

Cayo Pelau Preserve

Land Management Plan

Second Edition

Cayo Pelau Island
Lee County, FL



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

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Bob Repenning

Lee Waller

Table of Contents

VISION STATEMENT	5
I. EXECUTIVE SUMMARY	6
II. INTRODUCTION	7
III. LOCATION AND SITE DESCRIPTION.....	8
IV. NATURAL RESOURCES DESCRIPTION.....	9
A. Physical Resources	11
<i>i. Climate</i>	11
<i>ii. Geology</i>	11
<i>iii. Topography</i>	11
<i>iv. Soils</i>	13
<i>v. Hydrologic Components and Watershed</i>	15
B. Biological Resources	17
<i>i. Ecosystem Function</i>	19
<i>ii. Natural Plant Communities</i>	20
<i>iii. Fauna</i>	22
<i>iv. Designated Species</i>	23
<i>v. Biological Diversity</i>	22
C. Cultural Resources	23
<i>i. Archaeological Features</i>	23
<i>ii. Land Use History</i>	24
<i>iii. Public Interest</i>	25
V. FACTORS INFLUENCING MANAGEMENT.....	28
A. Natural Trends and Disturbances	28
B. Internal Influences.....	29
C. External Influences	29
D. Legal Obligations and Constraints	30

<i>i. Permitting</i>	30
<i>ii. Other Legal Constraints</i>	30
<i>iii. Relationship to Other Plans</i>	30
E. Management Constraints	31
F. Public Access and Resource-Based Recreation	31
G. Acquisition	31
VI. MANAGEMENT ACTION PLAN	33
A. Management Unit Descriptions	34
B. Goals and Strategies	34
VII. PROJECTED TIMETABLE FOR IMPLEMENTATION.....	38
VIII. FINANCIAL CONSIDERATIONS.....	21
IX. LITERATURE CITED	22
X. APPENDICES	24

List of Exhibits

FIGURE 1: LOCATION MAP.....	9
FIGURE 2: 2018 AERIAL PHOTOGRAPH	10
FIGURE 3: LiDAR MAP.....	8
FIGURE 4: SOIL MAP.....	15
FIGURE 5: WETLAND INVENTORY MAP	17
FIGURE 6: WATERSHED MAP.....	18
FIGURE 7: NATURAL PLANT COMMUNITIES MAP	22
FIGURE 8: 1953 AERIAL PHOTOGRAPH	25
FIGURE 9: 2002 AERIAL PHOTOGRAPH	26
FIGURE 10: 2011 AERIAL PHOTOGRAPH	27
FIGURE 11: FUTURE LAND USE AND ZONING MAP.....	33
TABLE 1: MANAGEMENT WORK SUMMARY (2008-2018).....	7
TABLE 2: SUMMARY OF SOIL CHARACTERISTICS.....	14
TABLE 3: EXOTIC WILDLIFE AT CAYO PELAU PRESERVE	23
TABLE 4: LISTED SPECIES FOUND AT CPP AND THEIR DESIGNATED STATUS.....	24

LIST OF ACRONYMS

BoCC	Board of County Commissioners
C20/20	Conservation 20/20
CPP	Cayo Pelau Preserve
CLASAC	Conservation Land Acquisition Stewardship Advisory Committee
DHR	Division of Historical Resources
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDNR	Florida Department of Natural Resources
FLEPPC	Florida Exotic Pest Plant Council
FLUM	Future Land Use Map
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
IRC	Institute for Regional Conservation
LCDCL	Lee County Division of County Lands
LCDCD	Lee County Community Development
LCPR	Lee County Parks and Recreation
LCTDC	Lee County Tourist Development Council
LIDAR	Light Detecting and Ranging
LSOM	Land Stewardship Operations Manual
LWCR	Lower West Coast Region
MOU	Memorandum of Understanding
NMFS	National Marine Fisheries Service
NRCS	Natural Resources Conservation Service
NWI	National Wetlands Inventory
PARI	Piper Archaeological Research, Inc.
ROW	Right of Way
SFWMD	South Florida Water Management District
STRAP	Section, Township, Range, Area, Parcel (Block Lot)
USDA	United States Department of Agriculture
USFWS	United States Fish and Wildlife Service

VISION STATEMENT

It is the vision of the Lee County Department of Parks and Recreation and the C20/20 program to conserve and protect the natural and cultural resources of Cayo Pelau Preserve. The Preserve, a coastal island, provides extensive tidal swamp and tidal marsh communities; and essential habitat for both natural marine and terrestrial ecosystems. The management of Cayo Pelau Preserve will ensure its health and continue to allow the opportunity for resource sensitive recreation while providing a scenic island backdrop for passing boaters, ecotourists, and fishermen.

I. EXECUTIVE SUMMARY

Cayo Pelau Preserve (CPP) is an island surrounded by Cape Haze, Charlotte Harbor and Gasparilla Sound; in northwest Lee County, Florida, within Sections 5 and 6, Township 43 South, Range 21 East. CPP is approximately 126 acres with 2.8 miles of coastline. The preserve was acquired in February 2007 for \$2.5 million, through C20/20, Lee County's Environmentally Sensitive Lands Acquisition Program,.

The C20/20 Program was established in 1996 when Lee County voters approved a referendum to increase taxes by up to 0.5 mil for the purpose of purchasing and protecting environmentally sensitive lands. Conservation 20/20 staff develops a land management plan for each Conservation 20/20 preserve that explains its natural resources and ecosystems as well as laying out the plans for appropriate public recreation and restoration projects. These plans are updated every 10 years to include current information, maps, and a summary of the work that has been completed and projects that remain. This land management plan is the first 10 year revision of the original plan which was written and approved by the Board of County Commissioners in 2008.

Natural trends and disturbances influencing plant communities and management at CPP include hurricanes, flooding, wildfires, occasional freezes and the cycling of wet and dry seasons. The entire preserve lies within Lee County's Coastal High Hazard area and is vulnerable to both tropical storms and hurricanes during June-November.

Lee County is located within the Gulf Coastal Lowlands of Florida that extend around the coastal periphery of the state where elevations are generally below 100 feet. The natural elevations at CPP range from sea level to approximately 8ft along the coastal berm and on anthropogenic features.

One soil type is identified at CPP; Wulfert Muck. This soil type has been identified as having severe limitations to development; either ponding, wetness or too sandy.

CPP consists of five natural plant communities. Tidal swamp is the most common plant community, which makes up 57.2% of the Preserve. Other communities include Tidal Marsh, Shell Midden and Unconsolidated Substrate. A number of designated plant and animal species can be found on site.

CPP is reported to have had a variety of uses throughout history. It is strongly suspected that in the past it was once used by the Calusa people as a temporary fishing camp. A shell mound on the island (although not in the preserve itself) and several shell middens throughout the Preserve provide evidence of this. Archeologists have completed cursory investigations of the island, however no complete inventory of archeological resources has been undertaken.

CPP is classified as a Category 4 Resource Protection & Restoration Preserve. As with all designated Category 4 preserves, "if there is a public interest, staff may provide

guided field trips when there are no safety concerns and it is compatible with protecting the animals and plant communities found at the specific preserve.”

Restoration activities on the preserve have been minimal over the last 10 years and have included exotic plant control and trash clean up. These activities are on-going. One exotic plant contract has been bid out in the past ten years. Maintenance work is performed during site inspections and as groups of volunteers allow.

The goal of this land management plan is to update the conditions on the preserve resources since acquisition, develop strategies to protect the resources and further implement restoration activities to preserve CPP as a productive, functional and viable ecosystem while ensuring that the preserve will be managed in accordance with Lee County Parks and Recreation’s Land Stewardship Operations Manual. Restoration and management activities at CPP will focus on controlling invasive exotic plant species, debris removal, and archeological resource protection. A Management Action Plan outlines restoration and stewardship goals. This plan outlines the goals and strategies, explains how the goals will be accomplished, and provides a timetable for completion. This land stewardship plan will be revised again in ten years (2028).

Table 1: Management Work Summary (2008-2018)

<p>Natural Resource Management</p> <ul style="list-style-type: none">✓ Invasive exotic plant species have been treated and the preserve is now at maintenance level. This work was completed using Conservation 20/20 funding <p>Overall Protection</p> <ul style="list-style-type: none">✓ Small debris has been removed from the preserve, during staff and volunteer workdays.✓ Perimeter boundary signs have been replaced as needed.✓ Tri-annual site inspections have been conducted. <p>Volunteers</p> <ul style="list-style-type: none">✓ Numerous staff, Lee County volunteer, and Calusa Land Trust volunteer days have assisted in exotic plant control, and debris removal

II. INTRODUCTION

Cayo Pelau Preserve (CPP) was acquired through Lee County's Environmentally Sensitive Lands Acquisition Program, Conservation 20/20 (C20/20). The purchase and perpetual preservation of this site will provide protection to the surrounding estuarine communities and cultural resources found on the island. CPP's natural communities will continue to contribute to the ecosystem functions and help maintain its integrity.

The purpose of this management plan is to define conservation goals for CPP. It will continue to serve as a guide for the Lee County Department of Parks and Recreation (LCPR) to use best management practices to ensure proper stewardship and protection of the preserve. A number of field surveys were conducted along with review of scientific literature and historical records to understand how the Preserve functions in the ecosystem, which wildlife and plants are found within its boundaries and how it has been impacted by humans. Numerous site visits by staff over the last ten years have identified the issues that need addressing on the island and potential threats to the resources. This plan incorporates this information to serve as a reference guide for those interested in learning more about the preserve and some of the land stewardship efforts in Lee County.

III. LOCATION AND SITE DESCRIPTION

Cayo Pelau Preserve is an island surrounded by Cape Haze, Charlotte Harbor and Gasparilla Sound located at Latitude 26° 46' 32", Longitude -82° 13' 16", Florida in northwest Lee County within Sections 5 and 6, Township 43 South, Range 21 East (Figure 1).

The preserve lies approximately 2 miles due east of Boca Grande (Gasparilla Island) and is surrounded by many shallow sand bars and smaller islands including Sandfly Key and Devilfish Key. Its northern boundary is the county line between Lee and Charlotte Counties; its eastern, southern and western boundaries are the edges of the island; considered to be located at the median of the tidal range. The island is situated on the edge of the Cape Haze Aquatic Preserve and the Gasparilla Sound - Charlotte Harbor Aquatic Preserve.

