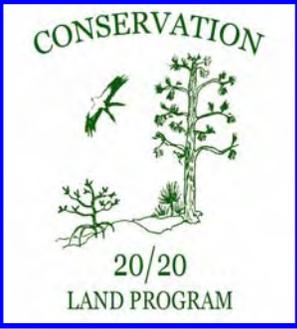
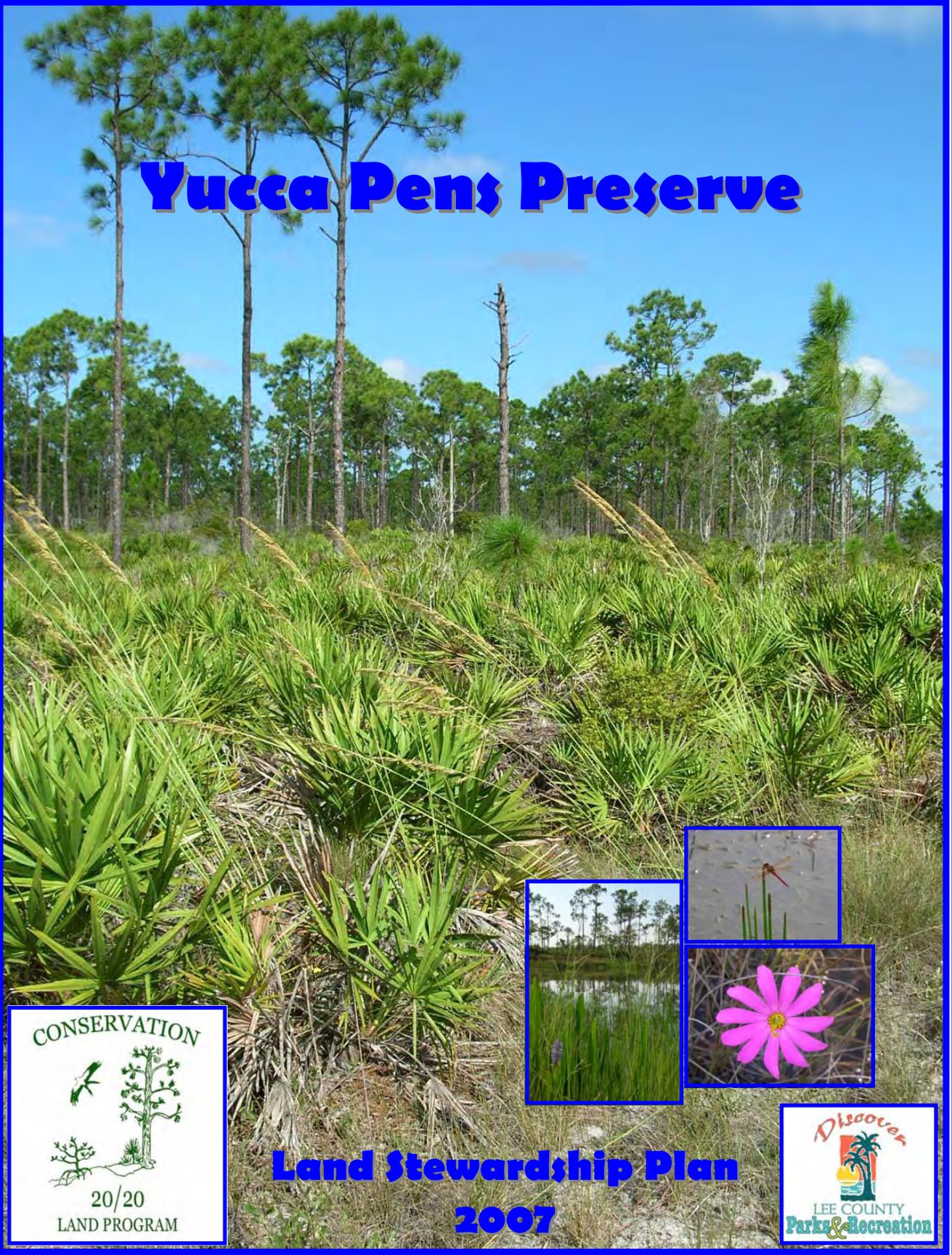


# Yucca Pens Preserve



## Land Stewardship Plan 2007



# Yucca Pens Preserve Land Stewardship Plan

4325 & 5201 Burnt Store Road N.  
16820 & 16930 James Walter Lane  
Cape Coral, FL 33993



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

Approved by the Lee County Board of County Commissioners: November 27, 2007

## **Acknowledgements**

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Peter De Witt  
Sherry Furnari

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## List of Acronyms

ATV	all-terrain vehicle
BWWMA	Fred C. Babcock – Cecil M. Webb Wildlife Management Area
C20/20	Conservation 20/20
DOC	Department of Corrections
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOF	Florida Division of Forestry
FLEPPC	Florida Exotic Pest Plant Council
FLUCFCS	Florida Land Use Cover and Forms Classification System
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
IRC	Institute for Regional Conservation
LCDCD	Lee County Department of Community Development
LCDCL	Lee County Division of County Lands
LCDP	Lee County Division of Planning
LCPR	Lee County Department of Parks and Recreation
LSOM	Land Stewardship Operations Manual
MU	management units
NWI	National Wetlands Inventory
ORV	off-road vehicle
SFWMD	South Florida Water Management District
STRAP	Section-Township-Range-Area-Block.Lot
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WMA	Wildlife Management Area
YPP	Yucca Pens Preserve
YPU	Yucca Pens Unit

## *Vision Statement*

*It is the vision of the land stewards in the Lee County Department of Parks and Recreation and the Conservation 20/20 Program to restore Yucca Pens Preserve to a productive, functional and viable ecosystem. The conservation objectives for the stewardship of this Preserve will be maintaining the upland ecosystems with prescribed fire and removing all invasive exotic plants and animals. Enhancing hydrologic features to improve wildlife habitat and preventing unauthorized off-road vehicle use and dumping will become ultimate objectives for the stewardship of this Preserve.*

## **I. EXECUTIVE SUMMARY**

Yucca Pens Preserve (YPP) is located along Burnt Store Road (County Road 765) in northwest Cape Coral, Florida, within Sections 5, 8 and 17, Township 43 South, Range 23 East. The Preserve includes five parcels, nominations 75, 102, 107, 202 and 281 which were acquired between 1999 and 2006 through the Conservation 20/20 (C20/20) Program for nearly \$1.65 million. The C20/20 Program was established in 1996 after Lee County voters approved a referendum that increased taxes by up to 0.5 mil for the purpose of purchasing and protecting environmentally sensitive lands.

The Preserve is approximately 234 acres in size and is divided between three distinct areas and has historically been used for agriculture and illegally as a site for outdoor recreation (camping, shooting/hunting and off-road activities).

The Gulf of Mexico and Caribbean Sea affect the climate of Lee County and these factors influence YPP by creating mild, sub-tropical conditions. Average annual rainfall is 52.88 inches, significantly lower than the average rainfall for the entire county during the same period (64.41 inches). The majority of the rain falls between June and September. Natural trends and disturbances influencing plant communities and stewardship at YPP include hurricanes, flooding, wildfires, occasional freezes and the cycling of wet and dry seasons.

YPP lies within a single stratigraphic unit, the Tertiary-Quaternary Sediments which was created during the Pliocene Epoch between 2 million to 10,000 years ago. The principle force in the creation of the geologic formations present in southwest Florida today has been the Ice Age, which occurred between 1.8 million and 10,000 years ago and had four distinct periods of freezing and melting. During the periods of freezing, huge sheets of ice (glaciers) covered the northern and southern latitudes creating substantial drops in sea level.

Lee County is located within the Gulf Coastal Lowlands of Florida that extend around the coastal periphery of the state where elevations are generally below 100 feet. The natural elevations at YPP range from 8-14 feet above sea-level. Natural topography has been altered by filling, ditching and draining the land for past agricultural uses and more recent residential development.

There are six different soil types found at YPP. A common relationship for all of these soil types is that their slopes range from 0-2 percent; essentially, YPP is level. The soils within the Preserve have all been identified as having severe limitations; either ponding, wetness or too sandy. Covering just over half of the Preserve (48.9% plus 6.3% with Limestone Substrate), Wabasso Sand is the most common soil type. Pineda Fine Sand is the second most common soil type covering 44.2 percent of YPP (14.9% of which is Pineda Fine Sand, Depressional). The remainder of the Preserve is made up of Felda Fine Sand, Depressional and Oldsmar Sand.

YPP is within the northwestern portion of the South Florida Water Management District's Lower West Coast Region. The Preserve lies within three watersheds; Yucca Pen Creek, Durden Creek and Greenwell Branch Watersheds.

Hydrological alterations have been made on and directly adjacent to YPP that affect the natural sheetflow across the lands. The existing ditches, abandoned agricultural furrows, off-road vehicle trails, borrow pond/pit, and adjacent roads alter the natural flow of water. The Preserve also contains a 3 acre borrow pond excavated between 1958 and 1966.

YPP contains a combination of wetland and upland communities that serve as important habitat for a variety of birds, mammals, reptiles and amphibians. YPP consists of twelve distinguishable plant communities of which eight are described by the Florida Natural Areas Inventory. The remaining four communities are highly disturbed and/or in a transitional stage between two or more plant communities as described by Florida Natural Areas Inventory. The "Mixed Mesic" community, one of the transitional stage communities, dominates one quarter of the Preserve. Mesic flatwoods and wet flatwoods are the next most common plant communities.

A variety of past land uses throughout this regional area and areas of the Preserve have altered its ecological condition. The results of logging of slash pine and cypress can be seen within the Preserve along with the impacts of agriculture and associated buildings and staging areas. Other land uses included ditching and drainage activities, staging area for hurricane debris collection and illegal recreation including hunting and the use of off-road vehicles. As such, diversity of fauna is much lower than would be expected in undisturbed communities.

There are no public recreation amenities proposed for YPP due primarily to its designation as a Category 4, Resource Protection & Restoration Preserve and its proximity to other recreation facilities such as the Charlotte Harbor Preserve State Park and Fred C. Babcock-Cecil M. Webb Wildlife Management Area.

Previous restoration activities on the Preserve included the removal of exotic plants, clean-up of trash and hazardous waste, and active enforcement of County Ordinances to cease illegal recreational activities.

The goal of this land stewardship plan is to identify Preserve resources, develop strategies to protect the resources and implement restoration activities to restore YPP to a productive, functional and viable ecosystem while ensuring that the Preserve will be managed in accordance with Lee County Parks and Recreation's Land Stewardship Operations Manual.

Restoration and management activities at YPP will focus on maintaining upland ecosystems with prescribed fire, controlling invasive exotic plant and animal

species, debris removal, and enhancing hydrologic features and wildlife habitat. A Management Action Plan outlines restoration and stewardship goals. This plan outlines these goals and strategies, explains how the goals will be accomplished, and provides a timetable for completion. This land stewardship plan will be revised in ten years (2017).

## **II. INTRODUCTION**

Yucca Pens Preserve (YPP) was acquired as five parcels between October 1999 and January 2006 through Lee County's Conservation 20/20 (C20/20) Program. It is approximately 234 acres in size and is located in northwest Lee County in Cape Coral. The five parcels are located in three separate areas with a distance of less than three miles from the most northern and southern regions. The YPP's boundaries are either directly adjacent to the Fred C. Babcock-Cecil M. Webb Wildlife Management Area (BWWMA), south of the Charlotte County Utilities – Burnt Store Public Drinking Water System (reverse osmosis plant) or private property.

The origins of the Yucca Pens name are linked to the regions' cattle industry. "The name Yucca Pens derived from the card game euchre, pronounced "you ker" and played at a gambling house at the cow pens where cattle was held and sold before being shipped to Cuba. Herds of cattle were lost-or gained-during euchre. A northern reporter wrote a story about the game but misspelled it, calling it "Yucca" (FWC 2007).

The Preserve consists of twelve plant communities; one-third of which are highly impacted from past uses. Ditches, berms, furrows, borrow and spoil areas, off-road vehicles (ORV), as well as invasive exotic plants have disturbed many portions of the wetland and upland plant communities at YPP. The dominant plant communities found on the Preserve are mixed mesic (flatwoods and hammock), mesic flatwoods and wet flatwoods.

Historic aerial photography shows evidence of several anthropogenic influences including agricultural uses and a borrow pond. More recent land uses include the dumping of trash and a staging area for hurricane debris, illegal hunting, camping, and ORV use.

Land stewardship activities for the site will include invasive exotic plant and animal control, prescribed fire in fire dependant plant communities, enhancing hydrologic features and wildlife habitat, debris removal, and boundary protection. There are no public recreation amenities proposed for this Preserve due primarily to its designation as a Category 4 Resource Protection & Restoration Preserve and having several existing state, county and city managed recreation opportunities in close proximity to YPP.

The purpose of this stewardship plan is to define conservation goals for YPP that will address the above concerns. It will serve as a guide for the Lee County Department of Parks and Recreation (LCPR) to use best management practices to ensure proper stewardship and protection of the Preserve. A significant number of field surveys were conducted along with review of scientific literature and historical records to understand how the Preserve functions in the ecosystem, which wildlife and plants are found within its boundaries and how it has been impacted by humans. 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**

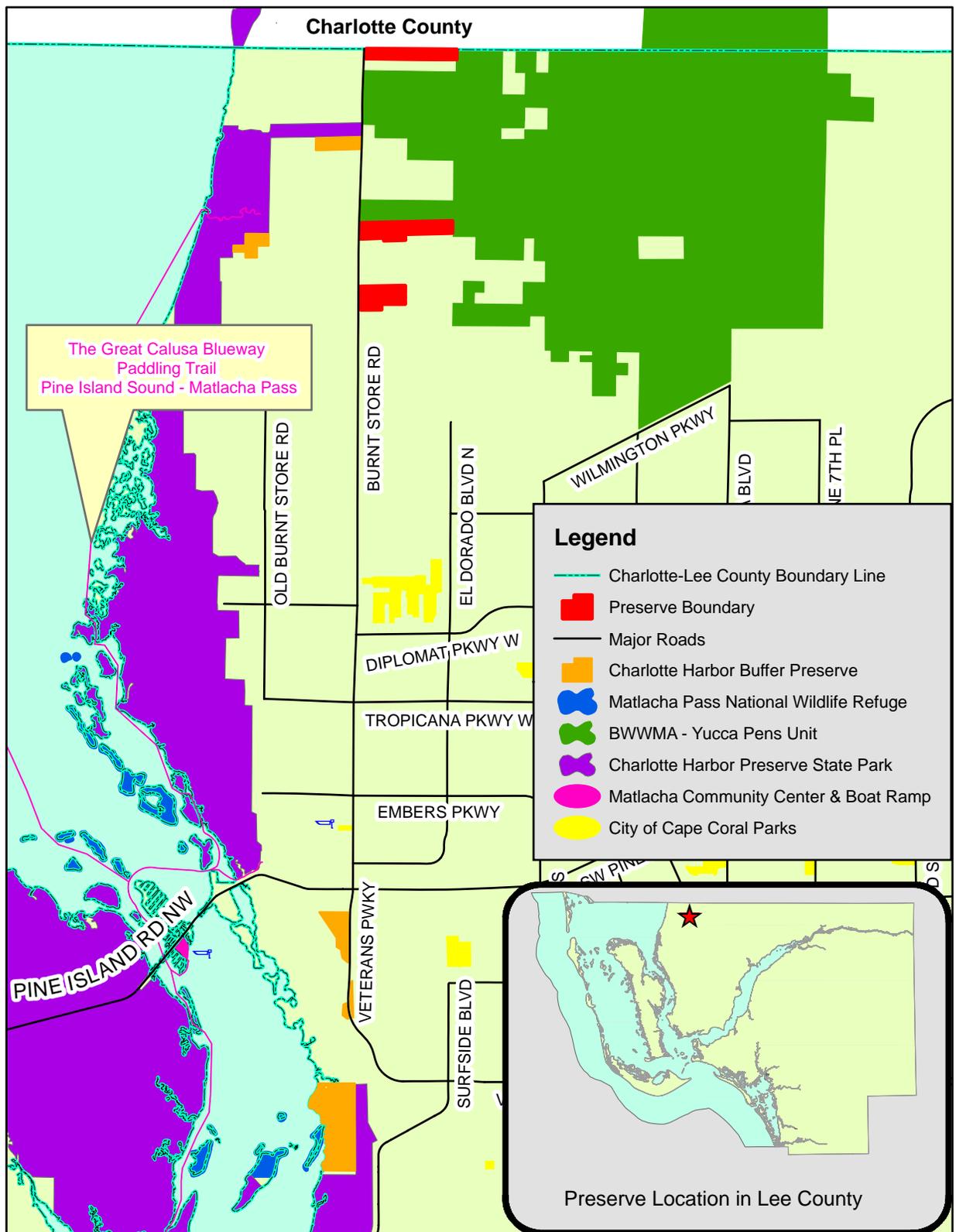
Yucca Pens Preserve is located at 4325 & 5201 Burnt Store Road and 16820 & 16930 James Walter Lane, Cape Coral, Florida in northwest Lee County within Sections 5, 8 and 17, Township 43 South, Range 23 East (Figure 1). The fifth parcel along Burnt Store Road (site #102) was not assigned an address by the Lee County Property Appraiser's office. Since 1996, Lee County Division of Public Safety (E-911 Program) will not assign an address to a parcel unless a structure will be placed on site.

The Preserve consists of three different areas separated by private and state property and are all located on the east side of Burnt Store Road (CR 765). The northern boundary is the county line between Lee and Charlotte Counties; its southern boundary is adjacent to James Walter Lane. The contiguous property to the east of the Preserve is the Yucca Pens Unit of the BWWMA managed by the Florida Fish and Wildlife Conservation Commission (FWC).

The Preserve is approximately 234 acres in size and has historically been used for agriculture and as a site for outdoor recreation (camping, shooting, hunting and off-road activities). The surrounding land is mostly undeveloped or other conservation lands; however several locations are being developed with residential housing. There are several industrial mining operations within the region.

The Preserve consists of twelve plant communities; dominant areas are mesic flatwoods, wet flatwoods and wet prairie. These community designations are based on the Florida Natural Areas Inventory (FNAI 1990). Figure 2 identifies the boundaries of YPP in a 2005 aerial photograph.

# Figure 1: Location Map



**CONSERVATION**  
20/20  
LAND PROGRAM

**Yucca Pens Preserve**

Miles  
0 0.5 1 2 3 4

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Prepared on: 09/17/07. bv sfurnari@leegov.com  
This is not a survey. Land Stewardship Staff has prepared this map for informational and planning purposes.

# Figure 2: 2005 Aerial Photographs

Site 107



Sites 102 and 202



Sites 75 and 281

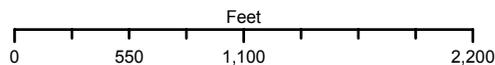


## Legend

-  County Boundary
-  Preserve Boundary
-  Major Roads



## Yucca Pens Preserve



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Prepared on: 08/24/07, by sfumari@leegov.com

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## 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. The Bermuda high-pressure cell prevents convective clouds from building into thunderstorms in the fall and winter and as the Bermuda High weakens in late spring, thunderstorms occur regularly. Superimposed on the pattern of daily showers and thunderstorms is precipitation resulting from large-scale circulation systems such as tropical storms and hurricanes. In the late fall, winter, and early spring, fronts from the northeastern United States sweep over the state. These fronts can bring significant swings in temperature and humidity, causing the weather to oscillate between maritime tropical and continental winter weather.

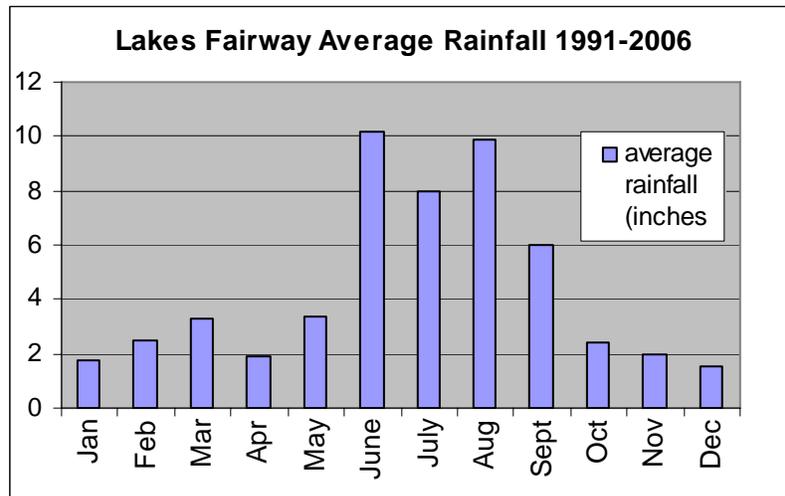
Temperate climate influences are exerted as well, with infrequent but significant freezes occurring in December and January (FCC 2005). These freezes occasionally damage the vegetation and prevent some of the more cold sensitive tropical plants from becoming established. Cold fronts regularly push cool, sometimes moist weather from the southeastern U.S. to southwest Florida during the winter. These cold fronts also encourage migratory birds to utilize the Preserve as either a stop-off point on a longer voyage, or as a winter roosting and feeding area. Table 1 shows the average high and low temperatures for Fort Myers, Florida compiled by the Southeast Regional Climate Center from 1931 to 2005.

**Table 1: Average High/Low Temperatures for Ft. Myers, FL (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 graph depicts the rainfall data collected by Lee County Division of Natural Resources on a daily basis from the Lakes Fairway rain gauge, located at the Lakes Fairway maintenance building on US 41 North, approximately 6.5 miles east of the Preserve. Average annual rainfall over the last sixteen years was 52.88 inches, significantly lower than the average rainfall for the entire county during the same period (64.41 inches). Low rainfall in the winter can lead

to drought in the spring, which consequently can influence plant growth and survival from one growing season to the next.



Occasionally, major hurricanes pass through southwest Florida impacting natural ecosystems and man-made infrastructure. Although these effects are believed by many to be short-term, long-term consequences may result in plant canopy restructuring, invasive plant introduction and/or further dispersal, and increased wildfire severity to communities from increased fuel loads (dead vegetation). The effect of hurricanes on natural systems is compounded by the already present anthropogenic impacts. During 2004, three tropical systems (Charley, Frances, and Jeanne) passed over Lee County. YPP experienced hurricane force winds from Hurricanes Charley and Jeanne, while only receiving tropical storm winds from Hurricane Frances. In 2005, two additional tropical systems (Katrina and Wilma) only came through southern areas of the county.

## *ii. Geology*

For millions of years, the Florida Platform was submerged in the ocean. Sediments accumulated upon it and hardened into sedimentary rock. Thirty-five (35) million years ago, portions of Florida rose above the ocean's 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 has always been above the ocean surface (Wilder 2005).

Ten lithostratigraphic units have been identified in the state of Florida. Lithostratigraphic units are differentiated by the conditions under which they were formed and when during geologic time they were formed. These lithostratigraphic units are further divided by timing of formation into stratigraphic units. YPP lies within the Tertiary-Quaternary Sediments which was created during the Pliocene Epoch between 2 million to 10,000 years ago. This period is also known as the Ice Age, where huge ice sheets formed across Canada and

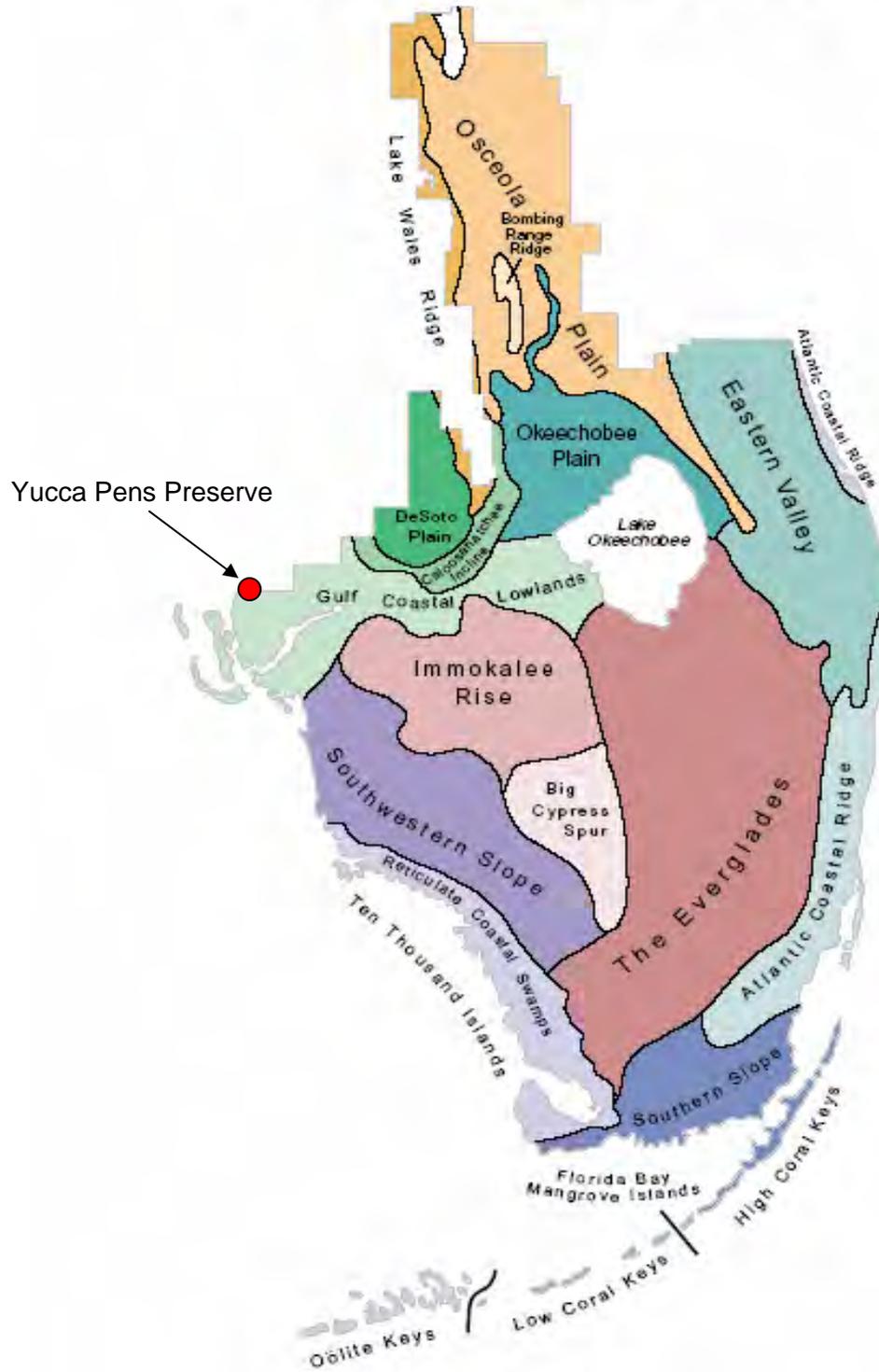
the northern United States. When these ice sheets were formed, they consumed large quantities of seawater, dropping the current sea level 300 or more feet, which greatly increased the land area of Florida. As the glaciers shrank, sea levels rose, and the Florida peninsula was again flooded. During the peak warm periods, sea level reached 150 feet above the current sea level. The waves and currents during these high sea level periods reworked the sediments and formed a series of geological units (Caloosahatchee, Ft. Thompson, Anastasia, Miami Limestone and Key Largo Limestone). Each of these geological units is characterized by their unique compositions. However, throughout much of Lee County, including these portions of YPP, the Caloosahatchee and Fort Thompson units are somewhat indistinct and have been lumped together as undifferentiated Tertiary-Quaternary Sediments. This unit consists of a quartz sand blanket covering limestone and clay. Fossils, including mollusks and corals, are very common and usually in excellent condition (Missimer and Scott 2001).

