HSP: there are negative environmental impacts and a potential future liability for public safety. At this Preserve, the cattle have produced harmful environmental impacts with regards to damaging native vegetation (common and designated species), trampling through wetland areas, spreading exotic plants such as TSA and caesarweed and reducing overall water quality. In addition, there are plans to open this Preserve for public access and the small size of the Preserve will not allow this incompatible usage. C20/20 staff recommends that the Licensee be notified summer 2006 of the county's intention not to renew the cattle lease.

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" (Lee County 2004). 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 HSP are **Chapter II – Future Land Use, Chapter IV – Community Facilities and Services**, **Chapter V – Parks, Recreation and Open Space** and **Chapter VII – Conservation and Coastal Management**.

Chapter II, Policy 1.4.6 states that Conservation Lands includes 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, parking 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. 2020 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 II, Goal 17 provides to manage future growth in the Buckingham area and to protect the unique historical and environmental values of the Buckingham community. **Objective 17.1** states the primary land use designation for the Buckingham area is "Rural Community Preserve." No land will be changed to a land use category more intense than Rural Community Preserve unless a finding of overriding public necessity is determined by three members of the Board of County Commissioners.

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 IV, Policy 60.1.4 provides that the county will examine steps necessary to restore principal flow-way systems, if feasible, to assure the continued environmental function, value, and use of natural surface water flow-ways and associated wetland systems. (Amended by Ordinance No. 00-22)

Chapter V provides that Land Stewardship staff will ensure that any public use facilities and recreational opportunities will comply with **Goal 85: Park Planning and Design**, which requires that parks and recreation sites are planned, designed, and constructed to comply with the best professional standards of design, landscaping, planning, and environmental concern. Staff will also work to meet **Goal 86: Environmental and Historic Programs, Objective 86.1** to provide information and education programs regarding its cultural history and its environment at appropriate facilities. (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 (FLUCFCS) 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," Florida Fish and Wildlife Conservation Commission (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 107.6: SOUTHERN BALD EAGLES, states that the county will continue to monitor for Southern bald eagle nesting activity and offer incentives to conserve buffer areas around Southern bald eagle nests. (Amended by Ordinance No. 98-09) **Policy 107.6.1** states that the county will maintain a policy of negotiations with owners of land surrounding eagle nests to provide an optimal management plan for land subject to imminent development. **Policy 107.6.2** states that the county Eagle Technical Advisory Committee will continue to conduct nest monitoring through the nesting season for all known eagle nests in Lee County. Information from these assessments will be used to modify, as needed, the adopted nest guidelines and to adopt guidelines for new eagle nests documented in Lee County. (Amended by Ordinance No. 94-30, 98-09, 00-22)

Chapter VII, Objective 107.8: GOPHER TORTOISES provides that the county will protect gopher tortoises through the enforcement of the protected species regulations and by operating and maintaining, in coordination with the FWC, the Hickey Creek Mitigation Park. (Amended by Ordinance No. 94-30) **Policy 107.8.1** provides that the county policy is to protect gopher tortoise burrows wherever they are found. However, if unavoidable conflicts make on-site

protection infeasible, then off-site relocation may be provided in accordance with FWC requirements. (Amended by Ordinance No. 94-30)

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 HSP management plan follows USFWS "Habitat Management Guidelines for the Wood Stork in the Southeast Region." according to **Policy 107.10.2**.

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)

E. Management Constraints

The principle stewardship constraints for HSP include limited funding, the brief dry season for conducting land stewardship activities, and increasing urbanization pressures surrounding the Preserve. Examples of urbanization pressures include that prescribed fire parameters become more restrictive with expanding residential and commercial development and increased traffic on nearby roadways.

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 public infrastructure projects will be pursued. These funds will be used to supplement the operations budget to meet the restoration goals in a timely manner.

Ordinarily depression marshes and locations within the hydric and mesic hammock communities (low spots and/or their associated tributary channels) at HSP have standing water for 6-8 months of the year. The driest months are typically January through April; therefore most stewardship activities will be conducted during these months.

F. Public Access and Resource-Based Recreation

There has been minimal public use at Hickory Swamp Preserve with the exception of an occasional Land Stewardship staff led field trip. In August 2004, Hurricane Charley knocked several trees onto the north boundary fence. As part of the fence replacement, a pedestrian gate was added. Due to the current cattle lease, this gate is kept locked. Once the cattle lease is terminated, a short wooden fence section will be installed to prevent motorized vehicle access through this pedestrian entrance and the lock will be removed.

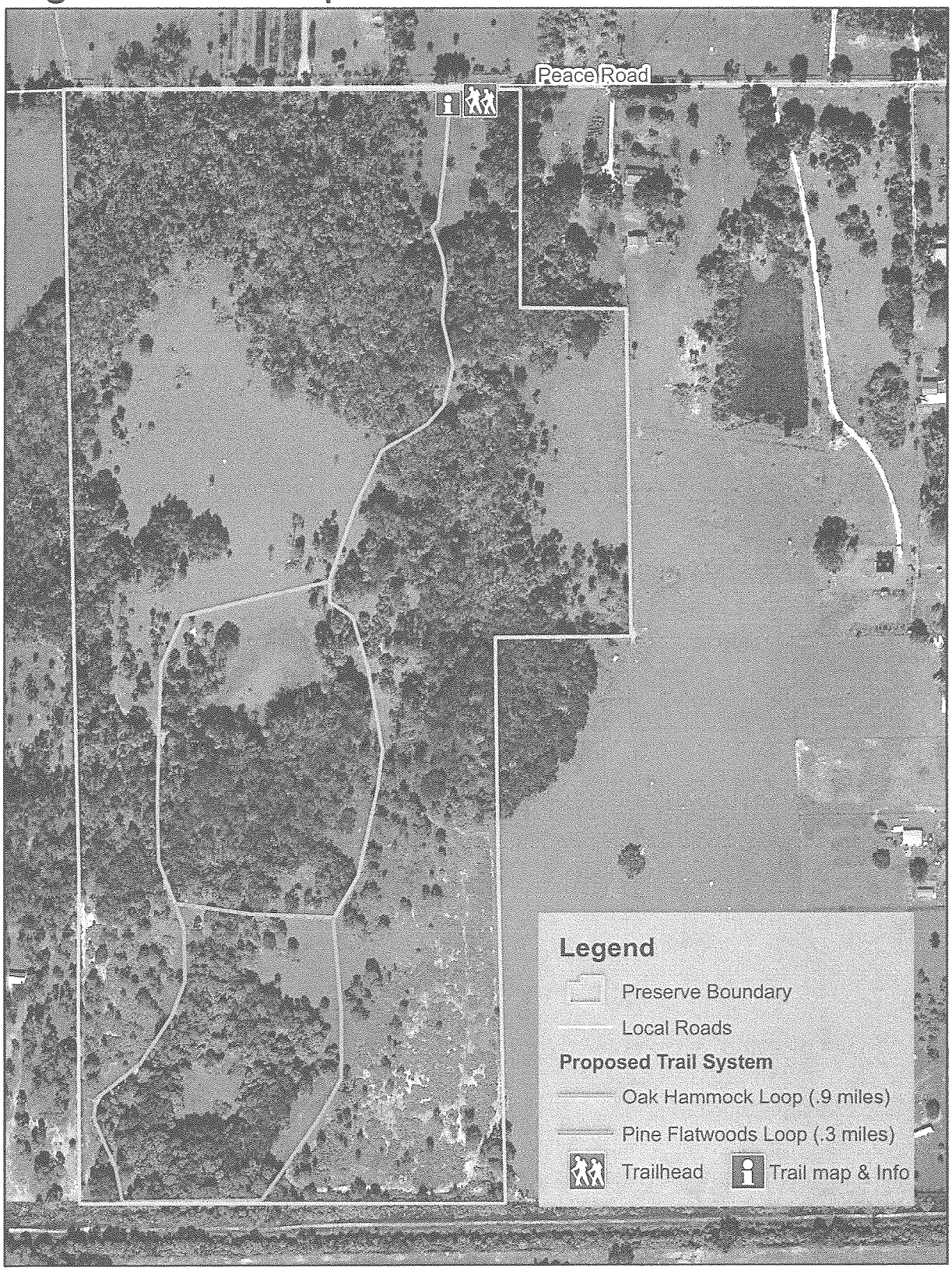
In accordance with the LSOM, HSP is classified as a Category 4 Resource Protection and Restoration Preserve. Once the cattle lease is terminated, it will become a Category 3 Limited Use Preserve. Since the Preserve is relatively small, staff does not recommend any additional recreational activities beyond hiking, bird watching, nature photography and nature study, utilizing a primitive trail system that are allowed at all Conservation 20/20 Preserves. More developed recreational opportunities already exist in eastern Lee County exploring the same types of habitats at both Caloosahatchee Regional Park and Hickey's Creek Mitigation Park.

