

# WEST MARSH PRESERVE LAND STEWARDSHIP PLAN



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& AIM ENGINEERING



Approved by:

Lee County Board of County Commissioners May 14, 2013

East County Water Control District Board of Commissioners February 25, 2013

## **ACKNOWLEDGEMENTS**

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**LIST OF ACRONYMS**

<b>ACRONYM</b>	<b>DEFINITION</b>
BOCC	Lee County Board of County Commissioners
C20/20	Lee County 20/20 Conservation Program
CLASAC	Conservation Lands Acquisition and Stewardship Advisory Committee
DDT	1,1,1-trichloro-2,2-bis-(p-chlorophenyl) ethane
DHR	Florida's Division of Historical Resources
ECWCD	East County Water Control District
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FFS	Florida Forestry Service
FLEPPC	Florida Exotic Pest Plant Council
FLU	Future Land Use
FLUCFCS	Florida Land Use Cover and Forms Classification System
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
HM	Hanes Marsh
LCDCD	Lee County Department of Community Development
LCDNR	Lee County Division of Natural Resources
LCDOP	Lee County Division of Public Safety
LCDP	Lee County Division of Planning
LCMCD	Lee County Mosquito Control District

LCPR	Lee County Parks and Recreation
LIDAR	Light Detection and Ranging
LSOM	Land Stewardship Operations Manual
LSP	Land Stewardship Plan
NCDC	National Climatic Data Center
NRCS	National Resource Conservation Service
NWI	National Wetlands Inventory
SFWMD	South Florida Water Management District
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service
WMP	West Marsh Preserve

## **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 enhance existing native communities and create productive, functional viable wetlands from disturbed lands on site. The created wetlands will provide increased habitat value for wetland dependent species, increase water quality treatment and increase water attenuation for added flood protection. The Preserve will also provide additional water quality treatment for waters reaching the Caloosahatchee Estuary via the Orange River and provide valuable scenic and ecological educational opportunities for visitors.

## I EXECUTIVE SUMMARY

West Marsh Preserve (WMP) is located in east Lee County, within portions of Section 15, Township 44 South, Range 26 East. The Preserve was nomination parcel 214. The county entered into a memorandum of understanding with the East County Water Control District (ECWCD) on January 6, 2009. This agreement indicated Lee County and ECWCD agreed that it was in their mutual interest and convenience to cooperate in the restoration, appropriate development and enhancement of public recreational, environmental, and surface water management functions on the WMP. The land was purchased through the C20/20 program by Lee County in December 2008 for over four million dollars.

The C20/20 program was established in 1996 after Lee County voters approved a referendum to increase property taxes by up to 0.5 mil. The increase in property taxes would fund the protection and purchase of environmentally sensitive lands (C20/20 2011). The objective of the C20/20 program is; to protect and preserve wildlife habitat, protect water quality and supply, protect developed lands from flooding and provide resource based recreation (C20/20 2011).

WMP preserve is approximately 206± acres. Along the preserve's western boundary is the Buckingham airpark and industrial center. East of the preserve is Harns Marsh, an ECWCD surface water management area. Single family residences and undeveloped land are located to the north and south. A channelized portion of the Orange River bisects the northeast corner of the Preserve.

Lee County's mild sub-tropical climate is influenced by the Gulf of Mexico and the Caribbean Sea. The average annual rainfall in Lee County is 64.4 inches. Rainfall patterns exhibit strong seasonal variations with the majority of rainfall occurring from June to September. There are no hydrological monitoring stations at WMP. However, the preserve is located between two rainfall monitoring stations. The Lehigh Utilities rain gauge is located approximately 3.8 miles southeast of the preserve and the Waste to Energy Plant rain gauge is located approximately 3.9 miles southwest of the preserve. From 2000 to 2010 annual rainfall at the stations ranged from 40.92" to 80.01" at Lehigh Utilities and between 40.64" to 67.76" at the Waste to Energy Plant. It is anticipated that annual rainfall at WMP would fall within similar ranges. Based on the rainfall from both stations in 2010 the average annual rainfall at WMP is estimated to be 54.58". The preserve is also influenced by natural trends and disasters including; hurricanes, flooding, wildfires, freezes and wet and dry seasons.

Lee County is composed of four physiographic provinces, Gulf Coastal Lowlands, Caloosahatchee Valley, Immokalee Rise and the Southwestern Slope. The majority of WMP is located in the Immokalee Rise province; a small part of the northwestern portion of the Preserve is located in the Caloosahatchee Valley province. The Immokalee Rise province is generally 25' in elevation however some areas are as high as 35' to 42'. The province was formed by "submarine shoal approximately 100,000 years ago" (Southwest Florida Regional Planning Council (SWFRPC), 2002). The Caloosahatchee Valley province rises less than 15' in elevation. Topography results from "natural forces acting upon regional geologic formations from ancient time until the present" (SWFRPC 2002). While a complete topography survey is not available spot elevations were taken at the Preserve. Those elevations ranged from 12.2' to 22.8'. The property is highest in the western and southwestern portions of the parcel which were historically altered and utilized as part of the air gunnery training facility.

There are ten different soil types found at the Preserve. All of the soils on the property were identified as having severe limitations including being too sandy, wetness and/or ponding. The majority of the preserve is underlain by Boca Fine Sand, Immokalee Sand or Matlacha Gravelly Fine Sand. Boca Fine Sand covers 33% of the preserve. Matlacha Gravelly Fine Sand covers 28% of the preserve. Immokalee Sand covers 17% of the preserve. The remaining soils on the property compose less than 8% coverage each.

WMP is within the South Florida Water Management District's (SFWMD) Lower West Coast Regions, Okeechobee Basin. More specifically WMP is located within the Tidal Caloosahatchee watershed basin, a sub basin of the Caloosahatchee River Basin. The property was historically developed and contains several man made ditches that have altered internal flows.

WMP contains a combination of wetland and upland communities that serve as important habitat for a variety of birds, mammals, reptiles and amphibians. The Preserve consists of twelve distinguishable plant communities. While pine flatwoods, cabbage palm and freshwater marsh are the most common natural plant communities; the entire site is historically disturbed.

The majority of WMP was utilized by the Army as the Flexible Gunnery School (Wadsworth 2010). Construction of the Flexible Gunnery School began in February 1942 (Freeman, 2010). By September 30, 1945 the army base was closed (Freeman, 2010). It is suspected, that the portion of Orange River that bisects the northeast corner of the property was excavated by the Army. This portion of the Orange River appears to have been recently excavated in the 1944 aerial photography. By the mid 1950's the majority of the runways associated with the gunnery school had been removed from the WMP property. Following the Army's use the property was allowed to naturally re-vegetate. A portion of the property appears to have been planted with pines between 1990 and 1999. Currently the Preserve is dominated by natural and disturbed lands.

Management activities at WMP include converting a portion of the uplands into wetlands. This will improve water quality of discharges into the Orange River, increase flood storage, reduce flooding to downstream properties, provide flood control for a 100 year return frequency storm event, and provide habitat for continued wildlife utilization. In addition exotics will be removed. An active exotic removal and maintenance program will be implemented in order to control exotic invasive plant species and enhance wildlife habitat. An area along the western portion of the property will be designated for bird watching. Pedestrian access will be allowed on the water management berms. Guided driving tours will also be conducted along the water management berms. This will allow for limited public use while protecting the Preserve's integrity and meeting the goals of Lee County and the East County Water Control District.

The land stewardship plan's goal is to identify and protect preserve resources, while developing a plan for the creation of additional wetland habitat. Implementation of the stewardship plan will restore WMP to a productive and functional ecosystem while ensuring that the property is managed in accordance with the Lee County Parks and Recreation's Land Stewardship Operations Manual.

The restoration and management activities will focus on creation of wetland habitat, restoration of disturbed areas to more natural communities through exotic removal and maintenance, maintaining fire dependent ecosystems with prescribed fire, removing debris and enhancing wildlife habitat. This plan specifically outlines the goals and strategies for preserve management as well as how those goals will be accomplished.

## II INTRODUCTION

WMP was acquired in December 2008 through the C20/20 Program for a total cost of \$4,631,625. The 206.44 acres preserve is located in east Lee County. The Preserve is situated approximately 1 mile west of Sunshine Boulevard and approximately 1 mile east of Buckingham Road. The Preserve is immediately east of the Buckingham Airpark and immediately west of Harns Marsh water management system. A Location Map is attached as Figure 1.

The Preserve is dominated by mesic flatwoods, hydric hammock and depression marsh. The remaining vegetative communities compose less than 4% coverage each. The majority of the Preserve has experienced prior disturbance and was utilized as a military training facility. It appears that a portion of the Orange River was excavated on the property as well as several ditches altering historical hydrological flow-way patterns and hydro-periods. The offsite surrounding area includes; an air field, single family residential homes and undeveloped lots and a water management system.

WMP contains a combination of wetland and upland communities that are important habitat for a variety of wildlife including listed species. The Preserve is located within the USFWS (United States Fish and Wildlife Service) Secondary Florida panther (*Puma concolor coryi*) Focus Zone and the FWC (Florida Fish and Wildlife Conservation Commission) Florida black bear (*Ursus americanus floridanus*) range. FWC threatened gopher tortoises (*Gopherus polyphemus*) were observed on the property. In addition the site contains wetland habitat which provides foraging and nesting opportunities for state and federally listed wading birds. The quantity and diversity of wildlife species is anticipated to increase as enhancement and wetland creation occurs. The habitat enhancement includes the removal of exotics from natural communities allowing greater use by the existing wildlife species. The wetland creation will provide a large expanse of marsh that will be used for foraging and nesting by many wildlife species.

The purpose of this stewardship plan is to define the conservation goals at WMP. The primary purpose at WMP is to increase flood storage and improve the water quality in the Orange River, which will ultimately allow for improved water quality in the Caloosahatchee River. The restoration plan includes converting a portion of the Preserve from disturbed uplands to wetlands. This will increase floodwater storage on the property, improve water quality and reduce flooding to developments downstream. Exotic plants will be removed from the remaining uplands and existing wetlands in order to reduce competition to native species thereby allowing native vegetation to thrive. All of the Preserve will continue to provide wildlife habitat.

### III LOCATION AND LAND USE

The West Marsh Preserve formerly hosted a portion of the Army's Flexible Gunnery School in the 1940's. The property is currently an undeveloped parcel located east of the Buckingham Airfield, west of Harns Marsh Preserve and east northeast of Felix Romano Avenue and north of Unice Avenue N in Buckingham Park.

The subject parcel is located in portions of Sections 15 & 22, Township 44 South, Range 26 East in Lee County. The parcel Identification number for the property is 15-44-26-00-00003.0000 and 22-44-26-00-00004.0000. The Lee County Property Appraisers lists the site address as access undetermined, Fort Myers FL. 33905. The property is not listed by Lee County's Division of Public Safety (LCDOPS) because LCDOPS does not assign addresses to undeveloped parcels without structures. A Location Map is included as Figure 1.

WMP is surrounded by a variety of property types. The Buckingham Airfield is west of the Preserve, developed and undeveloped residential properties are located to the north and to the south and Harns Marsh surface water management system is located to the east. A portion of the Orange River bisects the northeastern portion of the 206.44± acre Preserve. An Aerial Photograph of the property is attached as Figure 2.

Historically the property was utilized by the U.S. Army. In the 1940's the majority of the Preserve was utilized as the easternmost portion of Flexible Gunnery School's airfield. The north end of north-south runway 18 was situated on the western portion of the property (Professional Services Industries, Inc. 2008). The majority of the paving for the runway was removed sometime between 1953 and 1958. About 100 yards of the runway still remains.

A small pine plantation was planted in a small portion of the property between 1990 and 1999. The pines were planted in the disturbed area north of the remaining portion of runway 18. Other portions of the previously developed property appear to have naturally vegetated over time. Currently the Preserve contains twelve plant communities, most of which are disturbed.

**Figure 1: Location Map**

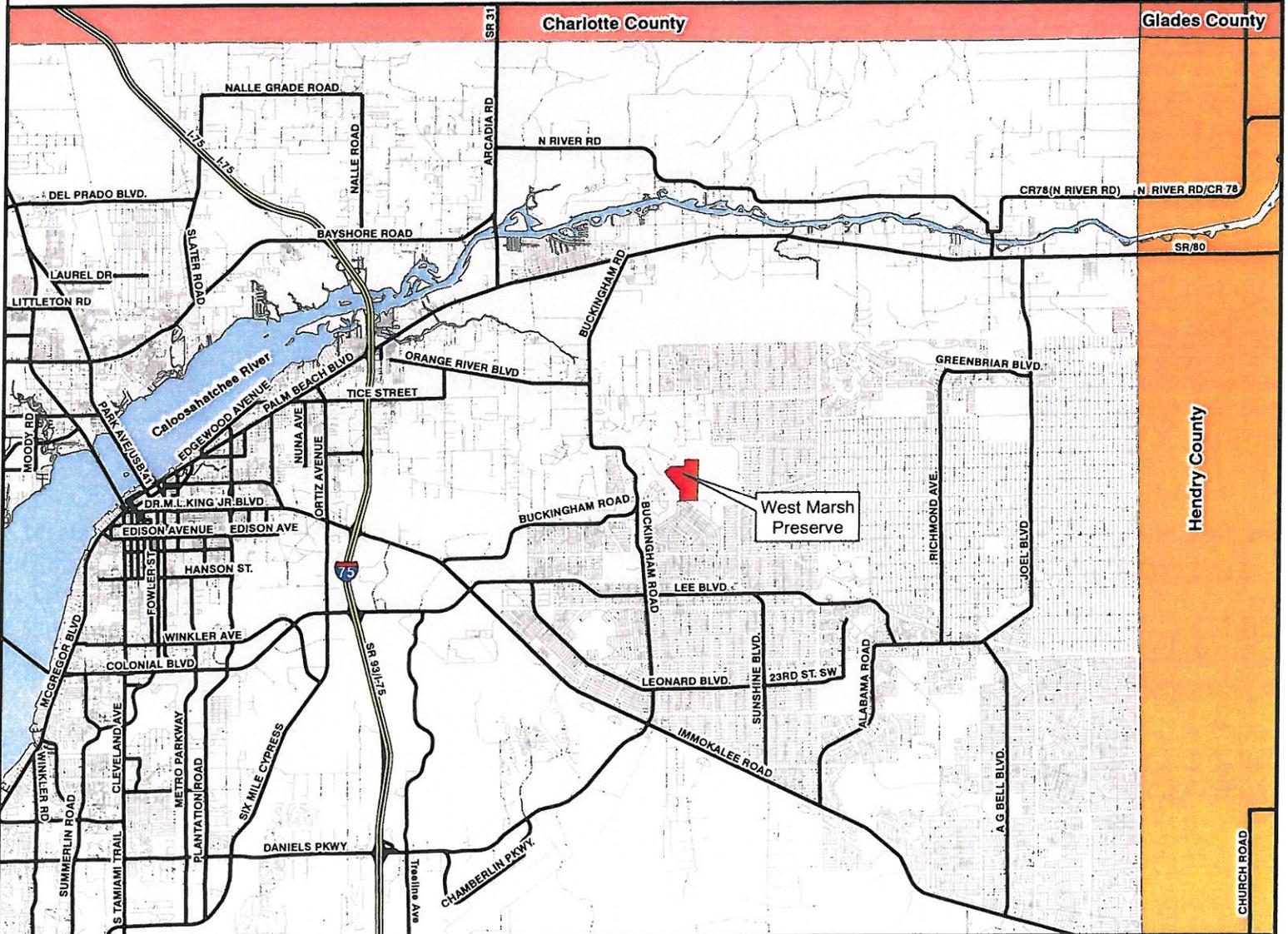
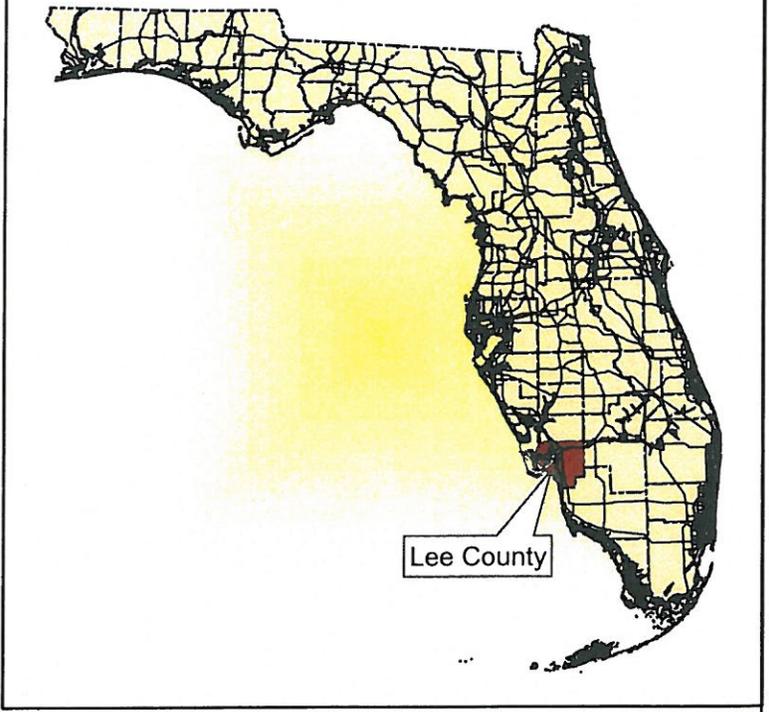
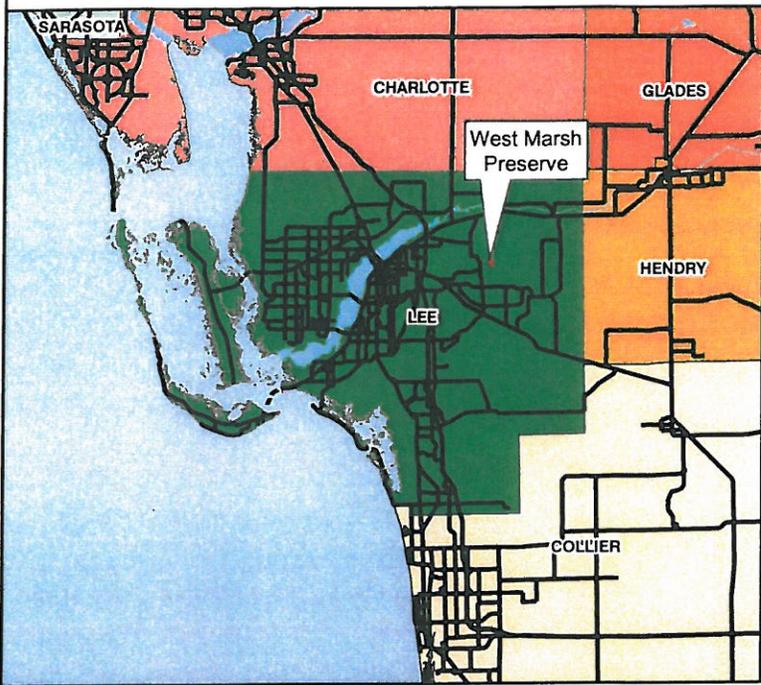
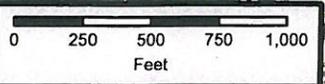
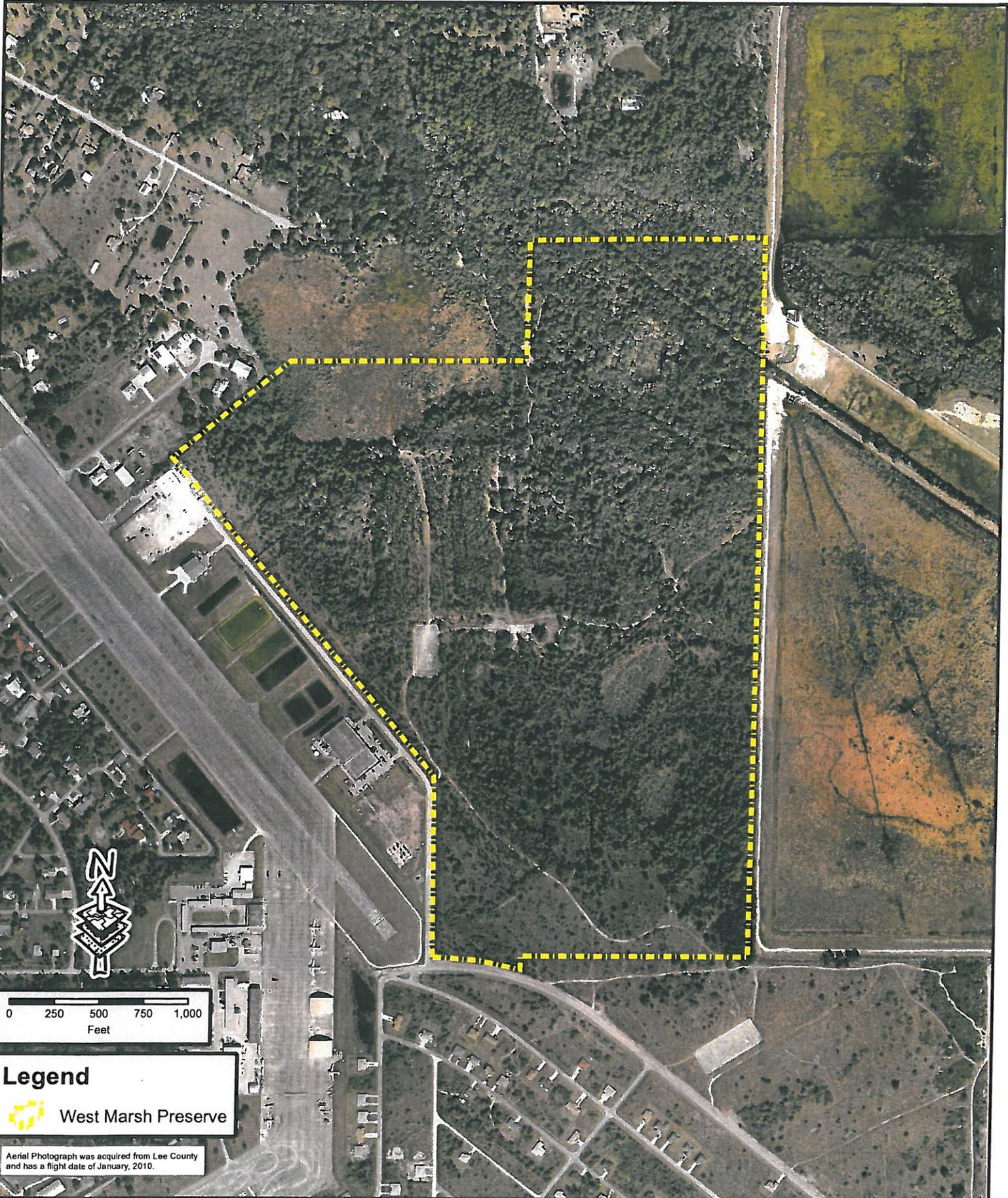


Figure 2: 2010 Aerial Photograph



**Legend**  
 West Marsh Preserve

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

**Boylan Environmental Consultants, Inc.**  
 Wetland & Wildlife Surveys, Environmental Permitting, & Impact Assessments



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**WEST MARSH PRESERVE**  
 2010 AERIAL PHOTOGRAPH  
 WITH BOUNDARY

Created by:	Date:	SEC/TWP/RNG	Page
BKM	5/11/11	15/44S/25E	8
Drawn by:	Date:	Category	
BKM	5/11/11	Aerial	
Project Number		County	
2009-13			

#### IV NATURAL RESOURCES DESCRIPTION

##### A PHYSICAL RESOURCES

###### i. CLIMATE

Florida is located within the “extreme southern portion of the Northern Hemisphere’s humid subtropical climate zone” according to the National Climatic Data Center (NCDC). Florida’s climate is governed by land and water distribution, winds, storms, ocean currents and pressure systems (NCDC 2008). During the winter Florida’s weather is influenced by the Azores-Bermuda High pressure system (NCDC 2008) which prevents convective clouds from forming into thunderstorms. The rainy season which typically begins in April and peaks in July/August can be delayed by the presence of the Azores-Bermuda High Pressure System or any other high pressure system that moves in from the Gulf of Mexico (NCDC 2008). Most of the summer rains in Florida occur in the daytime because these rains are dependent on air being heated by the earth’s surface (NCDC 2008).

During the winter and in the late fall and early spring, cold fronts from the northeastern United States may move into Florida. These fronts bring temperature and humidity changes which cause the weather to fluctuate between continental winter weather patterns and maritime tropical weather patterns.

Occasional winter freezes damage vegetation and prevent establishment of some cold sensitive tropical plants. In winter cold fronts push cool moist weather into southwest Florida. The occurrences of cold fronts encourage migratory birds to utilize the Preserve as a resting place during their longer voyage or as a winter roosting and feeding area. The normal daily mean temperatures per month for a 29 year period in Fort Myers according to the NCDC (2008) are included in Table 1.

**TABLE 1: DAILY MEAN TEMPERATURE FORT MYERS, FLORIDA (1971-2000)**

	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
<b>Daily Mean Temp. °F</b>	64.9	66.0	69.9	73.6	78.8	82.2	83.0	83.1	77.5	71.7	66.4	74.9

Table 2 includes the average high and low temperatures as compiled by the Southwest Regional Climate Center for Fort Myers, Florida.

**TABLE 2: AVERAGE HIGH AND LOW TEMPERATURE FORT MYERS, FLORIDA (1892-2009)**

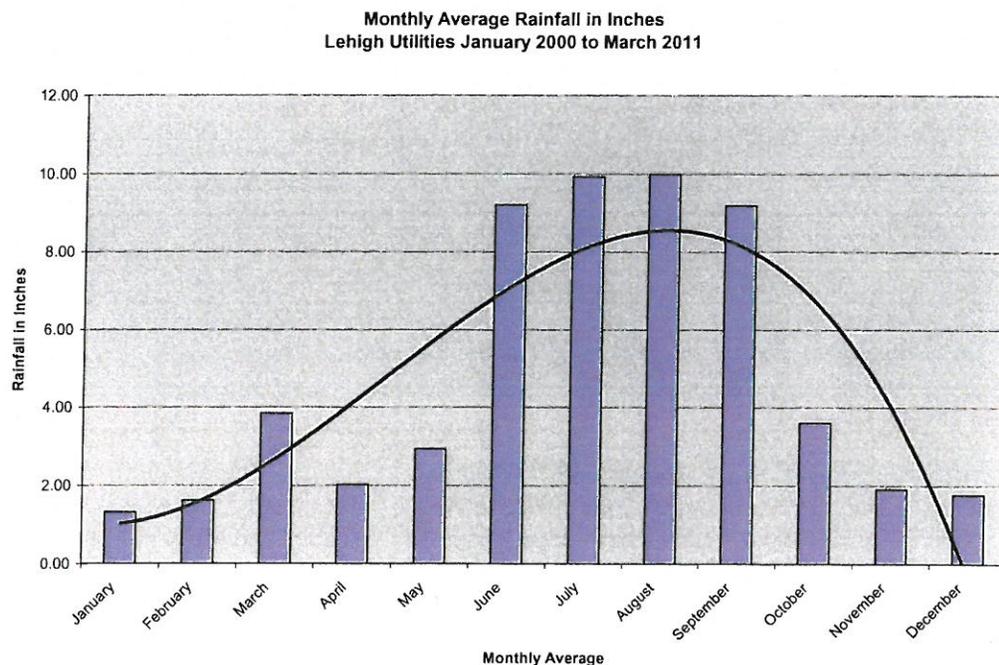
	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	Nov	Dec
<b>High Temp. °F</b>	74.4	75.8	79.7	84.0	88.1	89.9	90.5	90.8	89.2	85.1	79.5	75.4
<b>Low Temp. °F</b>	53.8	54.7	58.5	62.3	67.3	72.1	73.7	74.1	73.4	68.2	60.4	55.3

WMP is situated almost equal distance from two Lee County rainfall monitoring stations. The Lehigh Utilities rain gauge located southeast of the Preserve and the Waste to Energy Plant's rain gauge located southwest of the Preserve. Both stations are over 20,000' from the Preserve. At both monitoring stations there are distinct dry and wet seasons. The wet season primarily occurs from June to August. Table 2 and 3 include the rainfall in inches recorded at each monitoring station. Chart 1 and 2 graphically present the monthly average rainfall at each station from January 2000 to March 2011.

**TABLE 3: RAINFALL IN INCHES AT LEHIGH UTILITIES (JAN. 2000 TO MARCH 2011)**

Rainfall in Inches at Lehigh Utilities													
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Monthly Average
January	1.15	0.35	1.38	1.49	3.90	0.66	0.50	0.46	0.91	0.42	0.85	3.73	1.32
February	0.00	0.00	2.28	0.96	4.31	2.66	3.11	1.18	2.43	0.38	1.80	0.28	1.62
March	4.81	11.61	3.75	4.23	0.04	7.19	1.50	0.10	2.96	0.41	6.56	2.94	3.84
April	0.83	0.34	1.31	3.97	1.08	4.26	0.14	1.55	3.54	0.46	4.68		2.01
May	2.13	5.42	2.45	3.49	0.34+	3.72	3.72	1.20	0.19	5.80	3.74		2.93
June	10.96	16.51	9.79	11.59	4.21	11.03	5.59	7.03	6.57	5.91	12.12		9.21
July	12.45	17.94	1.71	8.00	10.60	15.44	6.86	8.83	12.16	5.52	9.64		9.92
August	11.03	8.09	5.65	16.05	16.60	6.54	13.16	5.93	12.37	7.46	6.98		9.99
September	21.08	13.12	9.17	13.29	9.58	1.57	4.54	7.52	8.41	8.35	4.46		9.19
October	12.48	4.34	7.03	1.00	0.53	7.68	1.09	1.52	2.55	0.47	0.89		3.60
November	0.34	0.32	4.54	3.30	0.93	4.93	0.55	1.09	0.74	2.40	1.74		1.90
December	1.43	1.97	3.33	2.38	1.72	0.37	1.26	1.46	1.21	3.34	0.97		1.77
Yearly Total	78.69	80.01	52.39	69.75	53.84	66.05	42.02	37.87	54.04	40.92	54.43	6.95	

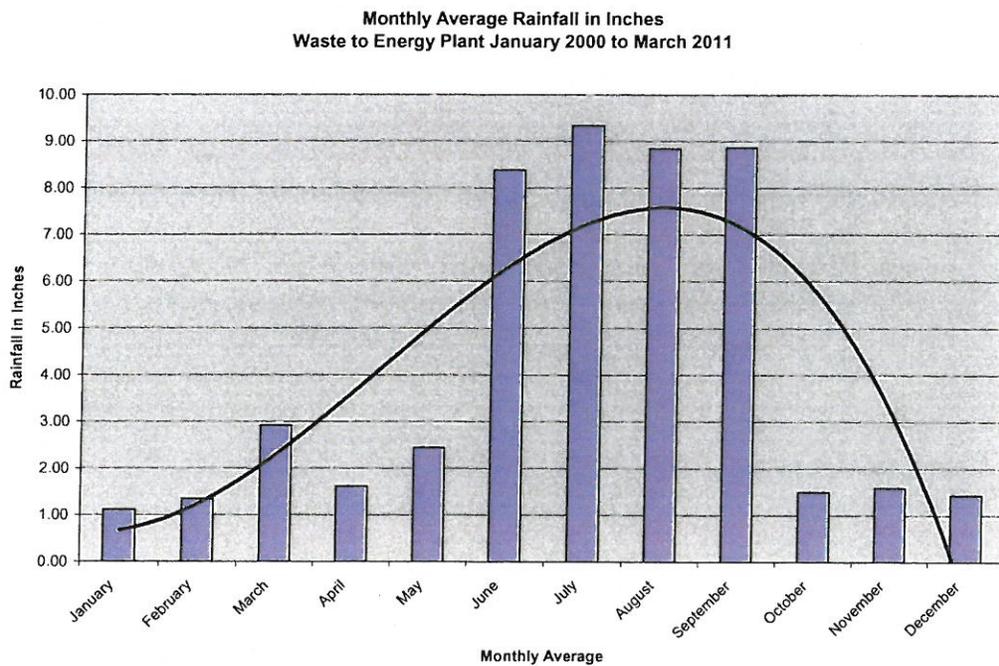
**CHART 1: MONTHLY AVERAGE RAINFALL AT LEHIGH UTILITIES**



**TABLE 4: RAINFALL IN INCHES AT WASTE TO ENERGY PLANT (JAN. 2000 TO MARCH 2011)**

Rainfall in Inches at the Waste to Energy Plant													
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	Monthly Average
January	1.45	0.22	2.47	0.62	1.39	0.46	0.41	0.32	1.11	0.35	1.19	3.30	1.11
February	0.12	0.14	0.86	0.09	1.79	3.28	3.13	1.35	1.87	0.31	2.79	0.35	1.34
March	2.94	7.24	0.62	0.90	0.05	7.17	1.40	0.26	2.19	0.57	8.26	3.35	2.91
April	0.83	0.14	2.66	0.11*	0.42+	3.28	0.00	1.83	4.18	0.30	3.97		1.61
May	0.13	2.29	5.67	0.54	0.42	2.84	1.40	4.33	1.09	5.33	2.82		2.44
June	8.78	9.48	11.39	1.75+	6.28	18.09	9.98	3.72	12.01	5.05	5.61		8.38
July	9.21	16.14	5.73	0.48	7.86	11.71	14.33	11.91	12.26	4.75	8.30		9.33
August	10.95	11.14	4.58*	5.44	12.29	8.63	10.82	5.23	11.71	7.78	8.62		8.84
September	14.51	13.46	5.51	9.65*	7.20	3.61	8.81	8.25	11.20	8.56	6.72		8.86
October	2.87	1.25	2.56	0.04	0.62	2.79	1.03	1.63	2.64	0.83*	0.21		1.50
November	0.52	0.48	1.32	0.18+	0.91	5.79	0.91	1.41	0.36	1.00	4.52		1.58
December	0.50	1.14	0.83	1.67	1.69	0.11	1.63	0.40	1.65	4.38	1.72		1.43
Yearly Total	52.81	63.12	44.20	21.47	40.92	67.76	53.85	40.64	62.27	39.21	54.73	7.00	