Southwest Florida can also be divided into ten major physiographic provinces. These are broad-scale subdivisions based on physical geography features such as terrain texture, rock type and geologic structure and history. Figure 3 illustrates where YPP lies within the Gulf Coastal Lowlands (SFWMD 2000).

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 (Missimer and Scott 2001).

Figure 3: Physiographic Regions of South Florida

## Physiographic Regions

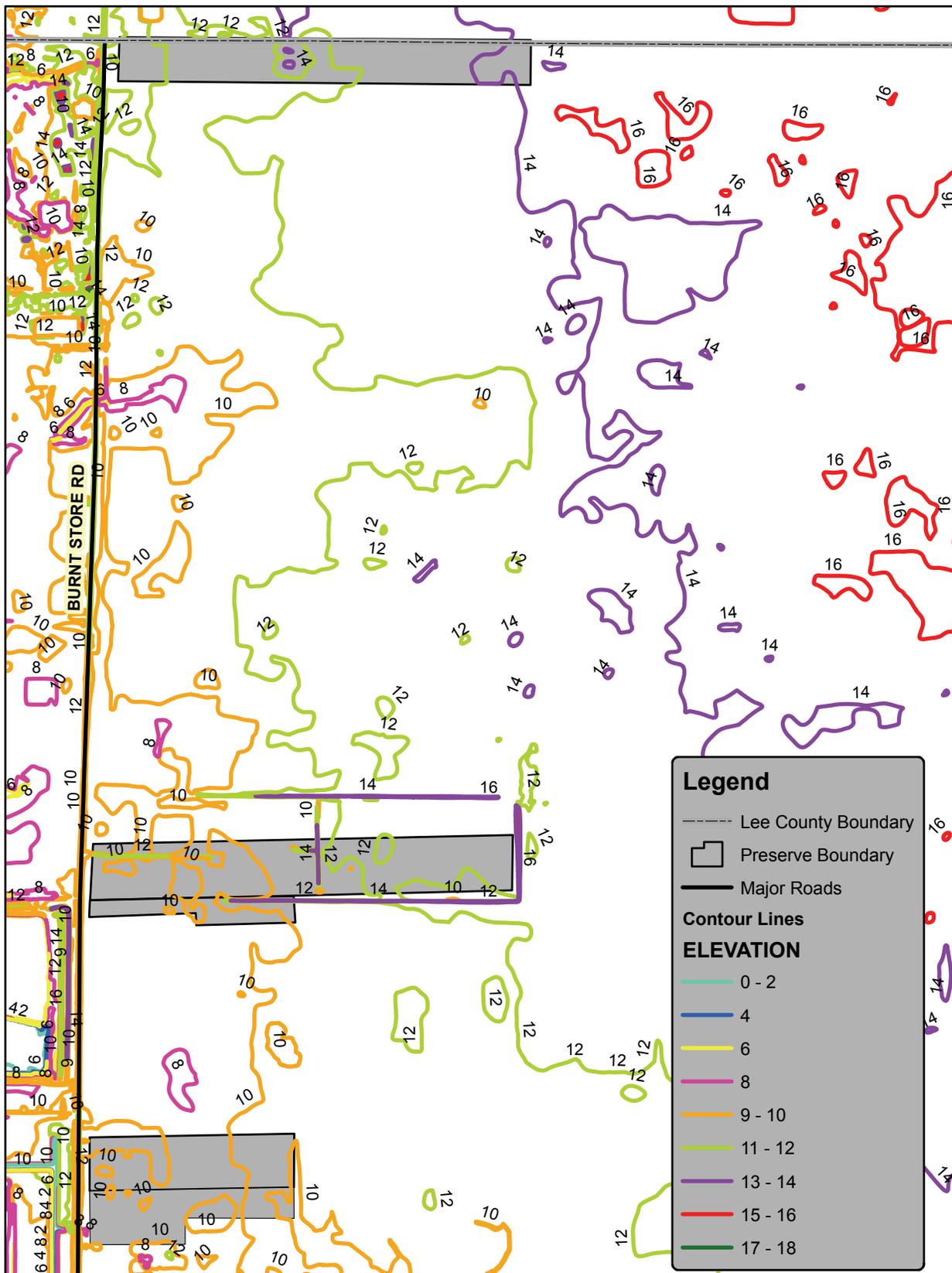


### *iii. Topography*

Most of Lee County is located within the Gulf Coastal Lowlands of Florida that extend around the coastal periphery of the state where elevations are generally less than 100 feet above sea level (Stubbs 1940; Cooke 1945).

Natural elevations at YPP range from 8-14 feet above sea level and generally slopes in a westerly to southwesterly direction (Figure 4). The majority of the land to the west of Burnt Store Road has been developed for single-family homes and a fire station; consequently the topography has been altered by filling, ditching and draining the land.

# Figure 4: Topography Map



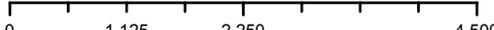


20/20  
LAND PROGRAM



## Yucca Pens Preserve

Feet



0 1,125 2,250 4,500

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Prepared on: 07/06/07, by sfumari@leegov.com

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

#### iv. Soils

The Soil Survey of Lee County, Florida (Henderson 1984) was designed for a diverse group of clients to be able to comprehend soil behavior, physical and chemical properties, land use limitations, potential impacts, and protection of the environment. The soils maps are based on vegetation and landscapes as interpreted from aerial photos, along with fieldwork. Major fieldwork conducted for the Lee County Soil Survey was completed in 1981. Accuracy of soil mapping is often around 70 to 80%, with a typical 3-acre mapping limit (WMI 2005).

There are six different soil types found at YPP (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, YPP is 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 generalized range site categories in Lee County, three of which are found on YPP. A range site has the potential to support a native plant community typified by an association of species different from that of other range sites. 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 three 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.
- Slough - Open grassland where nearly level areas act as broad natural drainage courses in the flatwoods. The potential plant community is dominated by blue maidencane (*Amphicarpum muhlenbergianum*), chalky bluestem (*Andropogon virginicus* var. *glaucus*), and blue-joint panicum (*Panicum tenerum*).
- Freshwater marshes and ponds - Open grassland marshes or ponds (depressions) with the potential to produce significant amounts of various grasses, sedges, and rushes. Water fluctuates throughout the year.

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

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

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

- B - Soils having a moderate infiltration rate (low to moderate runoff potential) when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well-drained soils that have moderately fine texture to moderately coarse texture. Moderate rate of water transmission.
- D - Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist mainly of clays that have a high shrink-swell 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 installation of adjacent roads, agricultural and drainage ditches, adjacent residential development, and ORV use. 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:

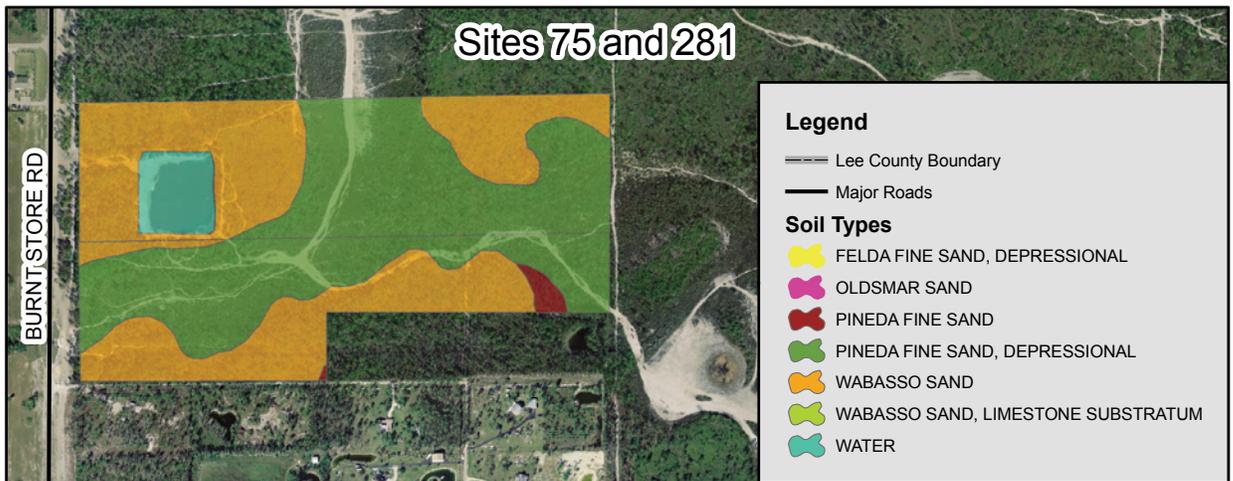
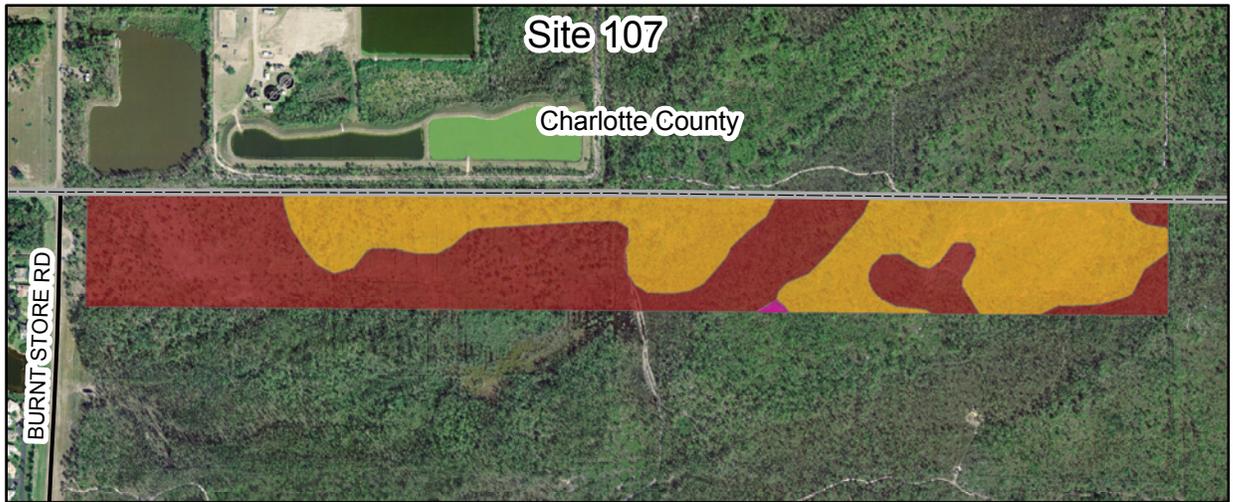
- Openland: Cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. Wildlife attracted includes northern bobwhite quail (*Colinus virginianus*), sandhill cranes (*Grus canadensis*), hawks, various birds, and rabbits.
- Woodland: Deciduous plants, coniferous plants, grasses, legumes, and wild herbaceous plants. Wildlife attracted includes wild turkeys (*Meleagris gallopavo*), thrushes, woodpeckers, squirrels, foxes, raccoons (*Procyon lotor*), white-tailed deer (*Odocoileus virginianus*), snakes, frogs, and bobcats (*Lynx rufus*).
- Wetland: Open, marshy or swampy shallow water areas. Wildlife attracted includes ducks, ibis, egrets, herons, shorebirds, snakes, frogs, alligators (*Alligator mississippiensis*), and otters (*Lutra canadensis*).
- Rangeland: Shrubs and wild herbaceous plants. Wildlife attracted includes white-tailed deer, quail, Virginia 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.”

# Figure 5: Soils Map



**Legend**

--- Lee County Boundary

— Major Roads

**Soil Types**

YELLOW Felda Fine Sand, Depressional

PINK Oldsmar Sand

RED Pineda Fine Sand

GREEN Pineda Fine Sand, Depressional

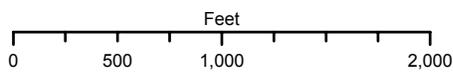
ORANGE Wabasso Sand

LIGHT GREEN Wabasso Sand, Limestone Substratum

CYAN Water



## Yucca Pens Preserve



S:\esri\C2020 ArcView\Yucca Pens Preserve\management plan\YPP\_soils.mxd

Prepared on: 07/06/07, by sfurnari@leegov.com

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

**Table 2: Summary of Soil Characteristics**

Soil Types	Map Symbol	Total Acres	% of Preserve	Physical Attributes							Biological Attributes				Limitations for Recreational Paths & Trails	
				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
Felda Fine Sand, Depressional	49	1.2	0.5%	freshwater marshes/ponds	P	B/D	rapid	rapid	3-6+ months (ponded)	4-6 months	1-4%	very poor	very poor	good	--	Severe: wetness, too sandy
Oldsmar Sand	33	0.1	0.0%	south Florida flatwoods		B/D	rapid	rapid	1-3 months	> 6 months	1-2%	fair	fair	poor	--	Severe: wetness, too sandy
Pineda Fine Sand	26	67.7	29.3%	sloughs	S	B/D	rapid	rapid	2-4 months	> 6 months	.5-6%	fair	poor	fair	--	Severe: wetness, too sandy
Pineda Fine Sand, Depressional	73	34.4	14.9%	freshwater marshes/ponds	P	D *	rapid	rapid	3-6+ months (ponded)	4-6 months	.5-6%	very poor	very poor	good	--	Severe: ponding, too sandy
Wabasso Sand	35	113	48.9%	south Florida flatwoods		B/D	rapid	rapid	2-4 months	> 6 months	1-4%	poor	fair	poor	--	Severe: wetness, too sandy
Wabasso Sand, Limestone Substrate	42	14.7	6.3%	south Florida flatwoods		B/D	rapid	rapid	1-3 months	2-4 months	2-5%	poor	fair	poor	--	Severe: wetness, too sandy

**Color Key:**

Dry
Wet
Wetter
Wettest
Saturated

- (1) S - Slough (sheet flow): A broad nearly level, poorly defined drainage way that is subject to sheet-flow during the rainy season.  
P - Ponding: Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.
- (2) \* Water table is above the surface of soil  
B - Soils having a moderate infiltration rate (low to moderate runoff potential) when thoroughly wet.  
D - Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.

#### *v. Hydrology and Watershed*

YPP is within the northwestern portion of the South Florida Water Management District's (SFWMD) Lower West Coast Region (SFWMD 2000). In 2005, a watershed study and report (Northwest Lee County Surface Water Management Plan - BEC 2005) was completed for the northwest region of the county. The Preserve lies within three watersheds. The north portion of YPP lies within a section of the Yucca Pen Creek Watershed, which contains an area of approximately 2.25 square miles. The remaining portions of the Preserve lie within Durden Creek and Greenwell Branch Watersheds, that when combined, contains approximately 16.1 square miles of land area (Figure 6). "The northwest region of Lee County consists of five principal watersheds, Yucca Pen Creek, Durden Creek, Greenwell Branch, Longview Run, and Gator Slough, draining into Charlotte Harbor. Yucca Pen Creek, Durden Creek, and Gator Slough have a significant part of their upstream drainage area in Charlotte County. Except for Yucca Pen Creek, all of these watersheds are interconnected with the Cape Coral canal system" (BEC 2005).

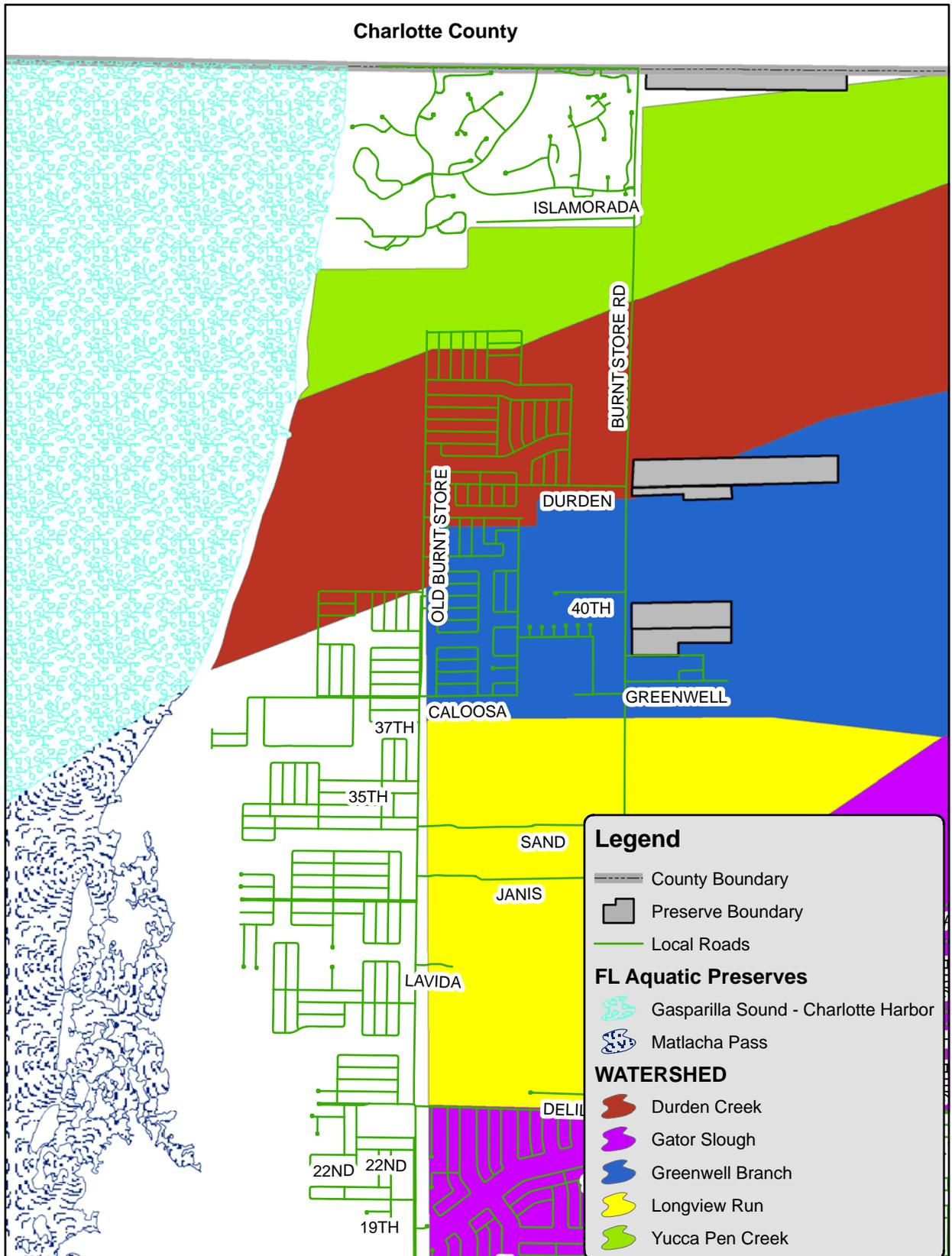
In 1974, the United States Fish and Wildlife Service (USFWS) directed its Office of Biological Services to conduct an inventory of the nation's wetlands. This National Wetlands Inventory (NWI) became operational in 1977. Wetlands were identified on the photography by vegetation, visible hydrologic features, and geography, 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 68 acres of Palustrine Forested, 18 acres of Palustrine Emergent and 3 acres of Palustrine Open Water (borrow pond) wetlands at YPP. Palustrine systems are all non-tidal wetlands dominated by trees, shrubs, persistent emergents, emergent mosses or lichens, and all such 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 (19.6 feet) tall or taller. These areas typically have an overstory of trees, an understory of young trees or shrubs and an herbaceous layer. Emergent wetlands are characterized by erect rooted, herbaceous hydrophytes, excluding mosses and lichens that are present for most of the growing season. Based on the federal NWI evaluation, about 38% of YPP is classified as wetlands.

Hydrological alterations have been made on and directly adjacent to YPP that affect the natural sheetflow across the lands (Figure 7). The impacts of existing ditches, abandoned agricultural furrows, ORV trails, borrow pond/pit, and roads alter the natural flow of water. The Preserve's sheetflow proceeds westerly towards two of Florida's most productive estuaries. These estuaries are managed by Florida Department of Environmental Protection (FDEP) and are part of the forty-one designated aquatic preserves in the state of Florida (Figure 6). In 1972, Matlacha Pass (12,500 acres of sovereign submerged lands) was established as an aquatic preserve, while in 1979, Gasparilla Sound – Charlotte Harbor (80,000 acres) received its aquatic preserve designation and is the

second largest estuary in Florida  
(<http://www.dep.state.fl.us/coastal/programs/aquatic.htm> ).

The 3 acre borrow pond in a western area of the Preserve was excavated sometime between 1958 and 1966. The depth is about 7.5 feet and water quality is unknown; although it contains water year-round. In June 2004, a large fish kill was noted in this pond, possibly from low dissolved oxygen levels. During mid-July 2007, a Lee County Parks and Recreation intern sampled the pond and fifteen species of fish were noted including bluegill (*Lepomis macrochirus*), largemouth bass (*Micropterus salmoides*), Florida gar (*Lepisosteus platyrhincus*) and the exotic African jewelfish (*Hemichromis letourneauxi*). Refer to Appendix A to review fish sampling information. Staff regularly observes several wading and shorebirds species using this area.

# Figure 6: Watersheds Map







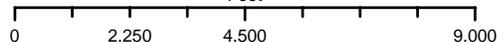
## Yucca Pens Preserve

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Prepared on: 07/18/07, by sfumari@leegov.com

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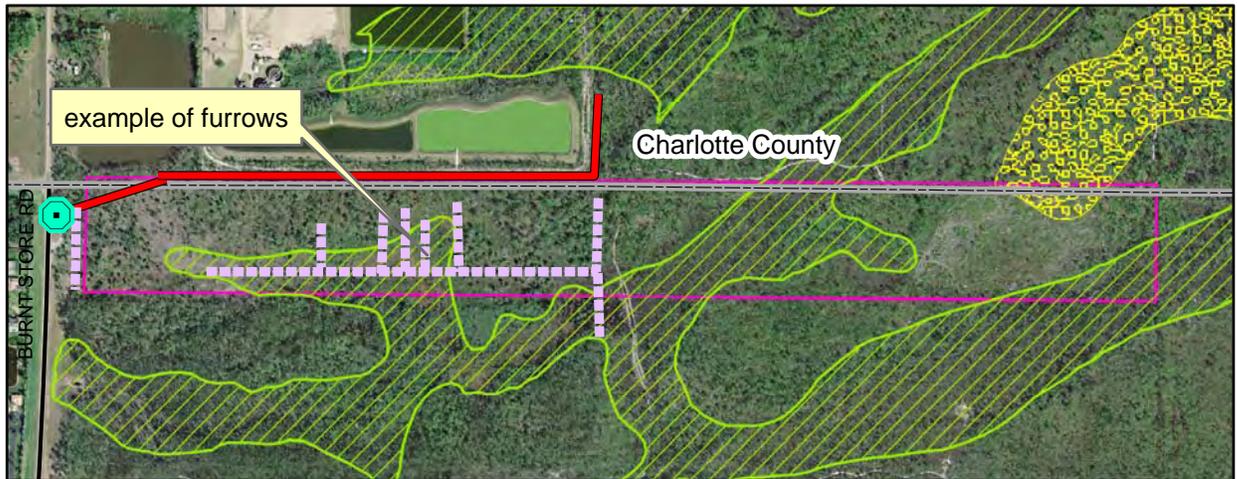
Feet



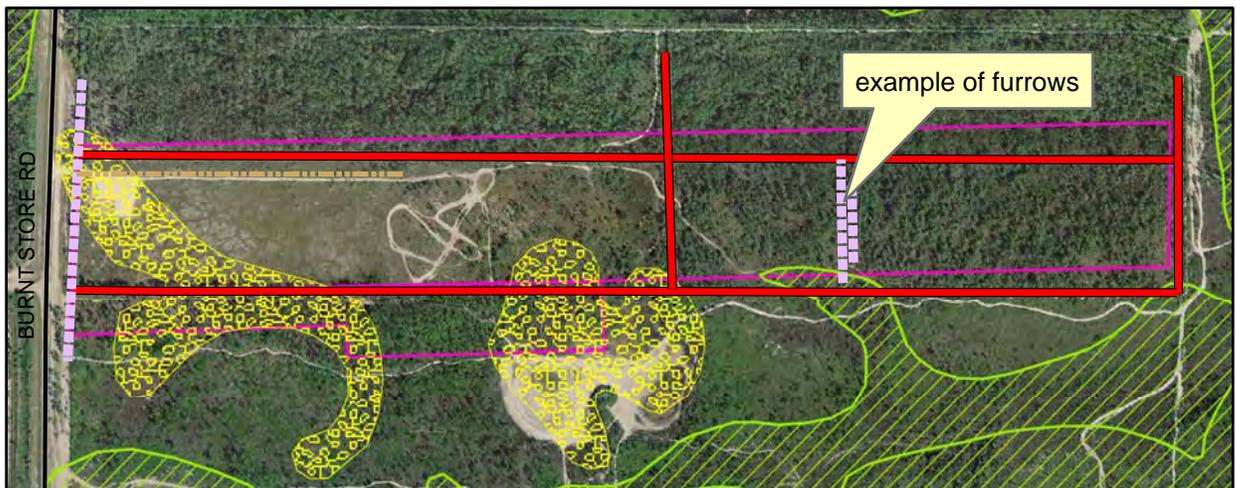
0      2,250      4,500      9,000

# Figure 7: Hydrologic Features Map

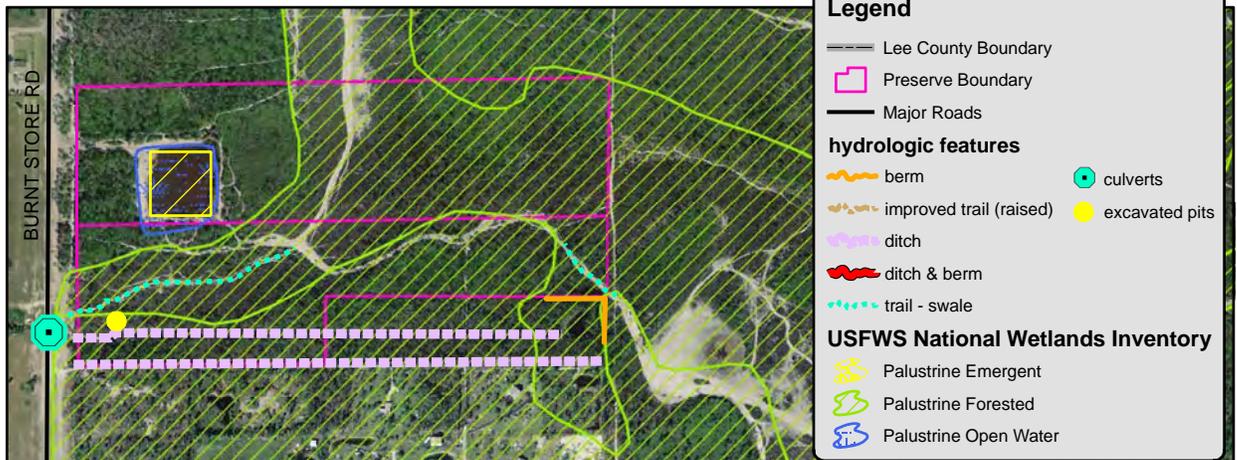
Site 107



Sites 102 and 202



Sites 75 and 281



**Legend**

- Lee County Boundary
- ▭ Preserve Boundary
- Major Roads

**hydrologic features**

- berm
- improved trail (raised)
- ditch
- ditch & berm
- trail - swale
- culverts
- excavated pits

**USFWS National Wetlands Inventory**

- ▭ Palustrine Emergent
- ▭ Palustrine Forested
- ▭ Palustrine Open Water

## Yucca Pens Preserve

Feet

0 230 460 920 1,380 1,840

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Prepared on: 07/16/07, by sfurnari@leegov.com

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

## **B. Biological Resources**

### *i. Ecosystem Function*

The YPP contains a combination of wetland and upland communities. 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 wildlife species have not been documented at the Preserve, there are a number of rare species that occur primarily in the 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 element affecting the health 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). A number of exotic plant species are present on the Preserve and are beginning to negatively affect the native species. Following exotic plant removal and brush reduction, fire will be a valuable management tool at YPP.

