

IMPERIAL RIVER PRESERVE



SECOND EDITION
LAND MANAGEMENT PLAN



Imperial River Preserve Land Management Plan

Second Edition



Prepared by:
The Conservation 20/20 Land Management Section of
Lee County's Department of Parks and Recreation

Approved by the Lee County Board of County Commissioners: 9/19/2017

Acknowledgements

Thank you to the Lee County Conservation Lands staff and members of Management Sub-Committee of the Conservation Lands Acquisition and Stewardship Advisory Committee for assisting with the creation of this plan and for carefully reviewing it.

Lee Waller

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List of Acronyms

BoCC	Board of County Commissioners
C20/20	Conservation 20/20
CLASAC	Conservation Lands Acquisition and Stewardship Advisory Committee
DHR	Division of Historical Resources
DRI	Development of Regional Impact
ESA	Environmental Site Assessment
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FFS	Florida Forest Service
FLEPPC	Florida Exotic Pest Plant Council
FLUCFCS	Florida Land Use, Cover and Forms Classification System
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
IRC	Institute for Regional Conservation
IRP	Imperial River Preserve
LCDCD	Lee County Department of Community Development
LCDCL	Lee County Division of County Lands
LCDP	Lee County Division of Planning
LCPR	Lee County Parks and Recreation
LiDAR	Light Detecting and Ranging
LSOM	Land Stewardship Operations Manual
LWCR	Lower West Coast Region
MDP	Master Development Plans
MU	Management Unit
NWI	National Wetlands Inventory
ROW	Right of Way
SFWMD	South Florida Water Management District
SMCSP	Six Mile Cypress Slough Preserve
STRAP	Section-Township-Range-Area-Block.Lot
SWFIA	Southwest Florida International Airport
USDA	United States Department of Agriculture
USACOE	United States Army Corps of Engineers
USFWS	United States Fish and Wildlife Service

Vision Statement

It is the vision of the Conservation Lands staff in the Lee County Department of Parks and Recreation and the Conservation 20/20 Program to maintain Imperial River Preserve as a productive, functional and viable ecosystem. The mangroves will continue to provide valuable habitat and foraging opportunities for both terrestrial and marine wildlife.

I. EXECUTIVE SUMMARY

Imperial River Preserve is north of Bonita Beach Boulevard in Bonita Springs, which is located in southern Lee County. The preserve is named after the Imperial River that surrounds much of the preserve and empties into Estero Bay. This preserve is part of Lee County's Conservation 20/20 land acquisition and management program which acquires, restores, and manages environmentally sensitive properties. Established in 1996, Conservation 20/20 is a land acquisition and management program created through a Lee County voter referendum and operated through the Lee County Department of Parks and Recreation and County Lands. In 2016, Lee County voters were given an opportunity to show support for continuation of the Conservation 20/20 Program, and the referendum passed with an 84 percent majority. Funding for the management of the conservation lands comes from the general budget fund in accordance to County Ordinance No. 15-08.

Conservation 20/20 staff writes a land management plan for each Conservation 20/20 preserve which explains its natural resources and ecosystems as well as laying out the plans for possible public recreation and restoration projects that might be needed. These plans are rewritten every 10 years with updated information, maps, and additional information explaining what work had been completed on the site since the last plan. Imperial River Preserve has its first management plan written in 2007, and this plan is its first 10 year revision or second edition.

Imperial River Preserve is located in Section 31, Township 47 South, Range 25 East, in Bonita Springs less than two miles west of US-41. The 39 acre preserve, nomination 81, was acquired from Lee County in 1998 through the Conservation 20/20 Program for \$600,000.

Two different soil types occur at Imperial River Preserve. Covering over 99 percent of the preserve, the most common soil type by far is Wulfert Muck which is the soil for tidal salt water marshes and mangroves. There is a minimal change in natural elevations at Imperial River Preserve. Elevation ranges from 0-2 feet with no notable slope across the preserve.

Imperial River Preserve is part of the 86 square mile Imperial River Watershed, the largest in Lee County within the South Florida Water Management District's Estero Bay Basin. Esplanade Street and the residential properties to the north of the preserve have blocked natural water movement across the site.

The preserve contains one natural plant community which is mangrove swamp. Imperial River Preserve provides habitat for a variety of animal species including the white ibis, reddish egret, and the little blue heron.

Several human influences have impacted the preserve. These influences can be attributed to adjacent road building and residential developments. These disturbances have altered the flow of water across the site and allowed invasive exotic plants to become established disrupting the natural systems and impact the native species on the property.

This preserve contains only wetland soils and plant communities making it unsuitable for resource based recreational opportunities other than paddling around the property.

Work done to date at Imperial River Preserve involves treatment of invasive exotic vegetation, native plantings, debris removal, and boundary sign installation.

Management Work Completed Since Last Plan Revision in 2007

- ✓ Exotic Plant Control
- ✓ Debris Removal

II. INTRODUCTION

Imperial River Preserve (IRP) was acquired on March 25, 1998 through Lee County's Conservation 20/20 (C20/20) Program. It is 38.95 acres in size and is located in Bonita Springs north of Bonita Beach Blvd. in southern Lee County. The preserve contains one natural plant community, mangrove swamp. Construction of Esplanade Street and a residential development to the north of the preserve, as well as invasive exotic plants have disturbed portions site.

Review of historic aerial photography prior to 1950 shows no evidence of human influences, however, a roadway was cleared in the 1950s followed by the installation of a canal along the eastern boundary in the 1960s and Esplanade Street and the residential community being built in the 1970s. In 1992 an encroachment of fill, gravel, and sod were installed onto the property while building a neighboring home and yard. That encroachment of 1,937 square feet was sold to the neighboring homeowner in 2000 with proceeds going back into the Conservation 20/20 acquisition fund.

Land management activities for the site will include ongoing invasive exotic plant control and debris removal. There are no public recreation amenities proposed for this preserve since the entire preserve is a wetland. Work done to date on the preserve has involved treatment of invasive exotic vegetation, native plantings, and boundary sign installation.

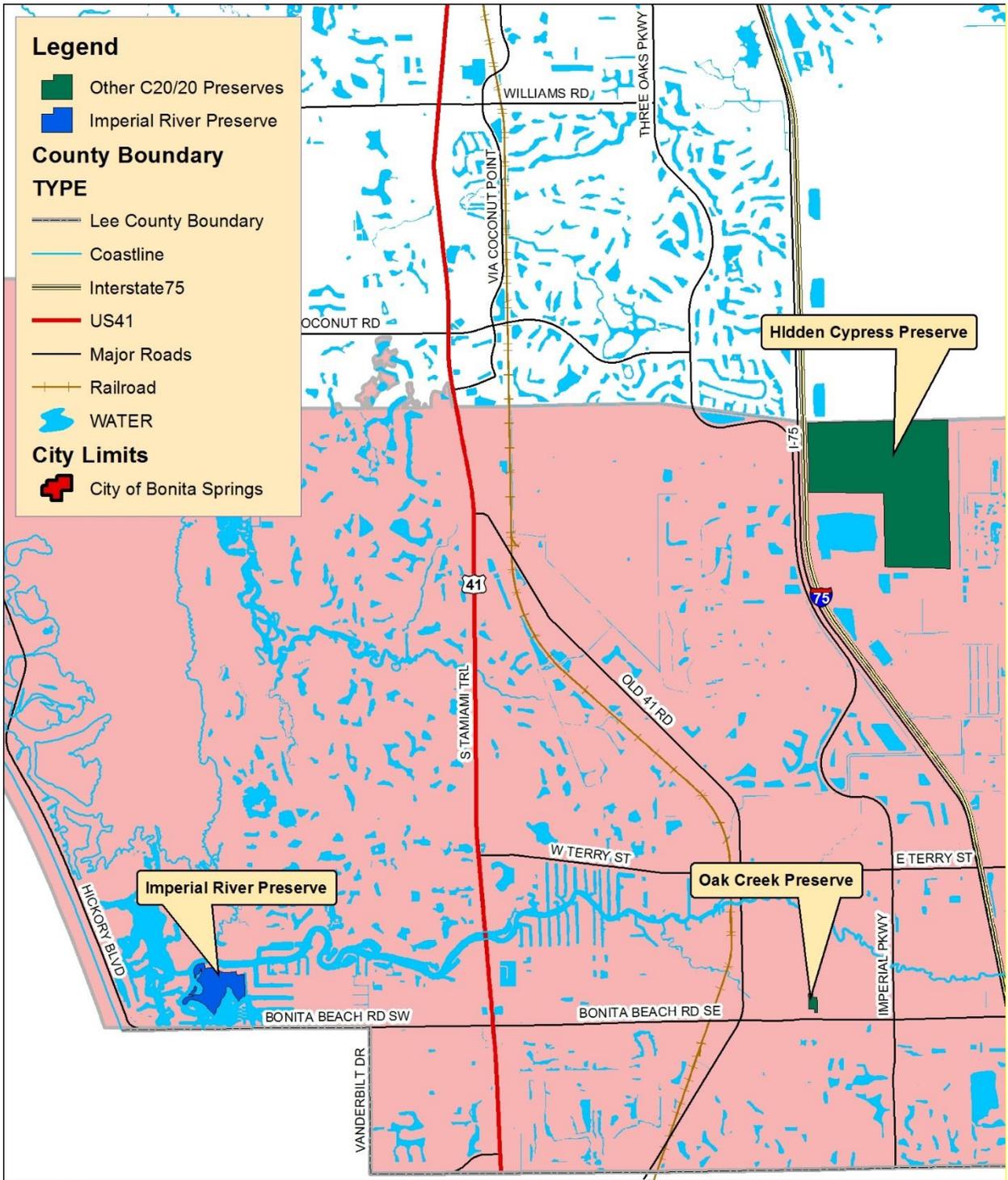
The purpose of this management plan is to define conservation goals for Imperial River Preserve that will address the above concerns. It will serve as a guide for

the Lee County Department of Parks and Recreation to use best management practices to ensure proper management and protection of the preserve. A significant number of field surveys were conducted along with reviewing scientific literature and historical records to understand how the preserve functions in the ecosystem, which wildlife and plants are found within its boundaries and how it has been impacted by humans. This allows the plan to serve the purpose as a reference guide for anyone interested in learning more about the preserve and some of the land management efforts in Lee County.

III. LOCATION AND SITE DESCRIPTION

Imperial River Preserve is located in southwestern Lee County just north of Bonita Beach Road, approximately one half mile east of Bonita Beach Road. IRP does not have an address listed by the Lee County Property Appraiser's office because the access is undetermined. It is in Section 31, Township 47 South, Range 25 East (Figure 1). The site located south of Estero Bay and is bordered by Esplande Street and the Imperial River to the north, a canal to the east, and Fish Trap Bay to the south and west. Figure 2 identifies the boundaries of IRP on a 2016 aerial photograph.

Figure 1: Location Map



Imperial River Preserve

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

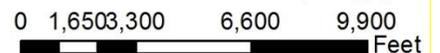


Figure 2: 2016 Aerial Photograph



Imperial River Preserve

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

0 125 250 500 750 Feet

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

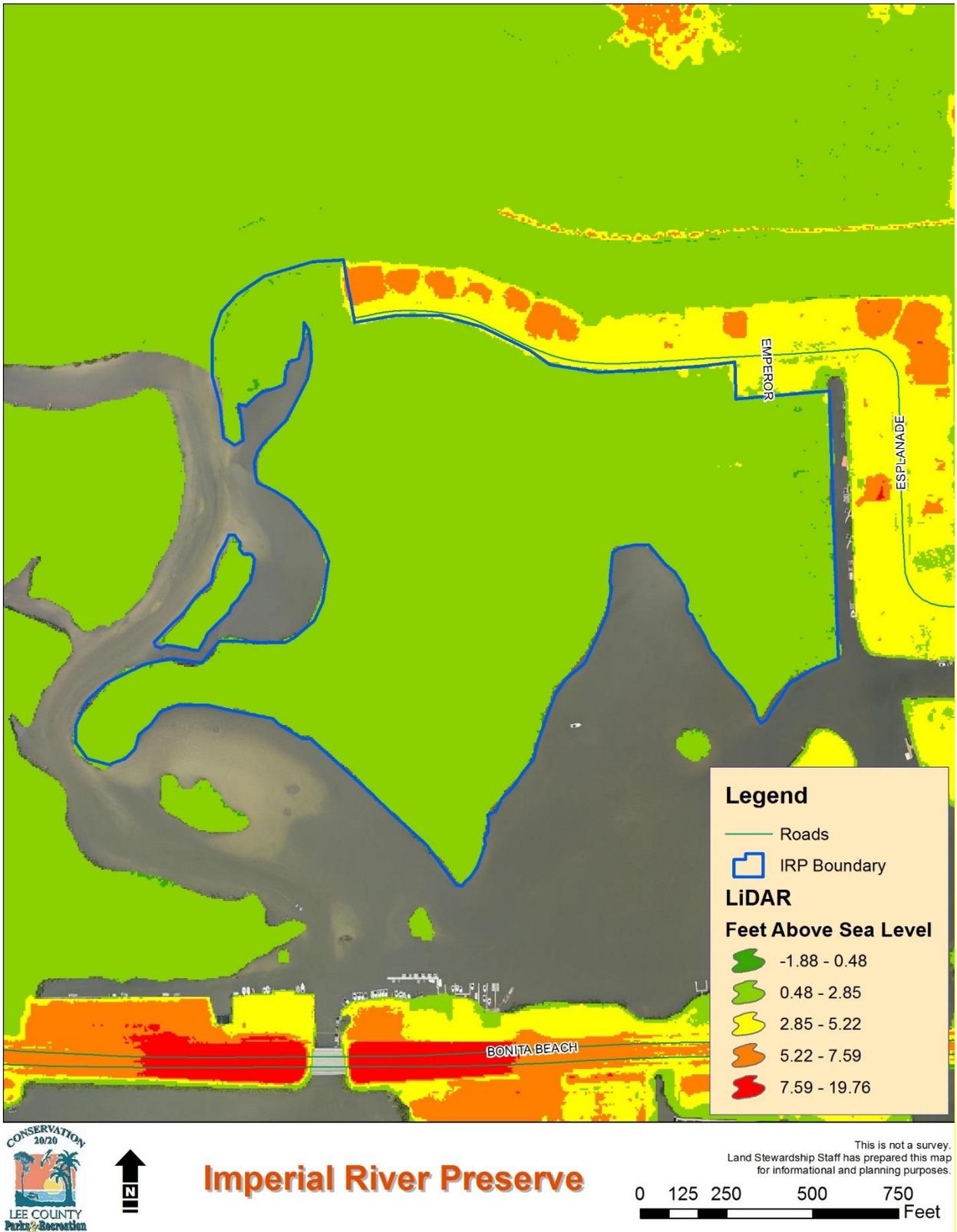
Specific information on the geologic features such as physiographic regions, formations and maps can be found in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

iii. Topography

There is a minimal change in natural elevations at IRP. Elevation ranges from 0-2 feet with no notable slope across the site. The elevation of the bridge portions of Bonita Beach Road to the south are as high as 20 feet above sea level.