**CHART 2: MONTHLY AVERAGE RAINFALL AT WASTE TO ENERGY PLANT**



## ii. GEOLOGY

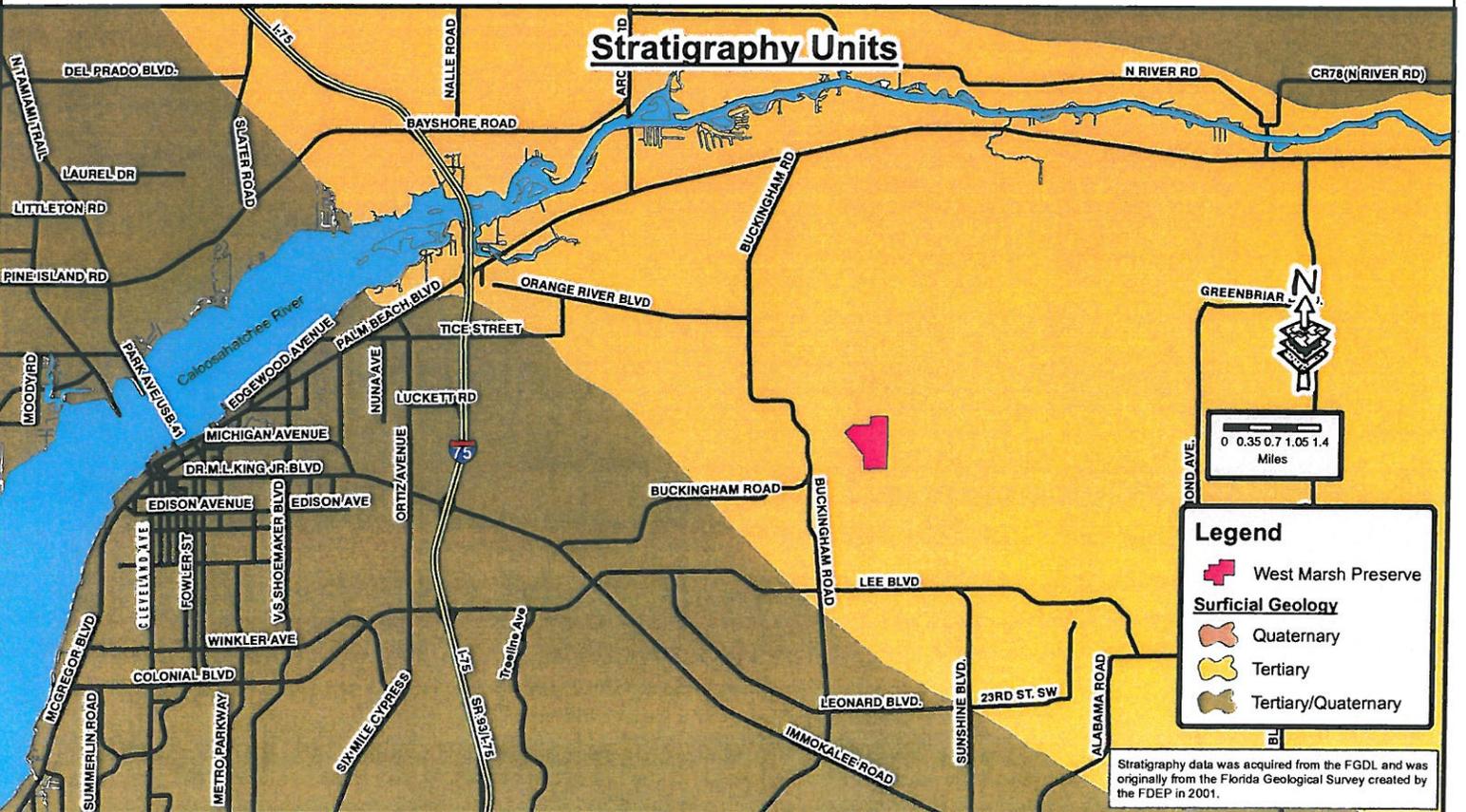
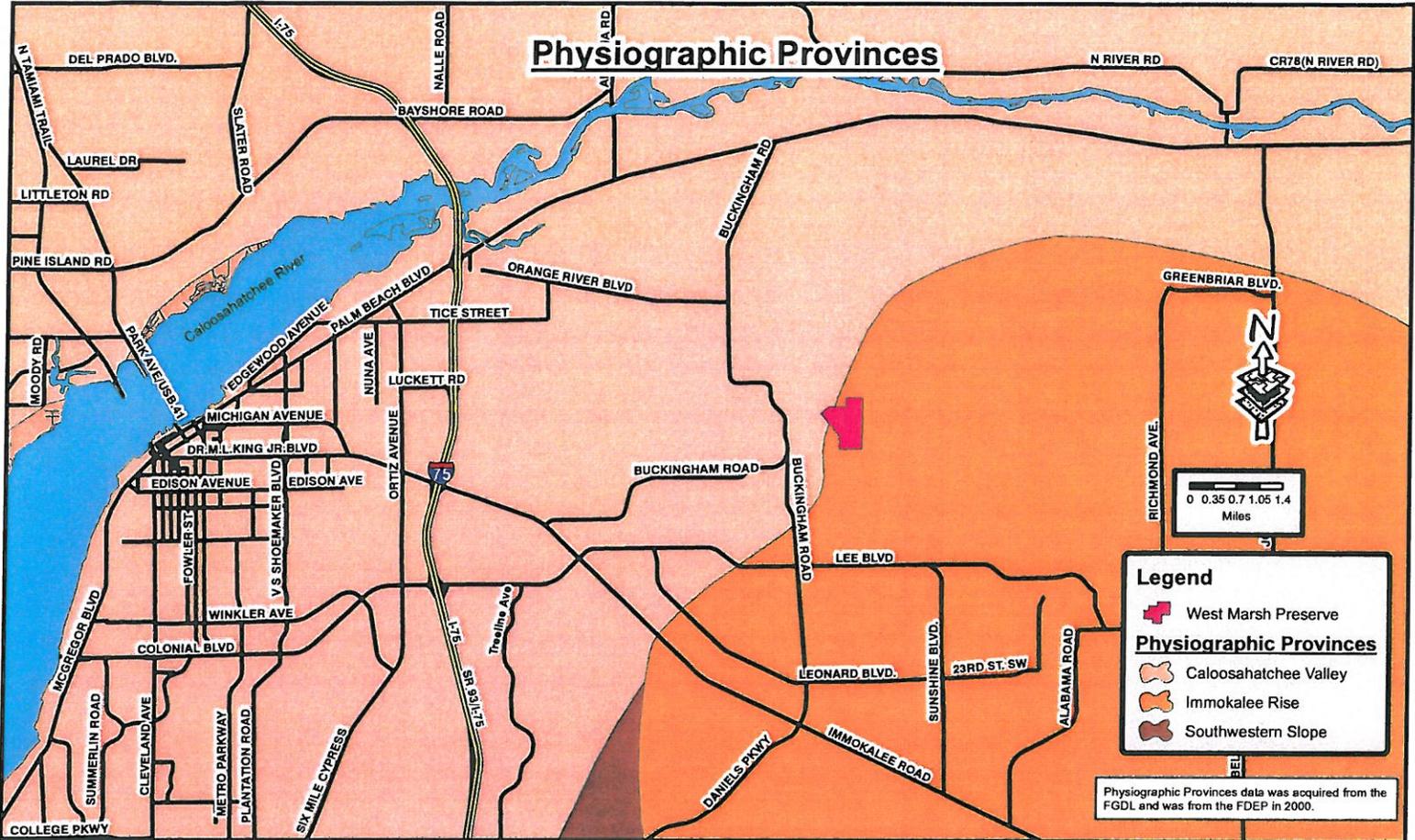
Southwest Florida can be divided into ten physiographic provinces (SWFRPC 2002). These provinces are broad-scale divisions based on geographic features including terrain, rock type, geologic structure and history. WMP is primarily located within the Immokalee Rise province with a small portion of the northwestern corner of the property in the Caloosahatchee Valley province. The Immokalee Rise province was formed approximately 100,000 years ago (SWFRPC 2002). This province is usually around 25' however some areas peak at 35' and 42' (SWFRPC 2002). The Caloosahatchee Valley was formed during the Plio-Pleistocene age and is an ancient river valley filled with sands and shells. In general this province rises less than 15' in elevation (SWFRPC 2002).

Scientists believe that Florida's landmass was originally part of northwest Africa during the Paleozoic Era (Lane 1994). However, the present configuration of Florida was not created until the Cenozoic Era. Florida's present configuration occurred as a result sedimentation and erosion from sea level fluctuation. (Lane 1994). The current natural topography of Florida was created as the surrounding seas flooded and retreated the state in the Quaternary Period (Lane 1994).

Florida is composed of ten lithostratigraphic units. Lithostratigraphic units are categorized based on the conditions under and time when they were formed. According to the Florida Geological Society as cited by the Florida Department of Environmental Protection Lee County is composed of Quaternary or Tertiary sediments (DEP 2005). Quaternary sediments within Lee County are subdivided into two categories Qh or Qsu. Qh is composed of Holocene sediments of quartz sand with organic matter and clay. Qsu is composed of undifferentiated shell beds. The only Tertiary sediment present in Lee County is the Tamiami Formation.

WMP is within the area of the Tamiami formation, which was created during the Pliocene Epoch between 5.3 and 1.8 million years ago. The Tamiami Formation (a Tertiary sediment) is a "poorly defined lithostratigraphic unit" (Scott 2001) composed of sandy limestone, clays, marls and sands with phosphate deposits and fossils. "Lithologies of the Tamiami Formation in the mapped area include: 1) light gray to tan, unconsolidated, fine to coarse grained, fossiliferous sand; 2) light gray to green, poorly consolidated, fossiliferous sandy clay to clayey sand; 3) light gray, poorly consolidated, very fine to medium grained, calcareous, fossiliferous sand; 4) white to light gray, poorly consolidated, sandy, fossiliferous limestone; and 5) white to light gray, moderately to well indurated, sandy, fossiliferous limestone" (Scott 2001). This soil type can be highly permeable to impermeable. A Geological map is attached as Figure 3.

Figure 3: Geological Features



### iii. TOPOGRAPHY

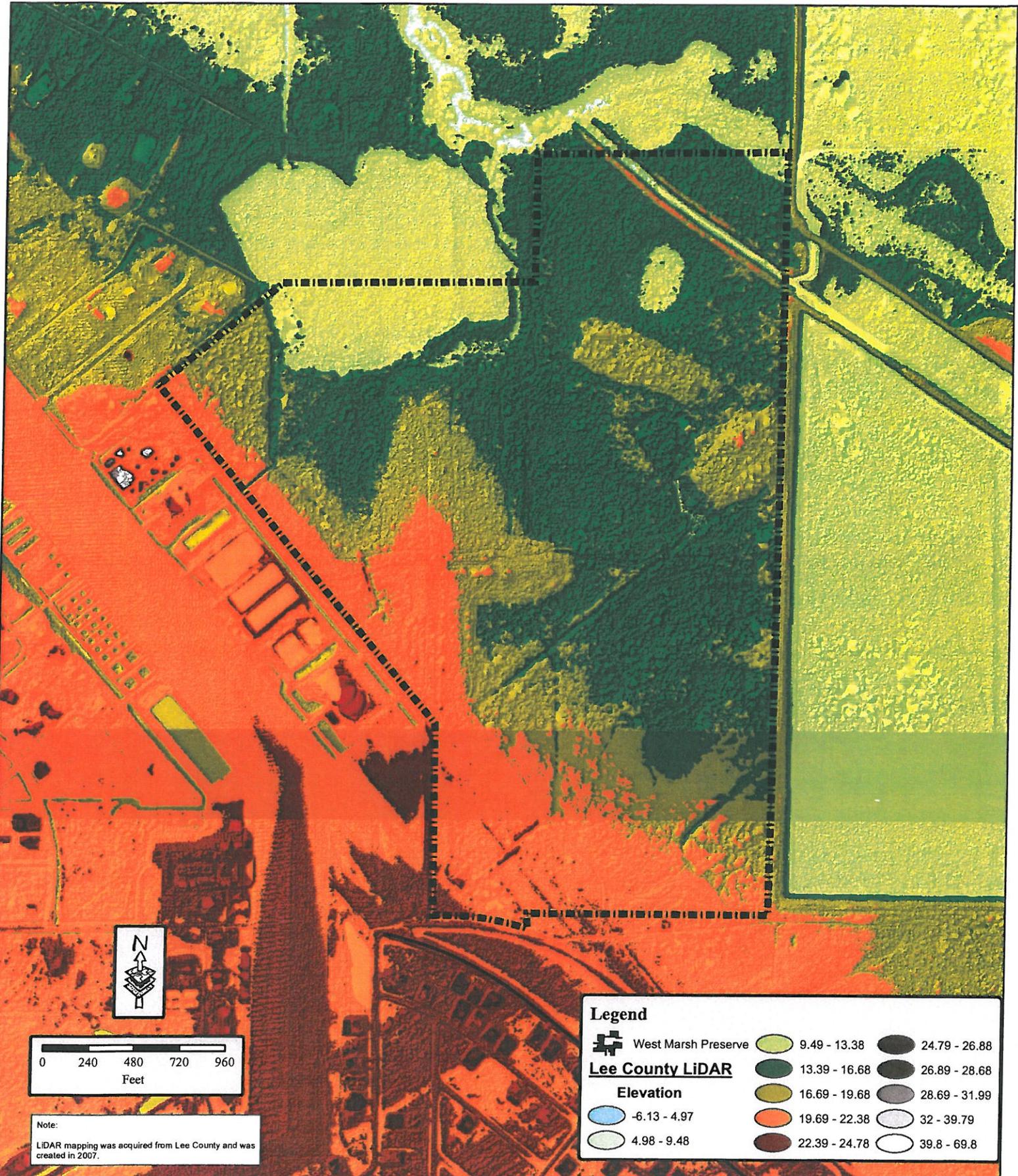
The highest point in Florida is 345' above sea level near Lakewood (Advameg 2010). Lee County is located within the Gulf Coastal Lowlands of Florida that extend around the coastal periphery of the state (Cooke 1945). Elevations in the Gulf Coastal lowlands are generally below 100 feet (Stubbs 1940).

The highest topographical area of WMP is located along the western portion of the property. This area is where the army airstrips were located. The topographically lowest areas include the onsite portion of the northwestern wetland and the onsite portion of the Orange River. A spot elevation survey indicates the onsite elevations range from 12.2' NAVD 88 to 22.8' NAVD 88.

Figure 4 is a Topography Map based on Light Detection and Ranging (LIDAR), an optical remote sensing technology which measures scattered light to find the range and/or other information of a distant target. Based on the LIDAR map the majority of the parcel is between 13.39'-22.38' NAVD 88.

The parcel is surrounded by developed lands along its western property boundary and a portion of the southern property boundary. Based on the topography of the site, water flows from the west and southwest then to the north and northeast with final discharge into the Orange River.

**Figure 4: Topography Map**



Legend		
	West Marsh Preserve	
Lee County LiDAR		
Elevation		
	-6.13 - 4.97	
	4.98 - 9.48	
	9.49 - 13.38	
	13.39 - 16.68	
	16.69 - 19.68	
	19.69 - 22.38	
	22.39 - 24.78	
	24.79 - 26.88	
	26.89 - 28.68	
	28.69 - 31.99	
	32 - 39.79	
	39.8 - 69.8	

Note:  
 LiDAR mapping was acquired from Lee County and was created in 2007.

#### iv. SOILS

The Soil Survey of Lee County (Henderson 1984) was designed for use by many individuals. The survey provides a general mapping and description of the soil type, soil composition, soil behavior and land use limitations. The soil survey was created as a joint effort between several government agencies led by the Natural Resources Conservation Service (NRCS). The soil map was based on observations of drainage patterns, the presence or absence of certain plant species and by bedrock type. Several soil profiles were dug and a model was created. The model allowed scientist to predict with "considerable accuracy" the kind of soils present throughout the landscaping (Henderson 1984). Accuracy of the soil mapping is generally between 70 to 80% within a typical 3 acre mapping area (Wilson Miller 2005).

Based on the NRCS mappings WMP contains ten different soil types. A soils map of the Preserve is included as Figure 5. The majority of the property is underlain by three soil types. The dominant soils are Boca Fine Sand, Immokalee Sand and Matlacha Gravelly Fine Sand. These are all poorly drained moderately permeable soils. Boca Fine Sand and Immokalee Sand naturally support pine flatwoods communities. Matlacha Gravelly Fine Sand is typically found in areas that have been prepared for development and is not suitable for most plant species without topsoil application.

The ten soil types on the property are; Hallandale Fine Sand, Boca Fine Sand, Immokalee Sand, Oldsmar Sand, Wabasso Sand, Wabasso Sand – Limestone Substratum, Felda Fine Sand – Depressional, Winder Sand – Depressional, Matlacha Gravelly Fine Sand, and Pineda Fine Sand – Depressional. The soil descriptions below for each soil type are paraphrased from the Soil Survey of Lee County, Florida (Henderson 1984).

Hallandale Fine Sand (6) 0.33% Coverage; 0.68 acres: Hallandale soils are poorly drained permeable soils formed over limestone. The surface layer is 0 to 2 inches of medium gray, fine sand. The subsurface layer includes light gray, single grained, fine sand and is at a depth of 2 to 7 inches. From 7 to 12 inches is khaki colored, fined sand. 12 inches onward is limestone. The Hallandale soil series is typically found in flatwoods and sloughs. In flatwoods the water table is usually 10 inches below the surface from 1 to 3 months, and at or below the limestone layer for the remainder of the year.

Boca Fine Sand (13) 33.07% Coverage; 68.28 acres: Boca soils are "loamy siliceous hyperthermic Arenic Ochraqualfs." This soil type is poorly drained and moderately permeable. The surface layer is 0 to 3 inches thick of gray, single grained, fine sand. The subsurface layer is from 3 to 9 inches of single grained, light gray, fine sand. From 9 to 14 inches is light gray, single grained, fine sand. The next 11 inches (14-25 inches) is very pale brown, single grained, fine sand. From 25 to 30 inches is a fine, gray, sandy loam with common, medium sized, brownish yellow mottles and few pale brown streaks. 30 inches and onward is a fractured limestone. These soils are typically found in flatwoods, sloughs and depression. In flatwoods the water table is within 10 inches of the surface for 2 to 4 months of the year. In sloughs, during periods of heavy rainfall there is a shallow layer of water on the surface. Depressional areas are ponded for 3 to 6 months of the year. Natural vegetation includes South Florida slash pine, saw palmetto, wax myrtle and pineland threeawn.

Immokalee Sand (28) 17.17% Coverage; 35.44 acres: Immokalee sand is a nearly level, poorly drained soil in flatwoods areas. Slopes are smooth to convex and range from 0 to 2 percent. Typically, the surface layer is black sand, about 4 inches thick. The

subsurface layer contains dark gray sand in the upper 5 inches and light gray sand in the lower 27 inches. The subsoil extends to a depth of 69 inches. The upper 14 inches of the subsoil is black and firm sand, the next 5 inches is dark reddish brown sand, and the lower 14 inches is dark yellowish brown sand. The substratum is very pale brown sand to a depth of 80 inches or more. Under natural conditions the water table is within 10 inches of the surface for 1 to 3 months, 10 to 40 inches below the surface for 2 to 6 months is and 40 inches or more below ground during dry periods. Natural vegetation consists of saw palmetto, fetterbush, pineland threeawn, and South Florida slash pine.

Oldsmar Sand (33) 0.47% Coverage; 0.97 acres: Oldsmar sands are near level, poorly drained soils. The surface layer is 3 inches of black sand. From 3 to 39 inches below ground is gray and light gray sand. The subsoil includes 5 inches of very dark gray sand followed by 11 inches of yellow brown and light brown gray, fine, sandy loam. To a depth of 80 inches or more is pale brown sand. In some areas this soil type will have limestone at a depth of 70 to 80 inches below the surface. Under natural conditions the water table is typically within 10 inches of the surface for up to 3 months, between 10 to 40 inches below the surface for 6 months or more and more than 40 inches below ground during extended dry periods. The surface and subsurface layers of this soil type are rapidly permeable. Natural vegetation includes saw palmetto, pineland threeawn, South Florida slash pine and meadow beauty.

Wabasso Sand (35) 1.92% Coverage; 3.96 acres: Wabasso sand is a nearly level, poorly drained soil in flatwoods. Slopes are smooth to slightly convex and range from 0 to 2 percent. Typically, the surface layer is dark gray sand, about 6 inches thick. The subsurface layer is sand to a depth of 24 inches. The upper 11 inches of the subsurface layer is light gray with dark grayish brown stains. The subsoil is about 38 inches thick. The upper 4 inches of the subsoil is dark brown sand, with few iron concretions. The next 8 inches is brownish yellow, sandy, clay loam with light brownish gray, light gray and reddish brown mottles. The lower 26 inches is light gray, sandy clay loam, with pale olive and olive mottles, and stains along the root channels. Below that is light gray, fine, sandy loam with olive mottles extending to a depth of 80 inches or more. Natural vegetation consists of saw palmetto, South Florida slash pine, pineland threeawn, cabbage palm, and bluestem.

Wabasso Sand Limestone Substratum (42) 7.43% Coverage; 15.34 acres: This soil type is a poorly drained, nearly level soil, with slopes ranging from 0 to 2 percent. The surface layer is about 3 inches of black sand. The subsurface layer extends from 3 to 19 inches. The first 10 inches of the subsurface layer is gray sand. The last 6 inches of the subsurface layer is light gray sand. The subsoil contains 2 inches of dark brown sand with organic matter, followed by 2 inches of "dark reddish brown friable sand". The next 14 inches of the subsoil is loose brown sand, with dark brown streaks. A firm, sandy loam with olive brown mottling is present, in the lower 14 inches of the subsoil. Fractured limestone and boulders are present 51 inches below the surface. This soil type is rapidly permeable in the surface, subsurface and subsoil layers. Under "natural conditions the water table is" 10 inches or less below ground for up to 3 months, between 10 and 40 inches below ground for 2 to 4 months and below 51 inches during dry periods. Natural vegetation includes South Florida slash pine, cabbage palm, saw palmetto, dwarf huckleberry, gallberry, and pineland threeawn.

Felda Fine Sand, Depressional (49) 1.84% Coverage; 3.80 acres: This nearly level soil is poorly drained and found in depressional areas. The surface layer is 4 inches of gray, fine sand. The first 13 inches of the subsurface layer is grayish brown, fine sand. The next 18 inches of the subsurface layer is "light gray fine sand with yellowish brown mottles". The subsoil is 6 inches of gray, sandy loam, followed by 11 inches of sandy, clay loam with brown and yellowish brown mottles. From 52 to 80 inches plus is a light gray, fine sand. The surface and subsurface layer is rapidly permeable and the subsoil is moderately permeable. This soil type is ponded for 3 to 6 months under natural conditions. For the remainder of the year the water table is between 10 and 40 inches below ground. Natural vegetation in this soil type includes; bald cypress, wax myrtle and hydric herbaceous species.

Winder Sand, Depressional (62) 3.39% Coverage; 7.0 acres: This soil is poorly drained and nearly level. The surface layer is 3 inches of dark gray sand. The 10 inch thick subsurface layer is light, brownish gray, sand. From 13 to 16 inches is light gray sand with intrusions of a "light brownish gray sandy loam" and yellowish brown mottles. The subsoil is composed of 7 inches of gray, sandy loam, with brown and yellowish brown mottles, followed by 6 inches of gray sand with yellowish brown mottles. The substratum contains 6 inches of "gray sand with brownish yellow mottles" followed by 6 inches of light brown gray, sand and olive mottles. The next layer of the substratum is 12 inches of "greenish gray loamy sand" and also contains olive mottles. "The lower 15 inches is a light greenish gray sand". This soil type is rapidly permeable in the surface and subsurface layers, with slow permeability in the subsoil. The water table, under normal conditions, is at or above the surface for 3 to 6 months, and between 10 to 40 inches below ground for the rest of year. Natural vegetation found in this soil type includes cypress, pickerelweed, St. John's wort and other hydric species.

Matlacha Gravelly Fine Sand (69) 28.52% Coverage; 58.88 acres: Matlacha soils are "sandy, siliceous, hyperthermic Udalfic Arents." These soils are deep, poorly drained, moderately permeable, soils. The first 35 inches of these soils are black, dark brown, light brownish gray, very dark gray, very pale brown, fine sands with olive brown and grayish brown loamy lenses. From 35 to 40 inches is dark gray, granular, fine sand. 40 to 80 inches is light gray, fine sand, with common, medium, dark grayish brown stains. These soils are typically found in areas that have been prepared for urban development. The depth of the water table varies depending upon the amount of fill and the artificial drainage. However the water table has been observed between 24 to 36 inches below the surface of the fill material for 2 to 4 months of the year, and more than 60 inches below the surface during dry periods. This soil type is not suitable for most plant species, unless topsoil is placed on the surface.

Pineda Fine Sand Depressional (73) 5.86% Coverage; 12.09 acres: Pineda is nearly level depressional sand that is very poorly drained. The surface layer is typically 3 inches of dark gray, fine sand. From 3 to 12 inches below ground is light gray, fine sand. From 12 to 19 inches is very pale brown fine sand with yellow-brown mottles. From 19 to 31 inches below ground is brownish, yellow fine sand, with iron coated grains. The subsoil extends to 55 inches below ground and is a gray, fine, sandy loam. Below that is gray, loamy sand to 80 inches. Under natural conditions the soil is ponded for 3 to 6+ months. The remainder of the year, the water table is 10 to 40 inches below ground. The vegetation found in this soil type consists of hydric species and may include; cypress, St. John's wort, maidencane and other non-listed hydric species.

**TABLE 5: SOILS LEGEND**

<b>SOIL NUMBER</b>	<b>SOIL NAME</b>	<b>HYDRIC OR NON-HYDRIC</b>	<b>ACREAGE</b>	<b>% COVER AT WMP</b>
6	Hallandale Fine Sand	Non-Hydric	0.68 ac	0.33%
13	Boca Fine Sand	Non-Hydric	68.28 ac	33.07%
28	Immokalee Sand	Non-Hydric	35.44 ac	17.17%
33	Oldsmar Sand	Non-Hydric	0.97 ac	0.47%
35	Wabasso Sand	Non-Hydric	3.96 ac	1.92%
42	Wabasso Sand, Limestone Substratum	Non-Hydric	15.34 ac	7.43%
49	Felda Fine Sand Depressional	Hydric	3.80 ac	1.84%
62	Winder Sand Depressional	Hydric	7.00 ac	3.39%
69	Matlacha Gravelly Fine Sand	Non-Hydric	58.88 ac	28.52%
73	Pineda Fine Sand Depressional	Hydric	12.09 ac	5.86%

All of the soils on the property have been classified as having severe limitations that affect their suitability for recreational use. A severe limitation means, the soils properties are unfavorable for recreational use and the soils "limitations can be offset only by soil reclamation, special design, intensive maintenance, limited use or a combination of these measures" (Henderson 1984). These limitations include; too sandy, wetness and/or ponding. The specific soil characteristics are outlined in Table 6.

**TABLE 6: SOIL ATTRIBUTES (AS DEFINED IN THE SOIL SURVEY OF LEE COUNTY (HENDERSON 1984))**

SOIL NUMBER	SOIL NAME	PHYSICAL ATTRIBUTES		BIOLOGICAL ATTRIBUTES				LIMITATIONS FOR RECREATIONAL USE (PATHS & TRAILS)
		HYDROLOGIC GROUP	% ORGANIC MATTER	POTENTIAL FOR WILDLIFE USE IN				
				OPEN LAND	WOOD LAND	WETLAND	RANGE LAND	
6	Hallandale Fine Sand	B/D	2-5	Poor	Poor	Fair	Poor	Severe: wetness, too sandy
13	Boca Fine Sand	B/D	1-3	Fair	Pair	Fair	Good	Severe: wetness, too sandy
28	Immokalee Sand	B/D	1-2	Poor	Poor	Poor	--	Severe: wetness, too sandy
33	Oldsmar Sand	B/D	1-2	Fair	Fair	Poor	--	Severe: wetness, too sandy
35	Wabasso Sand	B/D	1-4	Poor	Fair	Poor	--	Severe: wetness, too sandy
42	Wabasso Sand, Limestone Substratum	B/D	2-5	Poor	Fair	Poor	--	Severe: wetness, too sandy
49	Felda Fine Sand Depressional	D	1-4	Very Poor	Very Poor	Good	--	Severe: ponding, too sandy
62	Winder Sand Depressional	D	1-2	Very Poor	Very Poor	Good	--	Severe: ponding, too sandy
69	Matlacha Gravelly Fine Sand	C	--	--	--	--	--	Severe: too sandy
73	Pineda Fine Sand Depressional	D	5-6	Very Poor	Very Poor	Good	--	Severe: wetness, too sandy

**Hydrologic Soil Group:** The runoff producing characteristic of the soil. Slope and plant cover are not considered.

**Group B:** When wet these soils have a moderate infiltration rate. Soils have a moderate rate of water transmission.

**Group C:** When thoroughly wet these soils have a slow infiltration rate. Soils have a slow rate of water transmission.

**Group D:** When thoroughly wet these soils have a very slow infiltration rate and high runoff potential runoff.

**Potential for wildlife Use:**

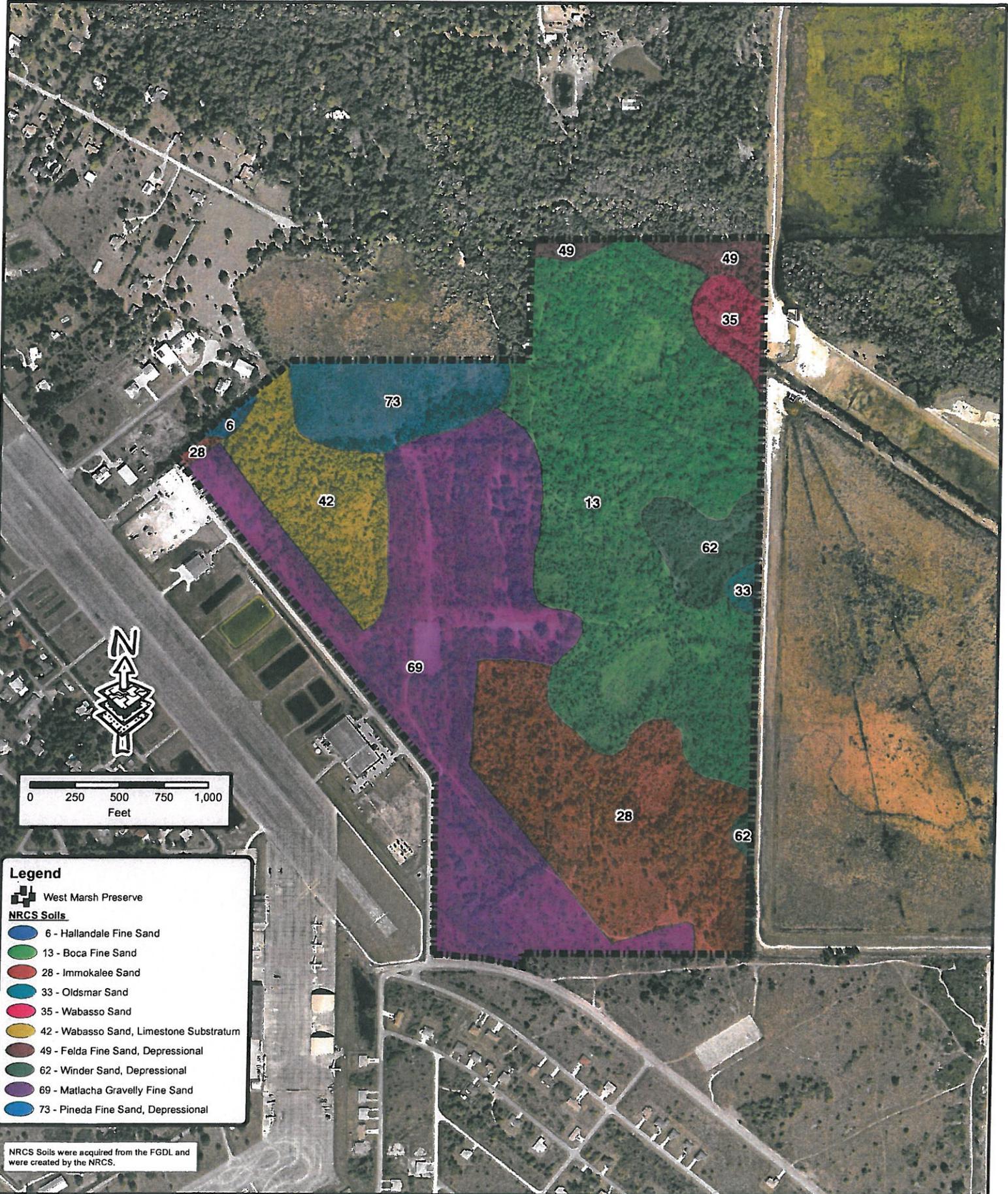
**Good:** Habitat is easily established, improved or maintained.

**Fair:** Habitat can be established, improved or maintained. Moderate to intensive management is required.

**Poor:** Limitations are severe, however habitat can be created, improved and or maintained. Management is difficult and intensive.

**Very Poor:** Habitat restrictions are very severe and unsatisfactory results can be expected. Creating, improving or maintaining habitat is impractical or impossible.

Figure 5: Soils Map



**Legend**

West Marsh Preserve

**NRCS Soils**

- 6 - Hallandale Fine Sand
- 13 - Boca Fine Sand
- 28 - Immokalee Sand
- 33 - Oldsmar Sand
- 35 - Wabasso Sand
- 42 - Wabasso Sand, Limestone Substratum
- 49 - Felda Fine Sand, Depressional
- 62 - Winder Sand, Depressional
- 69 - Matlacha Gravelly Fine Sand
- 73 - Pineda Fine Sand, Depressional

NRCS Soils were acquired from the FGDL and were created by the NRCS.

## V. HYDROLOGIC COMPONENTS AND WATERSHED

WMP is located within the Tidal Caloosahatchee watershed basin, a sub basin of the Caloosahatchee River Basin. A map of the Preserve location within the Tidal Caloosahatchee River Basin is included as Figure 6. The main water body of the Caloosahatchee River Basin is the Caloosahatchee River. The Caloosahatchee River runs from the Gulf of Mexico to Lake Okeechobee. The Caloosahatchee River was extended in 1881 to connect to Lake Okeechobee by a man-made canal (SFWMD, Florida Department of Environmental Protection (FDEP), Florida Department of Agriculture and Consumer Services (FDACS), Jordon, Jones and Goulding, 2009).

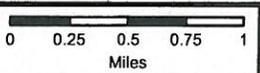
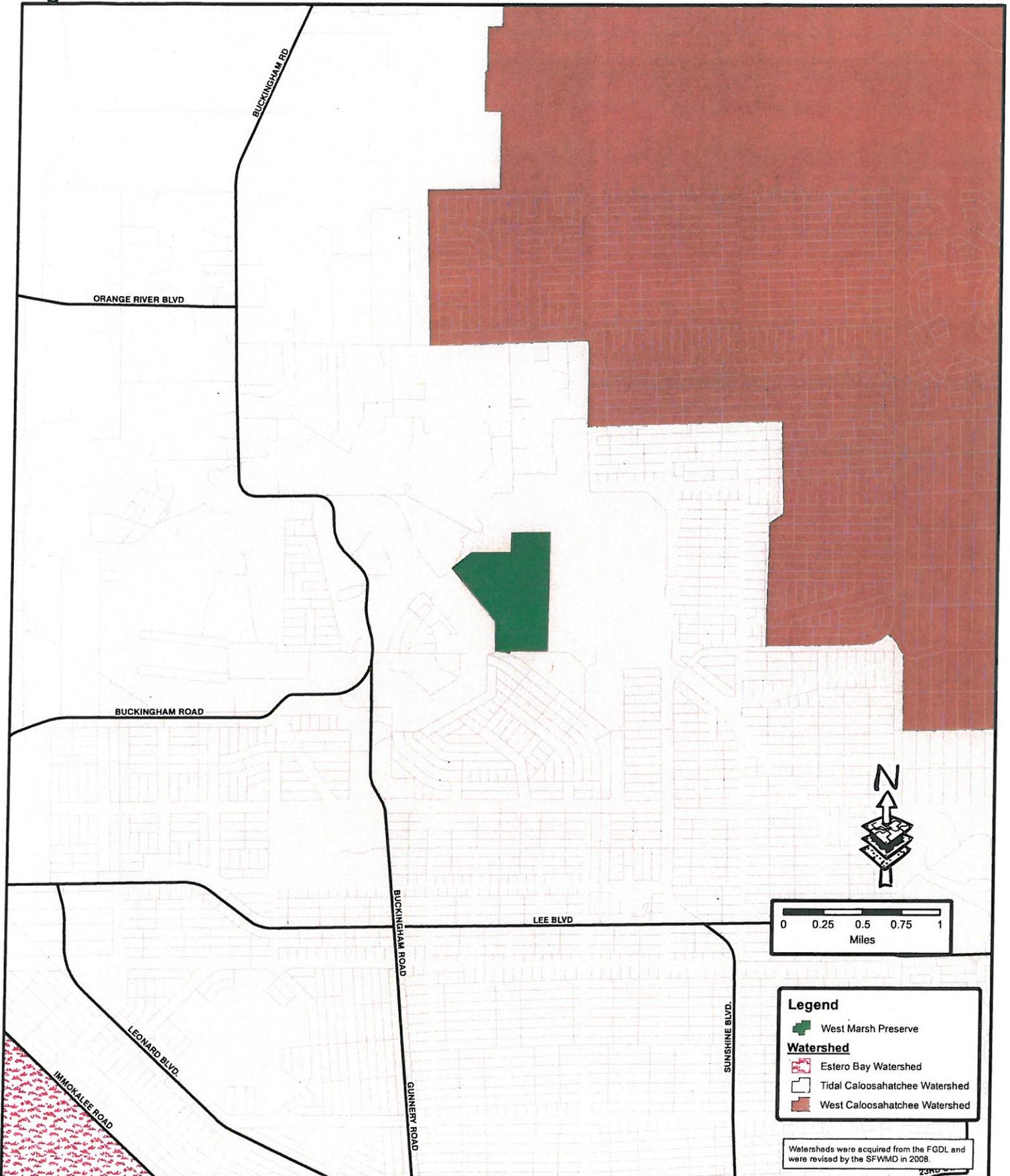
A series of locks control the flow and stage height of the Caloosahatchee River. Three locks prevent saltwater intrusion. The Moore Haven Lock and Ortona Lock were built in 1937. The Franklin Lock was constructed near Olga in the 1960s. The majority of the freshwater that enters the Caloosahatchee estuary is through the Franklin Lock. "The freshwater portion of the river is 60 km (37 miles) long and the Tidal Caloosahatchee extends downstream of Franklin Lock for about 45 km (28miles)" (FDEP, unknown). As a result the Caloosahatchee River is "no longer free-flowing and is operated as two "pools" maintained at different elevation between the major water control structures" (SFWMD et al., 2009).