The wetlands of south Florida are important to a variety of wildlife. Birds feed, fish and frogs live and breed, and people rely on these wetlands to improve water quality. Normally during the late spring and summer months, the rain begins to fall and the wetlands fill to capacity. Fish populations begin to increase both in number and biomass. In the fall when the rains end, the water recedes and the fish are concentrated in the shallow marshes. The wading birds come in to feast and this aids the remaining fish by decreasing the density and increasing the availability of dissolved oxygen. Most wildlife utilizing these communities have adapted by migrating from one wetland to another as the shallow ones dry up. The wetlands found at YPP are seasonal with the only year round standing water found in the borrow pit on site #75. Plants in these areas also benefit from the seasonal wet/dry flux. Most aquatic plants cannot germinate under water and require this drying phase. The plants in these wetlands become completely dry, die, decay and release nutrients that are bound in their tissues. This makes the soils highly productive for the next wet season. Typically, these plants have low nutrient requirements so they stockpile the excess, which is beneficial to herbivores feeding upon them. When the nutrient loads become too high, cattails (*Typha latifolia*) increase (Myers and Ewel 1990), which is evident around the borrow pit and along the ditches dug throughout the Preserve.

### *ii. Natural Plant Communities*

YPP consists of eight distinguishable native plant communities described by the Florida Natural Areas Inventory (FNAI) as well as two highly impacted areas that

do not fit with any of FNAI's community descriptions and two communities best described by the combination of several of FNAI's categories. Figure 8 shows the approximate locations of these differing communities and the areas they occupy within the Preserve. The natural communities found at YPP are defined using the Florida Natural Area's Guide to the Natural Communities of Florida (1990).

The site has been greatly disturbed and the natural hydrologic and fire conditions altered to the point that many of the communities are invaded by species common to other categories of plant community. In addition, invasive exotics have spread throughout the Preserve, these include primarily melaleuca (*Melaleuca quinquenervia*), Brazilian pepper (*Schinus terebinthifolius*) and Old World climbing fern (*Lygodium microphyllum*). The following descriptions best match current plant communities found on the Preserve.

**Mixed Mesic** – 60.5 acres, 25.9% coverage at YPP

Although mixed mesic flatwoods is not a true FNAI community classification, it is used here as a combination of the mesic flatwoods and mesic hammock descriptions that best describe it; the largest area of the Preserve. This community appears exclusively on the areas disturbed by agriculture in the past (it is absent from sites #75, #281 & #202). The canopy is spotty; open and closed, mixing the traditional south Florida slash pines (*Pinus elliotii* var. *densa*) observed in mesic flatwoods with the live oaks (*Quercus virginiana*) and other hardwoods noted in mesic hammocks. Cabbage palm (*Sabal palmetto*) and saw palmetto (*Serenoa repens*) are scattered throughout with occasional wax myrtle (*Myrica cerifera*) and other tropical shrubs.

The community is in a transitional stage of succession, having been cleared for agricultural up until the 1950s (#107) and 1970s (#102) and then abandoned. Since then it has passed from fallow land into a pine flatwoods and through lack of a consistent fire regime has been invaded by oaks and other species of the hammock community. Subtle hydrological alterations over the years have helped stabilize this mixed community allowing both large pines and oaks to co-exist and flourish. At this point introducing fire into this mixed community would unlikely separate the flatwoods and hammock communities; however it would improve the general health of this community.

This plant community supports wildlife species common to both mesic flatwoods and hammocks.

**Mesic Flatwoods** – 57.1 acres, 24.4% coverage at YPP

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 YPP include south Florida slash pine, saw palmetto and chalky bluestem.

Animals that have been documented utilizing mesic flatwoods at the Preserve include the northern cardinal (*Cardinalis cardinalis*), eastern phoebe (*Sayornis phoebe*), and southern black racer (*Coluber constrictor priapus*).

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

#### **Wet Flatwoods** – 44.6 acres, 19.1% coverage at YPP

Wet flatwoods occur on relatively flat, poorly drained terrain where water frequently stands on the surface for one or more months of the year. Many plants here are under the stress of water saturation during the wet season and under the stress of dehydration during the dry season (FNAI 1990). In addition to south Florida slash pines, some of the more common plants documented in this community includes wax myrtle, coastalplain St. John's-wort (*Hypericum brachyphyllum*), and toothpetal false reinorchid (*Habenaria floribunda*). Hydrological changes (both anthropogenic and natural) have started to have an impact on this community and like many of the other communities found on the Preserve the wet flatwoods does not strictly meet the FNAI descriptions. Much of the wet flatwoods community is in a transitional stage to a drier mesic flatwoods.

Natural fire regimes for this plant community range from every 3-10 years (FNAI 1990). Without a regular fire, wet flatwoods will succeed into hardwood-dominated forests whose closed canopy would gradually eliminate the groundcover herbs and shrubs. Lack of fire will allow pine needle drape and the height of flammable understory shrubs to increase, which will increase the probability of a catastrophic canopy fire.

Animals documented utilizing this plant community at YPP include red-shouldered hawk (*Buteo lineatus*), blue-gray gnatcatcher (*Poliioptila caerulea*), and Florida cricket frog (*Acris gryllus dorsalis*).

#### **Wet Prairie** – 41.7 acres, 17.9% coverage at YPP

Wet prairies are described as a treeless plain with a ground cover of grasses and herbs including gulf coast spikerush (*Eleocharis cellulosa*), beaksedge (*Rhynchospora sp.*), fringed yellow stargrass (*Hypoxis juncea*), meadowbeauty

(*Rhexia sp.*), yellow-eyed grass (*Xyris sp.*) and St. John's wort (*Hypericum sp.*). This community is somewhat disturbed at YPP through the illegal recreation ORV use that has historically occurred on the site and several areas within this community are totally devoid of vegetation, in other areas additional non-typical and invasive plants have become established, including torpedo grass (*Panicum repens*) and melaleuca.

Wildlife that would be expected in wet prairies include Florida cricket frog, killdeer (*Charadrius vociferus*) and marsh rabbit (*Sylvilagus palustris*).

Wet prairies are fire dependant communities. Typically these areas will burn every 2-4 years and will become invaded with wax myrtle and other trees and shrubs during longer fire intervals (FNAI 1990).

#### **Disturbed Marsh – 8.7 acres, 3.7% coverage at YPP**

This area contains herbaceous or shrubby wetland situated in a relatively large and irregular shaped depression that has been greatly disturbed by historic agricultural practices on the site. Since agricultural use of the land was abandoned, the furrows and berms have settled (through both natural deposition of sediments from the surrounding area and continued anthropogenic influences on the site). Currently this area is representative of a transitional state between a true marsh and a more mesic community. The hydroperiod is estimated at around 200 days per year and fire maintains the open herbaceous community by restricting shrub invasion, normal fire interval is between 1 to 10 years.

Typical plants in this marshy area include pennywort (*Hydrocotyle sp.*), redroot (*Lachnanthes caroliniana*), soft rush, primrose (*Ludwigia sp.*), arrowhead (*Sagittaria graminea*), coastalplain willow (*Salix caroliniana*), spikerush, and elderberry (*Sambucus canadensis*). Generally animals expected include great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*) and tri-colored heron (*Egretta tricolor*).

#### **Scrubby Flatwoods – 8.4 acres, 3.6% coverage at YPP**

The scrubby flatwoods at YPP are found only on site #107 in the northeast portion of the Preserve. Synonyms for this community include xeric flatwoods or dry flatwoods. Scrubby flatwoods are characterized by an open canopy of widely scattered pine trees with a sparse, shrubby understory. Plants typically found are south Florida slash pine, shiny blueberry (*Vaccinium myrsinites*) and saw palmetto. The white sandy soil found here is typically several feet deep and drains rapidly. These areas usually do not flood even under extremely wet conditions. Fire naturally occurs every 8 to 25 years (FNAI 1990). This return interval is longer than mesic flatwoods due to the lack of ground vegetation and abundance of combustible scrub-oak leaf litter that is present.

Wildlife seen here includes the southern black racer, gray catbird (*Dumetella carolinensis*) and brown anole (*Anolis sagrei*).

**Mesic Hammock** – 3.9 acres, 1.7% coverage at YPP

Mesic hammocks are characterized by having an open or closed canopy dominated by live oak with cabbage palm present in the canopy or subcanopy. They can have a dense understory of saw palmetto, American beautyberry (*Callicarpa americana*) and wax myrtle with other tropical shrubs mixed in. Mesic hammocks occur on the fringes of rivers, swamps, marshes or lakes. Other plant species that occur in the hammock community at YPP are south Florida slash pine, swamp fern (*Blechnum serrulatum*) and Virginia chain fern (*Woodwardia virginica*).

Wildlife species seen here include eastern gray squirrel (*Sciurus carolinensis*) and gray catbird.

**Depression Marsh** – 2.5 acres, 1.1% coverage at YPP

Synonyms for this community include isolated wetland, ephemeral pond and seasonal marsh. This community typically consists of open, treeless areas with vegetation that is often growing in concentric bands. Hydrologic conditions vary, with most depression marshes drying in most years. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year. Typical plants here include coastalplain willow and a variety of grasses and sedges.

Animals documented using this community include the great egret, great blue heron and pig frog (*Rana grylio*).

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

Fire is important to maintaining this community by restricting the invasion of shrubs and trees, which would eventually reduce the hydroperiod through increased evapotranspiration and 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 (FNAI 1990).

**Borrow Pond** – 2.4 acres, 1% coverage at YPP

The borrow pond/pit (located on site #75) was most likely excavated for fill dirt. This excavated pit holds water year-round, thus creating a man-made borrow pond. The fringe of the pond is populated with broadleaf cattail (*Typha latifolia*) and a variety of grasses and sedges.

Animal species using this area of the Preserve include several species of fish including, bluegill, African jewelfish, American flagfish (*Jordanella floridae*), wading birds and amphibians.

**Basin Marsh** – 2.1 acres, <1% coverage at YPP

A FNAI basin marsh is characterized as an herbaceous or shrubby wetland situated in a relatively large and irregular shaped basin. Basin marshes usually develop in depressions that were formerly shallow lakes as the bottom slowly filled up with sediments from surrounding uplands and soils are usually acidic peats. Hydroperiod is normally 200 days per year and fire maintains the open herbaceous community by restricting shrub invasion, normal fire interval is between 1 to 10 years.

**Prairie Hammock** – 0.8 acre, < 1% coverage at YPP

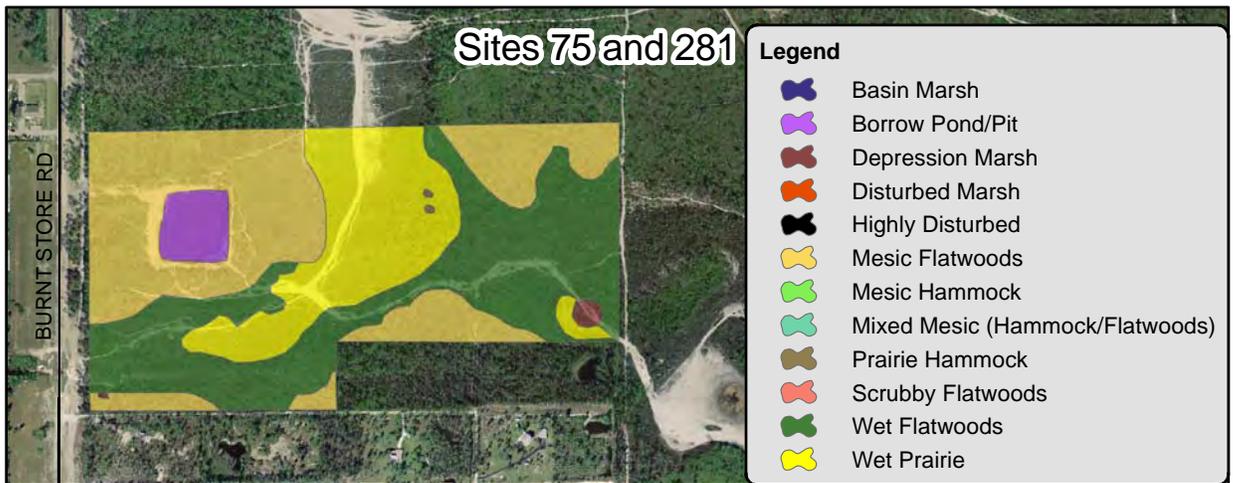
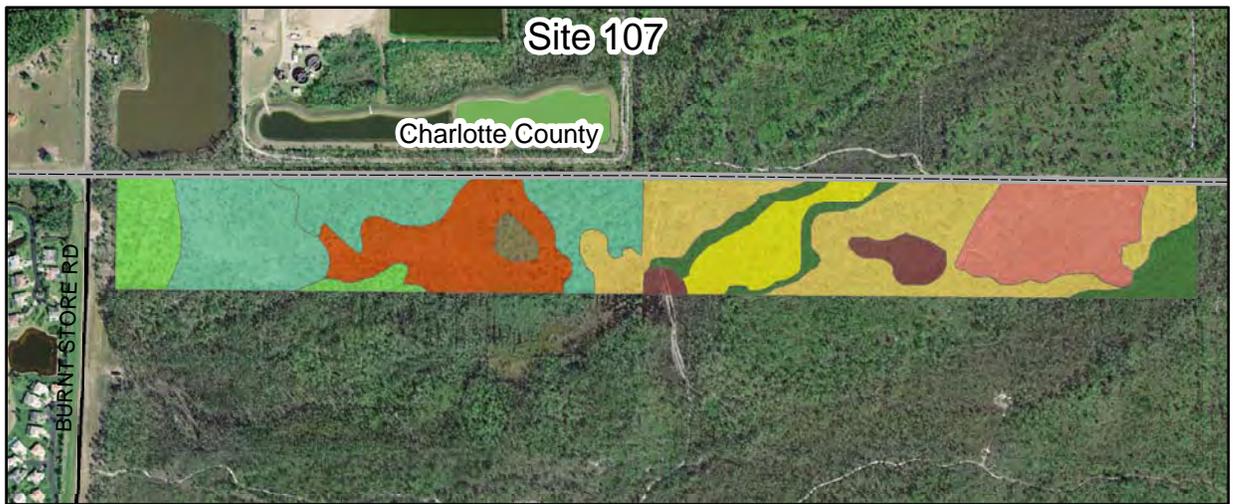
Two areas of prairie hammock can be found within the Preserve. The larger area located on site #107 that closely represents the FNAI description and a remnant of this community is located on site #75 within the wet prairie. Prairie hammocks typically consist of clumps of tall cabbage palms and live oaks in the midst of prairie or marsh communities with a very open understory. The few understory plants that would be expected are wax myrtle and those extending from the wet prairie (site #75) and disturbed marsh (site #107) that surround this community.

**Highly Disturbed** – 0.8 acre, < 1% coverage at YPP

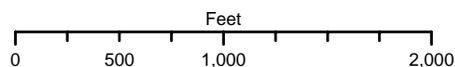
This area has very little vegetation; a few grass species have colonized the disturbed soil. The area has been used for the storage of hurricane debris, dumping of spoil and historically a staging point for agricultural operations. It is unclear how long the area has been devoid of vegetation; however the appearance of pioneer colonizing species indicates that succession is starting to take place and unaided the area will succeed into a community consistent with the hydrological, fire and climatic conditions present.

Appendix B contains a list of plant species identified during numerous site inspections to YPP. This list, however, is not necessarily a comprehensive list for the entire Preserve.

# Figure 8: Plant Communities Map



## Yucca Pens Preserve



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Prepared on: 07/25/07, by pdewitt@leegov.com

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

iii. Fauna

YPP has been greatly affected by past disturbances of the natural communities through the agricultural use of the land and the recreational activities that have illegally occurred on the site. As such, fauna diversity is much lower than would be expected in undisturbed communities. Appendix C has the complete list of wildlife seen on the Preserve; as recorded through field work, site inspections and the Lee County Bird Patrol volunteer program.

YPP is adjacent to the state managed Yucca Pens Unit of the Fred C. Babcock-Cecil M. Webb Wildlife Management Area, consequently increasing habitat for wildlife. Bird species observed include; osprey (*Pandion halietus*), bald eagle (*Haliaeetus leucocephalus*), wood stork (*Mycteria americana*) and several species of woodpeckers and herons. A variety of reptiles such as the Florida box turtle (*Terrapene carolina bauri*) and southern black racer have been observed along with several different species of mammals including bobcats and raccoons. Future sightings through site inspections and Lee County Bird Patrol volunteers will continue to be recorded.

Ten exotic wildlife species have been documented at the Preserve (Table 3). Of highest concern is the feral hog (*Sus scrofa*) because of its ability to uproot native vegetation and disturb the natural landscape.

**Table 3: Exotic Wildlife at Yucca Pens Preserve**

<u>Scientific Name</u>	<u>Common Name</u>
<i>Eleutherodactylus planirostris planirostris</i>	greenhouse frog
<i>Osteopilus septentrionalis</i>	Cuban treefrog
<i>Anolis sagrei</i>	brown anole
<i>Sus scrofa</i>	feral hog
<i>Oxyops vitiosa</i>	melaleuca weevil*
<i>Boreioglycaspis melaleucae</i>	melaleuca psyllid*
<i>Dasypus novemcinctus</i>	nine-banded armadillo
<i>Oreochromis aureus</i>	blue tilapia
<i>Hemichromis letourneauxi</i>	African jewelfish (jewel cichlid)
<i>Hoplosternum littorale</i>	brown hoplo

\*bio-control insect

Stewardship at the Preserve will focus on providing optimal habitat for native wildlife species. Restoration of the disturbed areas, control of invasive exotic plants and application of prescribed fire will be critical restoration components to provide improved habitat for wildlife. YPP is part of a countywide quarterly site inspection program for all Conservation 20/20 preserves. A copy of

the site inspection form is available in the Land Stewardship Operations Manual (LSOM). These inspections allow staff to monitor for any impacts and/or changes to each preserve and include lists of all animal sightings and new plant species that are found. If, during these inspections, staff finds FNAI listed species, they will be reported using the appropriate forms.

*iv. Designated Species*

There are a variety of designated animal and plant species (Table 4) found at YPP. Although all native plant and animal species found on 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 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, protecting and restoring water resources, prescribed fire, trash removal, wildlife monitoring, feral and exotic animal control, restricting construction of maintenance trails in certain areas and enforcement of no littering, no weapons and no motorized vehicles regulations.

**Table 4: Listed Species Found at YPP and Their Designated Status**

Scientific Name	Common Name	USFWS	FWC	FNAI	FDACS	IRC	Occurrence
<b>BIRDS</b>							
<i>Ardea alba</i>	great egret			G5/S4			confirmed
<i>Egretta caerulea</i>	little blue heron		SSC	G5/S4			confirmed
<i>Egretta thula</i>	snowy egret		SSC	G5/S3			confirmed
<i>Egretta tricolor</i>	tricolored heron		SSC	G5/S4			expected
<i>Nycticorax nycticorax</i>	black-crowned night-heron			G5/S3			confirmed
<i>Nyctanassa violacea</i>	yellow-crowned night-heron			G5/S3			confirmed
<i>Eudocimus albus</i>	white ibis		SSC	G5/S4			confirmed
<i>Mycteria americana</i>	wood stork	E	E	G4/S2			confirmed
<i>Elanoides forficatus</i>	swallow-tailed kite			G5/S2			confirmed
<i>Haliaeetus leucocephalus</i>	bald eagle	T	T	G4/S3			confirmed
<i>Grus canadensis pratensis</i>	Florida sandhill crane		T	G5/T2T3/S2S3			expected
<i>Sterna antillarum</i>	least tern		T	G4/S3			confirmed
<i>Aimophila aestivalis</i>	Bachman's sparrow			G3/S3			confirmed
<b>REPTILES</b>							
<i>Alligator mississippiensis</i>	American alligator	T	SSC	G5/S4			expected
<i>Drymarchon corais couperi</i>	eastern indigo snake	T	T	G4T3/S3			expected
<b>PLANTS</b>							
<b>Ferns and their allies</b>							
<i>Woodwardia virginica</i>	Virginia chain fern					R	confirmed
<i>Osmunda regalis</i>	royal fern				CE	R	confirmed
<b>Monocots</b>							
<i>Sagittaria graminea</i>	grassy arrowhead					R	confirmed
<i>Tillandsia fasciculata</i>	cardinal airplant				E		confirmed
<i>Fimbristylis puberula</i>	hairy fimbry					I	confirmed
<i>Rhynchospora tracyi</i>	Tracy's beaksedge					R	confirmed
<i>Eriocaulon compressum</i>	flattened pipewort					R	confirmed

**Table 4: Listed Species Found at YPP and Their Designated Status**

Scientific Name	Common Name	USFWS	FWC	FNAI	FDACS	IRC	Occurrence
<i>Eriocaulon decangulare</i>	tenangle pipewort					R	confirmed
<i>Syngonanthus flavidulus</i>	yellow hatpins					R	confirmed
<i>Juncus marginatus</i>	shore rush					R	confirmed
<i>Juncus megacephalus</i>	bighead rush					R	confirmed
<i>Juncus roemerianus</i>	needle rush					I	confirmed
<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>	purple bluestem					R	confirmed
<i>Andropogon virginicus</i>	chalky bluestem					R	confirmed
<i>Aristida spiciformis</i>	bottlebrush threeawn					R	confirmed
<i>Dichantherium erectifolium</i>	erectleaf witchgrass					R	confirmed
<i>Smilax tamnoides</i>	bristly greenbrier					I	confirmed
<b>Dicots</b>							
<i>Ruellia caroliniensis</i>	Carolina wild petunia					I	confirmed
<i>Asclepias lanceolata</i>	fewflower milkweed					R	confirmed
<i>Sarcostemma clausum</i>	white twinevine					R	confirmed
<i>Baccharis angustifolia</i>	saltwater falsewillow					R	confirmed
<i>Bigelovia nudata</i> subsp. <i>Australis</i>	pineland rayless goldenrod					R	confirmed
<i>Coreopsis floridana</i>	Florida tickseed					I	confirmed
<i>Mikania cordifolia</i>	Florida Keys hempvine					R	confirmed
<i>Rudbeckia hirta</i>	blackeyed Susan					R	confirmed
<i>Drosera capillaris</i>	pink sundew					R	confirmed
<i>Stillingia aquatica</i>	corkwood					R	confirmed
<i>Stillingia sylvatica</i>	queensdelight					R	confirmed
<i>Mimosa strigillosa</i>	powderpuff					I	confirmed
<i>Sabatia brevifolia</i>	shortleaf rosegentian					I	confirmed
<i>Proserpinaca pectinata</i>	combleaf mermaidweed					R	confirmed
<i>Physostegia purpurea</i>	eastern false dragonhead					I	confirmed
<i>Piloblephis rigida</i>	wild pennyroyal					R	confirmed
<i>Salvia lyrata</i>	lyreleaf sage					CI	confirmed
<i>Pinguicula pumila</i>	small butterwort					R	confirmed

**Table 4: Listed Species Found at YPP and Their Designated Status**

Scientific Name	Common Name	USFWS	FWC	FNAI	FDACS	IRC	Occurrence
<i>Utricularia cornuta</i>	horned bladderwort					R	confirmed
<i>Rhexia nuttallii</i>	Nuttall's meadowbeauty					I	confirmed
<i>Polygala balduinii</i>	Baldwin's milkwort					R	confirmed
<i>Polygala nana</i>	candyroot					R	confirmed
<i>Sideroxylon reclinatum</i>	Florida bully					R	confirmed
<i>Vitis aestivalis</i>	summer grape					I	confirmed

**Key**

**USFWS** - U.S. Fish and Wildlife Service

**FWC** - Florida Fish and Wildlife Conservation Commission

**FDACS** - Florida Department of Agriculture and Consumer Services

**E** – Endangered

**T** – Threatened

**CE** - Commercially Exploited

**SSC** - Species of Special Concern

**IRC** - The Institute for Regional Conservation

**CI** - Critically Imperiled

**I** – Imperiled

**R** – Rare

**FNAI** - Florida Natural Areas Inventory

**G** - Global rarity of the species

**S** - State rarity of the species

**T** - Subspecies of special population

**1** - Critically imperiled

**2** - Imperiled

**3** - Rare, restricted or otherwise vulnerable to extinction

**4** - Apparently secure

**5** - Demonstrately secure

## **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 the management recommendations were obtained from Hipes et al. (2001).

### **Great Egret, Little Blue Heron, Tricolored Heron, and Snowy Egret**

The little blue heron's and tricolored heron's decline are due to loss of freshwater wetlands and alteration of their natural hydroperiod. There is also some indication that pesticides and heavy metal contamination may affect this heron. Like these herons, the great egret and snowy egret have been declining throughout their range since the 1950s. Scientists believe that the main reason for this decline is the loss and alteration of wetlands where they forage.

### **Black-crowned Night Heron and Yellow-crowned Night Heron**

The Black-crowned night heron (*Nycticorax nycticorax*) and yellow-crowned night heron (*Nyctanassa violacea*) "populations have probably declined due to illegal shooting, disturbance at breeding colonies, and drainage of wetlands used for foraging. The contamination of pesticides is not well understood. In Florida, the destruction and alteration of more than half of the wetlands, due to the phenomenal increase in population has caused a substantial decline in ardeids. Wetlands have been filled and or impacted by housing developments, agriculture, human activity (i.e. sports, recreation) and the infrastructure that supports these activities" (Rodgers et al. 1996).

### **White Ibis**

Similar to the herons listed above, the white ibis (*Eudocimus albus*) is declining throughout their range due to the reduction and degradation of wetlands and human disturbances to their rookeries.