The proposed primitive nature trail will be marked with painted posts that will be reused from current interior fencing where possible. The trail system will have two loops: the Oak Hammock Loop, .9 miles long and the Pine Flatwoods Loop, .3 miles long. These trails follow the existing trails at HSP so additional impacts to the Preserve will be minimal. Maintenance of the trails, such as trimming, should be infrequent since these trails were originally created to be wide enough for vehicles. The portion of Pine Flatwoods Loop that lies along the southern boundary of the Preserve will need to be slightly improved as it was initially installed as a firebreak and is very uneven. The exterior boundary fence will be bumped in from the road to create an area approximately 30 feet wide and 20 feet deep (with crushed shell added) to prevent visitors from blocking Peace Road and the access gates for management. A sign will be posted at the pedestrian entrance providing an illustration of the trail system, instructions to download a trail map from the LCPR website (for future use) and a phone number for those without internet access. See Figure 14 for the proposed Master Site Plan. An explanation that the trails are primitive, uneven and seasonally flooded will also be posted on the sign.

Periodically, small portions of the trail will have standing water throughout the wet season, but the trail will remain open for visitors to wade if they choose. Portions of the trails may also be periodically disked in preparation of both prescribed burns and the wildfire season. The entire Preserve will be closed during certain restoration activities or prescribed fires. Temporary signs will be posted at the pedestrian gate when the Preserve is closed and the pedestrian gate will be locked. If unauthorized activities or vehicular parking become a problem at the trailhead area after the Preserve has closed (dusk until dawn), then staff will

consider making appropriate changes to close off vehicular access from Peace Road.

Figure 14: Proposed Master Site Plan



G. Acquisition

Hickory Swamp Preserve was purchased through C20/20 in December 1999 for $467,000 after being nominated to the program in the summer of 1997.

The STRAP number for the property is 08-44-26-00-00003.0000. No other parcels adjacent to HSP were nominated to the C20/20 Program, but a small conservation area is within a mile of the Preserve (Figure 15).

The future land use category for the Preserve is "Conservation Lands," further sub-categorized as 45.5-acres of "Uplands" and 21-acres of "Wetlands" (Figure 16). HSP is zoned as agriculture "Ag-2" on all 66.5-acres (Figure 17). Land Stewardship staff will work with the LCDP to change to this designation to "Environmentally Critical."

Figure 15: Acquisition Map

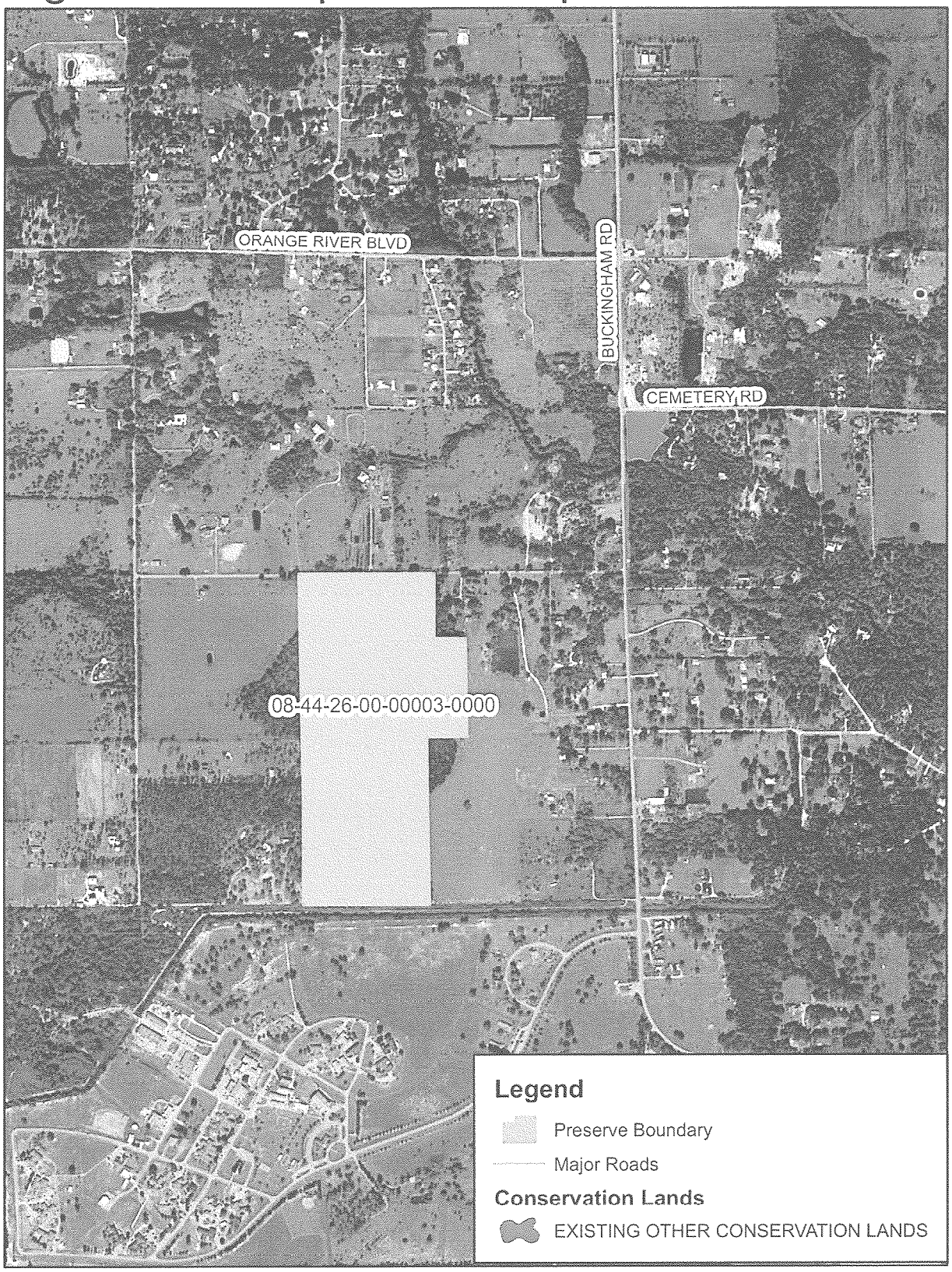
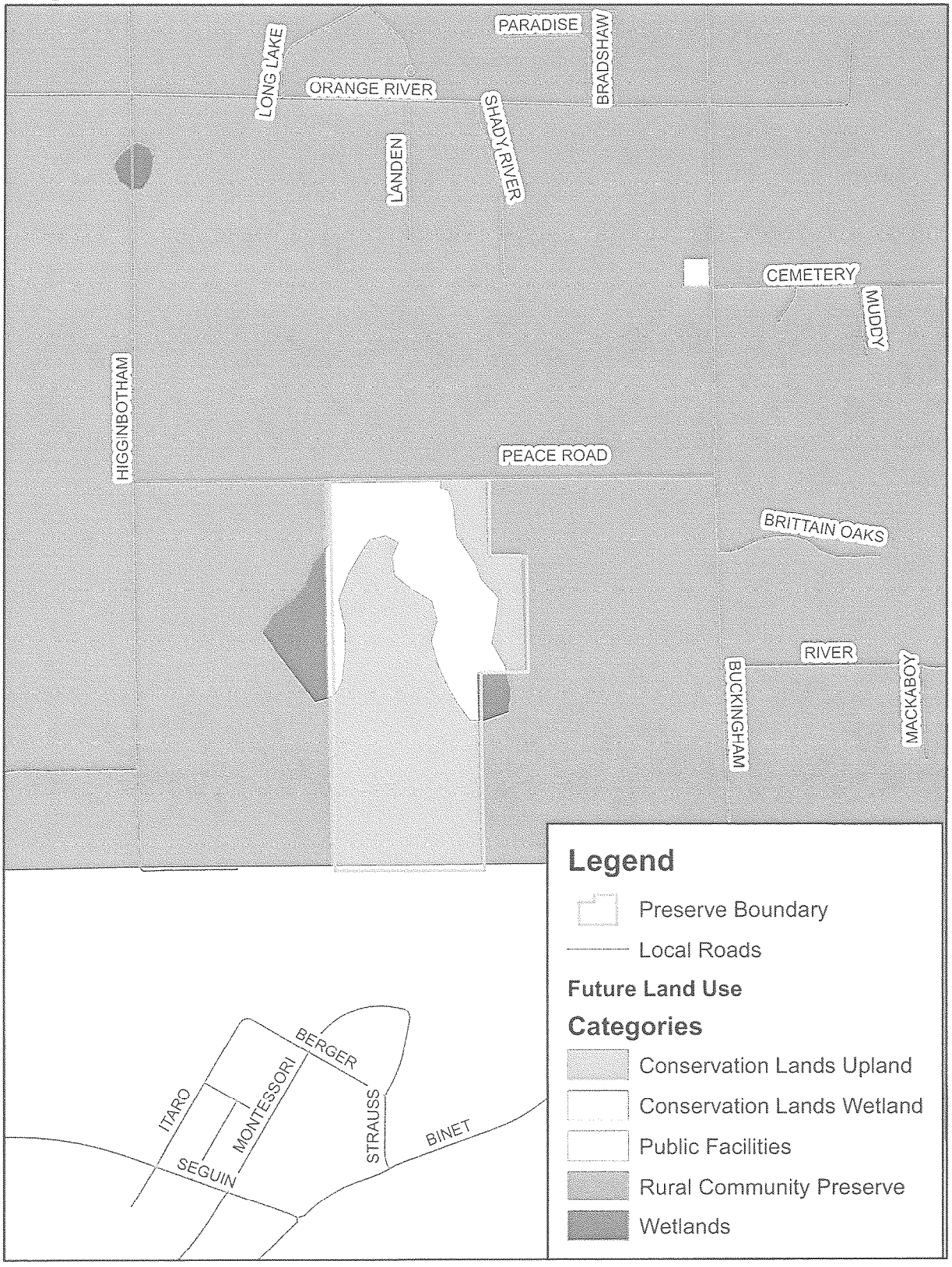