Specifically the tidal portion of the Caloosahatchee extends 28 miles from the San Carlos Bay to the Franklin Lock. "Tributaries of the Tidal Caloosahatchee include Billy Creek, Whiskey Creek, Orange River, Hickey Creek, Roberts Canal and Daughtrey Creek." (FDEP, unknown). The tributaries provide flood control and water supply to the surrounding rural and urban areas (SFWMD et al., 2009). The Orange River is the most important tributary affecting the estuarine portion of the Caloosahatchee River (Scarlatos, 1988).

A portion of the Orange River bisects the northeast corner of WMP. Flows from the Preserve and the surrounding area enter the Orange River and flow into Caloosahatchee River. The Caloosahatchee River is classified as an impaired waterbody; as a result, water quality is a particular concern. The WMP stewardship plan includes restoring/creating new wetlands; as well as, enhancing existing wetlands through exotic removal. This will not only provide onsite water storage and wildlife habitat but also provide a natural nutrient removal system that will improve the water quality to a portion of the flows entering the Orange River.

In this portion of Lee County, the Division of Natural Resources (LCDNR) has refined the watershed/basin boundaries and has located the site within the Orange River Watershed. A map depicting these boundaries is attached as Figure 7.

Figure 6: SFWMD Watersheds



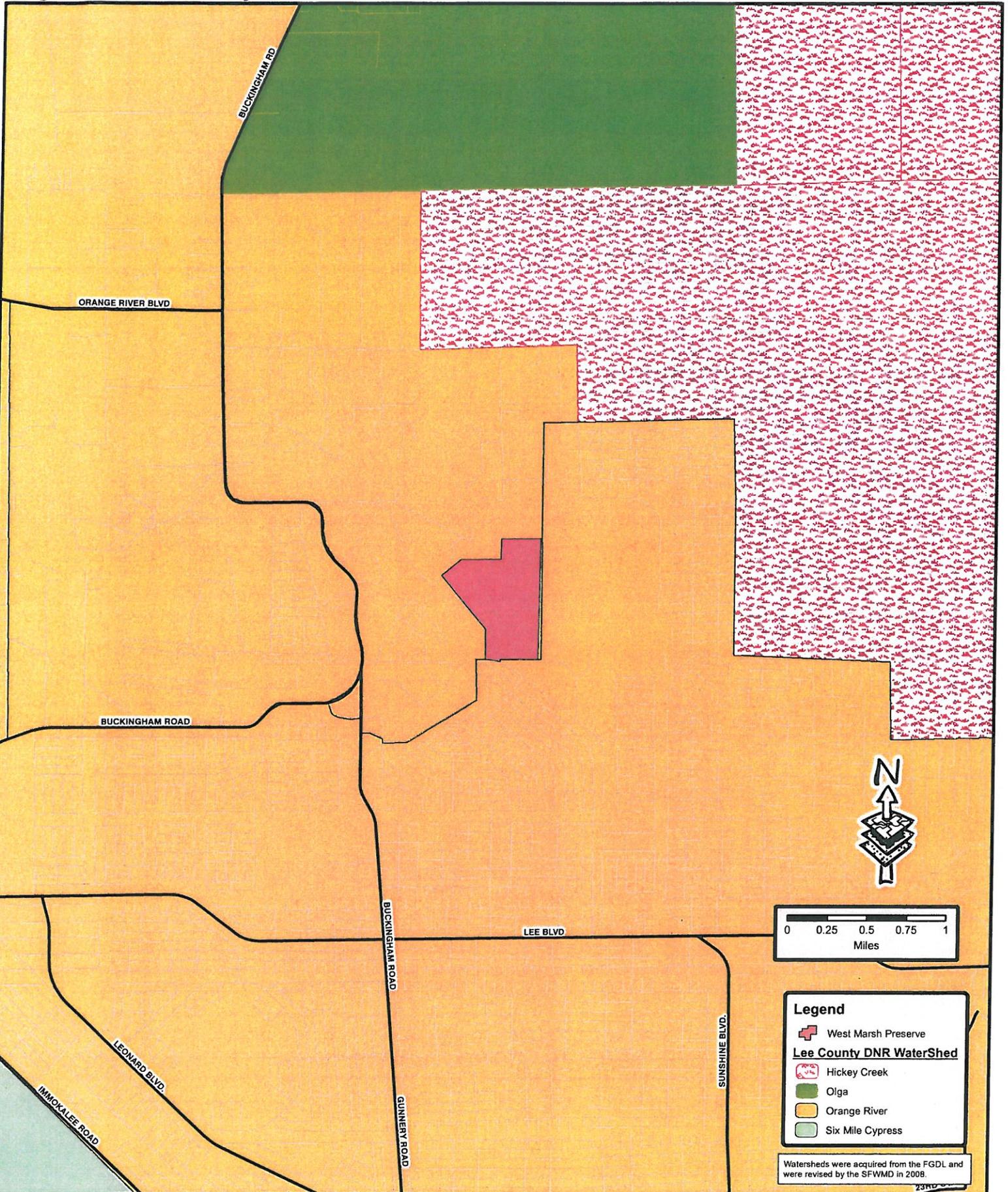
**Legend**

- West Marsh Preserve
- Watershed**
- Estero Bay Watershed
- Tidal Caloosahatchee Watershed
- West Caloosahatchee Watershed

Watersheds were acquired from the FGDL and were revised by the SFWMD in 2008.

Created by:	Date:	SEC/WP/PRNG	Page
BKM	5/11/11	15/44S/25E	
Drawn by:	Date:	Category	
BKM	5/11/11	Watersheds	
Project Number	County		
2009-13	Lee		

Figure 7: Lee County DNR Watersheds



**Legend**

- West Marsh Preserve
- Hickey Creek
- Olga
- Orange River
- Six Mile Cypress

**Lee County DNR WaterShed**

Watersheds were acquired from the FGDL and were revised by the SFWMD in 2008.

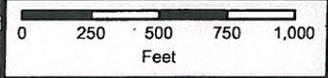
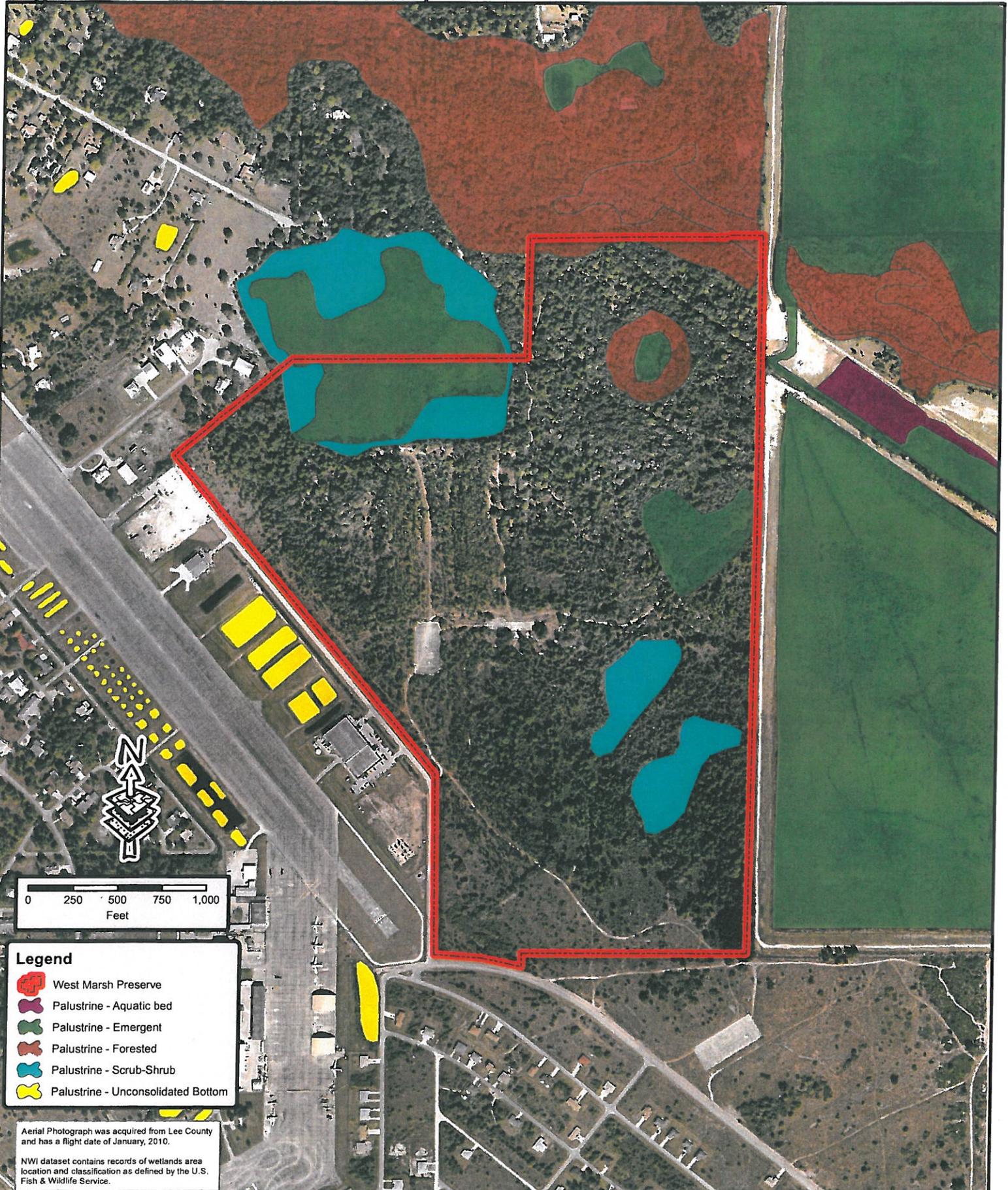
In 1974 the USFWS Office of Biological Services conducted an inventory of the nation's wetlands. By 1977 the National Wetlands Inventory (NWI) became operational and wetland maps were prepared analyzing high altitude aerial imagery in conjunction with field work and other data sources (USFWS 2011).

The USFWS identified six wetlands on the WMP property. The USFWS classified these wetlands as; freshwater emergent and/or freshwater forested/shrub systems. All of the wetlands on the property are classified as freshwater systems (having low concentrations of dissolved salts and total dissolved solids). All of the wetlands are also classified as Palustrine systems. Palustrine systems are non-tidal wetlands and/or wetlands in tidal areas with a salinity level below 0.5 ppt. The wetlands at WMP are non-tidal. Emergent wetlands are characterized as wetlands dominated by herbaceous species whereas forested/shrub systems are dominated by woody vegetation at least 6 meter tall. The USFWS also classifies the wetlands on the property as temporarily, seasonally, or semi-permanently flooded. Some of the wetlands are further classified by the USFWS as drained.

In addition to the NWI wetlands identified on the parcel some smaller wetlands were also identified. These wetlands include wax myrtle-willow wetlands and freshwater marsh habitats. An NWI map of the Preserve is included as Figure 8. Further information about these communities can be found within the Natural Plant Communities Section of this plan.

The final hydrological component at WMP is a variety of ditches and a man made section of the Orange River. These man made features were most likely created by the Army in the 1940's and 1950's to drain the property. These man-made water ways influence water flows on the property by interrupting sheet flow and draining areas. These features will be discussed further in the internal influences section of this plan.

**Figure 8: National Wetland Inventory**



- Legend**
-  West Marsh Preserve
  -  Palustrine - Aquatic bed
  -  Palustrine - Emergent
  -  Palustrine - Forested
  -  Palustrine - Scrub-Shrub
  -  Palustrine - Unconsolidated Bottom

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

NWI dataset contains records of wetlands area location and classification as defined by the U.S. Fish & Wildlife Service.

Created by:	Date:	SECTION/PLANS	Page
BKM	5/11/11	15/44S/25E	
Drawn by:	Date:	Category	26
BKM	5/11/11	NWI	
Project Number:	County:		
2009-13	Lee		

## **B BIOLOGICAL RESOURCES**

### **i. ECOSYSTEM FUNCTION**

WMP contains both upland and wetland plant communities. Almost half of the property is dominated by pine flatwoods. Pine flatwoods communities occur in topographically flat areas and are characterized by a canopy of pine trees. This community type is the “most extensive type of terrestrial ecosystem in Florida” (University of Florida 2006). Vegetation in pine flatwoods is limited to species that grow well in acidic soils (pine needles have a high acid content that leaches into soils) and vegetation able to adapt to drought and flood conditions. During severe floods, pine flatwoods act as a water storage area to protect adjacent land owners from flooding (Tiner 1998) and replenish ground water.

Pine flatwoods provide habitat for a variety of wildlife species. The under-story provides an area for nesting, refuge and foraging. The canopy provides tree cavities for home sites and branches which are utilized as a nesting area for tree nesting species and as a perch area for birds. Between “twenty and thirty species of reptiles and amphibians” also utilize pine flatwoods (University of Florida, IFAS. 2006). Nine mammal species and a variety of small rodents also utilize this community. Pine flatwoods provide year round and seasonal habitat for birds.

Pine flatwoods are considered fire dependent ecosystems. This community type requires regular burns in order to control vegetation growth, reduce competition between plant species, create soil conditions suitable for germination of seeds, and to turn over leaf litter. In the absence of fire, mechanical thinning methods may be employed to control vegetation growth. It is anticipated that either controlled burns or mechanical thinning will be included in the management activities at WMP.

WMP currently contains 15% coverage by wetland communities. The majority of these areas are overgrown and heavily infested with exotics. As a result, the onsite wetlands provide few benefits outside of water storage. Wetlands in good condition provide a wide variety of benefits and are crucially important in providing flood storage and improving water quality. A significant portion of the uplands on the property will be converted to wetland communities.

Quality wetlands provide a variety of benefits including improved water storage, flood protection, improving water quality and wildlife habitat. Wetlands provide water storage thereby protecting nearby developments from floods. Wetlands improve water quality by creating a settling area for suspended solids. In addition, nutrients are then utilized by the wetland plants. Wetland communities provide support for a wide diversity of species. Some species depend on wetlands entirely for their survival, and others may rely on wetlands for a portion of the year, or only for a portion of their life cycle. For example amphibians rely heavily on wetland communities for breeding and foraging. Some species of snakes utilize wetlands for foraging. Wading birds utilize wetlands for foraging, nesting and refuge.

## ii. NATURAL PLANT COMMUNITIES

Plant communities at WMP were mapped in the field according to the system in use by the agencies, the Florida Land Use Cover and Forms Classification System (FLUCFCS). See Florida Land Use, Cover and Forms Classification System (Department of Transportation 1999) for definitions. WMP contains 12 plant communities. The dominant plant communities are; pine flatwoods, cabbage palm uplands and disturbed lands. The other plant communities at the Preserve cover less than 7 percent of the property. The majority of the Preserve was utilized as a portion of the army's gunnery range in the 1940's. As a result most of the plant communities have some level of disturbance. However, it has been several years since this disturbance occurred and some natural regeneration has taken place.

Figure 9 is a Natural Plant Communities Map that depicts the various vegetation communities on site. A description of the plant communities on the property is included below. Included within the description of each community type are rare species that may inhabit each community as defined by the Guide to the Natural Communities of Florida (2010) prepared by Florida Natural Areas Inventory (FNAI).

### **411 Pine Flatwoods 85.32± ac. (41.33%)**

The canopy of this community is dominated by slash pine (*Pinus elliottii*). Brazilian pepper (*Schinus terebinthifolius*) could be found in the sub-canopy. Ground cover vegetation included Brazilian pepper saplings, saw palmetto (*Serenoa repens*), bahia grass (*Paspalum notatum*), Caesar weed (*Urena lobata*), and grapevine (*Vitis rotundifolia*).

Fire is an important factor in pine flatwoods. Frequent fires reduce hardwood competition and facilitate vegetation reproduction. Historically fire frequency in this community type "ranged from one to three years" (FNAI 2010). Without frequent fires or some other form of brush management pine flatwoods will transition into a mixed hardwoods community.

### **422 Brazilian Pepper 6.37± ac. (3.09%)**

The canopy of this community is open. The sub-canopy is dominated by Brazilian pepper. Very little groundcover vegetation is present under the dense shade of the Brazilian pepper.

While this community type may be utilized by animal species, it is a non-native community and does not provide preferred wildlife habitat.

### **428 Cabbage Palm 33.65± ac. (16.30%)**

This community's canopy and sub-canopy are dominated by cabbage palm (*Sabal palmetto*). The mid-story includes wild coffee (*Psychotria nervosa*) and beauty-berry (*Callicarpa americana*).

### **428H Hydric Cabbage Palm 0.56± ac. (0.27%)**

The canopy and sub-canopy of this community are dominated by cabbage palm. Brazilian pepper was also present in the sub-canopy. The ground cover was mostly open. This community contained advantageous rooting, water line staining, and algal matting.

The hydrology of cabbage palm hammocks is primarily maintained by rainfall accumulation in areas of poorly drained soils and by periodic flooding. This community type is only inundated for short periods following rain events. The normal hydro-period is typically less than 60 days per year (FNAI 2010).

**437 Australian Pine 0.86± ac. (0.42%)**

This community's canopy is dominated by Australian pine (*Casuarina equisetifolia*). The sub-canopy contained widely scattered cabbage palm. The ground cover included bahia grass, Caesar weed, Brazilian pepper, and cabbage palm.

While this community type may be utilized by animal species, it is a non-native community and does not provide preferred wildlife habitat.

**440 Planted Pine Flatwoods 14.37± ac. (6.96%)**

This community's canopy and sub-canopy vegetation are dominated by slash pine (*Pinus elliottii* var. *densa*). The sub-canopy also contained scattered Brazilian pepper. Ground cover vegetation included Brazilian pepper, Caesar weed, bahia grass, and grapevine.

This community type was planted with canopy vegetation. Over time this area will provide habitat similar to a natural pine flatwoods community and would be anticipated to provide wildlife habitat for similar species.

**500 Ditches and Waterways 2.92± ac. (1.41%)**

This community is comprised of several man-made ditches mostly excavated prior to 1944 and a portion of the Orange River. The sub-canopy contained Brazilian pepper, wax myrtle (*Myrica cerifera*), and Carolina willow (*Salix caroliniana*). The ground cover vegetation contained dotted smartweed (*Polygonum punctatum*) and cattail (*Typha latifolia*).

This community may be utilized by amphibians, reptiles, and birds for foraging and breeding.

**617 Mixed Wetland Hardwoods 3.24± ac. (1.57%)**

This wetland community's canopy consists of swamp laurel oak (*Quercus laurifolia*) and cabbage palm. The sub-canopy contained cabbage palm and Brazilian pepper. Ground cover vegetation included swamp fern (*Blechnum serrulatum*). This community contained some transitional wetland vegetation, advantageous rooting, water line staining, and algal matting.

This community type is influenced by high water tables, peak seasonal flooding and irregular high flood events (FNAI 2010).

**618 Wax-Myrtle/Willow 6.65± ac. (3.22%)**

This wetland community's canopy is open with scattered cypress (*Taxodium spp.*) and melaleuca (*Melaleuca quinquenervia*). The sub-canopy contained wax myrtle, Carolina willow, buttonbush (*Cephalanthus occidentalis*), and Brazilian pepper. Ground cover vegetation included pepper vine (*Ampelopsis arborea*), swamp laurel oak (*Quercus laurifolia*) saplings, iris (*Iris pseudacorus*), sawgrass (*Cladium jamaicense*), and asiatic

pennywort (*Centella asiatica*). There was adventitious rooting at the base of the melaleuca and Carolina willow trees.

Normally fires only burn along the edges of this community; however, during periods of drought this community type is subject to fires, on average, once every 10 to 20 years (FNAI 2010).

**641 Freshwater Marsh 11.70± ac. (5.67%)**

This wetland community has an open canopy with scattered cabbage palm. The sub-canopy was also open with scattered Brazilian pepper. Ground cover vegetation included iris, torpedo grass (*Panicum repens*), asiatic pennywort, frog fruit (*Phylla nodiflora*), smart weed (*Polygonum hydropiperoides*), white-top (*Rhynchospora colorata*), paragrass (*Brachiaria mutica*), and saltmarsh-mallow (*Kosteletzkya virginica*). This community contained advantageous rooting, water line staining, and algal matting.

This herbaceous community is generally maintained by periods of fire and hydrologic fluctuations. Fire frequency in this community type corresponds with fire frequency of the surrounding community (FNAI 2010).

**643 Wet Prairie 5.69± ac. (2.76%)**

This wetland contains an open canopy and sub-canopy. The ground cover vegetation included pickerelweed (*Pontederia cordata*), arrowhead (*Sagittaria lancifolia*), rosy camphorweed (*Pluchea rosea*), sand cord grass (*Spartina sp.*), dog fennel (*Eupatorium capillifolium*), little blue maidencane (*Amphicarpum muhlenbergianum*), mermaid-weed (*Proserpinaca palustris*), sandweed (*Hypericum fasciculatum*), and melaleuca. Hydrological indicators in this community included advantageous rooting, algal matting, and water line staining.

Wet prairies generally appear in “continuously wet, but not inundated, soils” (FNAI 2010). Generally natural fire occurs every 2 to 3 years. “In the absence of fire, shrubs and trees invade wet prairie and shade out the light-loving herbaceous species” (FNAI 2010).

**740 Disturbed Land 34.18± ac. (16.56%)**

This upland community is primarily located along the western and southwestern property boundary, where natural regeneration has not yet occurred. The canopy of this community was open with scattered live oak (*Quercus virginiana*). The sub-canopy was also open. Ground cover vegetation included; dog fennel (*Eupatorium capillifolium*), ragweed (*Ambrosia trifida*), caesar weed, hairy beggar-ticks (*Bidens alba*), sandspur (*Cenchrus echinatus*), saw palmetto, pepper vine, and bahia grass.

This community type lacks the vegetation and cover to provide suitable habitat for most animal species.

**8114 Abandoned Airport 0.93± ac. (0.45%)**

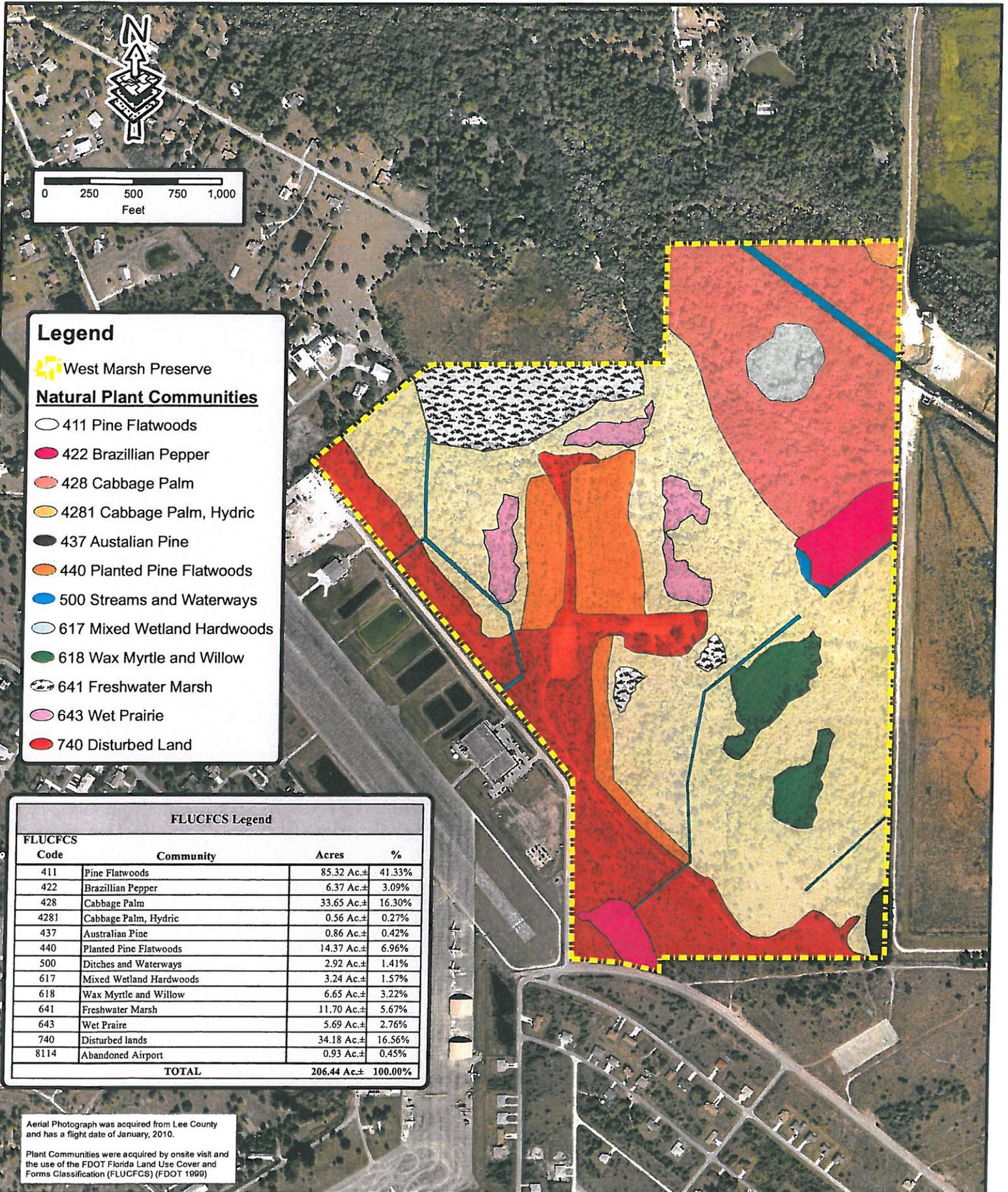
This community consists of the remnant paved portion of the airstrip associated with the Army's Flexible Gunnery School.

This community type lacks the vegetation and cover to provide suitable habitat for most animal species.

**TABLE 7: FLUCFCS COMMUNITY TABLE**

<b>FLUCFCS</b>	<b>Community Description</b>	<b>Acres</b>	<b>Percent</b>
411	Pine Flatwoods	85.32± Ac.	41.33%
422	Brazilian Pepper	6.37± Ac.	3.09%
428	Cabbage Palm	33.65± Ac.	16.30%
428H	Hydric Cabbage Palm	0.56± Ac.	0.27%
437	Australian Pine	0.86± Ac.	0.42%
440	Planted Pine Flatwoods	14.37± Ac.	6.96%
500	Ditches & Waterways	2.92± Ac.	1.41%
617	Mixed Wetland Hardwoods	3.24± Ac.	1.57%
618	Wax Myrtle - Willow Wetlands	6.65± Ac.	3.22%
641	Freshwater Marsh	11.70± Ac.	5.67%
643	Wet Prairie	5.69± Ac.	2.76%
740	Disturbed Lands	34.18± Ac.	16.56%
8114	Abandoned Airport	0.93± Ac.	0.45%
<b>Total</b>		<b>206.44± Ac.</b>	<b>100.00%</b>

**Figure 9: Natural Plant Communities**



**Legend**

- West Marsh Preserve
- Natural Plant Communities**
- 411 Pine Flatwoods
- 422 Brazillian Pepper
- 428 Cabbage Palm
- 4281 Cabbage Palm, Hydric
- 437 Austalian Pine
- 440 Planted Pine Flatwoods
- 500 Streams and Waterways
- 617 Mixed Wetland Hardwoods
- 618 Wax Myrtle and Willow
- 641 Freshwater Marsh
- 643 Wet Prairie
- 740 Disturbed Land

**FLUCFCS Legend**

FLUCFCS Code	Community	Acres	%
411	Pine Flatwoods	85.32 Ac.±	41.33%
422	Brazillian Pepper	6.37 Ac.±	3.09%
428	Cabbage Palm	33.65 Ac.±	16.30%
4281	Cabbage Palm, Hydric	0.56 Ac.±	0.27%
437	Australian Pine	0.86 Ac.±	0.42%
440	Planted Pine Flatwoods	14.37 Ac.±	6.96%
500	Ditches and Waterways	2.92 Ac.±	1.41%
617	Mixed Wetland Hardwoods	3.24 Ac.±	1.57%
618	Wax Myrtle and Willow	6.65 Ac.±	3.22%
641	Freshwater Marsh	11.70 Ac.±	5.67%
643	Wet Praire	5.69 Ac.±	2.76%
740	Disturbed lands	34.18 Ac.±	16.56%
8114	Abandoned Airport	0.93 Ac.±	0.45%
<b>TOTAL</b>		<b>206.44 Ac.±</b>	<b>100.00%</b>

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Plant Communities were acquired by onsite visit and the use of the FDOT Florida Land Use Cover and Forms Classification (FLUCFCS) (FDOT 1999)

### iii FAUNA

Despite the extent of human disturbance on the property the parcel has been allowed to naturally regenerate and currently provides a variety of wildlife habitats. Appendix A has the complete list of fauna and flora documented on West Marsh Preserve and the adjacent Harns Marsh; as recorded by Lee County staff, Boylan Environmental staff and volunteers.

One-hundred and forty four (144) different bird species have been observed at WMP/HM. Listed bird species observed include; Audubon's crested caracara (*Polyborus plancus audubonii*), brown pelican (*Pelecanus occidentalis*), Everglade snail kite (*Rostrhamus sociabilis plumbeus*), Florida sandhill crane (*Grus canadensis pratensis*), limpkin (*Aramus guarauna*), little blue heron (*Egretta caerulea*), osprey (*Pandion haliaetus*), roseate spoonbill (*Platalea ajaja*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), white ibis (*Eudocimus albus*) and wood stork (*Mycteria americana*).

In addition nine (9) reptile species, four (4) amphibian species, four (4) mammal species and six (6) species of butterfly have also been documented on the property. The two listed reptiles that were observed included; the American alligator (*Alligator mississippiensis*) and the gopher tortoise (*Gopherus polyphemus*). A list of the fauna observed on site is included in Appendix B.

Stewardship at WMP will include providing optimal habitat for native wildlife species. This will be established with creation and restoration of native habitats, control of invasive exotic plants and prescribed fire or mechanical thinning of the upland communities.

#### iv. DESIGNATED SPECIES

WMP will be a system of natural communities and created wetlands. WMP will continue to provide wildlife habitat for those species that currently utilize the property. The created wetland habitat will increase the potential utilization by wetland dependent species. This stewardship plan focuses on activities designed to enhance the existing habitat and create additional habitat on site used by species of plants and animals listed by the USFWS, FWC and the FDACS. As previously mentioned twelve listed avian species and two listed amphibians have been observed on the property. In addition to those listed species the Preserve is located within the USFWS consultation protection zones for the Florida panther and within the FWC Florida black bear range. No listed plant species (FDACS listed) have been documented at the Preserve. A map showing the designated species is included as Figure 10.

**TABLE 8: LISTED WILDLIFE SPECIES**

COMMON NAME	SCIENTIFIC NAME	USFWS	FWC	DOCUMENTED ONSITE
Audubon's crested caracara	<i>Polyborus plancus audubonii</i>	T	T	Yes
Brown pelican	<i>Pelecanus occidentalis</i>	--	SSC	Yes
Everglade snail kite	<i>Rostrhamus sociabilis plumbeus</i>	E	E	Yes
Florida sandhill crane	<i>Grus canadensis pratensis</i>	--	T	Yes
Limpkin	<i>Aramus guarauna</i>	--	SSC	Yes
Little blue heron	<i>Egretta caerulea</i>	--	SSC	Yes
Roseate spoonbill	<i>Platalea ajaja</i>	--	SSC	Yes
Snowy egret	<i>Egretta thula</i>	--	SSC	Yes
Tricolored heron	<i>Egretta tricolor</i>	--	SSC	Yes
White ibis	<i>Eudocimus albus</i>	--	SSC	Yes
Wood stork	<i>Mycteria americana</i>	E	E	Yes
American alligator	<i>Alligator mississippiensis</i>	--	SSC	Yes
Gopher tortoise	<i>Gopherus polyphemus</i>	--	T	Yes
Florida panther	<i>Puma concolor coryi</i>	E	E	No

Designated species benefit from management of their habitat. However, some species may require additional measures to ensure their protection. Exotic plant control, protecting and restoring water resources, prescribed fire, trash removal, wildlife monitoring, enforcement of no littering and no unauthorized weapons, will improve wildlife habitat at the Preserve.

## WILDLIFE SPECIES

The following is a brief summary of each listed wildlife species observed on the property and a description for the Florida panther and Florida black bear. WMP is located within the habitat range of the Florida panther and Florida black bear. Florida panthers and Florida black bears have not been observed at WMP.

## LISTED BIRDS

### **AUDUBON'S CRESTED CARACARA**

Audubon's crested caracara (*Polyborus plancus audubonii*) is listed as a threatened species with the USFWS and the FWC. In adults this large raptor has a naked red orange to yellow face, black crest, large bill, elongated neck and long yellow legs. The neck, throat, base of the tail and the lower portion, of the underside of the wings are white in color. The crest, body, tail and remainder of the wing feathers are dark brown to black in color. A black ring is visible around the white tail base. Caracara primarily occupy dry or wet prairie like areas and improved and unimproved pastures with scattered cabbage palms.

Florida's caracara population was relatively stable between 1972-1991 (FNAI 2001). However the caracara's range has become more fragmented as caracara habitat is being converted to residential development and/or to more intensive agricultural (e.g., citrus) uses. Removal of the exotic plants from cabbage palm hammocks adjacent to the wetlands to be preserved will enhance the habitat value for this species.

### **BROWN PELICAN**

The brown pelican (*Pelecanus occidentalis*) is listed as a species of special concern with the FWC. This large water bird has a long gray bill with a pouch of skin. Brown pelicans have a brown and gray body, long brown neck and a white head. They are found at sandy beaches along the coastline and at waterfront marinas.

