Pepper Ranch Preserve

Land Management Plan

Managed by

Conservation Collier Program
Collier County

October 2010 – October 2020 (10 yr plan)

Prepared by: Johnson Engineering, Inc.

Prepared for: Conservation Collier Program

May 2010

Pepper Ranch Preserve

Land Management Plan Executive Summary

Lead Agency: Conservation Collier Program

Properties included in this Plan: Pepper Ranch Preserve

Preserve lands consist of ten contiguous parcels located within Sections 22, 26, 27, 28, 33 & 35, Township 46 South, Range 28 East, in Collier County. A property survey and full legal description is provided in Appendix 1.

Parcel Folio Numbers	
00052360002	**00052680009**
00052440003	**00054040003**
00053000002	**00053920001**
00052960004	**00053840000**
00052640007	**00053200006**

Acreage Breakdown:

Natural Community	Acreage
Improved pasture	619.64
Depression marsh, disturbed	311.29
Upland mixed forest	270.92
Slough	243.38
Bottomland forest	241.63
Upland mixed forest, disturbed	160.59
Mesic flatwoods	149.95
Strand swamp	82.41
Mesic flatwoods, disturbed	77.20
Improved pasture, hydric	47.70
Dry prairie, disturbed	45.09
Wet flatwoods	43.66
Depression marsh	42.60
Ditches	35.15
Upland mixed forest, burned	34.65
Shell road, graded and drained	20.63
Slough, disturbed	14.17
Prairie hammock	11.22
Spoil, exotics	9.49

Natural Community (continued)	Acreage
Wet prairie, disturbed	7.99
Bottomland forest, disturbed	6.27
Prairie hammock, disturbed	5.88
Oil field	5.63
Wet prairie	5.21
Primitive trail	4.90
Brazilian pepper, hydric	4.26
Dry prairie	3.53
Borrow pond	1.43
Spoil	1.24
Australian pine	1.15
Brazilian pepper	1.15
TOTAL	2510.01

Management Responsibilities:

Agency: Collier County - Conservation Collier Program
Preserve Manager: Designated Collier County Environmental Specialist

Designated Land Use: Preservation

Unique Features: Largest Conservation Collier acquisition to date with frontage on north side of Lake Trafford

Archaeological/Historical: The Pepper Ranch Preserve is within an area of historical and archaeological probability, and historical and archaeological sites are most likely present on the property. The County will notify the Division of Historical Resources immediately if evidence is discovered to suggest any archaeological or historic resources are present.

Management Needs:

Monitoring of biological resources;

Exotic plant removal and maintenance

Conduct a hydrological analysis of the preserve to better determine restoration needs;

Restoration of select areas after exotic removal;

Implementation of a prescribed fire management program;

Habitat management to enhance protection of native and listed species populations; and

Planning for public use.

Public Involvement: Working with Immokalee Civic Group(s) including the Immokalee Community Redevelopment Association, Collier County Sheriff's Department and neighboring property owners to discuss public use and access issues. Two public

meetings were held (January 28 and February 11, 2010) to provide the general public an opportunity to review and comment on this Pepper Ranch Preserve Land Management Plan. Specifically, these meetings gave the general public an opportunity to learn about the Conservation Collier Program, future land management plans and potential for public use at Pepper Ranch Preserve. This forum also allowed the public to voice any concerns or objections they may have had with any of these issues as presented here in the Final Land Management Plan.

Conservation Collier and the Collier County Board of County Commissioners (BCC) have held workshops (February 18 and March 18, 2010) with outdoor sportsmen's clubs and hunters to develop a Hunt Program for Pepper Ranch Preserve. Over 20 people attended the February 18th, 2010 meeting, including representatives from the Florida Fish and Wildlife Conservation Commission (FWC) and Commissioner Colletta, to discuss how best to create a Hunt Program for the preserve. A significant amount of information was collected from this meeting to incorporate into a Hunt Management Plan for the preserve including how often to allow hunts, how many hunters, what types of weapons, check station and registration logistics etc.

After the February 18th, 2010 meeting a first draft of the Hunt Management Plan was created and posted for public review. During the March 18th, 2010 meeting, approximately 10 local hunters attended including the Commissioner Colletta, to review the draft Hunt Management Plan. The consensus at this meeting was to divide the ranch into sections and each hunter would have to stay in their section during the hunt. The use of rifles was also discussed as well as safety zones and parking areas.

Over the weekend of April 16-18, 2010 the first Annual Youth Hunt was held at Pepper Ranch Preserve. FWC and volunteers ran the hunt and it was a huge success. There were 15 kids that participated age 12-17 and 4 hogs were harvested.

At the April 27, 2010 Collier County BCC meeting, the draft Public Hunt Management Plan for Pepper Ranch was brought for BCC approval. At this meeting, Conservation Collier staff was directed to hold two (2) additional public meetings to determine if hunting should be limited to youth hunts only or to the general public. These meetings will be held on May 12 and May 19, 2010. Revisions to the Public Hunt Management Plan for Pepper Ranch will be discussed at that time.

Management Goals:

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

Goal 2: Develop a baseline monitoring program

Goal 3: Remove or control populations of invasive, exotic or problematic flora and fauna to restore and maintain natural habitats

Goal 4: Create a Prescribed Fire Plan

Goal 5: Restore native vegetation

Goal 6: Develop a plan for public use

Goal 7: Facilitate uses of the site for educational purposes

Goal 8: Provide a plan for security and disaster preparedness

Goal 9: Provide preliminary panther habitat unit (PHU) calculations and a draft monitoring plan per U.S. Fish and Wildlife Service (USFWS) requirements for an onsite panther conservation bank

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1.0 Introduction

The Pepper Ranch Preserve is 2,510.01 acres of natural and agricultural lands located along the north shore of Lake Trafford in north central Collier County, Florida. The preserve contains various native plant communities, including bottomland forest, upland mixed forest, strand swamp, slough, pine flatwoods, depression marshes, and improved pastures.

A site assessment to determine compliance with the Conservation Collier initial screening criteria was conducted in September, October and November 2007 and the Conservation Collier Program purchased the property in February 2009. The County holds fee simple title to the Pepper Ranch Preserve. The Conservation Collier program manages these lands under authority granted by the Conservation Collier Ordinance 2002-63 as amended (2007-65) (available from www.municode.com). Initial acquisition activities are summarized in Table 1.

Table 1: Acquisition History and Status of Pepper Ranch Preserve

Year	Benchmark
2006	FLUCFCS mapping of a portion of the preserve conducted by Scheda
2007	Property nominated to the Conservation Collier Program
2007	Initial Site Assessment by Conservation Collier Staff
2007	Acceptance of Initial Criteria Screening Report by the Conservation Collier Land Acquisition Advisory Committee
2008	Phase I Environmental Assessment Conducted by Environmental Consulting and Technology, Inc. for Collier County
2008	Approved for purchase by the Board of County Commissioners (BCC)
2009	Purchase of the Pepper Ranch property
2009	Developed Interim Management Plan
2009	BCC approved the Interim Management Plan
2009	Conducted initial exotic plant treatment specifically of Old World climbing fern (*Lygodium microphyllum*) (grant funded)
2010	Completed Final Land Management Plan

The preserve consists of approximately 43% (±1087.15 acres) wetland plant communities and approximately 57% (±1422.86 acres) upland plant communities. Conservation, restoration and natural resource-based recreation are the designated uses of this property. Management activities allowed include those necessary to preserve, restore, secure and maintain this environmentally sensitive land for the benefit of present and future generations. Public use of the site must be consistent with these management goals.

This is the Final Management Plan for the Pepper Ranch Preserve. This 10-year management plan will be submitted to the Collier County Board of County

Commissioners (BCC) for its approval. When approved, this plan will replace the Interim Management Plan.

1.1 Conservation Collier: Land Acquisition Program and Management Authority

The Conservation Collier program was originally approved by voters in November 2002 and subsequently confirmed in the November 2006 ballot referendum. Both voter-approved referendums enable the program to acquire environmentally sensitive conservation lands within Collier County, Florida (Ordinance 2002-63, as amended). Properties must support at least two of the following qualities to qualify for further consideration: rare habitat, aquifer recharge, flood control, water quality protection, and listed species habitat. The BCC appointed a Land Acquisition Advisory Committee to consider any selected or nominated properties that an owner has indicated a willingness to sell. The committee recommends property purchases for final approval by the BCC.

Lands acquired with Conservation Collier funds are titled to "COLLIER COUNTY, a political subdivision of the State of Florida, by and through its Conservation Collier program." The Collier County BCC established the Conservation Collier program to implement the program and to manage acquired lands. As such, Conservation Collier holds management authority for the Pepper Ranch Preserve.

1.2 Purpose and Scope of the Land Management Plan

The purpose of the plan is to provide management direction for Pepper Ranch Preserve by identifying the goals and objectives necessary to eliminate or minimize any threats to the resources and integrity of the preserve. This text is a working document that establishes the foundation of the ten-year plan by identifying the appropriate management techniques necessary to preserve and/or restore the resource.

This plan will balance resource restoration and protection with natural resource-based recreational and educational use while looking at restoration needs, listed species protection and maintenance of the site free of invasive, exotic plant and animal species. This plan is divided into sections that incorporate an introduction, descriptions of the natural and cultural resources, projected uses of the property, management issues, and goals and objectives.

1.3 Location of the Pepper Ranch Preserve

Pepper Ranch Preserve is located at 6505 Pepper Road just west of the town of Immokalee, Florida (See Figure 1; legal description in Appendix 1). It is in north central Collier County, along the north shoreline of Lake Trafford within Sections 22, 26, 27, 28, 33, and 35, Township 46 South, and Range 28 East.

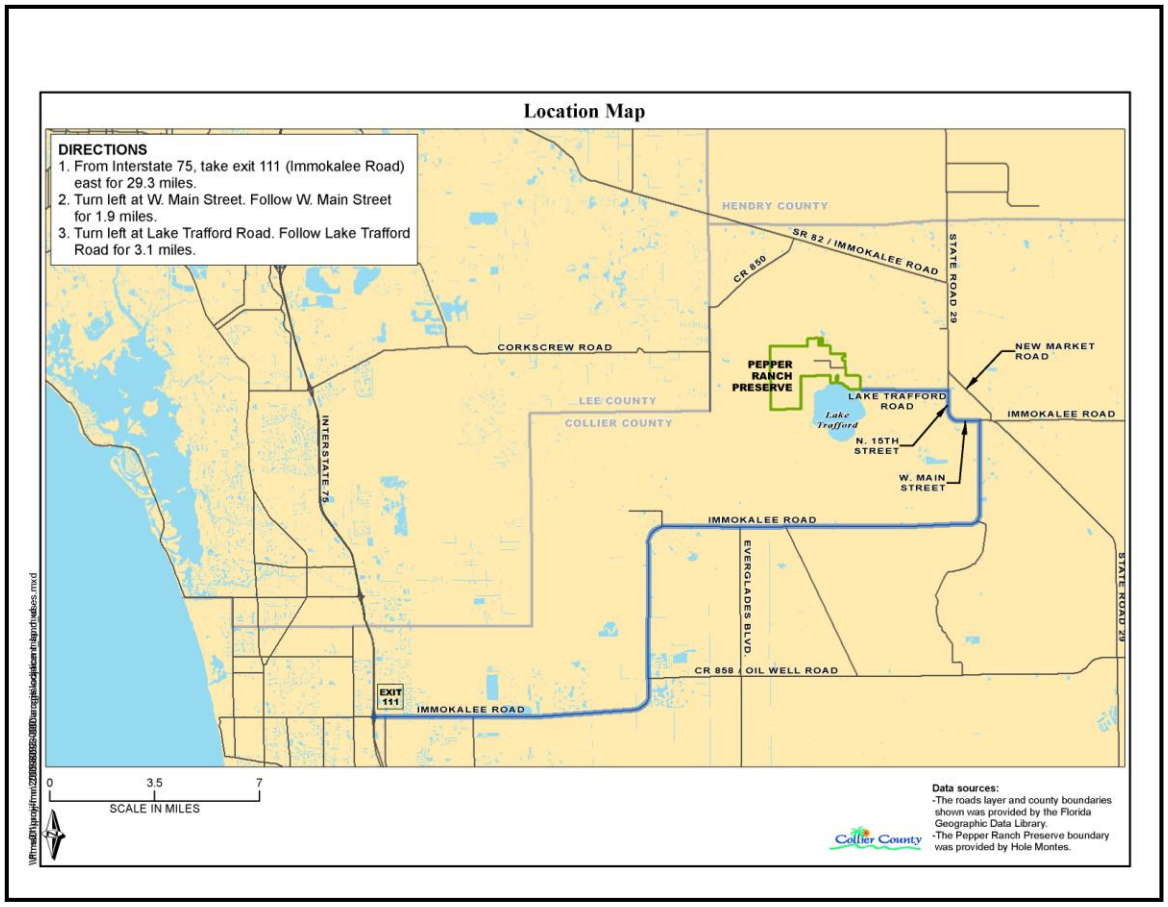


Figure 1: General Location of and Directions to Pepper Ranch Preserve.

1.4 Regional Significance of the Pepper Ranch Preserve

Ecosystem services such as the protection of water resources, flood control, maintenance of nutrient cycles, preservation of biological diversity, carbon sequestration, and the availability of recreational lands are imperative for the well-being of the citizens of Collier County and may be achieved through the preservation of natural areas. As of April 2008, approximately 66% (over 871,000 acres) of all land in Collier County were protected in conservation areas (Figure 2) and managed by private, local, state and federal agencies (FNAI 2008). Collier County's Conservation Collier Program manages the 2,510.01-acre Pepper Ranch Preserve; it contains upland mixed forest, strand swamp, slough, prairie hammock, pine flatwoods, improved pasture, dry prairie, freshwater marshes, bottomland forest, and wet prairie.

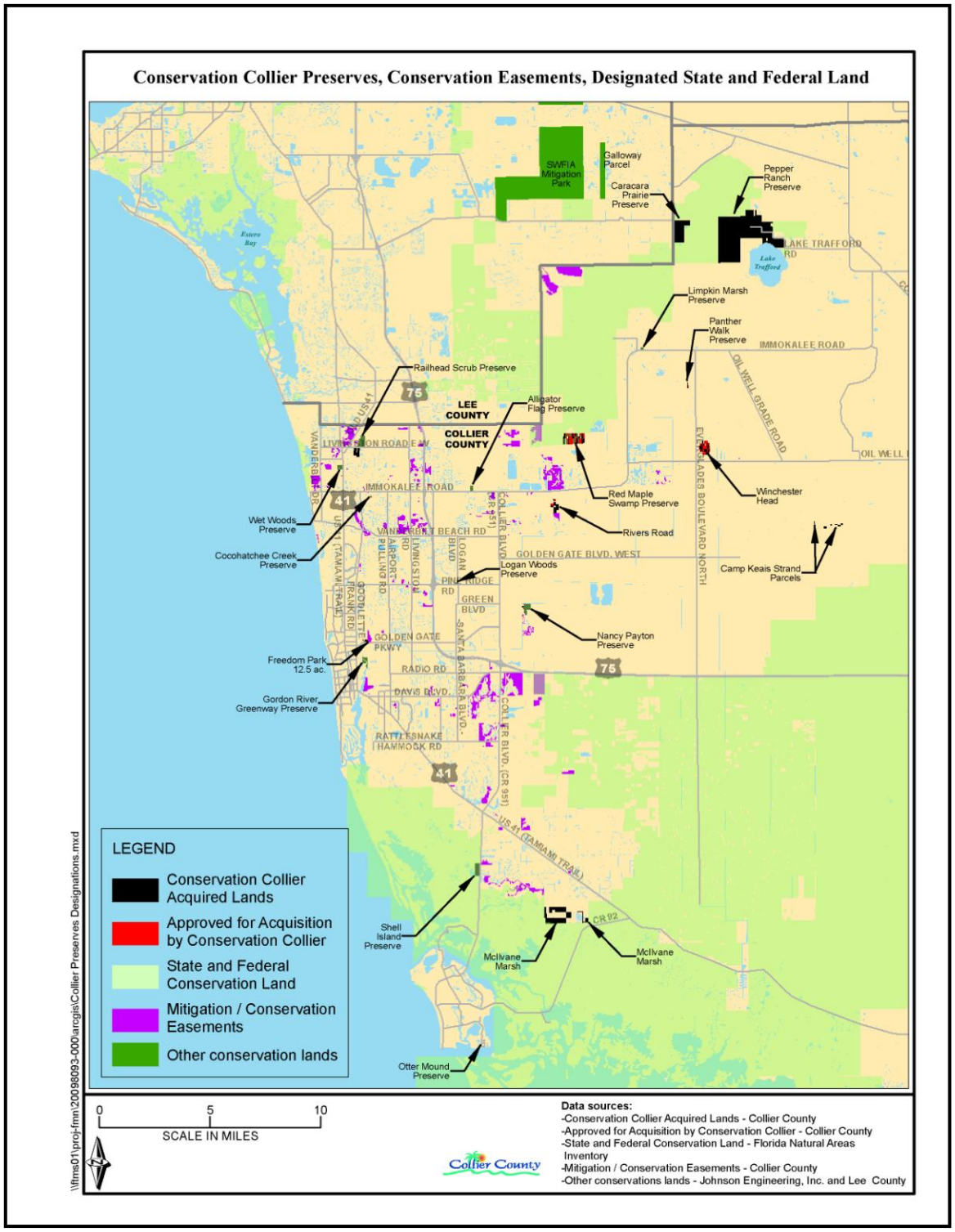


Figure 2: Conserved Lands in Collier County, Florida Including Lands Owned by Conservation Collier.

1.5 Nearby Public Lands and Designated Water Resources

Pepper Ranch Preserve shares its western and a portion of its northern boundary with the Corkscrew Regional Ecosystem Watershed or CREW Trust conservation lands. The closest Conservation Collier Program property to Pepper Ranch Preserve is the Caracara Prairie Preserve, which is approximately1.23 miles directly to the west. Other preserves, in order of increasing distance, are provided in Table 2. Figure 3 shows the locations of these preserves.

Table 2: Public Lands Located near the Pepper Ranch Preserve

Name	Distance (miles)	Direction	Type
CREW	0.00	W	State
Caracara Prairie Preserve	1.23	W	Conservation Collier
Corkscrew Swamp Sanctuary	2.03	SW	National Audubon Society
Limpkin Marsh Preserve	5.26	S/SW	Conservation Collier
Imperial Marsh Preserve	5.63	SE	Lee County Conservation 20/20

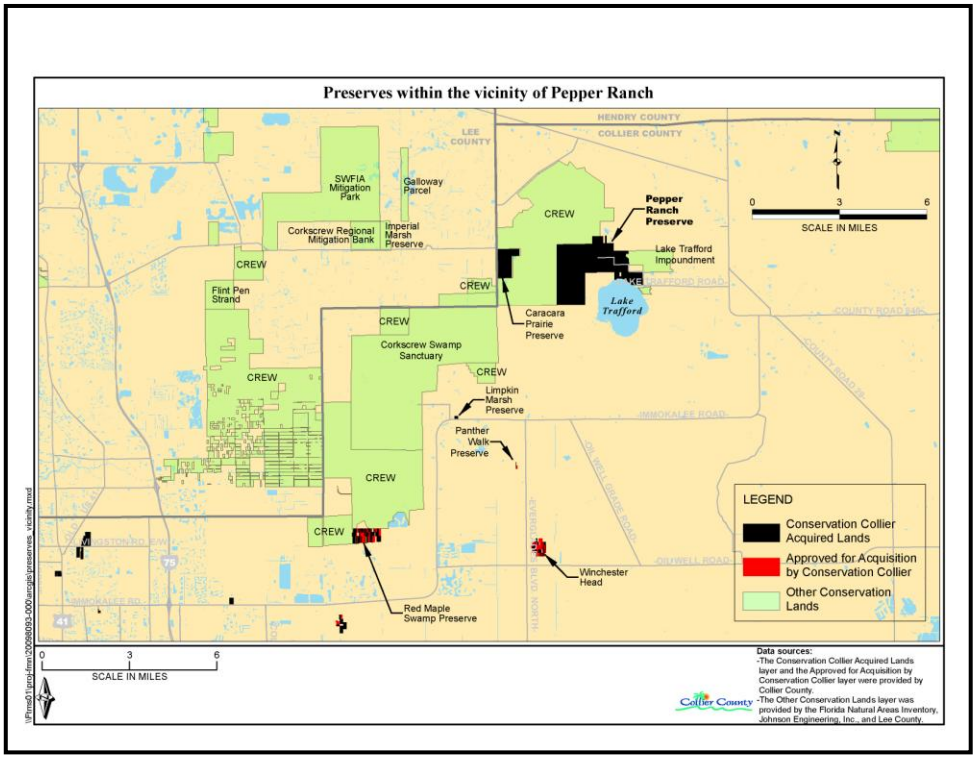


Figure 3: Preserves and Protected Lands in the Vicinity of Pepper Ranch Preserve

1.6 Public Involvement

Community involvement in the review of this management plan and all future updates will be coordinated through the general public via public meetings. The community at large will be contacted through direct mailing notices to residents, other preserve managers and businesses within 1,500 feet of the preserve boundaries. Official public notices will be posted on the County website. Staff will seek to coordinate management actions, such as exotic removal and prescribed fires with managers/owners of adjoining public and private lands.

2.0 Natural Resources

2.1 Physiography

Pepper Ranch Preserve lies within the Floridian section of the Coastal Plain. The Coastal Plain extends from New Jersey to Texas and was formed mainly from sedimentary rocks deposited in marine environments (U.S. Geological Survey, USGS 2004).

2.1.1 Topography and Geomorphology

The site is located in the Southwestern Slope region of the South Florida Water Management District (SFWMD). According to the Florida Geographic Data Layer (FGDL), taken from the USGS Quadrangle Map, the topography of the area is relatively level with an average elevation of twenty feet above sea level and slopes gently southwestward toward the Gulf of Mexico. Surface water percolates directly through the pervious ground or it collects in natural depressions and man made ditches onsite. In natural areas, when the ground is completely saturated the accumulated surface water will drain offsite through sheet flow.

2.1.2 Geology

The geology of northern Collier County, where the Pepper Ranch Preserve is located, is characterized by complex sequences of interbeded sands, clays, and limestone. Closest to the surface is the Holocene aged Pamlico Sand Formation, approximately ten feet thick and composed primarily of unconsolidated quartz sand and some silt. The Pamlico Sand unconformably overlies the Pleistocene aged Fort Thompson and Caloosahatchee Formations, which vary from a few feet to more than twenty feet in thickness and are characterized by shelly and sandy limestone with vugs and solution cavities (Miller 1986).

Below the Fort Thompson and Caloosahatchee Formations are the Ochopee and Buckingham Members of the Pliocene aged Tamiami Formation, which are at least 200 feet thick in the surrounding areas (Oaks & Dunbar 1974). The Ochopee Limestone unconformably overlies the Buckingham Limestone and/or the equivalent Cape Coral Clay. This unconformity marks the bottom of the surficial aquifer separating it from the brackish underlying aquifer below. Then the Hawthorn Formation, rich in phosphate and

other heavy minerals (Scott 1988), overlies the Oligocene age Suwannee Limestone and Eocene age Ocala Limestone that form the Floridan Aquifer System in Southwestern Florida. The Pepper Ranch Preserve is located within the Southwestern Slope. Geologically, this is the dominant feature of Collier County (Campbell 1990). Figure 4 provides a current aerial view of the Pepper Ranch Preserve.

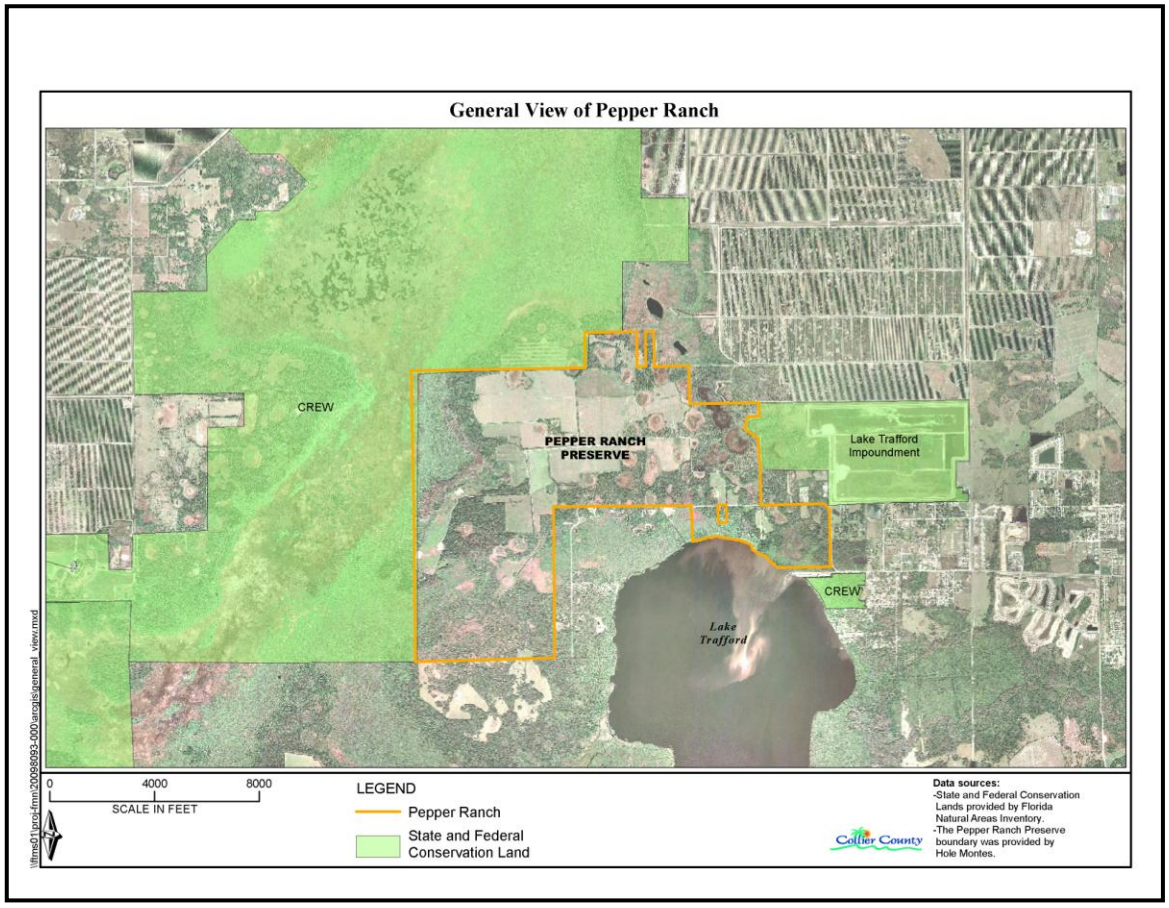


Figure 4: Aerial View of the Pepper Ranch Preserve

2.1.3 Soils

Mapped soils on this parcel were identified by the Natural Resource Conservation Services (NRCS) as Riviera Copeland fine sand, Oldsmar fine sand, Riviera fine sand, Ft. Drum and Malabar, Chobee Winder and Gator soils, Boca Riviera and Copeland depressional, Tuscawilla fine sand, Winder Riviera Chobee soils depressional, and Pennsuco silt loam (Figure 5).