Figure 16: Future Land Use Map



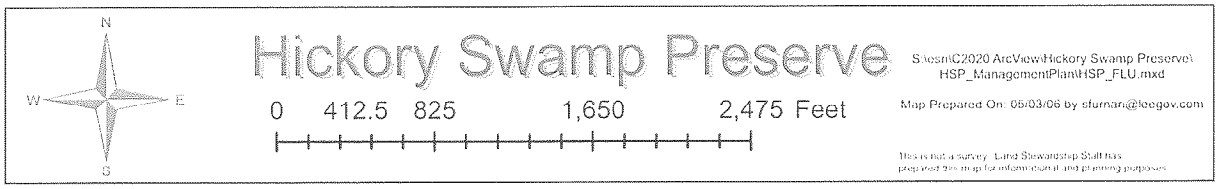


Figure 17: Zoning Map

VI. MANAGEMENT ACTION PLAN

A. Management Unit Descriptions

Hickory Swamp Preserve has been divided into five (5) management units (MU) to better organize and achieve management goals. Figure 18 delineates the units that were created primarily based on existing trails.

- Management Unit 1 – 14.5 acres

  Management Unit 1 is located on the northwest corner of the Preserve. In addition to the Preserve boundary, this unit is delineated by an existing well established trail and pasture. This unit consists of both hydric and mesic hammock communities. The entire unit has scattered invasive exotic plants consisting of less than 25% coverage. Stewardship activities will focus on exotic plant removal, removal of interior fencing, filling in a cow well, hurricane vegetation cleanup, large debris removal, and periodic small debris removal along Peace Road.

- Management Unit 2 – 15.7 acres

  Management Unit 2 is located on the northeast side of the Preserve. This unit is delineated by the Preserve boundary, existing trails and pasture. This unit primarily contains mesic hammock with two small open pasture areas and a narrow strip of mesic flatwoods. The entire unit has scattered invasive exotic plants consisting of less than 25% coverage. Stewardship activities will focus on exotic plant removal, removal of interior fence and remnant homestead site debris, repairing the eastern fence line, hurricane vegetation cleanup, and periodic debris removal along Peace Road. This unit will contain the public access point.

- Management Unit 3 – 11.2 acres

  Management Unit 3 is located in the north-central portion of the Preserve. The largest pasture dominates the unit and a small depression marsh is located on the southern portion of the MU. The Preserve's pasture primarily consists of bahiagrass (*Paspalum notatum*), with a few scattered native plants such as netted pawpaw (*Asimina reticulata*) and prickly pear (*Opuntia humifusa*). Because of the scattered native plants already growing in this unit, stewardship staff will wait several years to see what plants grow once the cows are removed.

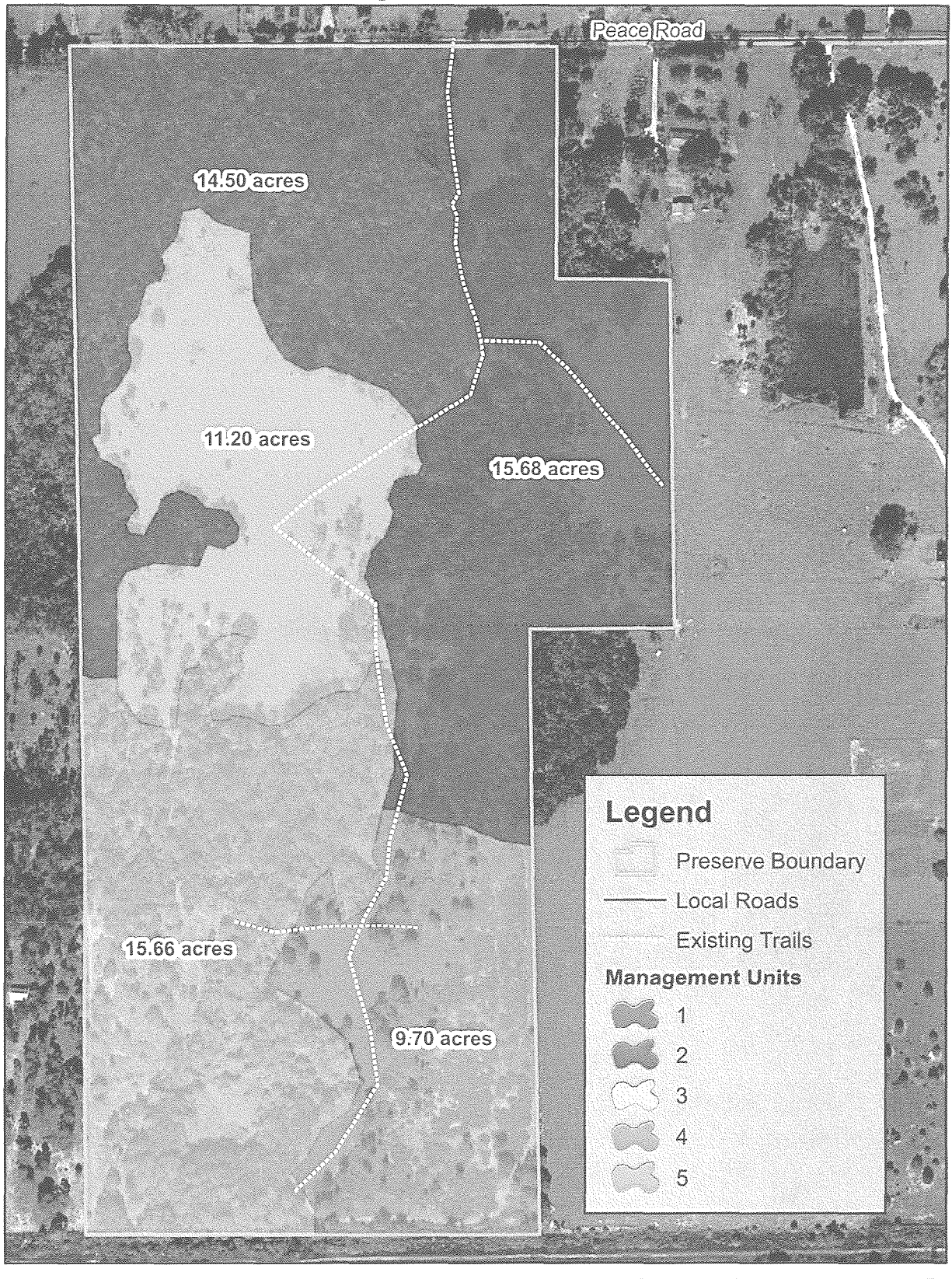
- Management Unit 4 – 9.7 acres

  Management Unit 4 is located in the southeast corner of the Preserve. This unit's other boundaries consist of the mesic hammock community in MUs 2 and 5. A small strip of pasture and mesic flatwoods community are found in this unit. With the exception of the bahia pasture, there are only scattered exotic plants. MU 4 shares the same boundaries as Burn Unit #1. Stewardship activities will focus on exotic plant removal, prescribed fire, debris clean up, and filling in a cow well.

- Management Unit 5 – 15.7 acres

  Management Unit 5 is located in the southwest portion of the Preserve. Its other boundaries are delineated by pastures or existing trails. This unit consists of mesic flatwoods, mesic hammock and a small depression marsh. Portions of Burn Units 2, 3 and 4 are all found in this MU. As with the other MUs, exotic plant coverage is less than 25%. Stewardship activities will focus on exotic plant removal, filling in a cow well, and prescribed fire.

Figure 18: Management Units Map



N
W E
S

Hickory Swamp Preserve

0 200 400 800 Feet

S:\esri\C2020 ArcView\Hickory Swamp Preserve\HSP_ManagementPlan\HSP_Managementunits.mxd

Map Prepared On: 06/13/06 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 the operations budget to meet goals in a timely manner.