The population decline of the brown pelican is related to pesticide use containing DDT. Despite banning the use of DDT the brown pelican's population has continued to decline. The decline is likely due to food shortage, human disturbance, increased turbidity, chemical spills, extreme cold temperatures and entanglement (FNAI 2001). The created wetlands should enhance the potential utilization by this species. The Biological Review Group has recommended delisting this species. Once the management plan for the brown pelican has been adopted by the FWC, it is anticipated the brown pelican will be removed from the list.

### **EVERGLADES SNAIL KITE**

The snail kite (*Rostrhamus sociabilis*) is listed as an endangered species by both the USFWS and the FWC. This is a medium sized hawk has a slender deeply hooked beak. Male snail kites are dark gray with a black head and wing tips. There is a white patch at the base of the square tail. Males have red legs and cere. Females have a buff colored face and body with heavy dark streaking. They have a white tail patch and a white line above the eyes. Their legs and cere are yellow to orange. Snail kites primarily feed on apple snails and are found in or near freshwater bodies and wetlands.

Snail kites are greatly affected by a loss of water habitat. Loss of wetlands and water pollution causing snail die-offs continues to be a problem in snail kite management (FNAI 2001). The created wetlands should enhance the potential utilization by this species.

### **FLORIDA SANDHILL CRANE**

The Florida sandhill crane (*Grus canadensis pratensis*) is listed as a threatened species with the FWC. This long legged, long necked heron like bird is the oldest known, surveying bird species. Cranes primarily utilize open freshwater wetlands however; they can also be found in bogs, meadows, grasslands, pine savannas, and cultivated lands. This bird appears is sensitive to human disturbance.

The population of sandhill cranes has remained stable since 1975 (FNAI 2001). A major area of concern in the conservation of sandhill cranes is the conversion of open rangeland and prairies to development and agricultural lands. The created wetlands will provide additional forage and nesting habitat for the sandhill crane.

### **LIMPKIN**

The limpkin (*Aramus guarauna*) is listed as a species of special concern with the FWC. This species of wading bird is a large brown bird with white spots. Limpkins superficially look like an ibis. Limpkins have a piercing cry (kree-ow, kra-ow). This bird is found in freshwater marshes, along the edges of ponds and lakes, and in wooded swamps along rivers. Its preferred food source is the apple snail; however, it will also eat mussels, insects, crustaceans, worms, frogs, lizards, and other snails.

The limpkin population is primarily affected by food shortages. The shortage is a result of pollution, hydrological disruptions and exotic plants which threaten the apple snail (FNAI 2001). The created wetlands will provide additional forage and nesting habitat for the limpkin. The Biological Review Group has recommended delisting this species. Once the management plan for the limpkin has been adopted by the FWC, it is anticipated the limpkin will be removed from the list.

### **LITTLE BLUE HERON**

The little blue heron (*Egretta caerulea*) is listed as a species of special concern with the FWC. This wading bird is a medium sized, slender heron whose appearance differs dramatically with age. First year herons are pure white, while adult herons appear slate blue. The little blue heron's diet includes; small fish, amphibians, and aquatic invertebrates. Little blues occupy swamps, estuaries, rivers, ponds, and lakes.

Primary threats to little blue herons include hydro-periods alterations in wetlands, pesticide exposure and heavy metal contamination (FNAI 2001). The population of little blues continues to decline and may be a result of illegal killings (FNAI 2001). The created wetlands will provide additional forage and nesting habitat for the little blue heron.

### **OSPREY**

The osprey (*Pandion haliaetus*) is listed as a species of special concern with the FWC within only the Monroe County population. This large bird has a dark brown backside, with a white head and belly. A low irregular crest is formed from feathers at the top of the head. This bird is a water dependent species. Ospreys are primarily found near large bodies of water including; lakes, rivers and coastal areas.

The decline in the osprey population primarily occurred as a result of organophosphate pesticides and food shortages (FNAI 2001).

#### **ROSEATE SPOONBILL**

The roseate spoonbill (*Platalea ajaja*) is listed as a species of special concern with the FWC. This wading bird is pink and white with a bare head. Its bill is grey-green, spoon shaped, and flattened out like a spatula. It is the only spoonbill species that lives in the western hemisphere. These birds primarily diet on small fish however; crustaceans, insects, and aquatic plants may also be consumed. The roseate spoonbill primarily occupies estuaries, rivers, ponds, and marshes. The created wetlands will provide additional forage and nesting habitat for the roseate spoonbill.

#### **SNOWY EGRET**

The snowy egret (*Egretta thula*) is listed as a species of special concern with the FWC. Snowy egrets are small sized, white herons, with a black bill, black legs, and yellow feet. They typically eat fish, crabs, amphibians, and insects. Snowy egrets occupy salt marshes, swamps, ponds, shores, tidal flats, rice fields, and shallow coastal bays.

Destruction of foraging wetlands is the primary reason for this species decline (FNAI 2001). The creation of the wetlands will provide additional forage and nesting habitat for the snowy egret. The Biological Review Group has recommended delisting this species. Once the management plan for the snowy egret has been adopted by the FWC, it is anticipated the snowy egret will be removed from the list.

#### **TRICOLORED HERON**

The tricolored heron (*Egretta tricolor*) is listed as a species of special concern with the FWC. This medium sized heron has a dark, slate gray head and upper body, with a purplish chest. These herons have a white strip running down the front of their neck that creates their tricolor. Their diets consist of small fish, crustaceans, reptiles, amphibians, insects, snails, and other invertebrates. Tricolored herons prefer saltwater and brackish water habitats; however, they will forage in both freshwater and saltwater areas. Tricolored herons can be found in salt and freshwater mudflats, marshes, swamps, and meadows.

Species numbers appear to be in decline. This is most likely due to destruction of foraging wetlands (FNAI 2001). The created wetlands will provide additional forage and nesting habitat for the tricolored heron.

#### **WHITE IBIS**

The white ibis (*Eudocimus albus*) is listed as a species of special concern with the FWC. Adults are predominantly white with black wing tips. The long legs and long downward curved bill are bright red. Young white ibis' have a brown head, back and wings with a white underside. Their bill and legs are brown. This wading bird utilizes freshwater, brackish, saltwater, and coastal marshes, mud flats and mangrove swamps.

While the Florida population continues to decline, this decline is somewhat offset by increasing numbers in nearby states (FNAI 2001). The decline in this species is primarily due to wetland destruction and degradation. The created wetlands will provide additional forage and nesting habitat for the white ibis. The Biological Review Group has recommended delisting this species. Once the management plan for the snowy egret has been adopted by the FWC, it is anticipated the snowy egret will be removed from the list.

## **WOOD STORK**

The wood stork (*Mycteria americana*) is listed as an endangered species with the USFWS and the FWC. This large, black headed, bald, wading bird has a white body with white wings and black flight feathers. The long, downward curved bill and legs are black. Wood storks are the largest wading bird native to America and primarily occupy wetlands.

Wood storks are highly vulnerable to hydrology changes and wetland destruction (FNAI 2001). The wetland creation areas will provide additional forage habitat for this species.

## **REPTILES**

### **AMERICAN ALLIGATOR**

The American alligator (*Alligator mississippiensis*) is listed for similarity in appearance as threatened with the USFWS and as a species of special concern with the FWC. The American alligator is the largest reptile in North America. Alligators have a short, rounded snout and can reach up to 18 feet in length. Alligators primarily occupy freshwater swamps and marshes, but are also found in rivers lakes and smaller bodies of water.

American alligators have recovered dramatically since the 1960's. They have recovered so much that some populations are large enough to support limited harvests (FNAI 2001). Pollution and destruction of wetlands are currently the main threat to this species. The wetland creation will provide additional forage and nesting habitat for this species.

### **GOPHER TORTOISE**

The gopher tortoise (*Gopherus polyphemus*) is a large reptile that averages 25 cm in length and 9 lbs in weight. Wild tortoises can live up to 60 years old. Gopher tortoises dig an approximately 4.5 meter long burrow which has a half moon shaped entry and a large dirt apron. Tortoise burrows create homes for 360 species of animals. These tortoises can be commonly found in dry scrub areas, including scrub oak, dry prairies, pine flatwoods, and coastal dune ecosystems. Tortoises are primarily herbivorous; however, they will eat bones of dead animals for calcium.

Gopher tortoises are in decline because of habitat loss. This species is dependant on dry, upland communities which are primarily being converted into urban and residential developments, agriculture, citrus groves, mining and pine plantations. Additional threats include a highly contagious respiratory disease and human consumption. The removal of exotic plant species from the uplands will improve the habitat value of these lands for the gopher tortoise.

## **MAMMALS (HAVE NOT BEEN OBSERVED AT WMP)**

### **FLORIDA PANTHER**

The Florida panther (*Puma concolor coryi*) is listed as an endangered species by both the USFWS and the FWC. Panthers are solitary, elusive animals that are rarely observed in the wild. Only 80 to 100 panthers still remain in Florida. The Florida panthers is one of the most rare and endangered animals in the world. These large, unspotted cats have a long, dark-tipped tail. They are usually found in pinelands, hardwood hammocks, and swamp forests. The average male panther's home range is 275 square miles.

The Florida panther's decline is due mainly to loss, fragmentation, and degradation of habitat. Other threats include inbreeding, insufficient numbers of large prey, disease, car accidents, mercury and other environmental contaminants.

#### **FLORIDA BLACK BEAR**

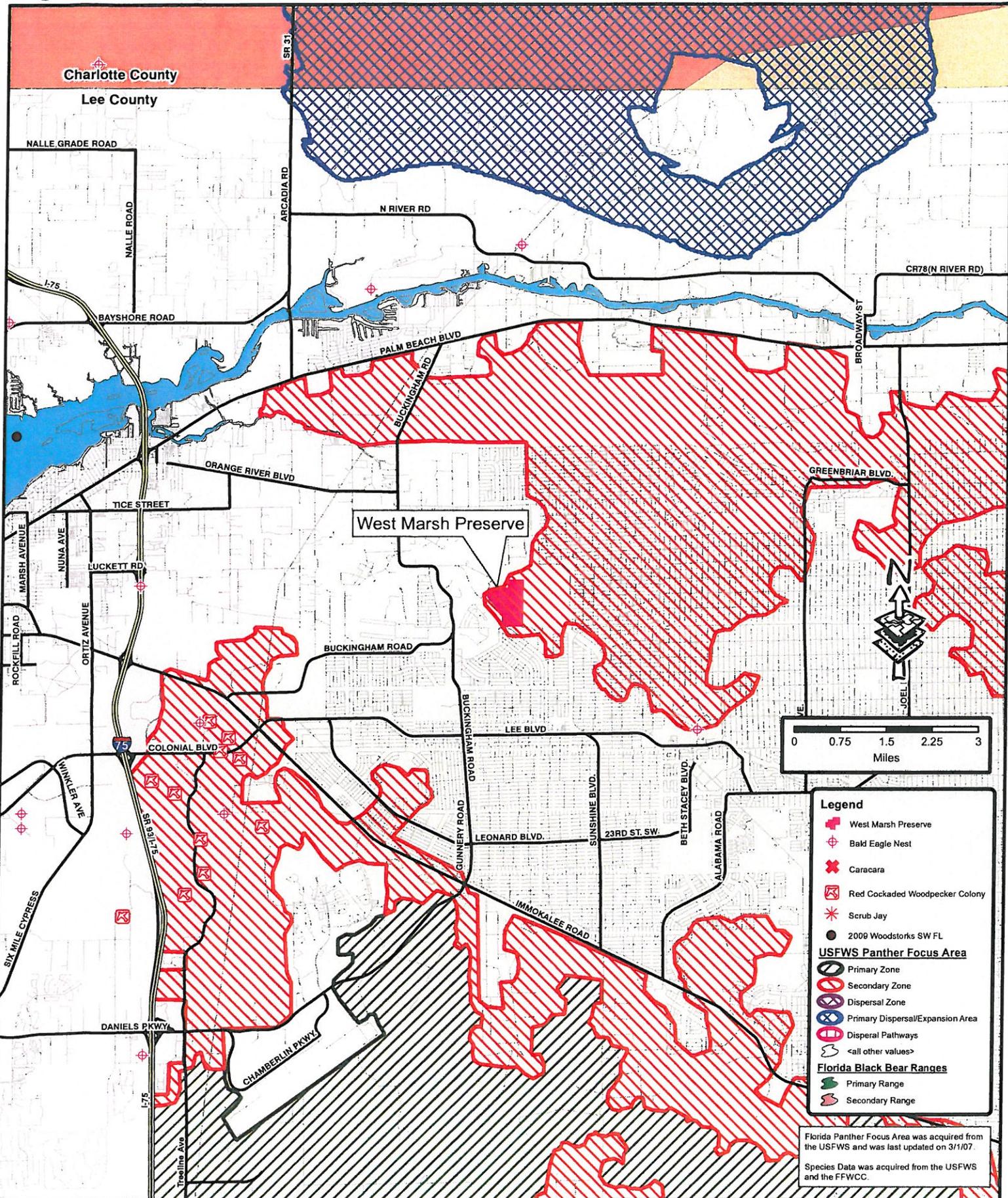
The Florida Black Bear (*Ursus americanus floridanus*) was removed from the Florida's Endangered and Threatened Species list as of August 23, 2012. The Florida Black Bear Management Plan has also been approved. The Florida black bear is a subspecies of the American black bear (*Ursus americanus*). The Florida black bear is black with a brown muzzle. Some have a white spot on their chest. Black bears inhabit pine flatwoods, hardwood hammocks, upland sand pine, and scrub oak. A male black bear's home range is approximately 66 square miles.

The Florida black bear faces numerous challenges including poaching, car accidents, low reproductive rate and most importantly loss of habitat to timber harvesting, development and other uses (FNAI 2001).

#### **LISTED PLANTS**

A list of the flora observed on site is included in Appendix C. No listed plant species have been observed at WMP.

Figure 10: Designated Species Map



## **v. BIOLOGICAL DIVERSITY**

WMP contains a variety of plant communities including both upland and wetland areas. The diversity of plant communities allows for a variety of wildlife to utilize the Preserve. While the property has been disturbed by previous development, the area has been allowed to naturally regenerate. Biodiversity levels will likely increase following management activities at the Preserve.

In addition, WMP is located adjacent to Harns Marsh (water management area). The connection to natural lands will provide a greater opportunity for mammals with large home ranges to utilize the property.

Listed Gopher tortoises were observed at the Preserve. This species is classified as a threatened species because of human consumption and development. WMP will be managed in accordance with the FWC management guidelines for gopher tortoises.

A portion of the Preserve will be managed as wetlands for the purpose of providing water storage and improving water quality. The creation of the wetlands areas will also provide additional habitat for wading birds and amphibians.

ECWCD staff will perform the following actions in order to preserve the integrity and diversity of WMP.

- Enhance hydrologic conditions on the property to allow for increased water storage and preventing downstream flooding.
- Implement a prescribed fire program, if feasible, to mimic natural fire regimes, control growth and increase plant diversity. The prescribed fire program will be performed by outside contractors.
- Control invasive exotic vegetation and perform annual maintenance to provide suitable habitat for wildlife.
- Temporarily close flooded trails to prevent soil disturbance and avoid damage to vegetation.
- Where necessary, install fire breaks to protect resources on the property and protect surrounding offsite properties from fire damage.
- Remove debris and prevent future dumping at the Preserve.
- Implement measures to control exotic, invasive animal populations, if necessary.
- Use adaptive management techniques, if monitoring and restoration activities indicate a change is necessary.
- Offer limited public access to allow the public to enjoy the natural beauty of the Preserve.

## C CULTURAL RESOURCES

### i. ARCHAEOLOGICAL FEATURES

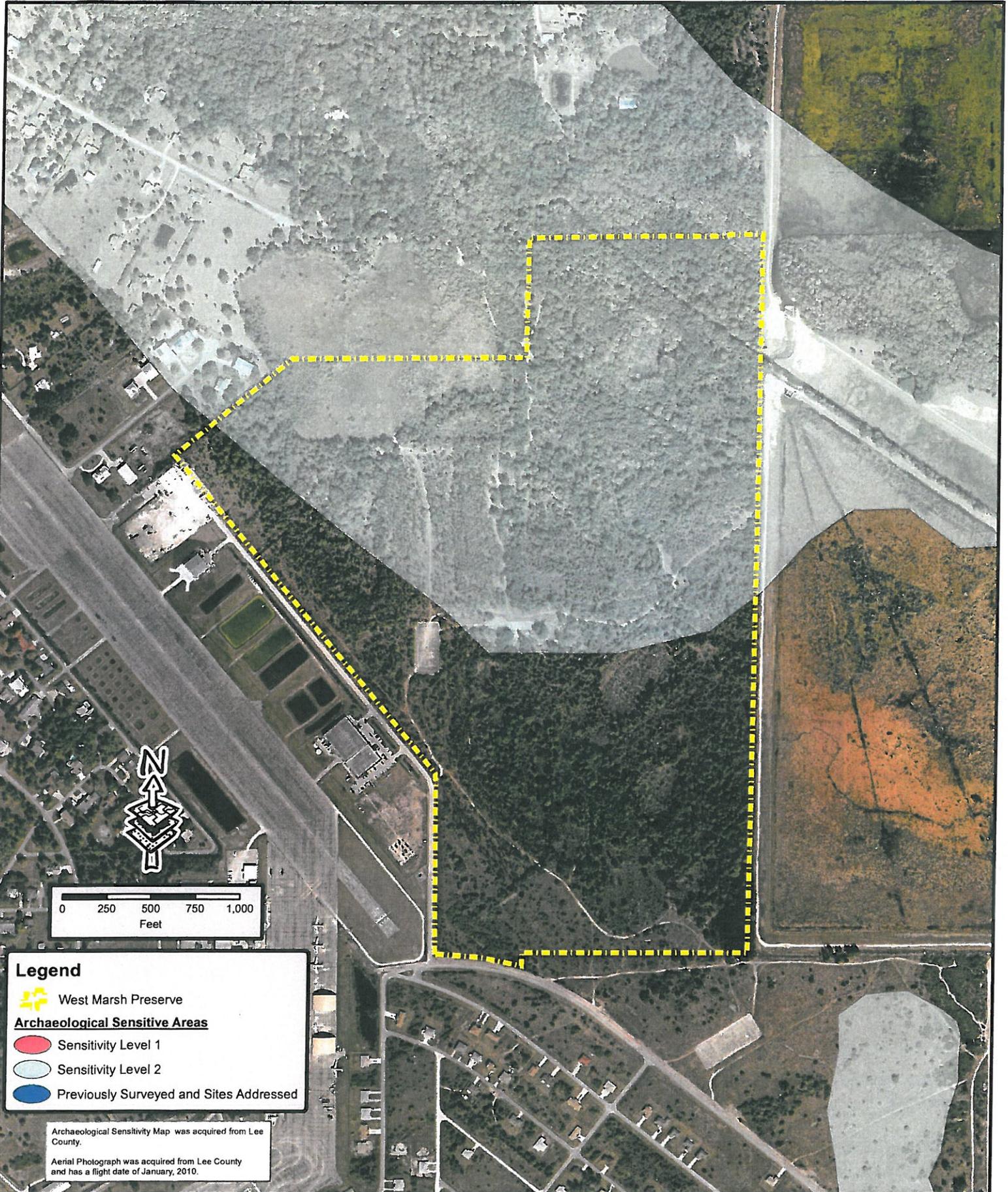
Piper Archaeological Research conducted an archaeological site inventory of Lee County in 1987. As part of the study Piper Archaeological Research created a site predictive model and archaeological sensitivity map for Lee County. A portion of WMP is designated as archaeological sensitivity area level 2 (Figure 11). Archaeological sensitivity areas 2 are defined by the study 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 determine the presence of any archaeological sites in the impact area and/or assess the significance of these sites" (Austin 1987).

A master site file search was requested from Florida's Division of Historical Resources (DHR). The search did not locate any previously known recorded cultural resources on the property. A copy of the correspondence from DHR is included in the appendix. If evidence of artifacts are found in the area during restoration activities, staff will follow the DHR, "Best Management Practices: An Owner's Guide to Protecting Archeological Sites" and contact the DHR.  
<http://www.flheritage.com/archeology/education/culturalmgmt/Handbook.pdf>

The Buckingham Army Air Field and Flexible Gunnery School existed on portions of the site from 1942-1945(Wadsworth, 2010). The area includes a paved airstrip that was removed sometime between 1953 and 1958. Remnants of the runway still remain.

Per the LSOM, a professional archeologist will be hired to conduct a survey of areas that will be impacted or excavated. If evidence of artifacts are found during construction, staff will follow the Division of Historical Resources (DHR) "Best Management Practices: An Owner's Guide to Protecting Archeological Sites" and DHR will be contacted. The LSOM prohibits collecting of archaeological or cultural resources from the site.

**Figure 11: Archaeological Resources Map**



**Legend**

- West Marsh Preserve
- Archaeological Sensitive Areas**
- Sensitivity Level 1
- Sensitivity Level 2
- Previously Surveyed and Sites Addressed

Archaeological Sensitivity Map was acquired from Lee County.

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

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 Fax: (239)418-0672

**WEST MARSH PRESERVE**

2010 AERIAL PHOTOGRAPH  
 WITH ARCHAEOLOGICAL SENSITIVE AREAS

Created by:	Date:	SEC/TWP/RNGS
BKM	5/11/11	15/44S/25E
Drawn by:	Date:	Category
BKM	5/11/11	Archaeological
Project Number	County	
2009-13	Lee	

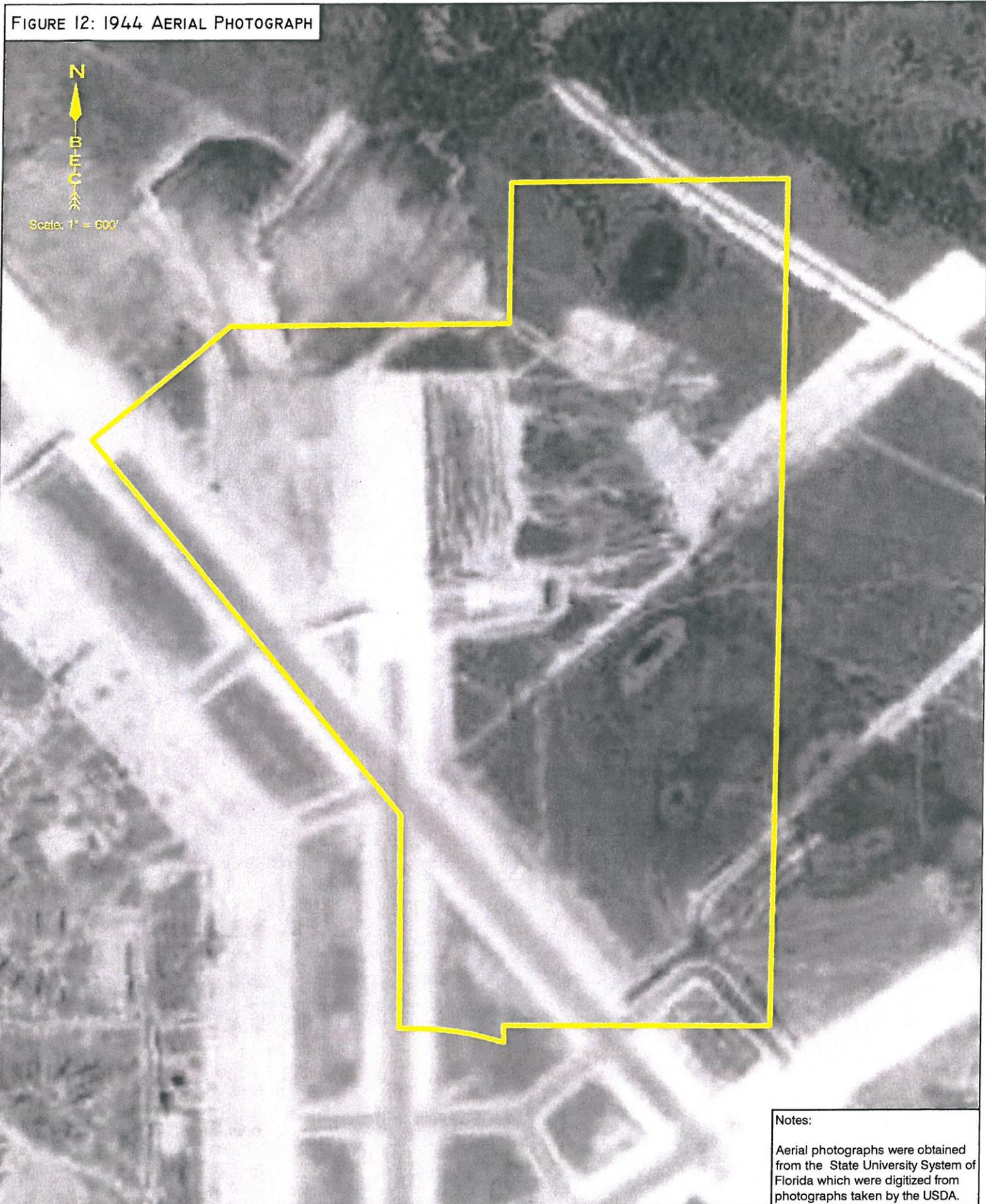
## ii. LAND USE HISTORY

The majority of WMP was utilized by the Army as Flexible Gunnery School (Wadsworth, 2010). Construction started on the military base in February 1942. The WMP parcel was cleared, several ditches were created and a portion of the site was paved and utilized as an airstrip. The north end of north-south runway 18 was situated on the western portion of the Preserve (Professional Service Industries, 2008). The portion of Orange River that bisects the northeast corner of the property appears to have been constructed in the 1940's. The school was utilized to train air-to-air and air-to-surface gunnery. By September 30, 1945 the base was closed (Freeman 2010).

The majority of the runway paving was removed sometime between 1953 and 1958. About 100 yards of the runway still remains. The majority of the site was allowed to naturally re-vegetate. There are not any indicators of the properties use between the 1950's and 1990's. Based on a series of aerial photography it appears that the land may not have been utilized. As a result a significant portion of the property was able to naturally re-vegetate.

Between 1990 and 1999 a series of slash pine rows were planted in the northwestern portion of the property. Currently the Preserve is dominated by native and disturbed lands. Figures 12 to 17 include a series of historical aerial photographs of the Preserve. All other aerals used in the report are from 2010.

FIGURE 12: 1944 AERIAL PHOTOGRAPH



X:\BEC\2009\2009-13 ECWCCP\Land Stewardship Plan\Historic Aerials.dwg Tab: 1944 Dec 04, 2012 - 3:00pm Plotted by: Bitem

Notes:  
Aerial photographs were obtained from the State University System of Florida which were digitized from photographs taken by the USDA.

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**West Marsh Preserve**  
1944 Aerial Photograph

Drawn By:	Date:	Category	Page
BKM	5/10/11	Historic	
Job Number	2009-13	Scale:	
S/T/R	1" = 600'	County	
15/44S/25E		Lee	<b>45</b>

FIGURE 13: 1953 AERIAL PHOTOGRAPH



Scale: 1" = 600'



Notes:  
Aerial photographs were obtained from the State University System of Florida which were digitized from photographs taken by the USDA.

X:\BEC\2009\2009-13 ECWCD\Land Stewardship Plan\Historic Aerials.dwg Tab: 1863 Dec 04, 2012 - 3:01pm Plotted by: Bklann

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**West Marsh Preserve**  
1953 Aerial Photograph

Drawn By:	Date:	Category	Page
BKM	5/10/11	Historic	
Job Number	2009-13	Scale:	
S/T/R	1" = 600'	County	
15/44S/25E		Lee	<b>46</b>

FIGURE 14: 1958 AERIAL PHOTOGRAPH



Notes:  
Aerial photographs were obtained from the State University System of Florida which were digitized from photographs taken by the USDA.

X:\BEC\2009\2009-19 ECWCD\Land Stewardship Plan\Historic Aerials.dwg Tab: 1958 Dec 04, 2012 - 3:01pm Plotted by: Brianm

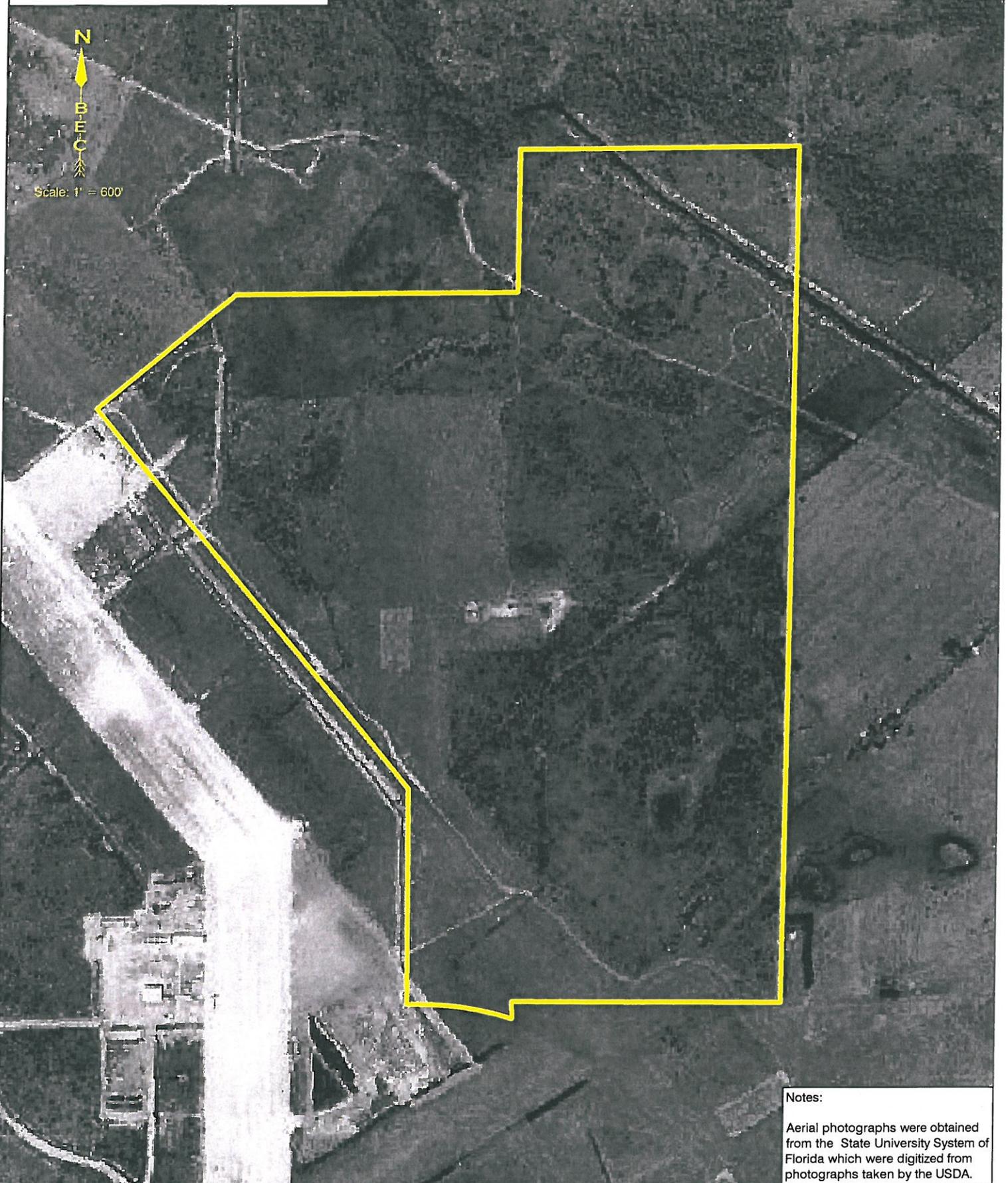
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**West Marsh Preserve**  
1958 Aerial Photograph

Drawn By:	Date:	Category	Page
BKM	5/10/11	Historic	47
Job Number	Scale:		
2009-13	1" = 600'		
S/T/R	County		
15/44S/25E	Lee		

FIGURE 15: 1970 AERIAL PHOTOGRAPH



X:\BEC\2009\2009-13 ECW\CD\Land Stewardship Plan\Historic Aerials.dwg Tab: 1970 Dec 04, 2012 - 3:01pm Plotted by: Brian

Notes:  
Aerial photographs were obtained from the State University System of Florida which were digitized from photographs taken by the USDA.

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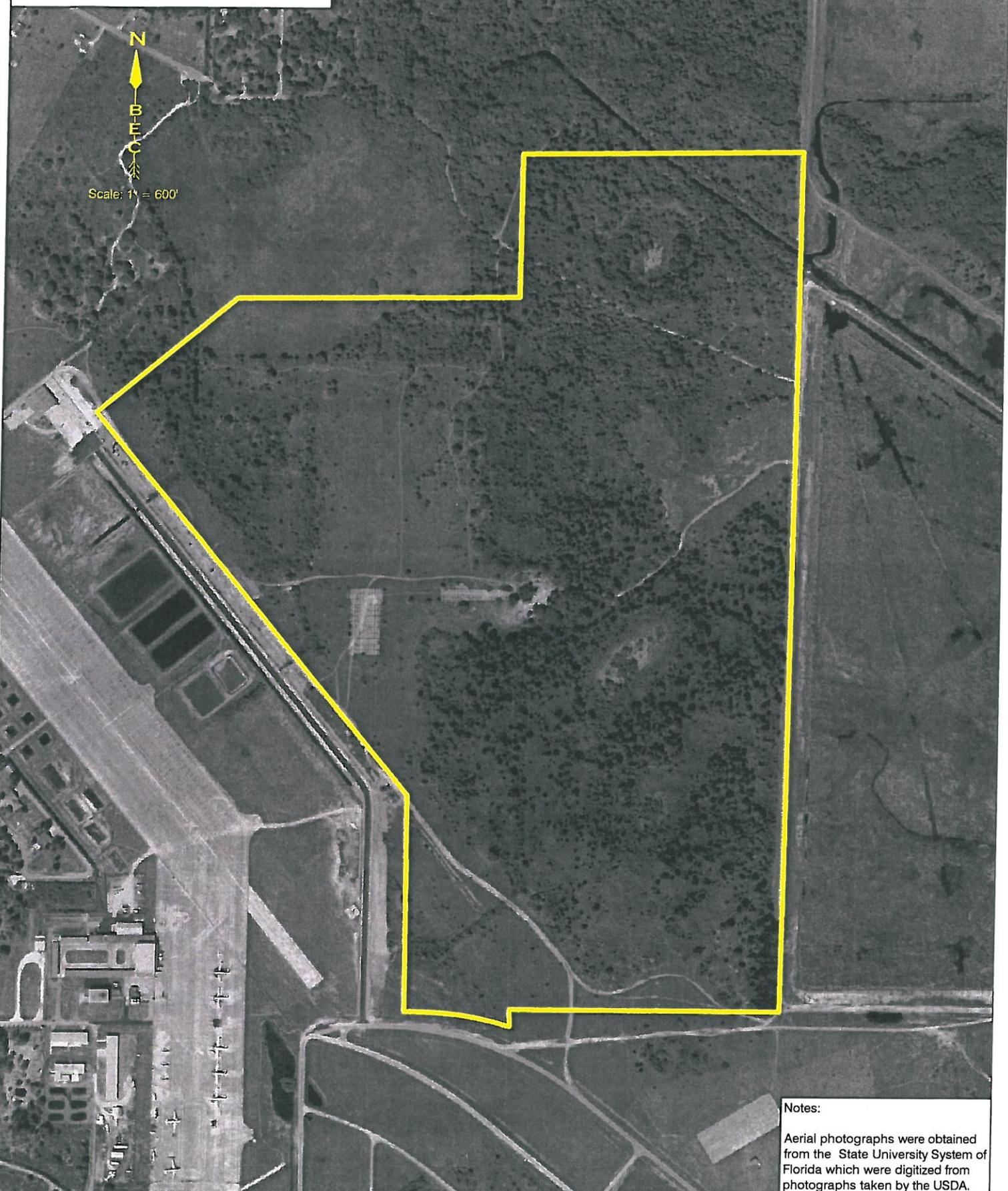


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**West Marsh Preserve**  
1970 Aerial Photograph

Drawn By:	Date:	Category	Page
BKM	5/10/11	Historic	
Job Number	2009-13	Scale:	
S/T/R	15/44S/25E	1" = 600'	
		County	48
		Lee	

FIGURE 16: 1990 AERIAL PHOTOGRAPH



X:\BREC\2009\2009-18 ECHWCD\Land Stewardship Plan\Historic Aerials.dwg Tab: 1990 Dec 04, 2012 - 3:01pm Plotted by: Bkamm

**Notes:**  
Aerial photographs were obtained from the State University System of Florida which were digitized from photographs taken by the USDA.

