Orange River Preserve

10651 & 10201 Palm Beach Boulevard

Fort Myers, FL 33905

Land Management Plan

Second Edition

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

Approved by the Lee County Board of Commissioners: 01/24/2017

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From the Authors

This plan was prepared by Hanna Joergens and Hank Forehand, Land Stewardship Coordinators with the Conservation 20/20 program. Constructive edits and suggestions were made by other Conservation Lands staff toward the development of this document, and members of the Management Sub-Committee of Conservation Lands Acquisition and Stewardship Advisory Committee helped to review the plan.

Hanna Joergens

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Table of Contents

List of Figures

List of Tables

List of Acronyms

BoCC	Board of County Commissioners
BU	Burn Units
C20/20	Conservation 20/20
DHR	Division of Historical Resources
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FDOT	Florida Department of Transportation
FFS	Florida Forest Service
FLEPPC	Florida Exotic Pest Plant Council
FNAI	Florida Natural Areas Inventory
FPL	Florida Power and Light Company
FWC	Florida Fish and Wildlife Conservation Commission
FLU	Future Land Use
IRC	Institute for Regional Conservation
LCDCD	Lee County Department of Community Development
LCDNR	Lee County Division of Natural Resources
LCPR	Lee County Department of Parks and Recreation
LCDOT	Lee County Department of Transportation
LiDAR	Light Detection and Ranging
LSOM	Land Stewardship Operations Manual
MU	Management Units
NWI	National Wetlands Inventory
ORP	Orange River Preserve
PARI	Piper Archaeological Research, Inc.
SFWMD	South Florida Water Management District
STRAP	Section-Township-Range and Parcel
ISWG	Invasive Species Working Group
USFWS	United States Fish and Wildlife Service

Vision Statement

It is the vision of the Lee County Department of Parks and Recreation and the Conservation 20/20 program to conserve, protect, and restore Orange River Preserve to a productive, functional, and biologically diverse ecosystem. The mesic flatwoods will be maintained as an open, natural and diverse community. The mangrove fringe on the shoreline of the Orange River will be maintained as a natural area, providing habitat for wildlife as well as a scenic backdrop for residents and visitors to southwest Florida who recreate on the river.

I. Executive Summary

Orange River Preserve is located in Fort Myers, Florida, just east of the Fort Myers city limits and within northeastern Lee County. The site is approximately one mile east of Interstate 75, on the south side of Palm Beach Boulevard and along the northern shore of the Orange River. The preserve is composed of 63.3 total acres, but is commonly recorded as having 60.5 acres of surveyed land because the island and mangrove fringes of the peninsula parcel were not included in official land surveys. The preserve was acquired through the Conservation 20/20 program as two nominations: #142, which cost a total of $1,750,000.00 for 61 acres in March 2002; and #470, which cost a total of $5,000.00 for 2.3 acres and was purchased in March 2012.

The preserve is divided into three soil types which all share slopes between 0-2%, indicating that the preserve is fundamentally level, and an ability to absorb runoff water quickly through rapid to moderate permeability with a tendency to flood when saturated. These shared soil characteristics also create severe limitations for recreation and have restricted the opportunities available to the preserve to hiking without a trail system, nature study, bird watching, and nature photography. Watercraft recreational opportunities are available along the Orange River, but there are no launching opportunities from the preserve.

Three plant communities exist at the preserve, including mesic flatwoods, mesic hammock, and mangrove swamp. The flatwoods are located in the higher elevations of the preserve's main parcel, which reach seven feet above sea level and slope gently downward through the mesic hammock to sea level within the mangrove swamp at the riverbank. The preserve's island within the Orange River and the peninsula on the southern shore of the river contain only mangrove swamps which reach between one and two feet above sea level at scattered high points, and slope downward into the river at various angels. The resulting inundation from the tidal influence of the Caloosahatchee River impacts the lower elevation communities and helps cycle nutrients, and the seasonal salinity changes of the water influences the plant species and their growth patterns within these plant communities. The close proximity to both the Orange River and Caloosahatchee River places the preserve within the Orange River Watershed, as defined by the Lee County Division of Natural Resources, and the Caloosahatchee Basin watershed of the South Florida Water Management District.