The preserve is approximately 126 acres with 2.8 miles of coastline. Little is known about its historical use; however, archeological sites including shell middens and a burial site have been discovered in and around the preserve. Presently the very limited beaches of the island play host to recreational boaters.

The northern section of the island is location in and owned by Charlotte County and not considered part of the preserve. Figure 2 identifies the boundaries of CPP in a 2018 aerial photograph.

Figure 1: Location Map

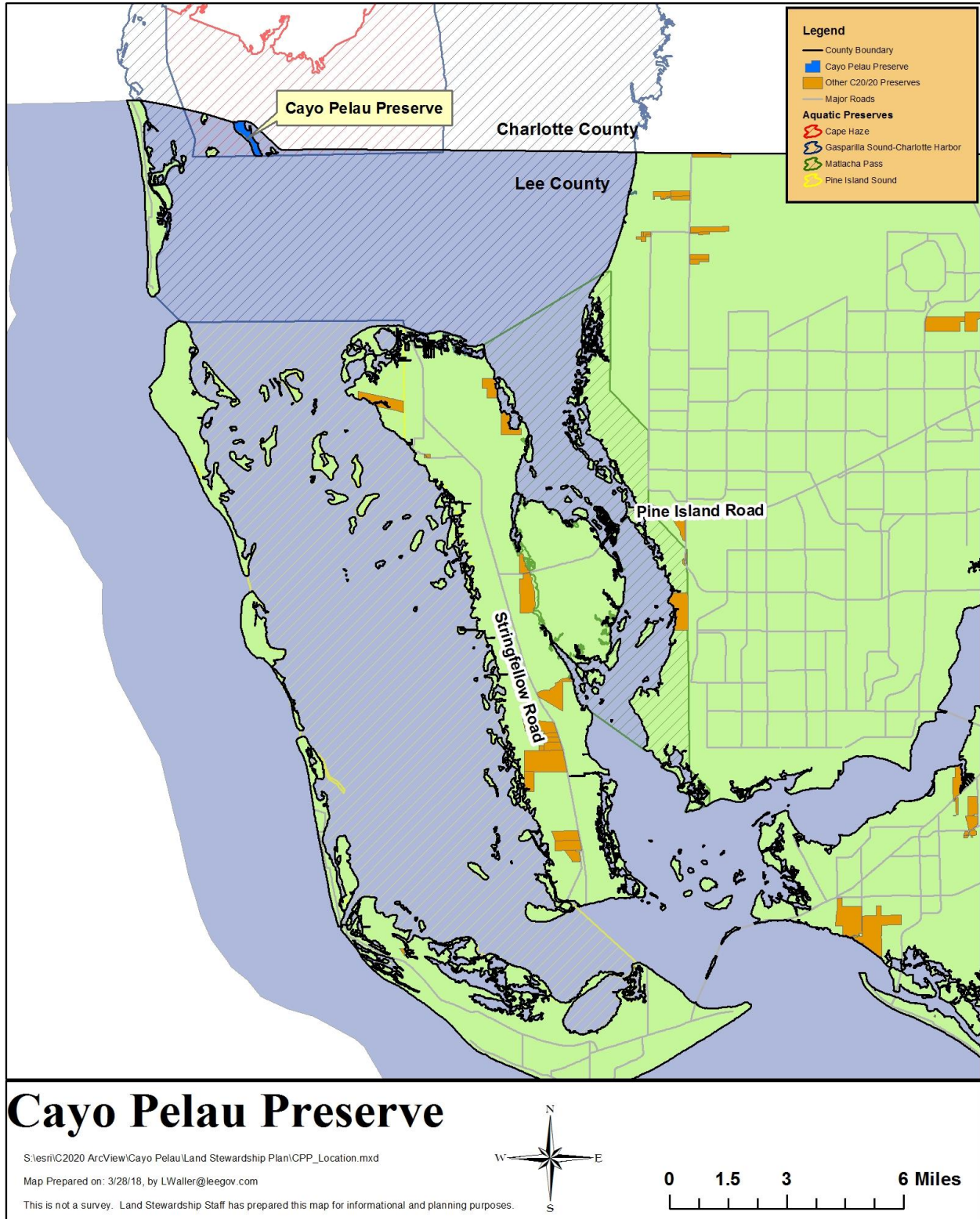


Figure 2: 2018 Aerial Photograph



IV. NATURAL RESOURCES DESCRIPTION

A. Physical Resources

i. Climate

General information on the climate of southwest Florida is located in the Land Stewardship Operations Manual's (LSOM) Land Stewardship Plan Development and Supplemental Information section.

ii. Geology

Specific information on the geologic features such as physiographic regions, formations and maps, can be found in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

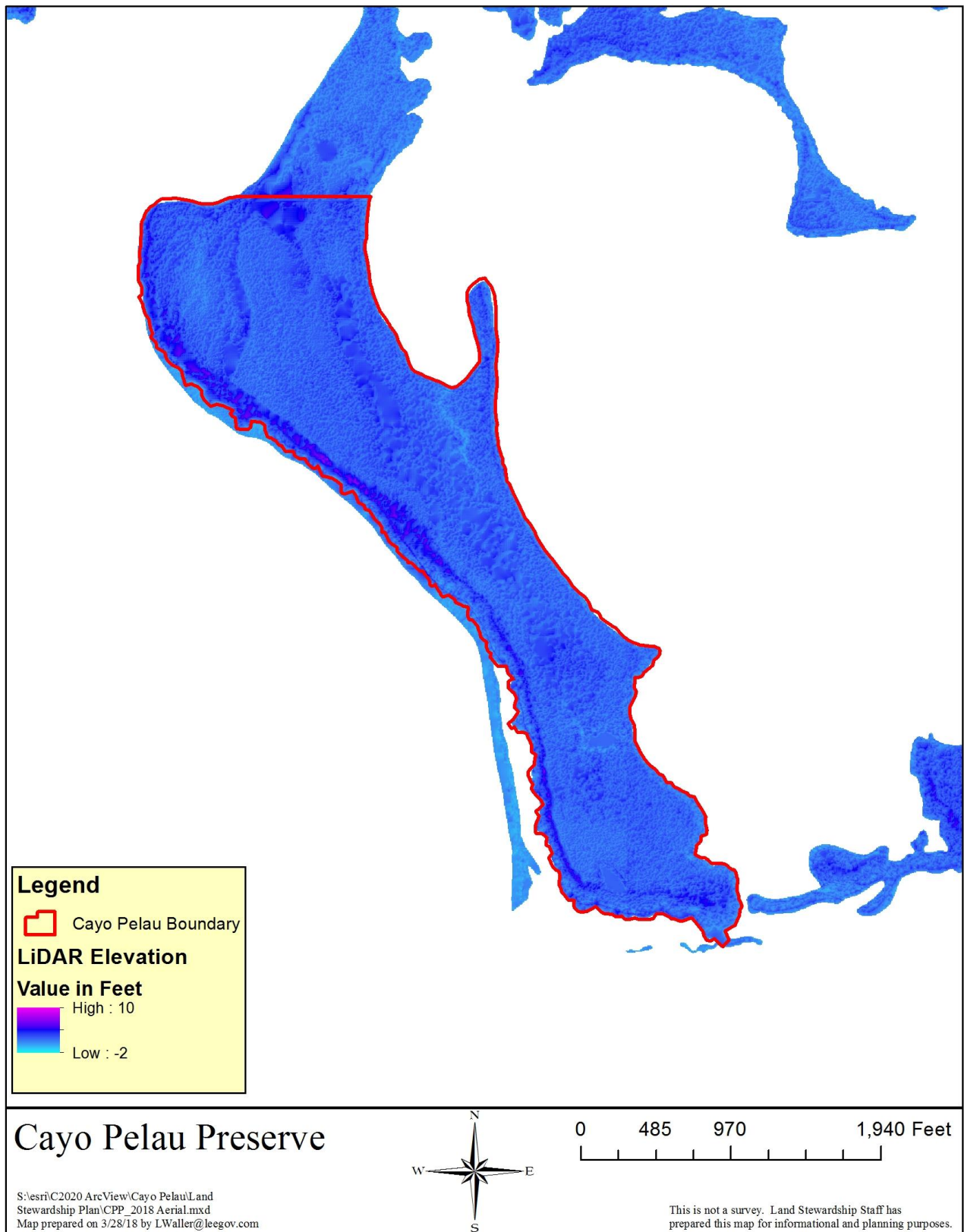
iii. Topography

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

Natural elevations at CPP range from sea level to approximately 8 feet above sea level and generally slope in a westerly to southwesterly direction. Several areas of the island have had their natural elevations altered through the deposition of material, in which case elevations exceed 10 feet in some places.

The following topographic map (Figure 3) uses Light Detecting and Ranging (LiDAR) data, which is an optical remote sensing technology that measures properties of scattered light to find range or other information of a distant target. These data were flown in 2007 and represent the published 5 foot digital elevation model. The change in color gradient visually demonstrates the relative flatness of CPP, but shows areas of elevated spoil piles up along the shoreline.

Figure 3: LiDAR Map



iv. Soils

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

There is one soil type found at CPP (Figure 4), Wulfert Muck (Table 2). Wulfert Muck is a soil type associated with tidal swamps and has a slope range from 0-1 percent. Table 2 and the descriptions below have been organized to quickly provide land managers with pertinent soils information for understanding restrictions and/or results regarding future restoration and probable recreational plan limitations and expense.

Table 2: Summary of Soil Characteristics

Soil Types	Map Symbol	Total Acres	% of Preserve	Physical Attributes							Biological Attributes				Limitations for Recreational Paths & Trails	
				Habitats (Range Site)	Wetland Class (1)	Hydrologic Group (2)	Surface Permeability	Subsurface Permeability	Water Table within 10" of surface	Water Table below 10-40" of surface	% Organic Matter	Potential as habitat for wildlife in--				
												Openland	Woodland	Wetland		Rangeland
Wulfert Muck	23	126	100%	Salt water marsh	F	D	rapid	--	Tidal	--	--	very poor	very poor	fair	--	Severe: wetness, excess humus

Color Key:

Wettest

(1) F - Flooding: The temporary inundation of an area caused by overflowing streams, runoff from adjacent slopes or tides.

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

Figure 4: Soils Map



v. Hydrologic Components and Watershed

CPP is entirely tidally influenced. During extreme high tides and storm events the whole island is inundated with water. As such there is no surface standing fresh water on the island.