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**West Marsh Preserve**  
1990 Aerial Photograph

Drawn By:	Date:	Category	Page
BKM	5/10/11	Historic	
Job Number	2009-13	Scale:	49
S/T/R	15/44S/25E	1" = 600'	
		County	
		Lee	

FIGURE 17: 1999 AERIAL PHOTOGRAPH



Notes:  
 Aerial photographs were acquired through Lee County Property Appraiser's office with a flight date of January, 1999

X:\BEC\2009\2009-13 ECWCD\Land Stewardship Plan\Historic Aerials.dwg Tab: 1999 Dec 04, 2012 - 3:02pm Plotted by: Bkmm

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**West Marsh Preserve**  
 1999 Aerial Photograph

Drawn By:	Date:	Category	Page
BKM	5/10/11	Historic	
Job Number	2009-13	Scale:	
S/T/R	1" = 600'	County	
15/44S/25E		Lee	<b>50</b>

### iii. PUBLIC INTEREST

WMP was purchased by C20/20. C20/20's primary goal is to protect and preserve wildlife habitat, protect water quality and supply, protect developed lands from flooding and provide resource based recreation (C20/20 2011). The primary goal at WMP is to provide water storage and to improve water quality. In order to meet this goal the Preserve will contain a large amount of sensitive wetland communities; as a result public access will be limited.

The proposed master site plan includes a bird watching area, picnic area, restroom facilities and a parking area along the western portion of the property. In addition the perimeter berm around the wetland system will be used for pedestrian access. This area will only be open to public vehicular traffic for guided driving tours. The Preserve will not be available for equestrian or all-terrain vehicle use.

Publicly available information concerning this and all C20/20 preserves can be found on the C20/20 web site along with copies of their associated stewardship plans ([www.conservation2020.org](http://www.conservation2020.org)).

## **V FACTORS INFLUENCING MANAGEMENT**

### **A NATURAL TRENDS AND DISTURBANCES**

A variety of weather trends and natural disturbances affect southwest Florida including; hurricanes, flooding, wildfires, occasional freezes, and wet and dry seasons. This Management Action Plan will take these weather trends and their influence on projects at WMP into consideration. Natural disasters such as a hurricane or wildfire may damage vegetation. While the extent of the vegetation damage that may occur cannot be predicted; it is known that it may be necessary to remove downed vegetation if the debris would negatively affect wildlife, habitat, hydrology, or public safety.

Florida's unique climate increases the risk of wildfires. Florida's mild, dry winters allow for abundant growth of groundcover species (NCDC 1998). This vegetative growth along with severe drought that occurs in May and June dries out groundcover vegetation and provides an abundant fuel source (NCDC 1998). While most fires are caused by humans, lightning strikes are a secondary cause (FEMA 1993). LCPR staff, along with the Florida Forestry Service (FFS)-Caloosahatchee District, have developed a wildland firefighting protocol for all of the County's preserves. This protocol will help to minimize impacts to the Preserve, as a result of, bulldozers, plows, and other emergency firefighting equipment creating dozer lines. In addition the Fire Management Plan will likely decrease the impact of catastrophic wildfires on County preserves and neighboring lands. The FFS has a copy of this plan and will continue to receive updated maps of newly acquired C20/20 parcels indicating the locations of gates, firebreaks, management units, and water sources. ECWCD staff will lead periodic site visits in order to familiarize FFS staff with WMP and the current management efforts.

Land management (invasive exotic plant control, prescribed burning, etc.) at WMP is influenced by seasonal flooding. The Land Stewardship Operations Manual's (LSOM) exotic plant prescription form will be used to define the conditions required for management activities. Care will be taken to prevent herbicide run off during summer thunderstorms, 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, if employed, will also be influenced by seasonal rain, weather, wind patterns and wildlife needs. The prescribed burn program will utilize outside consultants for implementation.

## **B INTERNAL INFLUENCES**

While not all of the alterations on the property occurred in the 1940's and 1950's; the majority of the man made alterations did. The land parcel where WMP is located was previously a portion of the Army's airfield. During this time the majority of the Preserve was cleared. In addition, ditches were excavated to drain the land and make it suitable for use. The ditches that remain on the property are located within the southern and northeastern portions of the parcel. There is also one ditch along the western property boundary.

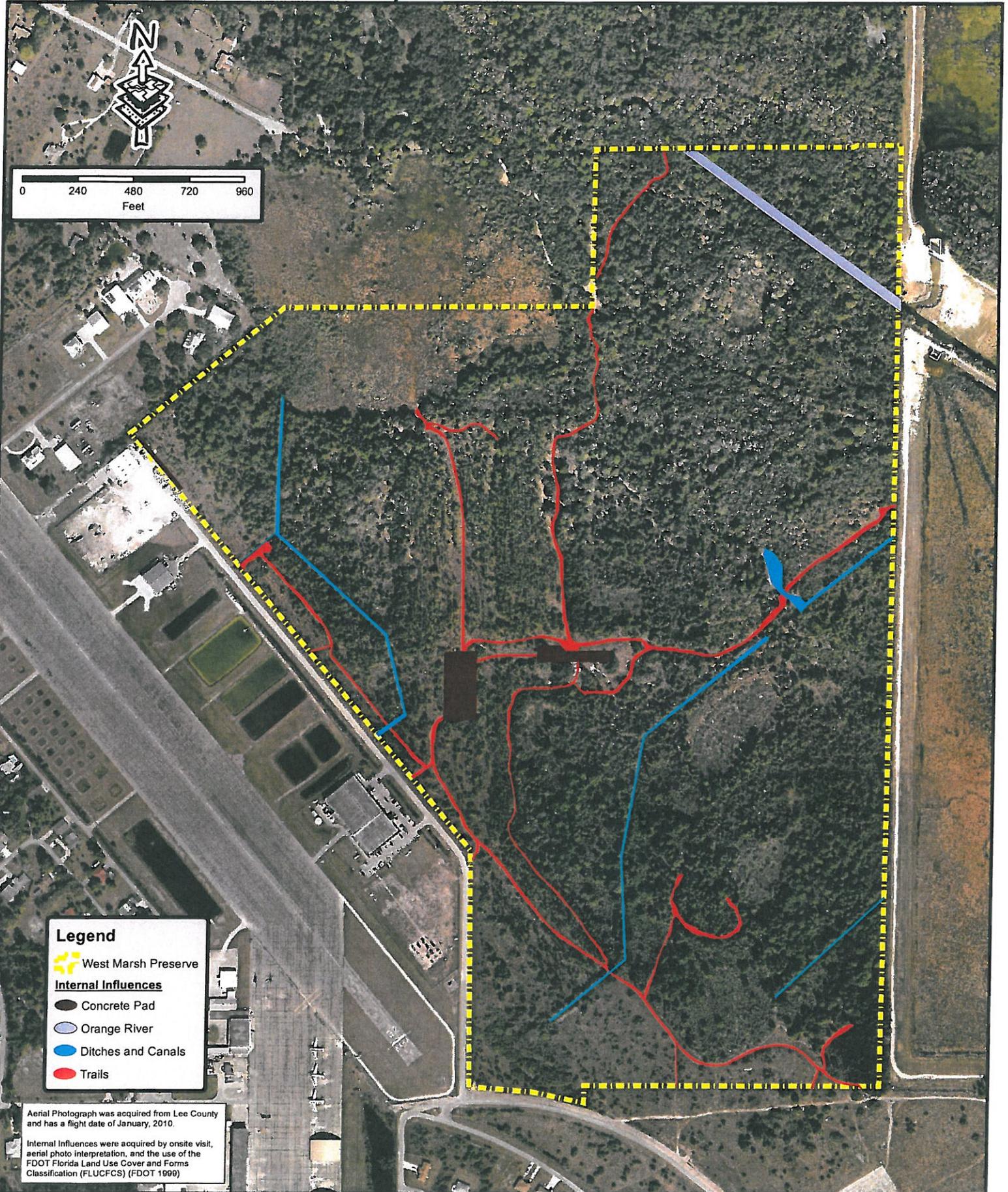
In addition to land clearing and ditch placement, asphalt runways were constructed. While the majority of the runways have been removed a small portion remains. Two asphalt/concrete areas are located along the mid western portion of the Preserve. In the areas where the asphalt runway was removed, the disturbance to the property's topography remains. These alterations in combination with the ditches adversely influence water flow by interrupting sheet flow and draining portions of the property. Figure 18 includes a map depicting the internal influences.

The highly intrusive level of man-made activities allowed for aggressive invasive exotic plant species infestation which further disrupted the regenerating native plant communities. Removal of invasive exotic plant species is an important part of the restoration of conservation lands.

The presence of exotic animals can also alter native landscapes. For example, feral hogs disturb soil and sensitive vegetation during rooting activities. This disturbance can provide optimal substrate for invasive exotic plant growth. Feral hog damage has occurred within the upland and wetlands. There was also evidence of hogs along the trunks of slash pines. Exotic snails, amphibians and fish can out-compete native species for habitat and food. A range of removal methods, such as using trappers to capture the feral hogs, may be used to control the problematic invasive exotic animals found on the Preserve.

The natural fire dependent communities have not been regularly exposed to fire. As a result mixed hardwoods and other non-fire tolerant species are establishing in the pine flatwoods and understory vegetation is becoming overgrown. Shrubs and exotic species are encroaching into the hydric herbaceous communities. Vegetation reduction measures, which may include a fire regime, are planned to re-establish healthier pine flatwoods and hydric communities. Conducting prescribed burns in fire dependent communities will enhance conservation measures by; inhibiting exotic plant growth and controlling native species growth, ultimately allowing for long-term sustainability. Implementation of the controlled burn program will be by outside contractors.

**Figure 18: Internal Influences Map**



**Legend**

- West Marsh Preserve
- Internal Influences**
- Concrete Pad
- Orange River
- Ditches and Canals
- Trails

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Internal Influences were acquired by onsite visit, aerial photo interpretation, and the use of the FDOT Florida Land Use Cover and Forms Classification (FLUCFCS) (FDOT 1999)

Created by	Date	SEC/WP/RMG	Page
BKM	5/11/11	15/44S/25E	
Drawn by	Date	Category	54
BKM	5/11/11	Influences	
Project Number	County		
2009-13	Lee		

## **C External Influences**

A variety of external influences affect WMP (Figure 19). WMP is adjacent to Harns Marsh and is in close proximity to Orange River Conservation Lands and East County Water Control District, which are positive external influences providing additional habitat, foraging, and nesting opportunities for wildlife. It may be possible to partner restoration activities limiting adjacent exotic seed sources, and improving the success of exotic treatments. Public use should be coordinated between the preserves.

The Preserve is not entirely surrounded by conservation lands. An airfield is located southwest of the Preserve. Buckingham Field Airport is the remnant of an Army Air Corps gunnery training base that operated from 1942–1945. It trained over 42,000 pilots during WW2. In 1968, it became the base of the Lee County Mosquito Control District (LCMCD). LCMCD operates a fleet of mosquito spraying C-47 airplanes and UH-1 helicopters from the airport. In addition, the airport is used by privately owned light aircraft, and as a base for the Lee County Sheriff's Office (LCSO) helicopters. LCSO also operates a gun range at the airport, and local law enforcement agencies use the airport for driver's training. A copy of the draft West Marsh Preserve Land Stewardship Plan was provided to LCMCD for review and comment. LCMCD expressed concerns that visitors to the site might complain of noise associated with the airpark, eventually inhibiting their operations. Consequently, the parking and picnic areas were moved to the southeast corner of the site. Lee County staff agreed to limit vehicular access on the western side of the Preserve to guided tours only, and granted an Aviation easement to LCMCD (Appendix H) to assure continuity of their operations.

Single family homes are located south and northwest of the Preserve. The surrounding developments may bring potential issues of illegal horticultural waste and trash dumping, as well as, increase the demand for access to the site. The nearby developments will also increase the challenges associated with prescribed burns. Regardless of the challenges establishing and maintaining fire lines and conducting prescribed burns, are necessary to control fuel loads, minimize the risk of wildfires and protect the Preserve's natural resources.

## **D LEGAL OBLIGATIONS AND CONSTRAINTS**

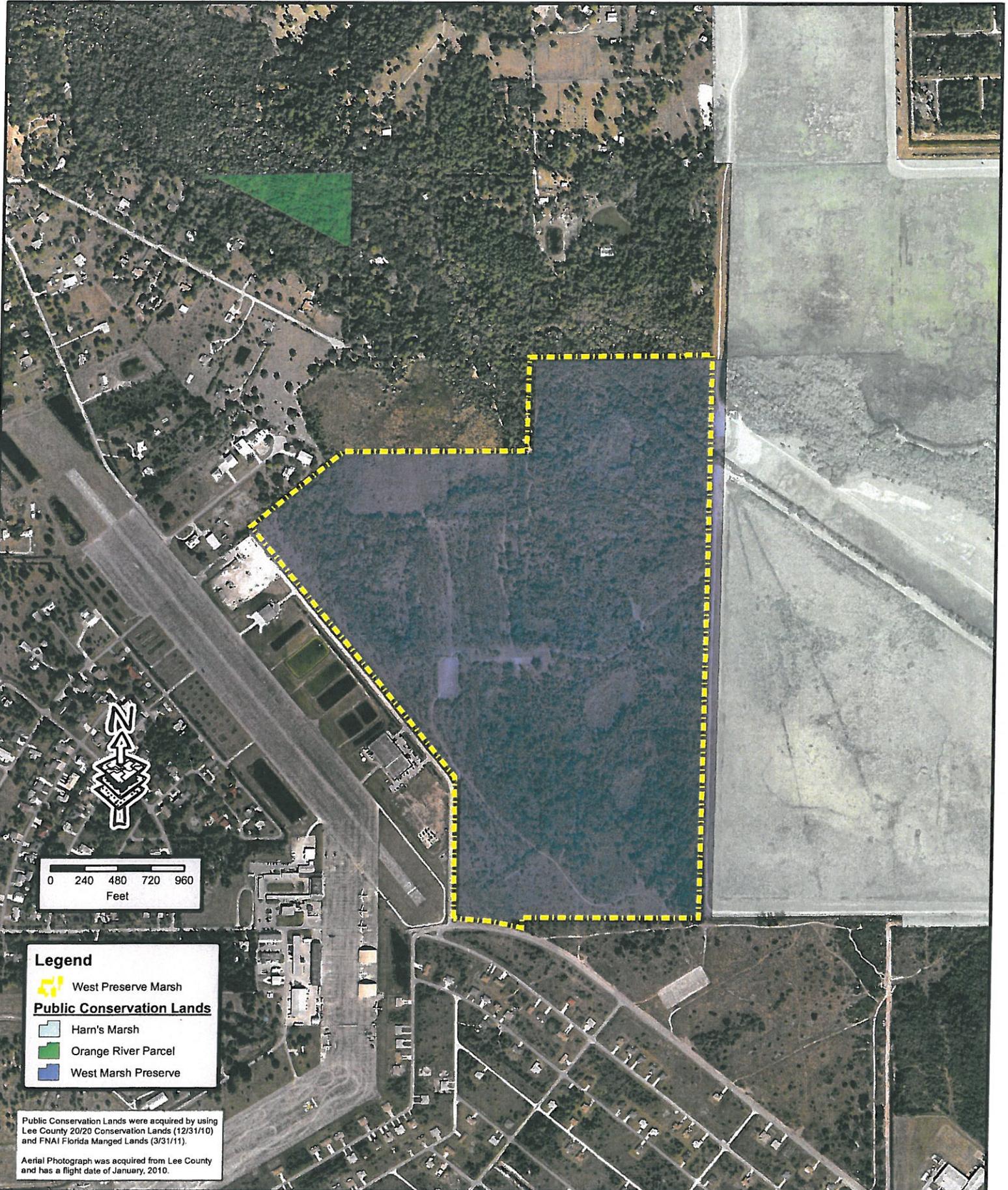
### **i. PERMITTING**

Enhancement activities at the Preserve may require permits from regulatory agencies. The proposed hydrologic improvements and any future improvements that impact wetlands may require permits from the FDEP, SFWMD and/or the U.S. Army Corps of Engineers (USACOE). Hydrological and/or habitat restoration projects requiring heavy equipment or tree removal in uplands will require notification to the Lee County Department of Community Development (LCDCD). Prior to conducting prescribed burns at WMP burn authorization is required from the FFS.

### **ii. OTHER LEGAL CONSTRAINTS**

There is one drainage easement recorded along the Orange River in the northeast corner of the Preserve (Figure 20). There are no plans for any trails or other improvements, outside of exotic removal in this area.

**Figure 19: External Influences Map**



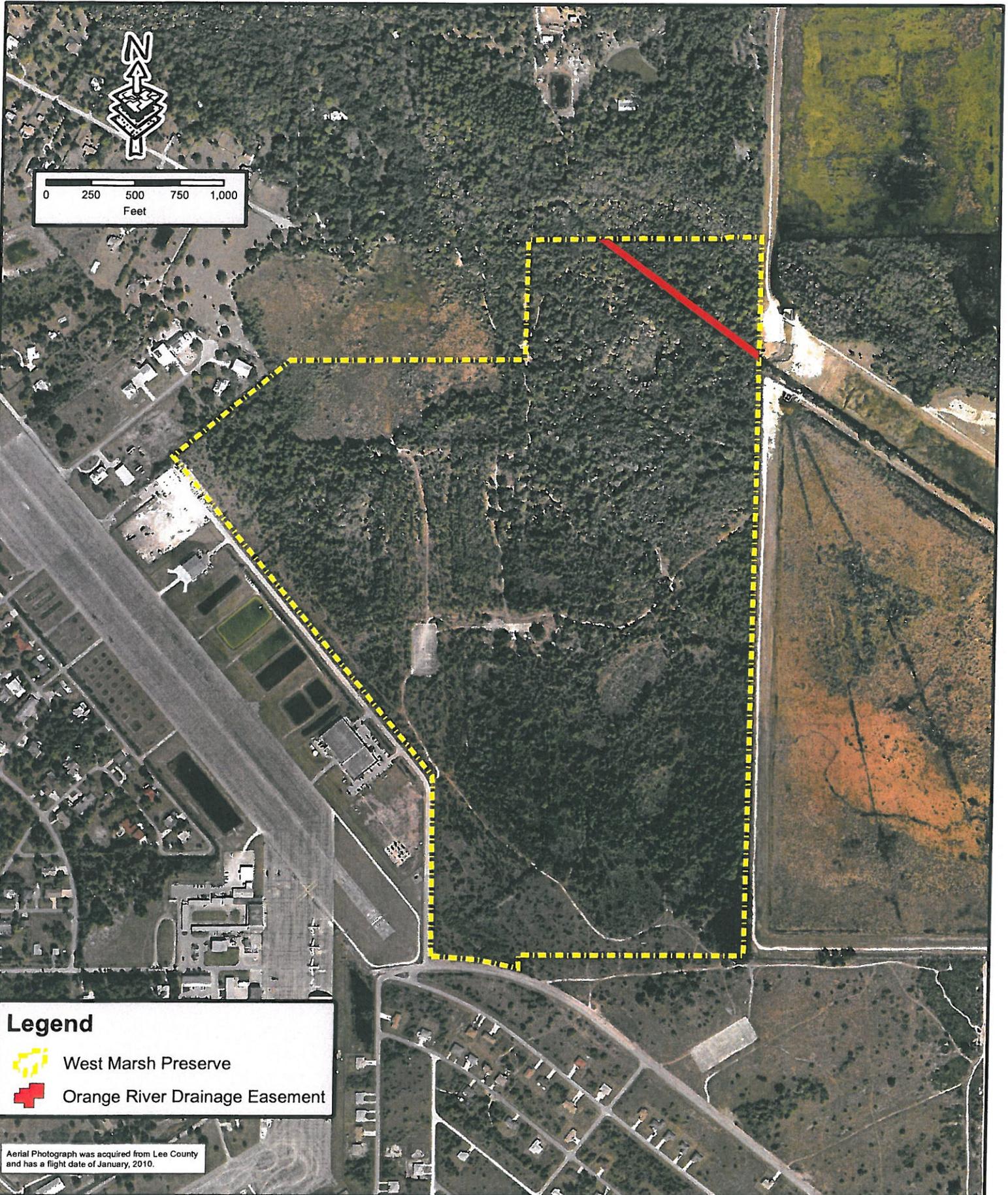
**Legend**

-  West Preserve Marsh
- Public Conservation Lands**
-  Harr's Marsh
-  Orange River Parcel
-  West Marsh Preserve

Public Conservation Lands were acquired by using Lee County 20/20 Conservation Lands (12/31/10) and FNAI Florida Manged Lands (3/31/11).  
 Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Created by:	Date:	SEC/TWP/RMS	Page
BKM	5/11/11	15/44S/25E	
Drawn by:	Date:	Category	
BKM	5/11/11	Conservation	
Project Number		County	
2009-13		Lee	

**Figure 20: Drainage Easement**



**Legend**

-  West Marsh Preserve
-  Orange River Drainage Easement

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

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**WEST MARSH PRESERVE  
 DRAINAGE EASEMENT MAP**

Created by: BKM	Date: 5/11/11	SECT/WP/RWS 15/44S/25E	Page  <b>57</b>
Drawn by: BKM	Date: 5/11/11	Category: Aerial	
Project Number: 2009-13		County: Lee	

### iii. RELATIONSHIP TO OTHER PLANS

Lee County's comprehensive plan (Lee Plan) depicts Lee County as anticipated to appear in the year 2030. Several themes have been identified as having "great importance as Lee County approaches the planning horizon" (LCDCD, 2011). These themes are:

- The growth patterns of Lee County will be dictated by the Future Land Use map.
- The natural resource base of the county will be protected.
- The diversification of the county's traditional economic base.
- Cultural, educational and recreational opportunities will be expanded.
- An increase in urbanized areas will require investment in the county's social and physical infrastructure.

The entire Lee Plan can be found on the Internet at:

<http://www3.leegov.com/dcd/LeePlan/Leeplan.pdf>. The four chapters that affect the management of TCP 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, "The Conservation Lands include uplands and wetlands that are owned and used for long range conservation purposes. Upland and wetland conservation lands will be shown as separate categories on the FLUM. Upland conservation lands will be subject to the provisions of this policy. Wetland conservation lands will be subject to the provisions of both the Wetlands category described in Objective 1.5 and the Conservation Lands category described in this policy. The most stringent provisions of either category will apply to wetland conservation lands. Conservation lands will include all public lands required to be used for conservation purposes by some type of legal mechanism such as statutory requirements, funding and/or grant conditions, and mitigation preserve areas required for land development approvals. Conservation Lands may include such uses as wildlife preserves; wetland and upland mitigation areas and banks; natural resource based parks; ancillary uses for environmental research and education, historic and cultural preservation, and natural resource based parks (such as signage, parking facilities, caretaker quarters, interpretive kiosks, research centers, and quarters and other associated support services); and water conservation lands such as aquifer recharge areas, flowways, 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** states, "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 60.1.3** states, "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, Relocated by Ordinance No. 07-12)"

**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. WMP will meet policy **84.1.1** which requires regional parks to be resource based facilities that preserve natural amenities and policy **84.1.2** which states that "Lee County will work with the East County Water Control District to establish a regional park at Harns Marsh. (Added by Ordinance No. 10-16)". The preserve will also meet policy **87.2.1** which encourages the county to work with outside agencies forming a "comprehensive park system that properly meets the needs of the county". WMP will also be maintained complying with **Goal 88: Parks and Program Administration**.

**Chapter VII, Goal 107: Resource Protection** which states the county will "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." WMP will meet **Objective 107.1: Resource Management Plan** placing WMP under conservation status will ensure the long-term protection of upland and wetland habitats.

**Chapter VII, Objective 107.2: Plant Communities.** Lee County will maintain and routinely update an inventory of natural plant communities and will protect at various suitable locations remnant tracts of all important and representative natural plant communities occurring within Lee County. (Amended by Ordinance No. 94-30).

**Chapter VII, Objective 107.3: Wildlife** by restoring native communities and creating additional wetland WMP will "Maintain and enhance the fish and wildlife diversity and distribution within Lee County for the benefit of a balanced ecological system."

**Chapter VII, Objective 107.4: Endangered and Threatened Species in General** by placing WMP under conservation with Lee County the County will be providing and protecting habitat that may be utilized by listed species thereby helping to maintain or enhance listed species populations.

**Chapter VII, Objective 107.11: FLORIDA PANTHER AND BLACK BEAR.** County staff will develop measures to protect the Florida panther and black bear through greenbelt and acquisition strategies. (Amended by Ordinance No. 92-48, 00-22)

**Chapter VII, Objective 107.10, Policies 107.10.1 and 107.10.2 Woodstork** Woodstorks have been observed utilizing WMP. Land Stewardship staff will continue to document wood stork utilization of the Preserve and ensure that the WMP management plan follows United States Fish and Wildlife Service's (USFWS) "Habitat Management Guidelines for the Wood Stork in the Southeast Region." (U.S Fish and Wildlife Service, 1990). (Amended by Ordinance No. 94-30, 00-22).

**Chapter VII, Objective 114.1 Wetlands** The natural functions of the existing wetlands at WMP will be protected and preserved. The wetlands created at WMP will provide additional flood protection and water quality treatment for downstream receiving waters.

## **E MANAGEMENT CONSTRAINTS**

A management constraint is the short dry period. WMP is located adjacent to Harns Marsh, a surface water management area, and the Orange River. The area in general floods frequently. The management activities proposed at WMP will help to relieve flooding. However contouring the created/restored wetlands area is difficult if the area is flooded during the enhancement efforts. The extent of the wet period also makes maintenance difficult. Stewardship activities will be conducted in the dry season when possible and if access is necessary for stewardship activities when water levels are low, vehicles such as an all-terrain vehicle (ATV) may be used; otherwise staff will travel on foot.

The nearby residences also affect stewardship activities. Conducting controlled burns is vital in fire dependent communities in order to reduce fuel loads, maintain biological diversity, and maintain functional wildlife habitat. Managing the smoke from controlled burns will be of particular importance during prescribed fires. Prescribed fire parameters are more restrictive when development and road traffic is nearby. WMP will be temporarily closed when restoration activities and/or prescribed burns are in progress that could be dangerous to visitors. Signs will be installed at the entrance and on the trails near the management activity to indicate that the area is temporarily closed.

Regular inspections will be conducted by C20/20 staff to maintain secure fence lines.

## **F PUBLIC ACCESS AND RESOURCE-BASED RECREATION**

The Land Stewardship Operations Manual (LSOM) currently classifies WMP as a Category 4 Resource Protection & Restoration Preserve. Category 4 preserves do not provide regular public access and do not have facilities or marked trails. Some additional services may be provided including; restrooms, and picnic tables.

When determining the resource based activities that would be offered at WMP several factors were considered including, but not limited to; preserve size, access areas, access points, presence of similar facilities nearby, plant communities present, listed species utilization, soil constraints, hydrologic components and the primary and secondary preserve purposes. Permissible activities will include hiking, on-trail bicycling, fishing, non-motorized boating and walking leashed dogs. Prohibited activities will include horseback riding and use of motorized vehicles (other than on ingress/egress routes or in the event of guided tours).

The wetlands within the southern portion of the Preserve will be enhanced. The uplands within this portion of the site will be graded, contoured, tied into the water management system and vegetated with wetland species. See the Proposed Master Site Plan Figure 21. The creation of additional wetlands will further onsite water storage while providing wildlife habitat and improving water quality. The uplands and wetlands outside of the wetland creation/restoration/enhancement area will be enhanced by select removal of exotics.

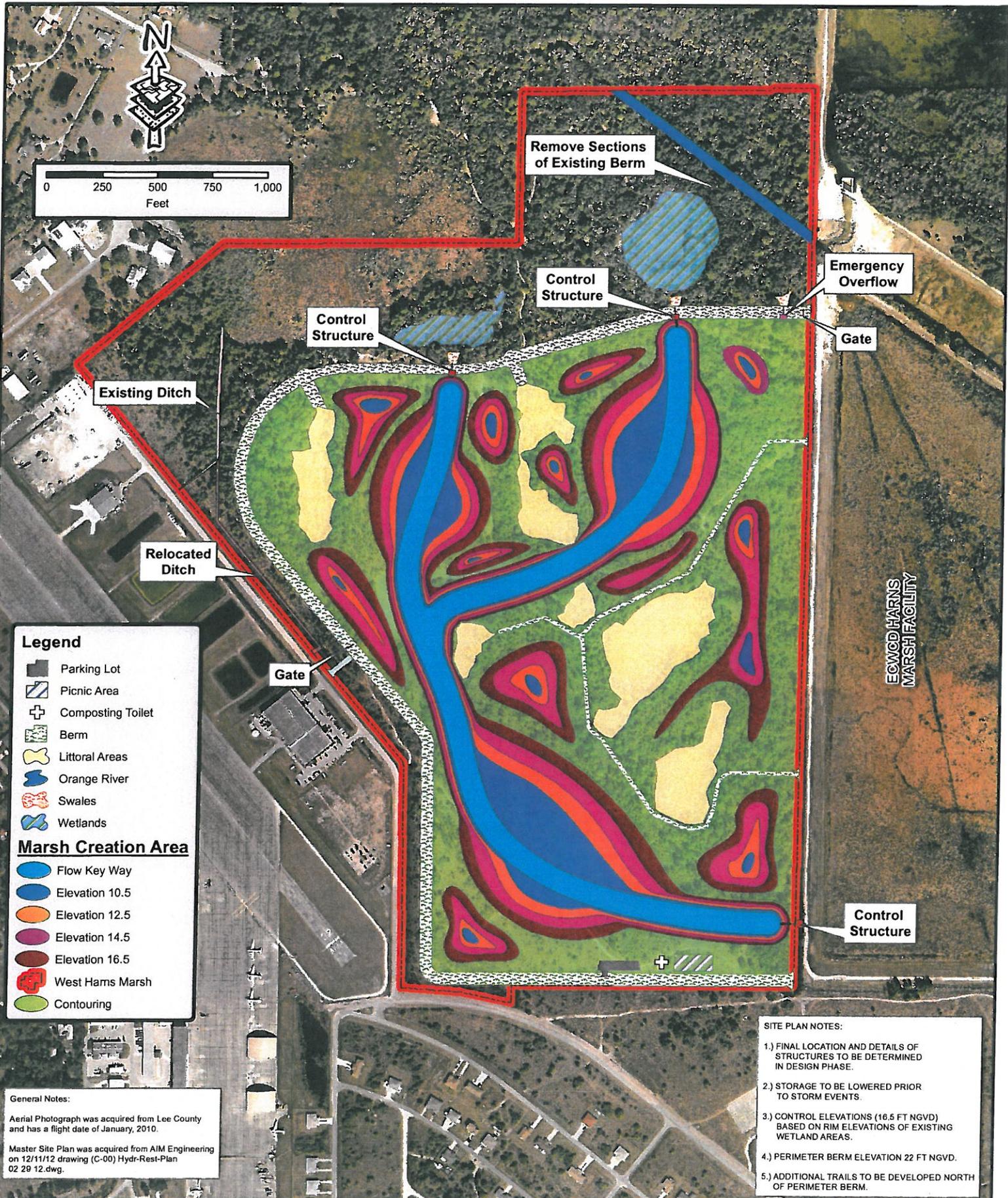
A parking area will be installed by C20/20 along the south portion of the property. Public access to parking area and the Preserve will be available from Felix Romano Avenue. Two other access points will be provided along the eastern boundary of WMP connecting WMP to Harns Marsh. These access entrances will primarily be used for maintenance and will only be open for vehicular during special driving tours along the berm. Pedestrian access to WMP will be along the berms. No additional public access points are planned at WMP. Gates from private property onto the Preserve will not be allowed due to legal and liability issues. Figure 22 depicts the public access facilities.

Only limited emergency vehicle staff vehicle access will be provided at WMP in order to ensure protection of the plant communities, wildlife and water quality. Pedestrian access will be available along the berms in the Preserve.

The primary purpose of the project is to improve water quality and provide flood protection. As a result the majority of the property will contain sensitive wetlands. For these reasons vehicular access onto the management area outside of the limited pedestrian use will be limited to guided tours. Launch points for canoe and other watercraft will not be available on the man-made onsite extension of the Orange River natural tributary, because it is shallow and exotic infested. Furthermore the banks are steep and would require infrastructure to be installed.

If there are additional recreational amenities that are currently offered on a C20/20 preserve that were not specifically considered for this plan, Lee County staff will evaluate the possibility of allowing those uses at the public's request. Otherwise, recreational amenities will be reexamined in ten years during the next revision of this plan (2021).