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. This data was collected in 2007 and represents the published 5 foot digital elevation model. The change in color gradient visually demonstrates the relative flatness of IRP. Due to its elevation, this preserve is prone to flooding and storm surge.

Figure 3: LiDar Map



iv. Soils

IRP contains two different soils (Figure 4 and Table 1). The vast majority of the site is Wulfert Muck, however, both of these soil types are associated with salt marsh and mangrove communities. The difference is that St. Augustine soils have been disturbed during urban development.

Table 1: 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
St. Augustine sand, organic substratum - Urban land complex	25	0.3	<.01	none	--	B	rapid	rapid	--	2-4 months	1-3%	very poor	very poor	poor	--	Severe: too sandy
Wulfert Muck	23	38.7	99.9	salt water marsh	F	D	rapid	--	tidal	--	--	very poor	very poor	fair	--	Severe: wetness, excess humus

Color Key:

Dry
Saturated

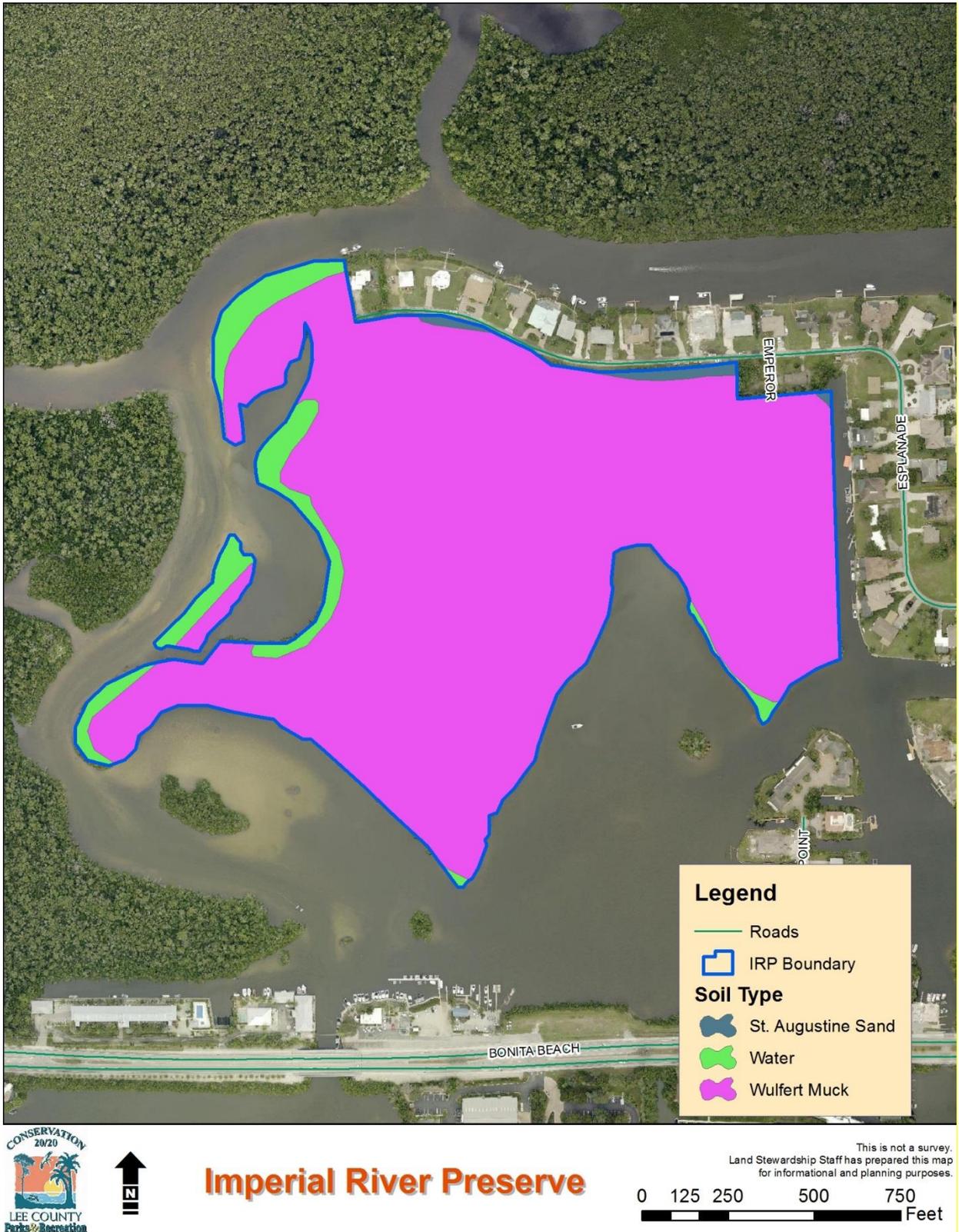
(1) F - Flooding: The temporary inundation of an area caused by overflowing streams, runoff from adjacent slopes or tides.

(2) * Water table is above the surface of soil

B - Soils having a moderate infiltration rate (low to moderate runoff potential) when thoroughly wet.

D - Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet.

Figure 4: Soils Map

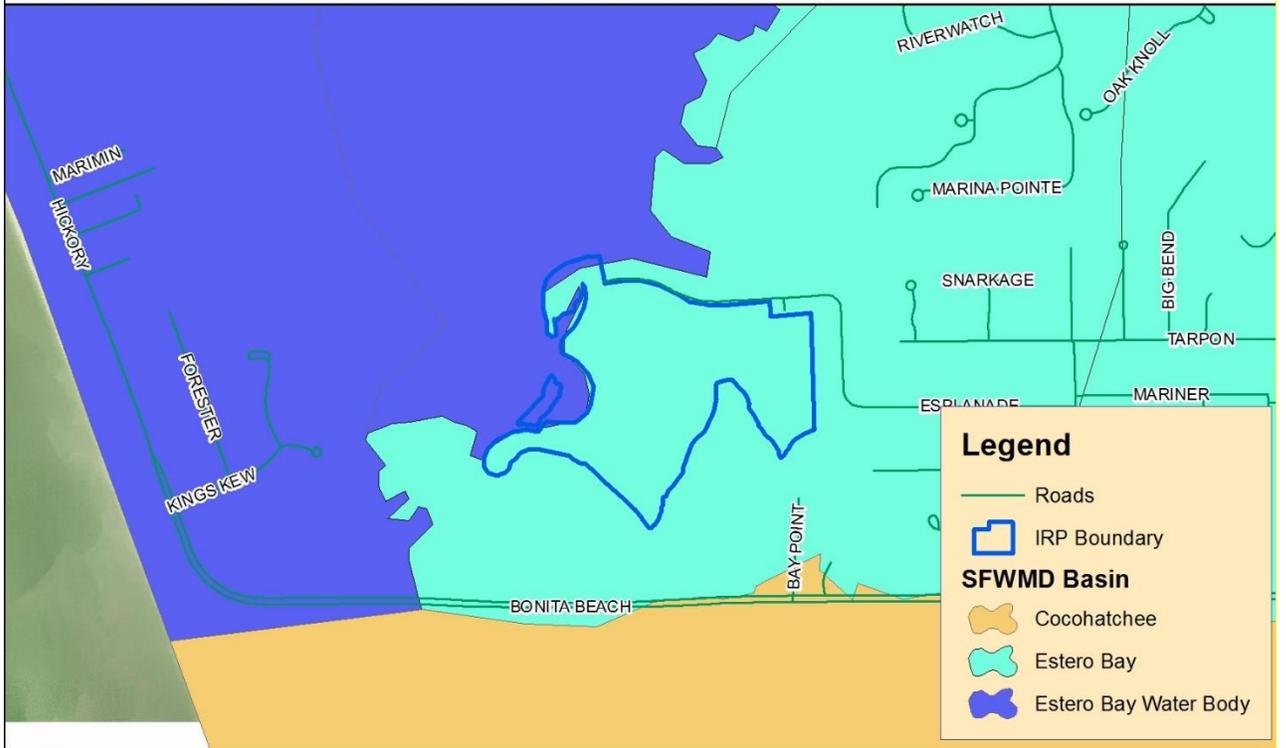


v. Hydrologic Components and Watershed

IRP is part of the 86 square mile Imperial River Watershed (Figure 5), the largest in Lee County within the South Florida Water Management District's (SFWMD) Estero Bay Basin. The preserve is positioned at the mouth of the Imperial River and is subject to tidal influence from the Fish Trap Bay estuarine system. While there have been few direct hydrological changes made to the property, its natural hydroperiod, such as tidal flushing from the north, has been altered by the surrounding Imperial Shores subdivision and canal bordering the eastern boundary. It is difficult to ascertain the hydrological impact to the preserve resulting from early historical landscape alterations. Two culverts that allow storm water from the residential side of Esplanade Road to flow under the road and be released onto the preserve are noted on the hydrological components map (Figure 6).

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. Wetlands were identified on aerial photography by vegetation, visible water 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). More information about the different classifications can be found there, or in the LSOM's Land Stewardship Plan Development and Supplemental Information section. Based on the federal National Wetlands Inventory (NWI) evaluation, nearly 100% of IRP is classified as wetlands as shown in Figure 6.

Figure 5: Watershed Map



Imperial River Preserve

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

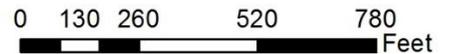
0 395 790 1,580 2,370 Feet

Figure 6: Hydrological Components Map



Imperial River Preserve

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



B. Biological Resources

i. Ecosystem Function

A tidal swamp, such as that found at Imperial River 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 constantly saturated with brackish water, and at high tides these same soils are usually inundated with standing water. In older areas 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. They require a warm annual average water temperature and do not tolerate temperatures below freezing or temperatures which fluctuate widely over the course of a year.

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. 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. 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. The 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 the 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 the mangrove salt marsh snake (*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. Additionally, mangroves can produce the majority of the total organic material available in the aquatic food web through the continuous shedding of its leaves and other plant components.

Refer to the Land Stewardship Plan Development section of the LSOM for additional information.

ii. Natural Plant Communities

Imperial River Preserve is primarily a mangrove forest. The Florida Natural Areas Inventory (FNAI) identifies and describes only one plant community at the preserve; Mangrove Swamp. Appendix A contains a complete list of plant species identified on numerous site inspections to Imperial River Preserve.

Mangrove Swamp - 38.95 acres, 100% coverage of Imperial River Preserve

Marine and estuarine mangrove swamps are floral based natural communities characterized as dense, low forests occurring along relatively flat, intertidal and supratidal shorelines of low wave energy along southern Florida. The dominant plants of mangrove swamp natural communities are red mangrove, black mangrove, white mangrove and buttonwood (*Conocarpus erectus*). These four species occasionally occur in zones that are defined by varying water levels, with red mangrove occupying the lowest zone, black mangrove the intermediate zone, and white mangrove and buttonwood the highest zone. The northern edge of the property along Esplanade Street is elevated leading to the roadway, which has allowed the majority of the invasive exotic plants to grow.

Salt water is a key element in reducing competition from other plants and allowing mangroves to flourish. In addition, mangroves have adapted to the salt water environment by either excluding or excreting salt from plant tissues. Mangroves can survive in fresh water but are usually not found in large stands under such conditions in nature because they succumb to competition.

Figure 7: Plant Communities Map



Imperial River Preserve

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

0 125 250 500 750 Feet

iii. Fauna

Common users of the mangrove swamp plant community include mangrove salt marsh snake (*Nerodia clarkii*), raccoon (*Procyon lotor*), brown pelican (*Pelecanus occidentalis*), white ibis, osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), and a variety of shorebirds, herons, egrets. Fish are likewise diverse in this community including; sharks, rays, tarpon (*Megalops atlanticus*), ladyfish (*Elops saurus*), sardines, snapper, sheepshead (*Archosargus probatocephalus*), and mullet (*Mugil cephalus*). Several of these species take advantage of the protection that the mangroves provide for their nurseries.