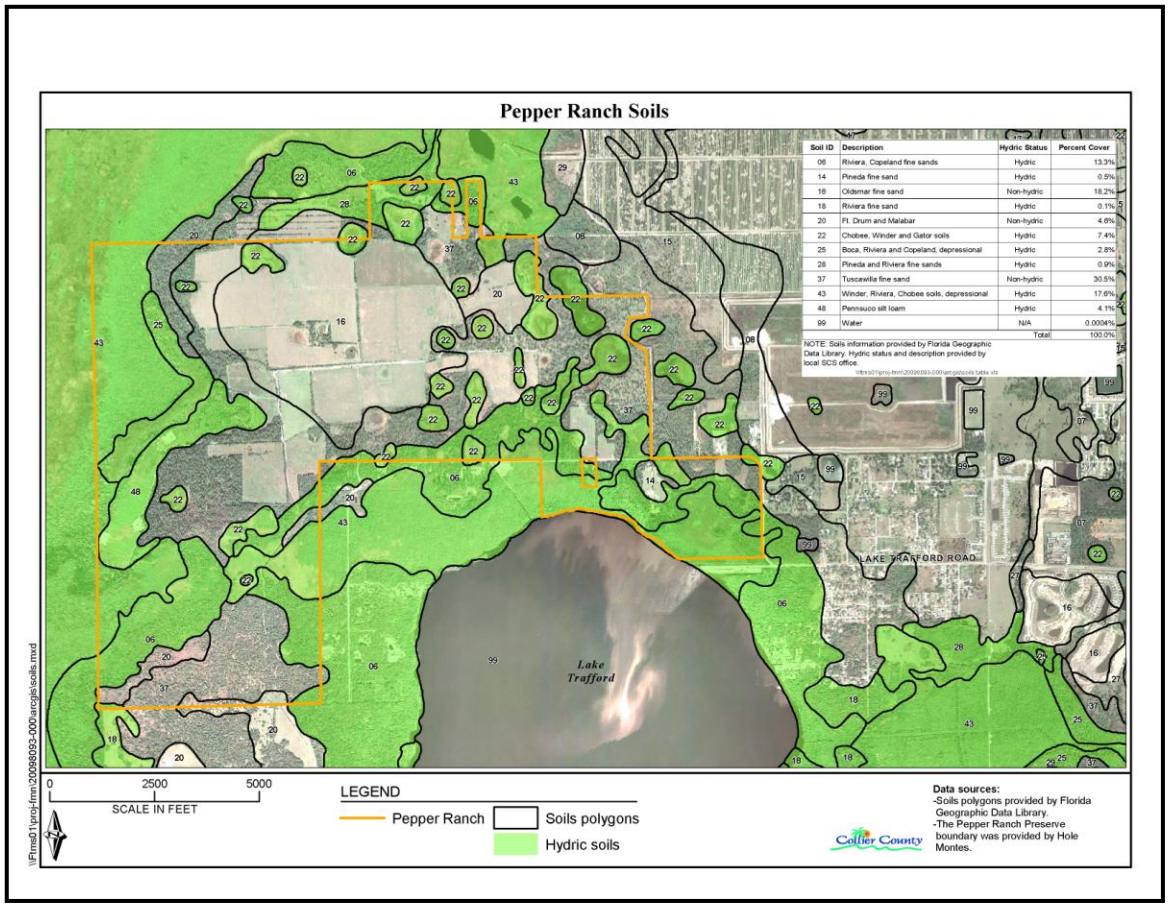


Figure 5: Soil Units on the Pepper Ranch Preserve

The following soils descriptions comprise the six hydric or depressional soils at Pepper Ranch Preserve. Winder Riviera Chobee soils underlie 17.6% of the Pepper Ranch Preserve and are very poorly drained soils, or depressional soils; they are typical of marshes. These soils under natural conditions remain ponded, i.e. have standing water, for 6 months or more during most years. Examples of natural vegetation found on these soils include: sawgrass, maidencane, pickerelweed, fireflag, willow, and other wetland plants (Liudahl et al. 1990). Riviera Copeland fine sand, which underlies 13.3% of the Pepper Ranch Preserve, is another hydric or depressional soil found on the preserve. They are a poorly drained soil and are typical of sloughs and cypress swamps. During times of high rainfall, the soils are covered by shallow, slowly moving water for about 7 days. Otherwise during most of the wet season, under natural conditions, the seasonal high water table is within a depth of 12 inches for 3-6 months; and for the remainder of the year the water table is below a depth of 12 inches receding to 40 inches or below during extended dry periods (Liudahl et al. 1990). Chobee Winder and Gator soils comprise 7.4% of Pepper Ranch Preserve. They are very poorly drained soils found in depressions and marshes. Under natural conditions these soils are ponded for 6 months or more of the year, for most years. The water table recedes to within 12 inches the remainder of the year and down to 12-40 inches during extended dry periods. Natural vegetation consists of pickerelweed, maidencane, rushes, fireflag, sawgrass, willow, and

a few cypress trees (Liudahl et al. 1990). Pennsuco silt loam is a poorly drained soil found on low prairies and it comprises 4.1% of the soils found at Pepper Ranch Preserve. Under natural conditions, the seasonal high water table is within a depth of 12 inches for 4-6 months during most years. A few inches of water is above the surface during extremely wet periods. Natural vegetation typically consists of sawgrass, reeds, scattered areas of cypress, maidencane, needlegrass, sedges, wax myrtle, and other wetland plants (Liudahl et al. 1990). The Boca, Riviera and Copeland map unit is a hydric soil that comprises 2.8% of the soils found at Pepper Ranch Preserve. It is found in depressions, cypress swamps, and marshes. Under natural conditions, these soils are ponded for 6 months or more each year. During the remainder of the year the water table is within a depth of 12 inches, and it recedes to a depth of 12-40 inches during extended dry periods. The natural vegetation consists mostly of cypress, pickerelweed, rushes, fireflag, sawgrass, and willow (Liudahl et al. 1990). Only a small percentage of the soils at Pepper Ranch Preserve are Riviera fine sand (0.1%), which is a poorly drained soil found in sloughs and broad, poorly defined drainageways. Under natural conditions, the seasonal high water table is within a depth of 12 inches for 3-6 months during most years. During the other months, the water table is below a depth of 12 inches, and it recedes to a depth of more than 40 inches during extended dry periods. During periods of high rainfall, the soil is covered by shallow, slowly moving water for about 7 days. Natural vegetation found on these soils consists of scattered areas of South Florida slash pine, cypress, cabbage palm, wax myrtle, sand cordgrass, gulf muhly, blue maidencane, South Florida bluestem, and chalky bluestem (Liudahl et al. 1990).

The following soils descriptions comprise the three non-hydric soils found at Pepper Ranch Preserve. Tuscawilla fine sand underlies 30.5% of the Pepper Ranch Preserve and is a non-hydric or non-wetland soil association found in areas typical of flatwoods and hammocks. Under natural conditions, the seasonal high water table is at a depth of 6-18 inches for 1-6 months during most years. The remainder of the year the water table is below 18 inches. During times of drought, the water table can recede to a depth of greater than 40 inches. Natural vegetation consists of oak, cabbage palm, red maple, red bay, South Florida slash pine, wax myrtle, maidencane, and chalky bluestem (Liudahl et al. 1990). Oldsmar fine sand underlies 18.2% of the Pepper Ranch Preserve and is also a non-hydric soil. Oldsmar fine sand is a nearly level and poorly drained soil found in pine flatwoods. During extended dry periods, the water table may recede to a depth of 40+ inches, but under natural conditions, the seasonal high water table is between a depth of 6-18 inches. Flora typically associated with this soil type includes South Florida slash pine, cabbage palm, saw palmetto and wax myrtle (Liudahl et al. 1990). Fort Drum and Malabar fine sands are non-hydric soils typically found on ridges adjacent to sloughs. These soils comprise 4.6% of the soils at Pepper Ranch Preserve. Under natural conditions, the seasonal high water table is at a depth of 6-18 inches for 1-6 months during most years. During the remainder of the year, the water table is below a depth of 18 inches, and it recedes to a depth of more than 40 inches during extended dry periods. Natural vegetation found on these soils is generally South Florida slash pine, saw palmetto, live oak, cabbage palm, wax myrtle, chalky bluestem, creeping bluestem, low panicum and pineland threeawn (Liudahl et al. 1990).

2.1.4 Hydrology/Water Management

Near the surface, the aquifer is highly permeable and the groundwater flows toward the west. However, permeability decreases downward from a porous limestone into poorly indurated sandstone cemented by micrite. The aquifer grades from freshwater downward into brackish water due to the proximity of the Gulf of Mexico to the west and the brackish water in the intermediate aquifer made primarily of Miocene aged sediments. Below that, the Hawthorne formation typically marks the upper boundary of the Floridian aquifer, which is contained within the underlying Oligocene age Suwannee Limestone (Lodge 2005).

There are numerous ditches and berms at Pepper Ranch Preserve that are associated with the former agricultural activities. There are also elevated roads with associated ditches that run through the center of the preserve, initially in an east-west direction, then running north-south all the way to the southwestern portion of the preserve (see Figure 6 for land use and cover map). These ditches and berms are likely affecting the hydrology of the wetlands in which they connect.

The Surficial Aquifer is an aquifer close to the surface and unconfined, typically associated with the groundwater table. This aquifer is generally limited to smaller uses such as household or small agricultural uses. The Lower Tamiami aquifer is below this aquifer and is recognized as being useful for long-term water needs. According to the SFWMD's technical publication 95-02 (Fairbank & Hohner 1995), the Surficial Aquifer recharge capacity on the Pepper Ranch Preserve is moderate at 43 to 56 inches annually, with parts of the eastern portion of the preserve exhibiting a recharge capacity of less than 43 inches annually. The Lower Tamiami Aquifer recharge capacity on the preserve is relatively low ranging from less than 7 inches and up to 14 inches annually.

2.2 Climate

The Pepper Ranch Preserve is located in an area of Florida where humid subtropical and tropical savanna climatic patterns overlap, with temperatures moderated by winds from the Gulf of Mexico and the Atlantic Ocean. Sharply delineated wet and dry seasons and average monthly temperatures greater than 64º Fahrenheit characterize a tropical savanna climate. Monthly rainfalls may exceed ten inches during the wet season. On the other hand, humid subtropical climates typically show less extreme rainfall fluctuations between wet and dry seasons and average monthly temperatures are less than 64º Fahrenheit in some months.

The average annual temperature for the coastal portion of Collier County is approximately 75º Fahrenheit. The warmest months are usually July and August. The humidity is high during these months but frequent afternoon thunderstorms prevent excessively high temperatures. Two-thirds of the annual rainfall occurs in the wet season from May to October. Thunderstorms are frequent during the wet season, occurring every two out of three days between June and September. Rainfall records for the area indicate that there is not significant variation in the annual rainfall throughout much of the county; however, large variations often occur during a single year. The

Atlantic hurricane season extends from June through November with peak activity occurring in September and October when ocean temperatures are highest.

2.3 Natural Plant Communities

A plant community refers to the suite of floristic species that form the natural vegetation of any place. In addition to anthropogenic influences, the combination of factors such as geology, topography, hydrology, underlying soils and climate determine the types of plants found in an area. These plants, in turn determine the animal species that may be found there. The description or classifications of these floral communities differ by agency and are based on an agency's goals and objectives for identifying plant communities. As some categorizations are broad (e.g., forest) while others are specific (e.g., mesic pine flatwoods), determining how each organization classifies a community may be difficult. The plant communities observed on the Pepper Ranch Preserve are presented using the Florida Land Use, Cover and Forms Classification System (FLUCFCS) created by the Florida Department of Transportation (1999). This system classifies all land uses including plant communities. These classifications were then translated to the Florida Natural Areas Inventory (FNAI) classifications. The Guide to the Natural Communities of Florida (1990) was utilized to convert from FLUCFCS to FNAI designations.

In the fall of 2009 Johnson Engineering ecologists mapped the vegetation communities and other land uses found on the Pepper Ranch Preserve using the FLUCFCS designations. There are 25 distinct plant communities/land uses on the preserve. Some of these land uses are further described as disturbed and/or by the level of invasive exotic plants they exhibit. The number 9 qualifier in the FLUCFCS code represents a disturbance in the plant community, generally due to a hydrologic impairment and in some cases the disturbance is from a cleared understory. The letter E qualifier represents the level of invasive exotic vegetation present by percent cover. Table 3 summarizes the plant communities mapped for the Pepper Ranch Preserve in 2009. The table also provides a brief description of each FLUCFCS code. Figure 6 visually depicts these land cover designations from 2009. Due to the size of Pepper Ranch Preserve, a 2'x3' map of the land cover designations for 2009 is provided in Appendix 2.

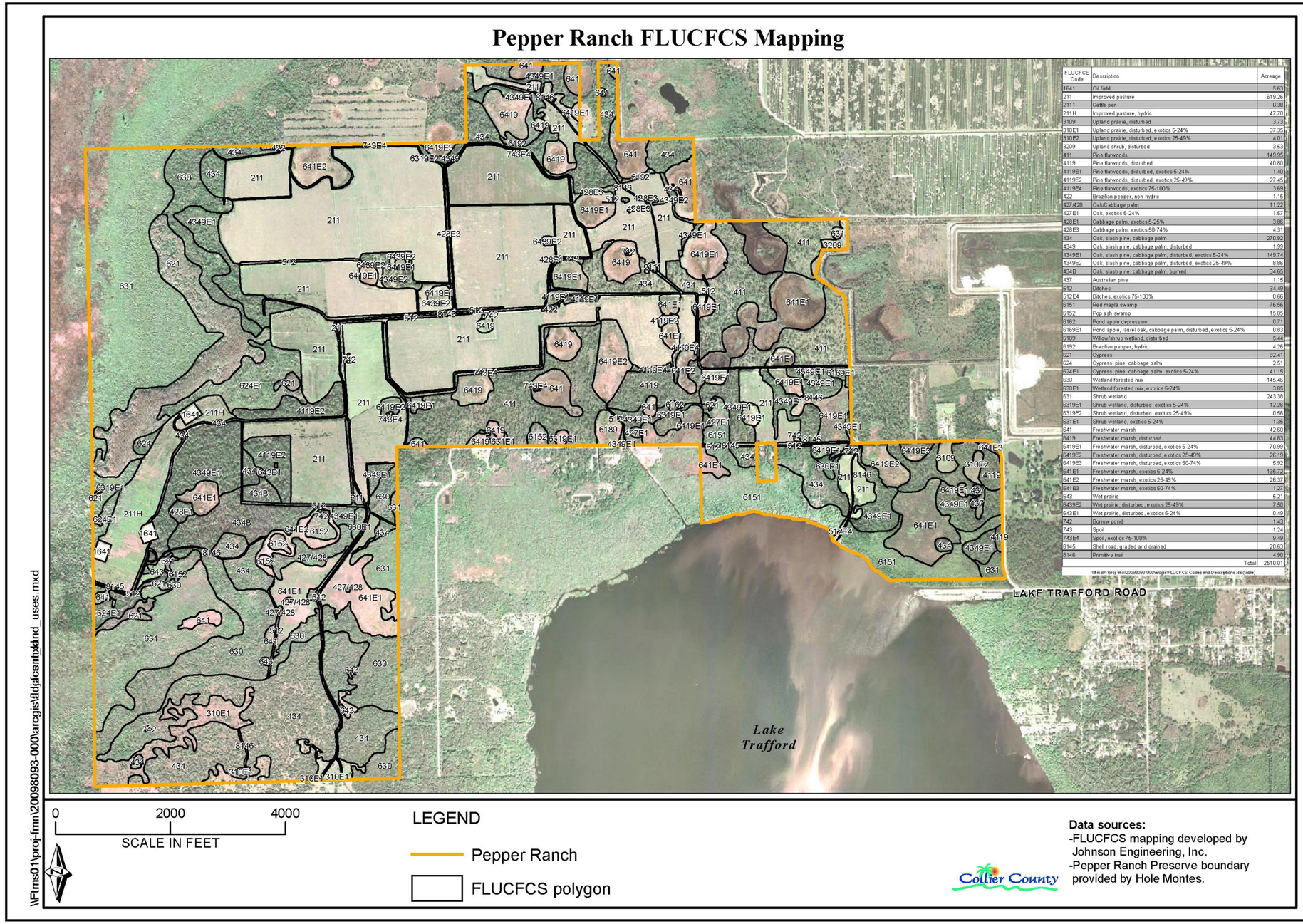
Table 3: Extent of Florida Land Use, Cover and Forms Classification System (FLUCFCS) Designations from 2009 on the Pepper Ranch Preserve

FLUCFCS Code	Description	Wetland Status	Acreage
1641	Oil field	N	5.63
211	Improved pasture	N	619.26
2111	Cattle pen	N	0.38
3109	Upland prairie, disturbed	N	3.73
310E1	Upland prairie, disturbed, exotics 5-24%	N	37.35
310E2	Upland prairie, disturbed, exotics 25-49%	N	4.01

Table 3: Extent of Florida Land Use, Cover and Forms Classification System (FLUCFCS) Designations from 2009 on the Pepper Ranch Preserve (continued)			
FLUCFCS Code	**Description**	**Wetland Status**	**Acreage**
3209	Upland shrub, disturbed	N	3.53
411	Pine flatwoods	N	149.95
4119	Pine flatwoods, disturbed	N	40.80
4119E1	Pine flatwoods, disturbed, exotics 5-24%	N	1.44
4119E2	Pine flatwoods, disturbed, exotics 25-49%	N	27.45
4119E4	Pine flatwoods, exotics 75-100%	N	3.69
422	Brazilian pepper, non-hydric	N	1.15
427/428	Oak/Cabbage palm	N	11.22
427E1	Oak, exotics 5-24%	N	1.57
428E1	Cabbage palm, exotics 5-24%	N	3.82
428E3	Cabbage palm, exotics 50-74%	N	4.31
434	Oak, slash pine, cabbage palm	N	270.92
4349	Oak, slash pine, cabbage palm, disturbed	N	1.99
4349E1	Oak, slash pine, cabbage palm, disturbed, exotics 5-24%	N	149.74
4349E2	Oak, slash pine, cabbage palm, disturbed, exotics 25-49%	N	8.86
434B	Oak, slash pine, cabbage palm, burned	N	34.65
437	Australian pine	N	1.15
743	Spoil	N	1.24
743E4	Spoil, exotics 75-100%	N	9.49
8145	Shell road, graded and drained	N	20.63
8146	Primitive trail	N	4.90
512	Ditches	OSW	34.49
512E4	Ditches, exotics 75-100%	OSW	0.66
742	Borrow pond	OSW	1.43
211H	Improved pasture, hydric	W	47.70
6151	Red maple swamp	W	76.56
6152	Pop ash swamp	W	15.05
6162	Pond apple depression	W	0.71
6169E1	Pond apple, laurel oak, cabbage palm, disturbed, exotics 5-24%	W	0.83
6189	Willow/shrub wetland, disturbed	W	5.44
6192	Brazilian pepper, hydric	W	4.26
621	Cypress	W	82.41
624	Cypress, pine, cabbage palm	W	2.51
624E1	Cypress, pine, cabbage palm, exotics 5-24%	W	41.15
630	Wetland forested mix	W	145.46

Table 3: Extent of Florida Land Use, Cover and Forms Classification System (FLUCFCS) Designations from 2009 on the Pepper Ranch Preserve (continued)			
FLUCFCS Code	**Description**	**Wetland Status**	**Acreage**
630E1	Wetland forested mix, exotics 5-24%	W	3.85
631	Shrub wetland	W	243.38
6319E1	Shrub wetland, disturbed, exotics 5-24%	W	12.26
6319E2	Shrub wetland, disturbed, exotics 25-49%	W	0.56
631E1	Shrub wetland, exotics 5-24%	W	1.35
641	Freshwater marsh	W	42.60
6419	Freshwater marsh, disturbed	W	44.83
6419E1	Freshwater marsh, disturbed, exotics 5-24%	W	70.99
6419E2	Freshwater marsh, disturbed, exotics 25-49%	W	26.19
6419E3	Freshwater marsh, disturbed, exotics 50-74%	W	5.92
641E1	Freshwater marsh, exotics 5-24%	W	135.72
641E2	Freshwater marsh, exotics 25-49%	W	26.37
641E3	Freshwater marsh, exotics 50-74%	W	1.27
643	Wet prairie	W	5.21
6439E2	Wet prairie, disturbed, exotics 25-49%	W	7.50
643E1	Wet prairie, disturbed, exotics 5-24%	W	0.49
		Total	2510.01

W – wetland
N – non-wetland
OSW – other surface water



FLUCFCS Code	Description	Acreage
1641	Oil field	5.63
211	Improved pasture	619.26
2111	Cattle pen	0.38
211H	Improved pasture, hydric	47.70
3109	Upland prairie, disturbed	3.73
310E1	Upland prairie, disturbed, exotics 5-24%	37.35
310E2	Upland prairie, disturbed, exotics 25-49%	4.01
3209	Upland shrub, disturbed	3.53
411	Pine flatwoods	149.95
4119	Pine flatwoods, disturbed	40.80
4119E1	Pine flatwoods, disturbed, exotics 5-24%	1.40
4119E2	Pine flatwoods, disturbed, exotics 25-49%	27.45
4119E4	Pine flatwoods, exotics 75-100%	3.69
422	Brazilian pepper, non-hydric	1.15
427/428	Oak/Cabbage palm	11.22
427E1	Oak, exotics 5-24%	1.57
428E1	Cabbage palm, exotics 5-25%	3.86
428E3	Cabbage palm, exotics 50-74%	4.31
434	Oak, slash pine, cabbage palm	270.92
4349	Oak, slash pine, cabbage palm, disturbed	1.99
4349E1	Oak, slash pine, cabbage palm, disturbed, exotics 5-24%	149.74
4349E2	Oak, slash pine, cabbage palm, disturbed, exotics 25-49%	8.86
434B	Oak, slash pine, cabbage palm, burned	34.65
437	Australian pine	1.15
512	Ditches	34.49
512E4	Ditches, exotics 75-100%	0.66
6151	Red maple swamp	76.56
6152	Pop ash swamp	15.05
6162	Pond apple depression	0.71
6169E1	Pond apple, laurel oak, cabbage palm, disturbed, exotics 5-24%	0.83
6189	Willow/shrub wetland, disturbed	5.44
6192	Brazilian pepper, hydric	4.26
621	Cypress	82.41
624	Cypress, pine, cabbage palm	2.51
624E1	Cypress, pine, cabbage palm, exotics 5-24%	41.15
630	Wetland forested mix	145.46
630E1	Wetland forested mix, exotics 5-24%	3.86
631	Shrub wetland	243.38
6319E1	Shrub wetland, disturbed, exotics 5-24%	12.26
6319E2	Shrub wetland, disturbed, exotics 25-49%	0.56
631E1	Shrub wetland, exotics 5-24%	1.35
641	Freshwater marsh	42.60
6419	Freshwater marsh, disturbed	44.83
6419E1	Freshwater marsh, disturbed, exotics 5-24%	70.99
6419E2	Freshwater marsh, disturbed, exotics 25-49%	26.19
6419E3	Freshwater marsh, disturbed, exotics 50-74%	5.92
641E1	Freshwater marsh, exotics 5-24%	135.72
641E2	Freshwater marsh, exotics 25-49%	26.37
641E3	Freshwater marsh, exotics 50-74%	1.27
643	Wet prairie	5.21
6439E2	Wet prairie, disturbed, exotics 25-49%	7.50
643E1	Wet prairie, disturbed, exotics 5-24%	0.49
742	Borrow pond	1.43
743	Spoil	1.24
743E4	Spoil, exotics 75-100%	9.49
8145	Shell road, graded and drained	20.63
8146	Primitive trail	4.90
	Total	2510.01

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Figure 6: Distribution of Natural Communities and other Land Uses on the Pepper Ranch Preserve; 2009 FLUCFCS Layer

The vegetation classification scheme of the FNAI and the Florida Department of Natural Resources (FDNR) (1990) are presented in Table 4. This table is based on the natural plant communities observed on the Pepper Ranch Preserve. The following subsections (2.3.1 - 2.3.6) provide information about the natural plant communities observed on the preserve according to their FNAI designations. Subsection 2.3.7 describes the altered communities found at Pepper Ranch Preserve. Figure 7 visually depicts the FNAI designations for the preserve based on the 2009 field verifications. Due to the size of Pepper Ranch Preserve, a 2'x3' map of the FNAI designations is provided in Appendix 3.

Table 4: Summary of Natural Communities on the Pepper Ranch Preserve

FNAI Natural Community Type	Global Rank	State Rank	Percent Cover[1]	Comments
Bottomland forest	G4	S3	9.87%	Also called bottomland hardwoods and mesic hammock
Depression marsh	G4	S4	14.09%	Also called isolated wetland and ephemeral pond
Dry prairie	G2	S2	1.94%	Also called palmetto prairie
Mesic flatwoods	G4	S4	8.97%	Also called pine flatwoods
Prairie Hammock	G3	S3	0.83%	Also called palm/oak hammock and hydric hammock
Slough	G3	S3	10.25%	
Strand swamp	G4	S4	3.28%	Also called cypress strand
Upland mixed forest	G4	S4	18.56%	Also called upland hardwood and mesic hammock
Wet flatwoods	G4	S4	1.74%	Also called hydric flatwoods
Wet prairie	G3	S2	0.53%	Also called savannah and coastal prairie

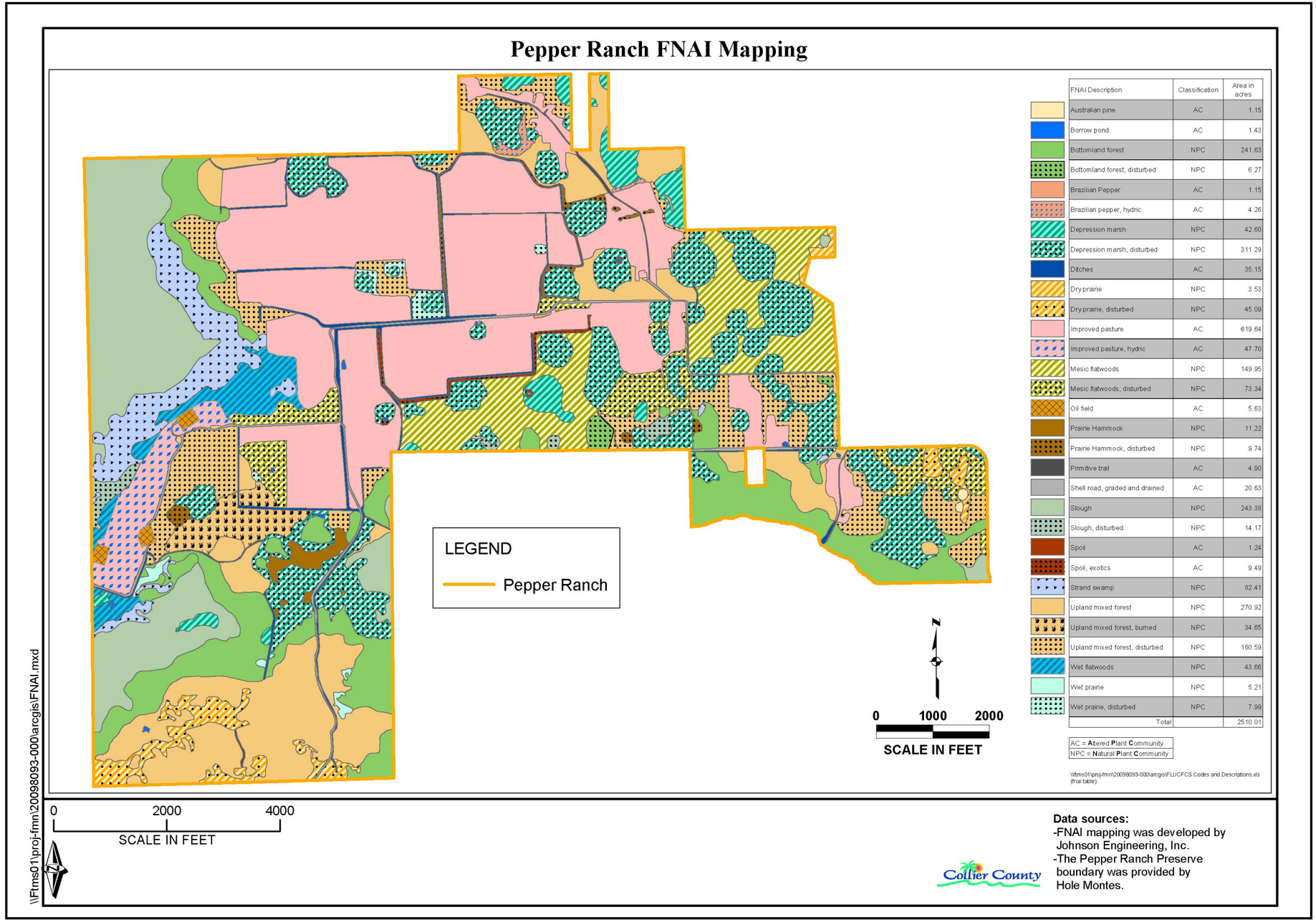
[1] 70.06% of Pepper Ranch Preserve is comprised of natural communities. The remaining 29.94% is comprised of altered communities as described in subsection 2.3.7.