The historical human land use of the property was minimal. Archaeological assessment of the area places the preserve within a category in which finding significant artifacts is improbable, and more modern alterations were limited to upland vegetation clearing, minor jeep trails, and neighboring residential development with associated infrastructure. These alterations most heavily impacted the preserve by introducing invasive exotic plants to the upland plant communities. After acquisition by Lee County, exotic plant treatment projects began to remove large infestations of melaleuca and Brazilian pepper from the upland plant communities, and habitat restoration projects began restoring these

altered areas into a mesic flatwoods plant community. Land management activities at this preserve will continue to focus on maintaining the upland mesic flatwoods with the use of prescribed fire and mechanical brush reduction, and preserve-wide invasive exotic plant control.

The purpose of this management plan is to define conservation goals for Orange River Preserve that will address the above concerns. It will serve as a guide for Conservation 20/20 staff 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, the wildlife and plants found within its boundaries, and how it has been impacted by people. This compilation of research will allow the plan to serve as a reference guide for anyone interested in learning more about this preserve and conservation efforts within Lee County.

II. Introduction

Orange River Preserve (ORP) is located in Fort Myers, Florida, just east of the Fort Myers city limits and within northeastern Lee County. The site is approximately one mile east of Interstate 75, on the south side of Palm Beach Boulevard and along the northern shore of the Orange River. The preserve is composed of 63.3 total acres, but is commonly recorded as having 60.5 acres of surveyed land because the island and mangrove fringes of the peninsula parcel were not included in official land surveys. The preserve was acquired through the Conservation 20/20 (C20/20) program as two nominations: #142, which cost a total of $1,750,000.00 for 58.5 surveyed acres (61 total acres) in March 2002; and #470, which cost a total of $5,000.00 for 2.0 surveyed acres (2.3 total acres) in March 2012.

Established in 1996, the C20/20 program 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 (LCPR) and County Lands. In 2016, Lee County voters were given an opportunity to show support for continuation of the C20/20 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.

ORP was acquired to provide a buffer for the Orange River with the goal of improving water quality, providing critical wildlife habitat, and protecting designated plant and wildlife species. A diversity of wildlife and plant species has been documented at the preserve, including seven state and federally designated wildlife species and two state designated endangered plant species. Due to the small size and segmented shape, in addition to the heavily traveled Palm Beach Boulevard along the northern boundary and the Orange River along the southern boundary, it is difficult for large wildlife to access the preserve. Transportation barriers, development of infrastructure and residential communities, and the construction of the Florida Power and Light Company’s (FPL) power plant have destroyed most of the adjacent habitat while also

creating obstacles for wildlife to traverse the urban space. As a result, the diversity and number of wildlife found at ORP are not as large when compared to other C20/20 preserves, but are still healthy numbers for this specific site. All of the wildlife recorded at ORP was observed during site evaluations and inspections conducted since acquisition, and the resulting species list will continue to be edited as future site inspections occur.

The habitat provided at the preserve is located within three plant communities that were identified by the Florida Natural Areas Inventory (FNAI) and Florida Department of Environmental Protection (FDEP), and includes mesic flatwoods, mesic hammock, and mangrove swamp. Despite a close proximity to both the Orange River and Caloosahatchee River, and the rapid early residential development in the surrounding areas, these communities experienced minimal ecosystem manipulation and development. Archaeological assessment of the area places the preserve within a category in which finding significant artifacts is improbable, and more modern alterations were limited to upland vegetation clearing, minor jeep trails, and neighboring residential development with associated infrastructure. The small changes that took place at the site were recorded over the past 60 years through aerial photography, and have enabled land management staff to track the historical land uses and plant community modifications.

The largest challenge land managers have faced at the preserve has been the invasive exotic plant infestations that resulted from the historical site alterations. The upland clearing and jeep trails grew into melaleuca (*Melaleuca quinquenervia*) and Brazilian pepper (*Schinus terebinthifolius*) stands, and a lack of fire contributed to a buildup of fuels within the plant communities. These effects resulted in low plant diversity and increased the threat of a catastrophic wildfire event, which staff worked to correct once the property was acquired by Lee County. While completing initial exotic plant treatments and follow-up control on re-sprouts, land managers conducted mechanical brush reduction with the use of a roller chopper to reduce the fuel loads and reduce the risk of wildfire. At this time, partnership was forged with a local contractor to have exotic melaleuca trees removed in exchange for use of the logs for mulch, and the preserve had ten acres thinned. Once the fuel levels were at a manageable level, prescribed fire was introduced to the mesic flatwoods community of the preserve in 2008 and again in 2014. Land managers will continue to utilize prescribed fire to maintain the mesic flatwoods plant community, and will conduct mechanical brush reduction between burn rotations to reduce the build-up of fuels.