In 1974, the United States Fish and Wildlife Service (USFWS) directed its Office of Biological Services to conduct an inventory of the nation's wetlands. This National Wetlands Inventory (NWI) became operational in 1977. Wetlands were identified on the photography by vegetation, visible hydrologic features, and geography, and subsequently classified in general accordance with the Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979). CPP was classified as Estuarine forested and Estuarine Unconsolidated bottom. Estuarine systems are defined as deepwater tidal communities and adjacent tidal wetlands that are usually semi-enclosed by land but have open, partly obstructed, or sporadic access to the open ocean and in which ocean water is at least occasionally diluted by freshwater runoff from the land. Based on the federal NWI evaluation, all of CPP is classified as wetlands (Figure 5).

The two water features found on the island occur in the southern region as brackish ponds. The water in these features is regularly interchanged as the tide rises. Both water features appear natural, related to small depressions in the physical landscape of the island and account for approximately an acre of the preserve's size. Outside the official preserve boundaries, the developing sand spit has formed a lagoon that borders the south and west of the preserve.

The island of Cayo Pelau is not within any designated watershed (Figure 6). Surface run off from precipitation events ultimately enters the Cape Haze Aquatic Preserve.

Figure 5: Wetlands Inventory Map

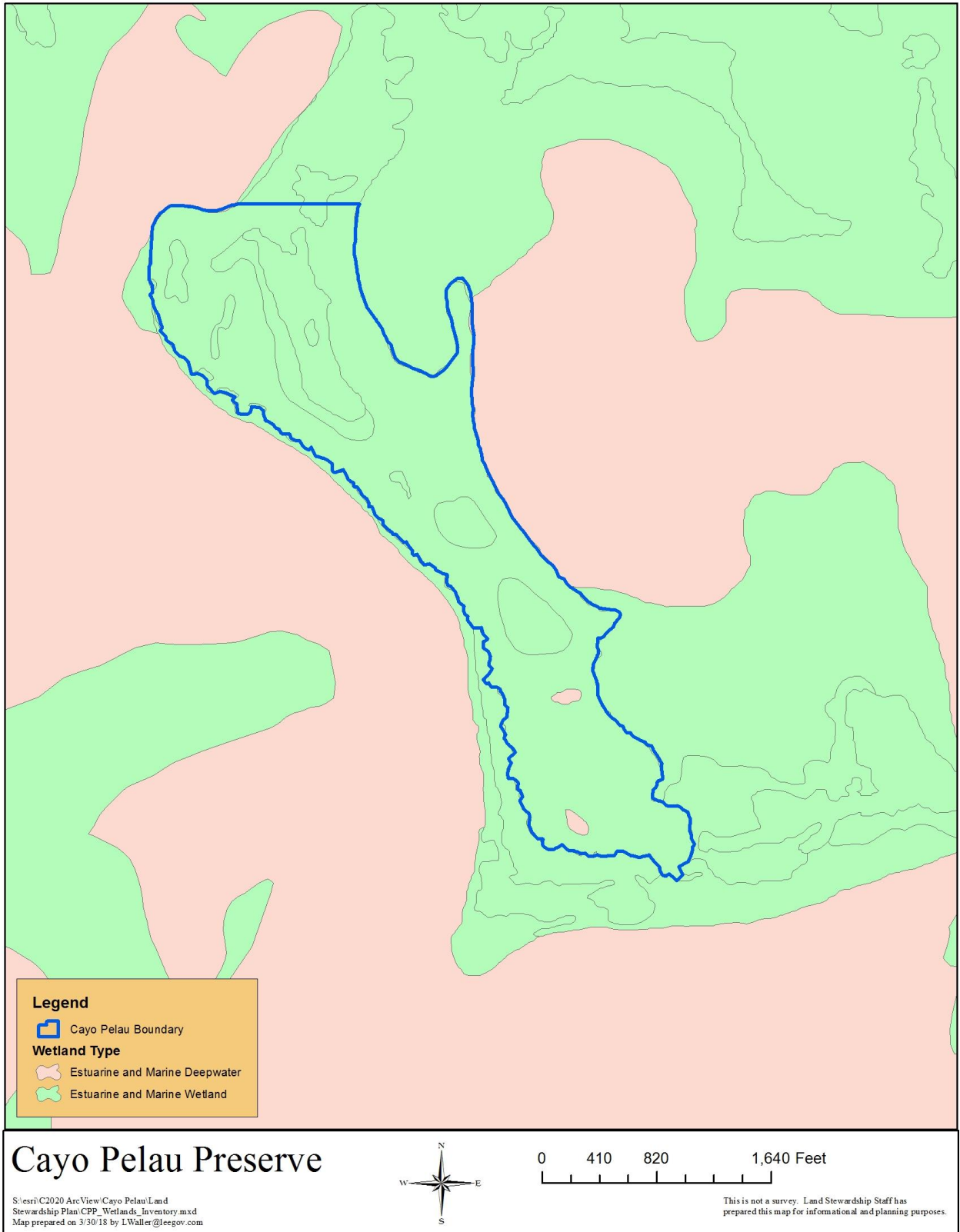
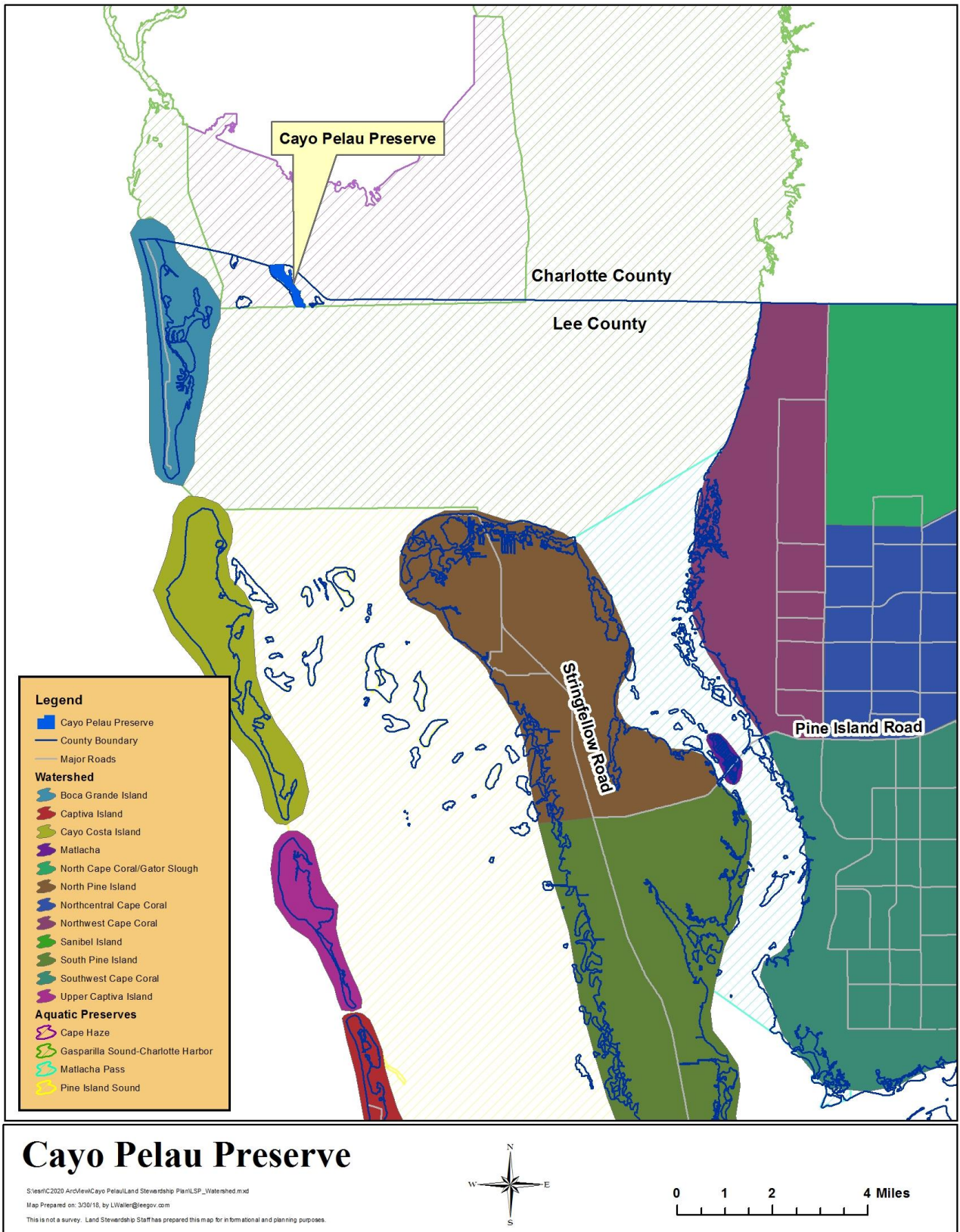


Figure 6: Watershed Map



B. Biological Resources

i. Ecosystem Function

A tidal swamp, such as the one found at Cayo Pelau Preserve, is a significant plant community because it functions as a nursery ground for most of Florida's commercially and recreationally important fish and shellfish. Occurring in flat coastal areas, the soils are generally saturated with brackish water at all times, and at high tides these same soils are usually inundated with standing water. In mature habitats the sands and muds are usually covered by a layer of peat which has built up from detritus (decaying plant material). Temperature, salinity, tidal fluctuation, substrate and wave energy are five physical factors influencing the size and extent of these communities. Requiring an annual average water temperature above 19°C (66°F) they do not tolerate temperatures below freezing or temperatures which fluctuate widely over the course of a year (FNAI & FDNR 1990).

The prop roots of red mangroves (*Rhizophora mangle*), the extensive pneumatophores (aerial roots) of black mangroves (*Avicennia germinans*) and the dense root mats of the white mangrove (*Laguncularia racemosa*) serve to entrap sediments and recycle nutrients from upland areas and from tidal import. This process serves in "island formation" and is a part of the successional process involved in land formation in south Florida. These root structures also provide substrate for the attachment of and shelter for numerous marine and estuarine organisms (FNAI & DNR 1990). In addition to island formation tidal swamps are also important in protecting the coastline from erosion. The roots of the mangroves act to disperse wave energy and stabilize the shoreline. Additionally, tidal swamps help protect other inland communities by absorbing the brunt of tropical storms and hurricanes.