### **Wood Stork**

Wood storks are very sensitive to water levels in freshwater wetlands, as 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.

### **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 1900s, swallow-tailed kites were

confirmed as nesting in 21 states; today they are only found in seven southeastern states including Florida. Loss of nesting sites through development and conversion to agriculture are the major threats to this species.

### **Bald Eagle**

Bald eagle 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.

### **Florida Sandhill Crane**

Florida sandhill cranes (*Grus canadensis pratensis*) and the migratory greater sandhill crane (*Grus canadensis tabida*) are indistinguishable from each other. Threats to Florida sandhill cranes include loss and degradation of wetlands, fire suppression, free ranging dogs and cats and entanglement in fencing (Rodgers et al. 1996).

### **Least Tern**

Least terns (*Sterna antillarum*) “nest in colonies on open ground and depend on camouflaged eggs and group mobbing by adult birds for defense. Their beachfront nesting habitat is vulnerable to natural conditions (i.e. ephemeral, successional changes) and highly desirable for human use. Across most of its range, the Least Tern now nests more commonly on modified or artificial sites than natural beaches. Numerous wildlife and land managers in Florida have actively improved sites for the birds. Examples of such activities include clearing vegetation, limiting vehicle access, constructing fences to deter predators, removing non-native predators, fencing roof edges, and constructing nesting platforms” (Rodgers et al. 1996).

### **Bachman’s Sparrow**

The Bachman’s sparrow’s (*Aimophila aestivalis*) “nests are grassy domes placed on or near the ground in a palmetto clump or dense shrub and lay 3-4 white eggs from early April through July” (Kale and Maehr 1990). Loss of habitat, predation (i.e. cats, raccoons), and forest management techniques are reasons listed for their decline. “Thinning of forest canopy and controlled burns can create suitable habitat for these birds. Thinning also provides more open habitat for a few years following timber harvest. Old-field habitat was once provided by abandoned farmland. Extensive ground disturbance during site management should be avoided” (MDC 2007).

## **American Alligator**

American alligators (*Alligator mississippiensis*) have recovered dramatically since the 1960's. There are even some populations large enough to support limited harvests. Pollution and destruction of wetlands are currently the main threat to this species. Protecting wetlands from ditching, filling and pollution are the management recommendations for this species.

## **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 (*Gopherus polyphemus*) 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 was another cause for decline of this species. The most common causes of mortality are human induced, either by people afraid of snakes or accidental highway mortality. The indigo snake utilizes a home range of approximately 125-250 acres, and the males are territorial during the breeding season. The indigo snake feeds diurnally on fish, frogs, toads, lizards, snakes, small turtles, birds, and small mammals, often around the edge of wetlands. The eastern indigo snake breeds from November through April, then lays 5-10 eggs in May or June (USFWS 1982).

## **Plant Species**

In addition to designated wildlife, YPP provides habitat for several listed plant species listed by the IRC and two species that are listed by FDACS. The following is a brief summary of the FDACS designated plant species explaining why they are in decline, typical habitats where they are located and management recommendations.

### **Royal Fern**

Royal fern (*Osmunda regalis var. spectabilis*) is listed as Commercially Exploited by FDACS.

### **Stiff-leaved wild pine (cardinal airplant)**

Stiff-leaved wild pine (*Tillandsia fasciculata var. densispica*) is an endangered species listed by FDACS and is also known as the cardinal airplant. It can be found in hammocks and pinelands and has been documented on YPP. Threats to these plants include illegal collecting, habitat destruction and the Mexican bromeliad weevil (*Metamasius callizona*) (Save 2003).

The majority of the designated plant species (see Table 4) were provided by IRC, which is not a regulatory agency. IRC's designation was either obtained from their book (Gann 2002) or Internet website

(<http://www.regionalconservation.org/ircs/database/search/QuickSearch.asp>).

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 YPP, a number of Rare, Imperiled, and Critically Imperiled plants occur. Rare plants are defined as being either very rare and local throughout its range in south Florida (21-100 occurrences, or less than 10,000 individuals), or found locally in a restricted range. IRC only ranks those taxa as rare with fewer than 100,000 individuals. Imperiled plants are those that are imperiled in south Florida because of rarity (6-20 occurrences, or less than 3,000 individuals) or because of vulnerability to extinction due to some natural or human factor. IRC only ranks those taxa as imperiled that have fewer than 10,000 individuals. Critically Imperiled plants are defined as being either extreme rarity (5 or fewer occurrences, or fewer than 1,000 individuals), or because of extreme vulnerability to extinction due to some natural or human factor. IRC only ranks those taxa as critically imperiled with 10,000 or fewer individuals.

In their book, Rare Plants of South Florida: Their History, Conservation and Restoration (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 YPP:

- Prohibit recreational activities such as off-road vehicle use to avoid impacts to 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.

- Divide the site so the entire area is not burned during the same year will also help protect these communities.

If additional listed species are documented on the Preserve, they will be added to the lists in Appendices B or C.

Table 5 outlines some specific management and restoration activities at the Preserve that will be taken to protect the designated wildlife and plant species. Rodgers et al. (1996), Hipes et al. (2001), IRC, Land Stewardship staff, and/or other groups are the sources for Table 5's management recommendations. When any of the designated species' nests or burrows 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 Recommendation
<u>Scientific Name</u>	<u>Common Name</u>	<u>Exotic Control</u>	<u>Prescribed Fire</u>	<u>Mark Nest/Burrow Location</u>
<i>Ardea alba</i>	great egret	X		
<i>Egretta caerulea</i>	little blue heron	X		
<i>Egretta thula</i>	snowy egret	X		
<i>Egretta tricolor</i>	tricolored heron	X		
<i>Nycticorax nycticorax</i>	black-crowned night heron	X		
<i>Nyctanassa violacea</i>	yellow-crowned night heron	X		
<i>Eudocimus albus</i>	white ibis	X		
<i>Mycteria americana</i>	wood stork	X		
<i>Elanoides forficatus</i>	swallow-tailed kite	X		
<i>Haliaeetus leucocephalus</i>	bald eagle	X	X	X
<i>Grus canadensis pratensis</i>	Florida sandhill crane	X	X	X
<i>Sterna antillarum</i>	least tern			X
<i>Aimophila aestivalis</i>	Bachman's sparrow	X	X	
<i>Alligator mississippiensis</i>	American alligator	X		
<i>Drymarchon corais couperi</i>	eastern indigo snake	X	X	
Flora Species				
<i>Tillandsia fasciculata</i>	cardinal airplant	X		
<i>Osmond regalis</i>	royal fern	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*

Biodiversity at YPP varies with on the community, but should increase significantly after stewardship activities have been put into practice (i.e. invasive exotic plant removal, hydrological restoration and prescribed fire). The plant communities range from mesic flatwoods to seasonally influenced wet prairies and depression marshes. Much of the land is disturbed to some extent from previous agricultural uses or historical recreational impacts. Restoration and protection of native plant communities across the landscape will enhance the overall biodiversity of the Preserve.

Many species of animals not only inhabit, but also frequently visit the Preserve. Currently 147 plant species (20 exotic) and 114 animal species (ten exotic) have been documented. Twelve of the 20 exotic plant species (60 percent) are on the Florida Exotic Pest Plant Council's 2005 List of Invasive Species (FLEPPC 2005).

The integrity and diversity of YPP 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.
- Enhance wetlands and borrow ponds to create improved feeding areas for wading birds.
- Implement a prescribed fire program to closely mimic the natural fire regimes for different plant communities to increase plant diversity and ensure the canopies remain open.
- Install perimeter fire breaks to protect resources on the Preserve and surrounding neighbors.
- Remove any debris and prevent future dumping on site.
- Control invasive exotic animal populations to reduce their impacts on the herbaceous plants, native animals and soils.
- Conduct on-going species surveys utilizing volunteers and staff to catalog and monitor the diversity that is present.

- Enhance hydrologic conditions to improve historic sheetflow and/or hydroperiods within wetland areas by modifying existing man-made features both off-site and on-site.

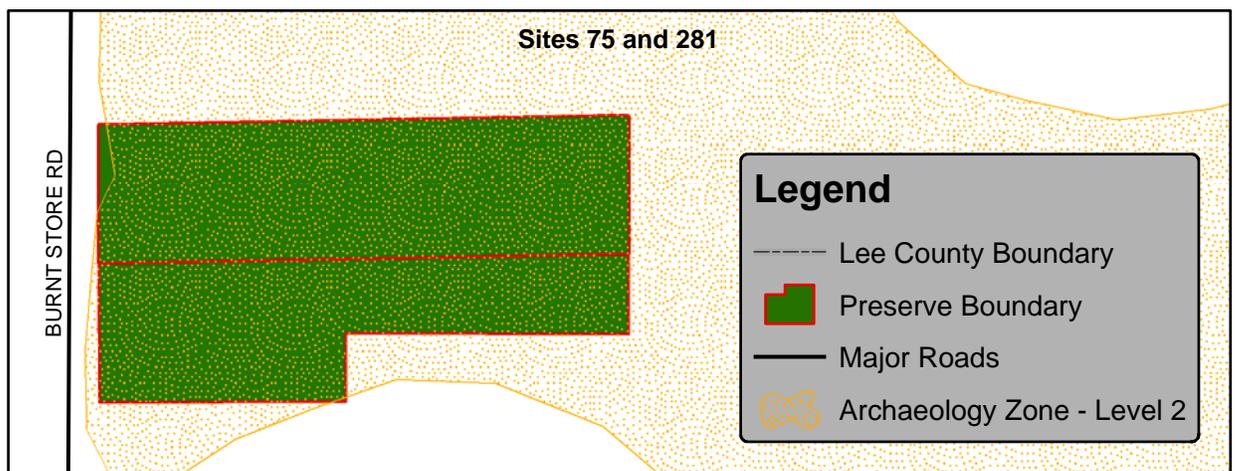
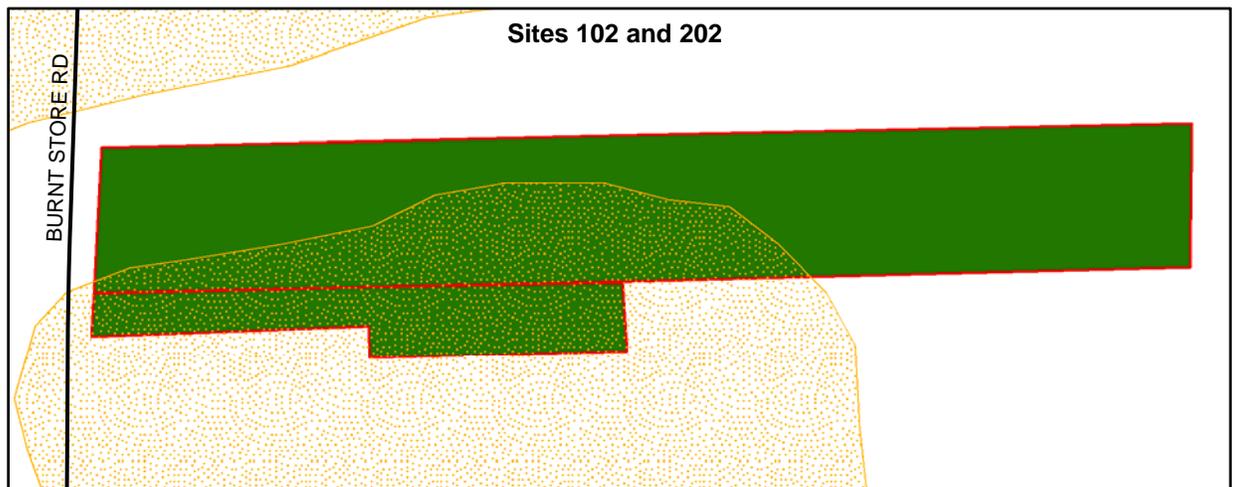
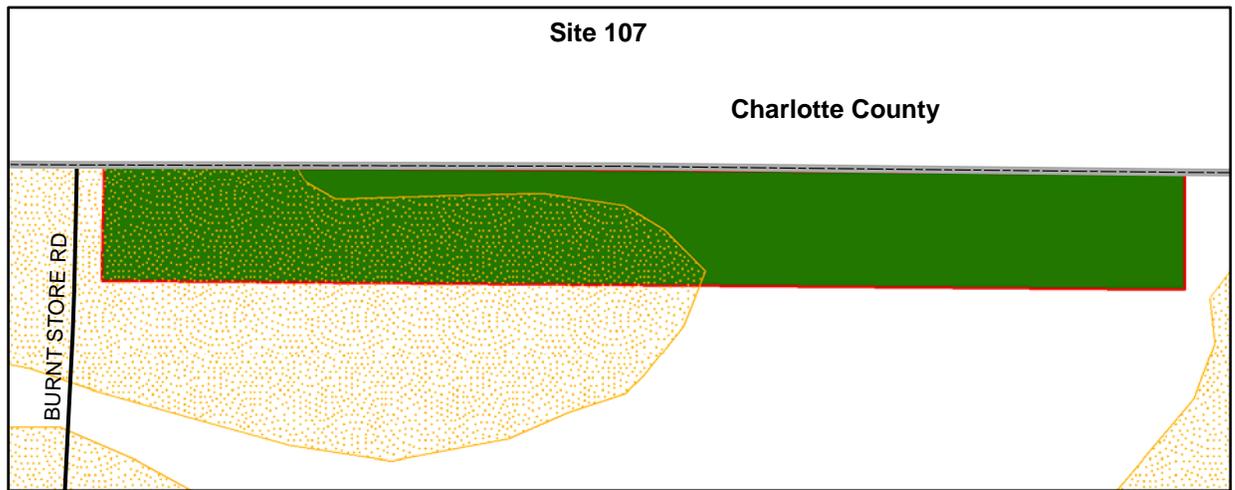
## **C. Cultural Resources**

### *i. Archaeology*

In 1987, Piper Archaeological Research, Inc. conducted an archaeological site inventory of Lee County. They were able to identify 53 sites increasing the total number of known archaeological sites in Lee County to 204. They also created a site predictive model and archaeological sensitivity map for the county that highlighted areas likely to contain additional archaeological sites. Nearly 70 percent of the Preserve is located within an area designated as archaeological Sensitivity Level 2 by Lee County (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 by development activities, 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 has already been extensive soil disturbance at YPP in areas that were used for agriculture, soil extraction for a small pond, or in areas where long-term ORV use occurred. These disturbances have occurred throughout all regions of the Preserve, 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 during restoration activities, the Division of Historical Resources 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 Department of State, Division of Historical Resources. The site will be managed in coordination with recommendations of the Division of Historical Resources 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 will be incorporated into the public educational program.

# Figure 9: Archaeological Features Map



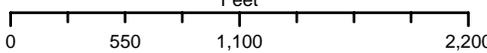


CONSERVATION  
20/20  
LAND PROGRAM



## Yucca Pens Preserve

Feet



0 550 1,100 2,200

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

## *ii. Land Use History*

Over the last 100 years, ecosystem manipulation on YPP and in the surrounding area has occurred. Intense logging of slash pine in the late nineteenth century through the 1930s virtually eliminated all virgin stands of the southern mixed forest in south Florida. This activity likely reduced slash pine densities throughout the Preserve and explains the lack of old growth pine trees found on site today. In addition, cypress stumps were observed in a couple of locations on the Preserve. There is no remaining evidence to support that cattle grazing was historically performed on the county acquired parcels.

The stumps of the logged slash pines were removed from many properties in the region during the 1960s and 1970s. This activity, referred to as “stumping,” was conducted to extract turpentine from the wood. Stumping created depressions in the soil, which created a microhabitat where soil moisture is higher for longer periods than adjacent habitats, allowing different plant species to occur.

According to interpretations based on aerial photography dating back to 1944 (Figure 10), land uses also included agricultural activities on the western half of site #107. Several buildings are shown in the 1944 photograph and the area was farmed until the early 1950s, then abandoned and buildings removed.

The 1953 aerial photograph doesn't show any additional changes (Figure 11), while the 1958 photograph (Figure 12) shows a notable amount of vegetation growth in the abandoned field.

No activities were observed on any other sections of the Preserve until the 1960s after Burnt Store Road was built, which is shown on a 1966 photograph. On site #102, the back eastern half was farmed in the 1960s, while the western half was only clear-cut of vegetation. In the 1966 historical aerial, site #75 has an excavated square pond (now referred to as a borrow pond).

The 1977 aerial photographs clearly illustrates that the agricultural lands on site #102 were abandoned as vegetation begins growing in the field. For site #281, a small pit was dug in the southeast corner and James Walter Lane is being constructed to the south.

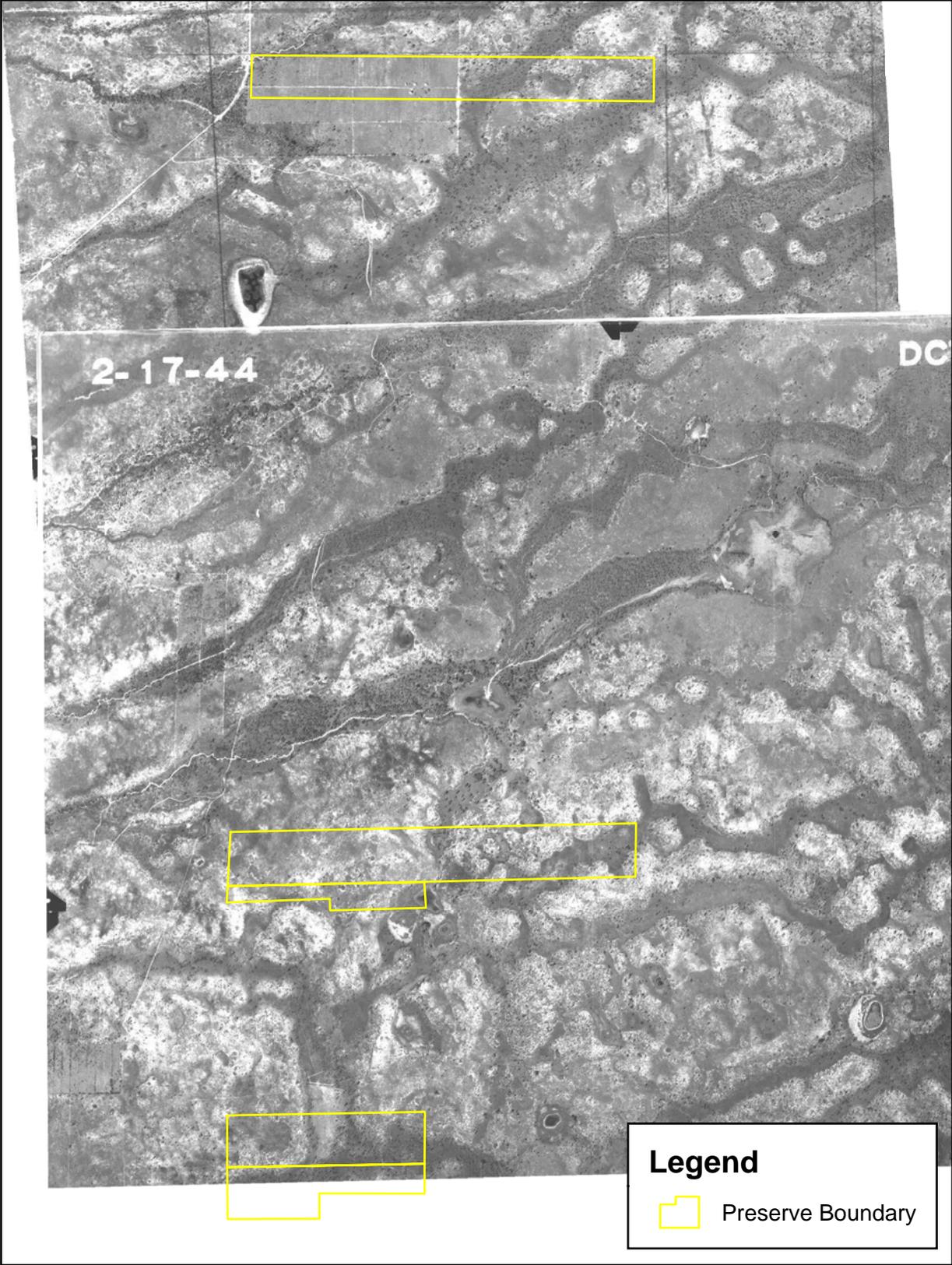
Near site #107, notable activities on the 1980 aerial include Burnt Store Utilities under construction and single-family homes are being built. On site #202, an ORV trail is observed.

During the 1990s, adjacent development and ORV use significantly increased throughout the area. For site #102: in 1990, a new trail appears on the western portion near the north boundary line; in 1993, ORV trails and a dirt racetrack can be seen, and in 1999, the western portion was partially cleared. On the

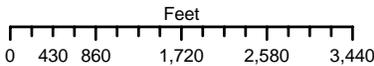
nomination application, the former owner noted that the timber was harvested in 1998. For site #75, on a 1999 aerial photograph, the Cape Coral Fire Department is now present and extensive ORV trails are observed. For site #281: in 1990, an ORV trail crosses through running east-west; in 1993, a small lake with berm is southeast of the site; and in 1998, pine trees were also removed (timber management) as noted by the previous owner on his nomination application. Several landowners in the area may have coordinated their forestry/timber management efforts with the same contractor.

During the 2000s, tropical systems and illegal ORV use continued to be an on-going issue throughout the region. After Hurricane Charley blew through this region, mountains of vegetation debris were deposited by clean-up crews at many county locations; site #102 was one of the chosen areas. Lee County Solid Waste brought fill in to stabilize the staging area; however, the site never received hurricane debris and the fill was not removed. This area remains relatively devoid of native plants (see Figures 2 & 8). The 2002 aerial photograph (Figure 13) illustrates some areas after exotic plant control work and before Hurricane Charley. In December 2005, LCPR staff removed two "jumps" constructed on sites #75 and #102 by ORV enthusiasts.

# Figure 10: 1944 Historical Aerial



## Yucca Pens Preserve

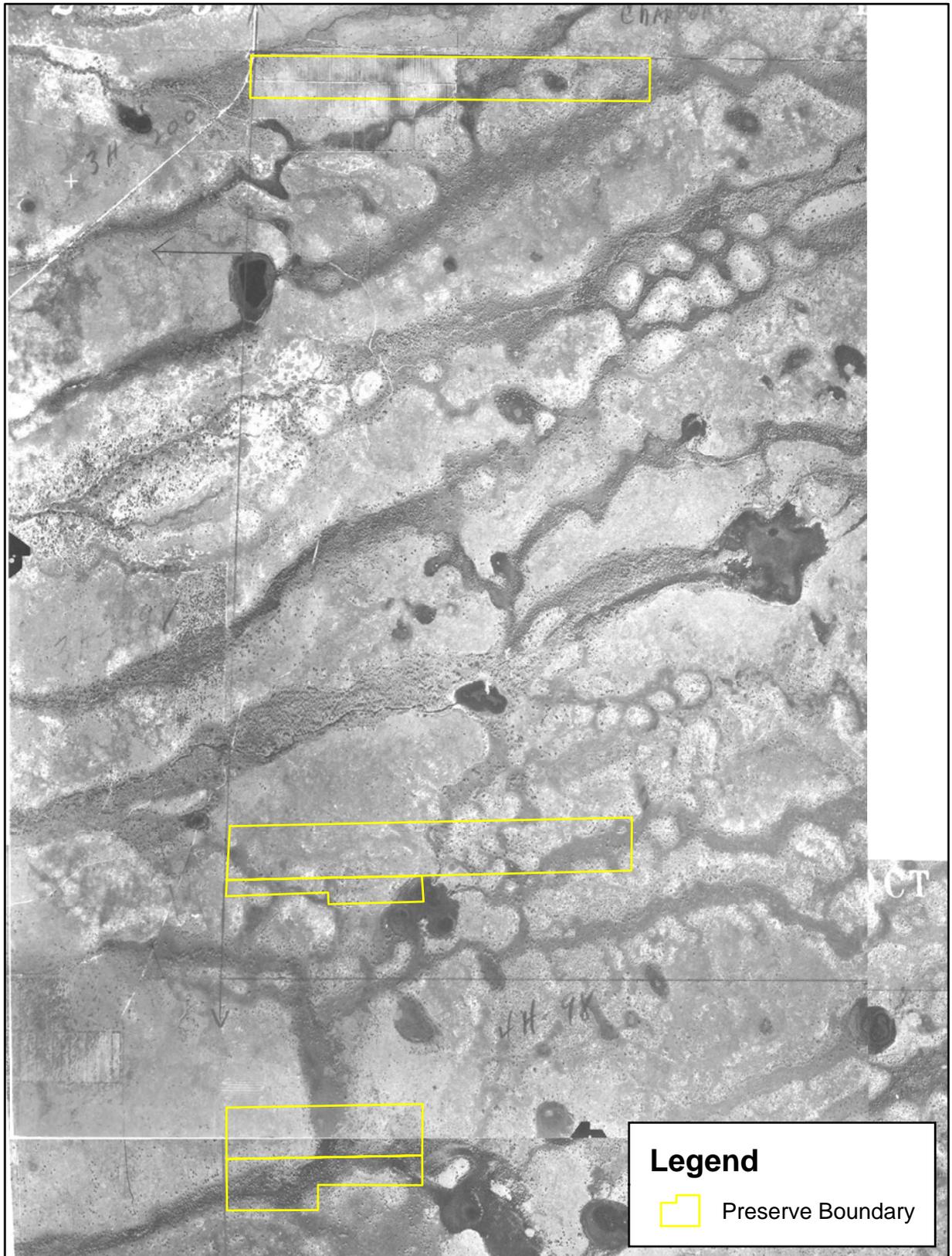


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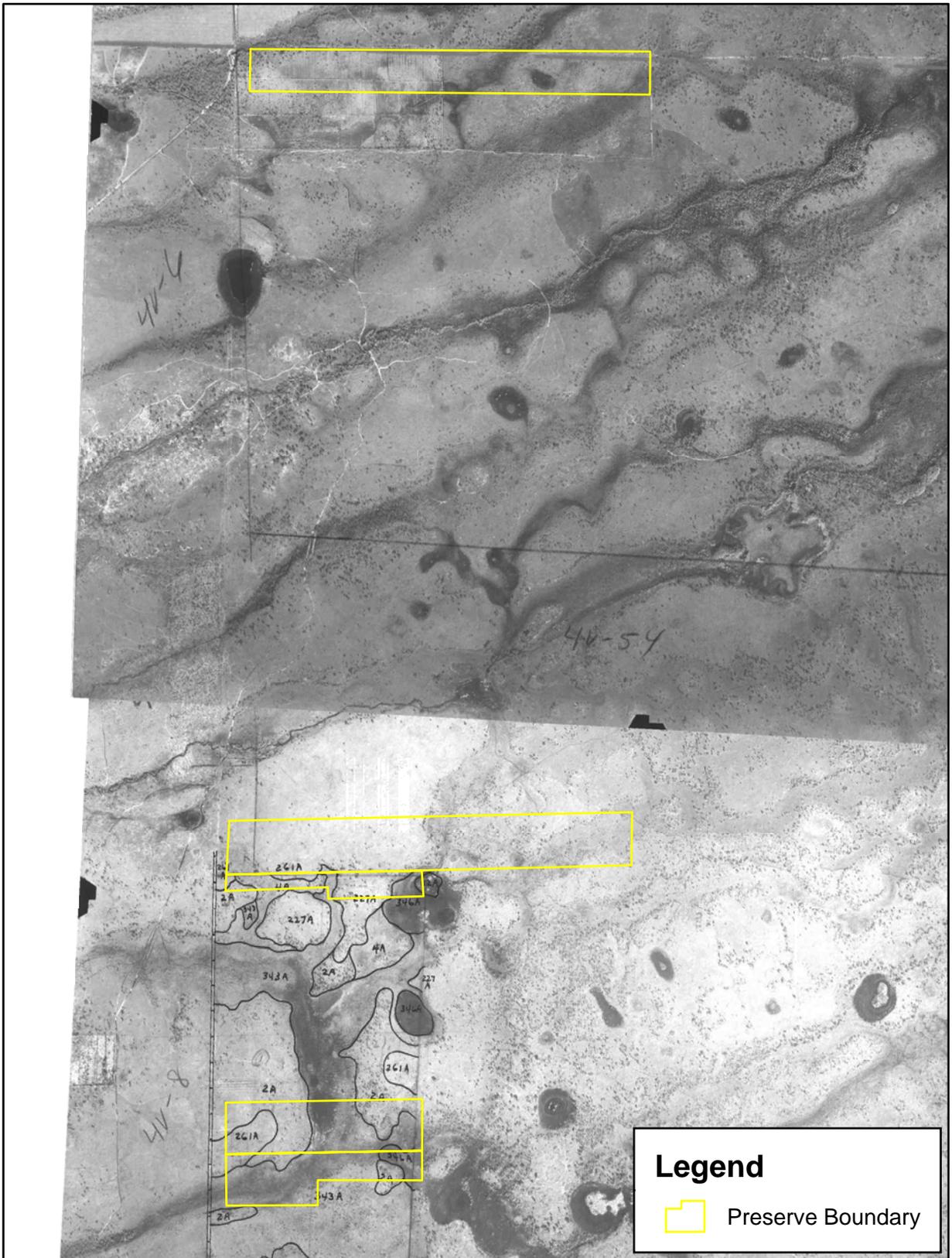
# Figure 11: 1953 Historical Aerial



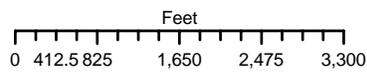
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Prepared on: 07/16/07, by sfurnari@leegov.com  
This is not a survey. Land Stewardship Staff has prepared this map for informational and planning purposes.