The remaining two plant communities at the preserve are not scheduled to receive prescribed fire because they are not fire-dependent, which means they do not rely on fire to maintain a thin canopy or succession state. Instead, the mesic hammock and mangrove swamp are intermittently inundated by the tidal influence flowing upstream from the Caloosahatchee River into the Orange River. ORP’s larger land surface is located along the northern shoreline of the Orange River and gently slopes from an elevation of seven feet above sea level in the

northeast corner, down to sea level at the riverbank. The island within the Orange River and the peninsula on the southern shore of the river only reach between one and two feet above sea level at scattered high points, which slope downward into the river at various angels. The resulting inundation from the tidal influence and low elevations helps cycle nutrients through the plant communities, and the seasonal salinity changes of the water influences the plant species and their growth patterns within these plant communities. The preserve is also located within both the Orange River Watershed as defined by the Lee County Division of Natural Resources (LCDNR) and the Caloosahatchee Basin watershed of the South Florida Water Management District (SFWMD), which subjects the plant communities of the preserve to the effects of dredging and other district water management projects.

The soil types found at ORP also contributes to the plant communities and maintenance needs by sharing characteristics of slopes between 0-2%, which indicates that the preserve is fundamentally level, and an ability to absorb runoff water quickly through rapid to moderate permeability with a tendency to flood when saturated. These shared soil characteristics also create severe limitations for recreation and have restricted the recreational opportunities available to the preserve to primitive hiking (without a trail system), nature study, bird watching, and nature photography. Watercraft recreational opportunities are available along the Orange River, but cannot be launched from the preserve. Preliminary discussions have been held with the landowner of a neighboring inholding parcel to develop a designated hiking trail to increase recreational opportunities at the preserve, but no tangible plans have been developed.

The future land uses for the preserve are currently divided between Conservation Upland and Wetland in nomination #142, and Wetlands in nomination #470. The zoning is also broken up into Environmentally Critical (#142) and Agriculture (#470). These inconsistencies are due to the timing of the acquisitions, because nomination #142 received a future land use category and was re-zoned shortly after acquisition, but nomination #470 was acquired after these changes were made. One of the management tasks in the near future will be to rezone and change the future land use for this parcel to match the remainder of the preserve.

The goal of this 10 year land management plan update is to identify preserve resources, develop strategies to protect those resources, and implement restoration activities to maintain ORP as a productive, functional, and viable ecosystem while ensuring that the site will be managed in accordance with Lee County Parks and Recreation’s Land Stewardship Operations Manual (LSOM). Restoration and management activities at the preserve will focus on maintaining upland ecosystems with prescribed fire, controlling invasive exotic plant and animal species, and enhancing wildlife habitat. A Management Action Plan that outlines restoration and land management goals has been developed to outline these goals and strategies, explain how to accomplish these goals, and provide a timetable for completion. This land management plan will be revised in 10 years (2026).

III. Location and Site Description

ORP is located in Fort Myers, Florida just east of the Fort Myers city limits and within northeastern Lee County with parcels found at street addresses 10651 and 10201 Palm Beach Boulevard. The preserve is also composed of an island within the Orange River and a peninsula on the southern shore of the Orange River that do not have addresses. Currently, the site remains undeveloped and has no public access, parking lot, trailhead, or structures.

As a Limited Use Preserve, the primary recreational opportunities at the preserve are restricted to watercraft recreation on the Orange River or primitive hiking, nature photography, and nature watching. This classification is a result of the smaller size, sensitive soils and habitats, and a lack designated public access at the preserve. Preliminary discussions have been held with the landowner of a neighboring inholding parcel to develop additional recreational opportunities at the preserve, but no tangible plans have been developed.

The site contains both natural and altered plant communities, identified by the FNAI to be mesic hammock, mangrove swamp, and mesic flatwoods (FNAI 2010). The mesic hammock and mesic flatwoods plant communities have undergone initial invasive exotic plant treatments, and the preserve as a whole is at a maintenance level for exotics.