Figure 21. Proposed Master Site Plan



**Legend**

- Parking Lot
- Picnic Area
- Composting Toilet
- Berm
- Littoral Areas
- Orange River
- Swales
- Wetlands

**Marsh Creation Area**

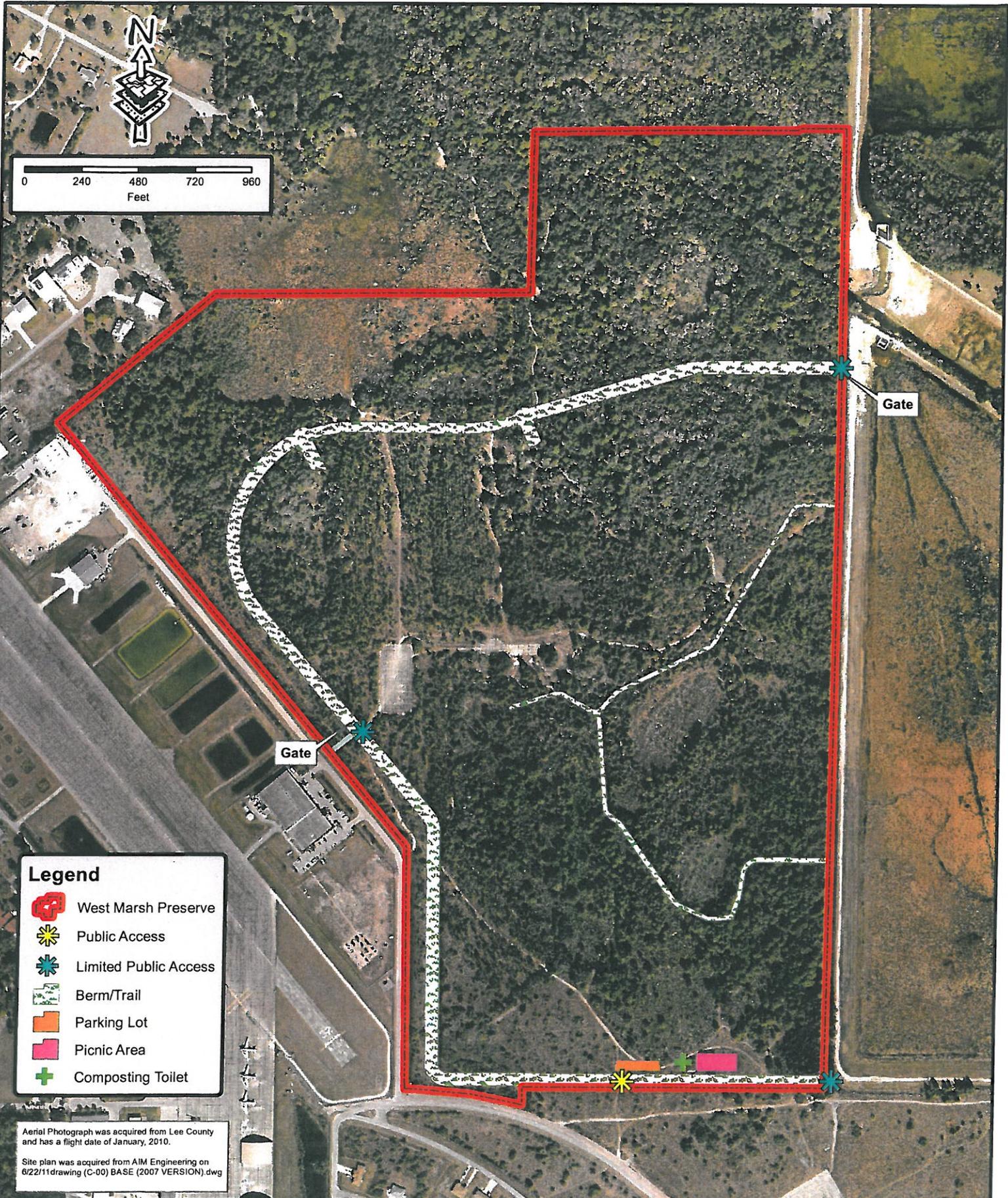
- Flow Key Way
- Elevation 10.5
- Elevation 12.5
- Elevation 14.5
- Elevation 16.5
- West Harns Marsh
- Contouring

**General Notes:**  
 Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.  
 Master Site Plan was acquired from AIM Engineering on 12/11/12 drawing (C-00) Hydr-Rest-Plan 02 29 12.dwg.

- SITE PLAN NOTES:**
- 1.) FINAL LOCATION AND DETAILS OF STRUCTURES TO BE DETERMINED IN DESIGN PHASE.
  - 2.) STORAGE TO BE LOWERED PRIOR TO STORM EVENTS.
  - 3.) CONTROL ELEVATIONS (16.5 FT NGVD) BASED ON RIM ELEVATIONS OF EXISTING WETLAND AREAS.
  - 4.) PERIMETER BERM ELEVATION 22 FT NGVD.
  - 5.) ADDITIONAL TRAILS TO BE DEVELOPED NORTH OF PERIMETER BERM.

Created by:	Date:	SEC/TWP/RANG	Exhibit Number
BKM	12/11/12	15/44S/25E	
Drawn by:	Date:	Category	62
BKM	12/11/12	Aerial	
Project Number:		County	
2009-13		Lee	

Figure 22: Proposed Public Access Map



**Legend**

-  West Marsh Preserve
-  Public Access
-  Limited Public Access
-  Berm/Trail
-  Parking Lot
-  Picnic Area
-  Composting Toilet

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Site plan was acquired from AIM Engineering on 6/22/11 drawing (C-00) BASE (2007 VERSION).dwg

Created by	Date	SECT/WP/PK	Page
BKM	5/11/11	15/44S/25E	
Drawn by	Date	Category	
BKM	5/11/11	Access	
Project Number		County	
2009-13		Lee	

## G ACQUISITION

WMP was acquired by Lee County through the C20/20 Program for \$4,631,625.00. The parcel was nomination 214 and was nominated by the Marion Land Company (Figure 24). CLASAC recommended acquisition of the WMP parcel through the C20/20 Program on November 8, 2007. The property was purchased in December 2008.

**TABLE 9: WEST MARSH PRESERVE ACQUISITION INFORMATION**

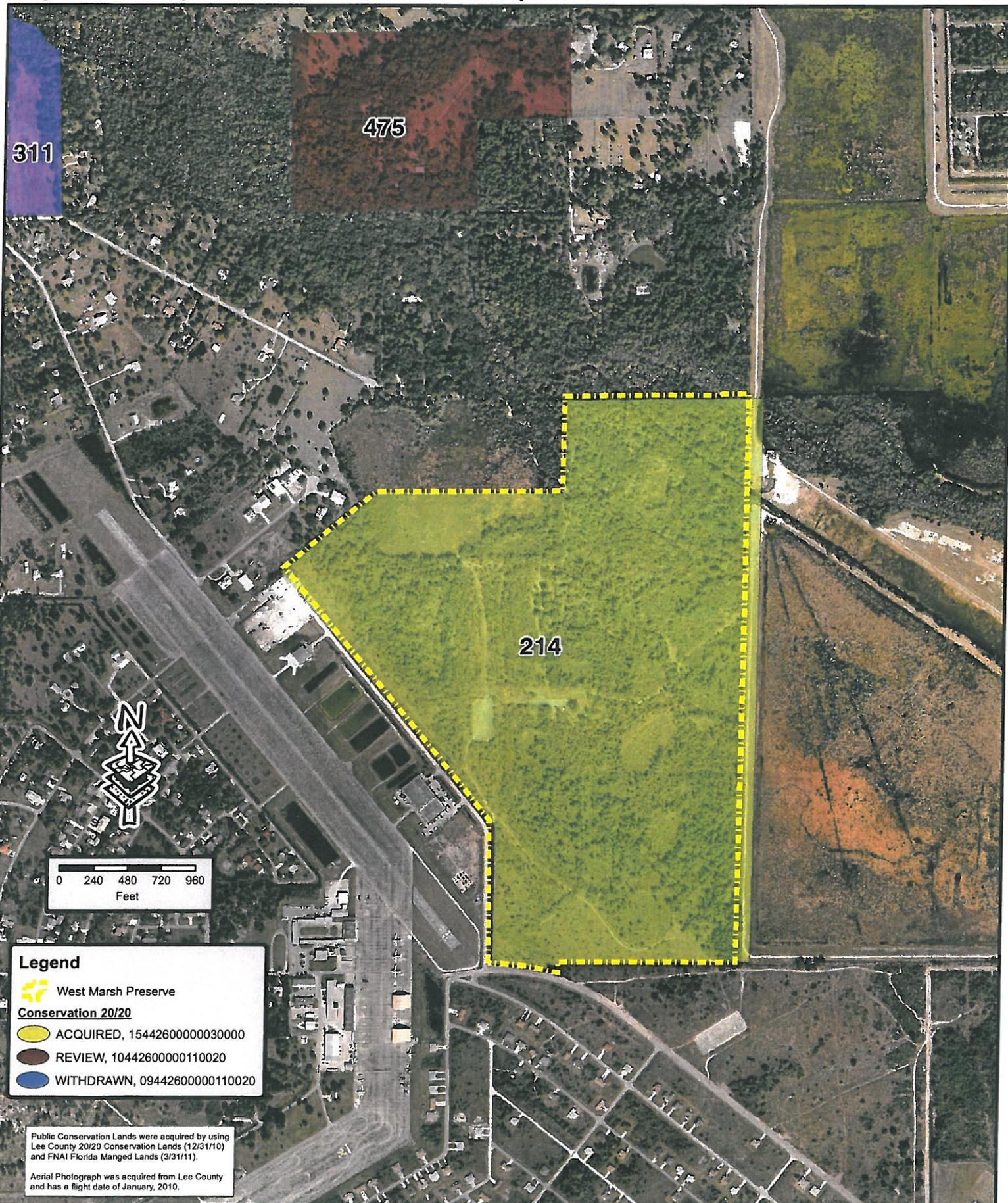
<b>NOMINATION</b>	<b>PARCEL ID</b>	<b>PREVIOUS OWNER</b>	<b>ACRES</b>	<b>PURCHASE PRICE</b>	<b>DATE ACQUIRED</b>
214	15-44-26-00-00003.0000 22-44-26-00-00004.0000	Marion Land Co.	206.44	\$4,631,625.00	12/2008

Figure 23 documents the parcels that were nominated and/or acquired by the C20/20 Program in the immediate vicinity of WMP. Two properties were nominated in close proximity to WMP. Nomination 311 a 60 acre parcel was withdrawn. Nomination 475 a 50.9 acre parcel is currently under review.

WMP contains two Future Land Use categories on the Future Land Use Map. The Categories include Rural Community Preserve and Wetlands. Staff will coordinate with Lee County Department of Community Development, Division of Planning (LCDP) to change the Future Land Use (FLU) to "Conservation Lands." A Future Land Use Map is attached as Figure 24.

Currently, all of WMP is zoned as agriculture "AG-2" (Figure 25). C20/20 may coordinate a change with LCDP to change the zoning to Environmentally Critical (EC).

Figure 23: Acquisition and Nominations Map



**Legend**

- West Marsh Preserve
- Conservation 20/20**
- ACQUIRED, 1544260000030000
- REVIEW, 10442600000110020
- WITHDRAWN, 09442600000110020

Public Conservation Lands were acquired by using Lee County 20/20 Conservation Lands (12/31/10) and FNAI Florida Manged Lands (3/31/11).  
 Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

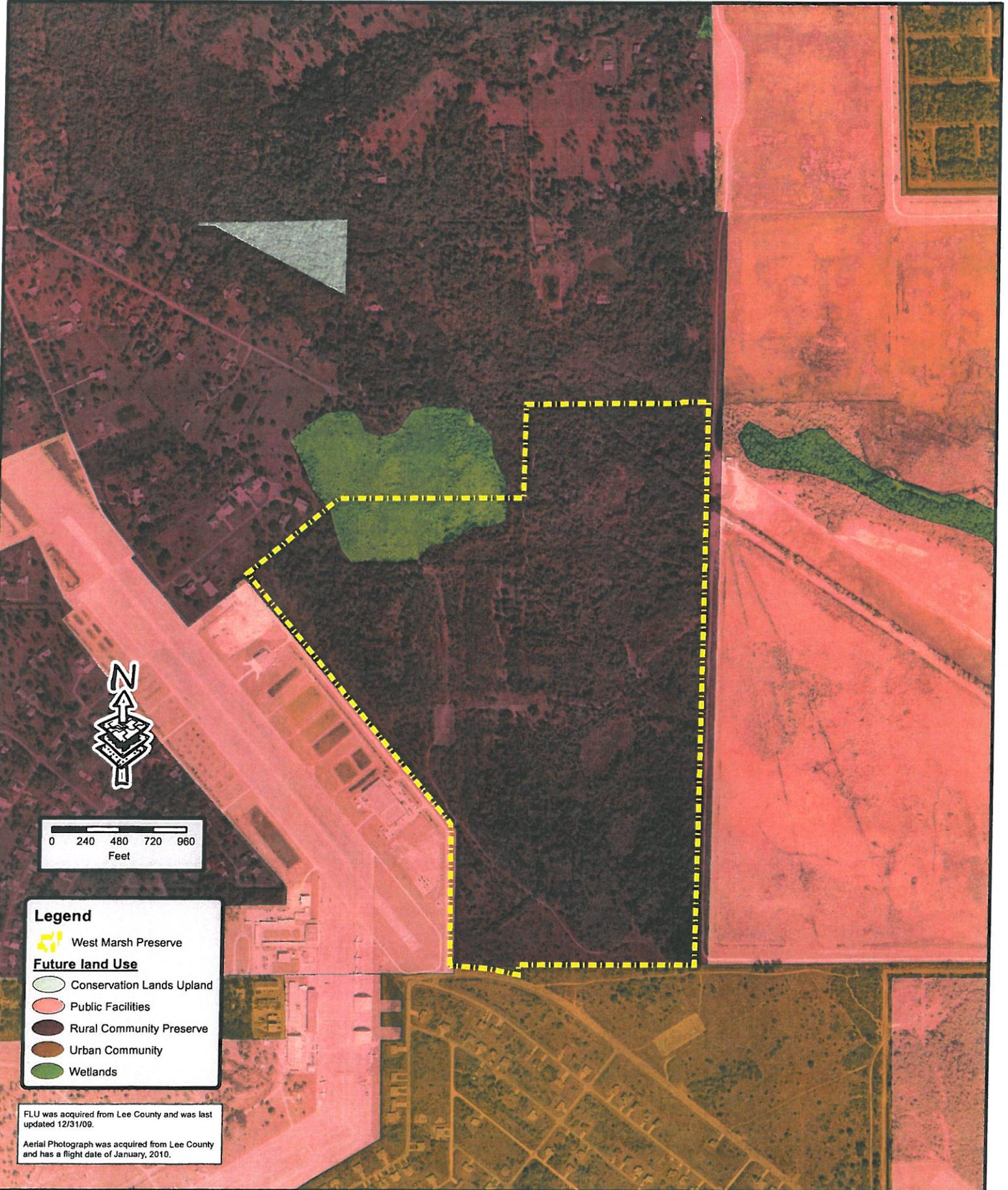
**Boylan Environmental Consultants, Inc.**  
 Wetland & Wildlife Surveys, Environmental Permitting, & Impact Assessments

11000 Metro Parkway, Suite 4  
 Fort Myers, FL 33966  
 Phone: (239)418-0671  
 Fax: (239)418-0672

**WEST MARSH PRESERVE**  
**ACQUISITION AND NOMINATIONS MAP**

Created by:	Date:	SEC/TWP/RNG	Page
BKM	5/11/11	15/44S/25E	
Drawn by:	Date:	Category	
BKM	5/11/11	Conservation	
Project Number		County	
2009-13		Lee	

**Figure 24: Future Land Use Map**



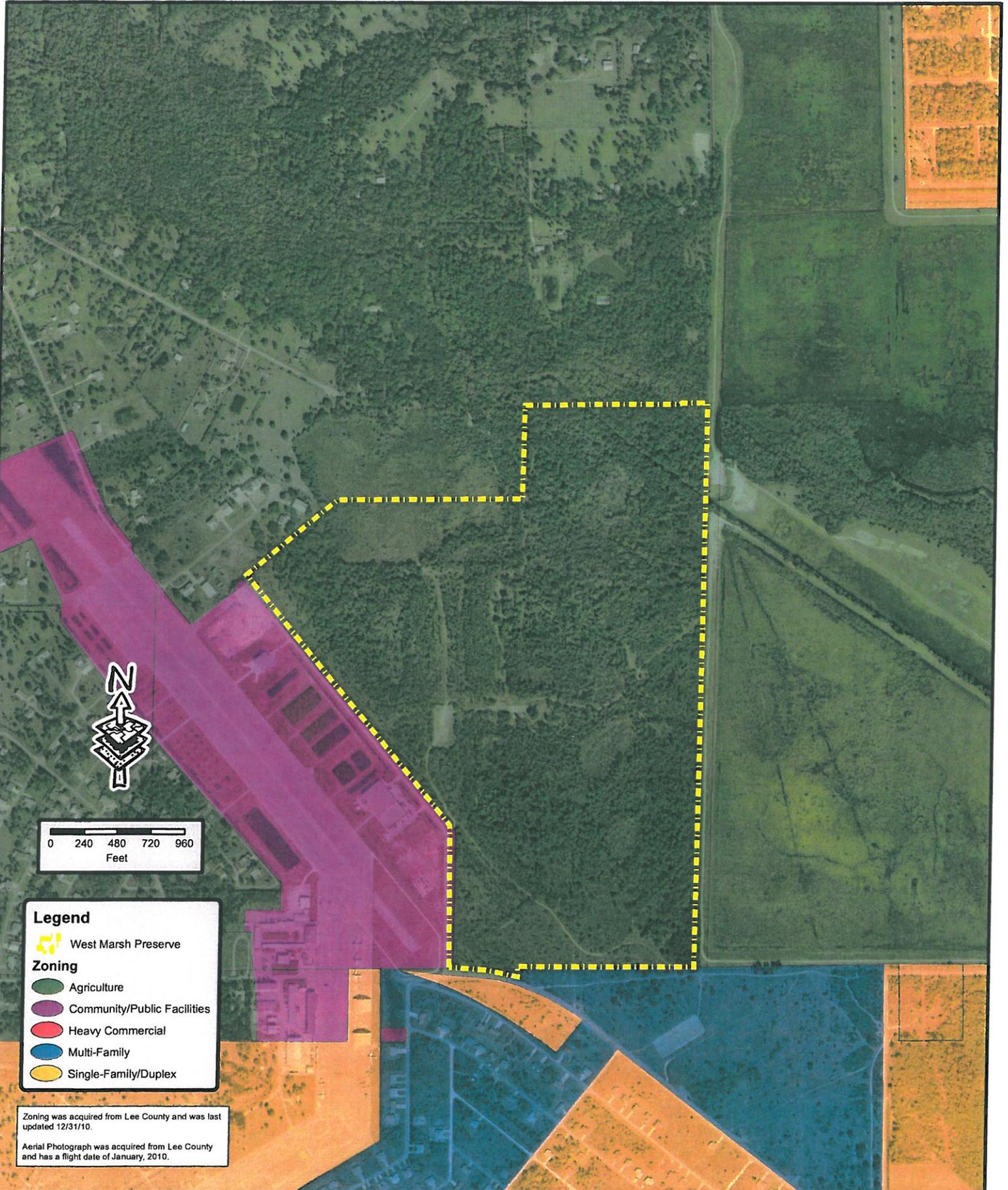
**Legend**

- West Marsh Preserve
- Future land Use**
- Conservation Lands Upland
- Public Facilities
- Rural Community Preserve
- Urban Community
- Wetlands

FLU was acquired from Lee County and was last updated 12/31/09.  
 Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Created by:	Date:	SEC/TWP/RING
BKM	5/11/11	15/44S/25E
Drawn by:	Date:	Category
BKM	5/11/11	Archaeological
Project Number	County	
2009-13	Lee	

**Figure 25: Zoning Map**



**Legend**

-  West Marsh Preserve
- Zoning**
-  Agriculture
-  Community/Public Facilities
-  Heavy Commercial
-  Multi-Family
-  Single-Family/Duplex

Zoning was acquired from Lee County and was last updated 12/31/10.  
 Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

## VI MANAGEMENT ACTION PLAN

### A MANAGEMENT UNIT DESCRIPTIONS

WMP has been divided into four management units (MU) to better organize and achieve management goals. Figure 26 delineates the MUs that were created based on the proposed elevations and trail locations in proposed master plan, as well as, the existing features in the upland areas.

The prescribed burn units will follow the boundaries of the management units where feasible (Figure 27). It should be noted that controlled burns in the wetland areas may be allowed to naturally die off and may not follow the distinct burn unit/management unit boundaries.

- MU 1 (50.65± acres) is located on the eastern side of WMP, adjacent to Harns Marsh. The inlet control structure, which provides a hydrological connection between West Marsh Preserve and Harns Marsh, is proposed to be located in the southern portion of this unit and is included within this management unit. Exotics within the existing wetland will be removed by hand or treated with herbicide. The uplands within this area will be cleared and graded to match the elevations on the proposed Master Site Plan. The top soil will be removed, stacked and then re-placed in the grading area in planting areas. These areas will then be planted with the appropriate wetland species based on ground and control elevations.

Following the initial preparations management activities may include prescribed fires, if feasible, removal of exotics and herbicides treatments. Only herbicides approved for aquatic application will be permitted in areas where the vegetation is below the existing water level. Regular harvesting of vegetation as deemed necessary by ECWCD and C20/20 will increase nutrient removal thereby improving the water quality in the area.

- MU 2 (83.54± acres) is located west of MU 1. The boundary for MU 2 includes a control structure along the northern boundary of the wetland area. Exotics within the existing wetlands will be removed or treated with herbicide. The uplands within this area will be cleared and graded to match the elevations on the proposed Master Site Plan. The top soil will be removed, stockpiled and then placed in the re-graded wetland area. These areas will then be planted with the appropriate wetland species based on ground and control elevations.

Following the initial preparations management activities may include prescribed fires, if feasible, removal of exotics and herbicides treatments. Only herbicides approved for aquatic application will be permitted in areas where the vegetation is below the existing water level. Regular harvesting of vegetation as deemed necessary by ECWCD and C20/20 will increase nutrient removal thereby improving the water quality in the area.

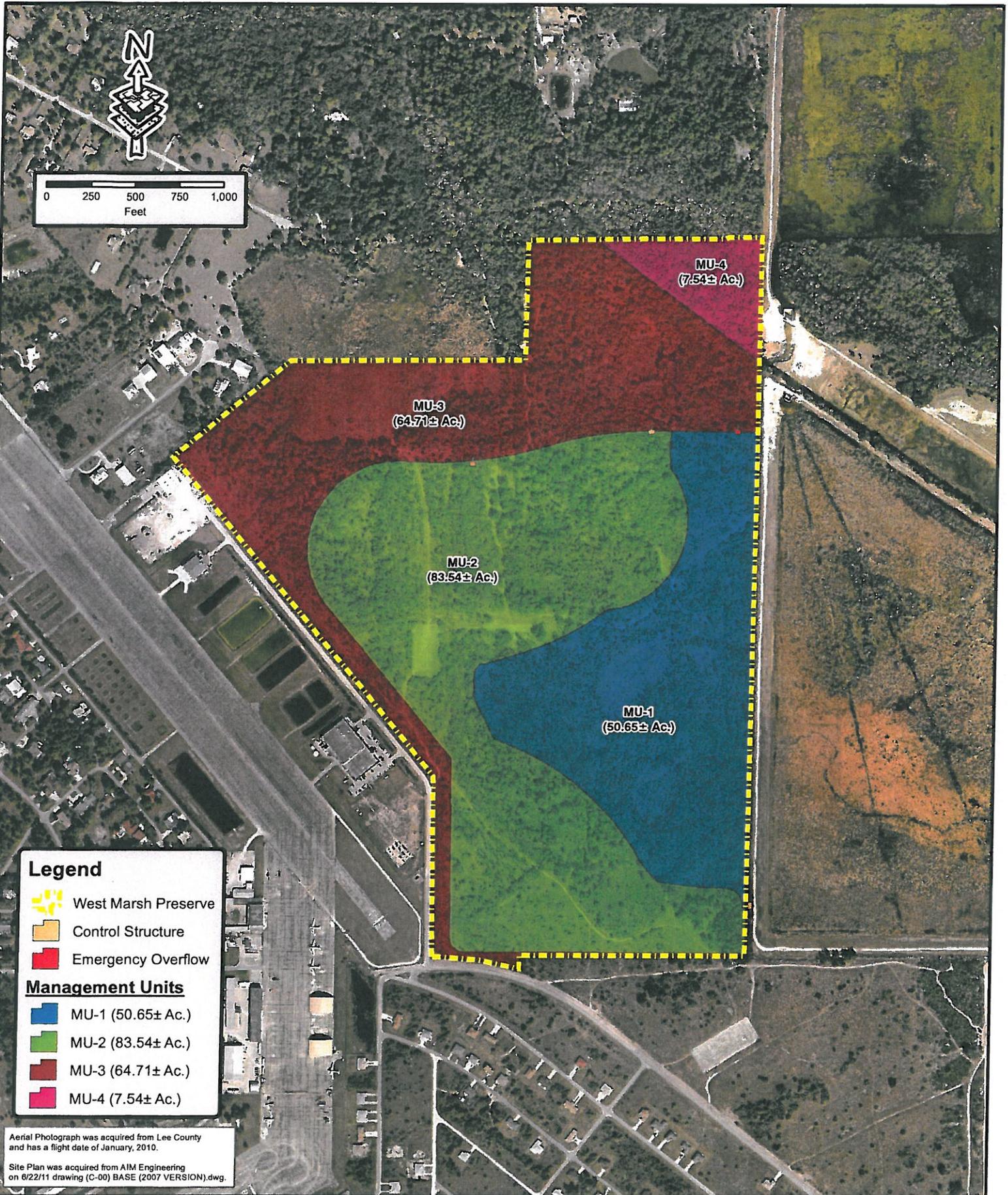
- MU 3 (64.71± acres) is located north and west of MUs 1 and 2. This unit includes freshwater marsh, pine flatwoods, mixed wetland hardwoods, wet prairie, pine flatwoods, cabbage palm communities and disturbed lands. Management activities may include prescribed fires, if feasible, removal of exotics and herbicides treatments.

Exotics within existing wetlands will be removed or treated with herbicide. It is anticipated that the exotics in the uplands will be sprayed with herbicide and left in place. In this instance prescribed fires may be used to thin over-story and understory vegetation.

- MU 4 (7.54± acres) is a small triangular portion of the property separated from the remainder of WMP by the Orange River. The onsite portion of the river is included in this management unit. This unit includes a wax myrtle willow wetlands, the river and cabbage palm uplands. Management activities may include prescribed fires, if feasible, removal of exotics and herbicides treatments.

Exotics within existing wetlands will be removed or treated with herbicide. It is anticipated that the exotics in the uplands will be sprayed with herbicide and left in place. In this instance prescribed fires may be used to thin over-story and understory vegetation.

Figure 26: Management Units Map



**Legend**

- West Marsh Preserve
- Control Structure
- Emergency Overflow

**Management Units**

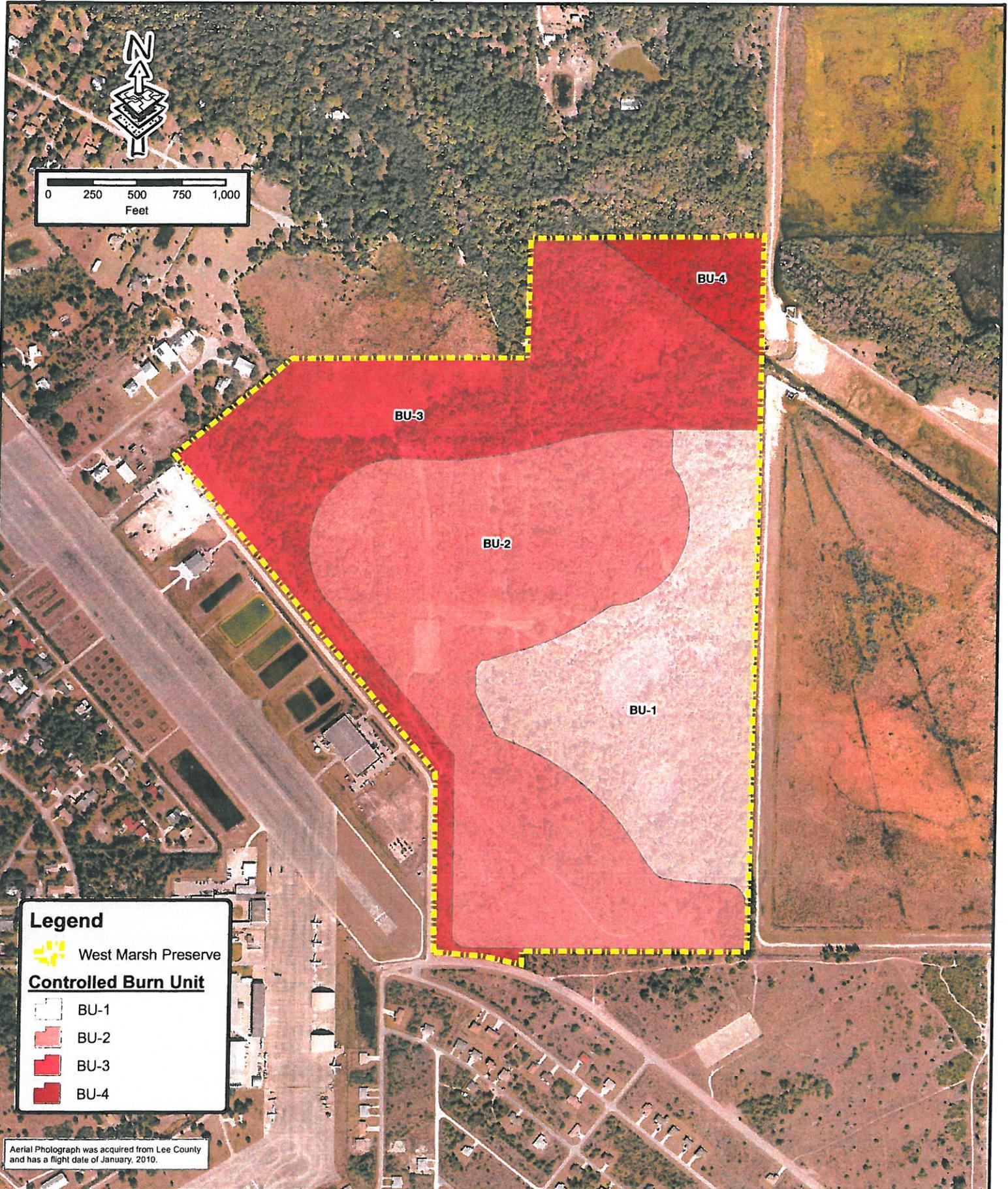
- MU-1 (50.65± Ac.)
- MU-2 (83.54± Ac.)
- MU-3 (64.71± Ac.)
- MU-4 (7.54± Ac.)

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Site Plan was acquired from AIM Engineering on 8/22/11 drawing (C-00) BASE (2007 VERSION).dwg.

Created by:	Date:	SEC/RWP/RNS
BKM	5/11/11	15/44S/25E
Drawn by:	Date:	Category
BKM	5/11/11	Aerial
Project Number		County
2009-13		Lee

Figure 27: Controlled Burn Units Map



## **B GOALS AND STRATEGIES**

The primary management objectives at WMP are to provide water storage and improve water quality. The secondary objectives include habitat improvement and public use. Funding is not currently available to conduct all of the stewardship tasks. Therefore the management activities that take place at WMP will focus on water storage and improving water quality prior to completing the secondary tasks. Management activities will also be prioritized in order of importance and ease of accomplishment. Grants and/or monies budgeted to mitigate public infrastructure projects may be used to supplement the operations budget to meet our goals in a timely manner.

### **OUTSIDE CONSULTANTS**

- ✓ Wetland and control structure design and permitting
- ✓ Construction
- ✓ Public access design and permitting
- ✓ Environmental/Engineering

### **LAND STEWARDSHIP**

- ✓ Hydrologic Enhancement/Wetland Creation
- ✓ Exotic plant control/maintenance
- ✓ Prescribed fire management
- ✓ Mechanical brush reduction
- ✓ Monitor and protect listed species
- ✓ Exotic and feral animal removal

### **OVERALL PROTECTION**

- ✓ Install/maintain fire breaks
- ✓ Boundary fence installation
- ✓ Boundary sign installation and maintenance
- ✓ Change Zoning and Future Land Use categories
- ✓ Debris removal and prevent dumping

### **PUBLIC USE**

- ✓ Infrastructure improvements for public access

### **VOLUNTEERS**

- ✓ Assist volunteer group(s)

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

## OUTSIDE CONSULTANTS

### **WETLAND/CONTROL STRUCTURE DESIGN AND PERMITTING**

Environmental and/or engineering contractors will be hired by ECWCD to perform all or most aspects of the wetland and control structure design and permitting.

### **CONSTRUCTION AND PLANT INSTALLATION**

The construction of the wetland areas, placement of the control structures and native plant installation may be contracted out. A consultant may be hired by ECWCD to implement and oversee construction.

### **PUBLIC ACCESS DESIGN AND PERMITTING**

Environmental and/or engineering contractors will be hired by Lee County 20/20 to perform all or most aspects of the public access design and permitting. If feasible this task will be completed concurrently with the wetland and control structure design and permitting. A consultant may be hired to implement and oversee construction.

### **ENVIRONMENTAL/ENGINEERING**

Environmental and/or engineering contractors will need to be hired to perform all or most aspects of the hydrological creation/restoration projects. The consultant will also be responsible for coordinating and obtaining appropriate environmental permits before restoration efforts begin.

## LAND STEWARDSHIP

### **HYDROLOGIC ENHANCEMENT/WETLAND CREATION**

Several control structures are proposed on the master site plan. These structures will need to be inspected regularly to ensure the structures are working properly.

### **EXOTIC PLANT CONTROL AND MAINTENANCE**

The Florida Exotic Pest Plant Council's (FLEPPC) List of Invasive Species will be utilized to determine the invasive exotic species that require treatment in the management units. The goal of the treatment is to remove or control Category 1 exotic invasive species, ideally bringing exotic/invasive coverage at WMP to a maintenance level (less than 5% coverage), after construction of all hydrological improvements.

Prior to any contractor conducting invasive exotic plant control at WMP, a Prescription Form (located in the LSOM) will be completed by the contractor(s), reviewed and approved by the ECWCD staff.

- Uplands with light to moderate infestations:

Exotics will be removed in areas where invasive plants are sporadic and/or less than 50% coverage. The removal method utilized will depend on stem size, plant type and season. However the stem will generally be cut near the ground and the stump will be sprayed with an appropriate herbicide. Vegetation that is too large to be practically cut may be girdled and a foliar application will be applied to the entire plant. When possible and practical, hand pulling will be utilized to minimize herbicide use. Basal bark treatment may be used at some locations. 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.

Herbicides shall be applied per the manufacturer's recommendations under the direction of a state certified applicator. Herbicides must be applied in such a manner as to protect non-target organisms, the environment and the public. Most herbicides are not to be applied; within two (2) hours of rainfall (previous or eminent), if the vegetation is wet and/or in windy conditions. Herbicides approved for aquatic use may be used.

- Uplands with moderate to heavy infestations:

There are not any areas estimated to be preserved that contain greater than 50% coverage with exotics. Herbicides shall be applied per the manufacturer's recommendations under the direction of a state certified applicator. Herbicides must be applied in such a manner as to protect non-target organisms, the environment and the public. Most herbicides are not to be applied; within two (2) hours of rainfall (previous or eminent), if the vegetation is wet and/or in windy conditions.

It is possible that if funds are not available for treatment that the exotics in these areas may experience greater than 50% coverage in the future. In areas where the exotics occur as monotypic stands or are higher than 50% of the vegetation cover, heavy equipment may be utilized to remove exotics in appropriate communities and during suitable season. Effort will be made to minimize soil disturbance and compaction. The debris will either be mulched or burned.