The intertidal zone shows the most diversity in fauna found on the preserve where the species is often determined by the amount of time spent underwater by a particular point on the mangrove's prop root. The roots themselves support populations of crabs including the mangrove tree crab (*Aratus pisonii*) and fiddler crab, as well as a variety of snails found along the roots and in the mud beneath. Acorn barnacles (*Semibalanus balanoides*) occupy the uppermost regions of the prop roots, while the larger gooseneck barnacles (*Lepas anatifera*) are found farther down, leading eventually to the oysters in the midtidal zone. Mussels populate the mid and lower intertidal zones. The subtidal zone is home to tunicates, sponges, fanworms, and numerous other invertebrates.

Additional faunal communities are supported in other areas of the preserve including a variety of arachnids and insects like the crab-like spiny orb weaver (*Gasteracantha cancriformis*) and mosquito.

Species occurring at the preserve are recorded during quarterly site inspections by staff and by Lee County Bird Patrol volunteers. Future sightings will continue to be recorded. See Appendix B for a complete list of wildlife documented at the preserve.

Table 2: Exotic Wildlife at IRP

<u>Scientific Name</u>	<u>Common Name</u>
<i>Osteopilus septentrionalis</i>	Cuban treefrog
<i>Anolis sagrei</i>	brown anole
<i>Eleutherodactylus planirostris</i>	greenhouse frog
<i>Streptopelia decaocto</i>	Eurasian collard-dove

Wildlife management at IRP will focus on providing optimal habitat for native species. This will continue to be accomplished primarily with occasional exotic plant treatments focusing on the northern boundary near the right of way, which is a prime location for invasive plant species to become established and extend down into the preserve. IRP is part of a countywide site inspection program for all Conservation 20/20 preserves. These inspections, which occur at least three times per year, allow staff to monitor for any impacts or changes to each

preserve and include updating the plant and wildlife lists if new plants or animals are noted. If, during these inspections, staff finds federal or state listed species, they will be reported appropriately.

iv. Designated Species

There are a variety of designated animal and plant species (Appendix A and B) found at IRP. 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), the Florida Fish and Wildlife Conservation Commission (FWC), the 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. Practices likely to benefit wildlife and plants at IRP include exotic plant control, protecting water resources, prescribed fire, trash removal, wildlife monitoring, feral and exotic animal control, and enforcement of no littering, no hunting, and no motorized vehicles regulations.

Table 3: Listed Species Found at IRP and Their Designated Status

		Designated Status			
Scientific Name	Common Name	FWC	FWS	FNAI	
BIRDS					
Family: Pelecanidae (pelicans)					
<i>Pelecanus occidentalis</i>	Brown pelican			G4/S3	
Family: Ardeidae (herons, egrets, bitterns)					
<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	
<i>Nyctanassa violacea</i>	yellow crowned night heron			G5/S3	
Family: Threskiornithidae (ibises and spoonbills)					
Subfamily: Threshiornithinae					
<i>Eudocimus albus</i>	white ibis			G5/S4	
Subfamily: Plataleinae					
<i>Platalea ajaja</i>	roseate spoonbill	T		G5/S2	
Family: Pandionidae (ospreys)					
<i>Pandion haliaetus</i>	osprey			G5/S3S4	
Family: Accipitridae (hawks, kites, accipiters, harriers, eagles)					
<i>Elanoides forficatus</i>	swallow-tailed kite			G5/S2	
<i>Haliaeetus leucocephalus</i>	bald eagle			G5/S3	
Family: Laridae (gulls)					
Subfamily: Sterninae (terns)					
<i>Sterna antillarum</i>	least tern	T		G4/S3	
PLANTS					
Scientific Name	Common Name	Native Status	FDA	IRC	FNAI
Family: Pteridaceae (brake fern)					
<i>Acrostichum aureum</i>	golden leather fern	native	T	R	G3/S3
Family: Apocynaceae (dogbane)					
<i>Rhabdadenia biflora</i>	rubbervine, mangrovevine	native		R	
Family: Bromeliaceae (pineapple)					
<i>Tillandsia fasciculata</i> var. <i>densispica</i>	cardinal airplant	native	E		
<i>Tillandsia utriculata</i>	giant airplant	native	E		
Family: Orchidaceae (orchid)					
<i>Encyclia tampensis</i>	Florida butterfly orchid	native	CE		
Family: Asteraceae (aster)					
<i>Baccharis angustifolia</i>	saltwater false willow	native		R	
Family: Bataceae (saltwort)					
<i>Batis maritima</i>	saltwort	native		R	
Family: Malvaceae (mallow)					
<i>Gossypium hirsutum</i>	wild cotton	native	E	R	G4G5/S3
Family: Rubiaceae (madder)					
<i>Spermacoce prostrata</i>	prostrate false buttonweed	native		R	

Wildlife 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

Plants Key:

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

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 the Florida Natural Areas Inventory's "Field Guide to Rare Plants and Animals of Florida," <http://www.fnai.org/FieldGuide>.

Brown Pelican

This species is recovering after being greatly reduced due to DDT and other pesticides. The brown pelican (*Pelecanus occidentalis*) has now been removed from the FWC listed species list, however, it remains on the FNAI list. Chemical spills, increased turbidity levels, and entanglement in fishing gear are now the primary threats to this species.

Little Blue Heron, Tricolored Heron, White Ibis

The little blue heron's (*Egretta caerulea*) and the tricolored heron's (*E. tricolor*) and 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 little blue herons and human disturbance to rookeries may be an increased factor for the white ibis (Hipes et. al. 2000).

Reddish Egret

The rarest of the herons, the reddish heron (*Egretta rufescens*) population was hit hard by plume hunters early in the 20th century. While rebounding slightly this species suffers from stress related to increasing human population interfering with restricted habitat requirements.

Bald Eagle

Bald eagle (*Haliaeetus leucocephalus*) numbers have steadily increased in Florida after a low of 120 active nests in 1973 (Hipes et. al. 2000). Still, loss of habitat and human disturbance due to development is a primary concern for this species.

Osprey

The osprey (*Pandion haliaetus*) population in southern Florida had a decline in the second half of the 20th century which seems to be related to eggshell thinning, boat traffic stress near some nesting sites and lowered food availability.

Roseate Spoonbill

The roseate spoonbill population is especially vulnerable to human disturbance of nesting colonies and alteration of unprotected foraging sites.

Swallow-Tailed Kite

The swallow-tailed kite (*Elanoides forficatus*) population has declined drastically from its numbers in the 1900s primarily due to habitat alteration and loss due to human development.

Least Tern

The least tern (*Sterna antillarum*) population declined until the 1970s due to human recreational use and development of its nesting area as well as destructive storm events, and predation of nests by other animals. Careful protection of beach nests has helped the least tern population recover in recent decades from its lowest numbers.

Plant Species

In addition to designated wildlife, IRP provides habitat for several listed plant species. IRC, which is not a regulatory agency, maintains a separate listing of threatened plant species. The scientists working for this institute have documented 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 or common these plants are in protected areas. For information on the parameters used to rank these species, refer to the IRC's publication "Rare Plants of South Florida: Their History, Conservation and Restoration" (Gann 2002).

In the IRC publication, the authors provide recommendations to restore south Florida's rare plant diversity. Several of these recommendations, particularly those that protect plants on the preserve and relate to management practices, will be followed. More information on the specific restoration and preservation 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 IRP.

- ❖ 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.
- ❖ Trap feral hogs, if recorded at the preserve in the future, 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 the Florida Department of Agriculture and Consumer Services (FDACS), including reasons for their decline and typical plant communities in which they can be found. A complete list of plant species observed at IRP, including designated species, can be found in Appendix B.

Golden Leather Fern

The golden leather fern is found in mangrove swamps, saltwater and brackish marshes and coastal hammocks. Its range is restricted to the southern coastal regions of Florida. It has been documented in several portions of IRP.

Florida Butterfly Orchid

Although locally abundant (Brown 2002), the Florida butterfly orchid (*Encyclia tampensis*) is designated as Commercially Exploited by the FDACS. A plant that is designated as “Commercially Exploited” is considered to be threatened by commercial exploitation. Butterfly orchids are not allowed to be collected, injured or destroyed on public lands and strict limits for collection are permitted on private lands (with permission from the land owner).

Cardinal and Giant Airplants

Also known as the stiff-leaved wild pine, cardinal airplants are typically found in hammocks, cypress swamps, and pinelands. Threats to this plant include illegal collecting, habitat destruction, and the exotic Mexican bromeliad weevil (*Metamasius callizona*). While this weevil has not yet been observed at the preserve, staff will continue to research control methods and assist research when possible.

Giant airplants (*Tillandsia utriculata*) are another bromeliad considered to have been quite common in Florida before the arrival of the Mexican bromeliad weevil. Another common name for this bromeliad is giant wild-pine, and it typically grows in hammocks and pinelands. Human-caused threats to this species include illegal collecting and habitat destruction.

Wild Cotton

This wetland plant (*Gossypium hirsutum*) is related to commercial cotton, but it is listed by the state of Florida as endangered. Reasons for its decline include habitat loss related to human development and the attempted eradication of the species due to it being a potential host to the pink boll weevil, which could devastate the commercial cotton industry.

v. Biological Diversity

Since this system is relatively healthy and intact, biodiversity at Imperial River Preserve is good however, it could be enhanced with additional maintenance of exotic plant control. Many species of animals not only inhabit, but also frequently visit the site. Currently 71 plant species and 75 animal species (3 exotic) have been documented (Appendices A and B). Fifteen of the 24 exotic plant species are on the Florida Exotic Pest Plant Council's 2015 List of Invasive Species (FLEPPC 2015).

The integrity and diversity of IRP must be protected and restored 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.
- Maintain boundaries signs to eliminate illegal access to the preserve and protect fragile ecosystems.
- Remove any debris and prevent future dumping on site.
- Conduct on-going species surveys utilizing volunteers and staff to catalog and monitor the diversity that is present.

C. Cultural Resources

i. Archaeological Features

In 1977, an archeological investigation was performed on the preserve by the Southwest Florida Archeological Society. The site was called the Wild Lime Site. The preserve's archeological significance was found to consist of shell middens, where investigators found sand tempered plain ceramics from the Glades Period. The preservation of the archaeological site will consist of passive management by keeping the site location confidential and periodic monitoring for impacts.

If evidence of additional shell middens or other artifacts are found in the preserve, the Division of Historical Resources (DHR) will be immediately contacted and protection procedures will comply with the provision of Chapter 267, Florida Statutes 267.061 2 (a) and (b). Collection of artifacts and/or any

disturbance of the archaeological site will be prohibited unless prior authorization has been obtained from the DHR.

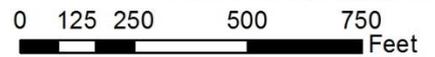
In 1987, Piper Archaeological Research, Inc. conducted an archaeological site inventory of Lee County. They created a site predictive model and archaeological sensitivity map for the county that highlighted potential areas likely to contain archaeological sites. The map shows the “Sensitivity Level 2” category areas of IRP (Figure 8). Since this designation suggests that there is a higher probability of these areas having unknown archaeological sites within them, these areas are to be subjected to a cultural resource assessment survey by a qualified professional archaeologist before any impacts or significant soil disturbances. General information on archeological features in Lee County can be found in the LSOM.