Definition of Global (G) element ranks:

G2 = Imperiled globally because of rarity (6-20 occurrences or very little remaining area, e.g., <10,000 acres) or because of some factor(s) making it very vulnerable to extinction throughout its range;
G3 = Either very rare and local throughout its range or found locally (even abundantly at some of its locations) in a restricted range or because of other factors making it vulnerable to extinction throughout its range, 21 to 100 occurrences;
G4 = Apparently secure globally, though it may be quite rare in parts of its range, especially at the periphery.

Definition of State (S) element ranks:

S2 = Imperiled in state because of rarity (6-20 occurrences or little remaining area) or because of some factor(s) making it very vulnerable to extinction throughout it range;
S3 = Rare or uncommon in state (on the order of 21 to 100 occurrences);
S4 = Apparently secure in state, although it may be rare in some parts of its state range.



FNAI Description	Classification	Area in acres
Australian pine	AC	1.15
Borrow pond	AC	1.43
Bottomland forest	NPC	241.63
Bottomland forest, disturbed	NPC	6.27
Brazilian Pepper	AC	1.15
Brazilian pepper, hydric	AC	4.26
Depression marsh	NPC	42.60
Depression marsh, disturbed	NPC	311.29
Ditches	AC	35.15
Dry prairie	NPC	3.53
Dry prairie, disturbed	NPC	45.09
Improved pasture	AC	619.64
Improved pasture, hydric	AC	47.70
Mesic flatwoods	NPC	149.95
Mesic flatwoods, disturbed	NPC	73.34
Oil field	AC	5.63
Prairie Hammock	NPC	11.22
Prairie Hammock, disturbed	NPC	9.74
Primitive trail	AC	4.90
Shell road, graded and drained	AC	20.63
Slough	NPC	243.38
Slough, disturbed	NPC	14.17
Spoil	AC	1.24
Spoil, exotics	AC	9.49
Strand swamp	NPC	82.41
Upland mixed forest	NPC	270.92
Upland mixed forest, burned	NPC	34.65
Upland mixed forest, disturbed	NPC	160.59
Wet flatwoods	NPC	43.66
Wet prairie	NPC	5.21
Wet prairie, disturbed	NPC	7.99
Total		2510.01

Figure 7: Extent of Natural Plant Communities Currently Found on the Pepper Ranch Preserve.

2.3.1 Uplands: Upland Mixed Forest

The upland mixed forest community comprises approximately 18.56% of the Pepper Ranch Preserve, the largest acreage of which is located primarily in the southwestern portion of the preserve but also occurs throughout the preserve in smaller acreages (Figure 7).

Upland Mixed Forest Community within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

Upland mixed forests in south Florida are also known as upland hardwoods, mesic hammocks, prairie hammocks, xeric hammocks, hydric hammocks (FNAI 1990) and mesic temperate hammocks (USFWS 1999). This plant community at Pepper Ranch Preserve is characterized by live oaks (*Quercus virginiana*) and laurel oaks (*Quercus laurifolia*) (both hardwood species), south Florida slash pine (*Pinus elliottii* var. *densa*), cabbage palms (*Sabal palmetto*), and some cypress (*Taxodium* spp.) and strangler figs (*Ficus aurea*), that together generally form a closed canopy. The midcanopy includes myrsine *(Myrsine guainensis)*, dahoon holly (*Ilex cassine*) and wax myrtle *(Myrica cerifera)*. The plant species found in the understory are mainly native species including blue maindencane (*Amphicarpum muhlenbergianum*), foxtail grass (*Setaria* sp.), carpet grasses (*Axonopus* spp.), slender goldenrod (*Euthamia caroliniana*), musky mint (*Hyptis alata*), chocolate weed (*Melochia corchorifolia*), swamp fern *(Blechnum serrulatum)*, capeweed (*Phyla nodiflora*), wild coffee (*Psychotria nervosa*) and varying densities of the invasive exotic torpedo grass (*Panicum repens*). In the disturbed portions of this community Brazilian pepper (*Schinus terebinthifolius*) comprises up to 24% of the midcanopy otherwise it is present at less than 5% coverage. In the herbaceous layer of the disturbed areas of this community there are significant levels (26-50% coverage) of caesarweed *(Urena lobata)* and some (1-5% coverage) dogfennel *(Eupatorium capillifolium).*

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

2.3.2 Wetlands: Depression Marsh

Depression marsh, also known as freshwater marsh, isolated wetland, or ephemeral pond, comprises approximately 14.09% of the Pepper Ranch. Even though these wetlands are present throughout the preserve, they are more prevalent in the central portion of the preserve and eastward to the property boundary.

Freshwater marshes are often scattered among upland, pine flatwoods communities as is the case at Pepper Ranch Preserve. Only 12% of this plant community at Pepper Ranch Preserve appears to be hydrologically undisturbed. This determination was made solely by observing the plant composition in the disturbed marshes, which consisted of varying levels of upland and transitional species, nuisance and invasive exotic species, as well as by noting the relatively low water levels or lack there of in comparison to the seemingly undisturbed marshes. Further hydrologic investigations would be necessary to determine if hydrology was the actual cause of the noted disturbance.

Depression Marsh Community within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

Native plant species found within this plant community included maidencane (*Panicum hemitomon*), Southeastern sunflower (*Helianthus agrestis*), blue maidencane, American cupscale (*Sacciolepis striata*), pickerelweed (*Pontederia cordata*), alligator flag (*Thalia geniculata*), swamp fern , sawgrass (*Cladium jamaicense*), narrowfruit horned beaksedge (*Rhyncospera inundata*), southern beaksedge (*Rhyncospora microcarpa*), pale meadowbeauty (*Rhexia mariana*), bulltongue arrowhead (*Sagittaria lancifolia*), musky mint, Virginia buttonweed (*Diodea virginiana*), common buttonbush (*Cephalanthus occidentalis*), lemon bacopa (*Bacopa caroliniana*), spikerushes (*Eleocharis* spp.), American white waterlily (*Nymphaea odorata*), broomsedge bluestem (*Andropogon virginicus*), sand cordgrass (*Spartina bakeri*), redtop panicum (*Panicum rigidulum*), and corkwood (*Stillingia aquatica*). The nuisance and invasive exotic plant species observed in this community include torpedo grass, dog fennel , caesarweed , Southern crabgrass (*Digitaria ciliaris*), tropical soda apple (*Solanum viarum*), alligator weed (*Alternanthera philoxeroides*), Brazilian pepper, melaleuca (*Melaleuca quinquenervia*), Peruvian primrosewillow (*Ludwigia peruviana*), and valamuerto (*Senna pendula var. glabrata*).

In Florida, these marshes are influenced by their subtropical location, fluctuating water levels, frequency and intensity of fire, organic matter accumulation and hard water (Kushlan 1990). These factors, combined with the dominant species found within a marsh, dictate the category within which the marsh is placed. Six major categories of freshwater marshes are recognized in Florida. The marshes in the Pepper Ranch Preserve are generally within the "flag marsh" category. These marshes usually have a moderate (flooded 6 to 9 months) hydroperiod, a moderate (about once every ten years) fire frequency and moderate to high (usually less than one meter deep to over a meter deep) accumulation of organic material (Kushlan 1990).

2.3.3 Wetlands: Slough

Sloughs are generally abundant throughout Florida and at Pepper Ranch Preserve this community comprises 10.25% of the preserve. It is located almost entirely in the western portion of the preserve, and most of this community extends onto the adjacent CREW land.

According to the FNAI Guide to the Natural Communities of Florida (1990), sloughs are characterized as broad shallow channels, inundated with flowing water except during extreme droughts. They are the deepest drainageways within strand swamps and swale systems. The vegetation structure of sloughs is variable but at Pepper Ranch Preserve it is characterized, in general, by Carolina willow (*Salix caroliniana*), which is dominate, Carolina (pop) ash (*Fraxinus caroliniana*). Sawgrass, bog hemp (*Boehmeria cylindrica*) and climbing hempweed (*Mikania scandens*) were some of the herbaceous species observed in the understory.

Slough Community within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

The canopies formed in these sloughs, especially in south Florida, are ideal moist, warm habitats for rare and endangered tropical epiphytes. Many Caribbean species that occur in this community are virtually never encountered in other Florida habitats. Pond apple branches are often heavily loaded with epiphytic orchids, bromeliads, and ferns. Typical animals include ribbon snake, cottonmouth, opossum, gray squirrel, black bear, raccoon, mink, otter, Florida panther, and white-tailed deer (FNAI 1990).

Sloughs often occur over the lowest part of linear depressions in the underlying limestone bedrock. The peat soils found in sloughs can be destroyed by catastrophic fires that often occur during droughts. The typical hydroperiod in this community is at least 250 days per year. Sloughs are often found in association with cypress swamps and may also occur in floodplain swamps and basin swamps (FNAI 1990).

Sloughs are extremely vulnerable to hydrologic disturbance and must have a reliable, quality water source to persist. The lack of invasive plant species observed in this community at Pepper Ranch Preserve is indicative of a high quality system.

2.3.4 Wetlands: Bottomland Forest

This community at the Pepper Ranch Preserve appears in association with Lake Trafford along the southern perimeter of the preserve, and with the large slough occurring on the western portion of the preserve. This natural community covers 9.87% of the preserve.

Bottomland forest is characterized as a low-lying, closed-canopy forest of tall, straight trees with either a dense shrubby understory and little ground cover, or an open understory and ground cover of ferns, herbs, and grasses (FNAI 1990). At Pepper Ranch Preserve the latter is most often observed, with red maple (*Acer rubrum*) as the dominate canopy tree, some buttonbush in the midcanopy and sawgrass, alligator flag, swamp fern, and cinnamon fern (*Osmunda cinnamomea*) in the understory.

Bottomland Forest Community
within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

The canopy of these forests is dense and closed, except during winter in areas where deciduous trees predominate, as in Pepper Ranch Preserve. The air movement and light penetration are thus generally low, making the humidity high and relatively constant. Because of these characteristics, bottomland forests rarely burn. This is also a very stable community that requires a hundred years or more to mature. Nearly all bottomland forests in Florida have been logged, which often leaves long-lasting scars from soil disturbance (FNAI 1990).

2.3.5 Uplands: Mesic Flatwoods

The pine flatwoods community comprises approximately 8.97% of the Pepper Ranch Preserve. This plant community is located predominately in the central and eastern portions of the preserve. Pine flatwoods are one of the most wide-ranging terrestrial plant communities in Florida and consequently one of the most influenced by anthropogenic activities (Abrahamson & Hartnett 1990). Fire strongly influences the community structure and composition of this community. The term pine flatwoods is a general categorization of areas that are dominated by various species of pine (*Pinus* spp.) trees. Pine flatwoods may be found in mesic flatlands where the landscape is made up of flat, moderately well drained sandy substrates with a mixture of organic material, often with an underlying hard pan layer. An open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs characterize natural, mesic flatwoods that have been burned regularly (FNAI 1990).

Mesic Flatwoods Community within Pepper Ranch Preserve
Photo by Steven W. Woodmansee

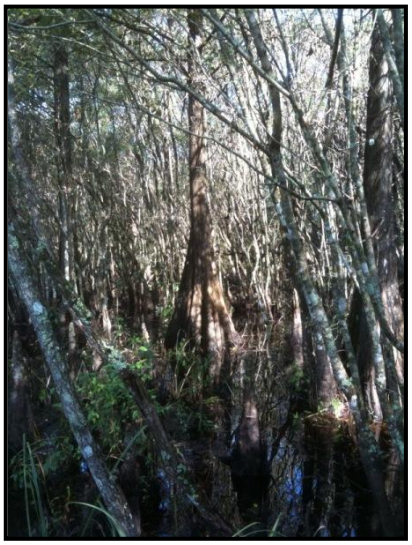
The U.S. Department of Agriculture (USDA) NRCS classification system refers to these areas as South Florida flatwoods. South Florida flatwoods are typically savannas, a type of plant community intermediate between forest and grassland. Mesic pine flatwoods are also called mesic flatwoods, pine savanna, cabbage palm savanna, and pine barrens. The flatwoods at Pepper Ranch are characterized by a south Florida slash pine dominate canopy with some live oaks, wax myrtle and saw palmetto (*Serenoa repens*) in the subcanopy, and a myriad of herbs and forbs forming the ground cover, such as: swamp fern, grape vine (*Vitis rotundifolia*), American beautyberry (*Callicarpa americana*), tall elephant's foot (*Elephantopus elatus*), greenbrier (*Smilax* sp.), caesarweed, and tick-trefoil (*Desmodium* sp.).

Mesic flatwoods provide essential forested habitat for a variety of wildlife species including Neotropical migratory birds, wide-ranging large carnivores, mid-sized carnivores, ground-nesting vertebrates, tree-cavity dependent species, tree-nesting species and non-aquatic plant life. "At the current rate of habitat conversion, the mesic pine flatwoods, once the most abundant upland habitat in South Florida, is in danger of becoming one of the rarest habitats in South Florida" (USFWS 1999*c*).

2.3.6 Other Natural Communities

All other natural communities (strand swamp, dry prairie, wet flatwoods, prairie hammock, and wet prairie) at the Pepper Ranch Preserve collectively cover less than 9% of the preserve.

Strand swamp is most commonly known as cypress swamp and it is strictly found in the western portion of Pepper Ranch Preserve in association with the slough natural community. The typical vegetation found in this community at Pepper Ranch Preserve includes: cypress (*Taxodium ascendens*) in the canopy, Carolina (pop) ash in the midcanopy, and the understory is mainly open water with some alligator flag, pickerelweed, and sawgrass.



Strand Swamp Community within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

The dry prairie community at Pepper Ranch Preserve is located in the extreme southwest and eastern portions of the preserve. Portions of this community exhibit no canopy, but where a canopy is present it is at less than 10% coverage and is made up of south Florida slash pine and cabbage palms. The midcanopy appears to have been cleared at one time and now consists mainly of saw palmetto and wax myrtle. The understory is dominated by bahiagrass (*Paspalum notatum*), and other grasses and herbs present including: blue maidencane, torpedo grass, knotroot foxtail (*Setaria parviflora*), big carpetgrass (*Axonopus furcatus*), chocolate weed, tall elephant's foot, tick-trefoil, musky mint, netted pawpaw (*Asimina reticulata*), slender goldenrod, wire grass (*Aristida stricta*), and a variety of sedges. The disturbed portions of this community located in the eastern part of the preserve exhibit less native plant diversity, which has been replaced by cogongrass (*Imperata cylindrica*), smutgrass (*Sporobolus indicus*), Peruvian primrosewillow, caesarweed, and Brazilian pepper. The disturbance to the portions of this community located in the southwestern part of the preserve appears to be due to a cleared canopy.

Dry Prairie Community within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

The wet flatwoods of Pepper Ranch Preserve are exclusively found in the western portion of the preserve and they exhibit cypress, south Florida slash pine and cabbage palms in the canopy, little to no midcanopy and an understory similar to the adjacent strand swamp community.

Wet Flatwoods Community within
Pepper Ranch Preserve
Photo by Steven W. Woodmansee

The prairie hammocks at Pepper Ranch Preserve are an upland community comprised of predominately live oaks and cabbage palms in the canopy and a midcanopy and understory similar to the upland mixed forest as described above.

Prairie Hammock Community
within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

There are only four small areas of wet prairie at Pepper Ranch Preserve located in the southwestern portion of the preserve and they exhibit the following plant species: blue maidencane, sand cordgrass, corkwood, broomsedge bluestem, haspan flatsedge (*Cyperus haspan*), spadeleaf (*Centella asiatica*), cypress witchgrass (*Dichanthelium ensifolium var. unciphyllum*), southern umbrellasedge (*Fuirena scirpoidea*), maidencane, narrowfruit horned beaksedge, narrowleaf blue-eyed grass (*Sisyrinchium angustifolium*). Portions of this community also have the invasive exotic torpedo grass, up to 50% coverage, and the remaining portions are free of invasive exotic vegetation.

Wet Prairie Community
within Pepper Ranch Preserve
Photo by Johnson Engineering, Inc.

2.3.7 Altered Communities

The most common community at Pepper Ranch Preserve is the improved pastures, which is an altered community; they comprise 26.57% of the preserve. The majority of the pastures exhibit upland grass and forbs species dominated by bahiagrass with a mixture of the following species: limpograss (*Hemarthria altissima*), ragweed (*Ambrosia artemisiifolia*), dogfennel, smutgrass, bushy bluestem (*Andropogon glomeratus var. hirsutior*), tick-trefoil, capeweed, creeping woodsorrel (*Oxalis corniculata*), rabbitbells (*Crotalaria rotundifolia*), flatsedges, torpedo grass, purple thistle (*Cirsium horridulum*), knotroot foxtail, big carpetgrass, woodland false buttonweed (*Spermacoce assurgens*), and crabgrass. Most of the pastures at Pepper Ranch Preserve are rimmed with large Brazilian pepper trees associated with ditch/berm and fence lines. In the far western portion of the preserve there is a hydric pasture that exhibits more wetland species than the other pastures and the underlying soils are hydric soils. There is a midcanopy in the hydric pasture of pop ash, Brazilian pepper, and Carolina willow. The herbaceous layer consists of southeastern sunflower, torpedo grass, bushy bluestem, spadeleaf, Virginia buttonweed, blue mistflower (*Conoclinium coelestinum*), musky mint, and southern beaksedge.

Improved Pastures within Pepper Ranch Preserve
Photo taken by Johnson Engineering, Inc.

Three oil fields are located adjacent to the hydric pasture at Pepper Ranch Preserve, two of which are currently in operation. An elevated, graded shell road traverses the preserve and provides access to the oil fields in the western portion of the preserve. There are also numerous primitive roads and trails that provide access to the pastures and to the lodge; the latter is located in the southeastern portion of the preserve. Ditches are typically associated with the roads, trails, oil fields and pastures of the preserve. A few borrow ponds are scattered throughout the preserve, usually located within pastures to provide water for the cattle. These borrow ponds typically have spoil piles, some of which are covered with Brazilian pepper.

There are only a few areas where exotics have formed a monoculture. The largest of these areas is located at the southern end of a large depression marsh in the north portion of the preserve where there is a hydric Brazilian pepper monoculture (4.26 acres). In the southeastern portion of the preserve there are two small pockets of mature suckering Australian pines (*Casuarina glauca*) totaling 1.15 acres.

2.4 Native Plant and Animal Species

The Pepper Ranch Preserve is composed of several upland and wetland natural communities as well as altered communities such as the dominant feature, the improved pastures. This section discusses the flora and fauna observed within these communities and the next section (2.5) discusses all listed species in greater detail.

2.4.1 Plant Species

To date, 416 plant species have been recorded at the preserve (Appendix 4). A comprehensive plant survey was conducted in September 2009 by botanist Steven W. Woodmansee of Pro Native Consulting. An additional survey of Pepper Ranch Preserve was conducted in May of 2010 to capture species in bloom that might have been missed during the fall survey. Of these 416 species, 334 (80%) are native to Florida and 82 are non-native (20%). Of the 82 non-native species, 32 are listed on Florida Exotic Pest Plant Council's (FLEPPC) 2009 List of Invasive Plant Species (23 Category I and nine Category II).

2.4.2 Animal Species

Due to the limited surveys conducted specifically for the occurrence of animal species (in contrast to plants) and the lack of on-site staffing, little is recorded for actual occurrences of animals at the Pepper Ranch Preserve. Occurrences of fauna at the preserve are based on direct visual and aural observations made by staff, Johnson Engineering ecologists, and Pro Native Consulting biologist during site visits or evidence of activity such as spoor, scat, or burrows, and from the site information available in documents such as the site's initial criteria screening report, the property's interim management plan and anecdotal information from persons with knowledge of the site. Table 5 provides a comprehensive list of animals, both native and non-native, recorded on the Pepper Ranch Preserve thus far.

Table 5: Faunal Species Observed at Pepper Ranch Preserve

Common Name	Scientific Name	Protection Status
American Bittern	*Botaurus lentiginosus*	
American Kestrel	*Falco sparverius*	
American Redstart	*Setophaga ruticilla*	
Anhinga	*Anhinga anhinga*	
Audubon's Crested Caracara	*Polyborus plancus audubonii*	T (FWC, USFWS)
Bald Eagle	*Haliaeetus leucocephalus*	T (FWC) Delisted (USFWS)
Barred Owl	*Strix varia*	
Belted Kingfisher	*Megaceryle alcyon*	
Black Vulture	*Coragyps atratus*	
Blue-gray Gnatcatcher	*Polioptula caerulea*	

Table 5: Faunal Species Observed at Pepper Ranch Preserve (continued)		
Common Name	**Scientific Name**	**Protection Status**
Blue Jay	*Cyanocitta cristata*	
Brown Thrasher	*Toxostoma rufum*	
Carolina Wren	*Thryothorus ludovicianus*	
Cattle Egret	*Bubulcus ibis*	
Common Bobwhite	*Colinus virginianus*	
Common Grackle	*Quiscalus quiscula*	
Downy Woodpecker	*Picoides pubescens*	
Eastern Meadowlark	*Sturnella magna*	
Florida Sandhill Crane	*Grus canadensis pratensis*	T (FWC)
Black-Bellied Whistling Duck	*Dendrocygna autumnalis*	
Gray Catbird	*Dumetella carolinensis*	
Great Blue Heron	*Ardea herodias*	
Great Crested Flycatcher	*Myiarchus crinitus*	
Great Egret	*Ardea alba*	
Green Heron	*Butorides virescens*	
Limpkin	*Aramus guarauna*	SSC(1)(FWC)
Little Blue Heron	*Egretta caerulea*	SSC (1,4)(FWC)
Loggerhead Shrike	*Lanius ludovicianus*	
Mourning Dove	*Zenaida macroura*	
Northern Cardinal	*Cardinalis cardinalis*	
Northern Mockingbird	*Mimus polyglottos*	
Osprey	*Pandion haliaetus*	
Pileated Woodpecker	*Dryocopus pileatus*	
Pine Warbler	*Dendroica pinus*	
Red-bellied Woodpecker	*Melanerpes carolinus*	
Red-shouldered Hawk	*Buteo lineatus*	
Red-winged Blackbird	*Agelaius phoeniceus*	
Roseate Spoonbill	*Ajaia ajaja*	SSC (1,4) (FWC)
Snowy Egret	*Egretta thula*	SSC (1)(FWC)
Swallow-tailed Kite	*Elanoides forficatus*	
Tricolored Heron	*Egretta tricolor*	SSC (1,4)(FWC)
Turkey Vulture	*Cathartes aura*	
White-eyed Vireo	*Vireo griseus*	
White Ibis	*Eudocimus albus*	SSC(2)(FWC)
Wild Turkey	*Meleagris gallopavo*	
Wood Stork	*Mycteria americana*	E (FWC), E (USFWS)
Yellow-crowned Night-Heron	*Nyctanassa violacea*	
Yellow-rumped Warbler	*Dendroica coronata*	

Table 5: Faunal Species Observed at Pepper Ranch Preserve (continued)		
Common Name	**Scientific Name**	**Protection Status**
Big Cypress Fox Squirrel	*Sciurus niger avicennia*	T (FWC)
Coyote	*Canis latrans*	
Eastern Cottontail Rabbit	*Sylvilagus floridanus*	
Feral Hog	*Sus scrofa*	
Florida Black Bear	*Ursus americanus floridanus*	T (FWC)
Florida Panther	*Puma concolor coryi*	E (FWC); E (USFWS)
Opossum	*Didelphis virginiana*	
Raccoon	*Procyon lotor*	
Round-tailed Muskrat	*Neofiber alleni*	
White-tailed Deer	*Odocoileus virginianus*	
American Alligator	*Alligator mississippiensis*	SSC (FWC); T (USFWS)[1]
Black Racer	*Coluber constrictor priapus*	
Brown Anole	*Anolis sagrei*	
Coral Snake	*Micrurus fulvius*	
Gopher Tortoise	*Gopherus polyphemus*	T (FWC)
Green Anole	*Anolis carolinensis*	
Pigmy Rattlesnake	*Sistrurus miliarius*	
Florida Softshell	*Apalone ferox*	
Three-striped Mud Turtle	*Kinosternon bauri*	
Yellow Rat Snake	*Elaphe obsoleta quadrivittata*	
Pig Frog	*Rana grylio*	
Florida Cricket Frog	*Acris gryllus dorsalis*	
Eastern Narrowmouth Toad	*Gastrophryne carolinensis*	

List of Abbreviations:
FWC = Florida Fish and Wildlife Conservation Commission
USFWS = United States Fish and Wildlife Service
E = Endangered
T = Threatened
SSC = Species of Special Concern
Reasons for SSC listings prior to January 1, 2001 as indicated by number in parenthesis

(1) Has a significant vulnerability to habitat modification, environmental alteration, human disturbance, or human exploitation which, in the foreseeable future, may result in its becoming a threatened species unless appropriate protective or management techniques are initiated or maintained
(2) May already meet certain criteria for designation as a threatened species but for which conclusive data are limited or lacking
(4) Has not significantly recovered from past population depletion

The Florida Breeding Bird Atlas (FWC 2003) lists 49 avian species that have been recorded as confirmed, probable, or possible breeding in the vicinity of the site (Table 6). The Breeding Bird Atlas documents breeding distributions of all bird species in Florida between 1986 and 1991. Due to the size and diversity of natural communities found at Pepper Ranch Preserve, it is likely several of these species may breed at the preserve.

Other wildlife species that have not yet been recorded undoubtedly occur at the Pepper Ranch Preserve. During migration periods, transient bird species would be expected to utilize this area for short periods of time. The developed character of the adjacent areas may inhibit transient use by many mammal, reptile, and amphibian species, thus limiting the utilization of the preserve to resident individuals or inhibiting the dispersal of many species to and from the preserve.

Table 6: Breeding Bird Species Recorded in the Corkscrew and Immokalee Quadrangles Encompassing the Pepper Ranch Preserve

Common Name	Scientific Name	Common Name	Scientific Name
Green Heron	*Butorides virescens*	Red-cockaded Woodpecker	*Picoides borealis*
Yellow-crowned Night-Heron	*Nyctanassa violacea*	Northern Flicker	*Colaptes auratus*
Wood Duck	*Aix sponsa*	Pileated Woodpecker	*Dryocopus pileatus*
Mottled Duck	*Anas fulvigula*	Great Crested Flycatcher	*Myiarchus crinitus*
Swallow-tailed Kite	*Elanoides forficatus*	Loggerhead Shrike	*Lanius ludovicianus*
Red-shouldered Hawk	*Buteo lineatus*	White-eyed Vireo	*Vireo griseus*
Northern Bobwhite	*Colinus virginianus*	Blue Jay	*Cyanocitta cristata*
King Rail	*Rallus elegans*	Fish Crow	*Corvus ossifragus*
Common Moorhen	*Gallinula chloropus*	Purple Martin	*Progne subis*
Limpkin	*Aramus guarauna*	Northern Rough-winged Swallow	*Stelgidopteryx serripennis*
Killdeer	*Charadrius vociferus*	Tufted Titmouse	*Baeolophis bicolor*
Mourning Dove	*Zenaida macroura*	Carolina Wren	*Thryothorus ludovicianus*
Common Ground-Dove	*Columbina passerina*	Blue-gray Gnatcatcher	*Polioptilia caerulea*
*Rose-ringed Parakeet	*Psittacula krameri*	Northern Mockingbird	*Mimus polyglottos*
Yellow-billed Cuckoo	*Coccyzus americanus*	Brown Thrasher	*Toxostoma rufum*
Barn Owl	*Tyto alba*	Northern Parula	*Parula americana*
Eastern Screech-Owl	*Megascops asio*	Pine Warbler	*Dendroica pinus*
Great Horned Owl	*Bubo virginianus*	Prairie Warbler	*Dendroica discolor*
Barred Owl	*Strix varia*	Common Yellowthroat	*Geothlypis trichas*
Common Nighthawk	*Chordeiles minor*	Eastern Towhee	*Pipilo erythrophthalmus*
Chuck-will's-widow	*Caprimulgus carolinensis*	Northern Cardinal	*Cardinalis cardinalis*
Red-headed Woodpecker	*Melanerpes erythrocephalus*	Red-winged Blackbird	*Agelaius phoeniceus*
Red-bellied Woodpecker	*Melanerpes carolinus*	Eastern Meadowlark	*Sturnella magna*
Downy Woodpecker	*Picoides pubescens*	Common Grackle	*Quiscalus quiscula*
**** = non-native species***		Boat-tailed Grackle	*Quiscalus major*

2.5 Listed Species

Official lists of rare and endangered species are produced at the federal level by the USFWS and the National Marine Fisheries Service (NMFS) and at the State level by the Florida Fish and Wildlife Conservation Commission (FWC) and the Florida Department of Agriculture and Consumer Services (FDACS). FNAI produces a list of rare and endangered species, and maintains a database of occurrences of these species in Florida. The Institute for Regional Conservation (IRC) also ranks native plant species by conservation status in the 10-county area of South Florida. The following subsections (2.5.1 and 2.5.2) discuss the listed, rare and protected plant and animal species found within the Pepper Ranch Preserve in detail.