Feet  
0 480 960 1,920 2,880 3,840

# Figure 12: 1958 Historical Aerial



## Yucca Pens Preserve



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# Figure 13: 2002 Historical Aerial



  **Yucca Pens Preserve**

Feet  
0 410 820 1,640 2,460 3,280

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Prepared on: 09/21/07, by sfurnari@leegov.com

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

### *iii. Public Interest*

YPP was purchased for the preservation of environmentally sensitive lands, high probability for state and federally listed species, floodplain protection, and the potential to provide water quality protection and enhancements. Since most of YPP is contiguous to state managed preserve lands, it is likely that there are co-management opportunities with FWC.

For nearly eight years, C20/20 staff has not received any public visitation requests for the parcels that make up YPP. Adjacent neighbors, however, have complained about the illegal activities (gunfire, loud parties, all-terrain vehicle (ATV) use, campfires) that were regularly occurring on state, county and privately owned lands. Several law enforcement organizations coordinated their efforts to reduce these illegal activities. At this time, illegal recreational uses have decreased. Staff anticipates field trips with community groups and neighboring residents to educate the public on the importance of conservation lands for wildlife and its significance to the surrounding areas watersheds.

## **V. FACTORS INFLUENCING MANAGEMENT**

### **A. Natural Trends and Disturbances**

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

Wildfires caused by lightning strikes are natural occurrences in Florida. The Florida Division of Forestry (FDOF) – Caloosahatchee District - and Lee County Department of Parks and Recreation staff are developing a wildland firefighting protocol for County preserves. The FDOF received a map of this Preserve showing the locations of gates, firebreaks, management units and water sources. Once new perimeter firebreaks have been created, it will not be necessary for FDOF to create additional plow lines to protect property outside the Preserve boundary. This agreement between FDOF and the County will help to minimize damage to the Preserve from the potential damage associated with emergency firefighting equipment. Land Stewardship staff will lead periodic site visits in order to familiarize FDOF with YPP and current management efforts. A Fire

Management Plan has been drafted for Lee County owned conservation lands to help decrease the impact of catastrophic wildfires on the Preserve and neighboring lands. Fire lines on the perimeter of the Preserve, as well as those created once burn units are established, will be kept clear of debris and disked or mowed a minimum of once a year during the onset of the dry (wildfire) season.

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

## **B. Internal Influences**

Several anthropogenic influences have impacted YPP. Many of these influences can be attributed to historic agricultural operations and illegal recreation uses. See Figure 14 for approximate location of some of these features.

Hydrological impacts include excavation of several east-west ditches, which drain water away from the site and a north-south ditch that runs the length of the Preserve crossing through private property and state lands (Figure 14). The spoil piles from these efforts create berms parallel to these drainage channels which have become over grown with exotic species including melaleuca and Brazilian pepper. One borrow pit was dug in the Preserve on site #75. The natural sheet flow within the Preserve has been altered in several areas through the historic farming activities which created rows for irrigation. These natural sheet flows are also interrupted by the web of ORV trails that criss-cross the Preserve. In addition, ORV use has slightly altered the natural topography of the Preserve by creating small berms and depressions which allow water to pool and create mixed micro-communities of exotic and native plants.

Many invasive exotic plants disrupt the natural systems and impact the native species on the Preserve. Melaleuca is the most prevalent exotic species within the Preserve, occurring in almost every natural community. Before acquisition by the county, some work was done to reduce the amount of standing melaleuca on site #281; however, these efforts appear to have increased the numbers of sapling plants within this area. In the past, melaleuca has also been treated to some extent on all the sites within the Preserve, most notably aerial treatment of sites #102 & #202 in early 2007 by FWC. Brazilian pepper patches are growing along the roads that border the various sites within the Preserve, along the spoil piles created from the dredged ditches and associated with the illegal ORV trails

within the Preserve. Caesarweed (*Urena lobata*), most likely spread by hogs and the actions of ORV users, and Old World climbing fern (which received treatment in 2006, with limited success) are scattered throughout much of the Preserve.

Absence of fire within areas of the Preserve has had noticeable impact on the natural fire dependant communities. In several areas, pine flatwoods have become mixed with hardwoods and other non-fire tolerant species. Also, palmetto has flourished to the extent of overshadowing other understory shrubbery. Within some areas of pine flatwoods, lack of fire has allowed smaller pines to become predominant and increased slash pine density to an unhealthy level. Vegetation reduction measures will need to be implemented to reestablish healthier pine flatwoods communities and to be able to reintroduce a fire regime. After restoration projects are completed in management units that contain fire dependent communities, a prescribed fire management program will be implemented. This will aid conservation measures by inhibiting exotic plant regrowth and return an essential fire regime for fire dependent plants and animals for long-term sustainability. Implementing an appropriate fire regime within the landscape will help prevent the sometimes-devastating affects of wildfires and possibly avoid the need for FDOF to intervene with bulldozers and plows.

While many trails on site are the result of ORV use, some are from past fire suppression events. The trails which criss-cross the Preserve influence the hydrologic patterns of the area. The trails also impact the passage of wildlife, intersect and disrupt the natural communities and impact the condition of the soil. Their very existence entices illegal ORV use throughout the area.

Site #102 contains an east-west road and cleared pad that was once associated with the agricultural operation on the site. The first 50ft of the road is mixed aggregate and concrete; however it is in a degraded condition. The pad in the northwest corner of this site still remains clear of vegetation; due to the spoil/fill brought in to prepare the area for expected hurricane-related vegetation waste.

Site #107, like site #102, was historically used for agriculture. Both sites show evidence of furrows in certain areas along with ditches and spoil resultant from ditching that were put in place to control water to the crops. In addition to the agricultural fields, site #107 also had several buildings approximately half way into the site along the southern boundary, however no obvious trace is left. More recently, a water monitoring well was installed on site #107 about 25ft into the Preserve from the gate off Burnt Store Road.

Scattered throughout the Preserve there are signs of timber harvesting. Tree stumps of various species and some associated logging trails can be found in sites #102 & #75. The timber operation within site #75 occurred before 1944 (no evidence on historic aerial photographs); however, the cut stumps of cypress trees can still be found within this site. More recently (within the late 1990s) site

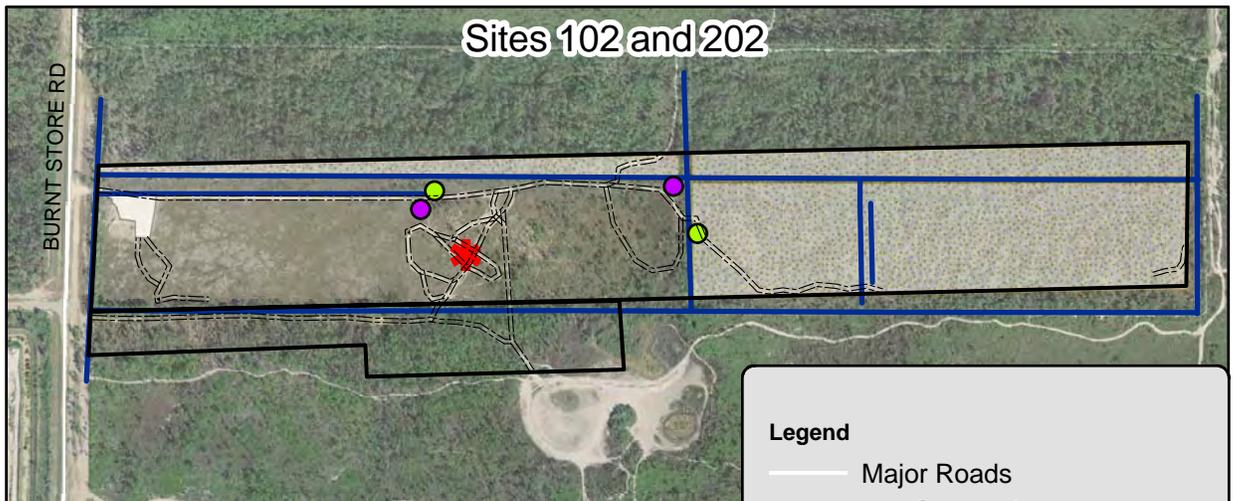
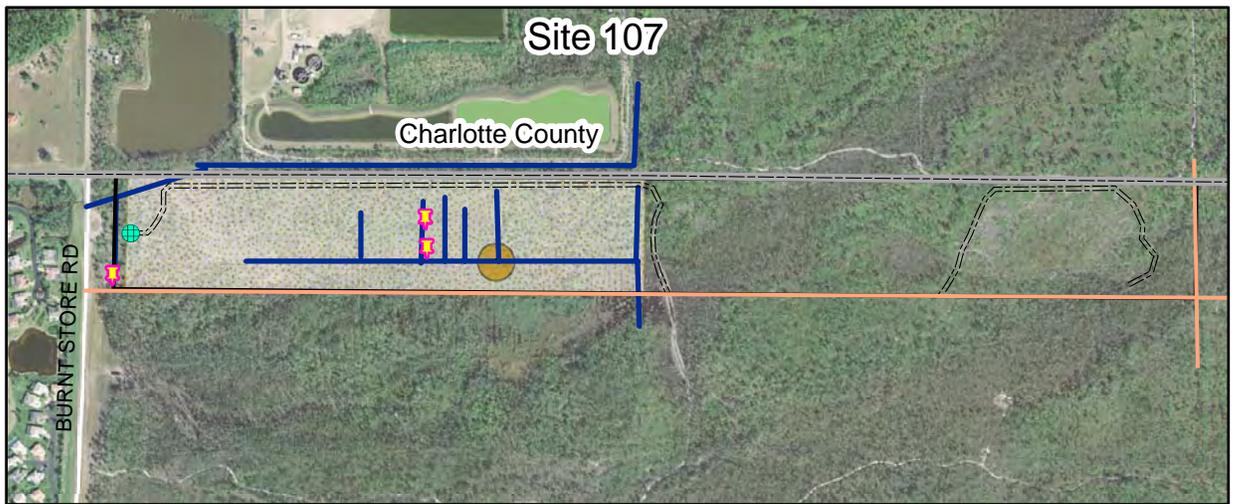
#102 was actively harvested for timber, as reported by the previous owner (Curtis, per.comm.). A representative for site #281 stated that the tracts were under a forest management plan, that firelines were cut around the perimeter and melaleuca was treated in 1992 and in 2001 (Hoyer, per. comm.).

Throughout the Preserve, litter is a problem. The historic illegal use as a recreation area has proliferated localized areas of general waste where camping occurred and aided in the spread of general trash along the trails. Trash is also blown in from Burnt Store Road and the nearby residential and industrial areas. The trash and general waste consists mostly of cans, bottles and household packaging; however ORV parts, batteries, tires, and larger appliances are dotted throughout the Preserve. Illegal dumping has occurred on the site (specifically site #102) where vegetative debris, furniture, lumber, paint buckets, and air conditioning duct had been deposited (WRS 2000). A large amount of asphalt roofing tiles, auto batteries and additional items have been dumped since the county's acquisition of these parcels; consequently, the necessity for fencing.

During a quarterly site inspection in the fall of 2003, staff found newly dumped hazardous materials on site #102. In January 2004, hazardous materials were removed from the central part of the site (the approximate location is marked on Figure 14). The hazardous materials consisted of waste oil and diesel in two 55 gallon drums and a 20 gallon plastic container. The oil spilled and stained the soil of an approximate 6 foot by 3 foot area. Subsequent soil analysis concluded that the soil met Florida Department of Environmental Protection Soil Cleanup Goals (WRS 2004). It is possible, due to the illegal use of the site for ORV activities that additional hazardous materials may be found within the Preserve.

Exotic animals can have a detrimental affect on native species. 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 snails, fish and amphibians can compete with native fauna for habitat and food. A range of removal methods will be considered for problematic invasive exotic animals found on the Preserve.

# Figure 14: Internal Influences Map



**Legend**

- Major Roads
- - - Lee County Boundary
- Easements
- - - - - ORV Trail
- ▭ Preserve Boundary
- General Waste
- ★ Hazardous Waste (removed)
- ORV Parts
- ♀ Photo point stations
- Ditches & Berms
- ▨ Borrow Pits
- Highly Disturbed Soil
- ▤ Historic Agricultural Field
- Historic Site of Buildings
- ⊕ Well monitoring station

### C. External Influences

YPP is located within the Burnt Store Community, an area designated by the Lee County Board of County Commissioners as one of 22 planning communities. “This community is located in the northwest corner of the mainland of unincorporated Lee County. The Burnt Store Marina development is primarily residential with a high percentage of seasonal residents. There are some commercial and marine oriented amenities within this development primarily serving residents of that development. This area is expected to double its dwelling units during the life of this plan from 917 in 1996 to over 2000 in 2020. Today, most of the community’s commercial needs are served outside of the community in Cape Coral, North Fort Myers and Fort Myers, or in Charlotte County” (Lee Plan 2006). There are several Future Land Use categories for properties directly adjoining the Preserve including Open Lands, Wetlands, Outlying Suburban, Public Facilities, and Rural (Figure 16).

The first external influence is the illegal ATV/ORV use, target shooting, hunting, and sporadic dumping coming from trespassers. This is a persistent problem; although some improvement has been seen after several law enforcement agencies and C20/20 Rangers coordinated a “sting operation” within the Yucca Pens area in early 2006. Staff and/or volunteers will have occasional work days to remove existing and future debris.

Other external influences consist of large drainage canals, ditches and culverts. Most of these are either related to prior agricultural operations or the Burnt Store Utilities reverse osmosis and wastewater treatment plants. These man-made features affect the historic sheet flow and/or remove/impede water from recharging the wetland ecosystem by quickly channeling water off-site and into natural waterways.

Another probable external influence is the potential for a major roadway to be constructed, west of the Preserve. Currently, Burnt Store Road is an undivided rural two-lane road where the end-of-pavement lies within a range of 120-150 feet from the Preserve’s western boundary. The Bi-County Corridor Study began in 2003 and the Phase II: Concept Report - Final ([http://www.lee-county.com/publicworks/pdf/DOT/Burnt%20Store/Index\\_Phase%20II.pdf](http://www.lee-county.com/publicworks/pdf/DOT/Burnt%20Store/Index_Phase%20II.pdf) ) was completed in 2005 (PBSJ 2005). The report outlines plans to make improvements along this existing Charlotte-Lee County transportation corridor to meet the long-term 2030 travel needs. The Burnt Store Road-Veterans Parkway-Colonial Boulevard Expressway Corridor could range from 8-10 lanes and be completed within the existing 200 feet roadway easement.

The Preserve’s proximity to the expansive state managed Fred C. Babcock – Cecil M. Webb Wildlife Management Area (BWWMA) is a positive external

influence and provides additional habitat, foraging, and nesting opportunities for many plant and animal species. Portions of the YPP boundary are contiguous to the 14,781 acre Yucca Pens Unit (YPU) of the BWWMA. A variety of plant communities can be found on the YPU including mesic and hydric pine flatwoods, hammocks, cypress stands, freshwater marshes and both wet and dry prairies (FWCa 2003).

## **D. Legal Obligations and Constraints**

### *i. Permitting*

Land stewardship activities at YPP may involve obtaining permits from several regulatory agencies. Any proposed hydrologic improvements to the site may require obtaining permits from the FDEP, the U.S. Army Corps of Engineers (USACOE) or South Florida Water Management District (SFWMD). Hydrological and/or habitat restoration projects requiring heavy equipment or tree removal will require notification to the Lee County Department of Community Development (LCDCD). The use of prescribed fire will require obtaining a FDOF burn permit. Soil disturbance will require a 'Certificate to Dig' permit from Lee County.

### *ii. Other Legal Constraints*

There are several easements on or directly adjacent to the Preserve. Information on easements was gathered from surveys, where available or from various county GIS data layers.

Along the western boundary of all the parcels within the Preserve lies an easement containing Burnt Store Road (CR 765). The easement, which is a total of 200' wide, is outside the Preserve but lies within 32' of the Preserve boundary. Currently Burnt Store Road uses 62' of the easement, which places the road approximately 132' from the Preserve. Road widening projects have been suggested for Burnt Store Road and both the construction process and utilization of the road would have impacts on the Preserve.

Easements that lie within the Preserve include an east-west utility easement along the southern boundary of site #107, 30' of which lies inside the Preserve. This site also contains a north-south utility easement along the eastern boundary (20' of which lies within the Preserve). Site #281 contains three 30' easements within the southern portion of this parcel around the old tract boundaries of the Charlton Estates Ranchettes. Two of these easements run parallel east-west, the other running north-south between them (Figure 14).

Lee County Parks and Recreation; Land Stewardship staff and Rangers continue to work closely with the Lee County Sheriff's Office to eliminate the illegal use of ORVs within the Preserve.

Due to the proximity of YPP to BWWMA the idea of joint management of the Preserve by FWC has been investigated and although not currently an option will be evaluated in the future as described below.

*“We have evaluated the County-owned lands (75, 102, 107, 202, and 281) referenced in Lee County’s proposed management agreement. At this point in time we do not feel that the juxtaposition of these parcels complements the management of the Yucca Pens Unit of the Babcock Webb Wildlife Management Area (WMA) in a cost-effective or efficient manner that provides significant benefit to the public, our agency, or the extant resources on the WMA.*

*The efficacy of a management agreement may be re-evaluated in the future if the continued purchase of public lands in this region creates a more contiguous and functional land ownership pattern. In the absence of a formal management agreement, Commission staff may endeavor to partner with Lee County management staff to enhance the effectiveness of our land management practices on contiguous lands” (Wichrowski 2007).*

### *iii. Relationship to Other Plans*

Due to the proximity of YPP to BWWMA Land Stewardship staff will refer to the FWC management plan for the WMA and when possible work with FWC in the stewardship of the Preserve. If a future management agreement is completed between C20/20 and FWC, and hunting activities are organized by FWC, a county ordinance amendment will need to occur before hunting is allowed on county lands.

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” (LCDCD 2006). 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 YPP 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 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 HISTORICAL 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 107.10: WOODSTORK, Policy 107.10.1:** provides that Land Stewardship staff will continue to document wood stork utilization of the Preserve and ensure that the YPP 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 YPP include limited funding, limited vehicular access, the brief dry season for conducting land stewardship activities and increasing urbanization pressures adjacent to the Preserve. Although C20/20 has a management fund, it is inadequate to fulfill the restoration activities for this and the other preserves. Efforts to obtain additional funding through grants and/or monies budgeted for mitigation of 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.

Over one-third of the Preserve is classified as seasonally influenced wetlands. The only location that holds water year-round is the man-made borrow pond. Ordinarily depression marshes, wet prairies and flatwoods communities at YPP have standing water for about six months of the year. The remaining plant communities at YPP are typically driest between January and April, so most stewardship activities will be conducted during these months. If access is necessary for stewardship activities when water levels are high, vehicles such as an ATV may be used; otherwise staff will travel on foot.

Urbanization pressures increasingly affect stewardship activities and boundary security. Fire management is a vital tool used to keep fuel loads down, to ensure biological diversity, and to maintain functional habitat value for wildlife. Smoke management will be one of the greatest factors in planning prescribed fires. Prescribed fire parameters become more restrictive with expanding residential and commercial development and increased traffic on nearby roadways.

#### **F. Public Access and Resource Based Recreation**

The majority of the historic recreation occurring at YPP has been from unlawful trespassers, people illegally camping, riding ATV and other ORV, and shooting activities (target shooting and hunting). Since Lee County purchased the Preserve, these illegal uses have continued. The Parks and Recreation Ordinance, 06-26 prohibits these activities on C20/20 land as they are proven to negatively affect the natural communities as well causing safety concerns for all visitors (LCPR 2006).

No parking areas are planned for the Preserve, so recreational use will be limited. At this time, no public recreational amenities are proposed at YPP. There is a great need within the Preserve to restore damage caused to the natural communities by the historic illegal activities that have occurred on the site.

Other recreation opportunities exist in proximity to YPP including opportunities for trail hiking and paddle-craft launching in the state operated Charlotte Harbor Preserve State Park and the County managed C20/20 preserve sharing a similar name (Charlotte Harbor Buffer Preserve); both of which have access points less than one mile from portions of YPP. Opportunities exist for recreational hunting, hiking and birding within the adjacent BWWMA; although access to this area for hunting is not directly provided through the Preserve. Additional recreation opportunities in the area include those provided by the City of Cape Coral (public boat ramp and parks) and county facilities including Matlacha Community Center and Boat Ramp (within 8 miles of YPP) (see Figure 1).

In accordance with the LSOM, YPP is classified as a Category 4 Resource Protection & Restoration Preserve. As with all designated Category 4 preserves, “if there is a public interest, staff may provide guided field trips when there are no safety concerns and it is compatible with protecting the animals and plant communities found at the specific preserve.” Many issues are taken into consideration in determining resource based activities at C20/20 preserves, including but not limited to, acreage of the site, viable access, presence of similar facilities nearby, plant communities present, listed species utilization, and hydrologic components.

## **G. Acquisition**

The state of Florida’s land acquisition program is referred to now as “Florida Forever” (formerly named: Conservation and Recreation Lands-CARL). The Charlotte Harbor Flatwoods project encompassed the largest remaining tract of intact pine flatwoods in southwestern Florida. The Charlotte Harbor Flatwoods project boundary covers over 18,700 acres with a purpose to protect the pine flatwoods and connect the Charlotte Harbor Preserve State Park (formerly named: Charlotte Harbor State Buffer Preserve) with the BWWMA. The goal to protect these upland managed areas provides additional protection for the Outstanding Florida Waters of the Aquatic Preserves (FDEP 1998).

The majority of the C20/20 acquired and nominated parcels adjoined or were near the larger state-managed conservation lands, referred to as the Yucca Pens Unit (YPU) of the BWWMA. Lands that make up the YPU are within Florida Forever’s Charlotte Harbor Flatwoods project area. The 234-acre YPP consists of five separate nominations purchased through the C20/20 Program for a total cost of nearly \$1.65 million. YPP falls within the state’s Charlotte Harbor Flatwoods project area.

For over six years, Land Stewardship staff coordinated with FWC representatives on a management agreement for the C20/20 lands to be managed along with the state-owned YPU. Although no official agreement is in effect, county and state staff coordinate exotic control projects and hope to coordinate with prescribe fire. See Legal Obligations and Constraints section for additional information.

Relevant acquisition information on the five successfully acquired YPP nominations is located in Table 6.