- Wetlands with moderate to heavy infestations:

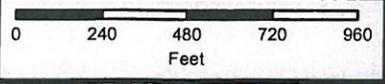
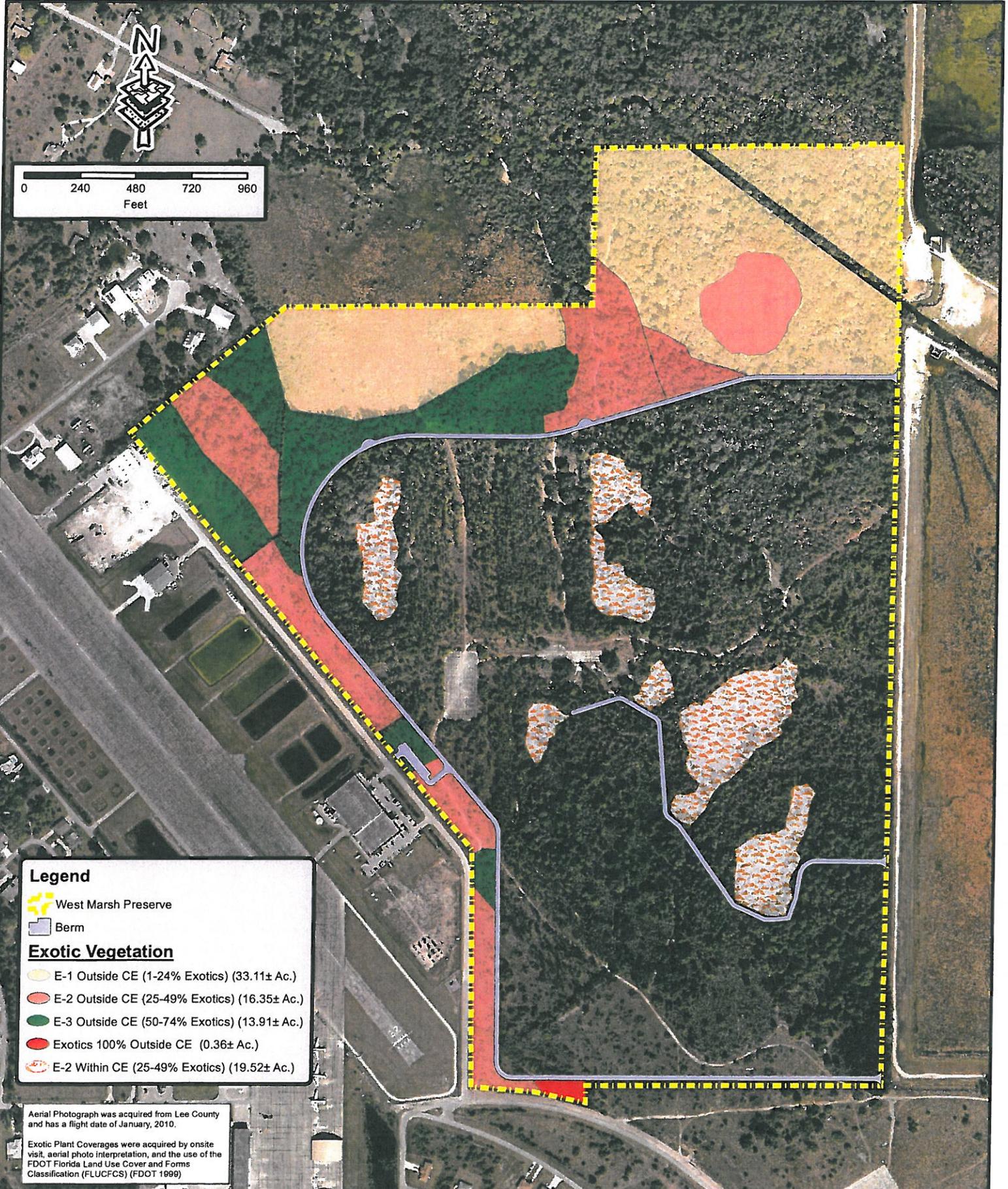
When practical, lightweight equipment may be used during dry, winter periods to remove exotics. If utilizing equipment is not deemed practical hand crews will either girdle or cut-stump the exotics and treat with appropriate herbicide or apply a foliar or basal bark herbicide application. Herbicides shall be applied per the manufacturer's recommendations under the direction of a state certified applicator. Herbicides must be applied in such a manner as to protect non-target organisms, the environment and the public. Most herbicides are not to be applied; within two (2) hours of rainfall (previous or eminent), if the vegetation is wet and/or in windy conditions. Herbicides approved for aquatic use may be used. Herbicide treatments will continue on an annual basis and may eventually decrease to every two years. Biomass may be removed, piled and burned and/or mulched.

- Wetlands with light to moderate infestations:

Hand crews will either girdle or cut-stump the exotics and treat with appropriate herbicide or apply a foliar or basal bark herbicide application. Herbicides shall be applied per the manufacturer's recommendations under the direction of a state certified applicator. Herbicides must be applied in such a manner as to protect non-target organisms, the environment and the public. Most herbicides are not to be applied; within two (2) hours of rainfall (previous or eminent), if the vegetation is wet and/or in windy conditions. Herbicides approved for aquatic

use may be used. Herbicide treatments will continue on an annual basis and may eventually decrease to every two years. Biomass may be removed, piled and burned and/or mulched. Figure 29 identifies areas needing exotic plant control work.

Figure 28: Exotic Plant Control Map



**Legend**

- West Marsh Preserve
- Berm

**Exotic Vegetation**

- E-1 Outside CE (1-24% Exotics) (33.11± Ac.)
- E-2 Outside CE (25-49% Exotics) (16.35± Ac.)
- E-3 Outside CE (50-74% Exotics) (13.91± Ac.)
- Exotics 100% Outside CE (0.36± Ac.)
- E-2 Within CE (25-49% Exotics) (19.52± Ac.)

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

Exotic Plant Coverages were acquired by onsite visit, aerial photo interpretation, and the use of the FDOT Florida Land Use Cover and Forms Classification (FLUCFCS) (FDOT 1999)

### **PRESCRIBED FIRE MANAGEMENT**

Several of the plant communities on the property are considered fire dependant and require some type of fire or mechanical brush control. As a result a fire management program may be implemented that closely mimics natural fire regimes. This will increase plant diversity and ensure tree canopies remain open. The prescribed burn program will be implemented by an outside contractor. Prescribed burns will be performed after the creation of appropriate fire lines/breaks. The timing of prescribed fires will be based on seasonal rain, staff and equipment availability, listed species requirements and wind patterns. A C20/20-wide Fire Management Plan was coordinated with the FDOF and the finalized plan applies to all C20/20 Preserves.

Prescribed fire may also be used to control exotic plant seedling/sapling in previously treated areas.

ECWCD staff will coordinate prescribed burn efforts with the managers of adjacent conservation lands and inform adjacent neighbors of imminent burn plans.

### **MECHANICAL BRUSH REDUCTION**

In some cases fuel loads may need to be reduced prior to a prescribed fire. In these instances overgrown areas will be mechanically thinned to prevent crown fires or intense fires from occurring. If brush control is required and a prescribed fire is not feasible then mechanical reduction may be substituted for prescribed fires. Some patches of dense vegetation will be left in areas to provide cover for Florida Panthers and Florida black bears.

### **MONITOR AND PROTECT LISTED SPECIES**

Listed species will benefit from exotic plant control, prescribed burns and restoration activities. During stewardship activities, efforts will be made to minimize negative impacts to listed species.

### **EXOTIC AND FERAL ANIMAL REMOVAL**

Exotic animal species have been observed at WMP. If necessary, ECWCD staff will develop a methodology consistent with the LSOM that to be implemented for unwanted exotic animal species.

While feral cats have not been observed at WMP if feral cats are observed in the future then the feral cats will be trapped and taken to Lee County Animal Services. Feral cats are not allowed to be released at WMP.

## **OVERALL PROTECTION**

### **INSTALL/MAINTAIN FIRE BREAKS**

Perimeter and internal fire breaks may be created, in order to reduce the potential for damage to areas outside the Preserve. Once completed, ECWCD staff will maintain the fire breaks. See Figure 29 for map of fire lines.

### **FENCE INSTALLATION**

In accordance with Section 5.1.E of the Memorandum of Understanding between East County Water Control District and Lee County, fencing the property boundaries will be performed by C20/20.

### **BOUNDARY SIGN INSTALLATION AND MAINTENANCE**

Boundary signs have been installed by C20/20 staff on all property boundaries and will be maintained by C20/20.

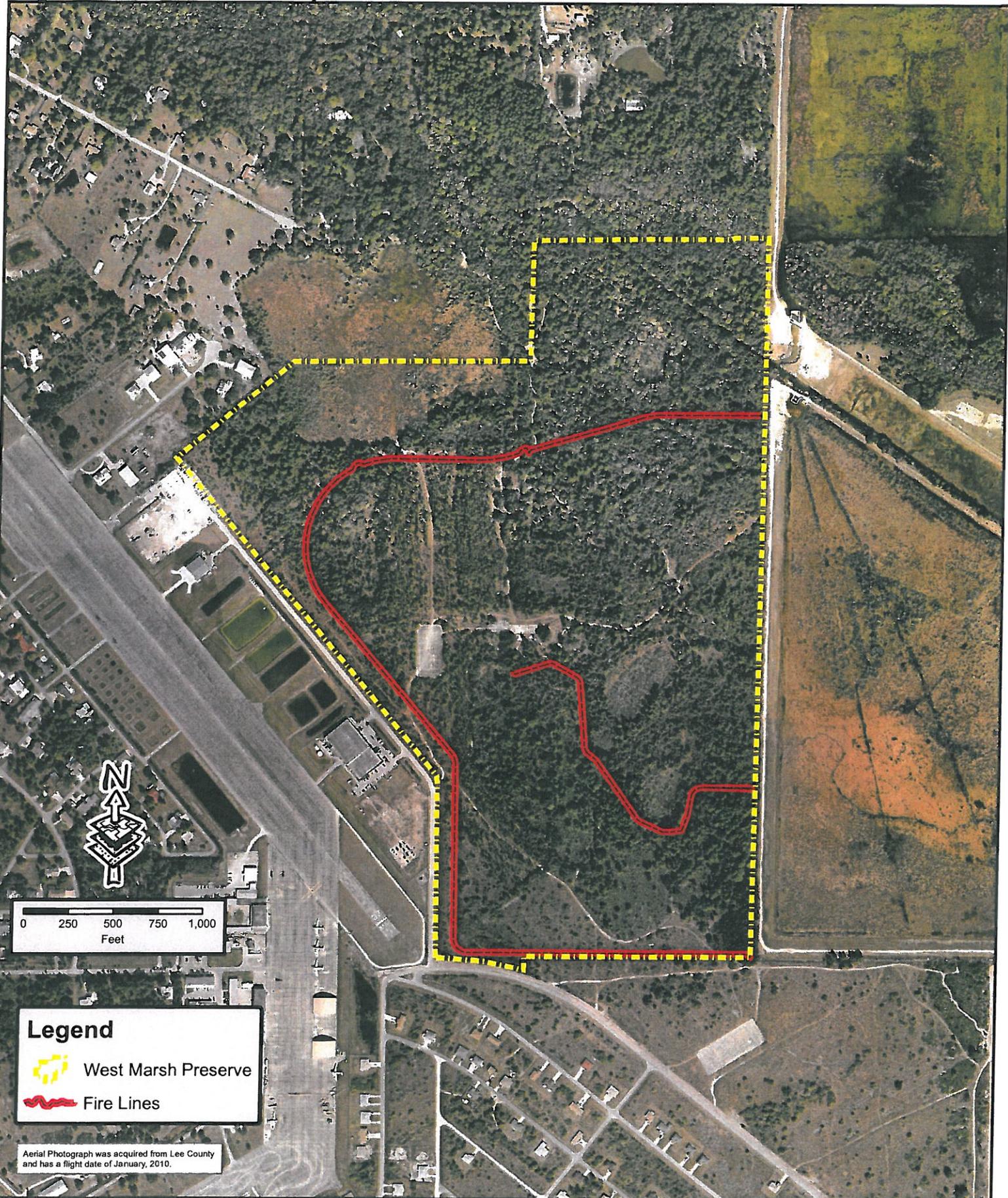
### **CHANGE ZONING AND FUTURE LAND USE CATEGORIES**

C20/20 staff will coordinate with LCDP staff to change the zoning and future land use categories at WMP, as necessary. All zoning designations will be changed to "Environmentally Critical". Future land use designations will be changed to either "Conservation Lands – Uplands" or "Conservation Lands – Wetlands".

### **DEBRIS REMOVAL AND PREVENT DUMPING**

WMP contains scattered debris throughout areas of the Preserve. It is anticipated that the debris will be removed during wetland creation activities. During site inspections and regular patrols, any debris that can reasonably be removed by hand will be removed.

**Figure 29: Fire Breaks Map**



**Legend**

- West Marsh Preserve
- Fire Lines

Aerial Photograph was acquired from Lee County and has a flight date of January, 2010.

**Boylan Environmental Consultants, Inc.**  
 Wetland & Wildlife Surveys, Environmental Permitting, & Impact Assessments

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 Phone: (239)418-0671  
 Fax: (239)418-0672

**WEST MARSH PRESERVE**  
**FIRE BREAKS MAP**

Created by:	Date:	SEC/TWP/RNG	Page
BKM	5/11/11	15/44S/25E	
Drawn by:	Date:	Category	
BKM	5/11/11	Aerial	
Project Number:		County	
2009-13		Lee	

## **PUBLIC USE**

### **INFRASTRUCTURE IMPROVEMENTS FOR PUBLIC ACCESS**

Public access facilities are anticipated to include a picnic area, restroom facilities and a parking area. These structures will be installed following completion of the wetland restoration/creation area. Public access to the Preserve will be primarily pedestrian access along the berm. Public vehicular access will only be through guided driving tours along the berm. Maintenance of these facilities will be conducted on an as needed basis.

## **VOLUNTEERS**

### **ASSIST VOLUNTEER GROUP(S)**

The Land Stewardship Volunteer Program's mission statement as defined in the LSOM is to:

"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."

The Lee County Bird Patrol, a volunteer group, has performed bird monitoring surveys at WMP and Harns Marsh in the past and has expressed an interest in continuing performing the surveys. If there is additional interest from other community members, C20/20 staff will work to assist the volunteers with the many diverse stewardship activities associated with WMP.

## VII PROJECTED TIMETABLE FOR IMPLEMENTATION

**TABLE 10: PROJECTED TIMELINE TABLE**

Management Activity	Oct 2013	Jan 2014	Apr 2014	July 2014	Oct 2014	Jan 2015	Apr 2015	July 2015	Oct 2015	Jan 2016	Apr 2016
<b>Outside Consultants</b>											
Engineering/Design	MU-1 MU-2	→	→	→							
Permitting		MU-1 MU-2	→	→							
<b>Hydrology</b>											
Wetland Construction					MU-1 MU-2	→	→	→			
Wetland Planting									MU-1 MU-2		
<b>Natural Resource Management</b>											
Initial Exotic Treatment*		MU-3				MU-4					
<b>Maintenance (On-Going)</b>											
Exotic Treatment						MU-3				MU-4	MU-1 MU-2
<b>Overall Protection</b>											
Debris Removal	MU-1 to 4	→	→	→	→	→	→	→	→	→	→
Berm Maintenance										MU-1 MU-2	→
Structure Maintenance										MU-1 MU-2	→
<b>Public Use</b>											
Facilities Construction	TBD										
<b>Volunteers</b>											
Volunteer Groups	TBD										

\*Treatment of Exotic Plants will occur after the construction of the wetlands.

The timeline outlined above is an estimate. This schedule may change dependent on available funding and permitting agency review time frames.

## **VIII FINANCIAL CONSIDERATIONS**

Funding for the management will be provided by ECWCD,

Other possible funding for exotic plant removal, restoration, water quality and flood protection projects may be requested through grants from agencies such as SFWMD, FDEP and USFWS or include additional mitigation opportunities.

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## **X APPENDICES**

Appendix A: Memorandum of Understanding

Appendix B: Wildlife Species List

Appendix C: Plant Species List

Appendix D: Legal Descriptions

Appendix E: Drainage Easement

Appendix F: Lee County Invasive Plant Control Prescription Form

Appendix G: Florida Master Site File Review

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## Appendix A: Memorandum of Understanding

**MEMORANDUM OF UNDERSTANDING  
BETWEEN  
LEE COUNTY AND EAST COUNTY WATER CONTROL DISTRICT  
FOR MAINTENANCE OF WEST MARSH**

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This **MEMORANDUM OF UNDERSTANDING** is made and entered in this 6<sup>th</sup> day of January 2009-2008 by and between **EAST COUNTY WATER CONTROL DISTRICT**, an independent special district of the State of Florida, acting by and through its Board of Supervisors, the governing body thereof (hereafter "District") and **LEE COUNTY**, a political subdivision and charter county of the State of Florida, acting by and through its Board of County Commissioners, the governing body thereof (hereafter "County"), collectively, the "Parties" hereto.

**WITNESSETH:**

**WHEREAS**, the Board of Supervisors is the governing body in and for the District, and the Board of County Commissioners ("BoCC") is the governing body in and for County; and

**WHEREAS**, the County has established a Conservation 20/20 Program, the purpose of which is "[t]o acquire properties of environmental significance, restore those lands to their natural state and condition, manage them in an environmentally acceptable manner and provide public recreational opportunities that are compatible with protecting the natural resources"; with the main objectives being "to protect and preserve natural wildlife habitat; protect and preserve water quality and supply; protect developed lands from flooding; and provide resource based recreation"; and

**WHEREAS**, the County has also established a Conservation Lands Acquisition and Stewardship Advisory Committee ("CLASAC"), which meets monthly to review offers of property from willing sellers to ensure that the property meets the established criteria, to make recommendations to the BoCC regarding the purchase of property, and to oversee stewardship of the properties once acquired; and

**WHEREAS**, CLASAC at its meeting on November 8, 2007, recommended acquisition by the County through the Conservation 20/20 Program of a certain, ±201.89 acre parcel of real property identified as "Conservation 20/20 Nomination Parcel 214-2" or the "West Marsh", located generally east of Buckingham Road between Lee County Mosquito Control Airfield and Harns Marsh and more particularly described in the attached **Exhibit "A"**, and illustrated on the attached **Exhibit "B"**, both made a part hereof (the "Property"); and

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**COPY**

**WHEREAS**, the District operates and maintains surface water management systems, facilities and lands within its jurisdictional area, which functions include the restoration and perpetual maintenance of environmentally sensitive lands; and

**WHEREAS**, the Property is located adjacent to and may be easily connected hydrologically to certain surface water management facilities and environmentally sensitive lands currently owned and operated by the District; and

**WHEREAS**, the District is not permitted by its authorizing legislation to construct, or maintain public access or recreation facilities and services, which facilities and services upon the Property must be provided by the County; and

**WHEREAS**, the County and the District agree that it is in their mutual interest and convenience to cooperate in the restoration, appropriate development and enhancement of the Property's public recreational, environmental, and surface water management functions and to provide for the ongoing maintenance thereof; and

**WHEREAS**, this Memorandum is intended to define the respective duties and responsibilities of the parties hereto to provide facilities and services upon the Property and the maintenance responsibilities therefore.

**NOW, THEREFORE**, in consideration of the foregoing, and of the mutual covenants and conditions hereinafter set forth, the District and the County, intending to be legally bound, hereby agree as follows:

**Section One:      Recitals.**

The above-referenced recitals are true and correct and are incorporated into this Memorandum and made a part hereof.

**Section Two:      Purpose.**

2.1 The purpose and intent of this Memorandum is to define the terms and conditions under which the District and the County will share responsibility for the appropriate development, management, operation and perpetual maintenance of the Property.

2.2 The parties agree that this Memorandum may be supplemented by written amendments or addendums to further implement its purposes

**Section Three:      Authority.**

3.1 The District represents to the County that the execution and delivery of this Memorandum has been duly authorized by all appropriate actions of the governing body of the District, has been executed and delivered by the authorized officers of the District, and constitutes a legal, valid and binding obligation of the District.

3.2 The County represents to the District that the execution and delivery of this Memorandum has been duly authorized by all appropriate actions of the governing body of the County, has been executed and delivered by an authorized officer of the County, and constitutes a legal, valid and binding obligation of the County.

**Section Four. Definitions.**

For the purpose of this Memorandum, the following terms shall have the meaning ascribed thereto:

"**CLASAC**" means the Conservation Lands Acquisition and Stewardship Advisory Committee of Lee County, Florida.

"**Conservation 20/20 Ordinance**" means the "Lee County Conservation Lands Implementation Ordinance", Ordinance 05-17 of Lee County, Florida, as amended.

"**Land Stewardship Plan**" (LSP), also known as a Management Plan, means a written report governing the conservation, protection and stewardship of lands acquired pursuant to Lee County's Conservation 20/20 Program. The LSP provides an overview of the environment and ecosystems on each preserve and outlines the actions necessary to restore, conserve and protect the land. The LSP is reviewed by the public, the Management Subcommittee of CLASAC, and CLASAC and approved by the Lee County Board of County Commissioners.

"**Water Control Plan**" means the comprehensive operational document that describes the activities and improvements to be conducted by the District, as provided in Ch. 298, F.S.

**Section Four: District Responsibilities.**

4.1 The District's responsibilities shall take effect as follows:

A. With respect to the planning, design and permitting of improvements and facilities upon the Property for which it is responsible, upon the execution of this Memorandum;

B. With respect to the installation and construction of improvements and facilities

upon the Property for which it is responsible and the provision of continuing maintenance thereof, upon final approval of an amendment to the District's Water Control Plan for Unit of Development No. 5, as amended.

4.2 The District's responsibilities shall include:

A. Funding, planning, design, permitting, site restoration, and maintenance for all improvements made to and facilities installed upon the Property consistent with the District's adopted Water Control Plan, except as otherwise identified herein; and

B. Coordination in all matters relating to the Property with the Lee County Land Stewardship Staff, their designees or successors in interest;

C. Preparation of and properly noticed public meeting a proposed Land Stewardship Plan for the Property, in accordance with the criteria, terms and conditions therefore and be in accordance with the terms of the Conservation 20/20 Ordinance. The Land Stewardship Plan will be developed in consultation with County's Land Stewardship Staff. The District shall be responsible for all costs incurred in preparing and adopting the Land Stewardship Plan; and

D. Submittal of the proposed Land Stewardship Plan to MSC, CLASAC and BoCC for approval within 2 years of County's acquisition and prior to any permitting or earthwork; the diligent processing thereof until conclusion, in the manner provided in the Conservation 20/20 Ordinance; and re-submittal of the Land Stewardship Plan to MSC, CLASAC and BoCC every 10 years thereafter for review, update, revision, and approval.

E. Unless otherwise provided herein, general stewardship over and perpetual maintenance of all improvements (except as otherwise provided herein) and natural areas (both native and created or recreated communities) upon the Property (and the restoration thereof following disturbance by natural disasters), according to the terms and conditions of the Property's approved Land Stewardship Plan; and

F. Removal and continuing maintenance of all those plants identified as Categories I and II Invasive Pests by the Florida Exotic Pest Plant Council (<http://www.fleppc.org>) or identified in the Property's Land Stewardship Plan; and

G. Use of native plants appropriate for each hydrological regime in all restored areas; and

H. The prior approval and permitting of any improvement or facility for public access to or use of the Property for recreational, educational or other public access purpose; and

I. Maintenance, repair and replacement of facilities and improvements, other than those used for or related to public access to and public recreation upon the Property; and

J. Provision to the County and CLASAC upon request of periodic status reports regarding the permitting, design and construction of facilities and improvements.

K. Responsibility for any environmental hazards and any mitigation thereof within or upon the Property existing on the date the County assumes ownership whether or not evident or previously identified.

L. Responsibility to pay all fines and/or penalties levied under the authority of permitting agencies associated with the District's construction of improvements on the Property.

**Section Five: County Responsibilities.**

5.1 The County's responsibilities shall take effect when title to the Property vests in the County.

5.2 The County's responsibilities shall include

A. Marking and posting boundary signs around the perimeter of the Property; and

B. Incorporation of the Property in the County's regular, quarterly site inspections process to monitor site conditions, on the basis of which the County may recommend to the District reasonable techniques for maintaining successful habitat restoration, provided such recommendations do not conflict with the Property's approved Land Stewardship Plan; and

C. Managing all interactions with neighboring property owners; and

D. The enforcement of county ordinances upon the Property; and

E. The planning, design, permitting, construction and perpetual maintenance of any recreational amenities or other improvements, at County expense, relating to use of the Property by the public for recreational, educational or any other purpose, including, but not limited to, signage, interpretative or maintenance structures and buildings, shelters, parking, fencing, privies, trails and boardwalks; and

F. Providing appropriate vessels, containers and services for trash and solid waste collection and disposal attributable to public access to the Property; and

G. Maintenance, repair and replacement of facilities and improvements used by the public or incidental to public access or public recreation.

**Section Six: Common Responsibilities**

6.1 All entrance signs and printed materials distributed to the public describing the Property or any recreational, educational or other facilities or services available thereon shall identify the District, the County, and the Conservation 20/20 Program as contributing partners in acquisition, restoration and maintenance of the Property.

6.2 The parties shall, upon reasonable request, cooperate with each other, their agents and assigns by providing necessary authorizations and consents and the execution of documents necessary to obtain all required permits and approvals from applicable regulatory agencies to improve and maintain the Property and construct facilities according to the Land Stewardship Plan.

6.3 All uncontaminated excavated soil or other fill material not required for construction on site of the District facilities identified in the Land Stewardship Plan or SFWMD permits shall be considered "Excess Soil". Excess Soil shall be an asset and property of the County. The District shall retain all Excess Soil on site unless off-site removal is approved in writing by County. If off site removal of Excess Soil is approved for District use, the District shall be responsible to obtain all required permits. Any contaminated soil or other material excavated in the process of constructing District facilities shall be disposed of on or off site in the manner required by state or federal law.

**Section Seven: Indemnification**

The parties agree that by execution of this Memorandum, no party will be deemed to have waived its statutory defense of sovereign immunity or increased its limits of liability, as provided in Section 768.28, Florida Statutes.

**Section Eight: Term of Memorandum**

This Memorandum will remain in full force and effect from its Effective Date for an initial term of fifty (50) years. Thereafter, it will be automatically renewed for an additional term of fifty (50) years, unless sooner terminated upon the schedule and in the manner provided herein in Section Nine.

**Section Nine: Termination.**

9.1 This Memorandum shall terminate and be of no further force or effect if the Property is not acquired by the County.

9.2 This Memorandum may be terminated:

A. By either party providing written notice of termination to the other no later than one (1) year prior to the expiration of any term; or

B. By the County upon District's failure to perform the requirements or to default in the responsibilities identified in Section Four. Prior to termination, County shall serve written notice upon District identifying specifically the allegation(s) of failure to perform or acts of default. The District shall then have ninety (90) calendar days from the date of receipt of County's notice within which to initiate action to remedy the alleged failure(s). The District shall be responsible for paying all costs of such corrective or remedial actions. Furthermore, if County is required to complete District's requirements and responsibilities identified in Section 4, District shall reimburse County, upon demand, for any and all costs County so incurs.

**Section Ten: Assignment**

No assignment, delegation, transfer, or novation to this Memorandum or part hereof, shall be made, unless approved in writing by the District and the County.

**Section Eleven: Notices**

Any notices or other documents permitted or required to be delivered pursuant to this Memorandum, shall be delivered to the following addresses:

To ECWCD: East County Water Control District  
601 East County Lane  
Lehigh Acres, FL 33936  
Attn: District Manager

To County: Lee County  
Parks and Recreation  
3410 Palm Beach Blvd.  
Fort Myers, FL 33916  
Attn: Parks and Recreation Director

With copies to: Lee County  
Attn: County Attorney  
P.O. Box 398  
Fort Myers, FL 33902

Lee County  
Parks and Recreation  
P.O. Box 398  
Fort Myers, FL 33902  
Attn: Conservation 2020 Supervisor

**Section Twelve: Amendment**

This Memorandum may only be amended in writing duly executed by the District and the County.

**Section Thirteen: Severability.**

The invalidity of any provision of this Memorandum shall in no way affect the validity of any other provision.

**Section Fourteen: Entire Agreement.**

It is understood and agreed that this Memorandum incorporates and includes all prior negotiations, agreements or understandings applicable to the matters contained herein and the parties agree that there are no commitments, agreements or understandings concerning the subject matter of this Memorandum that are not contained in this document. Accordingly, it is agreed that no deviation from the terms hereof shall be predicated upon any prior representations or agreements, whether oral or written.

**Section Fifteen: Waiver.**

The waiver by any party to this Memorandum of any failure on the part of another party to perform in accordance with any of the terms or conditions of this Memorandum shall not be construed as a waiver of any future or continuing similar or dissimilar failure.

**Section Sixteen: Third Party Beneficiaries.**

Neither the County nor the District intends to directly or substantially benefit a third party by this Memorandum. Therefore, the parties agree that there are no third party beneficiaries to this Memorandum and that no third party shall be entitled to assert a claim against either of them based on this Memorandum. The parties expressly acknowledge that it is not their intent to create any rights or obligations in any third person or entity under this Memorandum.

**Section Seventeen: Joint Preparation.**

The parties acknowledge that they have sought and received whatever competent advice and counsel as was necessary for them to form a full and complete understanding of all rights and obligations here and that the preparation of this Memorandum has been a joint effort. The language agreed to expresses their mutual intent and their resulting documents shall not, solely, as a matter of judicial construction, be construed more severally against one of the parties than the other.

**Section Eighteen: Applicable Law and Venue.**

This Memorandum shall be interpreted and construed in accordance with and governed by the laws of the State of Florida. Any controversies or legal problems arising out of this Memorandum and any action involving the enforcement or interpretation of any rights hereunder shall be submitted to the jurisdiction of the State Court of the 20<sup>th</sup> Judicial Circuit of Lee County, Florida, the venue site and shall be governed by the laws of the State of Florida. To encourage prompt and equitable resolution of any litigation that may arise hereunder, each party hereby waives any rights it may have to trial by jury of any such litigation.

**Section Nineteen. Effective Date.**

This Memorandum shall be deemed effective when signed by both parties.

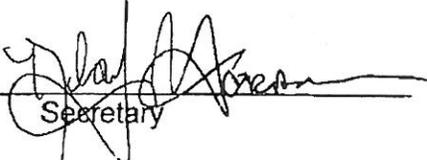
**REMAINDER OF PAGE INTENTIONALLY LEFT BLANK**

IN WITNESS OF THE ABOVE, the District and the County have executed this Memorandum on the day in the month indicated below.

EXECUTED BY THE DISTRICT THIS 11 DAY OF December, 2008.

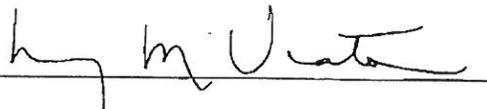
ATTEST

EAST COUNTY WATER CONTROL DISTRICT

By:   
Secretary  
(District Seal)

By:   
Chair

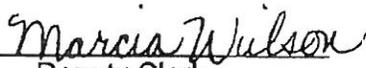
APPROVED AS TO FORM:

By:   
Office of the District Attorney

EXECUTED BY THE COUNTY THIS 6th DAY OF January, ~~2008~~ 2009.

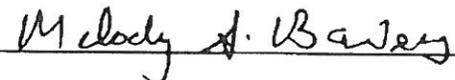
ATTEST:  
CHARLIE GREEN, CLERK

BOARD OF COUNTY COMMISSIONERS  
OF LEE COUNTY, FLORIDA

By:   
Deputy Clerk

By:   
Chairman

APPROVED AS TO FORM:

By:   
Office of the County Attorney



**EXHIBIT "A"**

**LEGAL DESCRIPTION OF THE PROPERTY**

All that part of the South Three-quarters of the West Three-Quarters of Section 15, Township 44 South, of Range 26 East, lying East of Buckingham Park Subdivision, as recorded in Plat Book 9, Pages 59 to 65 inclusive, Public Records of Lee County, Florida; Also that part of Section 22, Township 44 South, Range 26 East, described as follows:

Beginning at the point of Intersection of the East line of Buckingham Park, Northeast Section, as recorded in Plat Book 9, Pages 59 to 65, inclusive, with the North line of Section 22, Township 44 South, of Range 26 East; run South 89 degrees, 52 minutes, 10 seconds East, along said Section line for 500 feet; thence run South, No degrees, 49 minutes, 20 seconds East, for 51.3 feet to the North line of Homestead Road; thence run Westerly along said North line on an arc of a curve to the left with a radius of 1482.4 feet, for 467.2 feet to a point of tangency; thence run South 89 degrees, 10 minutes, 40 seconds West, along said North line for 40.5 feet to said East line of Buckingham Park Subdivision; thence run North, No degrees, 25 minutes, 10 seconds, West, along said East line, for 14.8 feet to the point of beginning.