Natural Resource Management

- ✓ Exotic plant control and maintenance
- ✓ Hydrologic restoration/enhancement
- ✓ Prescribed fire management
- ✓ Mechanical brush reduction
- ✓ Monitor and protect listed species
- ✓ Photo point monitoring
- ✓ Exotic and feral animal removal

Overall Protection

- ✓ Debris removal and prevention of dumping
- ✓ Replace boundary fencing
- ✓ Cap and/or utilize abandoned irrigation wells
- ✓ Boundary & Preserve sign installation
- ✓ Removal of cattle
- ✓ Change zoning category to Environmentally Critical

Public Use

- ✓ Infrastructure for Public Access
- ✓ Trail maintenance

Volunteers

- ✓ Assist volunteer groups

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

by 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 December 2001, the invasive exotic plant removal program began at HSP targeting Brazilian pepper (*Schinus terebinthifolius*), Surinam cherry (*Eugenia uniflora*), Java plum (*Syzygium cumini*), and TSA. Two subsequent exotic plant removal efforts were conducted in March (pasture) and November (other areas) of 2003. As with the initial exotic plant removal efforts and prior to each future invasive exotic plant control project at HSP, a Prescription Form (located in the LSOM) will be filled out by Land Stewardship staff, reviewed by the contractor(s) and filed appropriately. 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. To date, the total for the three contractor projects was $8,700. Land Stewardship staff has already provided intermittent follow up treatment efforts and recommends that another contractor effort be performed.

- TSA:
  Since the cattle remained on HSP after initial exotic plant removal efforts, TSA persists throughout all natural and disturbed areas of the Preserve. "TSA is native to South America, it was first detected in south Florida in 1988, and it has already invaded more than one million acres of grasslands, improved pastures and conservation areas in eleven states. A biological control project against TSA was initiated in 1997. After 3 years of intensive host-specificity testing, the South American beetle *Gratiana boliviana* (*Chrysomelidae*) was approved and a field release permit was issued by USDA-APHIS-PPQ in May 2003, and its release in Florida began in summer 2003. Up to now, approximately 45,000 beetles have been released in 20 counties in Florida (including Lee County), 2 counties in Georgia, and 2 counties in Alabama" (Medal 2006). While the "Super beetle" has already been documented at HSP, Land Stewardship staff coordinated with an USDA researcher to release additional beetles during August 2006. To prevent continued TSA infestation, the cattle lease will not be renewed in September 2006.

- Upland areas with light exotic species infestations:
  All upland areas of HSP have sporadic to light levels (below 25%) of exotic vegetation cover and hand removal will be utilized for control of these exotic species. 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 species may receive basal bark treatment, for example small clusters of Brazilian pepper or Surinam cherry. Follow-up treatments will be conducted on an

annual basis. No replanting will be needed due to significant presence of native vegetation and the native seed bank.

- Wetlands with light exotic species infestations:
  Hand crews will either hand pull, basal bark, foliar, or cut-stump treat the exotics with the appropriate herbicide during the dry season. Follow-up treatments will be conducted on an annual basis. No replanting will be needed due to significant presence of native vegetation and the native seed bank.

Hydrologic restoration/enhancement

Although there are no set plans to date, it is possible that future modifications will be made to the drainage canal that borders the southern boundary of HSP, which prevents natural sheet flow from southern lands onto HSP. The canal is part of a large area drainage system. Refer to External Influences for additional details.

LDOT maintains the culverts leading off HSP and under Peace Road. Cow wells will be filled with the adjacent spoil soils to improve the natural sheet flow of water into wetland ponds and/or assist flowing northward through tributary channels. Staff has coordinated with LCNR representatives and environmental permits are not required for back filling cow wells. Land Stewardship staff has coordinated with LCPR personnel for delivery assistance of material (15 tons of rip rap) for one of the cow wells in an area adjacent to a tributary channel. Material is needed to stabilize the bank where back filling of soil will occur.

Prescribed fire management

In March 2003, the first prescribed fire was conducted in MU 4 by Land Stewarship staff. A second prescribed fire followed in MU 5 during February 2006. The C20/20 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 other fire dependent communities, prescribed fire 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 FDOF and FWC to finalize the County-wide Fire Management Plan that will apply to all Land Stewardship Preserves.

Mechanical brush reduction

There are several large oak trees, a few slash pines and other vegetation that have toppled over or are damaged/dying from the past two years of tropical systems passing over southwest Florida. Most of the damage is along the

northern open edges of the Preserve. Several options exist to clean up areas containing heavy fuel loads such as mulching material in place or removing material from fence line and pile burning or allowing to decay. A perimeter fire break should be installed around most areas of HSP, except in sensitive wetland or hydric locations.

Monitor and protect listed species

As discussed in the Designated Species section, there are several listed species that have been documented on the Preserve including gopher tortoises and redmargin zephyrlilies. These species will benefit from restoration activities, such as the removal of cattle, follow up exotic plant control efforts, and ongoing prescribed fire activities. During stewardship activities, efforts will be made to minimize any negative impacts to listed species.

HSP 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 LSOM. 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.

Photo point monitoring

One photo point monitoring station was established in 2003, prior to the first prescribed fire in MU 4 in the pine flatwoods on the southeast corner of the Preserve. The purpose of this photo point was to provide an illustration of the effects of prescribed fire for education programs. A pre-burn photo was taken, followed by 5 post burn photos throughout the first year following the prescribed fire. Subsequent prescribed fires in MU 4 will follow the same photo point protocol until it is determined to be no longer necessary.

Exotic and feral animal removal

The exotic animal species Land Stewardship staff is primarily concerned with is the feral hog. Currently, the only acceptable method of hog removal on C20/20 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 in 2002 for one-month during which ten hogs were removed. Continued hog removal is needed.

The second exotic animal group of concern is invasive snails. Staff will hand collect and destroy any exotic snails found on site inspections or staff work days. Staff will investigate the feasibility to control other exotic species listed in Table 3. If practical, a methodology will be established and implemented.

Although not noted at HSP, this Preserve, like other C20/20 preserves, does not contain nor will support feral cat colonies. C20/20 preserves will follow FWC's Feral and Free Ranging Cats policy which is *"To protect native wildlife from predation, disease, and other impacts presented by feral and free-ranging cats"* (FWC 2003). Any feral cats will be trapped and taken to Lee County Animal Control.

Overall Protection

Debris removal and prevent dumping

Debris removal will be an ongoing effort at HSP. 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. All management units contain debris that will need to be removed with the help of several staff members (refer to Figure 13).

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.

Replace boundary fencing

Several portions of fencing along the perimeter boundary need to be replaced. Some fencing was damaged from falling trees or limbs during the hurricane winds, while other sections of fencing are in poor condition due to age.

Cap and/or utilize abandoned irrigation wells

In August 2006, LCNR staff evaluated the four abandoned irrigation wells' water depths, pipe diameters, and provided C20/20 staff with a report (Appendix D). Three of the wells are located in the Water Table Aquifer, while the fourth well was constructed to the Sandstone Aquifer, wherein they recommend be "plugged and abandoned" by a licensed contractor. LCNR will be able to utilize one of the wells for the county's hydrological monitoring program, while C20/20 staff will be able to retrofit the remaining two wells for prescribed fire protection.

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 sign will be installed at the Peace Road access gate that will inform the public of the Preserve's name,

acquisition information, public use category, LCPR website address and contact information.

Removal of cattle

An active cattle lease remains on the entire Preserve. Land Stewardship staff recommends that the lease not be renewed in September 2006. A notice of termination will be sent to the cattleman during the summer of 2006. Refer to the Internal Influences and Legal Obligations and Constraints sections for additional details. After the cattle have been removed, a chain and lock will be installed on adjacent neighboring gates.

Change zoning category

Staff will coordinate with LCDP staff to discuss the rezoning of HSP. The zoning will be changed to "Environmentally Critical" from "Agriculture."

Public Use

Infrastructure for Public Access

Amenities discussed in the recreation section of this plan, include a small trail head area off Peace Road, two primitive hiking trails, and trail markers created from removed interior cattle fence posts. A permanent sign will contain an illustration of the trail system, their lengths and instructions on how to download a trail map for future use. Trail maintenance will be coordinated as needed.

Volunteers

Assist volunteer groups

The LSOM identifies the Land Stewardship Volunteer Program's mission statement as:

> *To aid in the management and preservation of Lee County resource-based public parks and preserves and to provide volunteers with rewarding experiences in nature.*

If there is interest from the community to form a volunteer group, staff will work with them to assist with the many diverse stewardship activities that will be associated with this Preserve, such as trail maintenance, wildlife monitoring, bird box maintenance, and other land stewardship projects.