2.5.1 Listed Plant Species

The Florida State Statute titled "Preservation of Native Flora of Florida" (Statute 581.185) provides the following definitions:

- Endangered plants mean species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered or threatened pursuant to the federal Endangered Species Act of 1973, as amended, Pub. L. No. 93-205 (87 Stat. 884).
- Threatened plants mean species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.
- Commercially exploited plants mean species native to the state, which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

There are fourteen (14) plant species at Pepper Ranch Preserve that are listed by the FDACS, three (3) as endangered, eight (8) as threatened, and 3 as commercially exploited (Table 7). One species, *Tillandsia x smalliana* is listed in Table 7 because it is a hybrid between two endangered species but is not itself listed by the FDACS. A brief description of the species listed in Table 7 and their status is included in the following paragraphs.

Two (2) additional plant species found at Pepper Ranch Preserve are designated as critically imperiled in South Florida (SF1) by the Institute for Regional Conservation (IRC). IRC is a not-for-profit organization dedicated to the protection, restoration, and long-term management of biodiversity on a regional basis, and to the prevention of regional extinctions of rare plants, animals, and natural communities. This designation refers to the extreme rarity (five or fewer occurrences, or fewer than 1,000 individuals) of a species, or its extreme vulnerability to extinction due to some natural or human factor.

Table 7: Listed Plant Species Detected at the Pepper Ranch Preserve		
Common Name	**Scientific Name**	**Status**
Cardinal airplant	*Tillandsia fasciculata var. densispica*	E
Giant airplant	*Tillandsia utriculata*	E
Meadow jointvetch	*Aeschynomene pratensis*	E
Catesby's Lily	*Lilium catesbaei*	T
Everglades palm	*Acoelorraphe wrightii*	T
Leatherleaf airplant	*Tillandsia variabilis*	T
Long strap fern	*Campyloneurum phyllitidis*	T
Needleroot airplant orchid	*Harrisella porrecta*	T
Northern needleleaf	*Tillandsia balbisiana*	T
Simpson's stopper	*Myrcianthes fragrans*	T
Twisted airplant	*Tillandsia flexuosa*	T
Florida butterfly orchid	*Encyclia tampensis*	CE
Royal fern	*Osmunda regalis var. spectabilis*	CE
Cinnamon fern	*Osmunda cinnamomea*	CE
Oak mistletoe	*Phoradendron leucarpum*	SF1
Quillwort arrowhead	*Sagittaria isoetiformis*	SF1
Reddish wild pine (native hybrid)	*Tillandsia* x *smalliana*	

E: Endangered, **T:** Threatened, **CE:** Commercially Exploited

SF1: Critically imperiled in South Florida (as designated by IRC)

Five (5) of the fourteen listed plant species found on the Pepper Ranch Preserve are classified as bromeliads. Bromeliads are members of the pineapple family (Bromeliaceae). While some of these species may be found growing terrestrially, most native bromeliads found in Florida are found growing attached to tree trunks and branches and may therefore be referred to as epiphytes (a plant that lives upon other plants; from Greek "epi" = upon "phyte" = plant). The leaves and/or roots of these airplants (depending on the species) absorb the water and nutrients they need from the air and from the rain that falls through the canopy of the tree on which they are found. Since epiphytes use their roots only to anchor themselves to another plant, they are considered non-parasitic.

Even though the 5 listed bromeliad species found on the Pepper Ranch Preserve are fairly common in the state, they are listed due to illegal collecting and the destruction of the habitats in which they are found. Additionally, infestation by the introduced Mexican bromeliad weevil (*Metamasius callizona*) has been implicated in the decline of many airplant populations around the state. Currently, there are no control measures in place for the Mexican bromeliad weevil however, close research and monitoring is taking place.

Cardinal Airplant (*Tillandsia fasciculata*), is also known as common wild pine and stiff-leaved wild pine. *T. fasciculata* is listed as an endangered plant by the State of Florida and has been recorded in 24 counties throughout Florida (Wunderlin & Hansen 2008). This epiphyte was frequently found in South Florida before the introduction of the Mexican bromeliad weevil. Today, it may be found in hammocks, cypress swamps and pinelands.

Like most of the other bromeliads in Florida, this species is often referred to as a "tank" bromeliad because the leaf axils and central stems form a "tank" or reservoir at the base of the plant. These reservoirs capture and hold water, dead and decaying plant matter (leaves, seeds, twigs, etc.), and dead and drowning non-aquatic insects; these trapped items provide nutrients for the plant (Larson et al. 2006).

Giant airplant (*Tillandsia utriculata*) also known as the giant wild pine, is the largest epiphyte and is relatively common in hammocks and swamps in South Florida. It can reach 12-30 inches in height and its flower spike may be more than six feet in height. It is also listed by the State of Florida as endangered.

Meadow jointvetch (*Aeschynomene pratensis*), is endemic to Florida, meaning it occurs nowhere else in the world. It is a State endangered species that has been recorded in only four (4) southern Florida counties (Wunderlin and Hansen 2008).

Reddish wild pine (*Tillandsia* x *smalliana*), is a hybrid orchid derived from the crossing of two State endangered native orchids *T. balbisiana* and *T. fasciculata var. densispica*; it is not itself listed by FDACS. This species has been recorded in only seven (7) southern Florida counties (Wunderlin and Hansen 2008).

Catesby's Lily (*Lilium catesbaei*) is an herb endemic to the U.S. southeastern coastal plain and is listed as a threatened species in the State of Florida. It is found nearly throughout Florida and has been recorded in 50 counties (Wunderlin and Hansen 2008). In Collier County, it has only been recorded at Wet Woods Preserve, Railhead Scrub Preserve, Big Cypress National Preserve, Collier Seminole State Park, Florida Panther National Wildlife Refuge, Picayune Strand State Forest, and Pepper Ranch Preserve. Johnson Engineering found it on the preserve on October 8, 2009 in the mesic flatwoods located in the southeastern portion of management unit 8 (see management unit map in Appendix 5).

Everglades palm (*Acoelorraphe wrightii*) is a State threatened species that has been recorded in only three (3) southern Florida counties (Wunderlin and Hansen 2008). This salt-tolerant palm is at the northern limit of its range in southern Florida. It was once common here but many plants were taken for the nursery trade (Bush and Morton 1969).

Leatherleaf airplant (*Tillandsia variabilis*) is a State threatened species that has been recorded in ten (10) southern Florida counties (Wunderlin and Hansen 2008). Like other airplants described in this plan, leatherleaf airplant is typically found in hammocks and cypress swamps.

Long strap fern (*Campyloneurum phyllitidis*) is a State threatened species that is epiphytic in hammocks and swamps and can sometimes grow on rocks or on walls in limestone sinkholes where it is reduced in size (eflora – flora of NA).

Needleroot airplant orchid (***Harrisella porrecta***) is widespread in the central and southern counties of Florida and is considered a threatened species. This airplant's

flowering period is between August and November. Other common names are the jingle bell orchid or the leafless orchid (Brown 2002).

Northern needleleaf (*Tillandsia balbisiana*) also known as reflexed wild pine, is an epiphytic, "tank" bromeliad and is listed as a threatened plant by the State of Florida. Wunderlin and Hansen reported this species in 22 counties throughout Florida as of 2008 (Wunderlin and Hansen 2008). Reflexed wild pine is an occasional species in South Florida and is usually found in scrub, pinelands, strand swamps, hammocks, mangrove swamps and on shell ridges/mounds.

Simpson's stopper (*Myrcianthes fragran*) is a State threatened species found in hammocks. The red flaking bark of this tree can confuse its identification with the invasive exotic guava (*Psidium guajava*).

Twisted airplant (*Tillandsia flexuosa*), a State threatened species, is less common in Florida than the other *Tillandsia* species listed in this plan, but still frequent, especially in coastal ecosystems. It has been recorded in ten (10) southern Florida counties (Wunderlin and Hansen 2008).

Florida butterfly orchid (***Encyclia tampensis*)** is locally abundant in central and southern counties of Florida; it is commercially exploited. They grow on a wide variety of trees including live oak, red maple, bald cypress (*Taxodium distichum*), pop ash and pond apple. They normally flower in June or July but may also flower at other times of the year (Brown 2002).

Royal fern (*Osmunda regalis* var. *spectabilis*) is not in danger of being extirpated in Florida because of habitat loss, habitat fragmentation or attack by an exotic, invasive pest, but because of commercial exploitation. According to Nelson (2000), the fibers from the stem of royal fern have been used as a growing medium to grow orchids as well as to make ropes and nets. Additionally, this species is believed to have medicinal benefits; other parts of the plant may have been used to treat wounds and broken bones, relieve sprains and to help alleviate coughs and diarrhea. In Florida, this species is found in hydric areas such as wet flatwoods, cypress swamps, floodplains, stream banks and bogs.

Cinnamon fern (*Osmunda cinnamomea*) is widespread in swamps, wet woods and wet meadows throughout North and South America (Cobb et al. 2005). Its status as Commercially Exploited as listed by the FDACS makes it illegal to collect it in the wild but it is commercially available for native landscaping.

Oak mistletoe (*Phoradendron leucarpum*)
Oak mistletoe is a parasitic evergreen subshrub and despite its name it can be found growing on other broadleaf trees such as red maple (*Acre rubrum*). This plant is not listed by the State of Florida but has been recognized by IRC as a critically imperiled species for South Florida. This is a temperate species at the southern end of its range, and it is possible it has always been uncommon in South Florida (Gann et al. 2002).

Quillwort arrowhead (*Sagittaria isoetiformis*)
This plant is not listed by the State of Florida but has been recognized by IRC as a critically imperiled species for South Florida. As with oak mistletoe, this is also a temperate species at the southern end of its range, and it is possible it has always been uncommon in South Florida (Gann et al. 2002).

2.5.2 Listed Animal Species

Table 5 in section 2.4.2 indicates which of the wildlife species documented for Pepper Ranch Preserve are protected by the USFWS (2009) and FWC (2009). Listed wildlife species that have been observed at Pepper Ranch Preserve to date include: Audubon's Crested Caracara, Bald Eagle, Florida Sandhill Crane, Limpkin, Little Blue Heron, Roseate Spoonbill, Tricolored Heron, Snowy Egret, White Ibis, Wood Stork, Big Cypress Fox Squirrel, Florida Black Bear, Florida Panther, American Alligator and Gopher Tortoise. The following is a brief description of the conservation status for those species occurring at the preserve that are currently listed as threatened or endangered by the State or federal government.

Audubon's Crested Caracara (*Polyborus plancus audubonii*)
This State and federally threatened species nests predominately in cabbage palms where it will lay 2-3 eggs in late winter. Agricultural development for improved pastures and citrus groves, as well as indiscriminant killing has contributed to the caracara's decline in Florida. It was officially listed on the federal list of threatened species in August 1987 (Kale and Maehr 1990).

Bald Eagle (*Haliaeetus leucocephalus*)
On June 29, 2007, the bald eagle was officially delisted and removed from the federal Endangered Species List in the lower 48 states. However, according to the USFWS Division of Migratory Bird Management, this bird of prey will continue to be protected by the Bald and Golden Eagle Protection Act, the Lacey Act and the Migratory Bird Treaty Act.

Florida Sandhill Crane (*Grus canadensis pratensis*)
Sandhill cranes occur in pastures, open prairies and freshwater wetlands in peninsular Florida from the Everglades to the Okefenokee Swamp. They build large nests in thick patches of vegetation in freshwater wetlands where they will typically lay two eggs. Nesting lasts from January through June (Kale and Maehr 1990). They are listed as a threatened species in the State of Florida.

Wood Stork (*Mycteria americana*)
This bird species, sighted on the preserve by staff in 2008 and by Johnson Engineering, Inc. in 2009, and on multiple occasions since then, is listed as endangered by both FWC and USFWS. Also known as the wood ibis or flint head, this species is one of the largest wading birds found in Florida and the only stork in the United States. The wood stork is a tactile feeder and may be found in fresh, brackish, and saltwater ecosystems. Because of its dependence on naturally functioning hydrologic systems, the National Audubon Society refers to this wading bird as the "barometer of the Everglades". For this reason,

the wood stork is an excellent environmental indicator of wetland health (Mazziotti 2002).

Big Cypress Fox Squirrel (*Sciurus niger avicennia*)
Also known as the mangrove fox squirrel, the FWC lists Big Cypress Fox Squirrel as threatened in Florida. This species was first observed at Pepper Ranch Preserve by Wilson Miller in 2005 during a listed species survey. While the species is widespread in eastern and central North America, the subspecies is endemic to southwestern Florida – specifically in the Immokalee Rise, Big Cypress Swamp, and Devil's Garden area in Collier County. Some areas of this range have become vacated, while many other suitable areas are being altered or becoming isolated through development. The subspecies uses most types of forest occurring in its range. However, dense interiors of mixed cypress-hardwood strands seem to be avoided by Big Cypress fox squirrels due to dense populations of gray squirrels (*Sciurus carolinensis*) occupying these areas. Big Cypress fox squirrels have been reported in cypress swamp, pine flatwoods, tropical hammock, hardwood hammock, mangrove swamp, and suburban habitats including golf courses and residential areas in native vegetation. Big Cypress fox squirrel densities appear to be quite low, and on this basis the subspecies can be considered inherently rare (Humphrey & Jodice 1992).

Florida Black Bear (*Ursus americanus floridanus*)
The Florida black bear is a subspecies of the black bear found throughout North America. Black bears have been observed on several occasions at Pepper Ranch Preserve, on neighboring properties and on Pepper Road, by staff and neighbors. Florida black bears in south Florida are listed as threatened by the FWC. Because of its large home range and low population density the black bear is particularly vulnerable to habitat loss. Even though their population is affected by illegal killing and road kills, habitat loss is the major cause of concern (Humphrey 1992).

Florida Panther (*Puma concolor coryi)*
This large cat is a year-round resident of undeveloped lands in South Florida. It is listed as endangered by both FWC and USFWS. Panthers prefer hardwood hammocks and pine forests with numerous saw palmettos for resting, raising kittens, and stalking prey. Panthers are losing their habitat in South Florida and males require a large range. Increased development and traffic are another reason why this species is listed as endangered. Telemetry data from FWC demonstrates Florida panther frequently use the adjacent CREW lands and have used the Pepper Ranch Preserve on a few occasions (current Florida panther telemetry data obtained from FWC staff by Johnson Engineering, Inc. on 09/28/09). In their third revision to the Florida Panther Recovery Plan the USFWS (2008) states that there are three priority zones identified as important for panther habitat conservation: (1) Primary Zone – lands essential to the long-term viability and persistence of the panther in the wild; (2) Secondary Zone - lands contiguous with the Primary Zone, currently used by few panthers, but which could accommodate expansion of the panther population south of the Caloosahatchee River; and (3) Dispersal Zone - the area which may facilitate future panther expansion north of the Caloosahatchee River. The Pepper Ranch Preserve is entirely within the Primary Zone for the Florida panther.

American Alligator (*Alligator mississippiensis*)
The American alligator is listed as a Species of Special Concern (SSC) by FWC and as threatened by USFWS for its similarity in appearance with the endangered American Crocodile. Alligators are seen throughout the preserve on a regular basis and they are quite numerous in Lake Trafford that borders the Preserve to the south.

Gopher Tortoise (*Gopherus polyphemus*)
This medium-sized, native land turtle is listed by the State as a threatened species. Gopher tortoises are typically found in dry, upland habitats including scrub, xeric oak hammock, sandhills and dry pine flatwoods. Burrows are created for protection from weather, fire, and predators; they also provide refugia for more than 300 other species of animals. Active burrows exist in the pine flatwoods communities at Pepper Ranch Preserve.

2.6 Invasive, Non-native and Problem Species

In an ecological context, an invasive species is one that is aggressive in growth and expansion of range and tends to dominate others; its establishment and dominance can cause widespread harm to an ecological system by altering a plant community's species composition, susceptibility to fire and hydrology. Non-indigenous species (i.e., non-native or exotic species) are those that have been introduced purposefully or accidentally to an area outside their normal range. The characteristics of some of these species (high rate of growth/reproduction, no natural predators, easily dispersed, able to out-compete native species) make them invasive. Some indigenous species (a species whose natural range included Florida at the time of European contact circa 1500 AD or a species that has naturally expanded or changed its range to include Florida) may also become invasive. Invasions by native and non-native species often follow an alteration to ecosystem function, disruption of the food web, large-scale fragmentation of an ecosystem and/or disturbance (e.g., clearing, fire, drought, etc.) of an area. While some native species may become invasive, the establishment and dominance of non-native species is of particular concern. The exotic plant and animal species documented within the preserve and those that have a potential to occur within the preserve are discussed in the following sections.

2.6.1 Invasive and Problem Plant Species

FLEPPC maintains a list of exotic plants that have been documented to (1) have adverse effects on Florida's biodiversity and plant communities, (2) cause habitat loss due to infestations and (3) impact endangered species via habitat loss and alteration. To date, 82 non-indigenous or non-native plant species have been detected within Pepper Ranch Preserve (Table 8), accounting for 20% of the plant species recorded there. Of the 82 exotic species, 32 are listed by FLEPPC (23 Category I and nine Category II). FLEPPC defines Category I plants as those that alter native plant communities by displacing native species, change community structures or ecological functions, or hybridize with natives. Category II plants have increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species. These definitions do not rely on the economic severity or geographic range of the problem, but rather on the documented ecological damage caused by these plants (FLEPPC 2009).

Table 8: Non-Indigenous and Invasive Plant Species at Pepper Ranch Preserve		
Scientific Name	**Common Names**	**FLEPPC Category**
Abrus precatorius	ROSARY PEA; BLACKEYED SUSAN	I
Ageratum conyzoides	TROPICAL WHITEWEED	
Albizia lebbeck	WOMAN'S TONGUE	I
Alternanthera philoxeroides	ALLIGATORWEED	II
Alysicarpus ovalifolius	FALSE MONEYWORT; ALYCE CLOVER	
Alysicarpus vaginalis	WHITE MONEYWORT	
Amaranthus spinosus	SPINY AMARANTH	
Asclepias curassavica	SCARLET MILKWEED	
Blechum pyramidatum	BROWNE'S BLECHUM	II
Casuarina glauca	GRAY SHEOAK; SUCKERING AUSTRALIAN-PINE	I
Citrus x aurantium	SOUR ORANGE; GRAPEFRUIT; SWEET ORANGE	
Citrus x jambhiri	ROUGH LEMON	
Commelina diffusa	COMMON DAYFLOWER	
Crotalaria pallida var. obovata	SMOOTH RATTLEBOX	
Cuphea carthagenensis	COLOMBIAN WAXWEED	
Cynodon dactylon	BERMUDAGRASS	
Cyperus rotundus	NUTGRASS	
Desmodium triflorum	THREEFLOWER TICK-TREFOIL	
Eichhornia crassipes	COMMON WATER-HYACINTH	I
Eleusine indica	INDIAN GOOSEGRASS	
Emilia fosbergii	FLORIDA TASSELFLOWER	
Eragrostis atrovirens	THALIA LOVEGRASS	
Eragrostis ciliaris	GOPHERTAIL LOVEGRASS	
Eugenia uniflora	SURINAM CHERRY	I
Eulophia graminea	(no common name)	
Ficus microcarpa	INDIAN LAUREL	I
Hedychium coronarium	BUTTERFLY GINGER	
Hemarthria altissima	LIMPOGRASS	II
Hydrilla verticillata	WATERTHYME, HYDRILLA	I
Hymenachne amplexicaulis	TROMPETILLA	I
Hyptis verticillata	JOHN CHARLES	
Imperata cylindrical	COGONGRASS	I
Indigofera hirsute	HAIRY INDIGO	
Kigelia pinnata	SAUSAGE TREE	
Lantana camara	LANTANA, SHRUBVERBENA	I
Leucaena leucocephala	WHITE LEADTREE	II
Ludwigia peruviana	PERUVIAN PRIMROSEWILLOW	I
Lygodium microphyllum	SMALL-LEAF CLIMBING FERN	I
Macroptilium lathyroides	WILD BUSHBEAN	
Mangifera indica	MANGO	
Medicago lupulina	BLACK MEDIC	
Melaleuca quinquenervia	PUNKTREE	I
Melinis repens	ROSE NATALGRASS	I
Momordica charantia	BALSAMPEAR	
Murdannia nudiflora	NAKEDSTEM DEWFLOWER	
Murdannia spirata var. parviflora	ASIATIC DEWFLOWER	

Scientific Name	Common Names	FLEPPC Category
Nephrolepis multiflora	ASIAN SWORD FERN	I
Oldenlandia corymbosa	FLATTOP MILLE GRAINES	
Panicum maximum	GUINEAGRASS	II
Panicum repens	TORPEDO GRASS	I
Paspalum notatum	BAHIAGRASS	
Paspalum urvillei	VASEYGRASS	
Pennisetum polystachion	WEST INDIAN PENNISETUM; MISSIONGRASS	
Phoenix roebellini	PYGMY DATE PALM	
Pistia stratiotes	WATER-LETTUCE	I
Pouzolzia zeylanica	POUZOLZ'S BUSH	
Pseudelephantopus spicatus	DOG'S-TONGUE	
Pseudogynox chenopodioides	MEXICAN FLAMEVINE	
Psidium cattleianum	STRAWBERRY GUAVA	I
Psidium guajava	GUAVA	I
Pteris vittata	CHINESE LADDER BRAKE	II
Richardia grandiflora	LARGEFLOWER MEXICAN CLOVER	
Sacciolepis indica	INDIAN CUPSCALE	
Salvinia minima	WATER SPANGLES	
Schinus terebinthifolia	BRAZILIAN PEPPER	I
Senna alata	CANDLESTICK PLANT	
Senna obtusifolia	COFFEEWEED; SICKLEPOD	
Senna pendula var. glabrata	VALAMUERTO	I
Solanum diphyllum	TWOLEAF NIGHTSHADE	II
Solanum viarum	TROPICAL SODA APPLE	I
Spermacoce verticillata	SHRUBBY FALSE BUTTONWEED	
Sphagneticola trilobata	CREEPING OXEYE	II
Sporobolus indicus var. pyramidalis	WEST INDIAN DROPSEED	
Syzygium cumini	JAVA PLUM	I
Thelypteris dentate	DOWNY MAIDEN FERN; DOWNY SHIELD FERN	
Thunbergia grandiflora	SKYVINE	
Tradescantia zebrine	WANDERING-JEW; INCHPLANT	
Trifolium repens	WHITE CLOVER	
Triumfetta semitriloba	SACRAMENTO BURRBARK	
Urena lobata	CAESARWEED	II
Urochloa distachya	TROPICAL SIGNALGRASS	
Verbena brasiliensis	BRAZILIAN VERVAIN	

As of the February 2009 acquisition of the Pepper Ranch Preserve by the Conservation Collier program, the most problematic non-indigenous or exotic, invasive plant species were torpedo grass, Brazilian pepper and cogon grass. To date, exotic plant treatments have taken place within the northern SSA 7 area, a total of approximately 50 acres. The focus was primarily on small-leaf climbing fern, otherwise known as Old World climbing fern. Contractors also mowed and treated the Brazilian pepper growing along the main road within the preserve that leads to the oil fields. The control/removal of invasive, exotic species is discussed in detail in section 4 of this document.

2.6.2 Invasive and Problem Animal Species

Although Florida does not have an official exotic, invasive animal species list, at least 400 exotic fish and wildlife animal species have been reported in Florida, and approximately 125 species are established.

Two non-indigenous, invasive animal species have been documented on the preserve: the brown anole (*Anolis sagrei*), and the feral pig (*Sus scrofa*). One potentially problematic species is the coyote (*Canus latrans*). Based on the natural communities found within the preserve, proximity to residential areas and geographic location, several more species (native and non-native) have the potential to impact Pepper Ranch Preserve to varying degrees and may yet be observed on site during future visits and wildlife surveys. Brief descriptions of documented problematic species are provided in the following paragraphs.

Brown Anole (*Anolis sagrei*): documented within the Pepper Ranch Preserve

Also known as the Cuban anole, the brown anole is native to Cuba, the Bahamas, and neighboring islands (Schwartz & Henderson 1991). Like other anoles from the islands, this species is a small, tropical, diurnal, arboreal, territorial, and insectivorous lizard (Campbell 2001). The brown anole was first documented in the Florida Keys in the late 1800s (Lee 1985) and has since spread throughout Florida, into Georgia and into two other southeastern states (Campbell 1996). It feeds on a wide variety of insects, amphipods, and isopods. Brown anoles also prey on other small vertebrates including the hatchlings of the native green anole (*A. carolinensiis;* Campbell 2000). Campbell (2000) showed that, in the absence of the exotic brown anoles, native green anoles occupy perches from ground to the canopy of vegetation. However, in the presence of the exotic anole, native anoles move higher in trees, occupying only the trunk and crown of trees. Dietary overlap is high between both species, but the overall affects of the brown anole on the green anole are still undetermined.

Feral pig *(Sus scrofa):* documented within the Pepper Ranch Preserve

Hogs were first brought to Florida in the mid 1500's to provision settlements of early explorers. Their high rate of reproduction and their ability to adapt to Florida's natural areas has led them to populate every county in the state. Today, Florida is second only to Texas in its feral hog population (Giuliano & Tanner 2005*a;* 2005*b*). While feral pigs are able to survive in a variety of habitats, they prefer large forested areas interspersed with marshes, hammocks, ponds, and drainages; cover in the form of dense brush; and limited human disturbance (Giuliano & Tanner 2005*b*). Dense cover is used as bedding areas and provides protection from predators and hunters. Feral pigs are omnivorous, opportunistic feeders consuming grasses, forbs, and woody plant stems, roots, tubers, leaves, seeds, fruits, fungi and a variety of animals including worms, insects, crustaceans, mollusks, fish, small birds, mammals, reptiles, amphibians and carrion. Their propensity for digging for foods below the surface of the ground (rooting) destabilizes the soil surface, resulting in erosion and exotic plant establishment. Additionally, this behavior uproots or weakens native vegetation (Giuliano & Tanner 2005*a*; 2005*b*). Due to the natural communities that are found within the preserve, this species has the potential to thrive within the boundaries. As these animals are highly visible outside of natural plant communities, adjoining residents of the preserve may be useful in the early detection of

this nuisance animal. Several large families of feral pigs have been observed on the preserve since its acquisition.

Coyote (*Canis latrans*): documented within the Pepper Ranch Preserve
Coyotes may have potential to become a problematic species. Coyotes were introduced in very small numbers to Florida during the 1920's for sport hunting with domestic dogs. This introduction did not lead to the establishment of coyote populations in Florida. Concurrently, these canids expanded their range eastward across the United States and Canada as a result of nonspecific needs in habitat and food, decreased competition from other predators, large litter sizes and anthropogenic changes to the landscape. Since many species naturally expand or change their home ranges in response to climate and resource availability. The coyote may be considered naturalized or native to Florida based on fossil records and natural range expansion (FWC 2007). This crepuscular (active mostly at dawn and dusk) species is elusive and may travel individually or in groups of two or three (Coates et al. 1998). Coyotes commonly enlarge burrows made by other animals such as armadillos or gopher tortoises to use as dens or use dense vegetation for cover. Coyotes will kill smaller predators (e.g., foxes, opossums, etc.) and will help control rodents, which can be beneficial to turkey, quail, ducks and other ground nesting birds. Because their food habits are diverse, coyotes are unlikely to significantly affect the population of any single species. Coyotes are not reported to interact with bobcats and do not appear to influence bobcat home range size. Coyotes may prove beneficial in controlling potential problem species such as feral cats and hogs (Thornton, Sunquist, and Main 2004). Coyotes may attack calves (FWC 1999-2010), however this is relatively uncommon in Florida.