Tidal swamps provide breeding grounds for substantial populations of wading birds, shorebirds and other animals (FNAI & DNR 1990). Several bird species including; mangrove cuckoos (*Coccyzus minor*), black-whiskered vireos (*Vireo altiloquus*) and gray kingbirds (*Tyrannus dominicensis*) are dependent on mangroves for nesting and their numbers are jeopardized by the fragmentation of mangrove habitat. Tidal swamp is also important habitat for wading birds such as wood storks (*Mycteria americana*), white ibis (*Eudocimus albus*), and roseate spoonbills (*Platalea ajaja*) all of which are known to use larger mangroves as nesting areas. Although not all have been documented at the preserve, there are several wildlife species that are found exclusively in tidal swamps including mangrove salt marsh snakes (*Nerodia clarkii compressicauda*) and at least two butterfly species, the mangrove skipper (*Phocides pigmalion*) and the black mangrove buckeye (*Junonia evarete*), that depend on mangroves as a larval food source (Postmus, per.comm.). Additionally, mangroves can produce up to 80% of the total organic material available in the aquatic food web through the continuous shedding of its leaves and other plant components (FNAI & DNR 1990).

ii. Natural Plant Communities

CPP consists entirely of coastal communities, of which there are five natural plant communities as defined using the Guide to the Natural Communities of Florida (1990) prepared by FNAI and the Florida Department of Natural Resources. The largest communities are tidal swamp and tidal marsh which make up more than 90% of the vegetation on the islands. The other communities identified are coastal berm, unconsolidated substrate (beaches and mud flats) and shell mound.

The island also has two areas of open water (brackish ponds) that are tidally/precipitation influenced and deep enough to sustain standing water at low tides.

Shell Mound Community – 5 acres, 3.5% Coverage

The smallest of the communities is that associated with shell middens found on the island. The Shell Mound Community is largely a result of the activities of Native Americans and is characterized by an elevated mound of mollusk shells and living debris on which a community dominated by hardwood hammock species grow. At CPP these include the gumbo-limbo (*Bursera simaruba*) and cabbage palm (*Sabal palmetto*).

This community is not identified on the natural plant communities map (Figure 7) due to the cultural sensitivity of the resources they are associated with.

Unconsolidated Substrate Community – 3 acres, 2.5% Coverage

The most commonly used terms for this community are beach, mud flat or tidal flat. Mud flats may support large populations of organisms such as tube worms, sand dollars, mollusks, isopods, amphipods, burrowing shrimp, and a variety of crabs. These organisms are not readily visible in mud flats but their densities can reach the tens of thousands per meter square, making this community important feeding grounds for many bottom feeding fish, such as redfish, flounder (*Paralichthys ssp.*), spot and sheepshead (*Archosargus probatocephalus*) and shorebirds, which have been observed on the preserve.

This community occurs on and beyond the boundary of the preserve; including a sand spit which occurs along the western and southern edge of the island and has been colonized and stabilized by small pockets of mangroves.

Coastal Berm Community – 6 acres, 4.8% Coverage

This plant community is found exclusively in a small band around segments of the island. This plant community originates from extreme tidal and storm events where materials (such as sand and shell) are deposited to form a berm beyond the mean high tide level. This plant community consists of dense thickets of large shrubs and small trees. The dominant plants in this area are cabbage palm, sea grape

(*Coccoloba uvifera*) and several varieties of succulent plants. It is also in this community that exotic invasive species are able to make a foot hold. In this case, the Coastal Berm community had been heavily invaded by Brazilian Pepper (*Schinus terebinthifolius*) and Australian pine (*Casuarina equisetifolia*) but were treated with herbicide and are now at a maintenance level. This community is often associated with and grades into tidal swamp, which occurs at the preserve.

Tidal Marsh Community – 40 acres, 32% Coverage

Marine tidal marshes are characterized as expanses of grasses, rushes and sedges along coastlines and in areas of low wave energy. Typical plants include key grass (*Monanthochloe littoralis*), rushes, saltwort (*Batis maritima*), glassworts (*Salicornia spp.*) and seablight (*Suaeda linearis*). Plants here survive under extreme conditions including high salt in the soils, poor soil aeration, submersion, intense sunlight and occasional fire. This community is evident in the interior of the island where high tides and storms flood over the surrounding coastal berm communities and rain water with is then slowly evaporated away, leading to increasingly high salt concentrations.

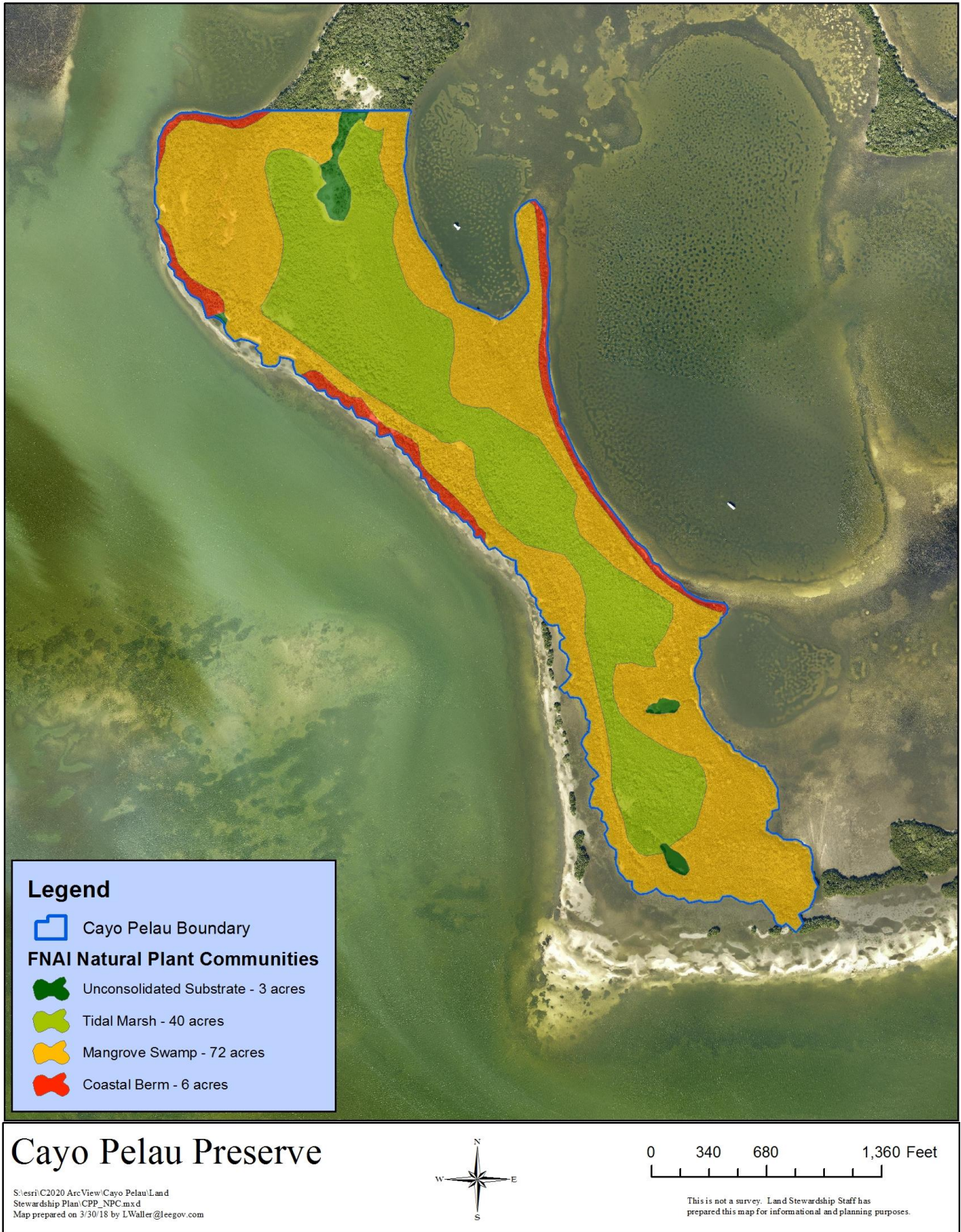
The periphery of this community is in the early stages of succession from tidal marsh to swamp as the mangroves recover from several storms that hit the area in 2004, 2005, and 2017.

Mangrove Swamp Community – 72 acres, 57.2% Coverage

Tidal swamps are characterized as dense forests located along the shorelines of southern Florida. The dominant plants in this community are black mangrove, red mangrove, white mangrove and buttonwood (*Conocarpus erectus*). The dominant species of mangrove found in different areas is dependent on abiotic factors such as tidal flushing and salinity.

At CPP, this community is the largest on the preserve making up a little less than 60% of the natural community's composition. Moving away from the red mangrove dominated shoreline, black mangroves and buttonwood become the dominate species towards the interior of the island. This interior has been heavily impacted by storms and hurricanes and in places the community has reverted to tidal marsh, however evidence of the once dense canopy is rife with decaying mangrove limbs and trunks scattering the area.

Figure 7: Natural Plant Communities Map



iii. Fauna

CPP is a relatively isolated island surrounded by the waters of Charlotte Harbor. The remoteness of the preserve provides a challenge for large wildlife, excluding birds, to access the preserve, although bobcat tracks have been noted on site. These reasons likely influence the small number of wildlife species that have been observed when compared to other county preserves (Appendix B). Wildlife species were recorded during field work and site inspections. Future sightings through site inspections and possible Lee County Bird Patrol volunteers will continue to be recorded. Two exotic wildlife species have been documented at the preserve (Table 3).

Table 3: Exotic Wildlife at Cayo Pelau Preserve

<u>Scientific Name</u>	<u>Common Name</u>
<i>Osteopilus septentrionalis</i>	Cuban treefrog
<i>Anolis sagrei</i>	brown anole

Wildlife management at the preserve will focus on providing optimal habitat for native species. Control of invasive exotic plants will be a critical restoration component to provide improved habitat for wildlife. CPP is part of a countywide tri-annual site inspection program for all Conservation 20/20 preserves. These inspections allow staff to monitor for any impacts and/or changes to each preserve and include lists of all animal sightings and new plant species that are found. If, during these inspections, staff finds FNAI listed species, they will be reported using the appropriate forms.

iv. Designated Species

There are a number of designated animal and plant species (Table 4) found at CPP. Although all native plant and animal species found at the preserve have some protection due to the preservation of this property, certain species need additional attention. For management purposes, all plants and animals listed by the United States Fish and Wildlife Service (USFWS), Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Agriculture and Consumer Services (FDACS), the Institute for Regional Conservation (IRC), and FNAI will be given special consideration.