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 (Sept 2006 – Sept 2011)

Management Activity	Sept-06	Dec-06	Mar-07	Jun-07	Sept-07	Dec-07	Mar-08	Jun-08	Sept-08	Dec-08	Mar-09	Jun-09	Sept-09	Dec-09	Mar-10	Jun-10	Sept-10	Dec-10	Mar-11	Jun-11	Sept-11	2011 or later
Natural Resource Management																						
Fire																						
Mechanical brush reduction											1,2											
Install additional fire breaks			X								X											
Perform prescribed fire			3,4,5									3			4,5							
Hydrologic Components																						
Fill in cow wells						X																
Maintenance (On-going/Annual)																						
Release exotic plant bio-control agent	X																					
Follow up exotic plant control		X				X				X				X				X				X
Exotic animal removal &/or monitor	snail	→	→	→	→	→	hog	hog / snail	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Fire break mow/disk			X				X				X				X				X			
Remove bird boxes (until volunteer found)		X																				
Photo point monitoring			4		4		4								4		4		4			
Overall Protection																						
Install Preserve's identification sign				X																		
Debris removal									X													
Replace damaged fencing											X											
Cap &/or utilize abandoned wells		X						Cap #2														
End cattle lease & lock 2 adjacent gates	X																					
Change Zoning category					X																	
Public Use																						
Create trailhead, trails, trail markers									X													
Install sign with trail information										X												
Modify entrance area for primitive parking										X												
Trail maintenance															X				X			
Volunteers																						
Assist volunteer group											X											

Numbers correspond to Management Units and details on each management activity are found in the Management Action Plan.
→ = project continues

Timetable 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 perpetual management fund established for all Conservation 20/20 preserves. Monies from this fund primarily serve to meet the operational needs of the Management section of the C20/20 Program, but a certain amount of this fund will be set aside for planned restoration projects. There is currently no outside funding available for this preserve. Compared to other C20/20 preserves, projected costs for HSP are relatively minor. Land Stewardship staff believes that the C20/20 management fund should be able to cover these costs, although possible funding for these projects may be requested through appropriate mitigation opportunities. Projected costs and funding sources are listed in Appendix F.

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X. APPENDICES

Appendix A: 2004 Tropical Systems Map

Appendix B: Plant Sightings

Appendix C: Wildlife Sightings

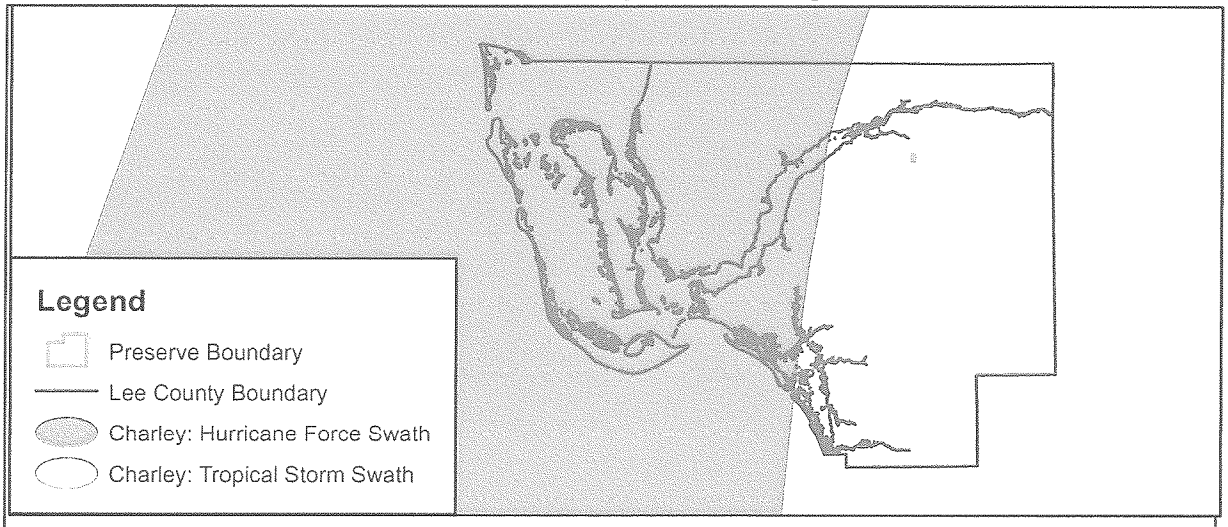
Appendix D: LCNR Inspection Report for Wells

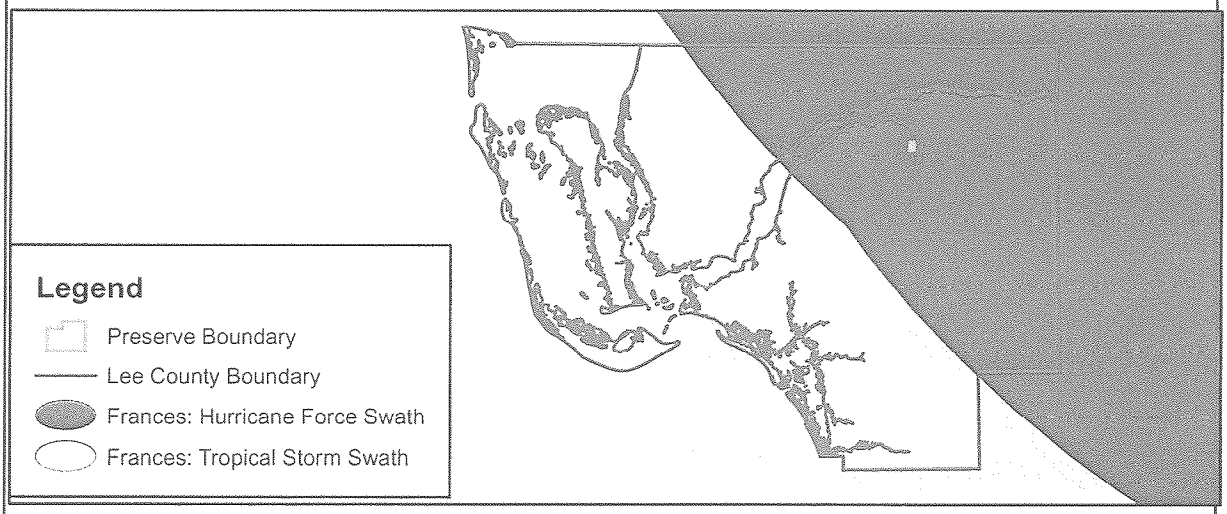
Appendix E: License for Cattle Grazing

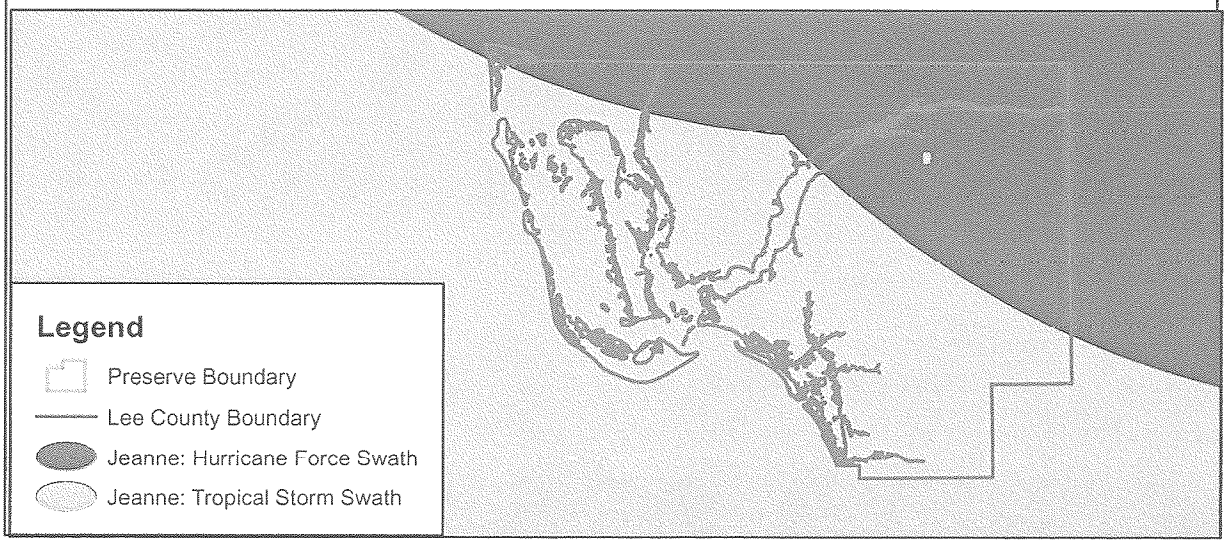
Appendix F: Projected Costs and Funding Sources