The preserve is composed of 63.3 total acres, but has had official land surveys on only 60.5 acres of surveyed land. The preserve was acquired through two separate nominations, numbers 142 and 470, through C20/20. The STRAP number, an identification code for the Section-Township-Range-Parcel location of the preserve, falls within Section 35-Township 43 South-Range 25 East and has 4 individual Parcel numbers. The full STRAP identification numbers for each parcel and additional acquisition information can be found in the Acquisition section of this plan.

All of the parcels of ORP are located approximately one mile east of Interstate 75 and south of the Caloosahatchee River. Palm Beach Boulevard (State Road 80) runs along the northern border and the Orange River defines the southern border, while the east and west boundaries are private properties. A portion of the preserve is bisected by a privately owned inholding, which completely severs the corridor between the mesic flatwoods and mesic hammock of the two management units with a chain link fence, but does not impact the mangrove swamp. Figure 1 identifies the boundaries of the preserve in a 2016 aerial photograph, Appendix A provides a legal description of the acquired parcels, and Figure 2 shows the location of ORP within Lee County and features prominent nearby properties, which are used for conservation and/or recreation.

Figure 1: 2016 Aerial

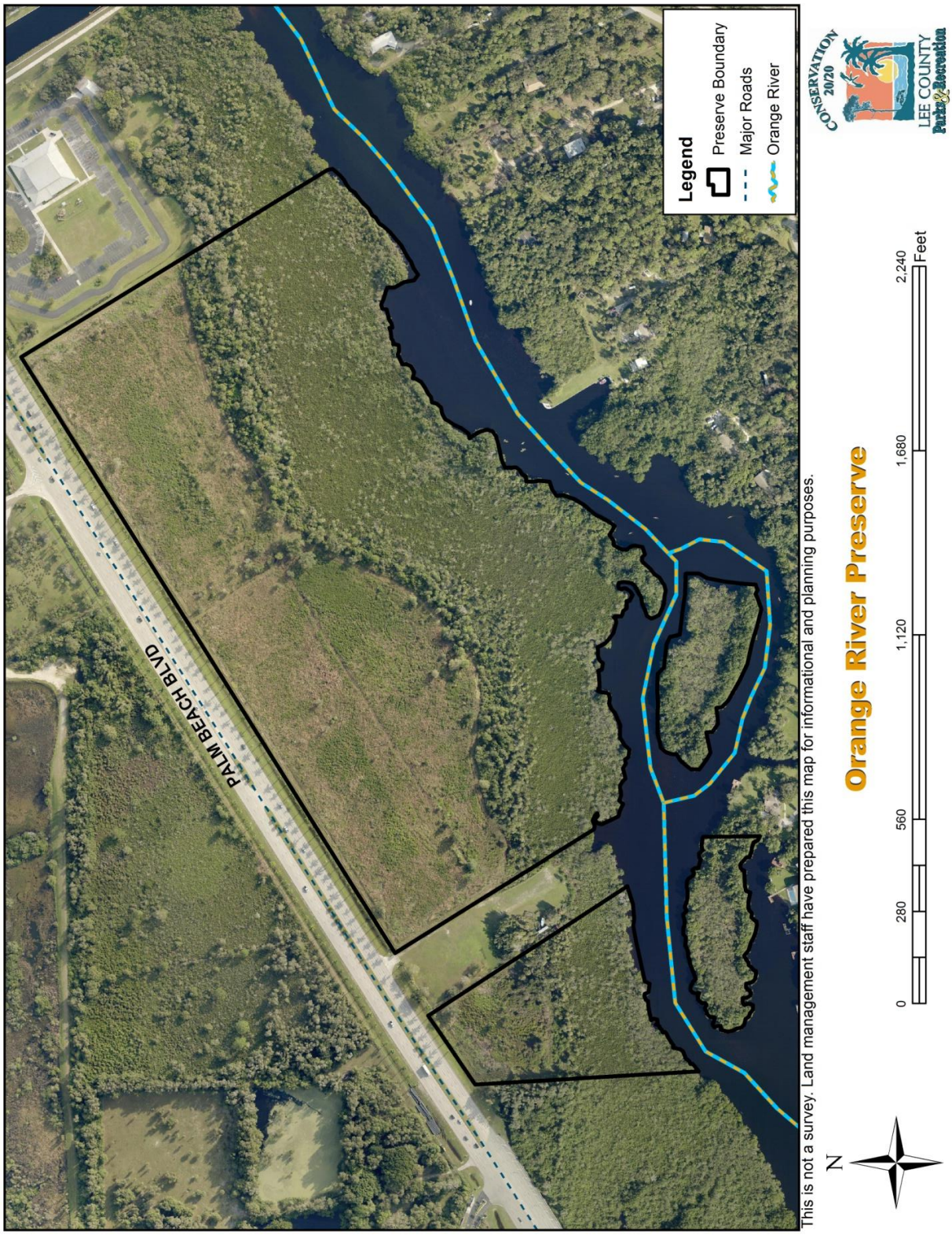
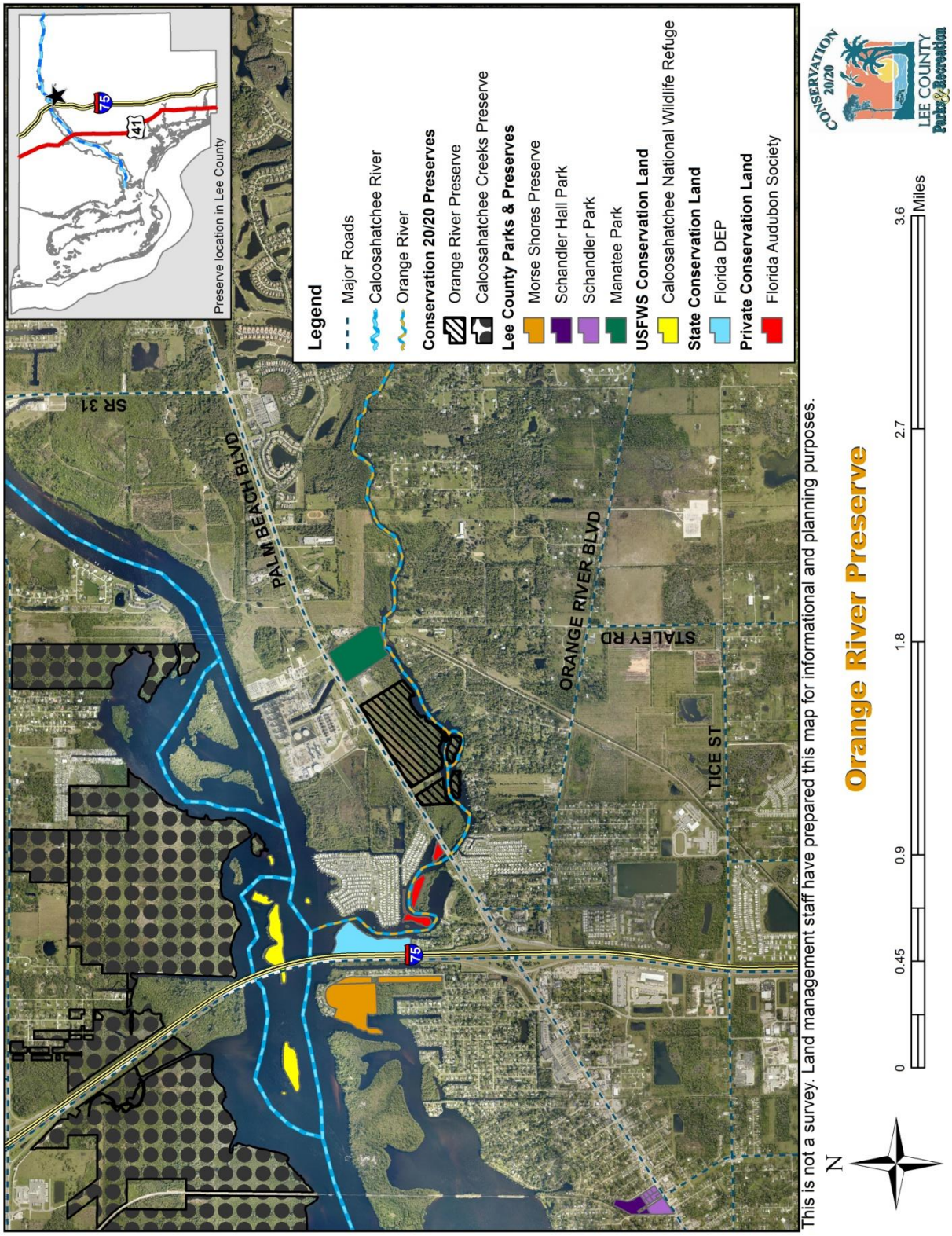