Figure 8: Archaeological Features Map



Imperial River Preserve

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



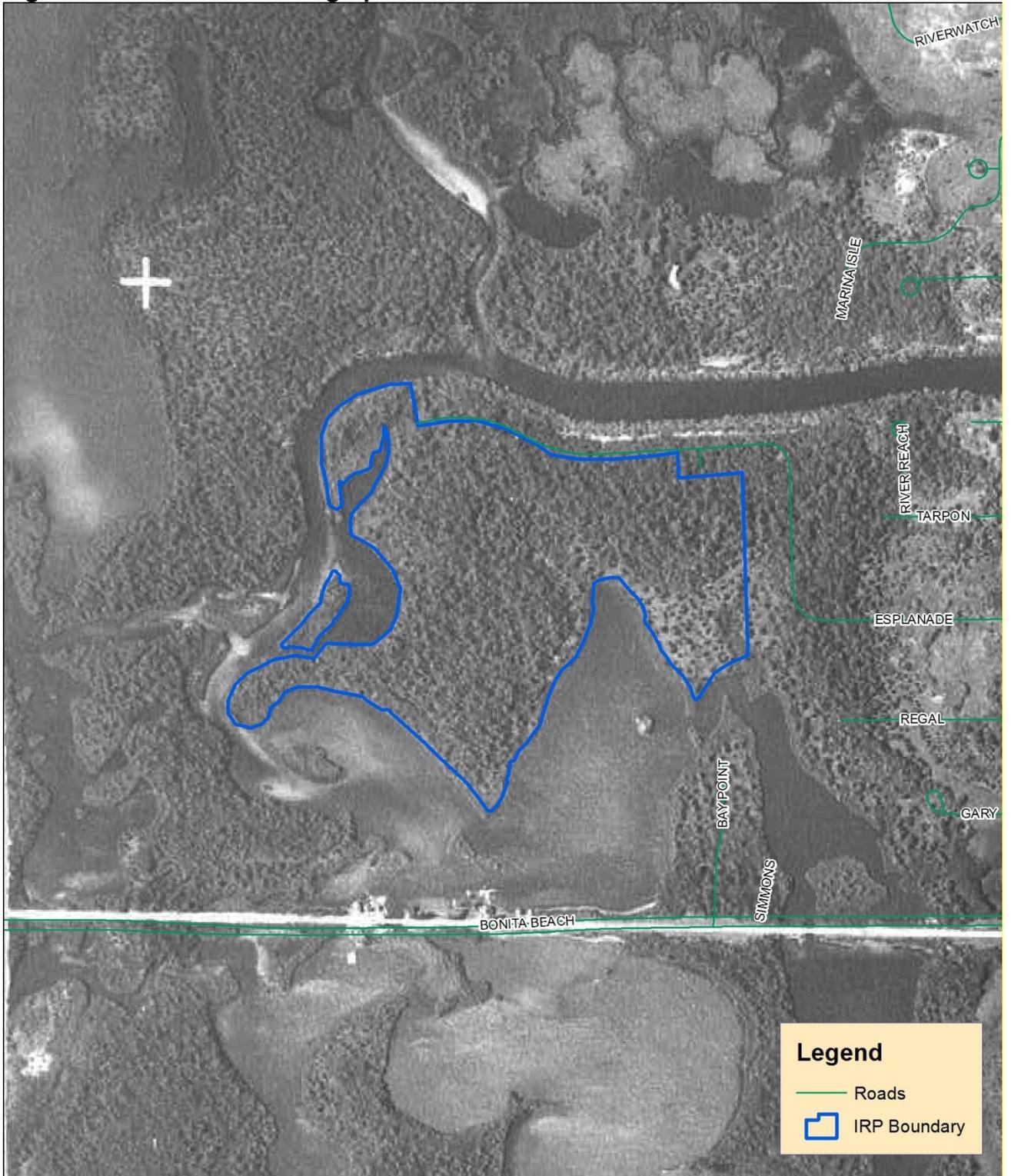
ii. Land Use History

According to interpretation of historical aerial photography (Figures 9-17), IRP has remained relatively unchanged since aerial photography was first used in Lee County in 1944. According to aerials provided by the Florida Department of Transportation, the preserve was part of a much larger coastal mangrove community through 1953. By 1958, numerous roads had been constructed throughout the area including a road that connected the present day Imperial Shores Boulevard through the northeast corner of the preserve, terminating at the Imperial River. A new channel had been created through the mangroves just west of the preserve, that rerouted the Imperial River directly out into Fish Trap Bay.

According to later aerial photographs, development of the surrounding neighborhood continued to impact the preserve. By 1968, the road visible in the 1958 aerial had vanished and the north-south canal, along the eastern boundary of the IRP, had been dredged. In 1974 and 1975, the mangroves were cleared along the future Esplanade Street, adjacent to the north boundary of IRP. This clearing included an encroachment into the Preserve by an extension of Esplanade Street further west than its current location. By 1977, the road encroachment was widened into a cul-de-sac and the lots adjacent to the northeastern boundary were cleared approximately 50 feet into IRP. By 1981, the Esplanade Street encroachment had filled in with mangroves. It took another 12 years for the northeast boundary encroachment to fill in.

After acquiring the preserve in 1998, Lee County Parks & Recreation (LCPR) staff wrote the first edition of the Stewardship Plan for the preserve and commenced restoration activities. Invasive exotic plants were removed in 2000, followed by native plantings in the road right-of-way (ROW) and in the northeast corner of the preserve also in 2000. Species planted include Snowberry (*Symphoricarpos albus*), Christmas Berry (*Lycium carolinianum*), wild cotton (*Gossypium hirsutum*), and sea oxeye daisy (*Borrichia frutescens*).

Figure 9: 1944 Aerial Photograph



Legend

- Roads
- IRP Boundary



Imperial River Preserve

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

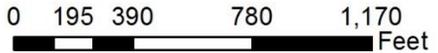
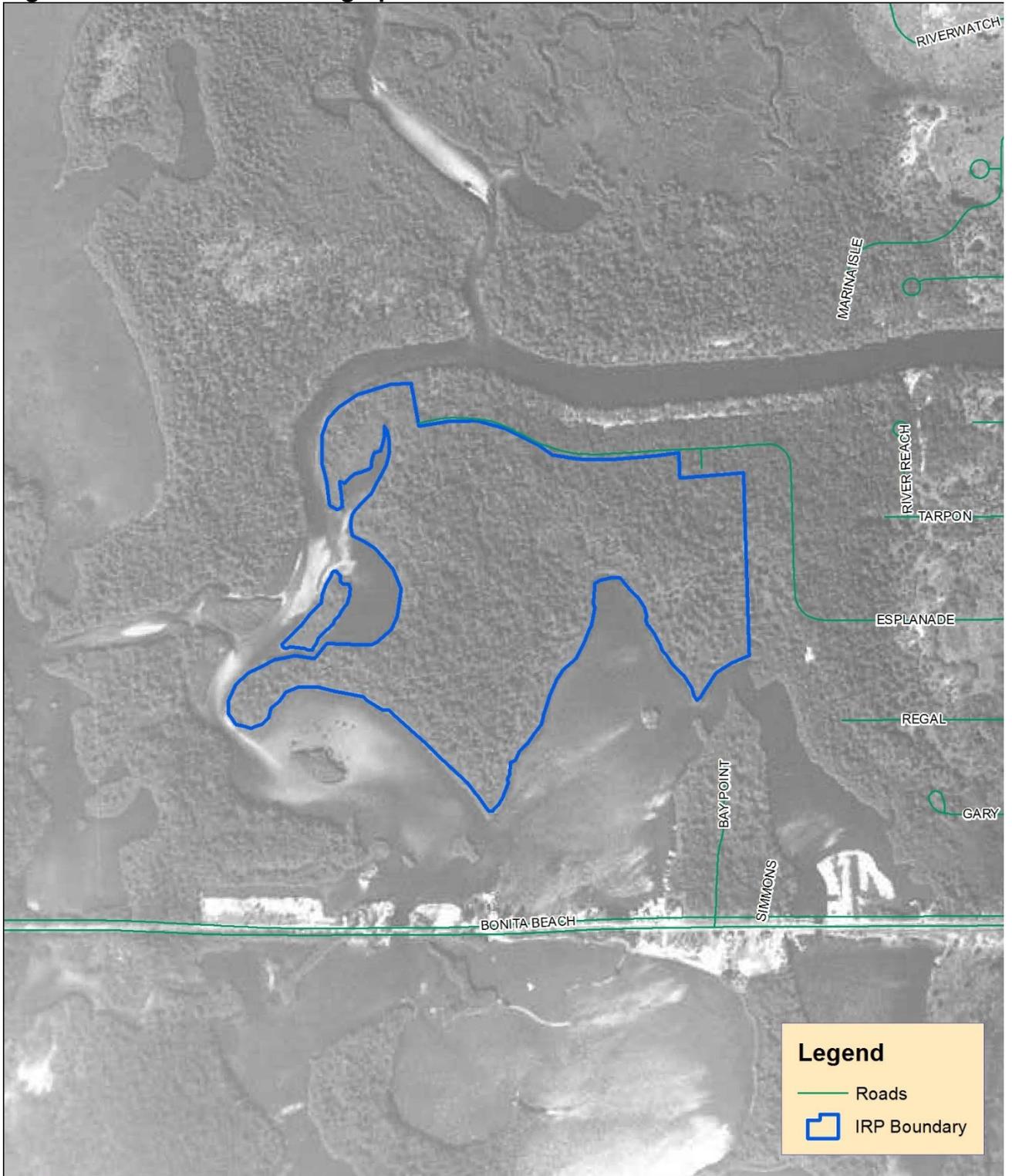


Figure 10: 1953 Aerial Photograph



Legend

- Roads
- ▭ IRP Boundary



Imperial River Preserve

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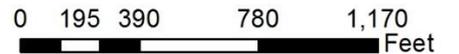


Figure 11: 1958 Aerial Photograph

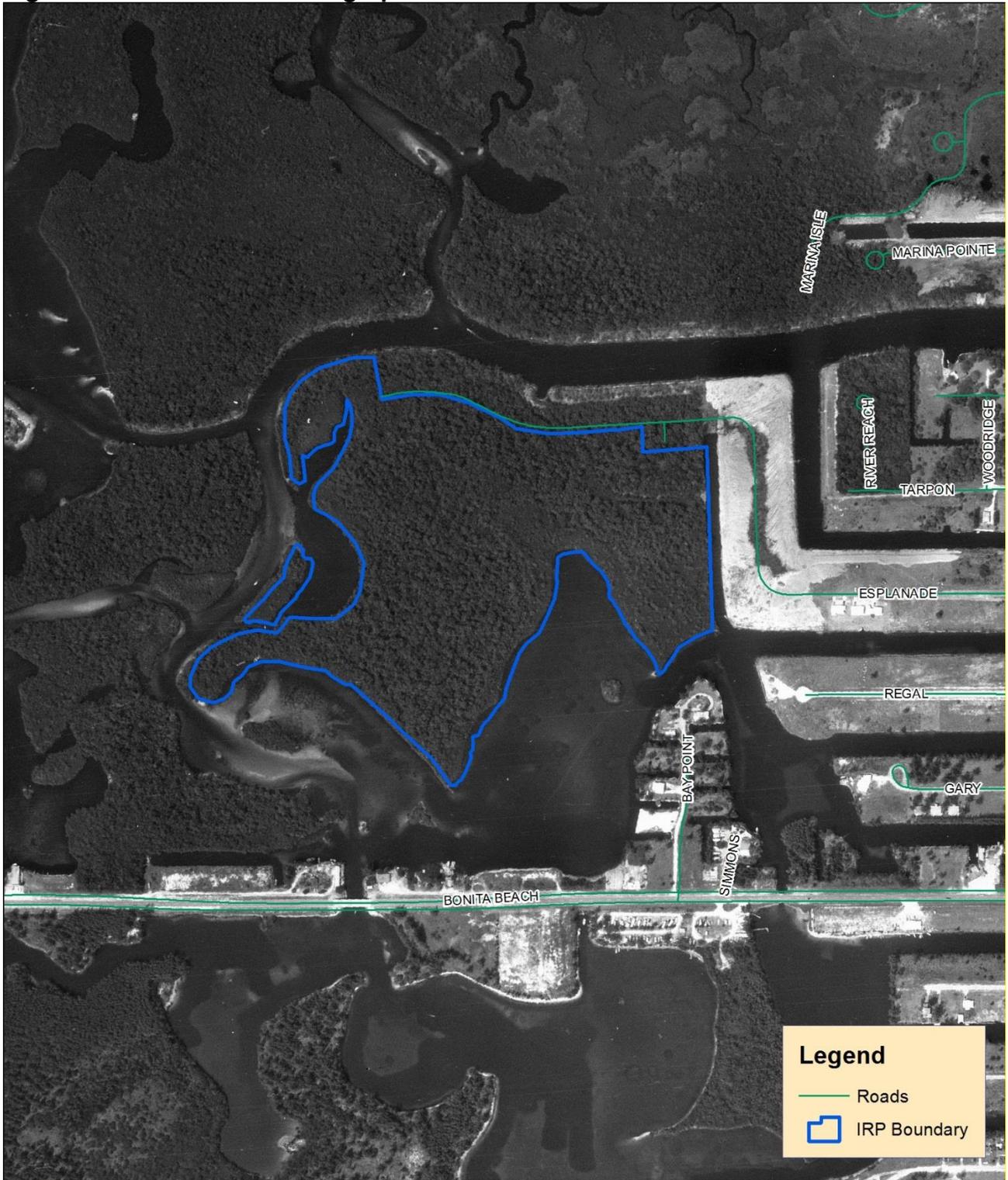


Imperial River Preserve

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Land Stewardship Staff has prepared this map
for informational and planning purposes.