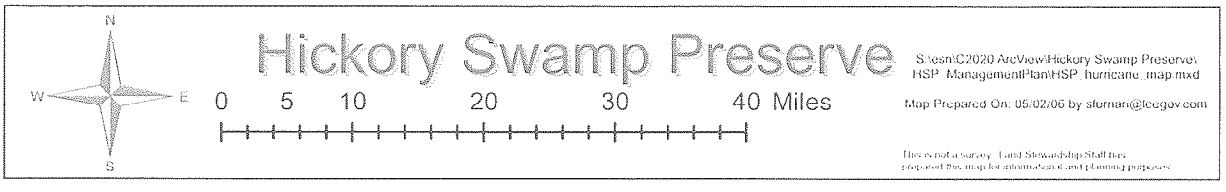
Appendix A: 2004 Tropical Systems Map

Appendix A: 2004 Tropical Systems









Appendix B: Plant Sightings

Appendix B: Plant Sightings at Hickory Swamp Preserve

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

Scientific Name	Common Name	Native Status	FLEPPC
Family: Polypodiaceae (polypody)			
Phlebodium aureum	golden polypody	native	
Pleopeltis polypodioides	resurrection fern	native	
Family: Thelypteridaceae (marsh fern)			
Thelypteris dentata	downy maiden fern	exotic	
Thelypteris kunthii	southern shield fern	native	
Family: Vittariaceae (shoestring fern)			
Vittaria lineata	shoestring fern	native	
Family: Cupressaceae (cedar)			
Juniperus virginiana	red cedar	native	
Taxodium distichum	bald cypress	native	
Family: Pinaceae (pine)			
Pinus elliottii var. *densa*	south Florida slash pine	native	
Family: Agavaceae (agave)			
Yucca filamentosa	Adam's needle	native	
Family: Alismataceae (water plantain)			
Sagittaria latifolia	duck potato	native	
Family: Amaryllidaceae (amaryllis)			
Zephyranthes simpsonii	redmargin zephyrlily	native	
Family: Arecaceae (palm)			
Phoenix reclinata	Senegal date palm	exotic	II
Sabal palmetto	cabbage palm	native	
Serenoa repens	saw palmetto	native	
Family: Bromeliaceae (pineapple)			
Tillandsia balbisiana	northern needleleaf	native	
Tillandsia fasciculata	cardinal airplant	native	
Tillandsia setacea	southern nettleleaf	native	
Tillandsia usneoides	Spanish moss	native	
Tillandsia utriculata	giant airplant	native	
Family: Commelinaceae (spiderwort)			
Commelina diffusa var. *diffusa*	common dayflower	exotic	
Commelina erecta	whitemouth dayflower	native	
Family: Cyperaceae (sedge)			
Cyperus haspan	haspan flatsedge	native	
Cyperus retrorsus	pinebarren flatsedge	native	
Cyperus surinamensis	tropical flatsedge	native	
Rhynchospora colorata	starrush whitetop	native	
Family: Dioscoraceae (yam)			
Dioscorea bulbifera	air-potato	exotic	I
Family: Hypoxidaceae (yellow stargrass)			
Hypoxis wrightii	bristleseed yellow stargrass	native	
Family: Iridaceae (iris)			
Iris hexagona	prairie iris	native	
Family: Marantaceae (arrowroot)			
Thalia geniculata	alligatorflag	native	

Appendix B: Plant Sightings at Hickory Swamp Preserve (continued)

Scientific Name	Common Name	Native Status	FLEPPC
Family: Orchidaceae (orchid)			
Encyclia tampensis	Florida butterfly orchid	native	
Habenaria floribunda	toothpetal false reinorchid	native	
Oeceoclades maculata	monk orchid	exotic	
Family: Poaceae (grass)			
Axonopus furcatus	big carpetgrass	native	
Cenchrus echinatus	southern sandbur	native	
Cenchrus spinifex	coastal sandbur	native	
Dactyloctenium aegyptium	durban crowfootgrass	exotic	
Eustachys petraea	pinewoods fingergrass	native	
Oplismenus hirtellus	woodsgrass	native	
Panicum maximum	Guinea grass	exotic	II
Panicum repens	torpedograss	exotic	I
Paspalum notatum	bahiagrass	exotic	
Schizachyrium scoparium	little bluestem	native	
Setaria parviflora	knotroot foxtail	native	
Sporobolus indicus	smutgrass	exotic	
Family: Smilacaceae (smilax)			
Smilax auriculata	earleaf greenbrier	native	
Smilax bona-nox	saw greenbrier	native	
Family: Acanthaceae (acanthus)			
Elytraria caroliniensis var. *angustifolia*	Carolina scalystem	native	
Ruellia caroliniensis	Carolina wild petunia	native	
Thunbergia fragrans	whitelady	exotic	
Family: Adoxaceae (moschatel)			
Viburnum obovatum	Walter's viburnum	native	
Sambucus nigra	elderberry	native	
Family: Amaranthaceae (amaranth)			
Achyranthes aspera	devil's horsewhip	exotic	
Gompherna serrata	Arrasa con todo	exotic	
Family: Anacardiaceae (cashew)			
Rhus copallinum	winged sumac	native	
Schinus terebinthifolius	Brazilian pepper	exotic	I
Toxicodendron radicans	eastern poison ivy	native	
Family: Annonaceae (custard-apple)			
Asimina reticulata	netted pawpaw	native	
Family: Apiaceae (carrot)			
Eryngium prostratum	creeping eryngo	native	
Family: Apocynaceae (dogbane)			
Asclepias curassavica	scarlet milkweed	exotic	
Family: Araliaceae (ginseng)			
Centella asiatica	spadeleaf	native	
Family: Asteraceae (aster)			
Ageratum houstonianum	bluemink	exotic	
Ambrosia artemisiifolia	common ragweed	native	
Baccharis halimifolia	groundsel tree	native	
Bidens alba	beggerticks	native	
Carphephorus corymbosus	Florida paintbrush	native	

Appendix B: Plant Sightings at Hickory Swamp Preserve (continued)

Scientific Name	Common Name	Native Status	FLEPPC
***Family: Asteraceae (aster)* (continued)**			
Conoclinium coelestinum	blue mistflower	native	
Conyza canadensis var. *pusilla*	dwarf Canadian horseweed	native	
Elephantopus elatus	tall elephantsfoot	native	
Emilia fosbergii	Florida tasselflower	exotic	
Emilia sonchifolia	lilac tassleflower	exotic	
Eupatorium capillifolium	dogfennel	native	
Eupatorium leptophyllum	falsefennel	native	
Erechtites hieraciifolius	fireweed	native	
Hieracium megacephalon	coastalplain hawkweek	native	
Mikania scandens	climbing hempvine	native	
Pterocaulon pycnostachyum	blackroot	native	
Solidago odora var. *chapmanii*	Chapman's goldenrod	native	
Sphagneticola trilobata	creeping oxeye	exotic	II
Family: Bignoniaceae (trumpet creeper)			
Campsis radicans	trumpet creeper	native	
Family: Brassicaceae (mustard)			
Cardamine pensylvanica	Pennsylvania bittercress	native	
Lepidium virginicum	Virginia pepperweed	native	
Family: Cactaceae (cactus)			
Opuntia humifusa	pricklypear	native	
Family: Campanulaceae (bellflower)			
Campanula floridana	Florida bellflower	native	
Lobelia feayana	bay lobelia	native	
Family: Caryophyllaceae (pink)			
Drymaria cordata	drymary	native	
Family: Celtidaceae (hackberry)			
Celtis laevigata	hackberry	native	
Family: Cistaceae (rockrose)			
Helianthemum corymbosum	pinebarren frostweed	native	
Family: Clusiaceae (mangosteen)			
Hypericum gentianoides	pineweeds	native	
Hypericum hypericoides	St. Andrew's-cross	native	
Hypericum tetrapetalum	fourpetal St. John's-wort	native	
Family: Convolvulaceae (morning-glory)			
Dichondra carolinensis	Carolina ponysfoot	native	
Ipomoea imperati	beach morning-glory	native	
Ipomoea pandurata	man-of-the-earth	native	
Ipomoea sagittata	saltmarsh morning-glory	native	
Family: Crassulaceae (orpine)			
Kalanchoe pinnata	life plant	exotic	II
Family: Cucurbitaceae (gourd)			
Melothria pendula	creeping cucumber	native	
Momordica charantia	balsampear	exotic	
Family: Euphorbiaceae (spurge)			
Bischofia javanica	bishopwood	exotic	I

Appendix B: Plant Sightings at Hickory Swamp Preserve (continued)