Figure 2: ORP Location



IV. Natural Resources Description

A. Physical Resources

i. Climate

General information on the climate of southwest Florida is located in the LSOM Land Stewardship Plan Development and Supplemental Information section (LSOM 2012).

ii. Geology

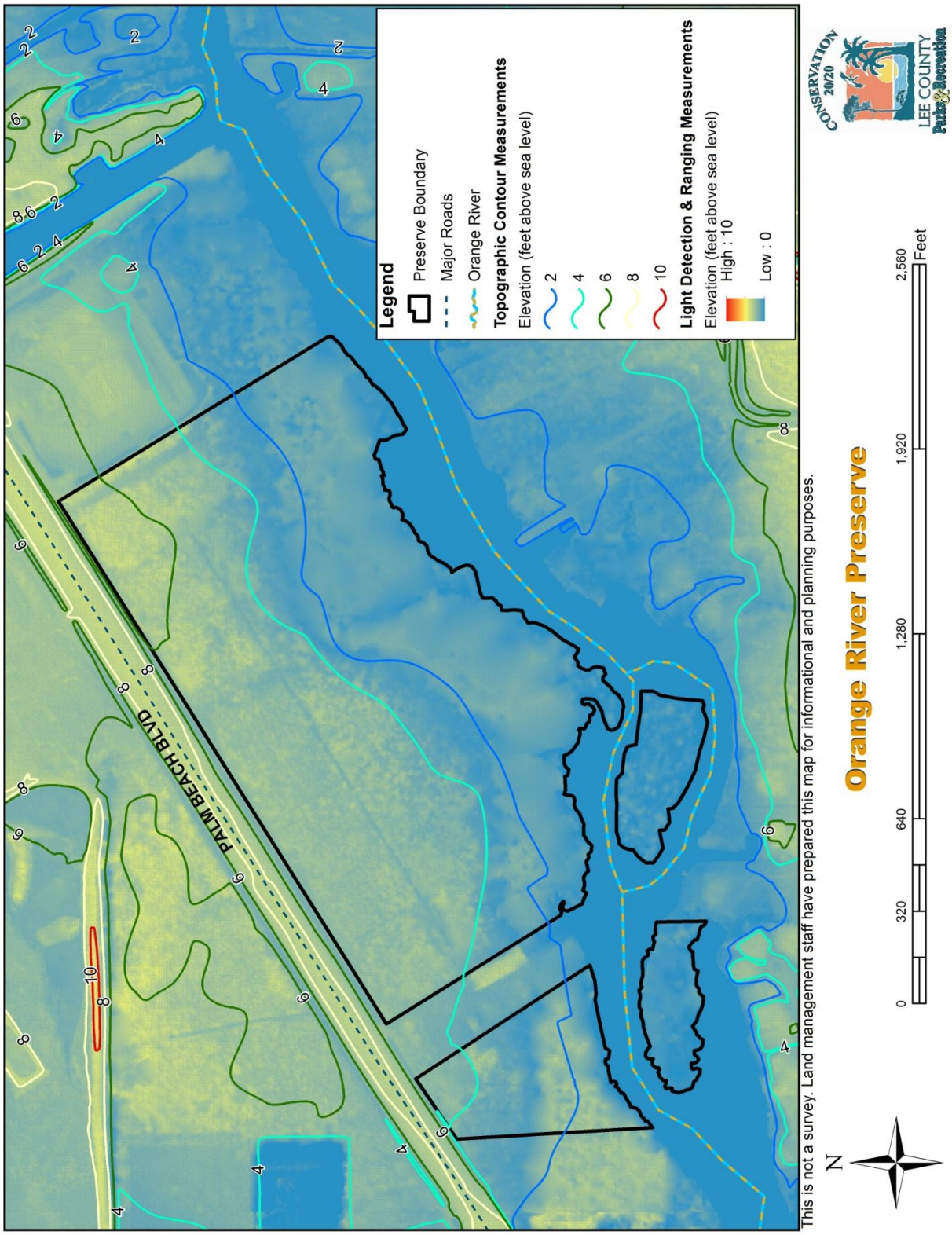
Specific information on the geologic features such as physiographic regions, formations and maps can be found in the LSOM Land Stewardship Plan Development and Supplemental Information section.

iii. Topography

The elevations at ORP range from seven feet above sea level at the northeast corner and slope downward in a general southwesterly direction towards the river at one foot above sea level. Due to these low elevations and proximity to the river, the entire preserve could be partially inundated during severe tropical storms. Figure 3 shows contour lines that can be used to determine which areas of the preserve would experience the most flooding during a severe storm.