3.0 Previous Conditions of the Preserve; Current Use of the Preserve and Adjacent Land Uses

3.1 Previous Land Uses of the Preserve

The earliest aerial photographs obtained of the preserve were taken in 1940, 1953 and 1963 (Figures 8, 9, and 10). Digital images were downloaded from the U.S. Department of Interior USGS historic aerial photo web page (USDI 2004) and the Florida Department of State Aerial Photography of Florida web page (FDOS 2006) and georeferenced in ArcGIS 9, ArcMap Version 9.3. Aerial photographs (1975 – 2009) from the Collier County Property Appraiser web page were also reviewed.

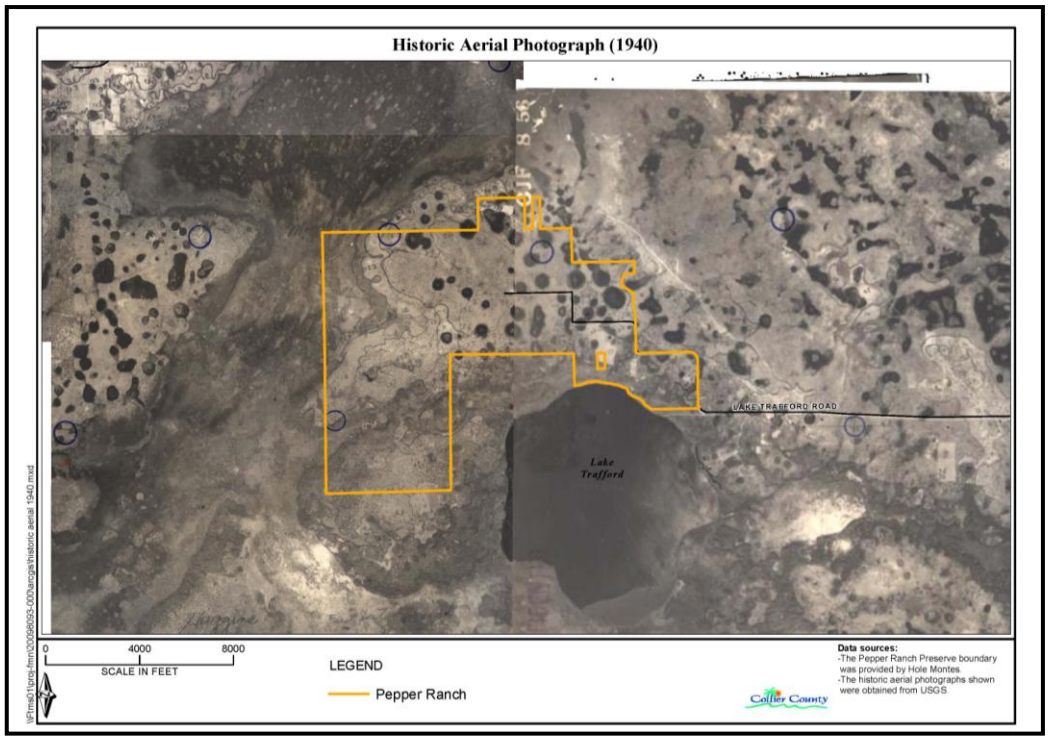


Figure 8: 1940 Aerial View of Pepper Ranch Preserve

Review of the historic aerial photographs revealed Lake Trafford Road and Pepper Road (both inside and along the edge of the preserve) existed in 1940. In 1940, the majority of the preserve was natural with the exception of one agricultural field in the southeast portion of the preserve in Section 26, Township 46 South, Range 28 East (identified as Folio Nos. 00052680009 and 00052640007 on the Collier County Property Appraiser web site) and one agricultural field in the northernmost central extent of the preserve in Section 22, Township 46 South, Range 28 East (identified as Folio No. 00052360002 on the Collier County Property Appraiser web site). Two areas cleared for homesteads appear on the 1940 aerial photograph in the southeastern extent of the preserve, one of which is the area surrounding the current caretaker house located at the main preserve entrance on the south side of Pepper Road. A trail from the homestead to Lake Trafford is evident on the 1940 aerial photograph. The other homestead appears on the 1940 aerial photograph east of the current caretaker house near Pepper Road along the northeast boundary of Section 35.

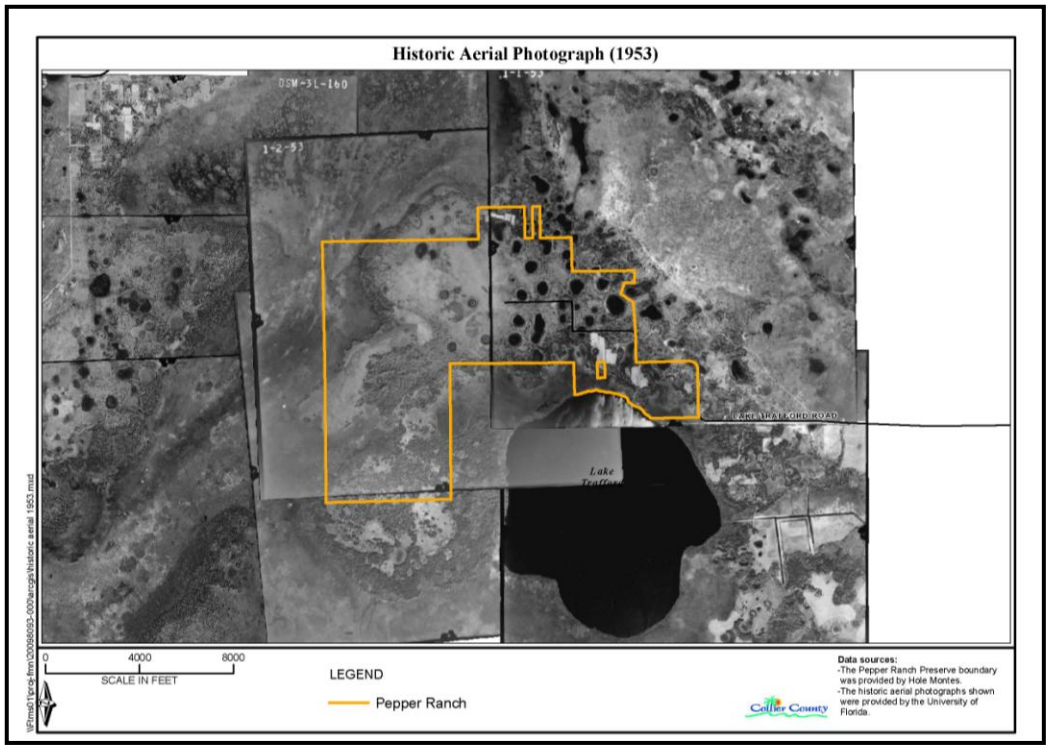


Figure 9: 1953 Aerial View of Pepper Ranch Preserve

Between 1940 and 1953, no further development was evident in the preserve. Between 1953 and 1963, the majority of the site agricultural fields and associated ditches were created. Between 1963 and 1975, a crescent shaped agricultural field was added at the central western extent of the site agricultural fields. Between 1975 and 1980, the east-west portion of Trafford Oaks Road was constructed, dividing the marsh and forested wetlands through which it was constructed.

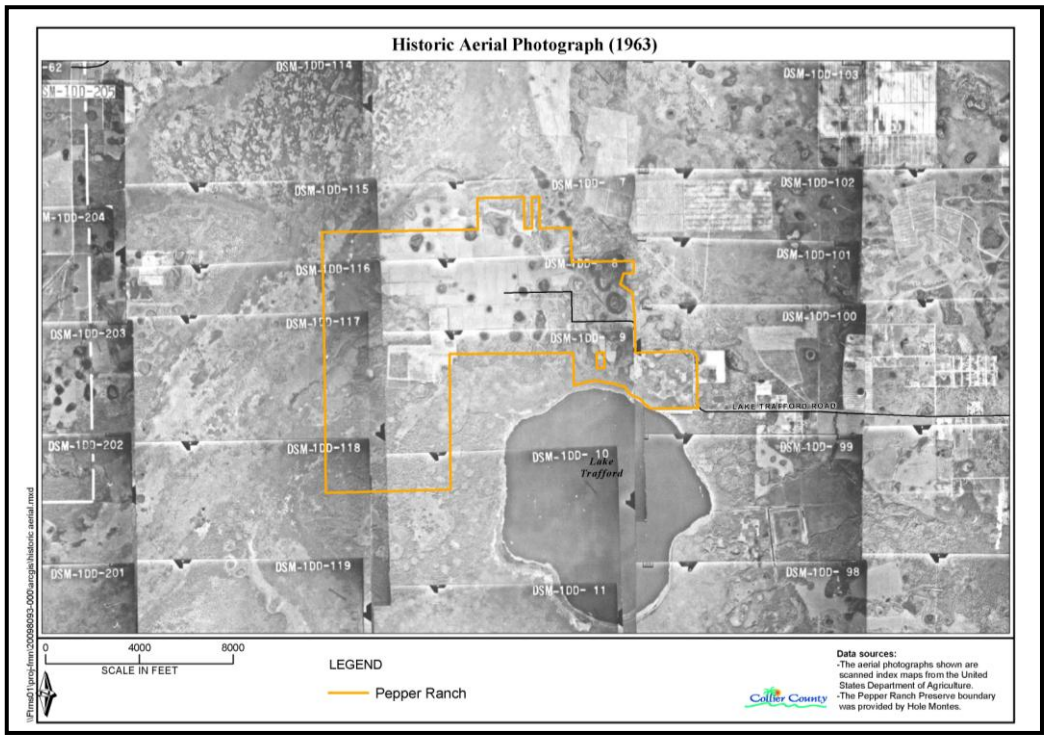


Figure 10: 1963 Aerial View of Pepper Ranch Preserve

Prior to 1995, the only additional development in the preserve included the construction of three oil fields adjacent to the hydric improved pasture at the central western extent of the preserve and the construction of two agricultural fields in the most eastern extent of the preserve (in the northeast corner of Section 35). Two of the three oil fields are currently active. The two agricultural fields have been fallow since approximately 2006 and are currently overgrown with shrubs (i.e. Brazilian pepper, wax myrtle, etc.).

3.2 Previous Land Uses of Adjoining Properties

Based on review of the 1940 aerial photograph, the lands that adjoin the preserve were natural. In 1953, canals were excavated from Lake Trafford and agricultural fields were constructed around them. Natural plant communities were converted to agricultural fields on lands southeast of Lake Trafford and south of Lake Trafford Road east of the preserve. Adjoining lands west and southwest of the preserve, the majority of which are now part of the major wetland slough on CREW lands, remained undeveloped.

By 1963, agricultural fields and residential properties (±2.5 or ±5.0 acre properties north and south of Lake Trafford Road) were constructed to the east between the preserve and the town of Immokalee. By 1975, a large agricultural field was constructed northeast of the preserve. The wetland slough (currently on CREW lands) and natural communities immediately north and south of the preserve remained undeveloped. Between 1980 and 1985 Trafford Oaks Road was extended from its western terminus to the south. Estate-

sized residential properties along the south extension of Trafford Oaks Road were developed with homes and borrow ponds. These properties adjoin the southwestern extent (Section 33) of the preserve. By 1985, agricultural development surrounding Lake Trafford had increased, however, the major wetland slough to the west and northwest of the Lake and the wetland slough south of the Lake remained undeveloped. Throughout the 1990s and early 2000s, residential development continued along Lake Trafford Road east of the preserve and agricultural uses remained on lands northeast of the preserve.

In 1990, SFWMD purchased the lands that encompass the major wetland slough located west and northwest of the preserve. These lands are referred to as the Corkscrew Regional Ecosystem Watershed or CREW. Through its adjacency to CREW project lands, the preserve is connected to several thousands of acres of preserved land in southeast Lee County and Northwest Collier County, including diverse systems located in Corkscrew Swamp Sanctuary, Panther Island Mitigation Bank, other CREW lands, the Southwest Florida Regional Airport 7,000-acre mitigation site and Conservation Collier's ±367-acre Caracara Prairie Preserve.

3.3 Current Land Uses of the Preserve

Currently, there is a cattle lease with Lake Trafford Ranch, LLP and a mineral rights lease with Newport Oil on the Pepper Ranch Preserve. The cattle lease encompasses 2,012.10 acres of the preserve and is for a three year period with option to renew for two additional terms of one year. The oil drilling lease covers the two quarter sections in which the oil wells exist (southwest quarter of Section 28 and northwest quarter of Section 33, both in Township 46 South, Range 28 East). The rights reserve all minerals below 250 feet.

To date, Conservation Collier staff has held two public outreach events at the preserve. The initial outreach event was held on May 9, 2009. The guided hikes offered to the public during the initial outreach event were completely filled. The second public outreach event was held November 21, 2009. Over 300 people attended the event and participated in the guided hikes and van tours of the preserve as well as the historical presentation about Pepper Ranch. As evident from the public outreach events, there is strong public interest in Pepper Ranch Preserve.

The preserve will be open on Saturdays, November 6, 2010 through the end of April 2011. The public will be able to utilize the lodge hiking trail, walk out to Lake Trafford, and picnic next to the lodge. The public will also be allowed to obtain a daily permit that will allow them to drive through the northern portion of the Preserve staying on the main road only until safe trail systems can be created. Public use of the preserve must be consistent with the preserve management goals and is discussed in section 4 of this document.

3.4 Current Land Uses of Adjoining Properties

The Pepper Ranch Preserve is bordered on its west and northwest boundaries by the CREW project lands. These are lands purchased by the SFWMD under the Save our Rivers program. Adjacent to the west are CREW project lands known as the CREW Marsh; to the north are SFWMD lands, agricultural lands and orange groves; to the east are SFWMD and residential lands (town of Immokalee); and to the south are Lake Trafford, estate-sized residential properties (Trafford Oaks), and agricultural and undeveloped lands owned by Baron Collier Investments, Ltd.

Directly south of CREW project lands and connected to them are private conservation lands owned by the National Audubon Society (Corkscrew Swamp), more conservation lands owned by the SFWMD (Bird Rookery Swamp) and various private mitigation lands, all together encompassing 60,000 acres, of which over 42,000 acres is currently held in conservation. The SFWMD makes certain capital improvements to its lands such as fencing, access roads/trails, and may provide basic public facilities on lands. Additionally, habitat management such as exotic plant species removal and prescribed burning may be conducted. Florida Statutes (F.S. 373.59) also require the SFWMD to develop appropriate public use.

The organization most frequently associated with CREW project lands is the CREW Land and Water Trust, Inc. (CREW TR), a nonprofit environmental education organization established in 1989 to coordinate the land acquisition, land management, and public use in the 60,000-acre CREW project area. The CREW TR does not own the land but operates in partnership with the SFWMD.

Approximately 180 acres of conservation land exists along the central eastern boundary of the Pepper Ranch Preserve. A 625-acre impoundment that serves as a dredge disposal site for nutrient-laden muck from the bottom of Lake Trafford is located east of the conservation land. The Lake Trafford hydraulic dredging restoration project is being conducted by SFWMD in cooperation with the Florida Department of Environmental Protection (FDEP) and through the cooperative efforts of various local organizations and state and federal agencies. Phase I of the restoration project, completed in 2006, removed over three million cubic yards of muck from the deeper portions of the lake. Phase II is projected to remove several million additional cubic yards of muck from the shallow littoral zone. The project was scheduled to be completed in 2007, but has been delayed due to lower than expected water levels.

Eight sections of land owned by Turner Grove Citrus LTD Partnership located to the northeast of the ranch, and extending into Lee County, currently have citrus groves on them.

3.5 Cultural, Historical and Archeological Resource Protection

The Pepper Ranch Preserve is within an area of historical and archaeological probability, and historical and archaeological sites are most likely present on the property. Before conducting any development, the County will obtain a Phase I Archaeological Survey within the area to be developed. When possible, the County will refrain from building in

areas identified as potential archaeological sites. If development is unavoidable in areas identified as potential archaeological sites, the County will develop improvements under the guidance of an archaeologist. In addition, the County will notify the Division of Historical Resources immediately if further evidence is discovered to suggest any archaeological or historic resources are present in areas that were not identified in the Phase I. If such resources are identified on-site, a professional survey and assessment shall be instituted. The archaeologist shall prepare a report outlining results of the assessments and issue recommendations to County staff about management of any sites discovered, per provisions of the Land Development Code Section 2.2.25. This report shall be sent to the Division of Historical Resources. The County shall cooperate fully with direction from the Division of Historical Resources on the protection and management of archaeological and historical resources. The management of these resources will comply with the provisions of Chapter 267, F.S., specifically Sections 267.061 2 (a) and (b).

The lodge and caretaker's home may be considered historical structures. Retaining one or both these structures and their designation as historical structures may provide benefits to Conservation Collier in terms of obtaining grant funds for restoration. Staff will work with the County's Historical/Archeological Preservation Board to identify options associated with designation of the lodge and/or caretakers home as historical structures and provide these options to the Conservation Collier Land Acquisition Advisory Committee (CCLAAC) for recommendation to the Collier County BCC.

3.6 Major Accomplishments since Acquisition

Collier County purchased the Pepper Ranch Preserve in February of 2009. The table below lists the accomplishments since acquisition of the property.

Table 9: Major Accomplishments During Previous Years

Accomplishment	Year(s)
Exotic vegetation treatment in North Stewardship Sending Area (50 acres)	2009
Cattle Vat Cleanup	2009
Removal of Old Structures	2009
Creation of a New Trail by the Lodge	2009
Two Public Outreach Events	2009
First Youth Hog Hunt Held	2010
Public Hog and Small Game Hunts Began	2010

4.0 Future Use of the Pepper Ranch Preserve including Management Issues, Goals and Objectives

This section describes the main management issues, goals and objectives for the Pepper Ranch Preserve as well as the overall management framework. Central to the management of the Preserve is the mission of the Conservation Collier Program, and the goals and objectives set forth in this management plan.

4.1 Management Plan Framework

Each property purchased by Conservation Collier shall have its own management plan. At the time the Pepper Ranch Preserve was purchased, the Conservation Collier Ordinance required that an "Interim" Management Plan be developed within 60 days of closing. Interim plans include basic items such as removal of invasive, exotic vegetation and trash, establishing site security, developing management partnerships and planning for public access. The interim plan for this site was officially approved in September 2009. The ordinance then requires a "Final" ten-year management plan be developed within two years. Subsequently, the property management plan must then be reviewed every five years. Final management plans, however, are considered living documents and can be updated at any time. Review of all management plans start in the Lands Evaluation and Management subcommittee and must be approved by both the CCLAAC and the Collier County BCC.

4.1.1 Preserve Manager: Contact Information

The site manager for Pepper Ranch Preserve will be a designated Collier County Environmental Specialist who may be contacted through electronic mail: ConservationCollier@Colliergov.net.

4.2 Planned Uses and Assessment of their Impacts

Future planned use will be consistent with the primary goals of conservation, preservation, restoration and maintenance of the resource. Official public use of the entire preserve will not be possible until safe public access trails can be created. However, citizens that desire to visit the northern public use area may do so by signing a waiver or by obtaining a daily use permit on days that are open to the public. These will allow them access at their own risk and releases the liability of the County until safe access is established. Details of planned uses for the Pepper Ranch Preserve and an assessment of their potential impacts are provided in the following sections.

4.2.1 Identification of Public Uses Consistent with Preservation, Enhancement, Restoration, Conservation and Maintenance of the Resources

The Conservation Collier Ordinance 2002-63 constrains the use of this property to "primary objectives of managing and preserving natural resource values and providing appropriate natural resource-based recreational & educational opportunities." Natural resource-based recreation shall mean all forms of uses, which are consistent with the goals of this program, and are compatible with the specific parcel (Ord. No. 02-63, as amended§ 5, 12-3-02). Additionally, no dumping, use of unauthorized vehicles, or removal or destruction of natural or historical/archaeological resources will be permitted within the preserve. The goal is to allow limited, non-destructive public access to native plant communities and animal species. Currently, the preserve rules are those identified in Collier County Ordinance 76-48 (available from www.municode.com), as amended.

The following are ***consistent*** uses for this particular site: hiking, nature photography, camping, horseback riding, bird watching and hunting. ***Inconsistent*** uses include off road vehicle use (ORV).

There is one lease and a number of easements existing on the Pepper Ranch Preserve, as identified below (see Figure 11):

Lease:

- A cattle lease held by Lake Trafford Ranch LLP for Two Thousand Twelve point One (2,012.1) acres of property, as described in Appendix 6, for the sole purpose of cattle grazing and incidental activities that are directly related to beef cattle production for a term of three (3) years, commencing on January 13, 2009, with payments, terms and provisions as set forth in Cattle Lease, attached as an Exhibit to the Pepper Ranch Purchase Agreement. A new lease agreement will be created to include additional parcels in exchange for additional mowing and the length of time will be extended to a total of 5 years giving the lessee the right to renew.

Easements:

- Access Easement entered into on February 6, 2009, with Lake Trafford Ranch LLP for a 30' wide strip of land running along the main interior ranch road, following an overall east to west directional track, and leading from the main ranch gate to the oil wells situated along the western side of the ranch. Recorded in O.R. Book 4425 and Page 3302, Public records of Collier County. The grantee is responsible for maintenance of this easement.
- Access Easement entered into February 2, 2009 by Lake Trafford Ranch LLP in favor of Baron Collier Investments (BCI), Ltd., a Florida Limited partnership, over a 15' wide strip of land running over the same main interior access road as the above easement but before arriving at the oil wells, turning south to facilitate access to a parcel adjoining the southern boundary of the Pepper Ranch Preserve. Access is granted solely for purposes of ingress and egress to serve specific activities on the BCI lands, which are cattle grazing, ranching, hunting and forestry. Recorded in O.R. Book 4425, Page 3263, Public Records of Collier County. The grantee is responsible for maintenance of this easement.
- Stewardship Easement Agreement recorded in OR Book 4089, Page 3837, Public Records of Collier County.
- Drainage Easement for 40' along SE corner of property in Section 35, recorded in O.R. Book 49, Page 147, Public Records of Collier County.
- Access Easement in favor of Trafford Oaks for 60' as for portion of Trafford Lakes Road that traverses Pepper Ranch property, as recorded in O.R. Book 907, Page 1383, Public Records of Collier County.
- A Conservation Easement over portions of the property associated with panther and/or wetland mitigation will be granted to the South Florida Water Management District (SFWMD).

Conservation Collier staff will maintain an open line of communication with the oil well operators to develop operational protocol where needed and to ensure this operation continues in a safe and clean manner at the preserve. This level of coordination will also be extended to the cattle lease holder on land management activities at the preserve. Staff

will also obtain a range management study from NRCS to further direct cattle lease operations at Pepper Ranch Preserve.

No other easements, concessions or leases exist on Pepper Ranch Preserve or are proposed for the future, unless they further conservation objectives, such as a conservation easement.

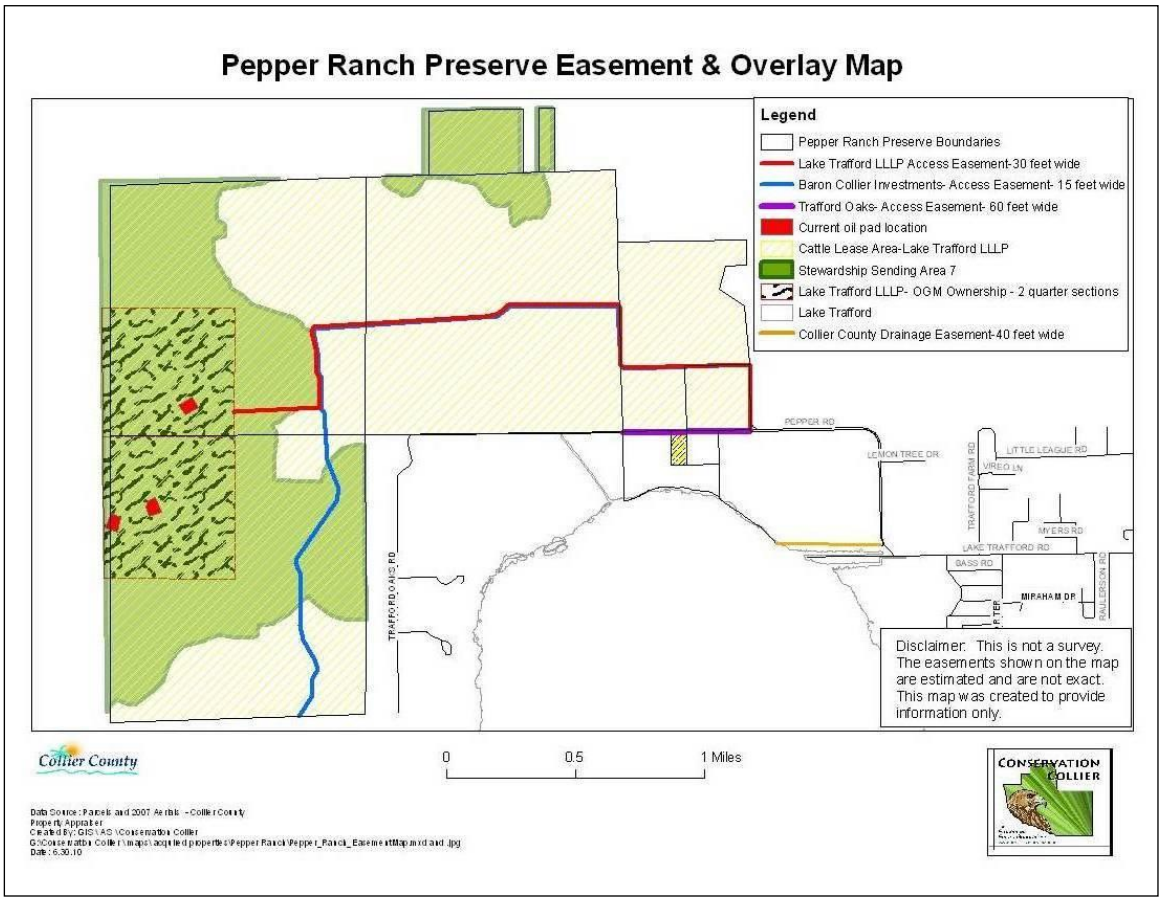


Figure 11. Pepper Ranch Preserve Easement and Overlay Map

4.3 Desired Future Conditions

This section includes a description of the proposed future conditions for the site's natural areas. Management techniques to achieve these conditions are outlined in section 4.4.

After managers complete recommended management actions, Pepper Ranch Preserve will consist of upland mixed forest, strand swamp, slough, prairie hammock, pine flatwoods, dry prairie, freshwater marshes, bottomland forest, and wet prairie. These communities will have a similar structure and composition to those that existed before non-indigenous people settled the region and before the exclusion of fire. Through restoration efforts the site will be vegetated with appropriate native flora that will provide suitable cover for a variety of wildlife species.

4.4 Goals for the 10-year period 2010-2020

A set of goals and objectives for Pepper Ranch Preserve were developed in conjunction with the drafting of this Management Plan. The goals and objectives in this plan are tailored specifically for Pepper Ranch Preserve based on the purposes for which the lands were acquired, the condition of the resources present, and the management issues for the property. On-site managers should be familiar with this entire Management Plan. Goals and objectives from the Interim Management Plan for the Pepper Ranch Preserve were reviewed to determine whether they should be included in this plan. The goals and objectives presented here reflect programmatic goals and ideas of Conservation Collier personnel in charge of managing and protecting the area. These goals shall not be modified, but specific application of management techniques may take into consideration input by user groups and other stakeholders from outside the program, accommodating user needs and desires where practicable and where overarching management goals are not violated.