Scientific Name	Common Name	Native Status	FLEPPC
Family: Fabaceae (pea)			
Abrus precatorius	rosary pea	exotic	I
Chamaecrista fasciculata	partridge pea	native	
Chamaecrista nictitans	sensitive pea	native	
Crotalaria pallida	smooth rattlebox	exotic	
Crotalaria rotundifolia	rabbitbells	native	
Desmodium incanum	zarzabaacoa comun	exotic	
Erythrina herbacea	coralbean	native	
Galactia elliottii	Elliott's milkpea	native	
Indigofera hirsuta	hairy indigo	exotic	
Senna ligustrina	privet wild sensitive plant	native	
Senna occidentalis	septicweed	exotic	
Senna pendula	climbing cassia	exotic	I
Family: Fagaceae (beech)			
Quercus laurifolia	laurel oak	native	
Quercus virginiana	Virginia live oak	native	
Family: Juglandaceae (walnut)			
Carya aquatica	water hickory	native	
Family: Lamiaceae (mint)			
Callicarpa americana	American beautyberry	native	
Hyptis alata	musky mint	native	
Family: Lauraceae (laurel)			
Persea palustris	swamp bay	native	
Family: Loganiaceae (logania)			
Mitreola petiolata	lax hornpod	native	
Family: Lythraceae (loosestrife)			
Lythrum alatum	winged loosestrife	native	
Family: Magnoliaceae (magnolia)			
Magnolia grandiflora	southern magnolia	native	
Family: Malvaceae (mallow)			
Melochia corchorifolia	chocolateweed	exotic	
Melochia spicata	bretonica peluda	native	
Sida abutifolia	spreading fanpetals	native	
Sida acuta	common wireweed	native	
Urena lobata	caesarweed	exotic	II
Family: Meliaceae (mahogany)			
Melia azedarach	Chinaberrytree	exotic	II
Family: Moraceae (mulberry)			
Morus rubra	red mulberry	native	
Family: Myricaceae (bayberry)			
Myrica cerifera	wax myrtle	native	
Family: Myrsinaceae (myrsine)			
Rapanea punctata	myrsine	native	
Family: Myrtaceae (myrtle)			
Eugenia uniflora	Surinam cherry	exotic	I
Syzygium cumini	Java plum	exotic	I

Appendix B: Plant Sightings at Hickory Swamp Preserve (continued)

Scientific Name	Common Name	Native Status	FLEPPC
Family: Oleaceae (olive)			
Forestiera segregata	Florida swampprivet	native	
Fraxinus caroliniana	pop ash	native	
Family: Onagraceae (eveningprimrose)			
Ludwigia maritima	seaside primrosewillow	native	
Ludwigia peruviana	Peruvian primrosewillow	exotic	
Family: Oxalidaceae (woodsorrel)			
Oxalis corniculata	common yellow woodsorrel	native	
Family: Phytolaccaceae (pokeweed)			
Phytolacca americana	American pokeweed	native	
Family: Polygalaceae (milkwort)			
Polygala grandiflora	showy milkwort	native	
Family: Polygonaceae (buckwheat)			
Polygonella polygama	October flower	native	
Polygonum hydropiperoides	swamp smartweed	native	
Family: Portulacaceae (purslane)			
Portulaca amilis	Paraguayan purslane	exotic	
Portulaca pilosa	pink purslane	native	
Family: Ranunculaceae (buttercup)			
Clematis reticulata	netleaf leather-flower	native	
Family: Rosaceae (rose)			
Rubus spp.	blackberry	native	
Family: Rubiaceae (madder)			
Cephalanthus occidentalis	common buttonbush	native	
Diodia virginiana	Virginia buttonweed	native	
Hamelia patens	firebush	native	
Psychotria nervosa	wild coffee	native	
Psychotria sulzneri	shortleaf wild coffee	native	
Richardia brasiliensis	tropical Mexican clover	exotic	
Spermacoce assurgens	woodland false buttonweed	native	
Spermacoce prostrata	prostrate false buttonweed	native	
Family: Rutaceae (citrus)			
Citrus spp .	citrus	exotic	
Family: Salicaceae (willow)			
Salix caroliniana	coastalplain willow	native	
Family: Sapindaceae (soapberry)			
Acer rubrum	red maple	native	
Family: Sapotaceae (sapodilla)			
Sideroxylon reclinatum subsp. reclinatum	Florida bully	native	
Family: Solanaceae (nightshade)			
Solanum americanum	American black nightshade	native	
Solanum diphyllum	twoleaf nightshade	exotic	II
Solanum torvum	turkeyberry	exotic	II
Solanum viarum	tropical soda apple	exotic	I
Family: Tetrachondraceae (tetrachondra)			
Polypremum procumbens	rustweed	native	
Family: Urticaceae (nettle)			
Boehumeria cylindrica	false nettle	native	

Appendix B: Plant Sightings at Hickory Swamp Preserve (continued)

Scientific Name	Common Name	Native Status	FLEPPC
Family: Verbenaceae (vervain)			
Phyla nodiflora	turkey tangle fogfruit	native	
Family: Veronicaceae (speedwell)			
Bacopa caroliniana	lemon bacopa	native	
Bacopa monnieri	herb-of-grace	native	
Gratiola hispida	rough hedgehyssop	native	
Lindernia grandiflora	Savannah false pimpernel	native	
Scoparia dulcis	licoriceweed	native	
Family: Vitaceae (grape)			
Ampelopsis cordata	heartleaf peppervine	native	
Parthenocissus quinquefolia	Virginia creeper	native	
Vitis cinerea var. *floridana*	Florida grape	native	
Vitis rotundifolia	muscadine	native	

Florida EPPC Status (Exotic Pest Plant Council)
I = species that are invading and disrupting native plant communities
II = species that have shown a potential to disrupt native plant communities

Appendix C: Wildlife Sightings

Appendix C: Wildlife Sightings at Hickory Swamp Preserve

Scientific Name	Common Name	Designated Status	
		FWC	FWS
BIRDS			
Family: Ardeidae (herons, egrets, bitterns)			
Ardea alba	great egret		
Ardea herodius	great blue heron		
Family: Threskiornithidae (ibises and spoonbills)			
Eudocimus albus	white ibis	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		
Haliaeetus leucocephalus	bald eagle	T	T
Subfamily: Buteoninae (buteos)			
Buteo jamaicensis	red-tailed hawk		
Buteo lineatus	red-shouldered hawk		
Family: Falconidae (falcons)			
Falco sparverius	American kestrel		
Family: Charadriidae (plovers)			
Charadrius vociferus	killdeer		
Family: Columbidae (pigeons and doves)			
Zenaida macroura	mourning dove		
Families: Strigidae and Tytonidae (true and barn owls)			
Strix varia	barred owl		
Family: Picidae (woodpeckers)			
Dryocopus pileatus	pileated woodpecker		
Melanerpes carolinus	red-bellied woodpecker		
Picoides pubescens	downy woodpecker		
Family: Tyrannidae (tryant flycatchers)			
Myiarchus crinitus	great crested flycatcher		
Sayornis phoebe	eastern phoebe		
Family: Hirundinidae (swallows)			
Hirundo rustica	barn swallow		
Tachycineta bicolor	tree swallow		
Family: Vireonidae (vireos)			
Vireo solitarius	blue-headed vireo		
Family: Corvidae (crows, jays, etc.)			
Cyanocitta cristata	blue jay		
Family: Troglodytiae (wrens)			
Thryothorus ludovicianus	Carolina wren		
Troglodytes aedon	house wren		
Family: Sylviidae			
Subfamily: Polioptilinae (gnatcatchers)			
Poloiptila caerulea	blue-gray gnatcatcher		
Family: Turdidae (thrushes)			
Turdus migratorius	American robin		

Appendix C: Wildlife Sightings at Hickory Swamp 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: Parulidae (wood-warblers)			
Dendroica coronata	yellow-rumped warbler		
Dendroica magnolia	magnolia warbler		
Dendroica palmarum	palm warbler		
Dendroica pinus	pine warbler		
Geothlypis trichas	common yellowthroat		
Mniotilta varia	black-and-white warbler		
Parula americana	northern parula		
Setophaga ruticilla	American redstart		
Vermivora peregrina	Tennessee warbler		
Wilsonia citrina	hooded warbler		
Families: Fringillidae, Emberizidae, Cardinalidae (grosbeaks, finches, sparrows, buntings)			
Cardinalis cardinalis	northern cardinal		
Family: Icteridae (blackbirds, orioles, etc.)			
Icterus galbula	Baltimore oriole		
Quiscalus quiscula	common grackle		
Family: Passeridae (old world sparrows)			
Passer domesticus	house sparrow		
AMPHIBIANS			
Family: Leptodactylidae (tropical frogs)			
Eleutherodactylus planirostris planirostris	greenhouse frog *		
Family: Hylidae (treefrogs)			
Hyla cinerea	green treefrog		
Hyla squirella	squirrel treefrog		
Osteopilus septentrionalis	Cuban treefrog *		
REPTILES			
Family: Emydidae (box and water turtles)			
Terrapene carolina bauri	Florida box turtle		
Family: Testudinidae (gopher tortoises)			
Gopherus polyphemus	gopher tortoise	SSC	
Family: Polychrotidae (anoles)			
Anolis carolinensis	green anole		
Anolis sagrei	brown anole *		
Family: Teiidae (racerunners)			
Cnemidophorus sexlineatus	six-lined racerunner		
Family: Colubridae (colubrids)			
Coluber constrictor priapus	southern black racer		
Diadophis punctatus punctatas	southern ringneck snake		
Storeria victa	Florida brown snake		