Typically, designated species will benefit from proper management of the biological communities in which they occur. However, some species may require additional measures to ensure their protection. Management practices likely to benefit wildlife at the preserve include exotic plant control, hydrological restoration, trash removal, wildlife monitoring and enforcement of no littering, no weapons and other regulations.

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

Scientific Name	Common Name	USFWS	FWC	FNAI	FDACS	IRC
REPTILES						
<i>Gopherus polyphemus</i>	gopher tortoise		T	G3/S3		
BIRDS						
<i>Pelecanus occidentalis</i>	brown pelican		SSC	G4/S3		
<i>Egretta caerulea</i>	little blue heron		SSC	G5/S4		
<i>Egretta thula</i>	snowy egret		SSC	G5/S3		
<i>Egretta tricolor</i>	tricolored heron		SSC	G5/S4		
<i>Eudocimus albus</i>	white ibis		SSC	G5/S4		
<i>Egretta rufescens</i>	reddish egret		SSC	G4/S2		
<i>Charadrius melodus</i>	piping plover	T	T	G3/S2		
PLANTS						
<i>Agave decipiens</i>	false sisal					R
<i>Distichlis spicata</i>	saltgrass					R
<i>Capparis cynophallophora</i>	Jamaican capertree					R
<i>Harrisia aboriginum</i>	prickly applecactus			G1/S1	E	CI
<i>Pithecellobium unguis-cati</i>	catclaw blackbead					R
<i>Sophora tomentosa</i>	yellow necklacepod					R
<i>Gossypium hirsutum</i>	upland cotton			G4G5/S3	E	R

Wildlife Species

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

Gopher Tortoise – Threatened

Gopher tortoises (*Gopherus polyphemus*) are in decline throughout their range due to loss and degradation of habitat and are state listed as a species of special concern. As a species dependent on dry, upland communities much of their habitat has been lost to urban and residential development, agriculture, mining, and pine plantations. Additional threats include a highly contagious respiratory disease and human consumption.

Reddish Egret, Little Blue Heron, Tricolored Heron - Threatened

Reddish egrets (*Egretta rufescens*) are the rarest heron in Florida. They were nearly extirpated by plume hunters by 1910. They have restricted habitat requirements and are extremely vulnerable to dredging, filling and bulkheading that occurs with coastal development. The little blue heron's (*Egretta caerulea*) and tricolored heron's (*Egretta tricolor*) decline are due to loss of freshwater wetlands and alteration of their natural hydroperiod. There is also some indication that pesticides and heavy metal contamination may affect this heron. Like these herons, the snowy egret (*Egretta thula*) is declining throughout its range, and has been since the 1950's. Scientists believe that the main reason for this decline is the loss and alteration of wetlands where they forage.

Plant Species

In addition to designated wildlife, CPP provides habitat for several listed plant species. There are at least two state listed plant species at the preserve; the prickly applecactus (*Harrisia aboriginum*) and upland cotton (*Gossypium hirsutum*) the majority of the other designated plant species (see Table 4) were provided by IRC, which is not a regulatory agency. For this plan, IRC's designation was taken from their report, A Floristic Survey and Rare Plant Assessment of Caloosahatchee Creeks Preserve, Lee County, Florida Final Report (IRC 2006). Scientists working for this Institute have conducted a tremendous amount of field work and research documenting plants occurring in conservation areas in the 10 southernmost counties of Florida. This initial floristic inventory allowed the IRC to rank plant species to indicate how rare/common these plants are in protected areas. IRC has designated several plants at CPP as SF1, "Critically Imperiled in South Florida."

In their book, Rare Plants of South Florida: Their History, Conservation and Restoration (Gann 2002), the authors provide an entire chapter of recommendations to help restore south Florida's rare plant diversity. Several of these recommendations, particularly those that protect plants on the Preserve and relate to stewardship practices, will be followed. More information on the specific techniques used will be discussed in the Management Action Plan. The following list highlights those recommendations by IRC that will be incorporated into the management of CPP:

- Prohibit recreational activities such as off-road vehicle and equestrian use to avoid impacts to rare plant populations.
- Ensure preserve improvements and management activities do not needlessly threaten or destroy rare plant populations.
- Prevent illegal poaching of rare plants, and prosecute poachers to the fullest extent of the law.
- Continue to implement an exotic pest plant control program.
- Educate exotic plant control crews about rare plants to ensure they avoid non-target damage.
- If noted trap feral hogs, to prevent destruction of vegetation and disturbance of soil due to rooting (feeding).

The following includes a brief summary of state-listed plant species as identified by FDACS, including reasons for their decline and typical plant communities in which they can be found. A complete list of plant species observed at CPP, including designated species, can be found in Appendix A.

v. Biological Diversity

Biodiversity at CPP varies depending on the community. The plant communities range from shell mound to tidally influenced mangrove swamps. This range of plant communities contributes to the plant and wildlife diversity throughout the preserve. Protection of and management for native plants across the landscape will enhance the overall biodiversity of the preserve.

Many species of animals not only inhabit, but also frequently visit the preserve. Currently 41 plant species (four exotic) and 33 fauna species (two non-natives) have been documented. Three of the four exotic plant species (75%) are on the Florida Exotic Pest Plant Council's 2017 List of Invasive Species (FLEPPC 2017).

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

- Control of invasive exotic vegetation followed by annual maintenance to provide more suitable habitat for native aquatic and terrestrial species.
- Remove any debris on site.
- Control invasive exotic animal populations to reduce their impacts on the herbaceous plants, native animals and soils.
- Conduct on-going species surveys utilizing volunteers and staff to catalog and monitor the diversity that is present.

C. Cultural Resources

i. Archaeological Features FIX

In 1987, Piper Archaeological Research, Inc. conducted an archaeological site inventory of Lee County. They were able to identify 53 sites, increasing the total number of known archaeological sites in Lee County to 204. They also created a site predictive model and archaeological sensitivity map for the county that highlighted areas likely to contain additional archaeological sites. The entire preserve is located within an area designated as archaeological sensitivity level 2. The study defines this level as “areas that contain known archaeological sites that have not been assessed for significance and/or conform to the site predictive model in such a way that there is a high likelihood that unrecorded sites of potential significance are present. If these areas are to be impacted by development activities, then they should be subjected to a cultural resource assessment survey by a qualified professional archaeologist in order to determine the presence of any archaeological sites in the impact area and/or assess the significance of these sites.” (Austin 1987).

Although not identified through the Piper Archaeological site inventory of Lee County, known archaeological sites described by entries in the Florida Master Site File do exist in and around the preserve. Some of these sites lie partially in Charlotte County slightly north of the Preserve boundary, however at least seven of the sites described are partially within the preserve. It is likely that the entire island was occupied historically and additional archaeological sites may be found within the preserve.

In addition to the aboriginal sites, post-contact Mission Indian, Seminole and Colonial Spanish materials have been found on the island. More recently, several mid-twentieth century homesteaders and a commercial clam harvesting operations have left organic remains, trash dumps and a well, all rich in historic diagnostics.

A professional archaeologist will be hired to conduct a survey of the area to be impacted if restoration projects require any major soil disturbance. If evidence of

shell middens or other artifacts are found in the area during restoration activities, staff will follow the Division of Historical Resources (DHR) “Best Management Practices: An Owner’s Guide to Protecting Archeological Sites” (<http://dos.myflorida.com/media/30904/handbook.pdf>) and immediately DHR will be contacted. The site will be managed in coordination with recommendations of the Division of Historical Resources and, if necessary, the site will be kept confidential with periodic monitoring for impacts. If any significant archaeological resources are found and confidentiality is not found to be necessary, they will be incorporated into the public educational program.

ii. Land Use History

The land use history of Cayo Pelau is complicated by the persistent rumors of pirates, so separating fact from fiction is difficult. What is known is that Native American Indians historically used the island, as evidence from the numerous archeological sites (shell middens and mounds found on the Island) shows. The island and the islands around it also had temporary Cuban fishing settlements. There is no known evidence on the island of these small fishing settlements remaining today.

In more recent history, the preserve was known to be home to Columbus G. McLeod, who was a state deputized warden employed by the Audubon Society. McLeod was tasked with the dangerous job of protecting Charlotte Harbor’s wild birds from plumage hunters. Game Warden McLeod disappeared while on duty presumably murdered by poachers in 1908. His death spurred a national campaign against wearing feathers and became the tipping point for public sentiment toward prosecution of plume hunters.

Presently the island as a whole is used recreationally. Boaters access the island and surrounding waters for fishing, swimming and sunbathing. Evidence of overnight camping has been found on the island along with signs of looting.