Management issues are discussed below in separate sections. Within each section, approaches for dealing with these issues are described. The ability to implement the specific goals and objectives identified in this plan is dependent upon the availability of staffing and funding sources. The following goals have been identified for Pepper Ranch Preserve:

Goal 1: Eliminate or significantly reduce human impacts to indigenous flora and fauna
Goal 2: Develop a baseline monitoring report
Goal 3: Remove or control populations of invasive, exotic or problematic flora and fauna to restore and maintain natural habitats
Goal 4: Create a Prescribed Fire Plan
Goal 5: Restore native vegetation
Goal 6: Develop a plan for public use
Goal 7: Facilitate uses of the site for educational purposes
Goal 8: Provide a plan for security and disaster preparedness
Goal 9: Provide preliminary Panther Habitat Unit (PHU) calculations and a draft Monitoring Plan per USFWS requirements for an onsite Panther Conservation Bank

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

Action Item 1.1 Maintain the existing boundary fence and access gates on the Pepper Ranch Preserve as needed.

Currently, a fence is present along most of the Pepper Ranch Preserve boundary with the exception of along the western boundary which this preserve shares with the adjacent CREW lands, also there is no fence along the southern boundary on Lake Trafford. Under the existing cattle lease the lessee is responsible for the installation and maintenance of all fences on the preserve necessary for retaining cattle on the property. Firebreaks will be installed along fence lines that exist along upland areas. This will also allow for better access for fence line patrolling and maintenance.

Action Item 1.2 Install signs encouraging people to stay on public access trails situated on the preserve.
Signs will be posted along public access trails to remind visitors to remain on the trails for their safety and the protection of the natural resources of the preserve.

Action Item 1.3 Identify locations of rare and listed native plant species.
The location of these species has been identified using a global positioning system (GPS) device and mapped to allow staff to monitor them. All future sightings of such plants will be GPS-located and mapped accordingly. Public trails will be constructed to avoid areas where rare and listed species exist.

Action Item 1.4 Enforce regulations prohibiting trash in or near the preserve.
Staff will monitor the preserve on a regular basis and if dumping occurs, enforcement actions will be sought through the County Sheriff's Department.

Action Item 1.5 Identify actual and potential locations of resident animal life and take steps such as locating visitor amenities away from animal nesting sites.
An inventory of sensitive areas, such as location of listed plant species and animal nesting sites, will be maintained based on existing knowledge and to be built upon with all future protected species surveys that are conducted at the preserve. During the development of public use facilities this inventory will be utilized to locate the amenities away from known sensitive areas.

Action Item 1.6 Avoid non-target damage to native plants and animals, especially rare species, during invasive, exotic plant treatments.
If the use of herbicides is appropriate during the treatment of invasive, exotic plant species, decisions on the types of herbicides utilized will be made on the best information available at the time of exotic removal. Staff has prohibited the use of herbicides containing Imazapyr (e.g., Arsenal) due to reports that these herbicides have potentially caused a great deal of non-target damage throughout the state. Licensed County or State contractors will be monitored closely to ensure the proper herbicide applications are being utilized while treating the site. In addition, close attention will be taken to identify listed species (Table 7) that may be attached to invasive trees being cut down or removed. Individuals of these species will be relocated prior to removal. Special attention will be given to avoid damage to native species in the vicinity of exotic removal activities.

Action Item 1.7 Note, research and provide input as to all site development occurring adjacent to Pepper Ranch Preserve to determine that the proper site development permits have been obtained and that the site development complies with the permits.
Activities on adjacent and neighboring properties may have an impact on the indigenous plant and animal life on the Pepper Ranch Preserve. As such, all existing local, state, and federal regulations should be strictly followed and enforced during any site development adjacent to the preserve. It shall be the responsibility of the developer to establish erosion control measures and vegetation protection measures (i.e., protective fencing or barriers). If any site developer working in areas adjacent to

the preserve does not take the necessary control measures, construction shall be immediately halted until control measures are put into place and mitigation and/or remediation will be the sole responsibility of the developer.

GOAL 2: *DEVELOP A BASELINE MONITORING REPORT*

Action Item 2.1 Establish a long-term biological monitoring program and conduct additional wildlife surveys.

Long-term management of the preserve should be based on biological data. Changes following baseline conditions should be assessed as negative or positive, and management strategies changed appropriately. This section discusses information needs and long-term monitoring needs.

Pro Native Consulting has conducted a floristic inventory of the Pepper Ranch Preserve; these findings will comprise the baseline floristic data on which future actions will be based. The site should be inspected by Conservation Collier staff at least twice a year and thoroughly inventoried at regular intervals (ca. 5-10 years) to detect new invasions (by natives or exotics) and extirpations. Areas undergoing extreme restoration should be assessed more frequently. While some wildlife data has been collected, additional baseline data should be collected, especially on invertebrates, small mammals, reptiles, and amphibians. The site manager may contract this work out or enlist the assistance of local educators to coordinate student research projects. Wildlife surveys, like plant surveys, should take place at regular intervals (ca. 5-10 years) to detect long-term trends.

White-tailed deer and turkey surveys will be conducted each year to aid in the County's panther mitigation requirements as well as providing staff with the number of surplus animals that will be allowed to be taken in the Quality Wildlife Management Hunt Program.

Photo points will be established throughout the preserve. The total number of photo stations installed will be dependent on future restoration plans and staffing levels. Locations of photo points will be recorded with a GPS unit and all photographs taken at these locations will be taken at a standard height and angle of view. During photo documentations, one photo will be taken in each of the cardinal directions (north, east, south and west) and a 360-degree panoramic photo will also be taken. Photos will be taken with a vegetation profile board to aid in the determination of what (if any) changes occur over time. These photos will help to monitor exotic removal efforts and native plant recruitment, as well as the result of other land management activities. If necessary, more photo points will be established to aid in management decisions.

GOAL 3: *REMOVE OR CONTROL POPULATIONS OF INVASIVE, EXOTIC OR PROBLEMATIC FLORA AND FAUNA TO RESTORE AND MAINTAIN NATURAL HABITATS*

Action Item 3.1 Prioritize the removal of invasive, exotic and/or problematic plant species.

Due to the size of Pepper Ranch Preserve, it will be helpful to the preserve manager to prioritize the exotic control efforts by area of the preserve. A management unit map has been created (Appendix 5) dividing the preserve into 9 separate management units. In general, the management units will assist the preserve manager in prioritizing and allocating resources available for the management of Pepper Ranch Preserve.

Action Item 3.2 Acquire services of licensed and qualified contractor(s) for the removal of invasive, exotic and/or problematic plant species.

The following table (Table 10) describes recommended controls (Langeland & Stocker 2001; Langeland 2008) of the Category I, invasive, exotic plant species recorded to date on the Pepper Ranch Preserve. These recommended control methods may be altered by site managers dependent on new information and products available on the control of these species.

Table 10: Invasive, Exotic Plant Species Control Plan for the Pepper Ranch Preserve FLEPPC Category I species[1]

Scientific Name	Common Name	Recommended Control(s)[2]
Abrus precatorius	Rosary pea; blackeyed susan	Treat base of vine with 10% Garlon 4. Site must be revisited several times to pull seedlings.
Albizia lebbeck	woman's tongue	Basal bark treatment with 10% Garlon 4. Cut stump treatments are also effective with 50% Garlon 3A or 10% Garlon 4. Small seedlings can be hand-pulled.
Casuarina glauca	gray sheoak; suckering australian-pine	Basal bark treatment with 10% Garlon 4 is very effective, as is a cut-stump treatment with 50% Garlon 3A or 10% Garlon 4. When basal bark treatment is used on trees greater than 1' diameter it may be necessary to slough off loose bark in the application area to prevent the bark from trapping the herbicide. Addition of 3% Stalker will increase consistency on older trees. Broadcut of 4-6 lb Velpar ULW may be used when appropriate.

Table 10: Invasive, Exotic Plant Species Control Plan for the Pepper Ranch Preserve FLEPPC Category I species[1] (continued)		
Common Name	**Common Name**	**Common Name**
Eugenia uniflora	Surinam cherry	For seedlings and small plants up to ½ inch diameter, use a basal bark treatment with 10% Garlon 4. This species takes a long time to die, and may require a subsequent herbicide application. For larger stems, use a cut-stump treatment with either 50% Garlon 3A or 10% Garlon 4. Seedlings should be hand pulled.
Ficus microcarpa	Indian laurel	Basal bark application of 10% Garlon 4 is effective.
Hymenachne amplexicaulis	trompetilla	Foliar treatment with 3-5% Rodeo.
Imerata cylindrical	cogongrass	3-4 qt. Roundup Pro or 0.5 qt. Fusulade per acre. For high volume, spot treatment use 3%-5% Roundup Rpro or 0.25%-0.5% Aresenal. Herbicides should be used in combination with burning or tillage for optimum control. See IFAS publication SS-AGR-52 for additional information.
Ludwigia peruviana	Peruvian primrosewillow	Treatments can be basal bark, foliar and/or cut stump, depending on the size of the plant, with Renovate 3 in aquatic conditions or Garlon 4 in upland areas. Adjust percentage of chemical based on application method.
Lygodium microphyllum	small-leaf climbing fern	Thoroughly spray foliage to wet with 1.25% Garlon 4 (4 pt/acre), 0.6% Roundup Pro (maximum 5 pt/acre), 1.0%-3.0% Rodeo (maximum 7 pt/acre). Only Rodeo can be used if plants are growing in aquatic site. Plants growing high into trees, cut vines and treat lower portions. Do not apply when plants are under environmental stress.
Melaleuca quinquenervia	Melaleuca, punktree, paper bark	For seedlings and saplings: (1) hand pull, being sure not to break plant off of root system and remove or place in piles to help reduce the chance that they will re-root or; (2) Treat with foliar, low volume spot application of 5% Rodeo. For mature trees: (1) Fell large trees with chain saw leaving a level surface, or fell small trees with machete and treat with triclopyr or glyphosate products according to frill and girdle directions on SLN. Use aquatic versions where standing water is present. Monitor for resprouting and retreat as necessary. (3) Mature trees are very difficult to control with foliar applications.

Table 10: Invasive, Exotic Plant Species Control Plan for the Pepper Ranch Preserve FLEPPC Category I species[1] (continued)		
Scientific Name	**Common Name**	**Recommended Control(s)[2]**
Melinis repens	rose natalgrass	Foliar application of 1-2% Roundup will provide control. Roundup (glyphosate) is a short-term solution, because regrowth from seed is rapid.[3]
Nephrolepis brownii	Asian sword fern	A foliar application of Roundup at 1.5% provides control. Follow-up applications are necessary.[4]
Panicum repens	torpedo grass	Foliar application of 0.75%-1.5% Rodeo and surfactant solution. Re-apply as necessary when plants re-grow to within 4-6 inches in height; or foliar application of 0.5% spot treatment.
Pistia stratiotes	water-lettuce	Foliar application with Reward.
Psidium cattleianum	strawberry guava	Basal bark application of 10% Garlon 4.
Psidium guajava	Guava	Basal bark application of 10% Garlon 4.
Schinus terebinthifolia	Brazilian pepper	Cut-stump treatment with 50% Garlon 3A, 10% Garlon 4 or a basal bark application of 10% Garlon 4. Foliar application of Garlon 4, Garlon 3A, Roundup Pro, Roundup Super Concentrate, or Rodeo, according label directions may be used where appropriate. Glyphosate products are less effective when used alone in spring and early summer. Use Rodeo where plants are growing in aquatic sites.
Senna pendula var. glabrata	valamuerto	Foliar application, spray to wet with 1-2% Roundup Pro.[5]
Solanum viarum	tropical soda apple	Foliar application of 1% Garlon 4 or 3% Roundup.
Syzygium cumini	Java plum	Mature trees may take up to 9 months to die. Cut-stump treatment with 50% Garlon 3A or 10% Garlon 4, or use a basal bark treatment with 10% Garlon 4.

[1] FLEPPC 2009: Category I plants are those that alter native plant communities by displacing native species, change community structures or ecological functions, or hybridize with natives (FLEPPC 2009)
[2] All species except as cited otherwise
[3] (Stokes 2009)
[4](Langeland 2008)
[5](Langeland et al. 2003)

<u>Action Item 3.3</u> Acquire services of licensed or qualified contractor(s) for the removal of invasive, exotic or problematic animal species.

To date, three (2) introduced animal species have been documented on the Pepper Ranch Preserve, the brown anole and the feral hog. One potentially problematic

species is the Coyote. No attempts will be made to remove occurrences of the brown anole at the preserve. This is a pervasive animal that is now present in natural and urban areas alike.

Widespread control of coyotes has been found to be ineffective and is not ecologically or economically defensible. Individual coyotes may need to be removed from the preserve if they become a problem to the current cattle operation; that decision will be made on a case by case basis. The coyote can be legally hunted all year long with guns, dogs, live traps, or snares. A permit is required to use steel traps, to trap on another person's property, or to use a gun and light at night. Possessing or transporting a live coyote requires a Class II captive wildlife permit and the use of poison is prohibited.

Action Item 3.4 Implement the Quality Wildlife Management Hunt Program to assist in Feral Hog Management (See Regulations in Appendix 7)

It is doubtful that the total eradication of this species at Pepper Ranch Preserve can be achieved, however, efforts will be made to reduce their population and limit the damage they cause to natural areas, native plants and animals. In late 2009, the Collier County BCC approved a contract with the USDA Wildlife Services for the control of feral hogs at the preserve; fourteen hogs were removed from the preserve until the contract was cancelled in January 2010. The BCC decided that hunting was a better alternative to trapping. As a result, the first Annual Youth Hunt was held at the preserve in April 2010, with the assistance of FWC, and 4 hogs were harvested as a result. The Pepper Ranch Quality Wildlife Management Hunt Program for this preserve was then developed and began on September 11, 2010. In 2010-2011, two to three youth hunts and six public hunts are scheduled. This program will provide some control of the hog population at Pepper Ranch. Hunting alone may not properly manage the hog population and thus a monitoring program should be developed to assess the amount of hog damage to natural communities. Efforts will be made to request assistance from nearby colleges to conduct such studies. Additional control measures such as trapping may be necessary to protect the resource. Monitoring the hog population will be particularly important in the event that a wetlands mitigation bank is developed on Pepper Ranch Preserve; created/enhanced wetlands will be required to meet certain success criteria within a set timeframe and hog foraging behavior could severely impact creation/enhancement efforts. Hog fencing may also need to be installed around the entire perimeter of the preserve.

GOAL 4: *CREATE A PRESCRIBED FIRE MANAGEMENT PLAN*

Fires were a naturally occurring event in native communities prior to mankind's intervention. The primary ecological functions of fire are to eliminate accumulated plant material, return nutrients to the soil, and germinate fire-dependent species. In today's preserve areas prescribed burning is an essential tool in both land and wildlife management, and helps reduce potential damage and hazards from wildfires in the wildland/urban interface areas. Proper prescribed burns promote the growth of green shoots, roots, and rhizomes of grasses and sedges that are then available for foraging. In

wetlands, burning creates deep pools and edges for nesting and feeding of waterfowl and controls undesirable vegetation.

Much of Collier County is comprised of natural communities in general, that are dependent on fire to maintain species composition and diversity. The use of prescribed fire as a management tool will be critical to the long-term health of the natural communities and native species at the Pepper Ranch Preserve.

Action Items 4.1: Create a Prescribed Fire Management Plan

Below is the prescribed fire management plan for Pepper Ranch Preserve. The preserve land manager with assistance from the Division of Forestry (DOF) and/or a Certified Prescribed Burn Manager will implement the prescribed fire management plan according to the specific needs of Pepper Ranch Preserve. Staff may coordinate this effort with other local qualified agencies for review and approval.

Objectives

The prescribed fire plan for the Pepper Ranch Preserve will be a program that mimics the natural fire cycle for the various natural community types identified within the preserve. Timing, based on weather conditions and ignition practices can be modified to accomplish goals ranging from exotic vegetation control to wildlife habitat enhancement and fuel reduction within burn units. This prescribed fire management plan will be implemented at Pepper Ranch Preserve for ecological purposes. The goals and objectives established for the preserve will be clearly laid out and incorporated into each prescription. Generally, prescribed burns conducted at the Pepper Ranch Preserve will involve a variety of firing techniques over a range of weather conditions to create mosaic burn patterns that will benefit an array of wildlife species.

Burn Units

The size of the Pepper Ranch Preserve, in conjunction with habitat fragmentation by existing (oil fields, cattle grazing) and future uses (lodge, possible housing, camping areas and public use trails) of the preserve create a complex mosaic of fire dependent communities. This will be taken into consideration when subdividing the preserve into burn units. The creation of burn units not only facilitates the application of prescribed fire, it will also help create a mixture of burned and unburned areas across the preserve. Patches of unburned habitat in conjunction with newly burned areas will increase habitat heterogeneity, ensuring a wide range of habitat compositions year round for use by a diversity of wildlife species. The size and boundaries of each burn unit should be established based on the preserve boundaries and the location of existing barriers such as fence lines, ditches, roads and other existing structures. The division of burn units may change over time as the prescribed fire plan is implemented and on-the-ground logistics become more obvious. Fire breaks will consist of primitive roads, trails disked to bare mineral soil, wet lines or foam lines and/or natural vegetation breaks. When the Pepper Ranch Preserve burn plan is implemented, additional manmade barriers may be constructed as a result of the development of public use facilities.

If new fire breaks are needed, efforts will be made to minimize disturbance to existing native vegetation during their creation and maintenance, and no wetlands will be adversely impacted as a result of fire break construction. In the event of a wildfire DOF may create fire breaks within existing wetlands. If plow lines are put in as a result of a wildfire, whether they are in a wetland or upland, efforts will be made to grade those areas to prior grade.

Burn Frequency and Burn Season

Historically the frequency of wildfire in Florida's ecosystem varied from year to year. However, fire frequency for natural communities as found within the Pepper Ranch Preserve will generally follow these guidelines (FNAI 1990):

- wet prairies – annual (1-2 year cycle) or frequent (3-7 year cycle);
- dry prairie – frequent (1-4 year cycle);
- mesic pine flatwoods – frequent (2-4 year cycle);
- hydric pine flatwoods – frequent (3-7 year cycle);
- depression marshes – more frequent around the periphery (3-7 year cycle) and becoming more occasional toward the center (8-25 year cycle);
- cypress/pine/cabbage palm – transitional community from moist upland to hydric sites – occasional (8-25 year cycle);
- cypress strand/dome swamp – occasional around the periphery (8-25 year cycle) and rare in the deepest peat towards the center of the strand/dome (26-100 year cycle);
- slough – occasional (8-25 year cycle) or rare (26-100 year cycle);
- prairie hammock – occasional or rare; if oak and palm dominated on drier sites tolerate occasional light ground fires, but more diverse hammocks rarely burn;
- upland mixed forest – rare or no fire; densely closed canopy limits air movement and light penetration, making high humidity relatively constant.

Burn units incorporating multiple natural communities under different fire cycles will be burned based on the community requiring the shortest cycle. The other communities within that burn unit that are on a longer fire cycle will likely not burn as frequently since fuels will not have built up. The seasonality, weather factors, or ignition techniques of the prescribed burn will also be chosen to selectively burn the community within the unit with the shortest fire cycle.

Fire maintenance of hydric hammocks will be accomplished primarily by burning the adjacent flatwoods and marshes, reducing the fuel needed to ignite the hammock. Maintenance of natural species composition and protection from excess fuel build-up will be accomplished by allowing fire to enter the edges but not completely burn through the hammocks. Fire will be introduced into the edges of hammocks under moist conditions that will not result in a destructive fire through the hammock. Fire frequency in this situation will be dictated by the frequency of fires in adjacent communities.

Fire will be applied to freshwater marshes in conjunction with the burning of surrounding pine flatwoods to maintain open herbaceous ponds and control woody plants found primarily on the edge of these depressions. The centers of depression marshes are much wetter than the surrounding flatwoods and may not burn at the same time the flatwoods are ignited. In this case, a separate fire under guarded conditions may be needed to carry the fire across the marsh. In cypress strands, fire is beneficial for the control of hardwoods and reduction of ground fuels near their outside edge. Conditions dry enough to burn soils in the center of strands, or muck fires, would most likely be damaging to trees within them. The burning of cypress strands will take place only when moist conditions allow for light surface fires in the outer portion of the dome and avoid muck fires. Fire will be excluded from strands under dryer conditions.

Qualitative observations will be made within each burn unit on an annual basis to determine current fuel loads, habitat structure, and habitat quality. The burn schedule will then be modified as needed based on these qualitative observations. Areas where fire cannot be implemented will instead be mowed, roller chopped, or pruned to mimic effects of fire. The burn manager will conduct post-burn inspections to ensure the burn objectives are being met for each natural community. When possible, vegetation monitoring activities will be conducted around burn events to help assess the effectiveness of the prescribed burn regime.

Burn Schedule

Generally, prescribed burns within the Pepper Ranch Preserve will be conducted during the growing season (mid-March through early September) as well as during the dry season (November to mid-May). Essentially burns will be scheduled when conditions allow, and the timing selected to best suit the objectives for each burn unit, as well as to provide protection to listed species.

Burn Manager Duties

Florida Statute 590.125 and Chapter 5I-2 of the Florida Administrative Code (FAC) grant the DOF the authority to regulate prescribed burning in Florida. Prescribed burning will be planned and carried out by a Certified Prescribed Burn Manager (as licensed by the DOF) and experienced fire crews utilizing a Prescribed Burn Plan form, referred to from here on as the prescription. The planning and application of prescribed burning will comply with all applicable federal, state, and local regulations.

Each prescription will include the following at a minimum:

- purpose for the burn;
- brief description of the natural community type(s) to be burned;
- a map depicting the location of the burn, firebreak locations, potential hazard areas and escape routes for the fire crew;
- acceptable ranges of weather and soil moisture conditions;

- a pre-burn inspection of burn unit, firebreaks and any potential hazards (including power transmission lines, active cattle grazing locations, and existing manmade structures) within the burn unit;
- names and contact information for neighbors, lease holders, local fire district and other pertinent stakeholders to be contacted prior to ignition;
- techniques used to ignite the controlled burn;
- personnel, equipment and safety requirements;
- personnel assignments and responsibilities; and
- post-burn evaluation.

All necessary permits and authorizations will be obtained by the Certified Prescribed Burn Manager before implementation of the burn. As part of each prescription, the burn manager will develop an emergency action plan that will include escape routes for all personnel and actions to be taken in the event of unexpected weather changes or fire behavior.

Weather and Fuel Considerations

When developing recommendations for a prescribed burn, the burn manager will give careful consideration to weather and fuel conditions including, but not limited to: wind, relative humidity, temperature, rainfall and soil moisture, airmass stability and atmospheric dispersion. It will be the responsibility of the Burn Manager to obtain current weather forecasts from DOF, and other weather sources as necessary, prior to executing the prescribed burn. Although preferred weather and fuel conditions may vary based on specific burn objectives, Wade and Lundsford (1989) suggest the following as preferred conditions for prescribed burns in southern forests:

- 6 to 20 mph persistent surface winds;
- 30 to 55 percent relative humidity;
- temperatures above 80 degrees Fahrenheit are recommended when the primary objective is to control undesirable species;
- damp soil moistures;
- slightly unstable or neutral airmass stability; and
- KBDI of 0 to 600 dependent on burn objectives.

Smoke Management

Smoke management is an essential component of the burn prescription. The burn manager will evaluate the potential impacts of each prescribed burn to smoke-sensitive areas located within a 20-mile radius from the location of the burn by employing a Screening System, such as recommended in Wade and Lundsford (1989). Based on definitions contained within the state regulations, smoke sensitive areas are areas within which smoke could have an adverse impact for reasons of visibility, health or human welfare (NRCS 2003). Monitoring of the prescribed burn will continue until smoke no longer presents a potential hazard and there is no potential for the fire to reignite and cause an uncontrolled fire.

Post-Burn Evaluation
The purpose of the post-burn evaluation is to ensure the objectives of the burn were attained and gain information to be used in future burns (Wade and Lundsford 1989). The post-burn evaluation will be conducted by the burn manager within one week following the burn, as well as a second evaluation after the first post-fire growing season. Quantitative vegetation monitoring, photo documentation and wildlife monitoring can be implemented to further aid in determining if the objectives of each burn were met.

Action Item 4.2 Develop Burn Units
Burn units will need to be delineated for Pepper Ranch Preserve, as outlined in the prescribed fire management plan above prior to the implementation of the plan.

Action Item 4.3 Install Perimeter Fire Lines/Obtain Permits
Before clearing any vegetation to create firebreaks, permits must be received from the Collier County Community Development and Environmental Services Department. Fire lines will be installed utilizing best management practices to minimize impacts to mature trees, natural communities and wildlife populations. Firebreaks will be disked or mulched down to soil and will go around all mature pine trees; they will be a maximum of 8-10 feet wide.

GOAL 5: *RESTORE NATIVE VEGETATION*

Action Item 5.1 Evaluate the feasibility of conducting a hydrological analysis of the preserve to better determine restoration needs.
During the fieldwork conducted by Johnson Engineering, Inc. in the fall of 2009 it was noted that many of the natural wetland natural communities at Pepper Ranch Preserve are disturbed; as described in section 2.3. This disturbance appears to be hydrologic in nature due to the lack of standing water observed in these wetland communities in comparison to the undisturbed wetlands, and by the relatively high number of upland and exotic/nuisance plant species observed in the disturbed wetlands. A hydrological analysis of the preserve would provide a baseline for the development of a hydrologic restoration plan for Pepper Ranch Preserve. The presence of invasive exotic vegetation can be related to a hydrologic disturbance. Identifying hydrologic disturbances and proposing remedial measures (i.e. ditch removal or ditch blocks) at the preserve would not only work towards the restoration of natural plant communities but also possibly help limit exotic plant invasions in those areas. The analysis could be taken a step further to incorporate water quality analysis especially as it pertains to water flows into Lake Trafford.

A hydrologic analysis of the preserve would generally involve the placement of Surface and ground water level monitoring wells at strategic locations throughout the preserve, mapping ditches and canals on the preserve, reviewing historic aerial photography of the preserve and determining the historic sheet flow patterns on site.

Surface and ground water level monitoring wells installed for the purpose of this hydrologic analysis could be left in place for long-term, on-going monitoring at Pepper Ranch Preserve. The data collected would help monitor the health of wetland systems on site over time, as well as provide a baseline of wetland function that could help evaluate possible effects from proposed adjacent land use changes (i.e. if a mine was ever proposed adjacent to the preserve).

Action Item 5.2 Maintain a revised GIS map and description of FNAI natural communities and disturbed areas on the property.
Maintaining updated maps will help to guide restoration efforts.

Action Item 5.3 Plant native plant species in their appropriate habitats.
Periods following exotic removal and prescribed fire (or mechanical treatment) are essential to the recruitment of native plants. If native plant recruitment is not sufficient from the surrounding, intact seed source, efforts will be made to plant indigenous flora in appropriate habitats. Natural area restoration of Pepper Ranch Preserve should include only site-specific native plant material that has been determined to be non-problematic at the site and whenever possible, site-specific seed sources should be utilized. In addition, hardwoods that may invade the natural areas (mesic pine flatwood area) should not be planted.

GOAL 6: *DEVELOP A PLAN FOR PUBLIC USE*

Action Item 6.1 Develop access and required facilities for intended public uses.
There are many opportunities for public use at the Pepper Ranch Preserve due to the size of the preserve, its proximity to the community of Immokalee and the diversity of natural communities present. In addition to public uses at the preserve there are also revenue-generating uses as presented above, cattle lease and oil fields, hunting, as well as mitigation uses that are proposed for the preserve, such as a panther conservation bank and wetland mitigation. All of these different uses may not be compatible with one another and thus a compatibility matrix was devised to better illustrate when and where at Pepper Ranch Preserve the different uses can occur. This matrix is included in this plan as Appendix 8.

Until a future public use plan is formalized, portions of Pepper Ranch Preserve will be open to the public on Saturdays from November 2010 through April 2011 from 8 AM until 1:30 PM. The public will be invited to lodge/visitor's center and to utilize a short hiking trail in the Southern Public Use Area. Daily permits will also be issued to allow the public to drive through the northern public use area. County staff will be at the south entrance gate on Pepper Rd. to provide access and assistance to visitors.

Portable toilet facilities will be available during this timeframe until a permanent facility can be built. Upon professional inspection of the existing septic system associated with the lodge, it was determined to be unsafe and was crushed and permanently shut down. A new septic system and water wells will be necessary for the development of permanent public use facilities at Pepper Ranch Preserve.

Conservation Collier staff will be discussing with the Collier County Parks and Recreation Program the possibility of their involvement in administering and staffing public access programs on the preserve. Staff will also attempt to develop a volunteer program for all of the Conservation Collier Preserves to assist with guided public tours and other activities.