The map also utilized Light Detection and Ranging (LiDAR) data, an optical remote sensing technology similar to sonar that measures properties of scattered light to find information of a distant target. The change in color gradient visually demonstrates the change in elevation from the higher point in the northern corner to the lower elevations in the southwestern corner of the preserve. The data used in this map were collected in 2007 and represent the published five foot digital elevation model.

Figure 3: Topography



iv. Soils

There are three soil types found at ORP with a commonality of having slopes ranging from 0-2%. Slope is the pitch of the land surface from the horizon, and a higher percentage indicates more fluctuations in the land surface. Essentially, the preserve is fundamentally level, but flooding is reduced with the shared soil type feature of rapid permeability which allows them to quickly soak up rainfall and runoff. A small portion of the preserve acreage is also covered by the tidal brackish water of the Orange River, which contributes to the overall acreage but does not contain soil attributes.

The soil type that encompasses the largest portion of ORP is Immokalee Sand, which features high runoff when saturated and moderate permeability. Classified as being typically found in flatwoods, this soil type is found throughout the mesic flatwoods and into the edge of the mesic hammock where the soils transition to Wulfert Muck. Temporarily inundated, this soil type is rapidly permeable with tendencies to flood and high levels of humus. The Myakka Fine Sand soil type covers the smallest area of ORP and is limited to the peninsula on the southern shore of the Orange River (Nomination #470), and features characteristics similar to that of the Immokalee Sands; sandy, poorly drained, moderately permeable, and typically found in flatwoods and depressions.

The three soil types found at ORP share characteristics which, when combined, create severe limitations for recreational opportunities at the preserve. Soil composition, lack of slope, and the duration of inundation of these soil types would require special reclamation and design to facilitate most recreational uses. Figure 4 displays the different soil types found at ORP, and Table 1 provides brief descriptions about the soils information which is used by land managers for understanding restoration and recreation plan limitations. Refer to the LSOM Land Stewardship Plan Development and Supplemental Information section for additional information on soil types and limitations.