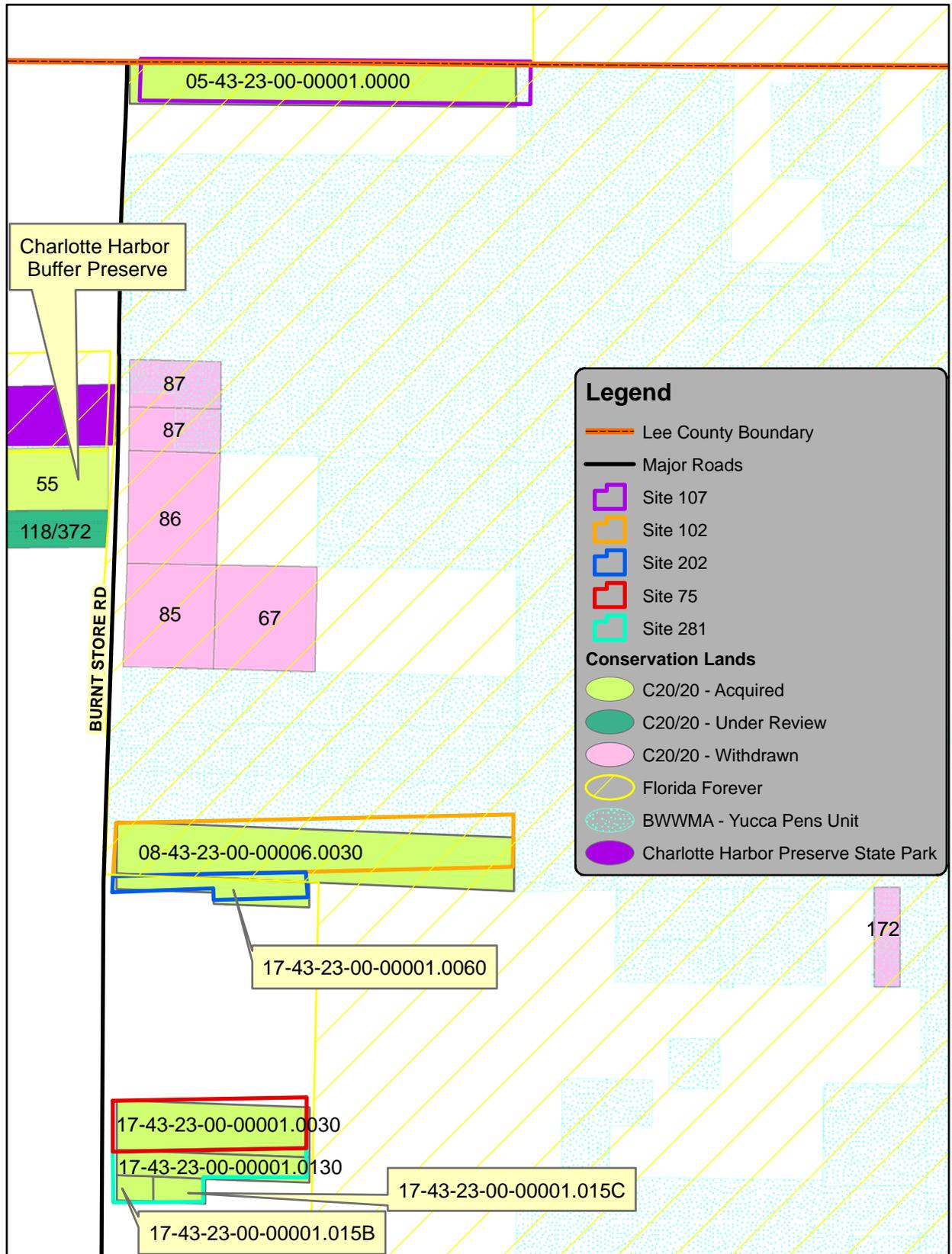
**Table 6: Yucca Pens Preserve Acquisition Information**

Site #	GIS Acres	PA Acres <sup>+</sup>	LCDCL Acres <sup>+</sup>	Acquisition \$	Date Acquired	STRAP#
75	39.0	38.2	38.9	\$100,000	10/29/99	17-43-23-00-00001.0030
102	83.6	83.37	83.02	\$310,000	3/03/00	08-43-23-00-00006.0030
107	66.0	64.9	66.01	\$264,000	3/30/00	05-43-23-00-00001.0000
202	15.5	15.47	14.5	\$72,500	3/21/03	17-43-23-00-00001.0060
281	29.9	28.1	28.6	\$900,900	1/31/06	17-43-23-00-00001.0130, 1.015B, 1.015C
<b>TOTALS</b>	<b>234.0</b>	<b>230.04</b>	<b>231.03</b>	<b>\$1,647,400</b>		
<sup>+</sup> Property Appraiser, Lee County Division of County Lands (LCDCL) and GIS acreages differ. For ease of understanding, this plan uses GIS acreages for all analysis and planning.						

Other nearby nominations to the C20/20 Program included seven parcels that were nominated, but not purchased. In December 1997, the first C20/20 nomination for the Yucca Pens area was a 40 acre parcel, nomination #67. In the summer of 1998, there were three other nominations (#85-87) adjacent to #67, each containing 36 acres. Two of these nominations have portions of Durden and Yucca Pen Creeks running through them. In July 1999, a 10 acre parcel, nomination #118, was located on the west side of the road and adjacent to one of Charlotte Harbor Buffer Preserve parcels. In October 2000, nomination #172 was another 10 acre parcel about one mile east of the YPP. A property recently nominated (summer of 2007) to the program is under review, nomination #372. The 31 acre parcel also includes 10 acres from a former nomination, #118. Figure 15 illustrates the acquired and nominated parcels by the C20/20 Program as well as state-managed conservation lands. In addition, Figure 15 shows that several of the withdrawn C20/20 nominations were eventually acquired by the state. There are many other undeveloped lands adjacent to YPP and the YPU that are in need of acquisition and preservation.

The Preserve’s future land use categories are shown on Figure 16 as “Conservation Lands,” further sub-categorized as 163 acres of “Uplands” and 99 acres of “Wetlands.” Currently, all of YPP is zoned as agriculture “AG-2” (Figure 17). Land Stewardship staff will coordinate with Lee County Division of Planning (LCDP) to change the zoning to “Environmentally Critical.”

# Figure 15: Acquisitions and Nominations Map







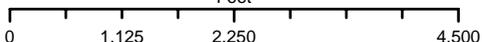
## Yucca Pens Preserve

S:\esri\C2020 ArcView\Yucca Pens Preserve\management plan\YPP\_acquisition.mxd

Prepared on: 07/23/07, by sfurnari@leegov.com

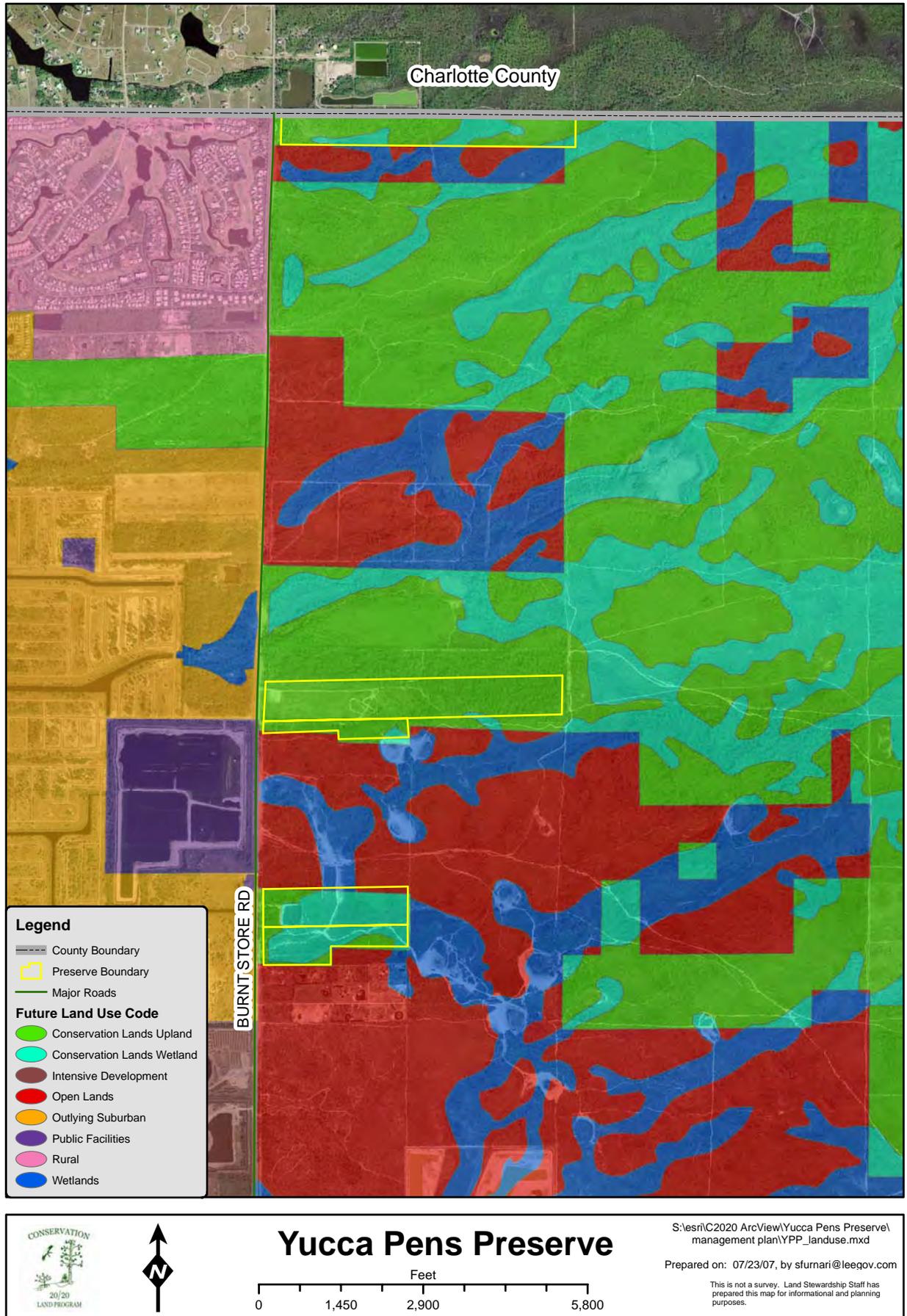
This is not a survey. Land Stewardship Staff has prepared this map for informational and planning purposes.

Feet

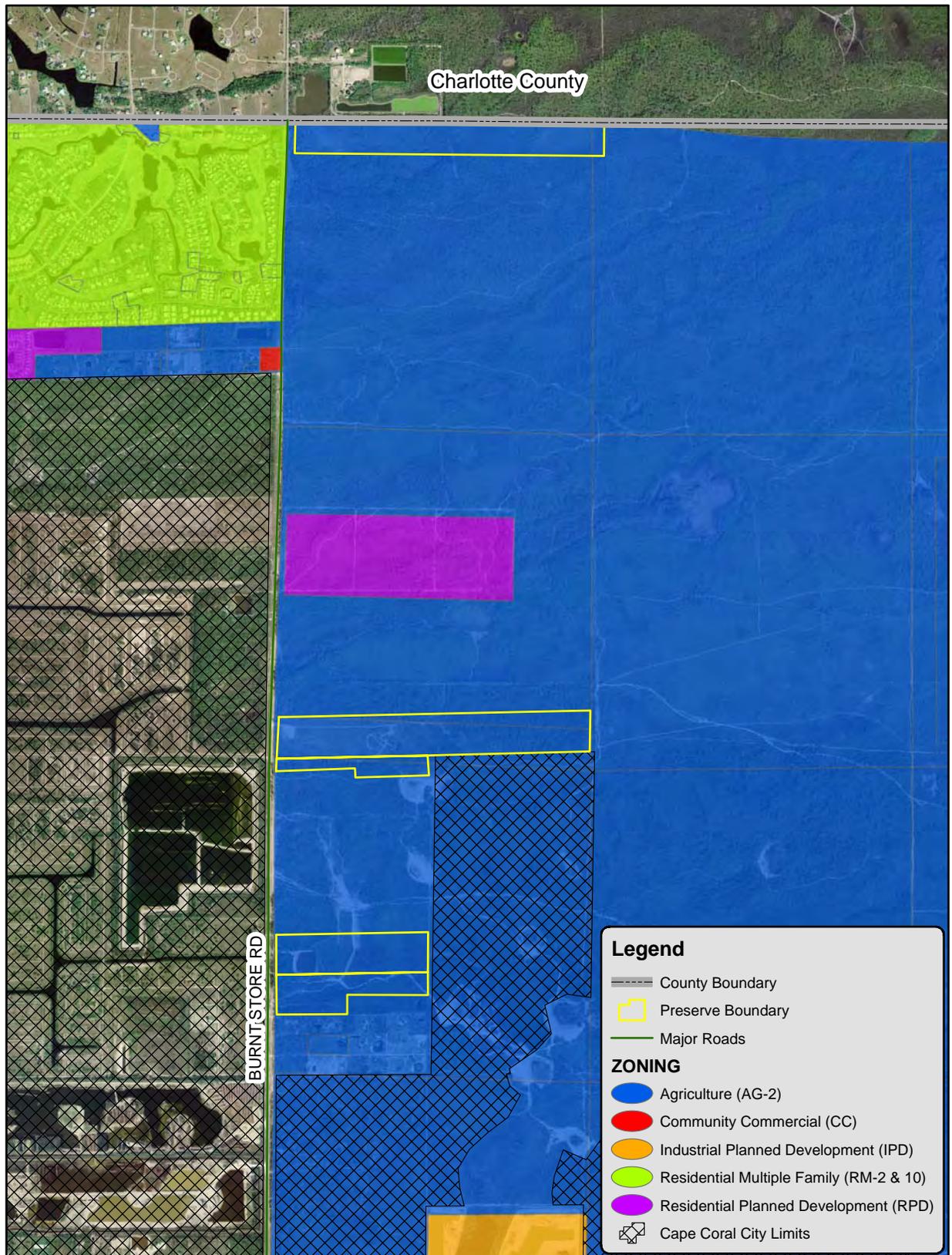


0      1,125      2,250      4,500

# Figure 16: Future Land Use Map



# Figure 17: Zoning Map





CONSERVATION  
20/20  
LAND PROGRAM



**Yucca Pens Preserve**

Feet

0      1,450      2,900      5,800

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Prepared on: 07/24/07, by sturnari@leegov.com

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

## VI. MANAGEMENT ACTION PLAN

### A. Management Unit Description

YPP has been divided into thirteen management units (MU) to better organize and achieve management goals. Figure 18 delineates the management units that were created based primarily upon man-made features, and each unit (except MU 9) consists of both upland and wetland plant communities.

- Management Unit 1 – 17.9 acres  
MU 1 is located in the northwestern portion of site #107. The dominant plant communities in this unit consist of mesic hammock and mixed mesic (flatwoods and hammock). The unit boundaries are Burnt Store Road to the west, the water treatment plant to the north, MU 2 to the east, and undeveloped land to the south. Previously, this unit had heavy infestations of melaleuca and some Brazilian pepper. Initial exotic plant control work was completed in 2001. Several follow-up control efforts have occurred and are still on-going. Old World climbing fern is widely scattered in this unit even after the BIPM Lygodium Strike Team's 2006 site visit. Contractor work crews will be hired for follow-up retreatment efforts. Stewardship activities here will focus on exotic plant retreatment, prescribed fire, boundary protection, photo point monitoring, and hydrologic enhancement.
- Management Unit 2 – 15.0 acres  
MU 2 is located in the central portion of site #107. Dominant plant communities in this unit consist of mixed mesic (flatwoods and hammock), prairie hammock and disturbed marsh. The unit boundaries are the water treatment plant to the north, private land to the south, MU 1 to the west and MU 3 to the east, with a Jeep trail along the eastern boundary. Initial exotic plant control work was completed in 2001 and follow-up control efforts have been on-going. Old World climbing fern is widely scattered in this unit even after the BIPM Lygodium Strike Team's 2006 site visit. Contractor work crews will be hired for follow-up retreatment efforts. Stewardship activities will focus on exotic plant retreatment, prescribed fire, boundary protection, photo point monitoring, and hydrologic enhancement.
- Management Unit 3 – 19.2 acres  
MU 3 is located in the central portion of site #107. Dominant plant communities in this unit consist of mesic flatwoods, wet prairie and depression marsh. The unit boundaries are state land to the north, private land to the south, MU 2 to the west and MU 4 to the east, with a Jeep trail

along the western boundary. Initial exotic plant control work was completed in 2002. Contractor work crews will be hired for follow-up retreatment efforts. Stewardship activities in this unit will focus on exotic plant retreatment, prescribed fire and boundary protection.

- Management Unit 4 – 13.9 acres  
MU 4 is located in the eastern portion of site #107. Dominant plant communities in this unit consist of scrubby, mesic and wet flatwoods. The unit boundaries are state land to the north and east, private land to the south, and MU 3 to the west. Initial exotic plant control work was completed in 2002. Contractor work crews will be hired for follow-up retreatment efforts. Stewardship activities in this unit will focus on exotic plant retreatment, prescribed fire and boundary protection.
- Management Unit 5 – 33.5 acres  
MU 5 is located in the western portion of site #102. Dominant plant communities in this unit consist of wet prairie and disturbed ruderal/spoil. The unit boundaries are Burnt Store Road to the west, state land to the north, MU 6 to the south, and MU 7 to the east. Previously, this unit had heavy infestations of melaleuca. Initial exotic plant control work was completed in 2001 by a Department of Corrections (DOC) crew with follow-up aerial treatment performed by FWC in March 2007. In June 2006, FWC fenced the western portion of YPP's boundary line. The unit has an elevated road/trail running east-west, deep ditches along northern and southern boundaries and extensive ATV/ORV damage. Stewardship activities will focus on exotic plant retreatment, prescribed fire, boundary protection, and hydrologic enhancement.
- Management Unit 6 – 15.5 acres  
MU 6 is the entire area of site #202. Dominant plant communities in this unit consist of mesic flatwoods and basin marsh. The unit boundaries are Burnt Store Road to the west, MU 5 and 7 to the north, private land to the south and east. There is a large ditch that physically divides sites #102 and #202. In June 2006, FWC fenced western, southern and eastern portions of the boundary. During March 2007, FWC performed initial aerial treatment on melaleuca infested locations. Stewardship activities will focus on exotic plant retreatment, prescribed fire, boundary protection, and hydrologic enhancement.
- Management Unit 7 – 12.2 acres  
MU 7 is located in the central portion of the site #102. Dominant plant communities in this unit consist of wet flatwoods and wet prairie. Most of this unit received initial exotic plant control work in 2001 by a DOC crew. A portion of this unit contains fallow agricultural land with ditches and notable furrows and several dumped items (i.e. roofing shingles, motorcycle, tires). The unit boundaries are MU 5 to the west, state land to

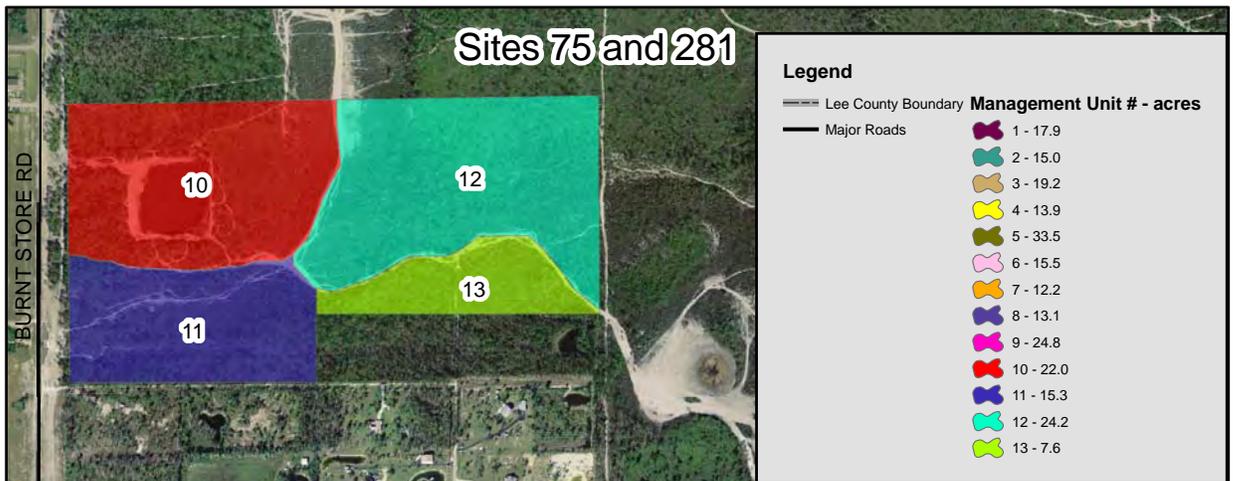
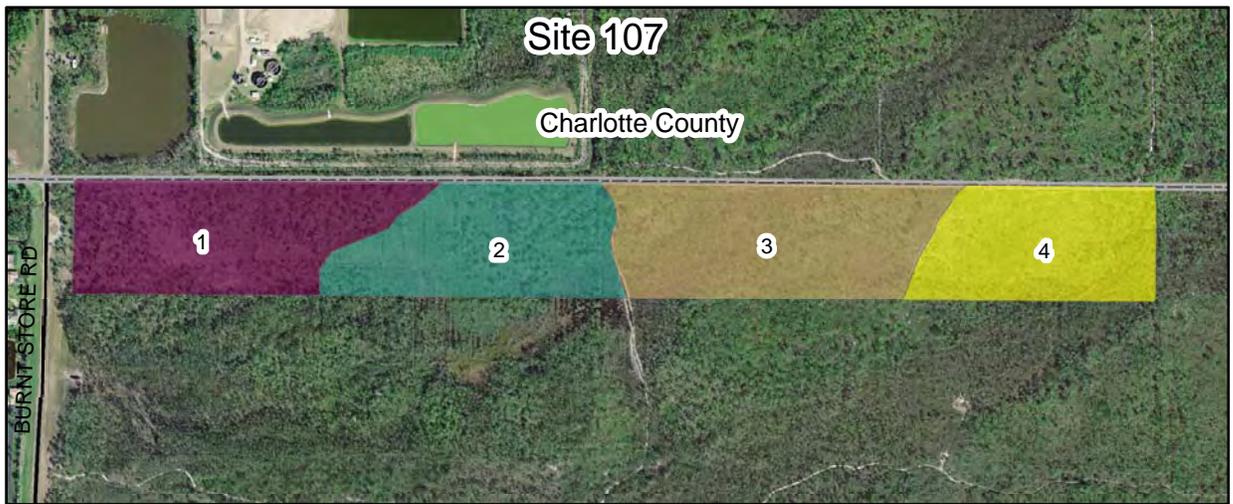
the north, MU 8 to the east and MU 6 and private lands to the south. In June 2006, FWC fenced southern portions of the boundary line. Stewardship activities will focus on exotic plant control and retreatment, prescribed fire, boundary protection, hydrologic enhancement, and trash removal.

- Management Unit 8 – 13.1 acres  
MU 8 is located in the central portion of site #102. Dominant plant communities in this unit consist of mixed mesic (flatwoods and hammock). This area is fallow agricultural land with ditches and notable furrows. The unit boundaries are the MU 7 to the west, state land to the north, MU 9 to the east, and private land to the south. In June 2006, FWC fenced the southern boundary line. Stewardship activities will focus on exotic plant control and retreatment, prescribed fire, boundary protection, and hydrologic enhancement.
- Management Unit 9 – 24.8 acres  
MU 9 is located in the eastern portion of site #102. Dominant plant communities in this unit consist of mixed mesic flatwoods and hammock. This area is fallow agricultural land with ditches and notable furrows. The unit boundaries are MU 8 to the west, state land to the north and east, and private land to the south. In June 2006, FWC fenced the southern boundary line. Stewardship activities will focus on exotic plant control and retreatment, prescribed fire, boundary protection, and hydrologic enhancement.
- Management Unit 10 – 22.0 acres  
MU 10 is located in the northwestern portion of site #75. Dominant plant communities in this unit consist of mesic flatwoods and the borrow pond. The unit boundaries are Burnt Store Road to the west, private land to the north, MU 12 to the east, and MU 11 to the south. Initial exotic plant removal work began in this unit in 2001 by a DOC crew. This unit is directly across the street from the Cape Coral Fire Department and has historically been an access point/meeting place for illegal ORV/ATV use and campfires. Stewardship activities will focus on exotic plant retreatment, prescribed fire, boundary protection, hydrologic enhancement, and trash removal.
- Management Unit 11 – 15.3 acres  
MU 11 is located along the western boundary of site #75 and contains most of site #281. Dominant plant communities in this unit consist of wet prairie and wet flatwoods. A portion of this unit (on site #75) received initial exotic plant control work in 2001 by a DOC crew. Extensive ORV/ATV damage has caused water to unnaturally collect in “trail-made shallow swales” and flow into roadway culverts. The unit boundaries are MU 10 to the north, Burnt Store Road to the west, undeveloped private

land the east, and developed private land to the south. James Walter Lane borders the southern boundary. This unit has some infestations of melaleuca, Brazilian pepper, and earleaf acacia. Stewardship activities will focus on exotic plant control and retreatment, prescribed fire, boundary protection, and hydrologic enhancement.

- Management Unit 12 – 24.2 acres  
MU 12 is located in the northeastern portion of sites #75 and #281. Dominant plant communities in this unit consist of mesic and wet flatwoods and wet prairie. Most of this unit (on site #75) received initial exotic plant control work in 2001 by a DOC crew. The unit boundaries are undeveloped private land to the north and east, MU 10 to the west, and MU 13 to the south. Jeep trails are along the western, southern and eastern boundaries. This unit has a minor infestation of melaleuca and Brazilian pepper. Stewardship activities will focus on exotic plant control and retreatment, prescribed fire, boundary protection, and hydrologic enhancement.
- Management Unit 13 – 7.6 acres  
MU 13 is located in the eastern portion of site #281. Dominant plant communities in this unit consist of mesic and wet flatwoods. The unit boundaries are MU 12 to the north, undeveloped private land to the east and south, and MU 11 to the west. Jeep trails run along the northern and eastern boundaries. This unit has some infestations of melaleuca and Brazilian pepper. Stewardship activities will focus on exotic plant control and retreatment, prescribed fire, boundary protection, and hydrologic enhancement.

# Figure 18: Management Units Map





CONSERVATION  
20/20  
LAND PROGRAM



## Yucca Pens Preserve

Feet

0 500 1,000 2,000

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Prepared on: 07/30/07, by sfurnari@leegov.com

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## **B. Goals and Strategies**

The long-term goals for the Preserve follow, but funding is currently not available to conduct all of these activities. Grants and/or monies budgeted to mitigate public infrastructure projects will be used to supplement the operations budget to meet our goals in a timely manner.

### ***Natural Resource Management***

- ✓ Exotic plant removal/maintenance
- ✓ Hydrologic restoration
- ✓ Prescribed fire management
- ✓ Monitor and protect listed species
- ✓ Photo point monitoring
- ✓ Exotic and feral animal removal
- ✓ Community restoration

### ***Overall Protection***

- ✓ Surveying, fencing and management access
- ✓ Debris removal and prevention of dumping
- ✓ Boundary and Preserve sign installation
- ✓ Install/Maintain fire breaks
- ✓ Termination of Easements
- ✓ Change Zoning designation

### ***Volunteers***

- ✓ Bird Patrol group

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

### ***Natural Resource Management***

#### **Exotic plant removal/maintenance**

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

Prior to each invasive exotic plant control project at YPP, a Prescription Form (located in the LSOM) will be filled out by Land Stewardship staff, reviewed by the contractor(s) and filed appropriately. All contractors involved in these projects will be required to fill out the Daily Report Control Form (located in the LSOM) and filed appropriately by staff.

- Uplands with light to moderate infestations:

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

- Uplands with moderate to heavy infestations:

In areas where the exotics occur as monotypic stands or are higher than 50% of the vegetation cover, the use of heavy equipment will be utilized in appropriate communities and during suitable season. Heavy equipment will be chosen so that soil disturbance and compaction are minimized. In areas along ditches where the hydric soils may not be conducive for heavy equipment, hand crews will be used to cut down and remove these plants. Heavy equipment may include mulching equipment such as the Brontosaurus or Gyrotrak. An excavator may be used in some areas to pull up the tree/stump (including roots). Tree debris will then either be pile burned or mulched. Follow-up treatment of these areas will include an application of an appropriate herbicide mixture to the foliage of any resprouts or seedlings. Land Stewardship staff will evaluate replanting on a case-by-case basis.