To avoid impacts to natural communities at Pepper Ranch, guidelines will need to be developed for the allowable uses on all proposed trails and other amenities. Guidelines will include instructions for users such as staying on trails to avoid altering the natural communities, to take only pictures and leave only footprints. The development of all trail systems at Pepper Ranch should to the extent practicable, utilize existing trails and other impacted areas, be developed along the natural edge of natural communities where their construction will minimize disturbances, as well as avoid impacts to marshes and other wetland systems.

The implementation of the proposed public uses at Pepper Ranch Preserve is dependent on funding, safety issues, site security and the availability of staff. Johnson Engineering, Inc. and Conservation Collier staff developed a conceptual site plan (Figure 12) incorporating the following proposed components:

The South Public Access Area will be situated on the south side of Pepper Road with a parking area and trailhead that will lead to the lodge, an ADA compliant walking trail will lead to a short boardwalk that will end at an elevated overlook along Lake Trafford.

- ***The lodge*** **–** Conservation Collier staff is evaluating the possibility of renovating the existing lodge and will use it as a public use as a visitor center. The lodge could also be rented for special events. Policies will need to be created though the Ordinance, Policy and Rules subcommittee in regard to special events, lodge rentals and ecotourism. Approved eco-tours need to be compatible with this management plan.
- ***The lodge hiking trail*** **–** The lodge hiking trail will be accessible from the south public entrance. It will be a loop trail (approximately 0.8 miles), heading east from the trailhead/parking area, meandering through oak hammock, mesic flatwoods and dry prairie communities; there will be a short segment of boardwalk crossing over a depressional marsh. Benches and interpretive signage will be placed at strategic locations along the trail.
- ***The boardwalk*** **–** The boardwalk (length = approximately 812’ or less) will begin at the south end of the south public access area trailhead/parking area and will provide access to a covered lake overlook platform.
- ***The lake overlook platform*** **–**A covered lake overlook platform is proposed at the terminus of the boardwalk and would allow visitors to view Lake Trafford from a raised elevation. This is proposed to be constructed on the existing raised shoreline and not directly over Lake Trafford.

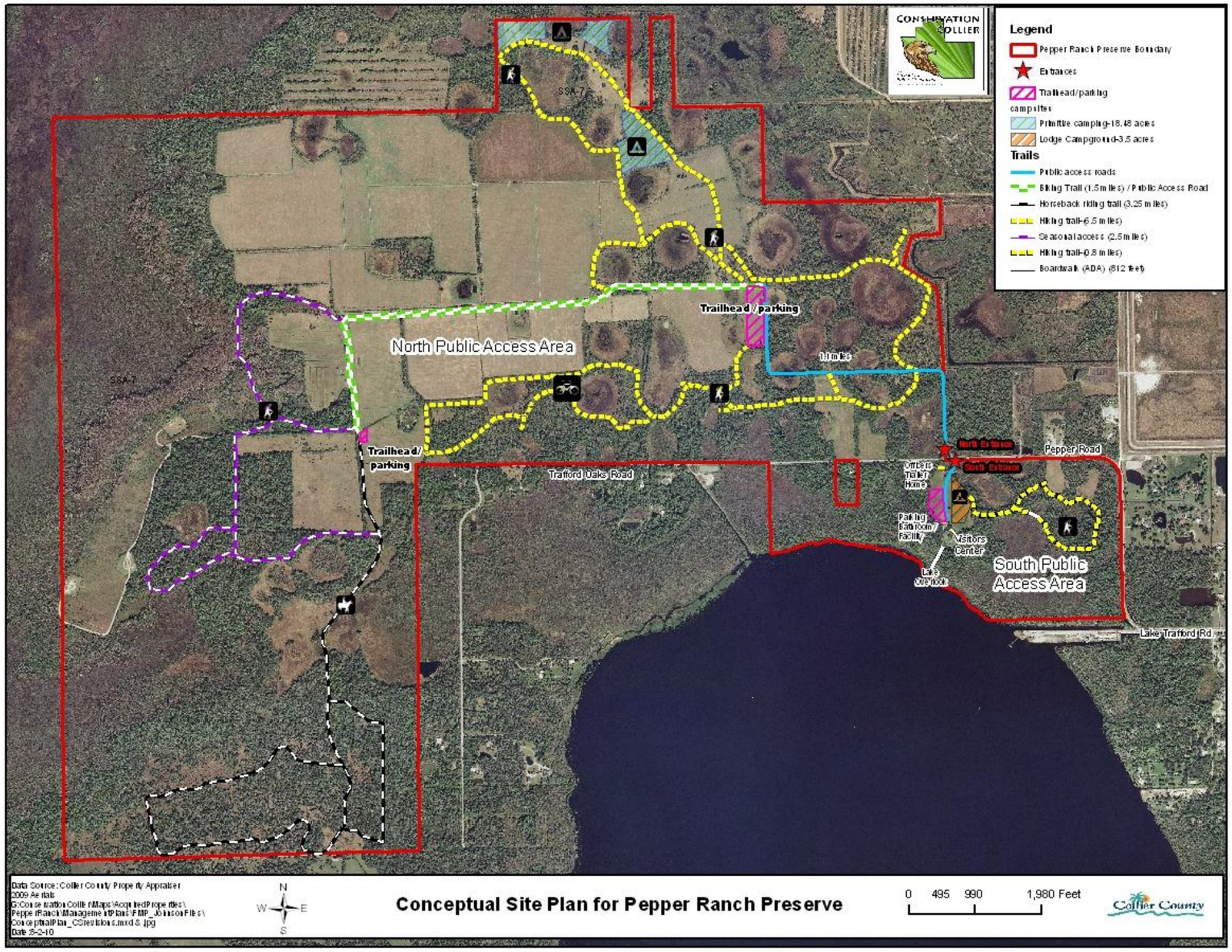


Figure 12: Conceptual Site Plan for Pepper Ranch Preserve

- ***Future camping area-*** A small camping area will be developed in the current eastern pasture area located between the entrance to the south public access area and the lodge. This will be open to the public as soon as adequate staffing is available and when the bathroom facilities are completed. This campground will be accessible to tent campers with vehicles, but not RV's. An RV may only be allowed in this campground for use by a campground host or possibly under other special circumstances.
- ***Officer's Trailer home-*** A single-wide manufactured trailer home will be placed on a small improved area just south and west of the gate to the south public access area. A County Sheriff's Department officer or FWCC officer will reside there to keep watch over the property.

The North Public Access Area is accessible from the north gate off of Pepper Road and will provide public access for a scenic drive, hiking trails, multi-use trails, and primitive camping areas. This northern area will be accessible after obtaining a daily use permit from the lodge/visitor center.

- ***The Scenic Drive-*** the public will be allowed to drive through the Preserve along the main road after obtaining a daily use permit from the visitor center. This will allow the public to view the majority of the preserve by vehicle to view the wildlife and different ecosystems present on the preserve. They would also be required to check out when they depart. Until designated trails listed below can be created for other uses, the public will be asked to stay on the main roads during their tour.
- ***The hiking trails –*** These trails will provide a view of live oak hammocks, mesic flatwoods, and depressional marshes; they will not be ADA compliant. Currently five (5) separate loop trails totaling (6.5) miles, are proposed to provide access to the east, north and south-central portions of the preserve. They will be accessible from the north public entrance, in addition to a multi-use trail and a seasonal access trail. Mountain biking may be allowed on the portions of this trail system. If large groups of bikers schedule a tour, portions of that trail system could be closed to hikers for safety reasons. Benches and interpretive signage will be placed at strategic locations along the trails. Staff and the appropriate subcommittee(s) of the Conservation Collier Land Acquisition Advisory Committee (CCLAAC) will collaborate with user groups to provide safe and compatible access.
- ***The Horseback riding trail –*** This trail (length = 3.25 miles), will start at the crossroads to the oil well road and the south easement road. The public will be required to park their horse trailers at the start of the trail in a designated parking area. The development and maintenance of this parking area and trail system will be based on public interest. A portion of this trail is currently a narrow road with an access easement associated with the adjacent property to the south. The trail will be created using existing trails and future firebreaks. Equestrian use at Pepper Ranch Preserve may also require additional amenities such as watering and feeding areas.
- ***The seasonal access trail –*** This trail (length = 2.5 miles) will allow visitors to the preserve to walk through some of the scenic wetland communities

located in the western portion of the preserve during the dry season. It is located west of the driving trail and will traverse through natural communities such as cypress strand and a red maple dominate bottomland forest. This trail will be limited to foot traffic to prevent damage to the sensitive wetland soils.

- ***The primitive camping*** **–** The primitive camping will be accessible from the north public entrance. There are three separate locations for primitive camping along the north hiking loop trail. These campsites will be walk-in only and will have no facilities other than possibly primitive restrooms.

Action Item 6.2 Pepper Ranch Quality Wildlife Management Hunt Program

Currently, the public are utilizing the preserve through the limited hunting of small game and hogs one weekend a month from September - June 2010-2011. Turkey hunts are also scheduled for February and April 2011. Deer hunting will be introduced in the Fall of 2011. Two to three FWC youth hunts will also be held each year depending on the continued interest and volunteers. The Preserve will be closed on Saturday and Sunday during each hunt weekend. Currently, the hunts are limited to 10 hunters per weekend and hunters have designated hunting zones. The zone closest to the lake and the structures is limited to archery only (See Appendix 7). The amount of public hunts and youth hunts that will be allowed each year may change when other public uses of the property increase and based on wildlife management determinations.

GOAL 7: *FACILITATE USES OF THE SITE FOR EDUCATIONAL PURPOSES*

Actions Item 7.1 Develop interpretive signage to educate preserve visitors.

Once a trail system is complete, site-specific signage will be developed to educate visitors on plant identification and general ecosystem information. A large sign with a map of the preserve will be installed at each of the trailheads at the north and south public entrances and smaller, more site specific interpretive signs, will be placed along the various trails.

Action Item 7.2 Provide preserve brochures in rainproof box on site.

A brochure outlining the native plant communities and wildlife present at the preserve will be created by County staff and kept in rainproof boxes near the preserve entrance. The preserve manager will inspect these boxes monthly and refill the brochures as necessary.

GOAL 8: *PROVIDE A PLAN FOR SECURITY AND DISASTER PREPAREDNESS*

Action Item 8.1 Discourage any unauthorized visitation to the preserve at night and identify the hours of operation.

A security light and sign designating park hours as sunrise to sunset will be installed at the entrances to the preserve and adjacent landowners will be given an emergency phone number if they detect human activity on the preserve after hours. If problems arise, the Collier County Sheriff's Office will be contacted to patrol the area and site

on a routine basis. Once any type of camping facilities are open to the public on site an automatic gate or combination lock at the entrance will allow nighttime access to the preserve to campers, law enforcement and staff only. Conservation Collier staff is developing a Preserve Ordinance which may address the issues of types of visitation, hours of operation, etc.

A single-wide manufactured trailer home will be placed on a small improved area in the south public access area. A County Sheriff's Department officer or FWCC officer with jurisdictional arrest capability will reside there to keep watch over the preserve.

Action Item 8.2 Enforce regulations prohibiting trash and landscape debris dumping in or near the preserve.
Currently, illegal dumping is not occurring on or near the preserve. Monthly property inspections will be conducted to monitor for such activity. Staff will work with the Collier County Sheriff's Office if problems start to arise.

Action Item 8.3 Survey trees along the trail and the perimeter of the property for damage.
Staff will routinely monitor the trees along the walking and hiking trails to determine if diseased, weak, or damaged trees/limbs exist and if so remove them to reduce the risk of visitor injury. Due to the length of the proposed trails at Pepper Ranch Preserve this activity will likely require the assistance from volunteers and/or the Department of Corrections work crews, as feasible.

Action Item 8.4 Visit the preserve within 48 hours after a major storm event to assess damage.
Staff will take photos of damage and fill out appropriate Collier County Risk Management Department forms. If damage is extensive, the preserve will be closed until public safety hazards are cleared.

Action Item 8.5 Promptly clear storm debris from preserve.
If necessary, a Collier County emergency debris removal contractor will be contracted as soon as possible after the storm to schedule clean up. Removal of debris and damaged or downed trees along the trail system may be needed. Downed trees and limbs that do not appear to be a public safety hazard will be cleared at the discretion of the Preserve Manager. As much of the hurricane debris as possible will be chipped and retained onsite to be used as mulch for the trails. The preserve will be closed temporarily until the potential hazards are eliminated.

GOAL 9: *PROVIDE PRELIMINARY PANTHER HABITAT UNIT (PHU) CALCULATIONS AND A DRAFT MONITORING PLAN PER USFWS REQUIREMENTS FOR AN ONSITE PANTHER CONSERVATION BANK*

A panther conservation bank on a portion of Pepper Ranch Preserve would create an inter-departmental partnership for Collier County. The mitigation or PHU's generated by restoring altered communities at the preserve would be utilized for

offsetting the panther impacts from Collier County transportation and other public works projects while providing the funding necessary to restore the preserve.

The information provided below in Action Items 9.1 and 9.2 is meant to provide the basis necessary to allow for the commencement of preliminary discussions with all stakeholders involved in a potential future bank. If Conservation Collier and other Collier County departments choose to pursue the option of a bank further, a consultant would likely be hired to assist with planning, agency coordination and permitting of the bank.

<u>Action Item 9.1</u> Provide Panther Habitat Unit calculations for the area of Pepper Ranch Preserve proposed for a Panther Conservation Bank.

Table 11 provides the calculations for the panther habitat units (PHU) for the entire Pepper Ranch Preserve, including the areas that are within the Stewardship Sending Area 7 (SSA 7). The calculations are based on the existing conditions at the preserve using current (January 2010) USFWS habitat suitability scores.

Table 11: Panther Habitat Unit Calculations including SSA 7

Pre Restoration

FWS Ecosystems	Habitat Suitability Score	Total Acres	Panther Habitat Units
Improved Pasture	5.2	667.34	3470.17
Urban	0	26.26	0.00
Dry Prairie	6.3	37.99	239.34
Shrub Swamp/Brush	5.5	264.27	1453.49
Upland-Hydric Pine Forest	9.5	209.59	1991.11
Exotic Plants	3	133.38	40.14
Upland Hardwood Forest	9	17.42	156.78
Hardwood-Pine Forest	9.3	440.38	4095.53
Berms	5	1.24	6.20
Barren (Primitive Trails)	3	4.9	14.70
Open Water	0	36.58	0.00
Hardwood Swamp	9	241.76	2175.84
Cypress Swamp	9	119.9	1079.10
Marsh/Wet Prairie	4.7	309	1452.30
		2510.01	**16534.69**

To date, the USFWS has indicated to Conservation Collier staff that the SSA 7 areas will not be eligible for PHU's. For this reason, Table 12 was created to provide the total PHU's based on existing conditions excluding SSA 7.

Table 12: Panther Habitat Unit Calculations excluding SSA 7 Pre Restoration			
FWS Ecosystems	**Habitat Suitability Score**	**Total Acres**	**Panther Habitat Units**
Improved Pasture	5.2	556.52	2893.90
Urban	0	13.83	0.00
Dry Prairie	6.3	36.24	228.31
Shrub Swamp/Brush	5.5	18.68	102.74
Upland-Hydric Pine Forest	9.5	197.59	1877.11
Exotic Plants	3	85.42	256.26
Upland Hardwood Forest	9	3.56	32.04
Hardwood-Pine Forest	9.3	247.21	2299.05
Berms	5	2.27	11.35
Barren (Primitive Trails)	3	2.12	6.36
Open Water	0	27.18	0.00
Hardwood Swamp	9	106.22	955.98
Cypress Swamp	9	0.72	6.48
Marsh/Wet Prairie	4.7	222.97	1047.96
		1520.53	**9717.54**

To determine the amount of PHU's that could be available for mitigation, the following calculations were performed based on site conditions post restoration. Site restoration includes converting improved/unimproved pastures, ditches, berms, and exotic communities to upland or hydric pine forest. Restoration also includes conversion of a borrow pond to marsh community. Tables 13 and 14 provide the post restoration PHU calculations including and excluding SSA 7, respectively.

Table 13: Panther Habitat Unit Calculations including SSA 7 Post Restoration			
FWS Ecosystems	**Habitat Suitability Score**	**Total Acres**	**Panther Habitat Units**
Improved Pasture to Upland-Hydric Pine Forest	7.35	*640.74	4709.44
Urban	0	26.26	0.00
Dry Prairie	6.3	39.45	248.54
Shrub Swamp/Brush	5.5	266.52	1465.86
Upland-Hydric Pine Forest	9.5	219.40	2084.49
Non-native (exotics) to Upland-Hydric Pine Forest	6.25	14.86	92.88
Upland Hardwood Forest	9	20.92	188.28
Hardwood-Pine Forest	9.3	464.19	4316.97
Barren (Primitive Trails)	3	4.90	14.70
Hardwood Swamp	9	242.46	2182.14
Cypress Swamp	9	126.07	1134.63
Marsh/Wet Prairie	4.7	367.08	1725.28
Berm Restoration to Upland-Hydric Pine Forest	7.25	2.43	17.62
Ditch to Upland-Hydric Pine Forest	4.75	35.15	166.96
Borrow Pond to Marsh	4.7	1.43	6.72
		1831.12	**18354.51**

*Approximately 38.13 acres of various habitat will be converted to recreational uses (i.e. trailhead parking areas, RV camping, campgrounds, etc.). This acreage has been removed from the PHU calculations.

Table 14: Panther Habitat Unit Calculations excluding SSA 7 Post Restoration			
FWS Ecosystems	**Habitat Suitability Score**	**Total Acres**	**Panther Habitat Units**
Improved Pasture to Upland-Hydric Pine Forest	7.35	*529.92	3894.91
Urban	0	13.83	0.00
Dry Prairie	6.3	37.39	235.56
Shrub Swamp/Brush	5.5	19.61	107.86
Upland-Hydric Pine Forest	9.5	199.52	1895.44
Non-native (exotics) to Upland-Hydric Pine Forest	6.25	9.96	62.25
Upland Hardwood Forest	9	6.00	54.00
Hardwood-Pine Forest	9.3	259.23	2410.84
Barren (Primitive Trails)	3	2.12	6.36
Hardwood Swamp	9	106.61	959.49
Cypress Swamp	9	0.72	6.48
Marsh/Wet Prairie	4.7	268.04	1259.79
Berm Restoration to Upland-Hydric Pine Forest	7.25	2.27	16.46
Ditch to Upland-Hydric Pine Forest	4.75	26.40	125.40
Borrow Pond to Marsh	4.7	0.78	3.67
		1482.40	**11038.51**

*Approximately 38.13 acres of various habitat will be converted to recreational uses (i.e. trailhead parking areas, RV camping, campgrounds, etc.). This acreage has been removed from the PHU calculations.

Subtracting the total PHUs pre restoration from the total PHUs post restoration provides the "lift" or PHUs available for mitigation. Based on existing and post restoration conditions at the Pepper Ranch Preserve, the entire Preserve (including SSA 7) could provide approximately 1,819.82 PHUs. The Preserve, excluding SSA 7, could provide approximately 1,320.97 PHUs. The preliminary PHU calculations are based on current (January 2010) USFWS habitat suitability scores and are subject to review and final approval by USFWS.

<u>Action Item 9.2</u> Provide a draft Monitoring Plan per USFWS requirements for the area of Pepper Ranch Preserve proposed for a Panther Conservation Bank.
With the establishment of a panther conservation bank the USFWS requires a monitoring plan for the lands within the designated bank to ensure the bank continues to meet its success criteria in perpetuity. Below is a draft monitoring plan for the creation of a possible panther conservation bank at Pepper Ranch Preserve.

Monitoring

Baseline monitoring will be completed within 60 days of approval of the Bank by USFWS and a baseline monitoring report will be forwarded to USFWS staff in Vero Beach within 45 days of the monitoring event. Time-zero monitoring will be completed within 60 days of the completion of exotic and nuisance vegetation removal. As with the baseline monitoring report, the time-zero monitoring report will be forwarded to USFWS staff in Vero Beach within 45 days of the monitoring event. Annual monitoring will begin 12 months following the time-zero monitoring event and continue for a total of five years. Annual monitoring reports will be forwarded to USFWS staff in Vero Beach prior to January 31 each year. If, at the end of five years of monitoring, the Bank has reached success criteria, monitoring will be conducted once every five years to insure that success criteria are met in perpetuity. If success criteria are not met then annual monitoring will continue until met. A summary of the reporting schedule can be found in Table 15.

Table 15: Monitoring and Reporting Schedule for Panther Conservation Bank

Report	Monitoring Implemented	Delivery
Baseline Monitoring	Within 60 Days of Approval	45 days
Time-Zero Monitoring	Within 60 Days of Initial Restoration	45 days
Annual Monitoring	Year 1 12 Months After Time-Zero Monitoring	45 days
Annual Monitoring	Year 2 1 Year from Previous Report	January 31
Annual Monitoring	Year 3 1 Year from Previous Report	January 31
Annual Monitoring	Year 4 1 Year from Previous Report	January 31
Annual Monitoring	Year 5 1 Year from Previous Report	January 31
Five-Year Monitoring (Year 10)	5 Years from Previous Report	January 31
Every 5 years thereafter	5 Years from Previous Report	January 31

Vegetation Monitoring:

Permanent monitoring transects will be established during the time-zero monitoring event and located throughout the site to include a thorough representation of the various natural communities onsite. Three vegetative strata will be sampled along each transect and will be representative of natural community types throughout the site. These strata are: canopy [plants >4 inches diameter breast height (DBH)], midstory (plants <4 inches DBH and greater than 3 feet in height) and ground cover (all non-woody plants and woody plants less than 3 feet in height). The canopy and midcanopy vegetation will be sampled in 10 square meter plots and the ground cover vegetation sampled in 1 square meter plots along each monitoring transect. Panoramic photographs will be taken at the beginning of each transect to provide physical documentation of the condition and appearance of the property as well as any changes taking place. The panoramic photographs will be included in each monitoring report. For the canopy and midcanopy stratums, the relative canopy closure for each species will be recorded. Average shrub height will be recorded for all species identified in the midcanopy stratum. Percent coverage and average height

for all saw palmetto will be recorded for plots located within communities with saw palmetto. The percent cover of ground cover species and bare ground will be estimated for the herbaceous study plots along the transects. Exotic and nuisance vegetation coverage within the plots will be recorded. Survival rate evaluations will occur throughout the site to include a thorough representation of the various natural communities onsite.

Exotic and Nuisance Species Monitoring:
In addition to the permanent monitoring transects, existing disturbed areas, such as fence lines, fire breaks and primitive roads/trails, will be surveyed annually, using the FWC protocol (FWC 2009), by vehicle and meandering pedestrian transects to assess the site for the presence and percent coverage of exotic vegetation species. Following the annual exotic vegetation surveys, an exotic vegetation map will be prepared illustrating the locations of exotic and nuisance vegetation in need of corrective action. The map will be provided to the County and USFWS annually to ensure timely and effective treatment.

Wildlife Utilization:
Regular and periodic observations of wildlife will be made during all monitoring events and other site visits by qualified ecologists. This will consist of recording evidence and signs of wildlife (i.e., direct sightings, vocalizations, burrows, nests, tracks, droppings, etc.). The number of white tailed deer, feral hog and panther observations at the site will be recorded during each monitoring event and included in the annual reports. In addition, permanent wildlife transects will be established in representative natural communities onsite from which surveys for panther and panther prey tracks will be conducted. Efforts will be made to establish the wildlife transects in areas that are conducive to track detection and identification with as little disturbance by vehicular traffic as possible. The wildlife transects will be monitored annually for a 5-day period, and results submitted in conjunction with the vegetation monitoring in the monitoring report. Updated panther radio telemetry data (when available) within a 2-mile radius of the site will be included in the monitoring report to document radio-collared panther activity in the Bank vicinity over the course of the monitoring period.

In addition to the information outlined above, the monitoring report will also include a general overview of the land management activities (i.e. prescribed burns, exotic vegetation maintenance, pasture restoration activities, etc.) conducted since the previous monitoring report and planned maintenance and management activities during the next period.

4.5 Establish an Operational Plan for the Pepper Ranch Preserve

This section provides management recommendations for operation of the Pepper Ranch Preserve. It discusses maintenance and budgeting needs, the possibilities for contracting the restoration activities, coordination and other management issues.

4.5.1 Maintenance

Initially, the primary maintenance activities for the preserve will include invasive exotic species control and trail maintenance and site security. Particularly important are the

security measures to keep intruders out and maintain the signage and fencing (where installed) in good condition. Signs that effectively convey the desired message provide an opportunity for increasing environmental education and awareness. Once the preserve is open to the public other significant maintenance activities will be necessary for the upkeep of all public facilities including but not limited to the trailheads/parking areas, lodge, campgrounds, boardwalks, fishing pier, restrooms and interpretive signage.

4.5.2 Estimated Annual Costs and Funding Sources

Preliminary budget estimates for Pepper Ranch Preserve include cost breakdowns associated with resource restoration and management. The funding source identified for the restoration and management activities is the Conservation Collier Program Management Trust Fund. Grants will be sought to supplement existing management funds particularly for the areas within SSA 7. Staff will also utilize the Collier County Sheriff's Department weekenders program for certain labor projects and may also separately involve the County Scout programs for trail creation and enhancement.

The budget in Table 16 represents the actual and unmet budgetary needs for managing the lands and resources of the preserve for the next ten years. The table shows the activities planned and the initial and annual cost estimate of each activity. The assumption was made that public facilities at the south public access area would be constructed first. This budget was developed using data from Conservation Collier and other cooperating entities, and is based on actual costs for land management activities, equipment purchase and maintenance, and for development of fixed capital facilities. The budget considers available funding and is consistent with the direction necessary to achieve the goals and objectives for Pepper Ranch Preserve.

There are presently no utilities on site; a septic system and well for potable water will need to be installed. Determining the extent and capacity of public use facilities to be developed will help determine the type and amount of utilities required. Due to these current unknowns it is difficult to estimate the cost of both the utilities and the public use facilities. The cost estimates provided in Table 16 are based on best available knowledge, are subject to change and many could not be given at this time.