Figure 8: 1953 Aerial Photograph

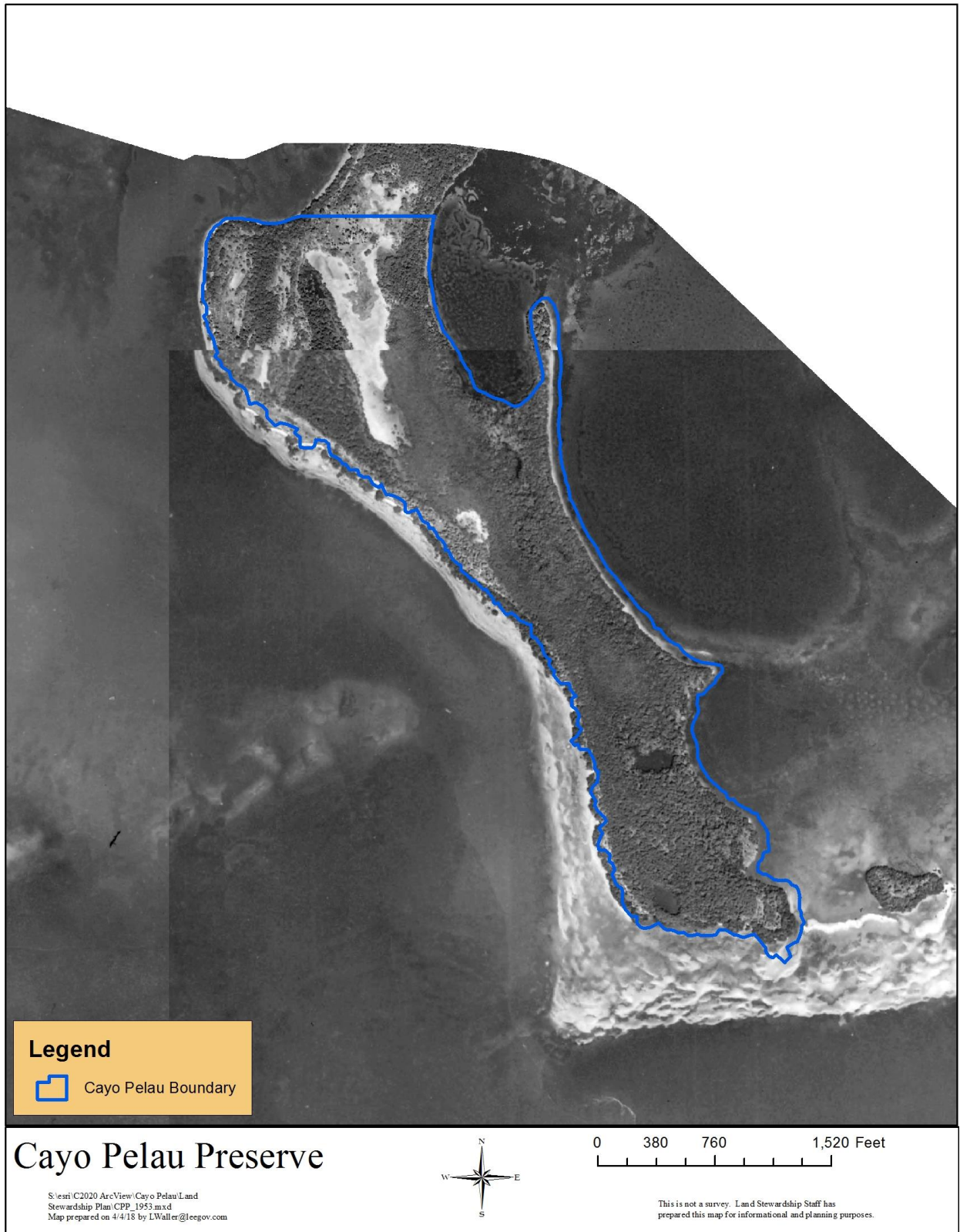


Figure 9: 2002 Aerial Photograph



Figure 10: 2011 Aerial Photograph



iii. Public Interest

CPP was purchased for the preservation of environmentally sensitive lands, high probability for state listed species, proximity to known archaeological resources, and overall benefits to the surrounding aquatic preserve.

Both the Calusa Land Trust and the Gasparilla Island Conservation & Improvement Association, Inc. actively showed an interest in the protection and preservation of Cayo Pelau and donated monies to the acquisition fund in order for C20/20 to purchase the island (see acquisition section for more information).

C20/20 staff has not received any public visitation requests concerning the preserve and limited requests for information. Publicly available information concerning this and all C20/20 preserve can be found on the website along with copies of their associated management plans when available (Conservation2020.org).

Although C20/20 has not received much evidence of public interest in the preserve, its colorful, although mythical, history of pirates, treasure, and ghosts persist in modern literature. The book *Gasparilla: Pirate Genius* by James Kaserman accounts details of how the pirate Jose Gaspa (Gasparilla) and his men used the island to secure their bounty and also the small Spanish settlement of “Low Town” that is said to have existed on the island to repair boats and entertain themselves.

In reality, the island was used as a seasonal settlement for Cuban fishermen, however, myths of treasure still persist and occasionally passing visitors make efforts to illegally excavate areas of any mounds in search fortune and fame. Beyond the interest from treasure hunters, the preserve receives casual recreational use from boaters and evidence of day/overnight camps have been found during the various site inspections, field work, and environmental survey.

V. FACTORS INFLUENCING MANAGEMENT

A. Natural Trends and Disturbances

Natural trends and disturbances influencing native communities and management at CPP include hurricanes, fluctuating tides, occasional freezes, and the cycling wet and dry seasons. Implementation of the Management Action Plan will take all of these factors and their influence on projects at CPP into consideration. For example, a tropical storm or hurricane could cause extensive damage to vegetation. In the event that CPP is impacted by a hurricane the site will be left to recover on its own, as was the case with the active hurricane seasons over the past 20 years in which the preserve has received hurricane force winds multiple times. Significant damage occurred to the tidal swamp plant community after the 2004 hurricane season but it is slowly recovering. In 2017, Hurricane Irma also caused some vegetative damage however, it was light and will also recover without human intervention.

Another natural trend important for the management of the preserve is an understanding of the dynamic nature of an island and how storms and continuous natural process can erode and deposit sediments that essentially change the boundaries of the island. The sand accretion appears to be causing the spit that protrudes to the southwest of the island to grow over the past several decades (Figures 8-10). Although this land mass doesn't fall within the boundary of the preserve, it shall be managed as part of CPP as will any future alterations to the island within Lee County.

Invasive exotic plant control is influenced by hydro-periods and tides. The LSOM's exotic plant prescription form will be used to define the conditions for control activities. Care shall be taken to prevent herbicide from running off during a typical summer thunderstorm so as not to affect non-target plants. Only herbicides approved for aquatic application will be used for treatment of vegetation in standing water or where flooding may occur.

B. Internal Influences

Internal Influences at CPP are limited to those areas utilized for historic activities and the few areas easily accessible for recreational use.

Shell middens and mounds along with a berm that runs the length of the island (created most likely by extreme tidal and storm events) provide areas for the establishment of invasive species. It is in these areas that the growth of Brazilian pepper and Australian pine had been most concentrated. These areas are also frequented by visitors and accumulate both their discarded trash and that which washes ashore. While exotic control has brought the exotic plants to maintenance level, many of the archeological sites have evidence of scavengers in the form of pits dug to remove artifacts. Prevention of additional digging and soil disturbance will protect possible cultural resources and minimize the growth of invasive species.

C. External Influences

The external influences on CPP are many and varied, as with all islands broad scale climate fluctuations and natural processes of erosion, long-shore drift, and disposition that affect the size and form of the island and in turn the boundaries of the preserve.

A more localized external influence is the water quality in the Cape Haze Aquatic Preserve. Water quality is greatly affected by a number of natural processes and is impacted by runoff from developed lands including pollutants such as oils, heavy metals, chemicals, and even nutrient levels such as nitrogen and phosphorus. More localized external influences include water quality within the Cape Haze Aquatic Preserve. This includes both water quality, which is greatly

affected by a number of natural processes and impacted by runoff from both the mainland and the populated barrier islands, and pollution.

Boat usage in the waters surrounding CPP can also influence the overall health of the preserve. These impacts include pollution from engines/exhausts, trash dropped from passing boats, and noise pollution which scares off wildlife.

Finally unauthorized uses including littering, campfires, camping, party hangouts, treasure hunting, and make-shift latrines may occasionally occur. Due to its location, the preserve is difficult to patrol; however, if these problems are noted restrictive signage will be used to inform and educate. If problems persist a structured patrol of the area will be considered in coordination with other enforcement services.

D. Legal Obligations and Constraints

i. Permitting

Exotic plant removal projects may require obtaining a de minimis permit from the Florida Department of Environmental Protection (FDEP) due to the extensive mangroves growing along the shoreline that may unintentionally be damaged. In addition all activities will be coordinated with input from Florida Division of Historical Resources.

ii. Other Legal Constraints

Beyond permitting and obligations associated with the discovery of archaeological features (as discussed in the Archaeological Features section), there are no other legal obligations expected to affect this preserve.

iii. Relationship to Other Plans

The Lee Plan, Lee County's comprehensive plan, is designed to depict Lee County as it will appear in the year 2020. Several themes have been identified as having "great importance as Lee County approaches the planning horizon" (Lee County 2004). These themes are:

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

The entire Lee Plan can be found on the Internet at: <http://www.leegov.com/dcd/planning/leeplan> and sections of the plan which may pertain to C20/20 preserves have been identified in the LSOM.

E. Management Constraints

The principle management constraints for CPP include limited funding, limited access (via boat only), the brief dry season for conducting land management activities, and the limitations on use of heavy equipment due to the sensitive nature of the archaeological sites found in and around the preserve. Although C20/20 has funding allocated each year by the Board of County Commissioners (BoCC), efforts to obtain additional funding through grants and monies budgeted for mitigation of public infrastructure projects will be pursued when possible. These funds will be used to supplement the operations budget to meet the restoration goals in a timely manner.

F. Public Access and Resource-Based Recreation

At this time, no public recreational amenities are proposed at CPP. In accordance with the Land Stewardship Operations Manual (LSOM), CPP is classified as a Category 4 Resource Protection & Restoration Preserve. As with all designated Category 4 preserves, "if there is a public interest, staff may provide guided field trips when there are no safety concerns and it is compatible with protecting the animals and plant communities found at the specific preserve."

Staff has consulted the DHR and was advised camping would be incompatible with the type of property involved and the sensitivity of the archeological sites. Due to the location of the preserve, site visits by rangers and staff are infrequent. The maintenance of any facilities would be problematic. If evidence of illegal recreational use, camping, bon fires, and relic collection is observed, signs may be posted to inform visitors of prohibited activities.