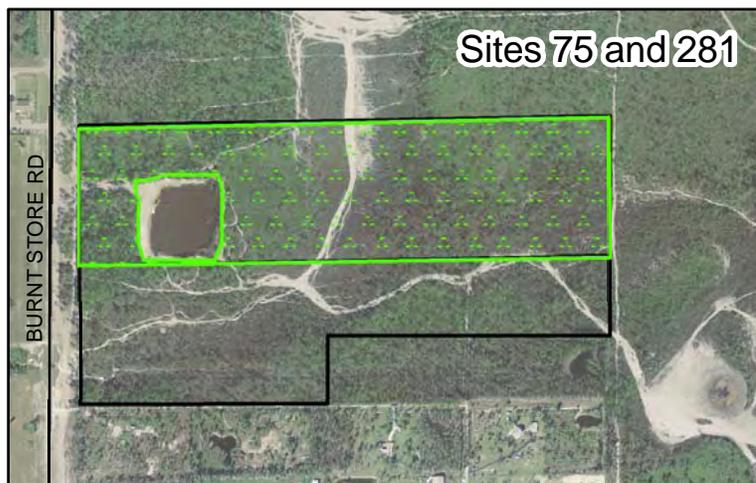
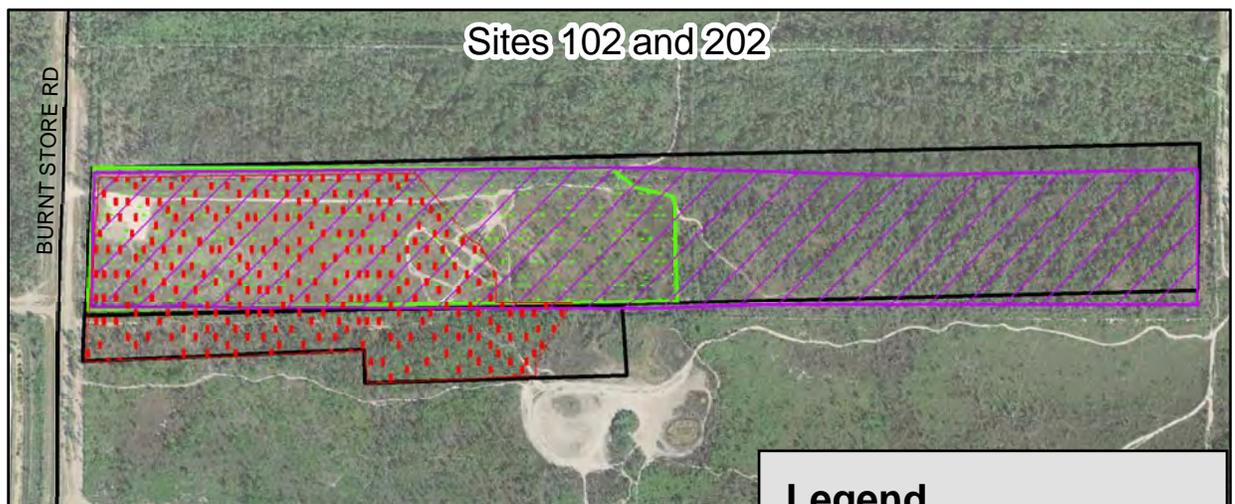
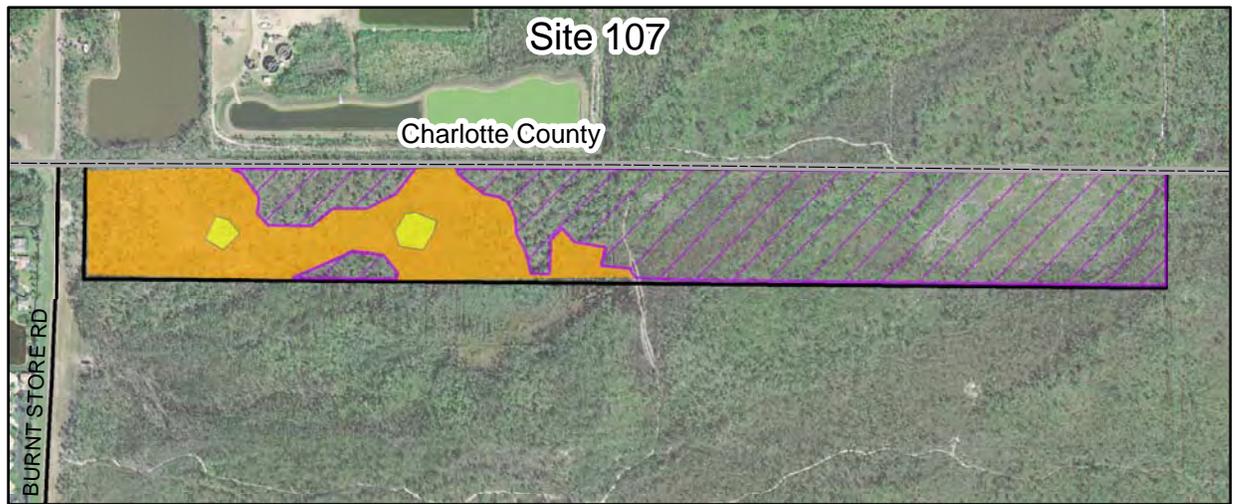
- Wetlands with light to moderate infestations:

Hand crews will need to hike in and foliar, girdle, basal bark, or cut-stump treat the exotics with the appropriate herbicide. Follow-up treatments will need to be done on an annual basis and may eventually decrease to every two years. Where feasible or necessary, biomass may be removed from wetland sites to be piled and burned and/or mulched.

Since 2001, nearly \$112,000 has been spent on initial exotic plant removal work (with some follow-up retreatment) on approximately 200 acres. The exotic plant

control efforts were funded by a combination of grants and the C20/20 management budget. The March 2007 exotic plant treatment by FWC, on parts of the Preserve, used an aerial application of “Velpar” and appears to have been successful in the control of melaleuca. These treated areas will be monitored and follow up treatment undertaken as needed. Further aerial applications might be considered in areas dominated by invasive exotic plants. Figure 19 illustrates areas that have received initial and follow-up exotic plant control efforts.

# Figure 19: Exotic Plant Control Map

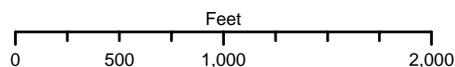


## Legend

- Lee County Boundary
- Preserve Boundary
- Major Roads
- Removal Method Used**
- Aerial Spraying
- Contractor Hand Crew
- Dept. of Correction Crew
- Heavy Equipment
- Lygodium Strike Team



## Yucca Pens Preserve



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## **Hydrologic restoration**

Land Stewardship staff will coordinate with SFWMD, Lee County Division of Natural Resources or other appropriate government representatives for hydrological restoration needs at YPP. Specifically, hydrologic restoration projects will include plugging and/or recontouring east-west ditches (Figure 7) to restore historic north-south flows. Additional hydrologic restoration projects will include creating gradual slopes and fish trap areas along the littoral zones within the borrow pond (site #75) to increase foraging habitats for wading birds and other wildlife. Another potential enhancement area is site #281 where a deep ORV trail has unnaturally carved/created a “streambed” that shunts water from the Preserve towards roadway culverts.

## **Prescribed fire management**

A prescribed fire program will be implemented that closely mimics the natural fire regimes for the different plant communities to increase plant diversity and ensure tree canopies remain open. Once restoration projects are completed in management units that contain fire dependent communities, a prescribed fire management program will be implemented after the creation of appropriate fire lines/breaks (Figure 20). The timing of prescribed burning will be influenced by seasonal rain and wind patterns. The Conservation 20/20 Burn Team Coordinator has coordinated with the FDOF to finalize the C20/20-wide Fire Management Plan that will apply to all Preserves.

Prescribed fire may be utilized for exotic plant control of seedling/sapling melaleuca in areas previously treated.

C20/20 will coordinate prescribed burn efforts at the Preserve with the manager of adjacent conservation lands (FWC) and inform adjacent neighbors of imminent burn plans.

## **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 bald eagle, wood stork and cardinal airplant. These species will benefit from exotic plant control and hydrological restoration activities. During stewardship activities, efforts will be made to minimize negative impacts to listed species.

YPP is part of a countywide quarterly site inspection program conducted for all C20/20 preserves. A copy of the site inspection form is available in the Land Stewardship Operations Manual. 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.

### **Photo point monitoring**

During 2001 and 2002, three photo point monitoring stations (see Figure 14) were installed on site #107, where Lee County's first restoration project using the Brontosaurus heavy equipment took place. The purpose of the photo points are to have an illustration of the long-term restoration of the area that can be used for educational programs. A pre-restoration photo was taken, followed by post restoration photos. Additional follow-up restoration photos are taken during quarterly site inspections. Photos will be taken as needed from then on or photo points will be removed after staff have evaluated this effort in four years.

### **Exotic and feral animal removal**

Ten exotic animal species have been recorded on YPP (see Fauna section). Although the melaleuca weevil and psyllid are non-native animals, they are beneficial biological control agents targeting the invasive melaleuca tree. 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. If practical, a methodology will be established and implemented against other unwanted exotic animal species.

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

### **Community restoration**

Several areas of the Preserve require community restoration; these include agricultural land that has been left fallow for many years, ORV trails that criss-cross the Preserve and an area of highly disturbed land prepared for hurricane debris, spoil dumping and as a staging area for the agricultural practices that occurred on the site.

All historic agricultural land within the Preserve has undergone succession to some degree and can be classified into one or more of the FNAI native plant community categories. However, several of these agricultural areas are still furrowed. Where possible, these areas will be regraded by intermittently leveling the elevated soils. This should allow a mosaic pattern of water to pool and

percolate into the ground, allowing for a more natural flow of water through the Preserve.

ORV trails, including; loops, “donuts”, jumps and staging areas will be regraded, disked and where possible/necessary replanted to match the surrounding native community unless the trails are needed for internal fire breaks.

The area of highly disturbed land (Hurricane Charley’s debris staging area - approximately ½ acre) on site #102 will be restored and replanted with native species, if necessary.

### **Overall Protection**

#### **Surveying, fencing and management access**

Site #107 currently does not have a boundary survey. It is important for the protection of the Preserve that Land Stewardship staff is able to delineate county property from that of the private property owners around them.

Sites #107, #102 & #202 are currently fenced to some degree; these existing fences will be maintained as needed. Additional fence installation will be required along the boundary of sites #75 & #281 to eliminate illegal recreational use of the site. The southern boundary of site #107 will also require fencing to eliminate ORV trespassing from the private property that borders the Preserve. Figure 20 depicts the boundaries where fencing is required. Areas contiguous with other conservation lands will not be fenced to allow the passage of wildlife easily within these areas.

#### **Debris removal and prevent dumping**

YPP has some debris scattered throughout portions of the Preserve. Staff anticipates that during restoration activities, the debris will be removed. However, several workdays may be required to remove the trash that has accumulated through the years of illegal recreational use. Since the Preserve is adjacent to Burnt Store Road, most of the trash from “litter bugs” will be picked up along the roadway and drainage easements by other county staff. During quarterly site inspections, any additional objects that are encountered will be removed. C20/20 Rangers will also assist with removing small items when they are on patrol at the Preserve.

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

## **Boundary and 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 or staff 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. Three signs (one for each area) will be installed along Burnt Store Road that will inform the public of the Preserve's name, acquisition information, public use category, C20/20 website address, and contact information.

## **Install/maintain fire breaks**

Fire breaks will be created, where needed, to reduce the potential damage to areas outside the Preserve from a wildfire or prescribed fire. Additional fire breaks will be installed, as needed, for prescribed fire stewardship actions. Land Stewardship staff will coordinate fire break installation and maintenance on the common boundary with other conservation lands. Figure 20 shows existing and needed fire breaks within the Preserve.

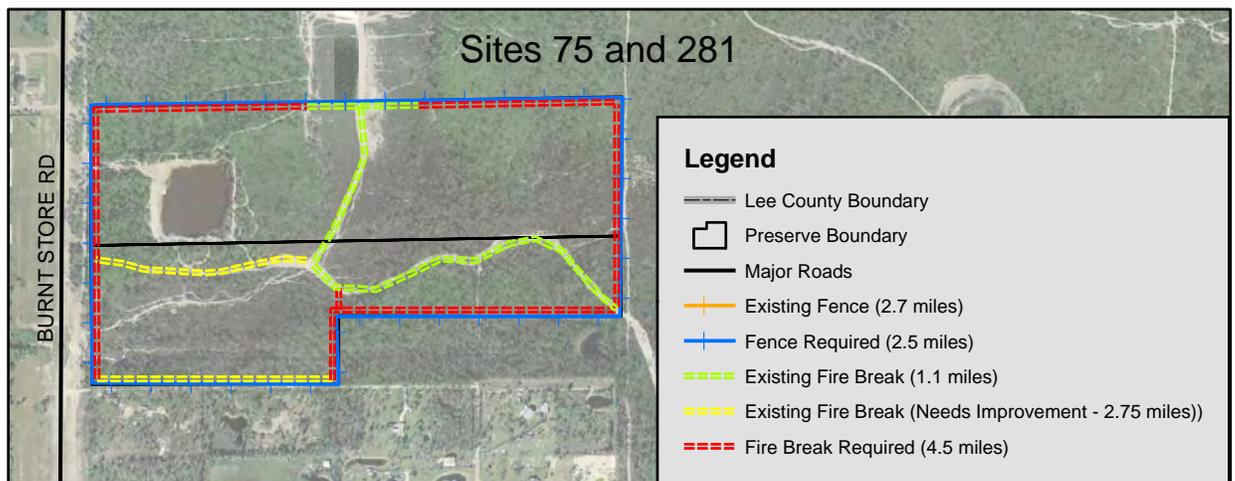
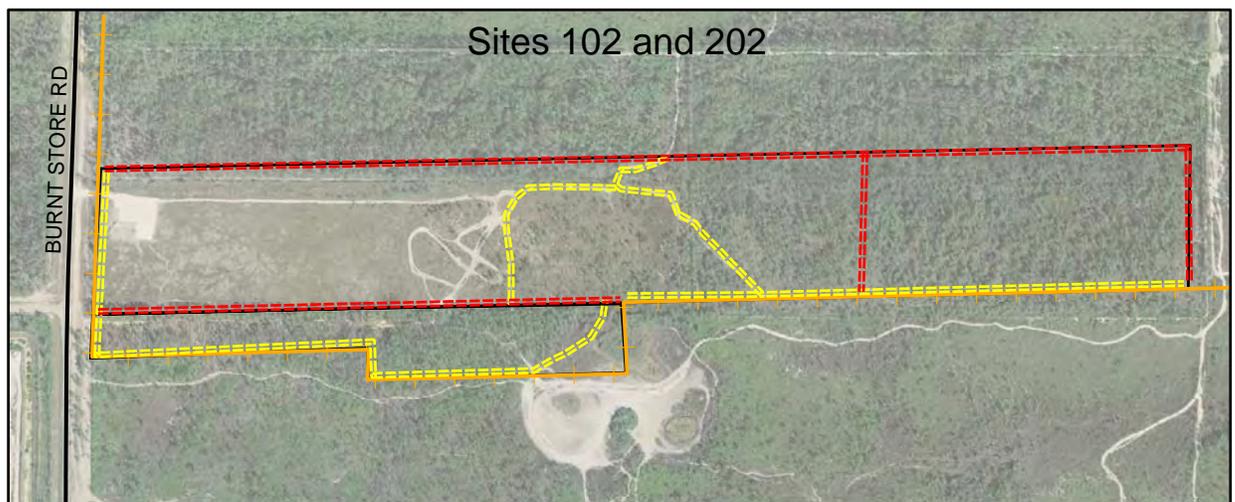
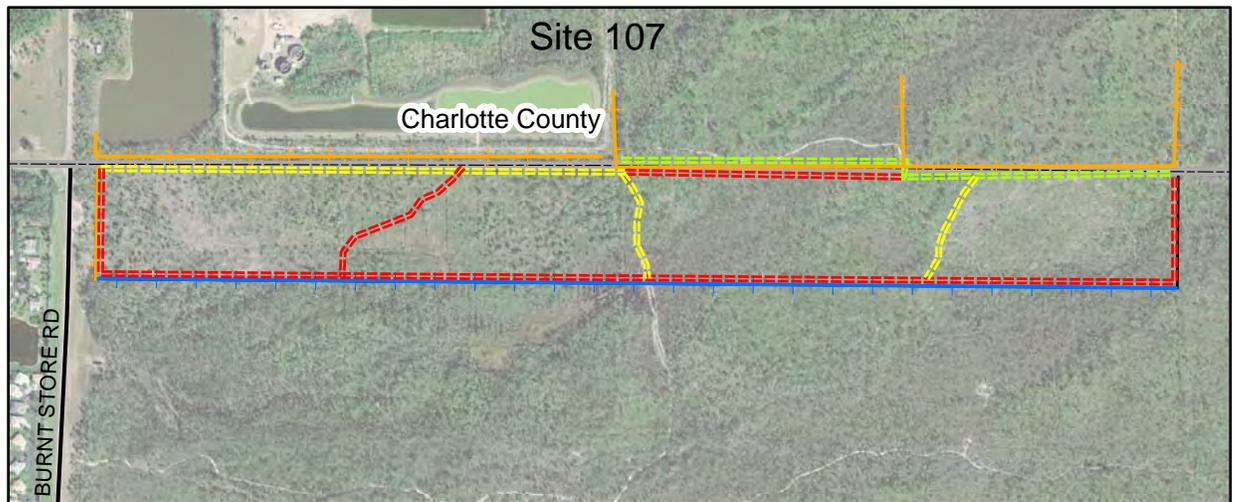
## **Termination of Easements**

Where possible, Land Stewardship staff will seek to terminate the agreements for easements that unnecessarily intrude upon the Preserve; specifically easements within the southern portion of site #281.

## **Change Zoning designation**

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

# Figure 20: Fence Line & Fire Breaks Map

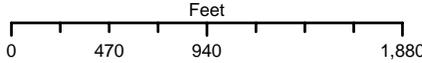






## Yucca Pens Preserve

Feet



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Prepared on: 10/10/07, by sfurnari@leegov.com

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## Volunteers

### **Bird Patrol volunteers**

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.*

Since 2002, the Lee County Bird Patrol volunteer group has actively performed bird monitoring surveys at this Preserve. On a monthly basis for five years, at least one of the volunteers has traveled to this site to record bird sightings on site #107. Staff will coordinate with Bird Patrol members to evaluate possibly expanding the monitoring effort to other areas of the Preserve.

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 (October 2007 – October 2012)**

Management Activity	Oct-07	Jan-08	Apr-08	Jul-08	Oct-08	Jan-09	Apr-09	Jul-09	Oct-09	Jan-10	Apr-10	Jul-10	Oct-10	Jan-11	Apr-11	Jul-11	Oct-11	Jan-12	Apr-12	Jul-12	Oct-12	2013 or later
<b>Natural Resource Management</b>																						
<b>Exotic Plants</b>																						
Initial exotic plant control							281															
<b>Fire</b>																						
Install additional firebreaks			75/281				107,102,202															
Perform prescribed fire							X			X	X			X	X			X	X			X
<b>Hydrologic Restoration</b>																						
Fill &/or plug ditches																						X
Impede ORV formed "streambed"																						X
Enhance borrow pond & plant vegetation																						X
<b>Habitat/Community Restoration</b>																						
Reduce elevated furrows																						X
Level ORV created berms							102															X
Enhance hurricane staging area																						X
<b>Maintenance (On-going/Annual)</b>																						
Exotic plant control		107				107	102/202			75		281		107	102/202			75	281			→
Exotic animal monitor &/or removal																X	→	→	→	→	→	→
Fire break mow/disk		X				X				X				X				X				→
Photo point surveys	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	Re-eval need						
<b>Overall Protection</b>																						
Remove trash						102/75	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Survey boundary (south line - 107)						X																
Install gate &/or fence			75/281						107													
Terminate unnecessary easements																X						
Install Preserve's identification signs				X																		
Change Zoning category										X												
<b>Volunteers</b>																						
Bird patrol	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→

Numbers correspond to site nominations 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. Possible funding for these projects may be requested through grants from agencies such as SFWMD, FDEP and USFWS as well as mitigation opportunities. Projected costs and funding sources are listed in Appendix D.

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## **X. APPENDICES**

Appendix A: Fish Sampling Data

Appendix B: Plant Species List

Appendix C: Wildlife Species List

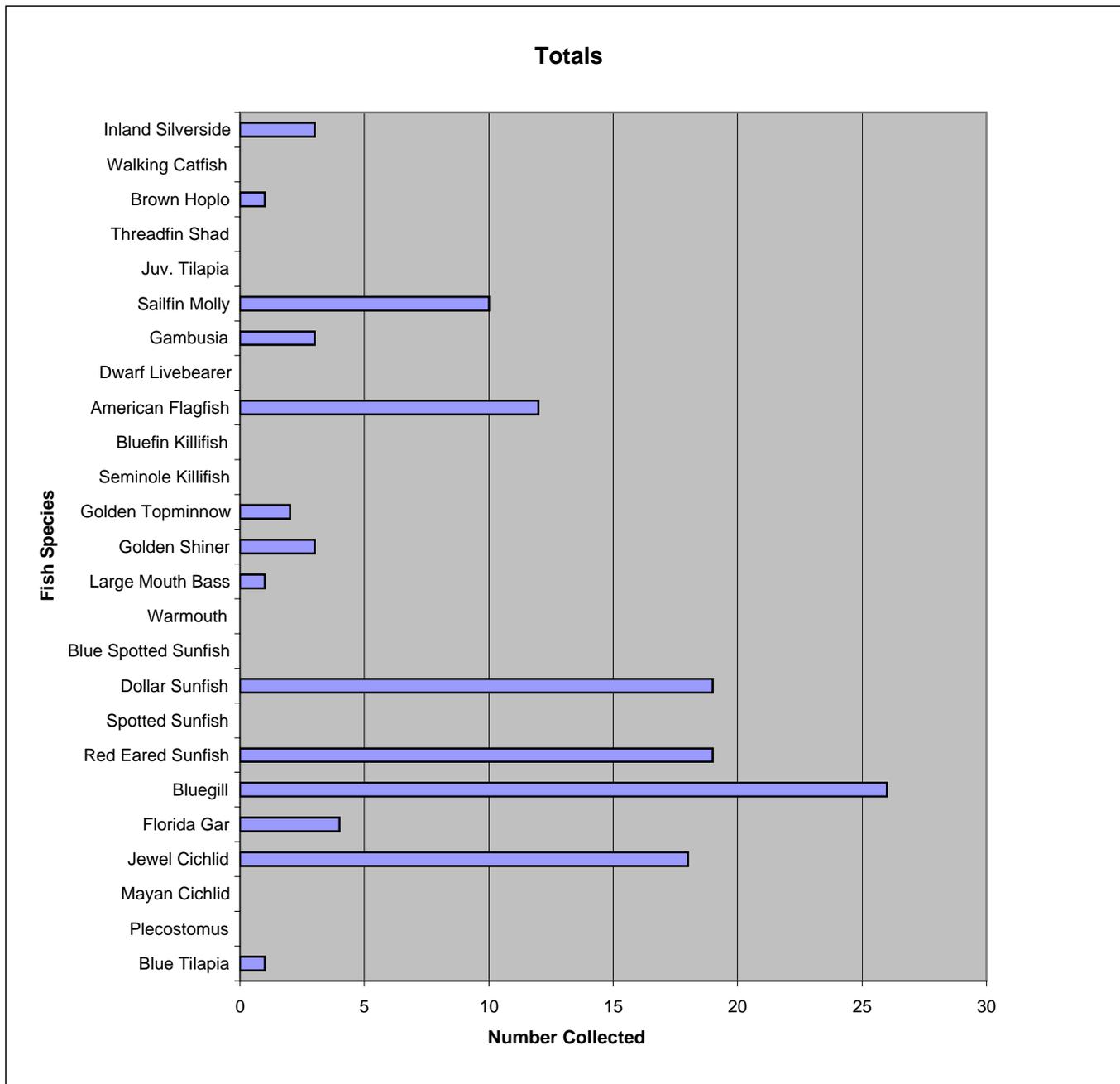
Appendix D: Projected Costs and Funding Sources

## Appendix A: Fish Sampling Data

Site:	Yucca Pens
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Date	Sampling Method	Weather	pH	Temp	DO	Species	Size	#
18-Jul-07	Cast Net	clear		31.5C	4.4mg/L	Florida Gar	17"	1
						Bluegill	2-3"	7
						Dollar Sunfish	1.5-2.5"	5
						Red Eared Sunfish	2-4"	11
						Golden Shiner	4"	1
						Blue Tilapia	11"	1
	Seine net					Inland Silverside	2"	3
						Dollar Sunfish	2-2.5"	6
						Jewel Cichlid	2"	1
	Breder Traps					Gambusia		3
						Dollar Sunfish	2"	4
						American Flagfish		8
						Jewel Cichlid		7
20-Jul-07	Cast net					Red Eared Sunfish	2.5"	8
						Bluegill	1.5-6"	19
						Dollar Sunfish	1-2"	4
						Florida Gar	14-20"	3
						Golden Shiner	3-4"	2
						Brown Hoplo	8"	1
	Breder Traps					Marsh Killifish	2"	1
						Jewel Cichlid	2-3"	10
						Sailfin Molly	1-2"	10
						American Flagfish	1-1.5"	4
						Golden Topminnow	1.5"	2
						Gambusia		
						Largemouth Bass	3"	1

Species	Totals
Blue Tilapia	1
Plecostomus	0
Mayan Cichlid	0
Jewel Cichlid	18
Florida Gar	4
Bluegill	26
Red Eared Sunfish	19
Spotted Sunfish	0
Dollar Sunfish	19
Blue Spotted Sunfish	0
Warmouth	0
Large Mouth Bass	1
Golden Shiner	3
Golden Topminnow	2
Seminole Killifish	0
Bluefin Killifish	0
American Flagfish	12
Dwarf Livebearer	0
Gambusia	3
Sailfin Molly	10
Juv. Tilapia	0
Threadfin Shad	0
Brown Hoplo	1
Walking Catfish	0
Inland Silverside	3
Marsh Killifish	1