**[STRAP NOs: 15-44-26-00-0003.0000 & 22-44-26-00-00004-0000]**

**EXHIBIT "B"**  
**SKETCH ILLUSTRATING LOCATION OF THE PROPERTY**



## Appendix B: Wildlife Species List

## Species List Birds

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Accipitridae)</b>				
<i>Accipiter cooperii</i>	Cooper's hawks	--	--	G5/S3
<i>Accipiter striatus</i>	Sharp-shinned hawk	--	--	--
<i>Buteo jamaicensis</i>	Red-tailed hawks	--	--	--
<i>Buteo lineatus</i>	Red-shouldered Hawk	--	--	--
<i>Circus cyaneus</i>	Northern harrier	--	--	--
<i>Elanoides forficatus</i>	Swallow-tailed kite	--	--	G5/S2
<i>Haliaeetus leucocephalus</i>	Bald eagle	Threatened	Threatened	G4/S3
<i>Pandion haliaetus</i>	Osprey	--	--	G5/S3S4
<i>Rosirhamus sociabilis plumbeus</i>	Everglade snail kite	Endangered	Endangered	G4G5T2/S2
<b>Family: (Alcedinidae)</b>				
<i>Ceryle alcyon</i>	Belted Kingfisher	--	--	--
<b>Family: (Anatidae)</b>				
<i>Aix sponsa</i>	Wood duck	--	--	--
<i>Anas acuta</i>	Northern pintail	--	--	--
<i>Anas americana</i>	American wigeon	--	--	--
<i>Anas clypeata</i>	Northern shoveler	--	--	--
<i>Anas crecca</i>	Green-winged teal	--	--	--
<i>Anas discors</i>	Blue-winged teal	--	--	--
<i>Anas fulvigula</i>	Mottled duck	--	--	--
<i>Anas platyrhynchos</i>	Mallard	--	--	--
<i>Anas strepera</i>	Gadwall	--	--	--
<i>Aythya affinis</i>	Lesser scaup	--	--	--
<i>Aythya americana</i>	Redhead	--	--	--
<i>Aythya collaris</i>	Ring-necked duck	--	--	--
<i>Cairina moschata</i>	Muscovy ducks	--	--	--
<i>Dendrocygna autumnalis</i>	Black-bellied whistling duck	--	--	--
<i>Lophodytes cucullatus</i>	Hooded merganser	--	--	--
<i>Mergus serrator</i>	Red-breasted merganser	--	--	--
<i>Podilymbus podiceps</i>	Pied-billed grebe	--	--	--
<b>Family: (Anhingidae)</b>				
<i>Anhinga anhinga</i>	Anhinga	--	--	--

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Apodidae)</b>				
<i>Chaetura pelagica</i>	Chimney swift	--	--	--
<b>Family: (Aramidae)</b>				
<i>Aramus guarauna</i>	Limpkin	--	SSC	--
<b>Family: (Ardeidae)</b>				
<i>Ardea alba</i>	Great egret	--	--	G5/S4
<i>Ardea herodias</i>	Great blue heron	--	--	--
<i>Botaurus lentiginosus</i>	American bittern	--	--	--
<i>Bubulcus ibis</i>	Cattle egret	--	--	--
<i>Butorides virescens</i>	Green heron	--	--	--
<i>Egretta caerulea</i>	Little blue heron	--	SSC	G5/S4
<i>Egretta thula</i>	Snowy egret	--	SSC	--
<i>Egretta tricolor</i>	Tricolored heron	--	SSC	--
<i>Ixobrychus exilis</i>	Least bittern	--	--	--
<i>Nyctanassa violacea</i>	Yellow-crowned night heron	--	--	--
<i>Nycticorax nycticorax</i>	Black-crowned night heron	--	--	--
<b>Family: (Bombycillidae)</b>				
<i>Bombycilla cedrorum</i>	Cedar Waxwing	--	--	--
<i>Sturnus vulgaris</i>	European Starling	--	--	--
<b>Family: (Caprimulgidae)</b>				
<i>Chordeiles minor</i>	Common nighthawk	--	--	--
<b>Family: (Cardinalidae)</b>				
<i>Cardinalis cardinalis</i>	Northern Cardinal	--	--	--
<b>Family: (Cathartidae)</b>				
<i>Cathartes aura</i>	Turkey vulture	--	--	--
<i>Coragyps atratus</i>	Black vulture	--	--	--
<b>Family: (Charadriidae)</b>				
<i>Charadrius semipalmatus</i>	Semipalmated Plover	--	--	--
<i>Charadrius vociferus</i>	Killdeer	--	--	--
<b>Family: (Ciconiidae)</b>				
<i>Mycteria americana</i>	Wood stork	Endangered	Endangered	G4/S2
<b>Family: (Corvidae)</b>				
<i>Aphelocoma coerulescens</i>	Florida Scrub-Jay	Threatened	Threatened	--
<i>Corvus brachyrhynchos</i>	American Crow	--	--	--
<i>Corvus ossifragus</i>	Fish Crow	--	--	--
<i>Cyanocitta cristata</i>	Blue Jay	--	--	--

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Columbidae)</b>				
<i>Columba livia</i>	Rock Pigeons	--	--	--
<i>Columbina passerina</i>	Ground-Dove	--	--	--
<i>Streptopelia decaocto</i>	Eurasian Collared-Dove	--	--	--
<i>Zenaida macroura</i>	Mourning Doves	--	--	--
<b>Family: (Emberizidae)</b>				
<i>Ammodramus savannarum</i>	Grasshopper Sparrow	--	--	--
<i>Melospiza georgiana</i>	Swamp Sparrow	--	--	--
<i>Melospiza melodia</i>	Song Sparrow	--	--	--
<i>Passerculus sandwichensis</i>	Savannah Sparrow	--	--	--
<b>Family: (Falconidae)</b>				
<i>Falco columbarius</i>	Merlin	--	--	--
<i>Falco peregrinus</i>	Peregrine Falcon	--	--	--
<i>Falco sparverius</i>	American kestrel	--	--	--
<i>Polyborus plancus audubonii</i>	Audubon's crested caracara	Threatened	Threatened	--
<b>Family: (Fringillidae)</b>				
<i>Spinus tristis</i>	American Goldfinch	--	--	--
<b>Family: (Gruidae)</b>				
<i>Grus canadensis</i>	Florida sandhill crane	--	Threatened	--
<b>Family: (Hirundinidae)</b>				
<i>Hirundo rustica</i>	Barn Swallow	--	--	--
<i>Progne subis</i>	Purple Martin	--	--	--
<i>Riparia riparia</i>	Bank Swallow	--	--	--
<i>Stelgidopteryx serripennis</i>	Northern Rough-winged Swallow	--	--	--
<i>Tachycineta bicolor</i>	Tree Swallow	--	--	--
<b>Family: (Icteridae)</b>				
<i>Agelaius phoeniceus</i>	Red-winged Blackbird	--	--	--
<i>Dolichonyx oryzivorus</i>	Bobolink	--	--	--
<i>Quiscalus major</i>	Boat-tailed Grackle	--	--	--
<i>Quiscalus quiscula</i>	Common Grackles	--	--	--
<i>Sturnella magna</i>	Eastern Meadowlark	--	--	--
<b>Family: (Lanidae)</b>				
<i>Lanius ludovicianus</i>	Loggerhead Shrike	--	--	--

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Laridae)</b>				
<i>Larus atricilla</i>	Laughing Gull	--	--	--
<i>Sterna caspia</i>	Caspian Tern	--	--	--
<i>Sterna nilotica</i>	Gull-billed Tern	--	--	--
<b>Family: (Mimidae)</b>				
<i>Dumetella carolinensis</i>	Gray Catbird	--	--	--
<i>Mimus polyglottos</i>	Northern Mockingbird	--	--	--
<i>Toxostoma rufum</i>	Brown Thrasher	--	--	--
<b>Family: (Odontophoridae)</b>				
<i>Colinus virginianus</i>	Northern bobwhite	--	--	--
<b>Family: (Paridae)</b>				
<i>Baeolophus bicolor</i>	Tufted Titmouse	--	--	--
<i>Poecile carolinensis</i>	Carolina Chickadee	--	--	--
<b>Family: (Parulidae)</b>				
<i>Dendroica coronata</i>	Yellow-rumped Warblers	--	--	--
<i>Dendroica discolor</i>	Prairie Warbler	--	--	--
<i>Dendroica dominica</i>	Yellow-throated Warbler	--	--	--
<i>Dendroica palmarum</i>	Palm Warbler	--	--	--
<i>Dendroica pinus</i>	Pine Warbler	--	--	--
<i>Dendroica virens</i>	Black-throated Green Warbler	--	--	--
<i>Geothlypis trichas</i>	Common Yellowthroat	--	--	--
<i>Mniotilta varia</i>	Black-and-white Warbler	--	--	--
<i>Parula americana</i>	Northern Parula	--	--	--
<i>Seiurus aurocapillus</i>	Ovenbird	--	--	--
<i>Vermivora celata</i>	Orange-crowned Warbler	--	--	--
<b>Family: (Passeridae)</b>				
<i>Passer domesticus</i>	House Sparrows	--	--	--
<b>Family: (Pelecanidae)</b>				
<i>Pelecanus erythrorhynchos</i>	American white pelican	--	SSC	--
<i>Pelecanus occidentalis</i>	Brown pelican	--	SSC	--
<b>Family: (Picidae)</b>				
<i>Colaptes auratus</i>	Northern Flickers	--	--	--
<i>Dryocopus pileatus</i>	Pileated Woodpecker	--	--	--
<i>Melanerpes carolinus</i>	Red-bellied Woodpeckers	--	--	--
<i>Melanerpes erythrocephalus</i>	Red-headed Woodpecker	--	--	--
<i>Picoides pubescens</i>	Downy Woodpecker	--	--	--
<i>Sphyrapicus varius</i>	Yellow-bellied Sapsucker	--	--	--

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Phalacrocoracidae)</b>				
<i>Phalacrocorax auritus</i>	Double-crested cormorant	--	--	--
<b>Family: (Phasianidae)</b>				
<i>Meleagris gallopavo</i>	Wild turkey	--	--	--
<b>Family: (Podicipedidae)</b>				
<i>Podilymbus podiceps</i>	Pied-billed Grebe	--	--	--
<b>Family: (Rallidae)</b>				
<i>Fulica americana</i>	American Coot	--	--	--
<i>Gallinula chloropus</i>	Common Moorhen	--	--	--
<i>Porzana carolina</i>	Sora	--	--	--
<i>Rallus elegans</i>	King rail	--	--	--
<b>Family: (Recurvirostridae)</b>				
<i>Himantopus mexicanus</i>	Black-necked Stilt	--	--	--
<b>Family: (Regulidae)</b>				
<i>Regulus calendula</i>	Ruby-crowned Kinglet	--	--	--
<b>Family: (Scolopacidae)</b>				
<i>Actitis macularia</i>	Spotted Sandpiper	--	--	--
<i>Calidris alpina</i>	Dunlin	--	--	--
<i>Calidris himantopus</i>	Stilt Sandpiper	--	--	--
<i>Calidris mauri</i>	Western Sandpiper	--	--	--
<i>Calidris minutilla</i>	Least Sandpiper	--	--	--
<i>Gallinago delicata</i>	Wilson's Snipe	--	--	--
<i>Limnodromus griseus</i>	Short-billed Dowitcher	--	--	--
<i>Scolopax minor</i>	American Woodcock	--	--	--
<i>Tringa flavipes</i>	Lesser Yellowlegs	--	--	--
<i>Tringa melanoleuca</i>	Greater Yellowlegs	--	--	--
<i>Tringa solitaria</i>	Solitary Sandpiper	--	--	--
<b>Family: (Strigidae)</b>				
<i>Bubo virginianus</i>	Great Horned owl	--	--	--
<i>Strix varia</i>	Barred owl	--	--	--
<b>Family: (Sylviidae)</b>				
<i>Poliophtila caerulea</i>	Blue-gray Gnatcatcher	--	--	--
<b>Family: (Threskiornithidae)</b>				
<i>Eudocimus albus</i>	White ibis	--	SSC	--
<i>Platalea ajaja</i>	Roseate spoonbill	--	SSC	--
<i>Plegadis falcinellus</i>	Glossy ibis	--	--	--

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Troglodytidae)</b>				
<i>Cistothorus palustris</i>	Marsh Wren	--	--	--
<i>Thryothorus ludovicianus</i>	Carolina Wren	--	--	--
<i>Troglodytes aedon</i>	House Wren	--	--	--
<b>Family: (Turdidae)</b>				
<i>Turdus migratorius</i>	American Robin	--	--	--
<b>Family: (Tyrannidae)</b>				
<i>Contopus virens</i>	Eastern Wood-Pewee	--	--	--
<i>Myiarchus crinitus</i>	Great Crested Flycatcher	--	--	--
<i>Sayornis phoebe</i>	Eastern Phoebe	--	--	--
<i>Tyrannus tyrannus</i>	Eastern Kingbird	--	--	--
<b>Family: (Vireonidae)</b>				
<i>Vireo griseus</i>	White-eyed Vireo	--	--	--
<i>Vireo solitarius</i>	Blue-headed Vireo	--	--	--

## Species List Reptiles

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Alligatoridae)</b>				
<i>Alligator mississippiensis</i>	American alligator	--	SSC	G5/S4
<b>Family: (Chelydridae)</b>				
<i>Chelydra serpentina</i>	Common snapping turtle	--	--	--
<b>Family: (Colubridae)</b>				
<i>Coluber constrictor priapus</i>	Southern black racer	--	--	--
<i>Thamnophis sauritus</i>	Ribbon Snake			
<b>Family: (Emydidae)</b>				
<i>Pseudemys floridana peninsularis</i>	Peninsula cooter	--	--	--
<b>Family: (Testudinidae)</b>				
<i>Gopherus polyphemus</i>	Gopher tortoise	--	Threatened	--
<b>Family: (Trionychidae)</b>				
<i>Apalone ferox</i>	Soft-shelled turtle	--	--	--
<b>Family: (Viperidae)</b>				
<i>Agkistrodon piscivorus</i>	Florida Cottonmouth	--	--	--

## Species List Amphibians

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Hylidae)</b>				
<i>Hyla cinerea</i>	American Green Tree Frog	--	--	--
<b>Family: (Ranidae)</b>				
<i>Acris gryllus</i>	Southern Cricket Frog	--	--	--
<i>Lithobates sphenoccephalus</i>	Southern Leopard Frog	--	--	--
<i>Rana grylio</i>	Pig Frog	--	--	--

## Species List Mammals

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Felidae)</b>				
<i>Lynx rufus</i>	Bobcat	--	--	--
<i>Puma concolor coryi</i> *	Florida panther	Endangered	Endangered	--
<b>Family: (Leporidae)</b>				
<i>Sylvilagus palustris</i>	Marsh Rabbit	--	--	--
<b>Family: (Mustelidae)</b>				
<i>Lontra canadensis</i>	North American River Otter	--	--	--
<b>Family: (Procyonidae)</b>				
<i>Procyon lotor</i>	Northern Raccoon	--	--	--
<b>Family: (Ursidae)</b>				
<i>Ursus americanus floridanus</i> *	Florida black bear	--	--	--

\*species not observed onsite, but site is within consultation area

## Species List Butterflies

Scientific Name	Common Name	USFWS Status	FWC Status	FNAI Status
<b>Family: (Nymphalidae)</b>				
<i>Agraulis vanillae</i>	Gulf Fritillary	--	--	--
<i>Anartia jatrophae</i>	White Peacock	--	--	--
<i>Danaus plexippus</i>	Monarch butterfly	--	--	--
<i>Heliconius charithonia</i>	Zebra Longwing	--	--	--
<b>Family: (Papilionidae)</b>				
<i>Papilio palamedes</i>	Palamedes Swallowtail	--	--	--
<i>Papilio polyxenes</i>	Black Swallowtail	--	--	--

Key:

FWC = Florida Fish & Wildlife Conservation Commission

FWS = U.S. Fish & Wildlife Service

E = Endangered

T = Threatened

SSC = Species of Special Concern

## Appendix C: Plant Species List

# Plant List

Scientific Name	Common Name	Status	EPPC	FDAC	IRC	FNAI
<b>Family : Alliismataceae</b>						
<i>Sagittaria lancifolia</i>	Arrowhead	native				
<b>Family : Anacardiaceae (cashew)</b>						
<i>Schinus terebinthifolius</i>	Brazilian Pepper	exotic				
<b>Family : Apiaceae (carrot)</b>						
<i>Hydrocotyle umbellata</i>	Asiatic Pennywort	native				
<b>Family : Arecaceae (palm)</b>						
<i>Sabal palmetto</i>	Cabbage Palm	native				
<i>Serenoa repens</i>	Saw Palmetto	native				
<b>Family : Asteraceae (Aster)</b>						
<i>Ambrosia artemisiifolia</i>	Ragweed	native				
<i>Bidens alba</i>	Hairy Beggar-Ticks	native				
<i>Eupatorium capillifolium</i>	Dog Fennel	native				
<i>Pluchea rosea</i>	Rosy Camphorweed	native				
<b>Family : Blechnaceae (mid-sorus-fern)</b>						
<i>Blechnum serrulatum</i>	Swamp Fern	native				
<b>Family : Casuarinaceae (sheoak)</b>						
<i>Casuarina equisetifolia</i>	Australian Pine	exotic				
<b>Family : Cupressnaceae (cedar)</b>						
<i>Taxodium distichum</i>	Bald Cypress	native				
<b>Family : Cyperaceae (sedge)</b>						
<i>Cladium jamaicense</i>	Sawgrass	native				
<i>Rhynchospora colorata</i>	White-top	native				

Scientific Name	Common Name	Status	EPPC	FDAC	IRC	FNAI
<b>Family : Fagaceae (beech)</b>						
<i>Quercus laurifolia</i>	Laurel Oak	native				
<i>Quercus virginiana</i>	Live Oak	native				
<b>Family : Iridaceae (Iris)</b>						
<i>Iris pseudacorus</i>	Iris	native				
<b>Family : Haloragaceae (watermilfoil)</b>						
<i>Proserpinaca palustris</i>	Mermaidweed	native				R
<b>Family : Malvaceae (mallow)</b>						
<i>Kosteletzkya virginica</i>	Saltmarsh-Mallow	native	II			
<i>Urena lobata</i>	Caesar Weed	native	II			
<b>Family : Myricaceae (bayberry)</b>						
<i>Morella Cerifera</i>	Wax Myrtle	native				
<b>Family : Myrtaceae (myrtle)</b>						
<i>Melaleuca quinquenervia</i>	Melaleuca	exotic	I			
<b>Family : Pinaceae (pine)</b>						
<i>Pinus elliotii</i>	Florida Slash Pine	native				
<b>Family : Poaceae (grasses)</b>						
<i>Amphicarpum muehlenbergianum</i>	Little Blue Maidencane	native				
<i>Brachiaria mutica</i>	Para Grass	exotic				
<i>Cenchrus echinatus</i>	Sandspur	native				
<i>Panicum repens</i>	Torpedo Grass	exotic				
<i>Paspalum notatum fluegge</i>	Bahia Grass	native				
<i>Spartina bakeri</i>	Sand Cordgrass	native				

Scientific Name	Common Name	Status	EPPC	FDAC	IRC	FNAI
<b>Family : Polygonaceae (buckwheat)</b>						
<i>Polygonum hydropiperoides</i>	Smartweed	native				
<i>Polygonum punctatum</i>	Dotted Smartweed	native				
<b>Family : Pontederiaceae (pickerelweed)</b>						
<i>Pontederia cordata</i>	Pickerelweed	native				
<b>Family : Rubiaceae (madder)</b>						
<i>Cephalanthus occidentalis</i>	Buttonbush	native				
<i>Psychotria nervosa</i>	Wild Coffee	native				
<b>Family : Salicaceae (willow)</b>						
<i>Salix caroliniana</i>	Carolina Willow	native				
<b>Family : Typhaceae (typha)</b>						
<i>Typha latifolia</i>	Cattail	native				
<b>Family : Verbenaceae (vervain)</b>						
<i>Callicarpa americana</i>	Beautyberry	native				
<i>Phyla nodiflora</i>	Frog Fruit	native				
<b>Family : Vitaceae (grape)</b>						
<i>Ampelopsis arborea</i>	Peppervine	native				
<i>Vitis rotundifolia</i>	Grapevine	native				

Scientific Name	Common Name	Status	EPPC	FDAC	IRC	FNAI
<b>Family : Polygonaceae (buckwheat)</b>						
<i>Polygonum hydropiperoides</i>	Smartweed	native				
<i>Polygonum punctatum</i>	Dotted Smartweed	native				
<b>Family : Pontederiaceae (pickerelweed)</b>						
<i>Pontederia cordata</i>	Pickerelweed	native				
<b>Family : Rubiaceae (madder)</b>						
<i>Cephalanthus occidentalis</i>	Buttonbush	native				
<i>Psychotria nervosa</i>	Wild Coffee	native				
<b>Family : Salicaceae (willow)</b>						
<i>Salix caroliniana</i>	Carolina Willow	native				
<b>Family : Typhaceae (typha)</b>						
<i>Typha latifolia</i>	Cattail	native				
<b>Family : Verbenaceae (vervain)</b>						
<i>Callicarpa americana</i>	Beautyberry	native				
<i>Phyla nodiflora</i>	Frog Fruit	native				
<b>Family : Vitaceae (grape)</b>						
<i>Ampelopsis arborea</i>	Peppervine	native				
<i>Vitis rotundifolia</i>	Grapevine	native				

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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 D: Legal Descriptions

Prepared by and return to:  
Corrine Collins

Duncan & Associates, P.A.  
1601 Jackson Street Suite 101  
Fort Myers, FL 33901  
239-334-4574  
File Number: 2008316  
Will Call No.: 24

[Space Above This Line For Recording Data]

## Warranty Deed

This Warranty Deed made this 11 day of December, 2008 between Marian Land Company, a Florida General Partnership whose post office address is P.O. Box 10, Maplewood, NJ 07040, grantor, and Lee County, a Political Subdivision of the State of Florida whose post office address is P.O. Box 398, Fort Myers, FL 33902-0398, grantee:

(Whenever used herein the terms "grantor" and "grantee" include all the parties to this instrument and the heirs, legal representatives, and assigns of individuals, and the successors and assigns of corporations, trusts and trustees)

Witnesseth, that said grantor, for and in consideration of the sum of TEN AND NO/100 DOLLARS (\$10.00) and other good and valuable considerations to said grantor in hand paid by said grantee, the receipt whereof is hereby acknowledged, has granted, bargained, and sold to the said grantee, and grantee's heirs and assigns forever, the following described land, situate, lying and being in Lee County, Florida to-wit:

As described in Exhibit A - Parcel 214-2, attached hereto and made a part hereof by reference.

Parcel Identification Number: 15-44-26-00-0003.0000 &

Parcel 22-44-26-00-00004.0000

Subject to: Covenants, conditions, restrictions, easements, limitations and zoning ordinances of record, if any.

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

To Have and to Hold, the same in fee simple forever.

And the grantor hereby covenants with said grantee that the grantor is lawfully seized of said land in fee simple; that the grantor has good right and lawful authority to sell and convey said land; that the grantor hereby fully warrants the title to said land and will defend the same against the lawful claims of all persons whomsoever; and that said land is free of all encumbrances, except taxes accruing subsequent to December 31, 2008.

In Witness Whereof, grantor has hereunto set grantor's hand and seal the day and year first above written.

Acquisition approved by the Lee County Board  
of Commissioners action on 6-10-08 Item A1B

and accepted on behalf of the board by \_\_\_\_\_

Michele McNeill on 12-16-08

in accordance with B.S. # 20080555

Project Cons 2020, Proj 800 Parcel 214-2

Signed, sealed and delivered in our presence:

Patricia E. Malanga  
Witness Name: PATRICIA E. MALANGA  
Shirley Terrell  
Witness Name: Shirley Terrell

Marian Land Company, a Florida General Partnership

By: Charles Brenner  
Charles Brenner, General Partner

State of New Jersey  
County of ESSEX

The foregoing instrument was acknowledged before me this 11 day of December, 2008 by Charles Brenner, General Partner on behalf of Marian Land Company, a Florida General Partnership. He/she  is personally known to me or  has produced a driver's license as identification.



Patricia A. Robinson  
Notary Public

Printed Name: PATRICIA A. ROBINSON  
Notary Public - New Jersey  
My Commission Expires May 12, 2009

## First American Title Insurance Company

### Schedule A (Continued)

Agent File No.: 2008316

All that part of the South Three-Quarters of the West Three-Quarters of Section 15, Township 44 South, of Range 26 East, lying East of Buckingham Park Subdivision, as recorded in Plat Book 9, Pages 59 to 65, Inclusive;

ALSO that part of Section 22, Township 44 South, of Range 26 East, described as follows:

Beginning at the point of Intersection of the East line of Buckingham Park, Northeast Section, as recorded in Plat Book 9, Pages 59 to 65, Inclusive, with the North line of Section 22, Township 44 South, of Range 26 East; run South  $89^{\circ}52'10''$  East, along said Section line for 500 feet; thence run South  $0^{\circ}49'20''$  East, for 51.3 feet to the North line of Homestead Road; thence run Westerly along said North line on an arc of a curve to the left with a radius of 1482.4 feet, for 467.2 feet to point of tangency; thence run South  $89^{\circ}10'40''$  West, along said North line for 40.5 feet to said East line of Buckingham Park Subdivision; thence run North  $0^{\circ}25'10''$  West, along said East line, for 14.8 feet to the Point of Beginning.

ALSO KNOWN AS:

A tract of land lying in the State of Florida, County of Lee, in Section 15 and 22, Township 44 South, Range 26 East, being more particularly described as follows:

Commencing at the Southeast corner of Section 15, Township 44 South, Range 26 East; thence N  $89^{\circ}52'49''$  W along the South line of said Section 15 for a distance of 1,315.07 feet to the Point of Beginning; thence continue N  $89^{\circ}52'49''$  W along said South line for a distance of 1,272.88 feet; thence S. 00 degrees 49' 59" E leaving said south section line for a distance of 84.92 feet to an Intersection with the North right-of-way line of Unice Avenue North being a point on a non tangent curve to the left having a radius of 1,482.40 feet; thence along said non tangent curve to the left through a central angle of  $18^{\circ}10'25''$ , a chord bearing of N  $81^{\circ}44'19''$  W, a chord distance of 468.23 feet, an arc distance of 470.20; thence S  $89^{\circ}10'28''$  W along said right-of-way line for a distance of 37.72 feet to an intersection with the Easterly right-of-way line of Felix Romano Avenue; thence N  $00^{\circ}25'04''$  W along said right-of-way for a distance of 19.22 feet to an Intersection with the South line of said Section 15; thence continue N  $00^{\circ}25'04''$  W along said right-of-way for a distance of 1,004.05 feet; thence N  $39^{\circ}40'14''$  W along said right-of-way line for a distance of 2,347.58 feet to an Intersection with the Southerly line of Buckingham Air Park East, as recorded in Plat Book 56, Pages 57 through 58 of the Public Records of Lee County, Florida; thence N  $50^{\circ}21'59''$  E, along said Southerly line for a distance of 851.54 feet; thence N 89 degrees 27'04" E for a distance of 1,332.92 feet to an Intersection with the West line of the East Half of said Section 15; thence N  $00^{\circ}25'25''$  E, along said West line for a distance of 674.31 feet; thence N  $89^{\circ}18'32''$  E, leaving said West line for a distance of 1,326.63 feet to an intersection with the West line of the East Half of the East Half of said Section 15; thence S  $00^{\circ}35'00''$  W, along said West line for a distance of 4,061.17 feet to an Intersection with the South line of said Section 15 and the Point of Beginning.

## Appendix E: Drainage Easement

142419

KNOW ALL MEN BY THESE PRESENTS

WHEREAS, Joe L. Moore and Company, an Alabama Corporation authorized to do business in Florida, is the owner of sections and parts of sections, located in the County of Lee and lying and being in Township 44 South, Range 26 East, to-wit:

Sections 7, 8, and 14 through 23, 25 through 30, and;

WHEREAS, there is now in existence a drainage canal approximately thirty (30) feet wide running through portions of the aforesaid properties commencing at or about the Buckingham Road in Section eight (8), and running in a generally, southerly direction to the South boundary of Section 21, thence Easterly into section twenty-three (23), thence Northerly into Section fourteen (14), thence Northwesterly and adjoining Orange River in the Northerly portion of Section fifteen (15), and;

WHEREAS, said drainage canal, known as "Rim Canal", is now serving to drain all adjacent and nearby properties, and;

WHEREAS, the Joe L. Moore and Company desires to convey a perpetual easement for draining purposes to all of the present and future owners of the lands in the aforesaid sections:

NOW THEREFORE, in consideration of One (\$1.00) Dollar, to it in hand paid, receipt of which is hereby acknowledged, the said Joe L. Moore and Company does hereby grant, sell, bargain, and convey to all the present and future owners of the lands in said sections, a perpetual right and easement to use said drainage canal for drainage purposes, said easement being thirty (30) feet each side of the center line of the said existing canal, the same being measured on a perpendicular from the said center line of said canal.

IN WITNESS WHEREOF, the said Joe L. Moore and Company, has caused these presents to be signed in its name by its vice-president, and its corporate seal to be affixed, attested by its assistant secretary, this 31 day of December, 1952.

JOE L. MOORE COMPANY

BY Paul E. Hunt  
Vice-President

(CORPORATE SEAL)

Attest: Harold J. [Signature]

Signed, sealed and delivered in our presence:

Robert W. Shanda  
Harold J. [Signature]



MISC. BOOK 32 PAGE 336

STATE OF FLORIDA  
COUNTY OF LEE

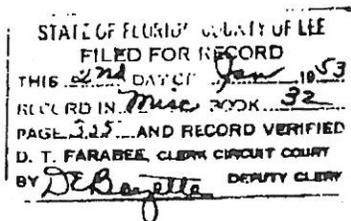
I HEREBY CERTIFY, That on this 31 day of December,  
A. D., 1952, personally appeared before me, Carl E. Hunt  
and Henry J. Wood, Vice

President and Assistant Secretary, respectively of Joe L. Moore  
Company, a corporation under the laws of the State of Alabama, authoriz-  
ed to do business in the State of Florida, to me known to be the persons  
described in and who executed the foregoing instrument and they  
severally acknowledged the execution thereof to be their free act  
and deed as such officers, for the uses and purposes therein men-  
tioned; and that they affixed thereto the official seal of said  
corporation, and the said instrument is the act and deed of said  
corporation.

WITNESS my signature and official seal at Fort Myers,  
County of Lee, and State of Florida, the day and year last  
aforesaid.

My Commission Expires: Oct. 3, 1953

Thomas J. Pharis  
Notary Public



Appendix F: Lee County Invasive Plant Control Prescription Form

# Invasive Plant Control Prescription Form

## TO BE FILLED OUT BY LEE COUNTY STAFF

Site Name/ Management Unit:		Date:	
Acres to Treat:		Prepared By:	

GENERAL SITE CONDITIONS							
Plant Community Type(s):							
General Soil	Sand		Muck		Clay		Other
Any special concerns (public use, time of year, hydrology, cattle, rare plants or wildlife, etc.):							
Weather conditions: Herbicide application <b>must</b> be conducted under label specifications according to temperature and rainfall							

## TO BE FILLED OUT BY CONTRACTOR

Date:		Name:		Company	
Address					
Phone		Email		Fax	

### Treatment methods

Control methods: ex: foliar spray, basal spray, cut stump etc.	Herbicide	Application rate (%)	Target plant species

*County Staff will attach aerial and scope of work to this form*

## Appendix G: Florida Master Site File Review



**This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333 for project review information.**

April 27, 2011

Alicia Lewis  
Boylan Environmental Consultants, Inc.  
11000 Metro Parkway, Suite 4  
Fort Myers, FL 33966  
[Alicia@boylanenv.com](mailto:Alicia@boylanenv.com)



In response to your inquiry on April 27, 2011, the Florida Master Site File lists no previously recorded cultural resources in the following section of Lee County:

**T44S R26E Section 15**

When interpreting the results of this search, please consider the following information:

- **This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.**
- **Federal, state and local laws require formal environmental review for most projects. This search DOES NOT constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.**

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Chris Fowler  
Archaeological Data Analyst  
Florida Master Site File  
[cgfowler@dos.state.fl.us](mailto:cgfowler@dos.state.fl.us)

## Appendix H: Avigation Easement

This instrument Prepared by:  
Lee County Attorney's Office  
PO Box 398  
Fort Myers, Fl 33901

received  
06/08/12

### AVIGATION EASEMENT

This Avigation Easement is made this 18th day of April, 2012 by and between **LEE COUNTY**, a political subdivision of the State of Florida, whose address is Post Office Box 398, Fort Myers, Florida 33901 (Grantor); and, **LEE COUNTY MOSQUITO CONTROL DISTRICT**, a special district and political subdivision of the State of Florida, whose address is 15191 Homestead Road, Lehigh Acres, Florida 33906 (Grantee).

**WHEREAS**, Grantor is the fee simple title holder to certain real property located in Lee County, Florida, more particularly described in attached Exhibit "A"; and

**WHEREAS**, Grantee is the owner and operator, respectively, of the Buckingham Airfield in Lee County, Florida (Airport), which is situated in close proximity to the land described in Exhibit A;" and

**WHEREAS**, Grantee desires to obtain and preserve a right of free and unobstructed flight for aircraft landing upon, taking off from, or maneuvering about the Airport; and

**WHEREAS**, it is the purpose of this Avigation Easement to grant to the Grantee a perpetual avigation easement over the land described in Exhibit A;" and

**WHEREAS**, it is the further purpose of this Avigation Easement and Release to release the Grantee from all claims, damages or causes of action which may now exist or may hereinafter arise by reason of the operation of the Airport and related aircraft activities.

**NOW, THEREFORE**, for and in consideration of the sum of \$10.00, paid by Grantee to Grantor, the receipt of which is hereby acknowledged, Grantor does hereby grant to Grantee, its successors and assigns, a perpetual avigation easement and right of flight through the Navigable Airspace directly and diagonally above, across and over all of the property described in attached Exhibit "A" as follows:

1. The use of the easement includes the right to generate and emit noise, vibrations, fumes, dust, and fuel particles from engines, wind and aircraft, to display aircraft landing lights, and to cause other related effects as may be associated with all normal aircraft landing and take-off at the Airport.

2. Grantor does hereby release Grantee, and its respective members, officers, managers, agents, servants, and employees from any and all claims, demands, damages, liabilities, costs, attorneys' fees and causes of action of every kind or nature

for which Grantor may now have or in the future have as a result of normal Airport operations or normal aircraft activities and noise levels, as contemplated under numbered paragraph 1.

3. This is a perpetual easement that runs with the land and is binding on the parties, their successors and assigns.

4. The term "Navigable Airspace" as used in this easement is defined as follows:

"Navigable Airspace" means the airspace above the minimum altitudes of flight prescribed by regulations issued under the Federal Aviation Act of 1958, Section 101 (24) 49 U.S. Code 1301, and includes such airspace as needed to ensure safety in the take-off and landing of aircraft.

**IN WITNESS WHEREOF**, the parties execute and accept this Avigation Easement.

ATTEST  
Charlie Green, Clerk of Court

LEE COUNTY BOARD OF COUNTY COMMISSIONERS

By: Marcia Wilson  
Deputy Clerk

By: J. Manning  
Chair

Approved as to form:

[Signature]  
County Attorney's Office

**ACCEPTANCE**

This Avigation Easement is accepted by Lee County Mosquito Control District in accordance with the District Board action on April 18th, 2012.

Witness

Carmen L. McKisney  
Witness' Printed Name

LEE COUNTY MOSQUITO CONTROL DISTRICT, a special taxing district of the State of Florida

By: T. Wayne Gale  
T. Wayne Gale, Executive Director

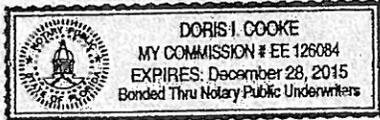
Witness

Deborah A. Newton  
Witness' Printed Name

STATE OF FLORIDA  
COUNTY OF LEE

THE FOREGOING INSTRUMENT was acknowledged before me this 18 day of APRIL, 2012, by T. Wayne Gale as Executive Director of LEE COUNTY MOSQUITO CONTROL DISTRICT, who is personally known to me or who has produced \_\_\_\_\_ as identification, acknowledging that the above and foregoing is true and correct and that it was executed freely and voluntarily for the purposes expressed therein.

My Commission Expires:



Doris I. Cooke  
Notary Public

DORIS I. COOKE  
Print/Type Name of Notary

Commission No. \_\_\_\_\_

EXHIBIT A

All that part of the South Three-Quarters of the West Three-Quarters of Section 15, Township 44 South, of Range 26 East, lying East of Buckingham Park Subdivision, as recorded in Plat Book 9, Pages 59 to 65, inclusive;

ALSO that part of Section 22, Township 44 South, of Range 26 East, described as follows:

Beginning at the point of intersection of the East line of Buckingham Park, Northeast Section, as recorded in Plat Book 9, Pages 59 to 65, Inclusive, with the North line of Section 22, Township 44 South, of Range 26 East; run South  $89^{\circ}52'10''$  East, along said Section line for 500 feet; thence run South  $0^{\circ}49'20''$  East, for 51.3 feet to the North line of Homestead Road; thence run Westerly along said North line on an arc of a curve to the left with a radius of 1482.4 feet, for 467.2 feet to point of tangency; thence run South  $89^{\circ}10'40''$  West, along said North line for 40.5 feet to said East line of Buckingham Park Subdivision; thence run North  $0^{\circ}25'10''$  West, along said East line, for 14.8 feet to the Point of Beginning.

ALSO KNOWN AS:

A tract of land lying in the State of Florida, County of Lee, in Section 15 and 22, Township 44 South, Range 26 East, being more particularly described as follows:

Commencing at the Southeast corner of Section 15, Township 44 South, Range 26 East; thence N  $89^{\circ}52'49''$  W along the South line of said Section 15 for a distance of 1,315.07 feet to the Point of Beginning; thence continue N  $89^{\circ}52'49''$  W along said South line for a distance of 1,272.88 feet; thence S  $00^{\circ}49'59''$  E leaving said south section line for a distance of 84.92 feet to an intersection with the North right-of-way line of Unice Avenue North being a point on a non tangent curve to the left having a radius of 1,482.40 feet; thence along said non tangent curve to the left through a central angle of  $18^{\circ}10'25''$ , a chord bearing of N  $81^{\circ}44'19''$  W, a chord distance of 468.23 feet, an arc distance of 470.20; thence S  $89^{\circ}10'28''$  W along said right-of-way line for a distance of 37.72 feet to an intersection with the Easterly right-of-way line of Felix Romano Avenue; thence N  $00^{\circ}25'04''$  W along said right-of-way for a distance of 19.22 feet to an intersection with the South line of said Section 15; thence continue N  $00^{\circ}25'04''$  W along said right-of-way for a distance of 1,004.05 feet; thence N  $39^{\circ}40'14''$  W along said right-of-way line for a distance of 2,347.58 feet to an intersection with the Southerly line of Buckingham Air Park East, as recorded in Plat Book 56, Pages 57 through 58 of the Public Records of Lee County, Florida; thence N  $50^{\circ}21'59''$  E, along said Southerly line for a distance of 851.54 feet; thence N  $89^{\circ}27'04''$  E for a distance of 1,332.92 feet to an intersection with the West line of the East Half of said Section 15; thence N  $00^{\circ}25'25''$  E, along said West line for a distance of 674.31 feet; thence N  $89^{\circ}18'32''$  E, leaving said West line for a distance of 1,326.63 feet to an intersection with the West line of the East Half of the East Half of said Section 15; thence S  $00^{\circ}35'00''$  W, along said West line for a distance of 4,061.17 feet to an intersection with the South line of said Section 15 and the Point of Beginning.