0 195 390 780 1,170
Feet

Figure 12: 1968 Aerial Photograph



Legend

- Roads
- IRP Boundary

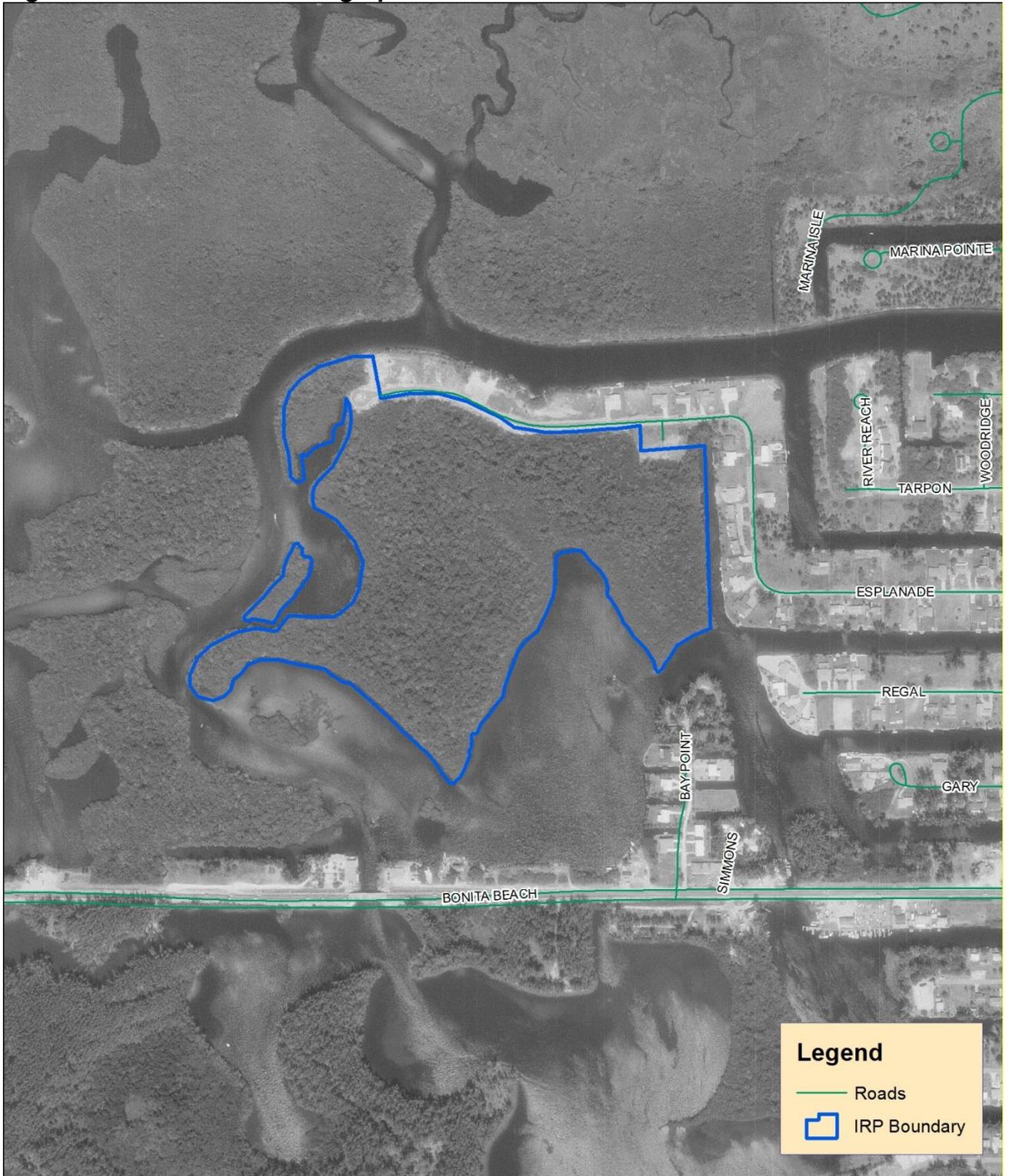


Imperial River Preserve

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Figure 13: 1979 Aerial Photograph



Imperial River Preserve

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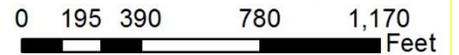
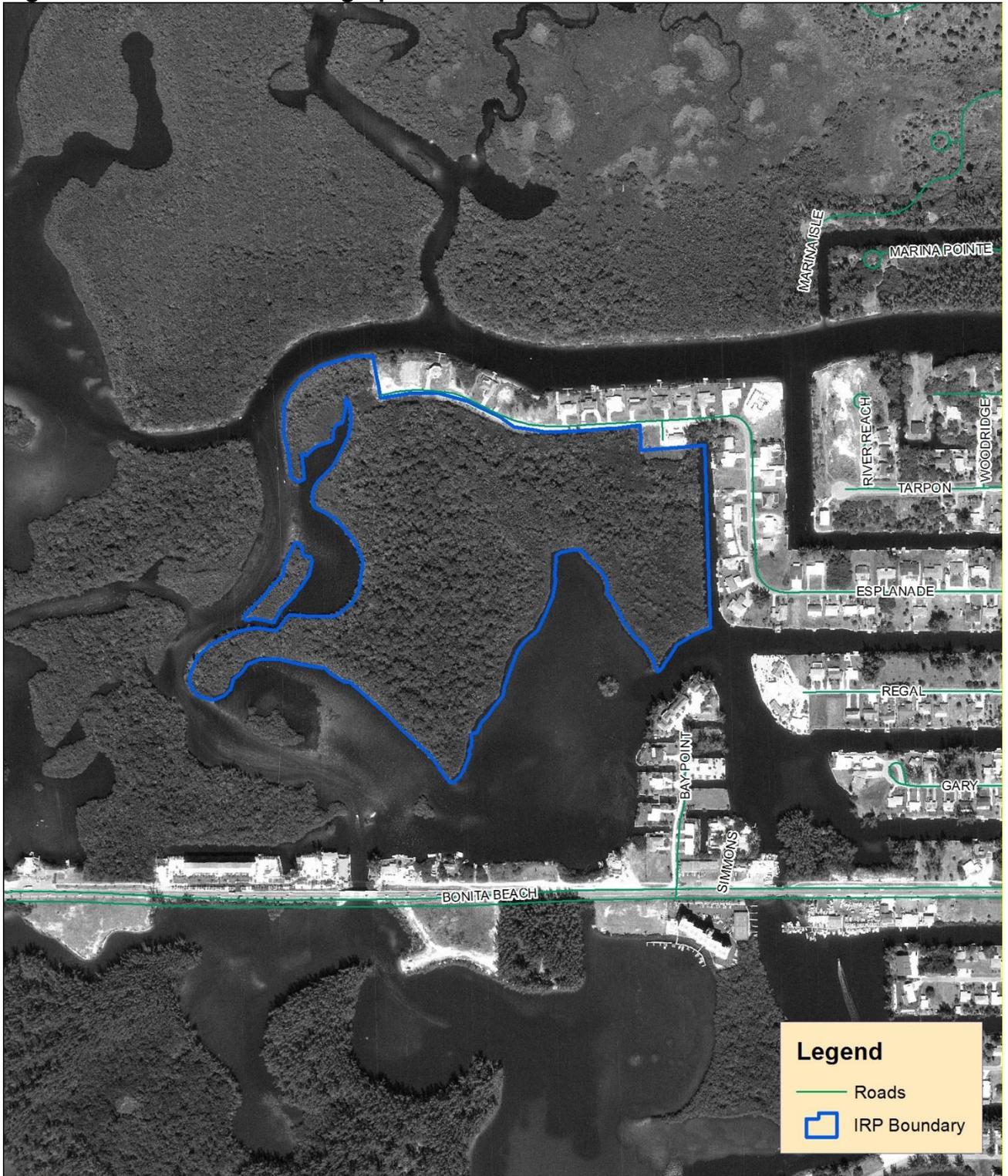


Figure 14: 1986 Aerial Photograph



Imperial River Preserve

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Land Stewardship Staff has prepared this map
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Figure 15: 1998 Aerial Photograph

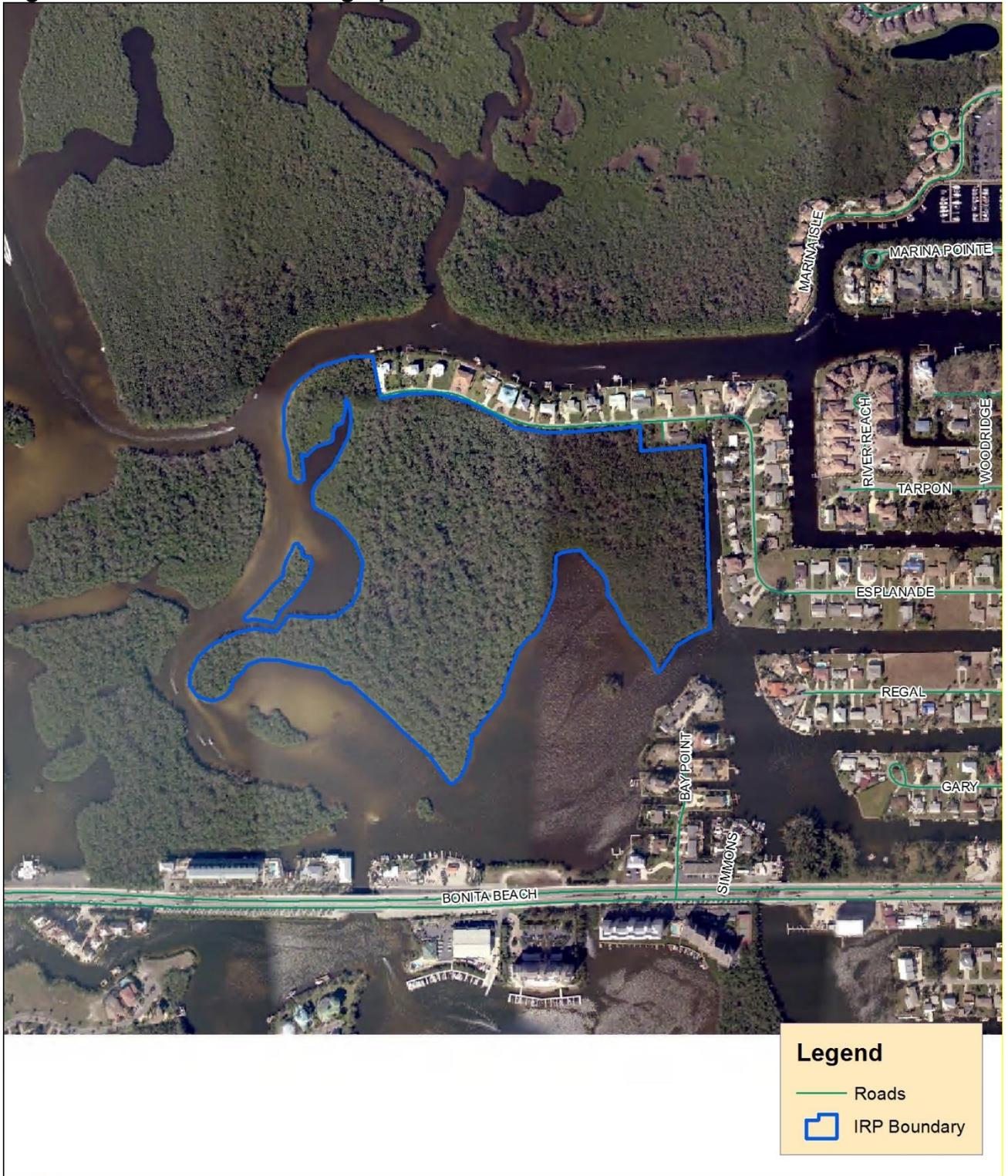


Imperial River Preserve

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

0 195 390 780 1,170 Feet

Figure 16: 2006 Aerial Photograph



Imperial River Preserve

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Land Stewardship Staff has prepared this map
for informational and planning purposes.

0 195 390 780 1,170
Feet

Figure 17: 2014 Aerial Photograph



Imperial River Preserve

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

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Feet

iii. Public Interest

Imperial River Preserve was purchased for its environmentally sensitive lands and groundwater recharge value. The preserve is an important part of improving water quality flowing through the Imperial River toward the Gulf of Mexico. Potential contaminants in the water are allowed to filter out within the preserve before entering the Gulf of Mexico. The entire preserve lies within the Tropical Storm Surge zone and the Coastal High Hazard area. The tidal swamp provides protection from flooding during extreme weather events for the interior areas. Staff hasn't received many requests for information about the site or access since most visitors just enjoy it as they paddle past the property in the Imperial River.

V. FACTORS INFLUENCING MANAGEMENT

A. Natural Trends and Disturbances

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

Wildfires caused by lightning strikes are natural occurrences in Florida. The Florida Forest Service (FFS) – Caloosahatchee District - and Lee County Department of Parks and Recreation staff have developed a wildland firefighting protocol for County preserves. However, IRP isn't a considerable wildfire risk due to its contiguous mangrove plant community.

Invasive exotic plants are an on-going disturbance to natural areas. Treatment of invasive plants at IRP is influenced by tidal water levels in addition to rainfall events and the wet and dry seasons. The LSOM's exotic plant prescription form will be used to define the conditions for control activities. Only herbicides approved for aquatic application will be used for treatment of vegetation in standing water or where flooding may occur.

B. Internal Influences

This preserve has a relatively unspoiled mangrove plant community that has remained relatively intact through the years. The right of way along Esplanade Street has had invasive exotic plants such as wedelia (*Wedelia trilobata*),

Brazilian pepper (*Schinus terebinthifolius*), and carrotwood (*Cupaniopsis anacardioides*) on it since Lee County purchased the property back in 1998. These exotic species push out native plant species and negatively impact the native plant community.

A pair of storm drains along the northern line allows water from heavy rains to make its way from the residences to the north of the preserve under the roadway to be released onto the preserve. While no negative effects have been noted, this additional fresh water could potentially alter the sensitive communities around them. Staff will watch carefully for any changes in these areas.

As with most coastal properties, the water allows trash and debris to wash ashore which is a continuous issue. Staff has removed items including lumber, styrofoam, crab traps, and other debris that has washed into the preserve.

Figure 18 shows both the internal and external influences at IRP.

Figure 18: Influences Map



C. External Influences

As mentioned earlier in this plan, the primary disturbances to the site were the residential development and the installation of the western end of Espanade Street on the boundary of IRP. These developments impacted the site by disrupting the flow of water across the property and by allowing invasive exotic plant species to become established right along the boundary of the property. Imperial River Preserve is surrounded to the east, south, and west by the Imperial River, which is itself a natural influence on the site. The fresh and salt water seasonal flows shape the natural plant community on the site, as well as the impacts from the tidal influence either pushing water into the preserve or drawing it down and away from the property. The boats traveling through the channel create wakes that impact the shoreline of the preserve. The river is an idle speed zone for boaters but boat waves still impact the shoreline. Climate change and sea level rise will also be strong influences on the preserve.