Appendix C: Wildlife Sightings at Hickory Swamp Preserve (continued)

Scientific Name	Common Name	Designated Status FWC	FWS
REPTILES (continued)			
Family: Colubridae (colubrids)			
Thamnophis sauritus sauritus	peninsula ribbon snake		
Thamnophis sirtalis siralis	eastern garter snake		
Family: Elapidae (coral)			
Micrurus fulvius fulvius	eastern coral snake		
MAMMALS			
Family: Canidae (wolves, foxes, and coyote)			
Canis latrans	coyote *		
Urocyon cinereoargenteus	common gray fox		
Family: Dasypodidae (armadillos)			
Dasypus novemcinctus	nine-banded armadillo *		
Family: Didelphidae (opossums)			
Didelphis virginiana	Virginia opossum		
Family: Procyonidae (raccoons)			
Procyon lotor	northern raccoon		
Family: Suidae (pigs and worthogs)			
Sus scrofa	feral hog *		
Family: Sciuridae (squirrels)			
Sciurus carolinensis	eastern gray squirrel		
BUTTERFLIES			
Family: Nymphalidae (brush-footed)			
Subfamily: Nymphalinae (true brush-foots)			
Anartia jatrophae	white peacock		
Subfamily: Heliconiinae (longwings and fritillaries)			
Heliconius charitonius tuckeri	zebra longwing		
Family: Hesperiidae (skippers)			
Subfamily: Pyrginae (spread-wing skippers)			
Pyrgus oileus	tropical checkered-skipper		
INSECTS AND SPIDERS			
Family: Araneidae (orb weavers)			
Gasteracantha elipsoides	crablike spiny orb weaver		
Family: Chrysomelidae (beetle)			
Gratiana bolivian	super beetle *		
SNAILS			
Family: Ampullariidae (aka: Pillidae)			
Marisa cornuarietis	giant ram's horn snail *		
Pomaceae canaliculata	channeled apple snail *		
Family: Polygyridae (land snails)			
Polygyra septemvolva	Florida flatcoil		

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 D: LCNR Inspection Report for Wells

Inspection of Hickory Swamp Preserve
Conservation 2020 Property located on Peace Rd.
Buckingham

On August 17, 2006 Brian Fagan and I visited the preserve and were able to locate and measure all four known wells on this project. The following are the results of our investigation: Well #1 is a 4 inch diameter well which has a total depth of 21 feet below land surface (BLS) which locates it in the Water Table aquifer and was maintaining a water level of 5.05 feet BLS. Brian would like to maintain this well as a monitoring well for the Water Table Aquifer. It will serve as a compliment to our monitoring program.

Well #2 was a 3 inch diameter well constructed to the Sandstone Aquifer upon arriving to this wells location is was noted that the well was flowing approximately a ½ gallon per minute. Our measuring tape was only able to descend to approximately 45 feet BLS. It is our recommendation that this well be at a minimum jetted out to its total depth which could exceed 70 feet then properly plugged and abandoned by a licensed water well contractor.

Well #3 was then located and measured to be 3 inch diameter well with a 9.6 feet total depth which locates it in the Water Table aquifer. The static water level was only 4.0 feet BLS. This well could have a coupling installed and be fitted so that it may be utilized as a fire protection well.

Finally Well number 4 is a 4 inch diameter well which has a total depth of 25.6 feet below land surface (BLS) which locates it in the Water Table aquifer and was maintaining a water level of 4.6 feet BLS. This well also could have a coupling installed and be fitted so that it may be utilized as a fire protection well.

Appendix E: License for Cattle Grazing

LICENSE FOR CATTLE GRAZING

This Agreement made this 31st day of January, 2002, by and between LEE COUNTY, a political subdivision of the State of Florida, hereinafter called the Licensor and (Mary Jo Parker), an individual, hereinafter called the Licensee:

WITNESSETH:

Licensor, in consideration of the fees paid, the covenants and agreements herein to be kept and performed by the Licensee, does hereby grant to the Licensee a license solely for the grazing of cattle on licensor's lands as described as follows, to wit: SEE EXHIBIT "A" ATTACHED HERETO AND MADE A PART HEREOF.

In further consideration of this Agreement, the parties agree as follows:

1. Licensee agrees to pay Licensor the total sum of (Sixty-Six) Dollars ($66.00) per year for the term of this license to use the described property solely for cattle grazing.
2. This License is not assignable to any other party.
3. This License shall extend for an initial term of one (1) year, which at the expiration of such term may be renewable upon the concurrence of both parties, and/or may be revocable by the Licensor by giving the Licensee thirty (30) days written notice to remove the cattle from the premises.
4. Licensee will not use the described lands for any other purpose other than cattle grazing.
5. Licensee will maintain the existing four (4)-strand barbed wire fence around the perimeter of the property during the term of this license. The fence shall remain the property of the Licensor.
6. Licensee agrees to keep the fence in an excellent state of repair at all times during the term of this Agreement.
7. It is mutually agreed that this Agreement may be canceled upon forty-eight (48) hours verbal notice to the Licensee if any of licensee's cattle are not kept within the confines of the property described in Exhibit "A".

8. Licensee covenants and agrees to file an annual personal property tax return with the County of Lee, State of Florida, as required by law.

9. All section corners, quarter corners, and other survey monuments lying in the premises will be properly flagged by the Licensor. Licensee agrees to bear any survey costs for the resetting of these monuments in the event they are disturbed by the Licensee in any way.

10. Licensee hereby indemnifies and releases the Licensor from any and all claims for damages to both persons and property as the result of the cattle grazing , and will hold Licensor harmless from all such damages during the term of this Agreement to include all reasonable fees, costs and expenses from any resulting litigation in any forum as the result of such damage as claimed or brought by third parties.

Signed and sealed the date above written.

ATTEST:
CHARLIE GREEN, CLERK OF COURTS

By:_____
Deputy Clerk

LICENSOR
LEE COUNTY BOARD OF
COUNTY COMMISSIONERS

By:_____
John Yarbrough, Director
Parks and Recreation

APPROVED AS TO FORM BY:

_____
Office of the County Attorney

LICENSEE

_____

_____
Witness
Printed Name:_____

_____
Witness
Printed Name:_____

STATE OF FLORIDA) ss:
COUNTY OF LEE)

The foregoing instrument was acknowledged before me this 31st day of January, 2002, by Mary Jo Parker, an individual, who [ ] is personally known to me or [ ] has produced _____ as identification and did (did not) take an oath.

_____
Notary Public

_____
(Print Name)

My Commission Expires:

EXHIBIT "A"

CONSERVATION LANDS PROGRAM, PROJECT NO. 8800

PARCEL 73

The Southeast Quarter of the Northwest Quarter and the West Half of the Northeast Quarter of the Southwest Quarter and the West Half of the East Half of the Northeast Quarter of the Southwest Quarter, all in Section 8, Township 44 South, Range 26 East, EXCEPTING THEREFROM the following described parcel:

Beginning at the Northeast corner of the Southeast Quarter of the Northwest Quarter of said Section 8, thence run South 525 feet; thence run West 232 feet; thence run North 525 feet; thence run East 232 to the Point of Beginning.

Appendix F: Projected Costs and Funding Sources

Appendix F: Projected Costs and Funding Sources Table

Resource Enhancement and Protection

Item	Possible Funding Source	Estimated Costs
Invasive exotic plant control	USDA, C20/20	$15,000
Hydrologic restoration/enhancement	LC P&R and C20/20	$500
Install fire breaks	C20/20 and DOF	$2,500
Mechanical brush reduction	mitigation	$3,500
total		$21,500

Overall Protection

Item	Possible Funding Source	Estimated Costs
Cap & utilize wells	LCNR and C20/20	$6,500
Replace damaged/old fencing	C20/20	$7,500
Debris removal		$200
Preserve & Boundary signs		$400
total		$14,600

Public Access

Item	Possible Funding Source	Estimated Costs
Wooden fence at trail head	LC P&R and C20/20	$2,000
Crushed shell at trail head		$3,500
Trail head instructional sign w/ trail map		$750
Clearing for trails		in-house
(15) Trail markers		in-house
total		$6,250

TOTAL COST ESTIMATE **$42,350**

Site Management and Maintenance

Item	Possible Funding Source	Estimated Costs
Exotic Plant Control	C20/20	$5,000
Prescribed Fire Regime	LC P&R and C20/20	in-house
Mow trails	C20/20	in-house
Feral hog trapping		$1,500
Fence Repairs		$500

Yearly Maintenance Estimate **$7,000**

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