G. Acquisition

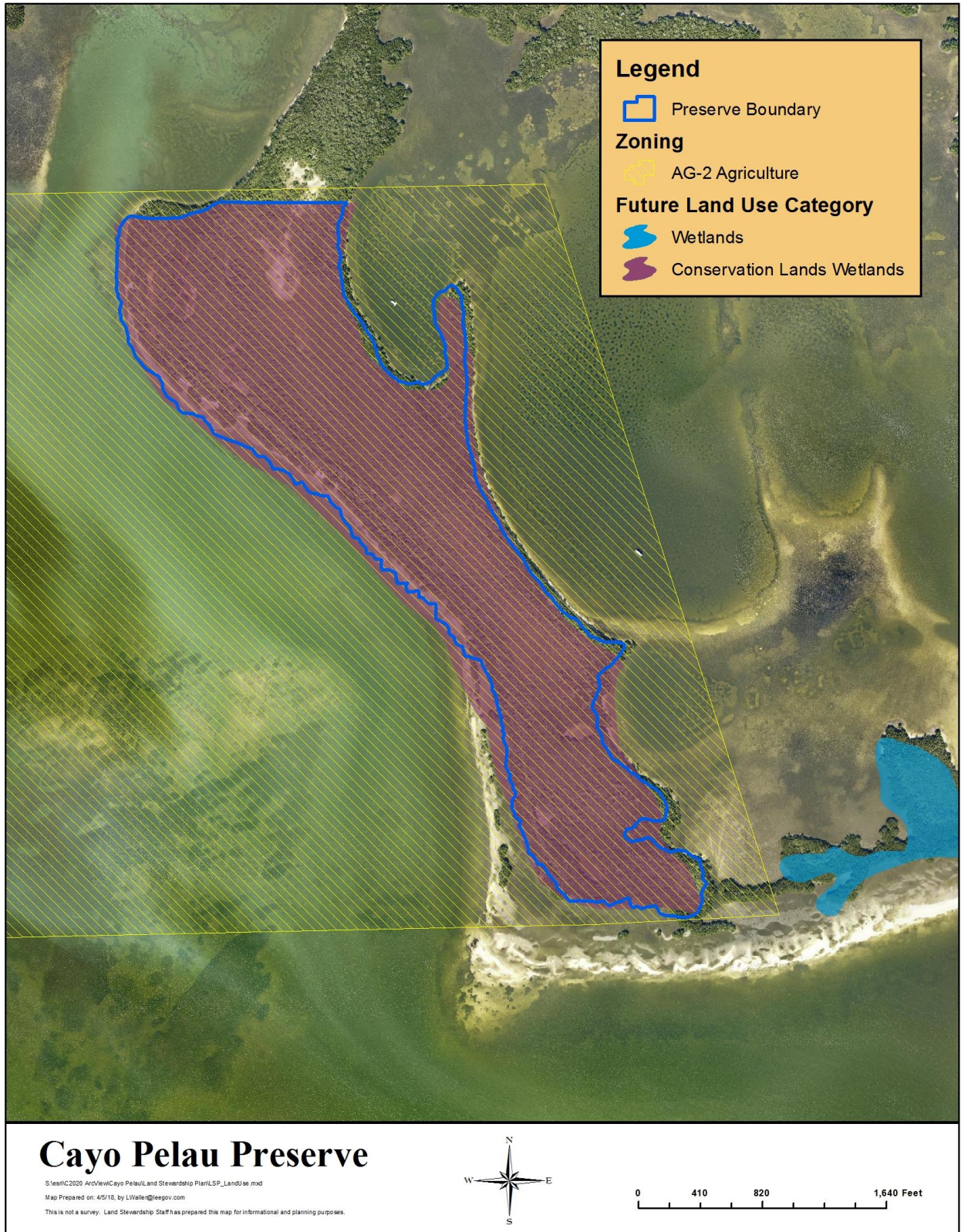
The 126-acre CPP consists of a single nomination (#161) purchased in 2006 through the C20/20 Program for a total cost of \$2.5 million. The parcel was acquired for a number of reasons including the overall beneficial effects to the surrounding aquatic preserves, preservation of environmentally sensitive lands and proximity to known archaeological resources. The STRAP numbers for the preserve are 05-43-21-00-00001.0000 and 06-43-21-00-00001.0000.

The preserve had been nominated to the C20/20 program twice but both times the property scored low in the initial review stage due to an asking price that greatly exceeded market value.

Some of the monies required for acquisition were contributed by the Calusa Land Trust and the Gasparilla Island Conservation & Improvement Association, Inc. who donated \$20,000 and \$10,000 respectively.

CPP's future land use category is "Conservation Lands," further sub-categorized as "Wetlands". Currently, all of CPP is zoned as agriculture "AG-2" (Figure12). Land Conservation management staff will coordinate with the Lee County Community Development (LCDCD) to change the zoning to "Environmentally Critical."

Figure 11: Future Land Use and Zoning Map



VI. MANAGEMENT ACTION PLAN

A. Management Unit Descriptions

Due to its small size, isolated location and consistency in coastal communities CPP will not be divided into separate Management Units.

B. Management Work to Date

Cayo Pelau Preserve was purchased with most of its natural plant communities intact. Therefore, large scale restoration projects were not required for this property. The primary area of concern for staff is an area surrounding the small beaches near the northwestern corner of the preserve. This area had been invaded by Australian pine and Brazilian pepper. Numerous staff and volunteer workdays along with Calusa Land Trust workdays were held in order to chip away at these species as well as remove debris washed ashore. In 2015, the remaining exotic control was contracted out with the initial treatment being completed in December of 2015 and a retreatment occurring in March of 2016. This work totaled \$6,784.

C. Goals and Strategies

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

Natural Resource Management

- Exotic plant control and maintenance
- Monitor and protect listed species

Overall Protection

- Cultural Resource Protection and Preservation
- Debris removal
- Boundary and preserve sign installation
- Change zoning categories
- Develop Cooperative Management with DEP and/or USFWS

Public Use

- Public Information

Volunteers

- Assist volunteer groups

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

Natural Resource Management

Exotic plant control and maintenance

The most current Florida Exotic Pest Plant Council's List of Invasive Species will be consulted in determining the invasive exotic plants to be controlled on the Preserve. The goal is to remove/control these exotic species, followed with treatments of resprouts and new seedlings as needed. This goal will continue to maintain the entire preserve at its maintenance level, defined as less than 5 percent invasive exotic plant coverage. Land management staff will designate one of the quarterly site inspections each year to the control of identified invasive exotic species. This site inspection/exotic control will occur during the driest part of the year between February and April.

Staff will hand pull, basal bark, girdle, foliar, or cut-stump treat the exotics with the appropriate herbicide during periods of extreme low tide. Follow-up treatments will be conducted on an as needed basis as discovered in the quarterly site inspections. No replanting will be needed due to significant presence of native vegetation and native seed bank.

Prior to each invasive exotic plant control project at CPP, a Prescription Form (located in the LSOM) will be filled out by land management staff. If future work involves hiring a contractor, the prescription will be reviewed by the contractor(s) and filed appropriately. Contractors involved in these projects will be required to fill out the Daily Report Control Form (located in the LSOM), which will be filed appropriately by staff.

Monitor and protect listed species

As discussed in the Designated Species section, there are several listed species that have been documented on the preserve. These species will benefit from exotic plant control activities. During management activities, efforts will be made to minimize any negative impact to listed species.

Although gopher tortoises are found on the island, the island doesn't provide much suitable habitat for them. Due to the small amount of habitat and existing tortoise population the preserve is unsuitable as a location for future relocations of this species from elsewhere in the County.

CPP is part of a countywide three-times-per-year site inspection program conducted for all C20/20 preserves. A copy of the site inspection form is available in the LSOM. These inspections allow staff to monitor for any impacts

and/or changes to each preserve and includes lists of all animal sightings and new plant species that are found. If, during these inspections, staff finds FNAI listed species, they will be reported using the appropriate forms.

Overall Protection

Cultural Resource Protection and Preservation

As funds become available a complete cultural resource survey of the preserve should be conducted. It is recommended that looter pits be carefully filled in to dissuade continued attempts to find artifacts and reduce any chance that visitors may become injured while walking the island. If possible these pits should be filled with non-indigenous sediment to allow future cultural investigation to identify historical layers with the substrate from the restoration. Restoration of these pits could easily coincide with investigation of the sediment layers and surface artifacts within the pits to give a better idea of the preserve and island's historic uses and be coordinated with the Florida Division of Historical Resources.

At this time there are no plans to actively interpret the cultural significance of the island. Increased publicity of cultural resources could lead to greater looting/treasure hunting issues and without adequate patrols of the preserve damage could occur.

Debris removal

CPP has a small amount of debris on interior portions and shoreline. The debris readily accumulates as it washes in. Debris removal will be an ongoing effort at CPP. During site inspections, small objects that are encountered will be removed.

Boundary sign installation

Boundary signs have been installed to further inform and delineate the preserve. Missing or damaged signs will be replaced. C20/20 Rangers or staff will check for boundary signs during the patrols and replace them immediately if possible or report the problem to the C20/20 coordinator or supervisor.

Change zoning categories

Staff will coordinate with Lee County Community Development staff to update the zoning designation of CPP. The zoning categories will be changed to "Environmentally Critical" from "Agriculture."

Develop Cooperative Management Agreements

As shown in Figure 2, the island of Cayo Pelau is transected by the County boundary. The preserve exists solely on the Lee County side of the island; however, significant cultural and natural resources occur within Charlotte County and along the boundary of the preserve. Every effort will be made to ensure that management of the preserve considers those resources and a cooperative management agreement or Memorandum of Understanding (MOU) will be sought with Charlotte County.

The portion of the island within Charlotte County is owned by the Charlotte County and is currently zoned as Environmentally Sensitive with a Future Land Use designation of "Preservation."

Public Use

Public Information

Information regarding CPP and the C20/20 program will be made available through the C20/20 website (www.conservation2020.org) and other published media.

Volunteers

Assist volunteer groups

The LSOM identifies the Conservation Lands Volunteer Program's mission statement as: To aid in the management and preservation of Lee County resource-based public parks and preserves and to provide volunteers with rewarding experiences in nature.

If there is interest from the community to form a volunteer group, staff will work with them to assist with the diverse stewardship activities that will be associated with this preserve, wildlife monitoring, debris removal, exotic plant removal, and other land management projects. Staff will also assist with Calusa Land Trust and Gasparilla Island Conservation & Improvement Association planned workdays.

VII. PROJECTED TIMETABLE FOR IMPLEMENTATION

Management Activity	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028
Natural Resource Management											
Continued Exotic Plant Control	X		X		X		X		X		X
Trash/Debris Removal	On-going	→	→	→	→	→	→	→	→	→	→
Overall Protection											
Replace missing boundary signs	On-going	→	→	→	→	→	→	→	→	→	→
Change Zoning Category			X								
Cultural Resource Inventory					X						
Volunteers											
Assist Volunteer Groups	As Volunteer Groups Require										

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

VIII. Financial Considerations

The Conservation 20/20 program is funded by the county's general fund in accordance with ordinance 18-12 (as amended). This annual allocation funds restoration maintenance of the preserves, and C20/20 staff costs. Funds not used in the annual allocation roll over to the following year for maintenance and restoration.