D. Legal Obligations and Constraints

i. Permitting

Land management activities at Imperial River Preserve may involve obtaining permits from several regulatory agencies. While no hydrological improvements are proposed for this preserve, they would require obtaining permits from the Florida Department of Environmental Protection (FDEP), the U.S. Army Corps of Engineers (USACOE) and SFWMD. Hydrological and/or habitat restoration projects requiring heavy equipment or tree removal will require notification to the Lee County Department of Community Development (LCDCD).

ii. Other Legal Constraints

Beyond the 1996 Mangrove Trimming and Preservation Act (Sections 403.9321 - 403.9333), no other legal constraints have been identified that would influence the land management activities on Imperial River Preserve at this time.

iii. Relationship to Other Plans

The Lee Plan, Lee County's comprehensive plan, is written to depict Lee County as it will appear in the year 2030. Several themes have been identified as having "great importance as Lee County approaches the planning horizon" (LCDCD 2016). 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 is found online at:
<http://www.leegov.com/dcd/Documents/Planning/LeePlan/Leeplan.pdf>. The sections of the Lee Plan which may pertain to C20/20 preserves have been identified in the LSOM. The sections of the Lee Plan which may pertain to Conservation 20/20 Preserves have been identified in the LSOM.

E. Management Constraints

The principle management constraint for IRP is limited vehicular access. Initial exotic plant removal was completed at IRP in 2000. The preserve is at a maintenance level for invasive exotic plants so the need for access with vehicles is minimal.

Access to the majority of the preserve is limited to boats or on foot through thick mangroves with a substrate of muck that is often inundated by the tides. The nearest public boat ramp access is 2.5 miles upstream at the Imperial River boat ramp. There is no good location to launch even small paddle craft such as canoes and kayaks from the preserve.

F. Public Access and Resource-Based Recreation

No public recreational amenities are proposed at IRP. In accordance with the LSOM, IRP is classified as a limited use preserve. With these limited use preserves, "if there is a public interest, staff may provide guided field trips when there are no safety concerns and it is compatible with protecting the animals and plant communities found at the specific preserve." Many issues have been taken into consideration in determining resource based activities, including but not limited to, acreage of the site, presence of similar facilities nearby, natural communities present, presence of listed species and/or sensitive areas such as wetlands.

IRP is approximately 39 acres and is surrounded primarily by residential development and Estero Bay as well as the Imperial River. This preserve contains only wetland soils and plant communities making it unsuitable for resource based recreational opportunities other than paddling around the property. Resource based recreational opportunities occur at nearby Lee County managed facilities (Figure 1) such as Pine Lake Preserve, Hidden Cypress Preserve, and Bonita Beach. All of these facilities are less than 6 miles away from IRP.

G. Acquisition

The 1984 Lee County Comprehensive Plan recognized the environmentally sensitive nature of the 39-acre mangrove tract, owned by Richard and Ann Reahard, and placed it in the “Resource Protection Area” designation (R.P.A.) of the Comprehensive Plan. This land use designation restricted density to a maximum of one dwelling unit per 40 acres or uses of a recreation open space or conservation nature. The Reahards maintained that due to the county imposition of the R.P.A. classification, they were unable to carry out the planned 41 to 126 residential unit development on the subject parcel, which had been platted to be included in the Imperial Shores residential development. Even though they acknowledged the validity of the Comprehensive Plan designation, the Reahards felt that they should be compensated for their inability to develop the subject parcel. Lee County’s position was that under the Laws of Florida, filling in wetlands and developing a 126 lot subdivision was not a property right that the Reahards possessed.

The Circuit court of Lee County ruled on March 4th, 1997 that the defendant, Lee County, pay to the plaintiffs, Richard and Ann Reahard, the sum of \$600,000.00, the value of the property as a 126 unit subdivision in 1984, plus interest from December 21st, 1984, in the amount of \$839,506.84, for a total sum of \$1,439,506.84. The Reahards then had 30 days to turn the title of the property over to Lee County.

Lee County purchased the property in 1998 from the Reahard family for \$600,000. Figure 19 shows the “actual” boundary of the site, reflecting the proposed development, including several canals. The portion of IRP that lies within the proposed canal boundaries are considered submerged and are technically not “owned”. Land management staff will continue to manage these portions of the preserve as part of the entire site.

Lee County Board of County Commissioners (BOCC) asked the Conservation Lands Acquisition and Stewardship Advisory Committee (CLASAC) to review the subject property using the established criteria and make a recommendation to BOCC as to whether or not the property should be purchased through the C20/20 program. CLASAC reviewed the property and felt that it had met the criteria and agreed to use C20/20 funds for the land cost only. Both the land cost and the interest costs were funded from the C20/20 fund, and were eventually reimbursed to C20/20 through the Lee County general fund.

At the time of acquisition, there was an existing encroachment of rip rap and sod, which had apparently occurred in 1992 during construction of an adjacent home located at the end of Espanade Street. To avoid future liability, reduce maintenance, and expense of fencing for a highly disturbed area, Conservation Lands and County Lands staff jointly recommended that the BOCC surplus the 1,937 square feet and sell it to the adjacent land owner who acquired the

neighboring property in 2000. This motion was approved June 13, 2006 and the property was sold on September 26th for \$3,500 which was put into the Conservation 20/20 acquisition fund.

C20/20 staff have updated the future land use for the 39-acre preserve to the "Conservation" designation (Figure 20). The "resource protection" property to the west of IRP is a portion of the Estero Bay Preserve State Park owned by the State of Florida. The preserve is zoned as "Agricultural," "Single Family/Duplex," and "Industrial" (Figure 21). Land management staff will work with the City of Bonita Springs to change to these designations to an environmental conservation land type of zoning which adds a layer of protection while restricting the development and use of the property. The legal description for this parcel is located in Appendix C.

Figure 19: Acquisition Map

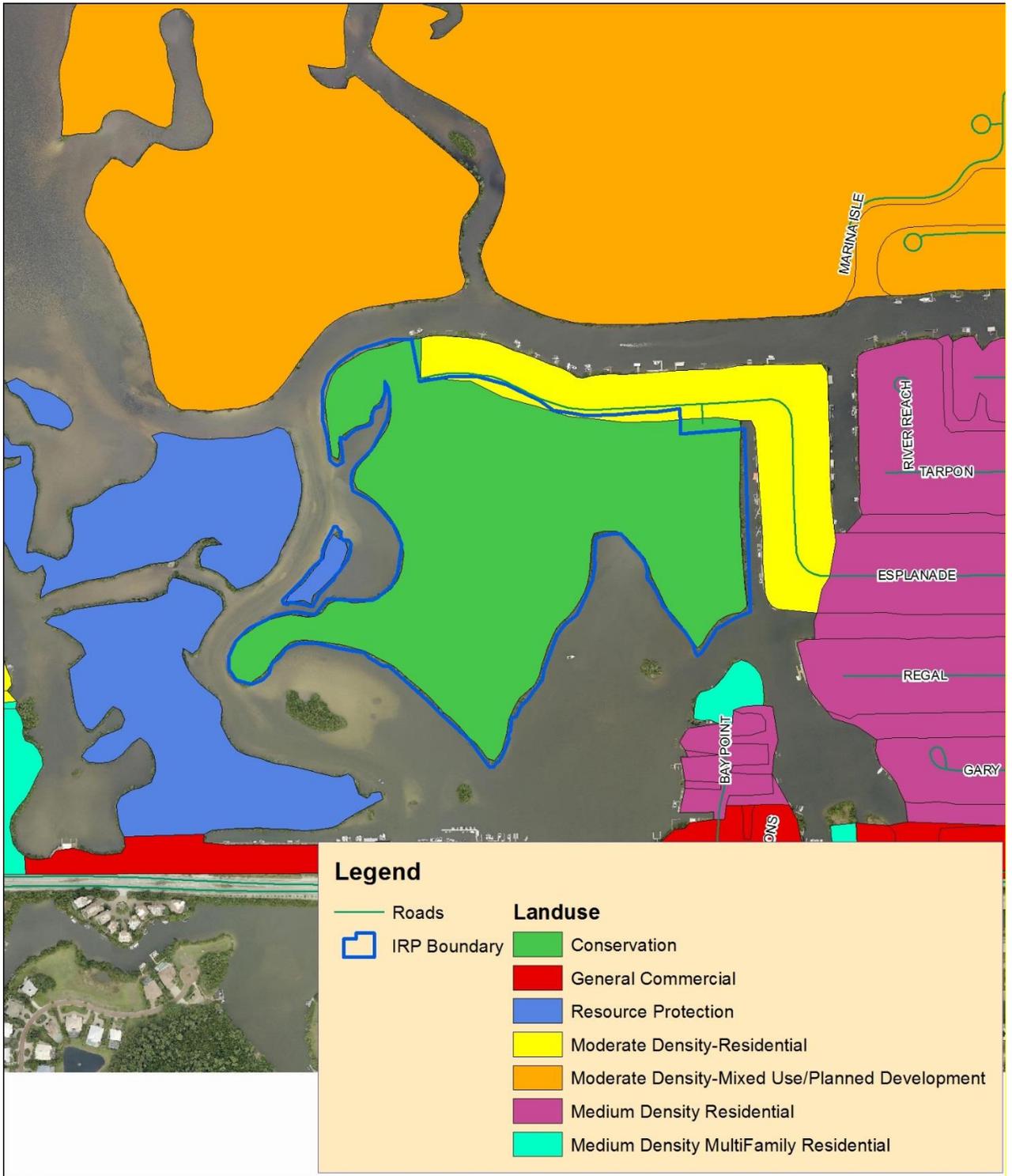


Imperial River Preserve

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

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Feet

Figure 20: Future Land Use Map



Imperial River Preserve

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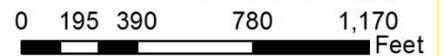
0 195 390 780 1,170 Feet

Figure 21: Zoning Map



Imperial River Preserve

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



VI. MANAGEMENT ACTION PLAN

A. Management Unit Descriptions

The relatively small size and contiguous plant community of Imperial River Preserve allows the entire property to be kept as one management unit (MU). This permits staff to have management goals that apply across the entire site rather than to segmented portions of the site which is needed for more complex properties.

- Management Unit 1 – 38.9 acres
MU 1 is a tidal mangrove swamp which is a wetland plant community that reaches across the entire site. MU 1 is bordered to the east, south, west, and portions of the north by the Imperial River; the majority of the northern boundary is shared with Espanade Street and residential properties. The preserve received its initial invasive exotic treatment in 2000. After this initial treatment there were some native plantings installed along the right of way on the northern boundary. Management activities in this preserve will continue to focus on exotic plant control and boundary protection.

B. Management Work to Date

In July 2000, C20/20 staff had taken numerous truckloads of debris found on IRP to the landfill. Later in September, the initial exotic plant removal on Imperial River Preserve occurred that was followed up with a native plant installation where the most exotic vegetation had been removed along the right of way of Espanade Street. Snowberry (*Symphoricarpos albus*), Christmas Berry (*Lycium carolinianum*), wild cotton (*Gossypium hirsutum*), and sea oxeye daisy (*Borrchia frutescens*) were the most common of the plantings and were also installed in the same month. Throughout the years, additional in-house exotic treatments occurred on the northern boundary right of way.

C. Goals and Strategies

The following are the long-term goals for the preserve.

Natural Resource Management

- ✓ Exotic plant control and maintenance
- ✓ Monitor and protect listed species
- ✓ Exotic and feral animal removal

Overall Protection

- ✓ Debris removal and prevention of dumping
- ✓ Boundary and Preserve sign installation
- ✓ Change zoning categories

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 FLEPPC list of invasive species will be consulted in determining the invasive exotic plants to be controlled on this preserve. The goal is to continue to control these exotic species by conducting semi-annual or “as needed” treatments of exotic plant regrowth and initial treatments of newly discovered species. This goal will maintain the entire preserve at a maintenance level of exotic species, defined as having less than 5% invasive exotic plant coverage. Contracted treatments have been included in the projected financial considerations to occur an estimated three times over the next ten years to treat woody vegetation re-growth, and follow-up treatments for herbaceous vegetation re-growth will be conducted by C20/20 staff on an annual basis. Each contracted project requires a completed Herbicide Prescription Form to be filled out by C20/20 staff, and then completed by the contractor along with a Daily Report Control Form as work is completed; copies of these forms are available in the LSOM. Completed forms are kept by land managers and used to help prepare future treatments.

Monitor and protect listed species

As discussed in the Designated Species section, there are several listed species that have been documented on the preserve including little blue heron, reddish egret, golden leather fern, as well as the giant and cardinal airplants. These species will benefit from exotic plant control. During management activities, efforts will be made to minimize negative impacts to listed species.

IRP is part of a countywide tri-annual site inspection program conducted for all Conservation 20/20 preserves. The site inspection spreadsheet is available on the LCPR's computer server ("S" drive). These inspections allow staff to monitor for impacts and/or changes on the site and to update lists of animal sightings and plant species that are found. If, during these inspections, staff finds designated species not previously documented, they will be reported using the appropriate forms.

Exotic and feral animal removal

Populations of invasive exotic snails have not yet been documented within the mangrove swamp. Land managers will continue to monitor for signs of the snails during the tri-annual site inspections, and will record the species using the appropriate forms if documented at IRP.

Although feral hogs have not been observed at the preserve, efforts will be taken to remove animals if a population becomes established. The preserve boundary and plant community will continue to be monitored for signs of the animals foraging at the preserve. Similarly, feral cats have not been observed or established at IRP, but a county-wide methodology has been established to prevent the establishment of feral cat colonies on or adjacent to all C20/20 preserves. C20/20 preserves will not contain nor will they support feral cat colonies, and feral cats will be trapped and taken to Lee County Animal Services per the FWC Feral and Free Ranging Cats policy: "To protect native wildlife from predation, disease, and other impacts presented by feral and free-ranging cats" (FWC 2003).