Table 16: Estimated Annual Land Management Budget

Item	QTY	Cost ($)	2010-11	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17	2017-18	2018-19	2019-20	Total
Facilities Development													
Entrance gates[1]	2	$2,500	$2,500				$2,500						$5,000
Interpretive signs[2]	2	$500		$500			$500						$1,000
Plant signs[3]	50	$10		$250			$250						$500
Entrance signage[4]	1	$2,000		$2,000									$2,000
Directional signage[5]	2	$500		$500									$500
Benches[6]	6	$650		$1,300			$2,600						$3,900
Parking areas (2)[7]	2	$30,000		$30,000			$30,000						$30,000
Primitive camping[8]	18.5 acres	$50/acre					$925	$925	$925	$925	$925	$925	$5,550
Campground[9]	12.4 acres	t.b.d.											t.b.d.
New septic system[10]	1-3	$30,000+	$30,000+	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	$30,000+
New well and treatment system[11]	1-3	$15,000+	$15,000+	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	t.b.d.	$15,000+
Temporary portable toilets (1 ADA; 1 regular; weekly maintenance)[12]	2	$1,740	$1,740										$3,480
Restroom facilities SDP and construction		$50,000	$50,000	$50,000			$50,000						$150,000
Drain field for restrooms		$15,000		$15,000			$15,000						$30,000
Removal of caretaker house[13]		$20,000											$20,000
Installation of trailer for onsite law enforcement[14]		t.b.d.											t.b.d.
Restoration/Monitoring													
Feral hog management			$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$1,000	$10,000
Firebreak and trail clearing/mowing	30,000 l.f.		$400,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$490,000

Table 16: Estimated Annual Land Management Budget (continued)													
Item	**QTY**	**Cost ($)**	**2010-11**	**2011-12**	**2012-13**	**2013-14**	**2014-15**	**2015-16**	**2016-17**	**2017-18**	**2018-19**	**2019-20**	**Total**
Restoration/Monitoring (cont.)													
Preserve assistance			$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$10,000	$100,000
Establish photo points	10	$15	$150	$30	$30	$30	$30	$30	$30	$30	$30	$30	$420
Remove invasive exotic and nuisance species		$1,000,000		$1,000,000	$97,500	$97,500	$72,500	$72,500	$72,500	$72,500	$72,500	$72,500	$1,630,000
Natural plant community restoration[15]		t.b.d.											t.b.d.
Mitigation													
Panther/wetland conservation bank planning and permitting		$91,000											$91,000
Regular Maintenance													
Maintenance			$182,300	$732,000	$732,000	$407,000	$407,000	$297,000	$75,000	$75,000	$75,000	$75,000	$2,650,300
Brochures[16]			$300	$300	$300	$300	$300	$300	$300	$300	$300	$300	$3,000
GRAND TOTAL:													**$5,335,650**

Assumptions for Cost Estimates:

1. **Entrance gates**: Two electronic gates, one at each of the entrances to the preserve, that would provide nighttime access to campers, law enforcement and preserve staff.
2. **Interpretive signs**: 2 interpretive signs, one at each of the trailhead/parking areas, 4'x6' at $500 each.
3. **Plant signs**: small signs identifying native plants, 50 @ $10 each.
4. **Entrance signage**: 1 welcome sign (8'x6') estimated @ $2,000.
5. **Directional signage**: 2 road signs indicating entrance to the preserve ($250 each).
6. **Benches**: each bench at $650; benches could be constructed as part of Eagle Scout projects to eliminate this cost.
7. **Parking areas**: 2 pervious parking areas; 1 at the south public entrance for up to 30 pervious spaces ($30,000); 1 at the north public entrance for up to 15 car spaces and 10 truck/horse trailer spaces, all pervious ($30,000).
8. **Primitive camping**: primitive camping areas total approximately 18.5 acres; areas would be created and maintained by bush-hog mowing.
9. **Campground**: due to the cost of installing new septic and well/treatment systems at the preserve, the feasibility of implementing this amenity is still being explored.
10. **New septic system**: This estimate is for the lodge and caretaker residence only; it does not include what would be required for the campground area. It also does not include the septic design.
11. **New well and treatment system**: This estimate is for the lodge and caretaker residence only; it does not include what would be required for the campground area. It will be costly to maintain these systems to public standards.
12. **Portable toilets**: $290/month for 6 months, based on United Site Services quote from IMP; this is a possible option until permanent facilities are constructed.
13. **Removal of caretaker house**: The estimate to renovate this house as a residence for onsite law enforcement came in at $65,000+; Conservation Collier staff is discussing with the law enforcement agencies the possibility of them providing their own trailer to place onsite as a residence.
14. **Trailer**: Even if the law enforcement agency provided their own trailer it would still need to be hooked up to onsite septic and well systems.
15. **Natural plant community restoration:** this cost will be based on the type and extent of restoration to be implemented, which will be determined during the conservation bank planning and permitting. If a bank is set up the cost of restoration will be the responsibility of the entity using the mitigation.
16. **Brochures:** Printing cost only.

4.5.3 Potential for Contracting Restoration and Management Activities by Private Vendors

A significant number of management operations and restoration activities on the Pepper Ranch Preserve can be considered for outsourcing. Restoration and management activities that can be considered for outsourcing to private entities are listed in Table 10.

Table 17: Potential Contracting for Restoration and Management Activities

Activity	Approved	Conditional	Rejected
Prescribed fire and/ or mechanical treatment application	X		
Minor fireline installation	X		
Fireline, fence and trail maintenance	X		
Fence installation	X		
Plant and wildlife inventory and monitoring		X	
Listed species mapping and needs assessment		X	
Restore/enhance encroachment and ruderal areas		X	
Reduce exotic species	X		
Literature development and printing		X	
Interpretive signs development and installation		X	
Trail installation	X		
Parking Area construction	X		
Law enforcement and patrol	X		

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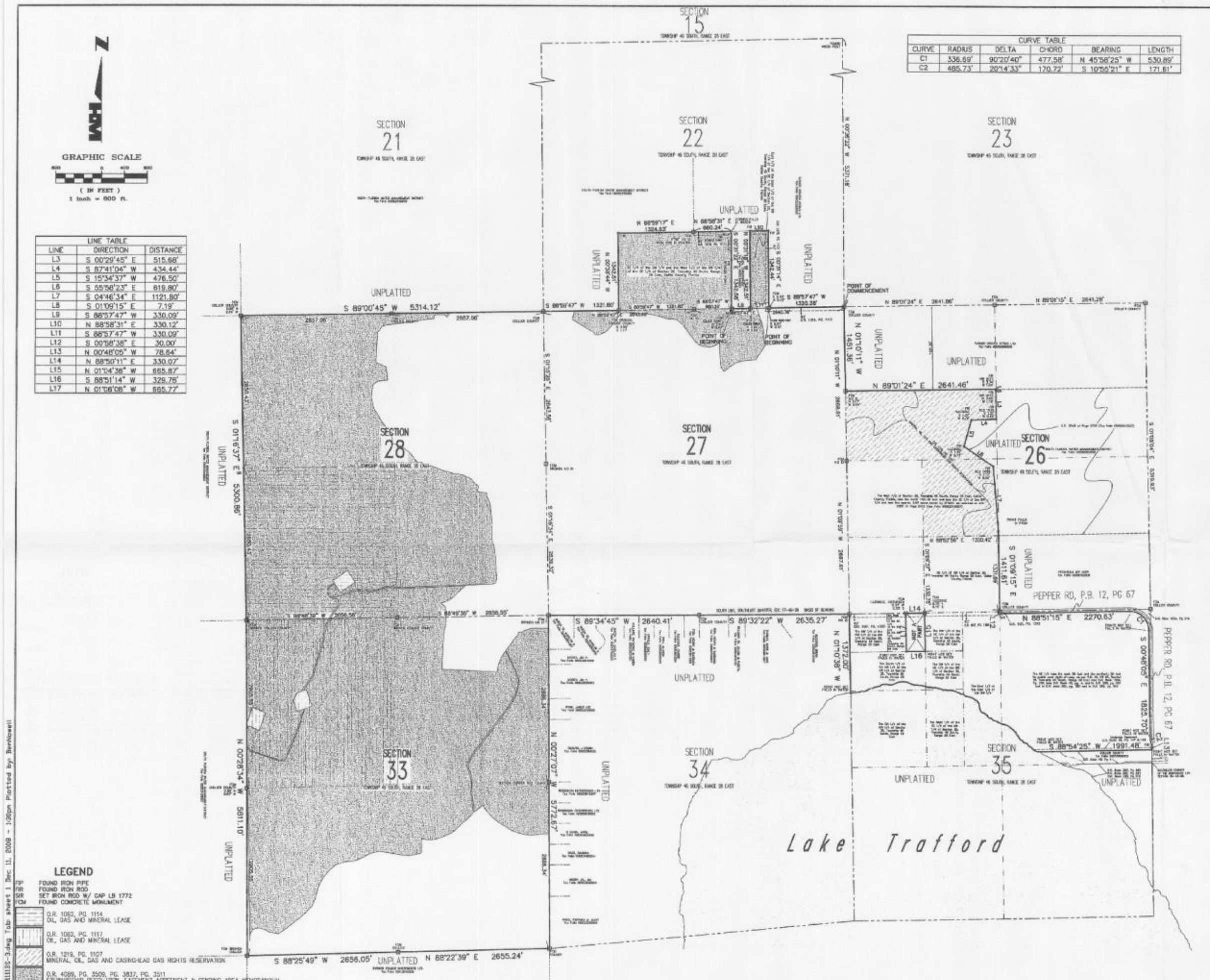
Appendix 1

Pepper Ranch Preserve Legal Description



LINE TABLE		
LINE	DIRECTION	DISTANCE
L3	S 00°29'45" E	515.68'
L4	S 87°41'04" W	434.44'
L5	S 15°34'37" W	476.50'
L6	S 55°58'23" E	619.80'
L7	S 04°46'34" E	1121.80'
L8	S 01°09'15" E	7.19'
L9	S 88°57'47" W	330.09'
L10	N 88°58'31" E	330.12'
L11	S 88°57'47" W	330.09'
L12	S 00°58'38" E	30.00'
L13	N 00°48'05" W	78.64'
L14	N 88°50'11" E	330.07'
L15	N 01°04'38" W	665.87'
L16	S 88°51'14" W	329.76'
L17	N 01°06'08" W	665.77'

CURVE TABLE					
CURVE	RADIUS	DELTA	CHORD	BEARING	LENGTH
C1	336.69'	90°20'40"	477.58'	N 45°58'25" W	530.89'
C2	485.73'	20°14'33"	170.72'	S 10°55'21" E	171.61'

PROPERTY DESCRIPTION:

THE EAST HALF OF THE EAST HALF OF THE SOUTHWEST QUARTER OF THE SOUTHEAST Q
TOWNSHIP 46 SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA.

AND

THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER AND THE WEST HALF OF THE SO
THE SOUTHEAST QUARTER OF SECTION 22, TOWNSHIP 46 SOUTH, RANGE 28 EAST, COLLIE

AND

THE SOUTHEAST QUARTER OF THE SOUTHWEST QUARTER OF SECTION 26, TOWNSHIP 46 S
COLLIER COUNTY, FLORIDA

AND

ALL OF SECTION 28, TOWNSHIP 46 SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA;

AND

THE NORTHWEST QUARTER OF THE NORTHEAST QUARTER OF THE NORTHWEST QUARTER O
46 SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA;

AND

THE WEST HALF OF SECTION 26, TOWNSHIP 46 SOUTH, RANGE 28 EAST, COLLIER COUNTY,
NORTH 1481.35 FEET THEREOF AND LESS THE SOUTHEAST QUARTER OF THE SOUTHWEST
SECTION 26, AND LESS THAT PARCEL OF LAND, AS DESCRIBED AND RECORDED IN O.R. BO
2735 THROUGH 2737, OWNED BY SOUTH FLORIDA WATER MANAGEMENT DISTRICT WITH TAX
00052640007;

AND

ALL OF SECTION 27, TOWNSHIP 46 SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA;

AND

ALL OF SECTION 33, TOWNSHIP 46 SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA;

AND

THE EAST HALF OF THE EAST HALF OF THE NORTHWEST QUARTER; AND THE NORTHEAST
EAST 30 FEET AND THE NORTHERLY 30 FEET FOR PUBLIC ROAD RIGHT-OF-WAY PER DED
RECORDED IN PLAT BOOK 12, PAGE 67 (KNOWN AS PEPPER ROAD), SECTION 35, TOWNSHI
EAST, PUBLIC RECORDS OF COLLIER COUNTY, FLORIDA, LESS 2.29 ACRES IN THE NORTHEA
IN DEED RECORDED IN O.R. BOOK 1834, PAGE 216; ALSO LESS THE REAL PROPERTY DESC
DEED RECORDED IN O.R. BOOK 49, PAGE 4; AND IN O.R. BOOK 280, PAGE 480; AND IN O
283; AND IN O.R. BOOK 288, PAGE 910, ALL OF THE PUBLIC RECORDS OF COLLIER COUN

AND

THE SOUTHWEST QUARTER OF THE NORTHWEST QUARTER; AND THE WEST HALF OF THE S
THE NORTHWEST QUARTER; AND THE SOUTHWEST QUARTER OF THE NORTHEAST QUARTER
QUARTER; AND THE SOUTH HALF OF THE NORTHWEST QUARTER OF THE NORTHWEST QUA
NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER; AND T
NORTHEAST QUARTER OF THE NORTHWEST QUARTER OF THE NORTHWEST QUARTER OF SEC
SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA

NOTES:

THIS PROPERTY IS SUBJECT TO EASEMENTS, RESERVATIONS OR RESTRICTIONS OF RECORD.

IMPROVEMENTS ON OR ADJACENT TO PROPERTY HAVE NOT BEEN LOCATED OR SHOWN.

TOTAL PROPERTY ACREAGE: 2,511.90 ACRES, MORE OR LESS. ACREAGES FOR PARCELS W
BEEN CALCULATED TO THE SHORELINE OF LAKE TRAFFORD, AS DIGITIZED FROM AERIAL PH
6/13/03.

BEARINGS SHOWN HEREON REFER TO SOUTH LINE OF THE SOUTHEAST QUARTER OF SECTIO
SOUTH, RANGE 28 EAST, COLLIER COUNTY, FLORIDA AS BEING S.89°32'22"W.

THE PARCEL OF LAND LOCATED WITHIN SECTION 22 TOWNSHIP 46 SOUTH, RANGE 28 EAST
UTILIZING THE EXISTING MONUMENTATION RECOVERED AND SHOWN ON THIS SURVEY. WE
RECOVER SEVERAL SECTION CORNERS WITHIN SECTIONS 21, 22, & 15 DUE TO SWAMPS AN
ALSO ATTEMPTED TO RECOVER THE NORTH LINE OF SECTION 23, AND WERE UNABLE TO R

THIS SURVEY IS NOT VALID WITHOUT THE SIGNATURE AND ORIGINAL RAISED SEAL OF A FL
SURVEYOR AND MAPPER.

EXCEPTIONS ACCORDING TO SCHEDULE B – SECTION 2 OF THE TITLE COMMITMENT ISSUED
GUARANTY COMPANY, HAVING COMMITMENT NUMBER 46613 WITH AN EFFECTIVE DATE OF
5:00 P.M. ARE AS FOLLOWS:

14. OFFICIAL RECORDS BOOK 907, PAGE 1383 IS LOCATED ON THIS PROPERTY AS SHOW

15. OFFICIAL RECORDS BOOK 1219, PAGE 1113 IS LOCATED ON THIS PROPERTY AS SHOW

16. OFFICIAL RECORDS BOOK 4089, PAGE 3509 IS LOCATED ON THIS PROPERTY AS SHO

17. OFFICIAL RECORDS BOOK 4089, PAGE 3837 IS LOCATED ON THIS PROPERTY AS SHO

18. OFFICIAL RECORDS BOOK 4089, PAGE 3511 IS LOCATED ON THIS PROPERTY AS SHO

19. RESTRICTIONS, CONDITIONS, RESERVATION, EASEMENTS AND OTHER MATTERS CONTAIN
PEPPER ROAD RIGHT-OF-WAY AS RECORDED IN PLAT BOOK 12, PAGE 67, IS NOT LOCAT

20. OFFICAL RECORDS BOOK 49, PAGE 147, IS LOCATED ON THIS PROPERTY AS SHOWN.

21. OFFICIAL RECORDS BOOK 157, PAGE 437 IS NOT LOCATED ON THIS PROPERTY.

22. OFFICIAL RECORDS BOOK 170, PAGE 731 EXPIRED APRIL 1974.

23. OFFICIAL RECORDS BOOK 1219, PAGE 1118 IS LOCATED ON THIS PROPERTY AS SHOW

24. OFFICIAL RECORDS BOOK 1219, PAGE 1107 IS LOCATED ON THIS PROPERTY AS SHOW

27. OFFICIAL RECORDS BOOK 1191, PAGE 1114 HAS ALL LANDS RELEASED BY OFFICIAL R
PAGE 578.

28. OFFICIAL RECORDS BOOK 1062, PAGE 1114, WITH PARTIAL RELEASE OFFICIAL RECORD
3580 IS LOCATED ON THIS PROPERTY AS SHOWN.

29. OFFICIAL RECORDS BOOK 1062, PAGE 1117, WITH PARTIAL RELEASE OFFICIAL RECORD
3586 & OFFICIAL RECORDS BOOK 4394, PAGE 578 IS LOCATED ON THIS PROPERTY AS S

CERTIFIED TO: STEWART TITLE
COLLIER COUNTY BOARD OF COMMISSIONERS
LAKE TRAFFORD RANCH, LLLP

I HEREBY CERTIFY THAT THIS SKETCH OF THE HEREON DESCRIBED PROPERTY WAS SURVEY
ON 11/26/2008. I FURTHER CERTIFY THAT THIS SURVEY MEETS THE MINIMUM TECHNICAL S
SURVEYING IN THE STATE OF FLORIDA PURSUANT TO CHAPTER 61G17-6, F.A.C.

HOLE MONTES, INC.
CERTIFICATE OF AUTHORIZATION NUMBER LB 1772

BY Thomas M. Murphy P.S.M. #5628
THOMAS M. MURPHY STATE OF FLORIDA

LEGEND

FIP FOUND IRON PIPE
FIR FOUND IRON ROD
SIR SET IRON ROD W/ CAP LB 1772
FCM FOUND CONCRETE MONUMENT

O.R. 1062, PG. 1114 OIL, GAS AND MINERAL LEASE

O.R. 1062, PG. 1117 OIL, GAS AND MINERAL LEASE

O.R. 1219, PG. 1107 MINERAL, OIL, GAS AND CASINGHEAD GAS RIGHTS RESERVATION

O.R. 4089, PG. 3509, PG. 3837, PG. 3511 STEWARDSHIP RESOLUTION, EASEMENT AGREEMENT & SENDING AREA MEMORANDUM

FIELD BOOK 909/15-16, 938/48-49, 953/06, 953/77, 996/51		
LETTER	REVISIONS	DATE
D		
C	UPDATED WITH NEW TITLE COMMITMENT	12/04/08
B	ADDED O.R. 1219, PG. 1107 IN SEC 26	10/30/08
A	ADDED O.R. 907, PG. 1383 ALONG N LINE SEC 35	10/06/08

LAKE TRAFFORD RANCH (PEPPER RANCH)

NOT VALID WITHOUT THE SIGNATURE AND THE ORIGINAL RAISED SEAL OF A FLORIDA LICENSED SURVEYOR AND MAPPER.

PARTY CHIEF: AL Z	DATE: 11/08
DRAWN BY: BEN	DATE: 12/08
CHECKED BY: TMM	DATE: 12/08
VERTICAL SCALE: N/A	HORIZONTAL SCALE: 1"=800'

HOLE MONTES
ENGINEERS-PLANNERS-SURVEYORS

950 Encore Way
Naples, FL. 34110
Phone: (239) 254-2000
Florida Certificate of
Authorization No.1772

EXHIBIT "A"
BOUNDARY SURVEY

Appendix 2
Florida Land Use, Cover and Forms Classification System Designations for Pepper Ranch Preserve – (2'x3' map)

(Same as map on page 22 only larger)

Appendix 3

Florida Natural Areas Inventory Designations for Pepper Ranch Preserve – (2'x3' map)

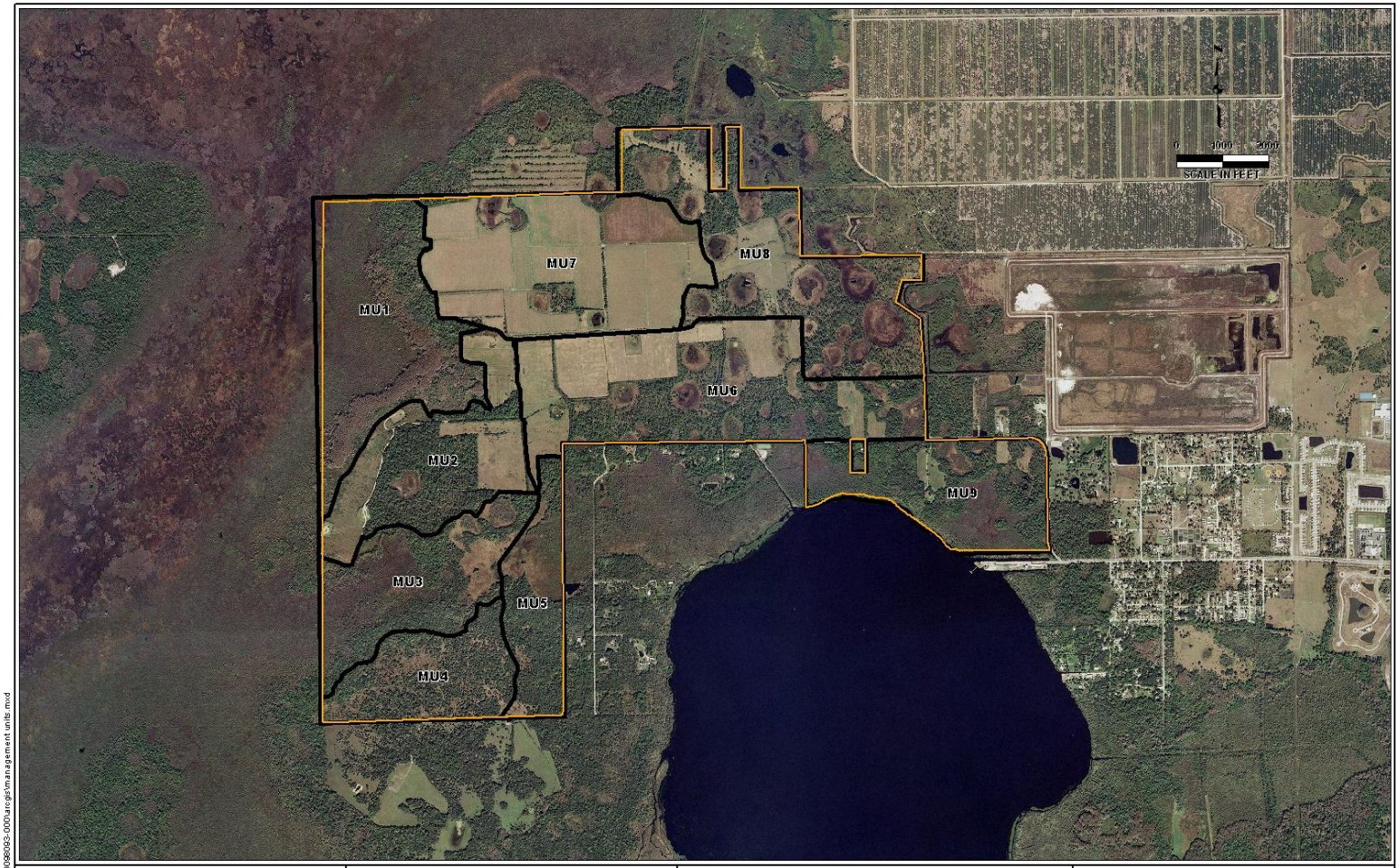
(Same map as on Page 24 only larger)

Appendix 4

Floristic Inventory of Pepper Ranch Preserve

Appendix 5

Management Unit Map of Pepper Ranch Preserve



Pepper Ranch
Collier County, Florida

JOHNSON ENGINEERING

2122 JOHNSON STREET
P.O. BOX 1550
FORT MYERS, FLORIDA 33902-1550
PHONE (941) 334-0046
FAX (941) 334-3661
E.B. #642 & L.B. #642

Management Units Map

DATE	PROJECT NO.	FILE NO.	SCALE	SHEET
Oct. 2009	20098093	-	As Shown	1

W:\fmc01\proj-fmc\20098093-000\arcgis\management units.mxd

Appendix 6

Cattle Lease

Appendix 7

Pepper Ranch Preserve Quality Wildlife Management Hunt Program 2010-2011 Brochure

Appendix 8

Pepper Ranch Preserve –
Land Use Compatibility Matrix

Pepper Ranch Preserve - Compatibility Matrix

		PUBLIC USES											MITIGATION & LAND USE				OTHER REVENUE GENERATING		Conservation Collier Ordinance No. 2007-65
		hiking	mountain biking	primitive camping	horseback riding	hunting	fishing	nature photography	special events lodge rental	ecotourism	campground	archery	Panther Conservation Bank	wetlands mitigation	water storage	SSA	oil drilling	cattle grazing	
PUBLIC USES	hiking																		
	mountain biking																		
	primitive camping																		
	horseback riding																		
	hunting																		
	fishing																		
	nature photography																		
	special events logde rental																		
	ecotourism																		
	campground																		
	archery																		
MITIGATION & LAND USE	Panther Conservation Bank																		
	Wetlands Mitigation																		
	water storage																		
	SSA																		
OTHER REVENUE GENERATING	oil drilling																		
	cattle grazing																		
Conservation Collier Ordinance No. 2007-65																			

Uses are compatible throughout the Preserve

Uses are compatible but on seperate portions of the Preserve

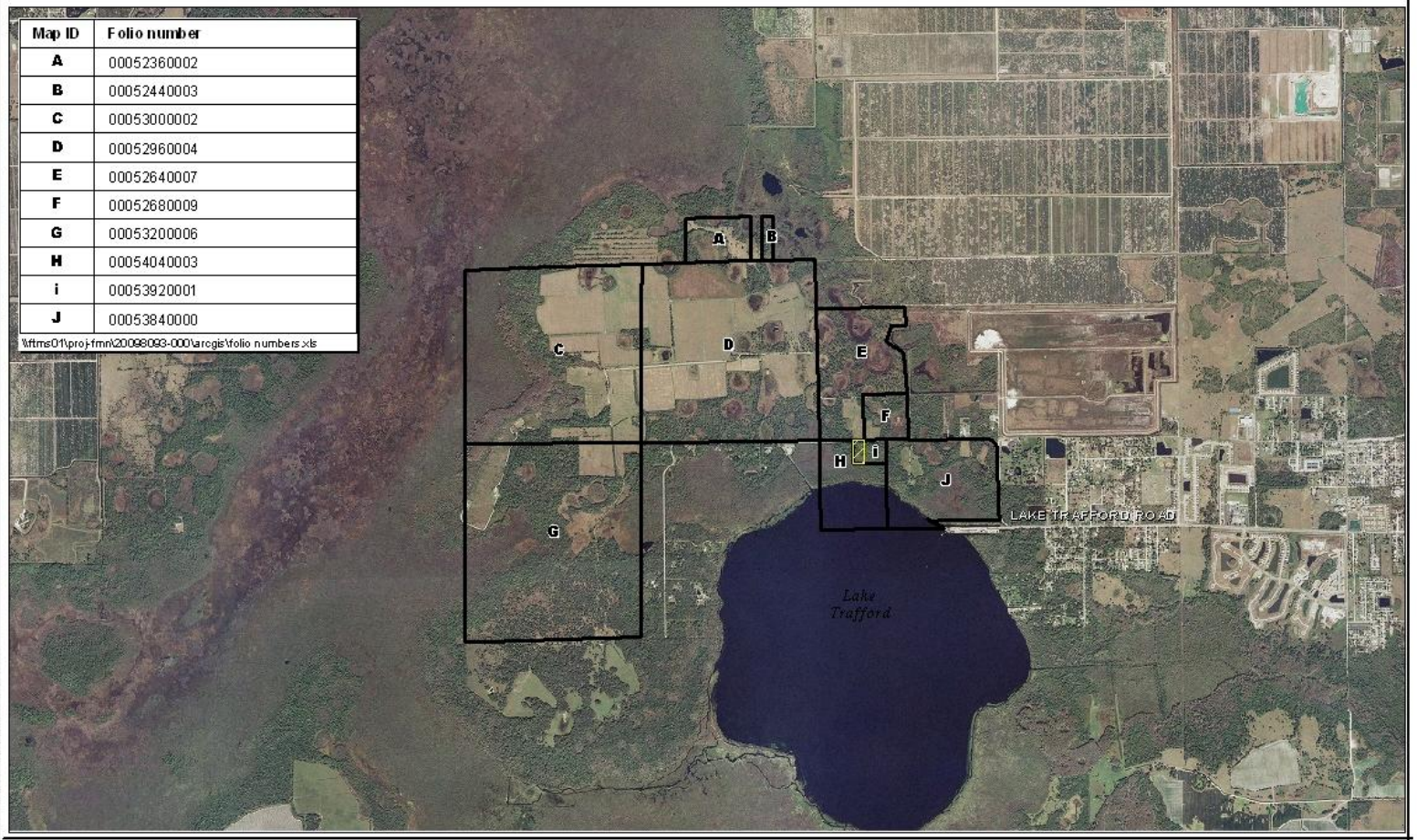
Uses are not compatible during certain times of the year

Appendix 9
Parcel Folio Map of Pepper Ranch Preserve

Pepper Ranch Parcels

Map ID	Folio number
A	00052360002
B	00052440003
C	00053000002
D	00052960004
E	00052640007
F	00052680009
G	00053200006
H	00054040003
i	00053920001
J	00053840000

\\ftms01\proj-fmn\20098093-000\arcgis\folio numbers.xls



0 4000 8000

SCALE IN FEET

LEGEND

Inholding not part of Preserve

Pepper Ranch Property Boundaries

Data source:
-Parcels and folio numbers provided by Collier County.

\\Ftms01\proj-fmn\20098093-000\arcgis\parcels.mxd