Other possible funding sources for exotic plant treatments and restoration projects may be requested through grant opportunities from agencies such as SFWMD, FDEP, FWC, and USFWS or include additional opportunities. Expended and projected cost and funding sources are listed in Appendix C.

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X. APPENDICES

Appendix A: Plant Species List

Appendix B: Wildlife Species List

Appendix C: Projected Costs and Funding Sources

Plant list for Cayo Pelau Preserve

Scientific Name	Common Name	Native status	EPPC	FDACS	IRC	FNAI
Family: Agavaceae (agave)						
<i>Agave decipiens</i>	false sisal	native			R	
<i>Yucca aloifolia</i>	Spanish bayonet	exotic				
Family: Amaryllidaceae (amaryllis)						
<i>Hymenocallis latifolia</i>	mangrove spiderlily	native				
Family: Arecaceae (palm)						
<i>Sabal palmetto</i>	cabbage palm	native				
Family: Cymodoceaceae (manateegrass)						
<i>Halodule wrightii</i>	shoalweed	native				
Family Hydrocharitaceae (frog's-bit)						
<i>Thalassia testudinum</i>	turtlegrass	native				
Family: Poaceae (grass)						
<i>Distichlis spicata</i>	saltgrass	native			R	
Family: Aizoaceae (mesembryanthemum)						
<i>Sesuvium portulacastrum</i>	shoreline seapurslane	native				
Family: Amaranthaceae (amaranth)						
<i>Alternanthera flavascens</i>	yellow joyweed	native				
<i>Blutaparon vermiculare</i>	samphire, silverhead	native				
<i>Suaeda linearis</i>	sea blite	native				
Family: Anacardiaceae (cashew)						
<i>Schinus terebinthifolius</i>	Brazilian pepper	exotic	I			
Family: Asteraceae (aster)						
<i>Borrchia frutescens</i>	bushy seaside oxeye	native				
Family: Avicenniaceae (black mangrove)						
<i>Avicennia germinans</i>	black mangrove	native				
Family: Bataceae (saltwort)						
<i>Batis maritima</i>	saltwort	native				
Family: Boraginaceae (borage)						
<i>Heliotropium angiospermum</i>	scorpionstail	native				
Family: Brassicaceae (mustard)						
<i>Capparis cynophallophora</i>	Jamaican capertree	native			R	
Family: Burseraceae (gumbo-limbo)						
<i>Bursera simaruba</i>	gumbo-limbo	native				
Family: Cactaceae (cactus)						
<i>Harrisia aboriginum</i>	prickly applecactus	native		E	CI	G1/S1
Family: Casuarinaceae (sheoak)						
<i>Casuarina equisetifolia</i>	Australian pine	exotic	I			
Family: Combretaceae (combretum)						
<i>Conocarpus erectus</i>	buttonwood	native				
<i>Laguncularia racemosa</i>	white mangrove	native				
Family: Fabaceae (pea)						
<i>Caesalpinia bonduc</i>	gray nicker	native				
<i>Dalbergia ecastaphyllum</i>	coinvine	native				
<i>Piscidia piscipula</i>	Jamaican dogwood	native				
<i>Pithecellobium unguis-cati</i>	catclaw blackbead	native			R	
<i>Sophora tomentosa</i>	yellow necklacepod	native			R	
Family: Malvaceae (mallow)						
<i>Gossypium hirsutum</i>	upland cotton	native		E	R	G4G5/S3
Family: Moraceae (mulberry)						
<i>Ficus aurea</i>	strangler fig	native				
Family: Myrsinaceae (myrsine)						

Plant list for Cayo Pelau Preserve

Scientific Name	Common Name	Native status	EPPC	FDACS	IRC	FNAI
<i>Rapanea punctata</i>	myrsine	native				
Family: Myrtaceae (myrtle)						
<i>Eugenia axillaris</i>	white stopper	native				
<i>Eugenia foetida</i>	Spanish stopper	native				
Family: Oleaceae (olive)						
<i>Forestiera segregata</i>	Florida swampprivet	native				
Family: Polygonaceae (buckwheat)						
<i>Coccoloba uvifera</i>	seagrape	native				
Family: Rhizophoraceae (mangrove)						
<i>Rhizophora ramosior</i>	red mangrove	native				
Family: Rubiaceae (madder)						
<i>Chiococca alba</i>	snowberry	native				
<i>Randia aculeata</i>	white indigoberry	native				
Family: Rutaceae (citrus)						
<i>Zanthoxylum fagara</i>	wild lime	native				
Family: Sapindaceae (soapberry)						
<i>Cupaniopsis anacardioides</i>	carrotwood	exotic	I			
Family: Sapotaceae (sapotaceae)						
<i>Sideroxylon celastrinum</i>	saffron plum	native				
Family: Solanaceae (nightshade)						
<i>Lycium carolinianum</i>	Christmasberry	native				

Key

Florida EPPC Status

I = species that are invading and disrupting native plant communities

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

FDACS (Florida Department of Agriculture and Consumer Services)

E = Endangered

T = Threatened

CE = Commercially Exploited

IRC (Institute for Regional Conservation)

CI = Critically Imperiled

I = Imperiled

R = Rare

FNAI (Florida Natural Areas Inventory)

G= Global Status

T= Threatened

CE= Commercially Exploited

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

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

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

4= Apparently secure

5= Demonstrably secure

Wildlife Species List for Cayo Pelau Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
MAMMALS				
Family: Felidae (cats)				
<i>Lynx rufus</i>	bobcat			
Family: Procyonidae (raccoons)				
<i>Procyon lotor</i>	raccoon			
BIRDS				
Family: Pelecanidae (pelicans)				
<i>Pelecanus erythrorhynchos</i>	American white pelican			
<i>Pelecanus occidentalis</i>	brown pelican			G4/S3
Family: Ardeidae (herons, egrets, bitterns)				
<i>Egretta thula</i>	snowy egret			G5/S3
<i>Egretta caerulea</i>	little blue heron	T		G5/S4
<i>Egretta tricolor</i>	tricolored heron	T		G5/S4
<i>Egretta rufescens</i>	reddish egret	T		G4/S2
Family: Threskiornithidae (ibises and spoonbills)				
Subfamily: Threshiornithinae				
<i>Eudocimus albus</i>	white ibis			G5/S4
Family: Cathartidae (new world vultures)				
<i>Coragyps atratus</i>	black vulture			
<i>Cathartes aura</i>	turkey vulture			
Family: Pandionidae (ospreys)				
<i>Pandion haliaetus</i>	osprey			
Family: Charadriidae (plovers)				
Subfamily: Charadriinae				
<i>Charadrius melodus</i>	piping plover	T	T	G3/S2
Family: Scolopacidae (sandpipers and phalaropes)				
Subfamily: Scolopacinae				
<i>Calidris minutilla</i>	least sandpiper			
<i>Calidris mauri</i>	western sandpiper			
Family: Laridae (gulls)				
Subfamily: Larinae				
<i>Larus atricilla</i>	laughing gull			
Subfamily: Sterninae (terns)				
<i>Sterna hirundo</i>	common tern			
<i>Sterna forsteri</i>	Forster's tern			
Family: Columbidae (pigeons and doves)				
<i>Columbina passerina</i>	common ground-dove			
Family: Alcedinidae (kingfishers)				
<i>Ceryle alcyon</i>	belted kingfisher			
Family: Tyrannidae (tyrant flycatchers)				
Subfamily: Fluvicolinae				
<i>Myiarchus crinitus</i>	great crested flycatcher			
Family: Vireonidae (vireos)				
<i>Vireo griseus</i>	white-eyed vireo			
Family: Polioptilidae				
<i>Polioptila caerulea</i>	blue-gray gnatcatcher			
Family: Mimidae (mockingbirds and thrashers)				
<i>Dumetella carolinensis</i>	gray catbird			
Family: Parulidae (wood-warblers)				
<i>Mniotilta varia</i>	black-and-white warbler			

Wildlife Species List for Cayo Pelau Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
<i>Parula americana</i>	northern parula			
<i>Dendroica palmarum</i>	palm warbler			
<i>Dendroica discolor</i>	prairie warbler			
Family: Cardinalidae (cardinals, some grosbeaks, new world buntings, etc.)				
<i>Cardinalis cardinalis</i>	northern cardinal			
REPTILES				
Family: Testudinidae (gopher tortoises)				
<i>Gopherus polyphemus</i>	gopher tortoise	T		G3/S3
Family: Polychridae (anoles)				
<i>Anolis sagrei</i>	brown anole*			
Family: Hylidae (treefrogs and their allies)				
<i>Osteopilus septentrionalis</i>	Cuban treefrog *			
CRUSTACEANS				
Family: Ocypodoidea (ghost and fiddler crabs)				
Subfamily: Ocypodinae (fiddler crabs)				
<i>Uca stylifera</i>	fiddler crab			

KEY:

FWC = Florida Fish & Wildlife Conservation Commission

FWS = U.S. Fish & Wildlife Service

E - Endangered

T - Threatened

SSC - Species of Special Concern

FNAI = Florida Natural Areas Inventory

G - Global rarity of the species

S - State rarity of the species

T - Subspecies of special population

1 - Critically imperiled

2 - Imperiled

3 - Rare, restricted or otherwise vulnerable to extinction

4 - Apparently secure

5 - Demonstrably secure

* = Non-native

Expended Costs 2007-2018

Natural Resource Management

<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>
Exotic Plant Treatments	C20/20	In House
Contracted Exotic Plant Treatments	C20/20	\$6,784.00

Total \$6,784.00

Overall Protection

<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>
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Total \$0.00

Public Use

<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>
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Total \$0.00

CCP Preserve Total Expended Cost To Date \$6,784.00

Projected Cost Formulas

Natural Resource Management			
<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>	<u>Occurrences</u>
Exotic Plant Treatments	C20/20	In House	10
Contracted Exotic Plant Treatments	C20/20	\$3,276.00	10
Overall Protection			
<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>	<u>Occurrences</u>
Boundary Sign Replacement	C20/20	\$10.00	10
Debris Removal	C20/20	In House	10
Public Use			
<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>	<u>Occurrences</u>

Due to the timeframe of this management report, all associated management expenses have been projected over 10 years.

Total costs have been distributed evenly across a 10 year timeframe to generate a projected annual management expense of **\$3,276.00 per year**.

Total projected annual management expense will be **\$32,760 over 10 years**.

Total projected restoration expense to occur within the timeframe of this plan will be **\$0**.