Land management staff will continue to investigate the feasibility to control other exotic species listed in Table 2: Exotic Wildlife, located in the Fauna section of this plan. If practical, a methodology will be established and implemented.

Overall Protection

Debris removal and prevent dumping

IRP has water on all but a portion of its northern boundary and therefore trash washes ashore from the Imperial River continuously. During site inspections, small objects that are encountered will be removed. Conservation 20/20 rangers will also assist with removing small items when they are on patrol at the preserve. Residential and commercial dumping of rubbish including landscaping debris is prohibited.

Boundary and Preserve sign installation

Boundary signs have been installed to further protect and delineate the preserve. Missing or damaged signs will be replaced as water levels allow. C20/20 staff will check for boundary signs during the patrols and replace missing ones as water levels allow safe access. Boundary signs are placed every 500 feet along the property boundary. An informational sign has been installed along Esplanade Street informing the public of the preserve's name, authorized and unauthorized activities, and contact information.

Change zoning categories

The Future Land Use was changed to "Conservation." Staff will coordinate with the City of Bonita Springs staff to update the zoning designation of IRP. The zoning categories will be changed to a zoning category similar to Lee County's "Environmentally Critical" designation from the "Industrial," "Multi-Family," "Single Family/Duplex," and "Agriculture" designations currently on the property.

VII. PROJECTED TIMETABLE FOR IMPLEMENTATION

Management Activity	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Maintenance (On-going/Annual)											
Exotic plant control	X		X		X		X		X		X
Exotic animal monitor &/or removal	Monitoring on-going	→	→	→	→	→	→	→	→	→	→
Remove debris washed ashore	On-going	→	→	→	→	→	→	→	→	→	→
Overall Protection											
Replace missing boundary signs	On-going	→	→	→	→	→	→	→	→	→	→
Change zoning categories			X								

→ = project continues

Timetable is based on obtaining necessary funding for numerous land management projects.

VIII. FINANCIAL CONSIDERATIONS

The Conservation 20/20 Program is funded by the County's general fund in accordance with ordinance 06-26 (as amended). This annual allocation supports restoration, maintenance of the preserves, and C20/20 staff costs. Funds not used in the annual allocation rolls over to the following year for maintenance.

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

IX. LITERATURE CITED

- Brown PM. 2002. Wild Orchids of Florida. Gainesville: University Press of Florida.
- Cowardin LM, Carter V, Golet FC, LaRoe ET. (Department of the Interior). 1979 December. Fish and Wildlife Service, Office of Biological Services. Classification of Wetlands and Deepwater Habitats of the United States. Washington, D.C.: DOI. 131 p. Available from: Superintendent of Documents, U.S. Government Printing Office, Washington, D.C.: FWS/OBS-79/31.
- [FLEPPC] Florida Exotic Pest Plant Council [Internet]. Ft. Lauderdale (FL): 2015 List of Florida's Invasive Species; 2015 [cited 2017 March 3]. Available from: <http://www.fleppc.org/list/list.htm>
- [FNAI & FDNR] Florida Natural Areas Inventory and Florida Department of Natural Resources. 2010. Guide to the Natural Communities of Florida. Tallahassee: FNAI & FDNR.
- [FNAI] Florida Natural Areas Inventory. "Field Guide to Rare Plants and Animals of Florida." *Field Guide Front Page*. FNAI, n.d. Web. 03 Mar. 2017.
- Gann GD, Bradley KA, Woodmansee SW. 2002. Rare Plants of South Florida: Their History, Conservation, and Restoration. Institute for Regional Conservation. Miami, Florida.
- Hipes D, Jackson DR, NeSmith K, Printiss D, Brandt, K. 2001. Field Guide to the Rare Animals of Florida. Tallahassee: Florida Natural Areas Inventory. 122 p.

X. APPENDICES

Appendix A: Plant Species List

Appendix B: Wildlife Species List

Appendix C: Deed/Legal Description

Appendix D: Expended and Projected Costs and Funding Sources

Appendix A: Plant Species List

Appendix A: Plant Species List for Imperial River Preserve

Scientific Name	Common Name	Native Status	EPPC	FDA	IRC	FNAI
Family: Blechnaceae (mid-sorus fern)						
<i>Blechnum serrulatum</i>	swamp fern	native				
Family: Nephrolepidaceae (sword fern)						
<i>Nephrolepis exaltata</i>	wild Boston fern	native				
Family: Polypodiaceae (polypody)						
<i>Phlebodium aureum</i>	golden polypody	native				
Family: Pteridaceae (brake fern)						
<i>Acrostichum aureum</i>	golden leather fern	native		T	R	G3/S3
<i>Acrostichum danaeifolium</i>	giant leather fern	native				
Family: Zamiaceae (Zamia)						
<i>Cycas revoluta</i>	sago palm	exotic				
Family: Apocynaceae (dogbane)						
<i>Rhabdadenia biflora</i>	rubbervine, mangrovevine	native			R	
Family: Arecaceae (palm)						
<i>Phoenix reclinata</i>	Senegal date palm	exotic	II			
<i>Sabal palmetto</i>	cabbage palm	native				
Family: Bromeliaceae (pineapple)						
<i>Tillandsia fasciculata</i> var. <i>densispica</i>	cardinal airplant	native		E		
<i>Tillandsia recurvata</i>	ballmoss	native				
<i>Tillandsia setacea</i>	southern needleleaf	native				
<i>Tillandsia usneoides</i>	Spanish moss	native				
<i>Tillandsia utriculata</i>	giant airplant	native		E		
Family: Commelinaceae (spiderwort)						
<i>Commelina diffusa</i> var. <i>diffusa</i>	common dayflower	exotic				
Family: Cyperaceae (sedge)						
<i>Fimbristylis cymosa</i>	hurricanegrass	native				
Family: Orchidaceae (orchid)						
<i>Encyclia tampensis</i>	Florida butterfly orchid	native		CE		
Family: Poaceae (grass)						
<i>Cenchrus spinifex</i>	coastal sandbur	native				
<i>Dactyloctenium aegyptium</i>	durban crowfootgrass	exotic				
<i>Eleusine indica</i>	Indian goosegrass	exotic				
<i>Eustachys petraea</i>	pinewoods fingergrass	native				
<i>Paspalum notatum</i>	bahiagrass	exotic				
<i>Setaria parviflora</i>	knotroot foxtail	native				
Family: Ruscaceae (butcher's broom)						
<i>Sansevieria hyacinthoides</i>	bowstring hemp	exotic	II			
Family: Acanthaceae (acanthus)						
<i>Ruellia tweediana</i>	mexican bluebell	exotic	I			
Family: Aizoaceae (mesembryanthemum)						
<i>Sesuvium portulacastrum</i>	shoreline seapurslane	native				
Family: Amaranthaceae (amaranth)						
<i>Iresine diffusa</i>	Juba's bush	native				
Family: Anacardiaceae (cashew)						
<i>Schinus terebinthifolius</i>	Brazilian pepper	exotic	I			
Family: Annonaceae (custard-apple)						
<i>Annona glabra</i>	pond apple	native				
Family: Apocynaceae (dogbane)						
<i>Asclepias curassavica</i>	scarlet milkweed	exotic				
<i>Cryptostegia madagascariensis</i>	madagascar rubbervine	exotic	II			
Family: Asteraceae (aster)						

Appendix A: Plant Species List for Imperial River Preserve

Scientific Name	Common Name	Native Status	EPPC	FDA	IRC	FNAI
<i>Ambrosia artemisiifolia</i>	common ragweed	native				
<i>Baccharis angustifolia</i>	saltwater false willow	native			R	
<i>Baccharis halimifolia</i>	groundsel tree	native				
<i>Bidens alba</i>	beggerticks	native				
<i>Borrchia frutescens</i>	bushy seaside oxeye	native				
<i>Eupatorium capillifolium</i>	dogfennel	native				
<i>Sphagneticola trilobata</i>	creeping oxeye	exotic	II			
<i>Wedelia trilobata</i>	wedelia	exotic	II			
Family: Avicenniaceae (black mangrove)						
<i>Avicennia germinans</i>	black mangrove	native				
Family: Bataceae (saltwort)						
<i>Batis maritima</i>	saltwort	native			R	
Family: Burseraceae (gumbo-limbo)						
<i>Bursera simaruba</i>	gumbo-limbo	native				
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: Convolvulaceae (morning-glory)						
<i>Ipomoea alba</i>	moonflowers	native				
<i>Ipomoea hederacea</i>	ivyleaf morning-glory	exotic				
Family: Crassulaceae (orpine)						
<i>Kalanchoe delagoensis</i>	chandelier plant	exotic				
<i>Kalanchoe pinnata</i>	life plant	exotic	II			
Family: Cucurbitaceae (gourd)						
<i>Momordica charantia</i>	balsampear	exotic				
Family: Euphorbiaceae (spurge)						
<i>Poinsettia cyathophora</i>	paintedleaf	native				
Family: Fabaceae (pea)						
<i>Acacia auriculiformis</i>	earleaf acacia	exotic	I			
<i>Albizia lebbek</i>	woman's tongue	exotic	I			
<i>Dalbergia ecastaphyllum</i>	coinvine	native				
<i>Dalbergia sissoo</i>	Indian rosewood	exotic	II			
<i>Vigna luteola</i>	hairypod cowpea	native				
Family: Malvaceae (mallow)						
<i>Gossypium hirsutum</i>	wild cotton	native		E	R	G4G5/S3
<i>Thespesia populnea</i>	portia tree	exotic	I			
Family: Myricaceae (bayberry)						
<i>Myrica cerifera</i>	wax myrtle	native				
Family: Myrtaceae (myrtle)						
<i>Melaleuca quinquenervia</i>	punktree	exotic	I			
<i>Psidium cattleianum</i>	strawberry guava	exotic	I			
<i>Syzygium cumini</i>	Java plum	exotic	I			
Family: Onagraceae (eveningprimrose)						
<i>Gaura angustifolia</i>	southern beeblossom	native				
Family: Passifloraceae (passionflower)						
<i>Passiflora suberosa</i>	corkystem passionflower	native				
Family: Polygonaceae (buckwheat)						
<i>Coccoloba uvifera</i>	seagrape	native				

Appendix A: Plant Species List for Imperial River Preserve

Scientific Name	Common Name	Native Status	EPPC	FDA	IRC	FNAI
Family: Rhizophoraceae (mangrove)						
<i>Rhizophora mangle</i>	red mangrove	native				
Family: Rubiaceae (madder)						
<i>Spermacoce prostrata</i>	prostrate false buttonweed	native			R	
Family: Sapotaceae (sapodilla)						
<i>Sideroxylon celastrinum</i>	saffron plum	native				
Family: Solanaceae (nightshade)						
<i>Lycium carolinianum</i>	Christmasberry	native				
<i>Solanum americanum</i>	American black nightshade	native				
Family: Urticaceae (nettle)						
<i>Boehmeria cylindrica</i>	false nettle	native				
Family: Vitaceae (grape)						
<i>Vitis rotundifolia</i>	muscadine	native				

Key

Florida EPPC Status

- I = species that are invading and disrupting native plant communities
- II = species that have shown a potential to disrupt native plant communities

FDACS (Florida Department of Agriculture and Consumer Services)

- E = Endangered
- T = Threatened
- CE = Commercially Exploited

IRC (Institute for Regional Conservation)

- CI = Critically Imperiled
- I = Imperiled
- R = Rare

FNAI (Florida Natural Areas Inventory)

- G= Global Status
- T= Threatened
- CE= Commercially Exploited

- 1= Critically imperiled because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- 2= Imperiled because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- 3= Either very rare and local throughout its range (21-200 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- 4= Apparently secure
- 5= Demonstrably secure

Appendix B: Wildlife Species List

Appendix B: Wildlife Species List for Imperial River Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
MAMMALS				
Family: Felidae (cats)				
<i>Lynx rufus floridanus</i>	Florida bobcat			
Family: Sciuridae (squirrels and their allies)				
<i>Sciurus carolinensis</i>	eastern gray squirrel			
Family: Delphinidae (oceanic dolphins)				
<i>Tursiops truncatus</i>	common bottlenose dolphin			
BIRDS				
Family: Anatidae (swans, geese and ducks)				
Subfamily: Anatinae				
<i>Anas fulvigula</i>	mottled duck			
<i>Mergus serrator</i>	red-breasted merganser			
Family: Phalacrocoracidae (cormorants)				
<i>Phalacrocorax auritus</i>	double-crested cormorant			
Family: Anhingidae (anhingas)				
<i>Anhinga anhinga</i>	anhinga			
Family: Pelecanidae (pelicans)				
<i>Pelecanus occidentalis</i>	brown pelican			G4/S3
Family: Ardeidae (herons, egrets, bitterns)				
<i>Ardea herodias</i>	great blue heron			
<i>Ardea alba</i>	great egret			
<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
<i>Butorides virescens</i>	green heron			
<i>Nyctanassa violacea</i>	yellow-crowned night heron			G5/S3
Family: Threskiornithidae (ibises and spoonbills)				
Subfamily: Threshiornithinae				
<i>Eudocimus albus</i>	white ibis			G5/S4
Subfamily: Plataleinae				
<i>Platalea ajaja</i>	roseate spoonbill	T		G5/S2
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			G5/S3S4
Family: Accipitridae (hawks, kites, accipiters, harriers, eagles)				
<i>Elanoides forficatus</i>	swallow-tailed kite			G5/S2
<i>Haliaeetus leucocephalus</i>	bald eagle			G5/S3
<i>Accipiter striatus</i>	sharp-shinned hawk			
<i>Buteo lineatus</i>	red-shouldered hawk			
Family: Scolopacidae (sandpipers, phalaropes)				
Subfamily: Scolopacinae				
<i>Actitis macularia</i>	spotted sandpiper			
<i>Tringa solitaria</i>	solitary sandpiper			
<i>Arenaria interpres</i>	ruddy turnstone			
Family: Laridae (gulls)				
Subfamily: Larinae				
<i>Larus atricilla</i>	laughing gull			
<i>Larus delawarensis</i>	ring-billed gull			
Subfamily: Sterninae (terns)				
<i>Sterna antillarum</i>	least tern	T		G4/S3
<i>Sterna forsteri</i>	Forster's tern			
Family: Columbidae (pigeons and doves)				