## Appendix B: Plant Species List

## Appendix B: Plant Species List for Yucca Pens Preserve

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

Scientific Name	Common Name	Native Status	FDACS	IRC	EPPC	FNAI
<b>Family: Blechnaceae (midsorus)</b>						
<i>Blechnum serrulatum</i>	swamp fern	native				
<i>Woodwardia virginica</i>	Virginia chain fern	native		R		
<b>Family: Osmundaceae (royal fern)</b>						
<i>Osmunda regalis</i>	royal fern	native	CE	R		
<b>Family: Polypodiaceae (polypody)</b>						
<i>Phlebodium aureum</i>	golden polypody	native				
<b>Family: Pteridaceae (brake fern)</b>						
<i>Acrostichum danaeifolium</i>	giant leather fern	native				
<b>Family: Schizaeaceae (curly-grass)</b>						
<i>Lygodium microphyllum</i>	Old World climbing fern	exotic			I	
<b>Family: Thelypteridaceae (marsh fern)</b>						
<i>Thelypteris kunthii</i>	widespread maiden fern	native				
<b>Family: Pinaceae (pine)</b>						
<i>Pinus elliotii</i> var. <i>densa</i>	south Florida slash pine	native				
<b>Family: Alismataceae (water plantain)</b>						
<i>Sagittaria graminea</i>	grassy arrowhead	native		R		
<i>Sagittaria latifolia</i>	duck potato	native				
<b>Family: Araliaceae (ginseng)</b>						
<i>Centella asiatica</i>	spadeleaf	native				
<b>Family: Arecaceae (palm)</b>						
<i>Sabal palmetto</i>	cabbage palm	native				
<i>Serenoa repens</i>	saw palmetto	native				
<b>Family: Bromeliaceae (pineapple)</b>						
<i>Tillandsia fasciculata</i>	cardinal airplant	native	E			
<i>Tillandsia usneoides</i>	Spanish moss	native				
<b>Family: Cyperaceae (sedge)</b>						
<i>Cyperus ligularis</i>	swamp flatsedge	native				
<i>Eleocharis cellulosa</i>	gulf coast spikerush	native				
<i>Fimbristylis puberula</i>	hairy fimbry	native		I		
<i>Fuirena scirpoidea</i>	southern umbrellasedge	native				
<i>Rhynchospora colorata</i>	starrush whitetop	native				
<i>Rhynchospora tracyi</i>	Tracy's beaksedge	native		R		
<i>Scleria</i> sp.	nutrush	native				
<b>Family: Eriocaulaceae (pipewort)</b>						
<i>Eriocaulon compressum</i>	flattened pipewort	native		R		
<i>Eriocaulon decangulare</i>	tenangle pipewort	native		R		
<i>Syngonanthus flavidulus</i>	yellow hatpins	native		R		
<b>Family: Haemodoraceae (bloodwort)</b>						
<i>Lachnanthes carolina</i>	Carolina redroot	native				
<b>Family: Hydrocharitaceae (frog's-bit)</b>						
<i>Egeria densa</i>	Brazilian waterweed	exotic				
<b>Family: Hypoxidaceae (yellow stargrass)</b>						
<i>Hypoxis juncea</i>	fringed yellow stargrass	native				
<b>Family: Juncaceae (rush)</b>						
<i>Juncus marginatus</i>	shore rush	native		R		
<i>Juncus megacephalus</i>	bighead rush	native		R		
<i>Juncus roemerianus</i>	needle rush	native		I		
<b>Family: Orchidaceae (orchid)</b>						
<i>Habenaria floribunda</i>	toothpetal false reinorchid	native				

## Appendix B: Plant Species List for Yucca Pens Preserve

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

Scientific Name	Common Name	Native Status	FDACS	IRC	EPPC	FNAI
<b>Family: Poaceae (grass)</b>						
<i>Andropogon glomeratus</i> var. <i>glaucoopsis</i>	purple bluestem	native		R		
<i>Andropogon virginicus</i>	chalky bluestem	native		R		
<i>Aristida purpurascens</i>	arrowfeather threeawn	native				
<i>Aristida spiciformis</i>	bottlebrush threeawn	native		R		
<i>Aristida stricta</i>	wiregrass	native				
<i>Dactyloctenium aegyptium</i>	durban crowfootgrass	exotic				
<i>Dichantherium erectifolium</i>	erectleaf witchgrass	native		R		
<i>Eragrostis</i> sp.	lovegrass	depends on species				
<i>Eustachys glauca</i>	saltmarsh fingergrass	native				
<i>Imperata cylindrica</i>	cogongrass	exotic			I	
<i>Muhlenbergia capillaris</i> var. <i>filipes</i>	gulf hairawn muhly	native				
<i>Panicum repens</i>	torpedograss	exotic			I	
<i>Rhynchelytrum repens</i>	rose natalgrass	exotic			I	
<i>Setaria parviflora</i>	knotroot foxtail	native				
<i>Sporobolus indicus</i>	smutgrass	exotic				
<i>Sporobolus junceus</i>	pineywoods dropseed	native				
<b>Family: Potamogetonaceae (pondweed)</b>						
<i>Potamogeton illinoensis</i>	Illinois pondweed	native				
<b>Family: Smilacaceae (smilax)</b>						
<i>Smilax auriculata</i>	earleaf greenbrier	native				
<i>Smilax laurifolia</i>	laurel greenbrier	native				
<i>Smilax tamnoides</i>	bristly greenbrier	native		I		
<b>Family: Typhaceae (cattail)</b>						
<i>Typha latifolia</i>	broadleaf cattail	native		R		
<b>Family: Xyridaceae (yelloweyed grass)</b>						
<i>Xyris</i> sp.	yelloweyed grass	native				
<b>Family: Acanthaceae (acanthus)</b>						
<i>Ruellia caroliniensis</i>	Carolina wild petunia	native		I		
<b>Family: Amaranthaceae (amaranth)</b>						
<i>Iresine diffusa</i>	Juba's bush	native				
<b>Family: Anacardiaceae (cashew)</b>						
<i>Schinus terebinthifolius</i>	Brazilian pepper	exotic			I	
<i>Toxicodendron radicans</i>	eastern poison ivy	native				
<b>Family: Annonaceae (custard-apple)</b>						
<i>Asimina reticulata</i>	netted pawpaw	native				
<b>Family: Apiaceae (carrot)</b>						
<i>Oxypolis filiformis</i> subsp. <i>filiformis</i>	water cowbane	native				
<i>Ptilimnium capillaceum</i>	mock bishopsweed	native				
<b>Family: Apocynaceae (dogbane)</b>						
<i>Asclepias lanceolata</i>	fewflower milkweed	native		R		
<i>Sarcostemma clausum</i>	white twinevine	native		R		
<b>Family: Aquifoliaceae (holly)</b>						
<i>Ilex cassine</i>	dahoon	native				
<i>Ilex glabra</i>	gallberry	native				

## Appendix B: Plant Species List for Yucca Pens Preserve

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

Scientific Name	Common Name	Native Status	FDACS	IRC	EPPC	FNAI
<b>Family: Asteraceae (aster)</b>						
<i>Ambrosia artemisiifolia</i>	common ragweed	native				
<i>Baccharis angustifolia</i>	saltwater falsewillow	native		R		
<i>Baccharis halimifolia</i>	groundsel tree	native				
<i>Bidens alba</i>	beggerticks	native				
<i>Bigelovia nudata subsp. Australis</i>	pineland rayless goldenrod	native		R		
<i>Chaptalia tomentosa</i>	pineland daisy	native				
<i>Cirsium horridulum</i>	purple thistle	native				
<i>Coreopsis floridana</i>	Florida tickseed	native		I		
<i>Coreopsis leavenworthii</i>	Leavenworth's tickseed	native				
<i>Emilia sonchifolia</i>	lilac tasselflower	exotic				
<i>Erechtites hieraciifolius</i>	fireweed	native				
<i>Eupatorium capillifolium</i>	dogfennel	native				
<i>Euthamia caroliniana</i>	slender flattop goldenrod	native				
<i>Flaveria linearis</i>	narrowleaf yellowtops	native				
<i>Iva microcephala</i>	piedmont marshelder	native				
<i>Mikania cordifolia</i>	Florida Keys hempvine	native		R		
<i>Mikania scandens</i>	climbing hempvine	native				
<i>Petrocaulon pycnostachyum</i>	blackroot	native				
<i>Pityopsis graminifolia</i>	narrowleaf silkgrass	native				
<i>Pluchea odorata</i>	sweetscent	native				
<i>Pluchea rosea</i>	rosy camphorweed	native				
<i>Rudbeckia hirta</i>	blackeyed Susan	native		R		
<i>Solidago odora var. chapmanii</i>	Chapman's goldenrod	native				
<i>Solidago stricta</i>	wand goldenrod	native				
<b>Family: Casuarinaceae (sheoak)</b>						
<i>Casuarina equisetifolia</i>	Australian-pine	exotic			I	
<b>Family: Chrysobalanaceae (coco plum)</b>						
<i>Licania michauxii</i>	gopher apple	native				
<b>Family: Convolvulaceae (morning-glory)</b>						
<i>Ipomoea sagittata</i>	saltmarsh morning-glory	native				
<b>Family: Cusiaceae (mangosteen)</b>						
<i>Hypericum brachyphyllum</i>	coastalplain St. John's-wort	native				
<i>Hypericum cistifolium</i>	roundpod St. John's-wort	native				
<i>Hypericum fasciculatum</i>	sandweed	native				
<i>Hypericum reductum</i>	Atlantic St. John's-wort	native				
<i>Hypericum tetrapetalum</i>	fourpetal St. John's-wort	native				
<b>Family: Droseraceae (sundew)</b>						
<i>Drosera capillaris</i>	pink sundew	native		R		
<b>Family: Ericaceae (heath)</b>						
<i>Lyonia fruticosa</i>	coastalplain staggerbush	native				
<b>Family: Euphorbiaceae (spurge)</b>						
<i>Stillingia aquatica</i>	corkwood	native		R		
<i>Stillingia sylvatica</i>	queensdelight	native		R		
<b>Family: Fabaceae (pea)</b>						
<i>Acacia auriculiformis</i>	earleaf acacia	exotic			I	
<i>Crotalaria spectabilis</i>	showy rattlebox	exotic				
<i>Leucaena leucocephala</i>	white leadtree	exotic			II	
<i>Mimosa quadrivalvis</i>	sensitive brier	native				
<i>Mimosa strigillosa</i>	powderpuff	native		I		
<i>Sesbania spp.</i>	Sesban	exotic				

## Appendix B: Plant Species List for Yucca Pens Preserve

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

Scientific Name	Common Name	Native Status	FDACS	IRC	EPPC	FNAI
<b>Family: Fagaceae (beech)</b>						
<i>Quercus geminata</i>	sand live oak	native				
<i>Quercus laurifolia</i>	laurel oak	native				
<i>Quercus virginiana</i>	live oak	native				
<b>Family: Gentianaceae (gentian)</b>						
<i>Sabatia brevifolia</i>	shortleaf rosegentian	native		I		
<i>Sabatia stellaris</i>	rose-of-plymouth	native				
<b>Family: Haloragaceae (watermilfoil)</b>						
<i>Proserpinaca pectinata</i>	combleaf mermaidweed	native		R		
<b>Family: Lamiaceae (mint)</b>						
<i>Callicarpa americana</i>	American beautyberry	native				
<i>Hyptis alata</i>	musky mint	native				
<i>Physostegia purpurea</i>	eastern false dragonhead	native		I		
<i>Piloblephis rigida</i>	wild pennyroyal	native		R		
<i>Salvia lyrata</i>	lyreleaf sage	native		CI		
<b>Family: Lauraceae (laurel)</b>						
<i>Cassytha filiformis</i>	love vine	native				
<i>Persea palustris</i>	swamp bay	native				
<b>Family: Lentibulariaceae (bladderwort)</b>						
<i>Pinguicula pumila</i>	small butterwort	native		R		
<i>Utricularia cornuta</i>	horned bladderwort	native		R		
<b>Family: Malvaceae (mallow)</b>						
<i>Melochia corchorifolia</i>	chocolateweed	exotic				
<i>Urena lobata</i>	caesarweed	exotic			II	
<b>Family: Melastomataceae (melastome)</b>						
<i>Rhexia nuttallii</i>	Nuttall's meadowbeauty	native		I		
<b>Family: Menyanthaceae (bogbean)</b>						
<i>Nymphoides aquatica</i>	big floatingheart	native				
<b>Family: Myricaceae (bayberry)</b>						
<i>Myrica cerifera</i>	wax myrtle	native				
<b>Family: Myrsinaceae (myrsine)</b>						
<i>Rapanea punctata</i>	myrsine	native				
<b>Family: Myrtaceae (myrtle)</b>						
<i>Melaleuca quinquenervia</i>	punktree	exotic			I	
<i>Rhodomyrtus tomentosa</i>	rose myrtle	exotic			I	
<i>Syzygium cumini</i>	Java plum	exotic			I	
<b>Family: Onagraceae (eveningprimrose)</b>						
<i>Gaura angustifolia</i>	southern beeblossom	native				
<i>Ludwigia octovalvis</i>	Mexican primrosewillow	native				
<b>Family: Orobanchaceae (broomrape)</b>						
<i>Buchnera americana</i>	American bluehearts	native				
<b>Family: Passifloraceae (passionflower)</b>						
<i>Passiflora suberosa</i>	corkystem passionflower	native				
<b>Family: Polygalaceae (milkwort)</b>						
<i>Polygala baldunii</i>	Baldwin's milkwort	native		R		
<i>Polygala nana</i>	candyroot	native		R		
<b>Family: Rubiaceae (madder)</b>						
<i>Spermacoce verticillata</i>	shrubby false buttonweed	exotic				
<b>Family: Salicaceae (willow)</b>						
<i>Salix caroliniana</i>	Carolina or coastalplain willow	native				

## Appendix B: Plant Species List for Yucca Pens Preserve

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

Scientific Name	Common Name	Native Status	FDACS	IRC	EPPC	FNAI
<b>Family: Sapotaceae (sapodilla)</b>						
<i>Sideroxylon reclinatum</i>	Florida bully	native		R		
<b>Family: Tetrachondraceae (tetrachondra)</b>						
<i>Polypremum procumbens</i>	rustweed	native				
<b>Family: Turneraceae (turnera)</b>						
<i>Piriqueta cistoides</i>	pitted stripeseed	native				
<b>Family: Verbenaceae (vervain)</b>						
<i>Phyla nodiflora</i>	turkey tangle fogfruit	native				
<b>Family: Veronaceae (speedwell)</b>						
<i>Bacopa monnieri</i>	herb-of-grace	native				
<b>Family: Vitaceae (grape)</b>						
<i>Ampelopsis arborea</i>	peppervine	native				
<i>Vitis aestivalis</i>	summer grape	native		I		
<i>Vitis rotundifolia</i>	muscadine	native				

### Key

#### Florida EPPC Status

I = species that are invading and disrupting native plant communities

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

#### FDACS (Florida Department of Agriculture and Consumer Services)

E = Endangered

T = Threatened

CE = Commercially Exploited

#### IRC (Institute for Regional Conservation)

CI = Critically Imperiled

I = Imperiled

R = Rare

#### FNAI (Florida Natural Areas Inventory)

G= Global Status

T= Threatened

CE= Commercially Exploited

1= Critically imperiled because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.

2= Imperiled because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.

3= Either very rare and local throughout its range (21-200 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

4= Apparently secure

5= Demonstrably secure

## Appendix C: Wildlife Species List

## Appendix C: Wildlife Species List for Yucca Pens Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
<b>MAMMALS</b>				
<b>Family: Dasypodidae (armadillos)</b>				
<i>Dasypus novemcinctus</i>	nine-banded armadillo *			
<b>Family: Sciuridae (squirrels and their allies)</b>				
<i>Sciurus carolinensis</i>	eastern gray squirrel			
<b>Family: Felidae (cats)</b>				
<i>Lynx rufus</i>	bobcat			
<b>Family: Procyonidae (raccoons)</b>				
<i>Procyon lotor</i>	raccoon			
<b>Family: Suidae (old world swine)</b>				
<i>Sus scrofa</i>	feral hog *			
<b>Family: Cervidae (deer)</b>				
<i>Odocoileus virginianus</i>	white-tailed deer			
<b>BIRDS</b>				
<b>Family: Phalacrocoracidae (cormorants)</b>				
<i>Phalacrocorax auritus</i>	double-crested cormorant			
<b>Family: Anhingidae (anhingas)</b>				
<i>Anhinga anhinga</i>	anhinga			
<b>Family: Ardeidae (herons, egrets, bitterns)</b>				
<i>Ardea herodias</i>	great blue heron			
<i>Ardea alba</i>	great egret			G5/S4
<i>Egretta thula</i>	snowy egret	SSC		G5/S3
<i>Egretta caerulea</i>	little blue heron	SSC		
<i>Bubulcus ibis</i>	cattle egret			
<i>Butorides virescens</i>	green heron			
<i>Nycticorax nycticorax</i>	black-crowned night-heron			G5/S3
<i>Nyctanassa violacea</i>	yellow-crowned night-heron			G5/S3
<b>Family: Threskiornithidae (ibises and spoonbills)</b>				
<i>Eudocimus albus</i>	white ibis	SSC		G5/S4
<b>Family: Ciconiidae (storks)</b>				
<i>Mycteria americana</i>	wood stork	E	E	G4/S2
<b>Family: Carthartidae (new world vultures)</b>				
<i>Carthartes aura</i>	turkey vulture			
<i>Coragyps atratus</i>	black vulture			
<b>Family: Pandionidae (ospreys)</b>				
<i>Pandion haliaetus</i>	osprey			
<b>Family: Accipitrinae (hawks, kites, accipiters, harriers and eagles)</b>				
<b>Subfamily: Elaninae and Milvinae (kites)</b>				
<i>Elanoides forficatus</i>	swallow-tailed kite			G5/S2
<b>Subfamily: Buteoninae (buzzard hawks and eagles)</b>				
<i>Haliaeetus leucocephalus</i>	bald eagle	T	T	G4/S3
<i>Buteo jamaicensis</i>	red-tailed hawk			
<i>Buteo lineatus</i>	red-shouldered hawk			
<b>Family: Falconidae (falcons)</b>				
<b>Subfamily: Falconinae (falcons)</b>				
<i>Falco sparverius</i>	American kestrel			
<b>Family: Rallidae (coots and gallinules)</b>				
<i>Gallinula chloropus</i>	common moorhen			
<b>Family: Charadriidae (plovers)</b>				

## Appendix C: Wildlife Species List for Yucca Pens Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
<i>Charadrius vociferus</i>	killdeer			
<b>Family: Recurvirostridae (avocets and stilts)</b>				
<i>Himantopus mexicanus</i>	black-necked stilt			
<b>Family: Scolopacidae (sandpipers and phalaropes)</b>				
<i>Tringa solitaria</i>	solitary sandpiper			
<b>Family: Laridae (gulls)</b>				
<i>Larus atricilla</i>	laughing gull			
<b>Subfamily: Sterninae (terns)</b>				
<i>Sterna antillarum</i>	least tern	T		G4/S3
<i>Sterna hirundo</i>	common tern			
<b>Family: Columbidae (pigeons and doves)</b>				
<i>Zenaida macroura</i>	mourning dove			
<i>Columbina passerina</i>	common-ground dove			
<b>Family: Strigidae (true owls)</b>				
<i>Bubo virginianus</i>	great horned owl			
<b>Family: Caprimulgidae (goatsuckers)</b>				
<i>Chordeiles minor</i>	common nighthawk			
<b>Family: Alcedinidae (kingfishers)</b>				
<i>Ceryle alcyon</i>	belted kingfisher			
<b>Family: Picidae (woodpeckers)</b>				
<i>Colaptes auratus</i>	northern flicker			
<i>Dryocopus pileatus</i>	pileated woodpecker			
<i>Melanerpes carolinus</i>	red-bellied woodpecker			
<i>Picoides pubescens</i>	downy woodpecker			
<i>Picoides villosus</i>	hairy woodpecker			
<i>Sphyrapicus varius</i>	yellow-bellied sapsucker			
<b>Family: Tyrannidae (tyrant flycatchers)</b>				
<i>Myiarchus crinitus</i>	great crested flycatcher			
<i>Sayornis phoebe</i>	eastern phoebe			
<b>Family: Laniidae (shrikes)</b>				
<i>Lanius ludovicianus</i>	loggerhead shrike			
<b>Family: Vireonidae (vireos)</b>				
<i>Vireo griseus</i>	white-eyed vireo			
<b>Family: Corvidae (crows, jays, etc.)</b>				
<i>Cyanocitta cristata</i>	blue jay			
<i>Corvus brachyrhynchos</i>	American crow			
<i>Corvus ossifragus</i>	fish crow			
<b>Family: Hirundinidae (swallows)</b>				
<i>Tachycineta bicolor</i>	tree swallow			
<b>Family: Troglodytidae (wrens)</b>				
<i>Thryothorus ludovicianus</i>	Carolina wren			
<i>Troglodytes aedon</i>	house wren			
<b>Family: Sylviidae (gnatcatchers)</b>				
<i>Poliophtila caerulea</i>	blue-gray gnatcatcher			
<b>Family: Turdidae (thrushes)</b>				
<i>Sialia sialis</i>	eastern bluebird			
<i>Turdus migratorius</i>	American robin			
<b>Family: Mimidae (mockingbirds and thrashers)</b>				
<i>Toxostoma rufum</i>	brown thrasher			
<i>Dumetella carolinensis</i>	gray catbird			

## Appendix C: Wildlife Species List for Yucca Pens Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
<i>Mimus polyglottos</i>	northern mockingbird			
<b>Family: Parulidae (wood-warblers)</b>				
<i>Dendroica coronata</i>	yellow-rumped warbler			
<i>Dendroica virens</i>	black-throated green warbler			
<i>Dendroica dominica</i>	yellow-throated warbler			
<i>Dendroica pinus</i>	pine warbler			
<i>Dendroica discolor</i>	prairie warbler			
<i>Dendroica palmarum</i>	palm warbler			
<i>Geothlypis trichas</i>	common yellowthroat			
<b>Family: Emberizine (sparrows and their allies)</b>				
<i>Pipilo erythrophthalmus</i>	eastern towhee			
<i>Aimophila aestivalis</i>	Bachman's sparrow			G3/S3
<i>Passerculus sandwichensis</i>	Savannah sparrow			
<b>Family: Cardinalidae (cardinals, some grosbeaks, new world buntings, etc.)</b>				
<i>Cardinalis cardinalis</i>	northern cardinal			
<b>Family: Icteridae (blackbirds, orioles, etc.)</b>				
<i>Agelaius phoeniceus</i>	red-winged blackbird			
<i>Molothrus ater</i>	brown-headed cowbird			
<i>Quiscalus major</i>	boat-tailed grackle			
<i>Quiscalus quiscula</i>	common grackle			
<i>Sturnella magna</i>	eastern meadowlark			
<b>REPTILES</b>				
<b>Family: Kinosternidae (musk and mud turtles)</b>				
<i>Sternotherus odoratus</i>	common musk turtle			
<b>Family: Emydidae (box and water turtles)</b>				
<i>Terrapene carolina bauri</i>	Florida box turtle			
<b>Family: Polychridae (anoles)</b>				
<i>Anolis sagrei</i>	brown anole *			
<b>Family: Anguidae (glass and alligator lizards)</b>				
<i>Ophisaurus ventralis</i>	eastern glass lizard			
<b>Family: Colubridae (colubrids)</b>				
<i>Thamnophis sirtalis sirtalis</i>	eastern garter snake			
<i>Coluber constrictor priapus</i>	southern black racer			
<b>AMPHIBIANS</b>				
<b>Family: Leptodactylidae (tropical frogs)</b>				
<i>Eleutherodactylus planirostris planirostris</i>	greenhouse frog *			
<b>Family: Bufonidae (toads)</b>				
<i>Bufo terrestris</i>	southern toad			
<i>Bufo quercicus</i>	oak toad			
<b>Family: Hylidae (treefrogs)</b>				
<i>Acris gryllus dorsalis</i>	Florida cricket frog			
<i>Hyla cinerea</i>	green treefrog			
<i>Hyla femoralis</i>	pine woods treefrog			
<i>Hyla squirella</i>	squirrel treefrog			
<i>Osteopilus septentrionalis</i>	Cuban treefrog *			
<i>Pseudacris ocularis</i>	little grass frog			
<b>Family: Microhylidae (narrowmouth toads)</b>				
<i>Gastrophryne carolinensis</i>	eastern narrowmouth toad			
<b>Family: Ranidae (true frogs)</b>				

## Appendix C: Wildlife Species List for Yucca Pens Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
<i>Rana grylio</i>	pig frog			
<b>FISHES</b>				
<b>Family: Lepisosteidae (gar fish)</b>				
<i>Lepisosteus platyrhincus</i>	Florida gar			
<b>Family: Cyprinidae (minnows)</b>				
<i>Notemigonus crysoleucas</i>	golden shiner			
<b>Family: Callichthyidae (callichthyid armored catfishes)</b>				
<i>Hoplosternum littorale</i>	brown hoplo *			
<b>Family: Fundulidae (topminnows and killifishes)</b>				
<i>Fundulus confluentus</i>	marsh killifish			
<i>Fundulus chrysotus</i>	golden topminnow			
<b>Family: Cyprinodontidae (pupfishes)</b>				
<i>Jordanella floridae</i>	American flagfish			
<b>Family: Atherinopsidae (silversides)</b>				
<i>Menidia beryllina</i>	inland silverside			
<b>Family: Poeciliidae (livebearers)</b>				
<i>Poecilia latipinna</i>	sailfin molly			
<i>Gambusia spp.</i>	mosquitofish			
<b>Family: Centrarchidae (sunfishes basses)</b>				
<i>Micropterus salmoides</i>	largemouth bass			
<i>Lepomis macrochirus</i>	bluegill			
<i>Lepomis microlophus</i>	redeer sunfish			
<i>Lepomis marginatus</i>	dollar sunfish			
<b>Family: Cichlidae (cichlids)</b>				
<i>Hemichromis letourneauxi</i>	African jewelfish, jewel cichlid *			
<i>Oreochromis aureus</i>	blue tilapia *			
<b>INSECTS</b>				
<b>Family: Acrididae (grasshoppers)</b>				
<i>Romalea microptera</i>	eastern lubber grasshopper			
<b>Family: Psyllidae (psyllids)</b>				
<i>Boreioglycopsis melaleuca</i>	melaleuca psyllid *			
<b>Family: Curculionidae (true weevils)</b>				
<i>Oxyops vitiosa</i>	melaleuca weevil *			
<b>Family: Nymphalidae (brushfoots)</b>				
<b>Subfamily: Heliconiinae (longwings)</b>				
<i>Agraulis vanillae</i>	gulf fritillary			
<b>Subfamily: Nymphalinae (brushfoots)</b>				
<i>Anartia jatrophae</i>	white peacock			
<b>Subfamily: Danaidae (milkweed butterflyes)</b>				
<i>Danaus plexippus</i>	monarch			

### KEY:

FWC = Florida Fish & Wildlife Conservation Commission

FWS = U.S. Fish & Wildlife Service

E - Endangered

T - Threatened

SSC - Species of Special Concern

## Appendix C: Wildlife Species List for Yucca Pens Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI

**FNAI = Florida Natural Areas Inventory**

G - Global rarity of the species

S - State rarity of the species

T - Subspecies of special population

1 - Critically imperiled

2 - Imperiled

3 - Rare, restricted or otherwise vulnerable to extinction

4 - Apparently secure

5 - Demonstrately secure

**\* = Non-native**

## Appendix D: Projected Costs and Funding Sources

## Appendix D - Projected Costs and Funding Sources Table

### *Resource Enhancement and Protection*

<u>Item</u>	<u>Possible Funding Source</u>	<u>Estimated Costs</u>
Exotic Plant Control	USFWS, BIPM, C20/20	\$200,000
Hydrological Restoration	C20/20, LCNR	\$105,000
Habitat Restoration		\$50,000
Install Fire Breaks (~6.0 miles)	C20/20, FDOF	\$58,000
<b>total</b>		<b>\$413,000</b>

### *Overall Protection*

<u>Item</u>	<u>Possible Funding Source</u>	<u>Estimated Costs</u>
Large debris removal	C20/20	\$2,500
Survey		\$4,500
Fencing (2.5 miles)		\$79,200
Boundary signs		\$750
<b>total</b>		<b>\$86,950</b>

**TOTAL COST ESTIMATE** **\$499,950**

### *Site Management and Maintenance*

<u>Item</u>	<u>Possible Funding Source</u>	<u>Estimated Costs</u>
Exotic Plant Control	C20/20, FWC	\$25,000
Prescribed Fire Regime	LCPR, C20/20, FWC	In-house
Assorted Repairs		\$500

**Yearly Maintenance Estimate** **\$25,500**

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