Appendix B: Wildlife Species List for Imperial River Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
<i>Streptopelia decaocto</i>	Eurasian collared-dove *			
<i>Zenaida macroura</i>	mourning dove			
<i>Columbina passerina</i>	common ground-dove			
Family: Apodidae (swifts)				
Subfamily: Chaeturinae				
<i>Chaetura pelagica</i>	chimney swift			
Family: Alcedinidae (kingfishers)				
<i>Ceryle alcyon</i>	belted kingfisher			
Family: Picidae (woodpeckers)				
Subfamily: Picinae				
<i>Melanerpes carolinus</i>	red-bellied woodpecker			
<i>Sphyrapicus varius</i>	yellow-bellied sapsucker			
<i>Picoides pubescens</i>	downy woodpecker			
<i>Colaptes auratus</i>	northern flicker			
<i>Dryocopus pileatus</i>	pileated woodpecker			
Family: Falconidae (falcons)				
Subfamily: Falconinae (falcons)				
<i>Falco sparverius</i>	American kestrel			
Family: Tyrannidae (tyrant flycatchers)				
Subfamily: Fluvicolinae				
<i>Myiarchus cinerascens</i>	great-crested flycatcher			
Family: Vireonidae (vireos)				
<i>Vireo solitarius</i>	blue-headed vireo			
<i>Vireo olivaceus</i>	red-eyed vireo			
Family: Corvidae (crows, jays, etc.)				
<i>Cyanocitta cristata</i>	blue jay			
<i>Corvus brachyrhynchos</i>	American crow			
<i>Corvus ossifragus</i>	fish crow			
Family: Hirundinidae (swallows)				
Subfamily: Hirundinidae				
<i>Progne subis</i>	purple martin			
<i>Tachycineta bicolor</i>	tree swallow			
<i>Hirundo rustica</i>	barn swallow			
Family: Polioptilidae				
<i>Polioptila caerulea</i>	blue-gray gnatcatcher			
Family: Mimidae (mockingbirds and thrashers)				
<i>Dumetella carolinensis</i>	gray catbird			
<i>Mimus polyglottos</i>	northern mockingbird			
Family: Parulidae (wood-warblers)				
<i>Mniotilta varia</i>	black-and-white warbler			
<i>Dendroica palmarum</i>	palm warbler			
<i>Dendroica coronata</i>	yellow-rumped warbler			
<i>Dendroica dominica</i>	yellow-throated warbler			
Families: Cardinalidae (cardinals, some grosbeaks, new world buntings, etc.)				
<i>Cardinalis cardinalis</i>	northern cardinal			
Family: Icteridae (blackbirds, orioles, etc.)				
<i>Quiscalus quiscula</i>	common grackle			
<i>Quiscalus major</i>	boat-tailed grackle			
REPTILES				
Family: Emydidae (box and water turtles)				
<i>Terrapene carolina bauri</i>	Florida box turtle			
Family: Polychridae (anoles)				
<i>Anolis sagrei</i>	brown anole *			
Family: Colubridae (harmless egg-laying snakes)				
<i>Coluber constrictor priapus</i>	southern black racer			

Appendix B: Wildlife Species List for Imperial River Preserve

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
Family: Natricidae (harmless live-bearing snakes)				
<i>Nerodia clarkii compressicausa</i>	mangrove salt marsh snake			
AMPHIBIANS				
Family: Eleutherodactylidae (free-toed frogs)				
<i>Eleutherodactylus planirostris</i>	greenhouse frog *			
Family: Hylidae (treefrogs and their allies)				
<i>Osteopilus septentrionalis</i>	Cuban treefrog *			
FISHES				
Family: Belonidae (needlefish)				
<i>Strongylura notata</i>	redfin needlefish			
Family: Centropomidae (snooks)				
<i>Centropomus undecimalis</i>	common snook			
Family: Dasyatidae (rays)				
<i>Dasyatis spp.</i>	stingray			
Family: Sparidae (porgies)				
<i>Archosargus probatocephalus</i>	sheepshead			
INSECTS				
Family: Nymphalidae (brush-footed butterflies)				
Subfamily: Heliconiinae (longwings)				
<i>Heliconius charitonius</i>	zebra			
ARACHNIDS				
Family: Araneidae (orb weavers)				
<i>Gasteracantha elipsoides</i>	crablike spiny orb weaver			
Family: Tetragnathidae (long-jawed orb weavers)				
<i>Leucauge venusta</i>	orchard orbweaver			
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

Appendix C: Deed/Legal Description

15.00R

4366303

THIS INSTRUMENT PREPARED BY:
THEODORE L. TRIPP, JR., ESQ.
Post Office Drawer 2040
Fort Myers, Florida 33902
Telephone: (941) 334-1824

QUIT-CLAIM DEED

WITHOUT TITLE EXAMINATION

THIS QUIT-CLAIM DEED, executed this 25th day of March, 1998, by

RICHARD REAHARD and ANN REAHARD, Husband and Wife, whose post office address is 4366 Pine Lake Road, Bonita Springs, FL, 33923, first party, to LEE COUNTY, FLORIDA, whose post office address is Post Office Box 398, Fort Myers, FL, 33902, second party:

(Whenever used herein the term "first party" and "second party" shall include singular and plural, heirs, legal representatives, and assigns of individuals, and the successors and assigns of corporations, wherever the context so admits or required).

WITNESSETH, That the said party of the first part, for and in consideration of TEN AND NO/100 DOLLARS (\$10.00), and other good and valuable consideration, to them in hand paid by the party of the second part, the receipt whereof is hereby acknowledged, has granted, bargained and sold to the said party of the second part, its heirs and assigns forever, the following described lot, piece or parcel of land, situate, lying and being in the County of Lee, State of Florida, to-wit:

That certain parcel of land described on Exhibit A, consisting of 40 acres more or less.

SUBJECT TO:

1. Taxes for the year 1984 and subsequent years.
2. Conditions, restrictions, easements, limitations and zoning ordinances of record, if any.

TO HAVE AND TO HOLD the same together with all and singular the appurtenances thereunto belonging or in anywise appertaining, and all the estate, right, title, interest, lien, equity and

APPROVED FOR PAYMENT
AS TO FORM

Amount
LEE COUNTY ATTORNEY'S OFFICE
By [Signature]
Attorney

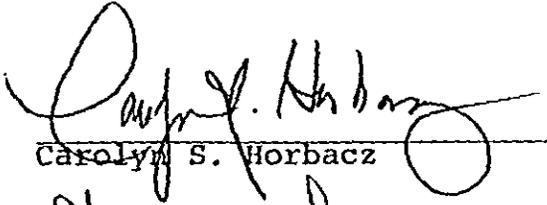
RECORDED BY
TRENT VOGES, D.C.

OR2945 160455

claim whatsoever of the said first party, either in law or equity, to the only proper use, benefit and behoof of the said second party forever.

IN WITNESS WHEREOF, the said party of the first part has hereunto set their hands and seals the day and year first above written.

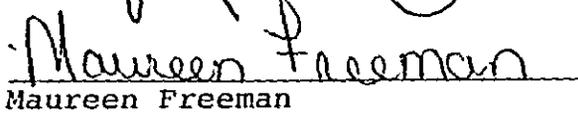
Signed, sealed and delivered
in the presence of:



Carolyn S. Horbacz



RICHARD REAHARD



Maureen Freeman

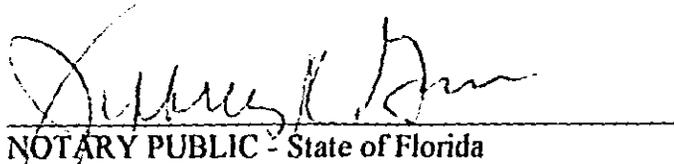


ANN REAHARD

STATE OF FLORIDA
COUNTY OF LEE

I HEREBY CERTIFY that on this day, before me, an officer duly authorized to administer oaths and take acknowledgments, personally appeared RICHARD REAHARD and ANN REAHARD, Husband and Wife, personally known to me to be the persons described in and who executed the foregoing instrument, or who produced _____ as identification who acknowledged before me that they executed the same, and an oath was not taken.

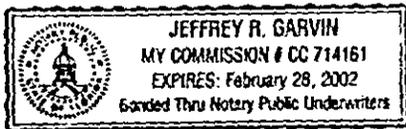
WITNESS my hand and official seal in the County and State last aforesaid this 25th day of March, 1998.



NOTARY PUBLIC - State of Florida

JEFFREY R. GARVIN

NOTARY'S PRINTED SIGNATURE



My Commission Expires:
My Commission Number:

DR2945 P60456

88. STRAP NO. 7-32-47-25-02-00009.0010

A tract or parcel of land lying in the SW 1/4 and the NW 1/4 of the SW 1/4 of Section 32 T47S R23E of Lee County, Florida which tract is more precisely described as follows:

Lots 1 through 5 and 7 through 24, Block 9 Unit 1 of Imperial Shores Subdivision and the land described as Emperor Drive and Princess Drive as per Map or Plat recorded in OR BK 53 PP 128-132 of Public Records of Lee County, Florida. Subject to easements and restrictions of record.

89. STRAP NO. 9-32-47-25-02-00007.010A

A tract or parcel of land lying in the SW 1/4 of the SW 1/4 of Section 32 T47S R23E of Lee County, Florida which tract is more precisely described as follows:

RECORDED 0585

Lot or land known and described as Commercial Park, South of Blocks 7 & 9, Unit 1 of Imperial Shores Subdivision as per Map or Plat recorded in OR BK 53 PP 128-132 of Public Records of Lee County, Florida.

90. STRAP NO. 9-32-47-25-02-00007.0120

A tract or parcel of land lying in the NW 1/4 of the SW 1/4 of Section 32 T47S R23E of Lee County, Florida which tract is more precisely described as follows:

Lots 32 through 36 Block 7 Unit 1 of Imperial Shores Subdivision as per Map or Plat recorded in OR BK 53 PP 128-132 of Public Records of Lee County, Florida. Subject to easements and restrictions of record.

91. STRAP NO. 9-32-47-25-04-00008.0130

A tract or parcel of land lying in Government Lots 1 and 2 Mainland Section 31 T47S R23E of Lee County, Florida which is more precisely described as follows:

Lots 39 thru 42A Block 8 Unit 1 of Imperial Shores Subdivision and the adjoining land described as Imperial Shores Blvd. as per Map or Plat recorded in OR BK 53 PP 128-132 of Public Records of Lee County, Florida.

92. STRAP NO. 9-31-47-25-04-00010.0010

A tract or parcel of land lying in Government Lots 1 and 2 Mainland Section 31 T47S R23E of Lee County, Florida which is more precisely described as follows:

Lots 1 through 25 Block 10 Unit 1 of Imperial Shores Subdivision and the land described as Scepter Drive as per Map or Plat recorded in OR BK 53 pp 128-132 of Public Records of Lee County, Florida.

93. STRAP NO. 1-31-47-25-04-00011-0010

A tract or parcel of land lying in Government Lots 1 and 2 Mainland Section 31 T47S R23E of Lee County, Florida which is more precisely described as follows:

Lots 1 through 34 Block 11 Unit 1 of Imperial Shores Subdivision and the land described as King Drive and King Court as per Map or Plat recorded in OR BK 53 PP 128-132 of the Public Records of Lee County, Florida.

94. STRAP NO. 3-31-47-25-04-00012-0010

A tract or parcel of land lying in Government Lots 1 and 2 Mainland Section 31 T47S R23E of Lee County, Florida which is more precisely described as follows:

Lots 1 through 34 Block 12 Unit 1 of Imperial Shores Subdivision and the land described as Scepter Court and Queens Court as per Map or Plat recorded in OR BK 53 PP 128-132 of the Public Records of Lee County, Florida.

EXHIBIT "A"

98 APR 10 PM 4:03

CHARLIE GREEN, CLERK
LEE COUNTY, FL

2945 PRO457

Appendix D: Projected Costs and Funding Sources

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	7
Contracted Exotic Plant Treatments	C20/20	\$3,042.00	3

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	\$20.00	20

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 **\$962.60 per year**.

Total projected annual management expense will be **\$9,626 over 10 years**.

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

Expended Costs 1998-2017

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	\$5,555.00
Native Plantings	C20/20	\$2,650.00
Total		\$8,205.00
Overall Protection		
<u>Item</u>	<u>Funding Source</u>	<u>Costs</u>
Debris Removal	C20/20	\$962.08
Total		\$962.08
Imperial River Preserve Total Expended Cost To Date		\$9,167.08