Figure 4: Soil Types

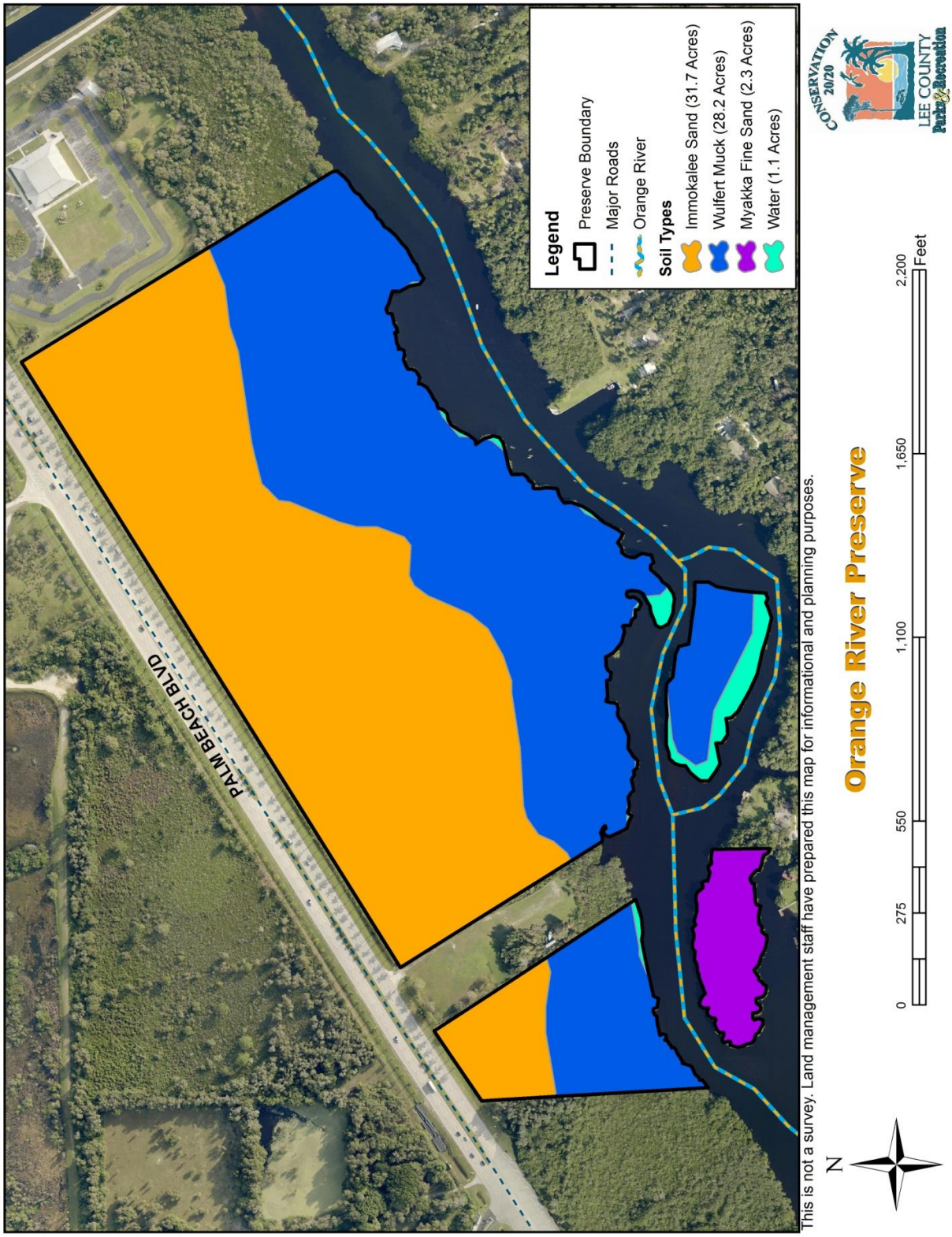


Table 1: Soil Attributes

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	
Immokalee Sand	28	31.7	50.1%	South Florida Flatwoods		B/D	Rapid	Rapid	1-3 Months	2-6 Months	1-2%	Poor	Poor	Poor	---	Severe; wetness, too sandy
Wulfert Muck	23	28.2	44.6%	Saltwater Marsh	F	D	Rapid	Rapid	Water table fluctuates with tide & area subject to tidal flooding		---	Very Poor	Very Poor	Fair	---	Severe; wetness, excessive humus
Myakka Fine Sand	11	2.3	3.6%	South Florida Flatwoods		B/D	Rapid	Moderate-Rapid	1-3 Months	2-6 Months	<2%	Fair	Poor	Poor	---	Severe; wetness, too sandy
Water	99	1.1	1.7%	Water covers a portion of the preserve acreage area which consists of tidal brackish water of the Orange River and therefore does not have soil characteristics.												
	TOTAL	63.3	100%													

Wetland Class (1) Key:

F – Flooding: Temporary inundation of an area caused by overflowing streams, runoff from adjacent slopes, or tides.

Hydrologic Group (2) Key:

* 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.

Color Key:

Wet
Saturated
Water

v. Hydrologic Components and Watershed

ORP is located within the northwest portion of the SFWMD Lower West Coast Region. The preserve lies within a subset of a combined Lower West Coast Region and Lower East Coast Region known as the Caloosahatchee Basin, which stretches 1,400 square miles (SFWMD 2012). Locally, the LCDNR places the preserve on the northern boundary of the Orange River Watershed. Figure 5 shows the LCDNR watershed and SFWMD basins in reference to the location of ORP.

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, and subsequently classified in general accordance with the "Classification of Wetlands and Deep Water Habitats of the United States" (Cowardin et al. 2013); this publication further classifies wetlands according to the type of dominated vegetative cover. Wetlands were identified on aerial photography by vegetation, and visible hydrologic and geographic attributes.

Figure 6 identifies both estuarine and marine wetland types found at ORP utilizing the NWI, which are further classified as 20.3 acres of estuarine and marine deepwater, and 27.8 acres of estuarine and marine wetland. Estuarine systems contain brackish water in semi-enclosed water bodies with partial access to the open ocean, and include deepwater tidal and adjacent tidal wetlands. Marine systems contain salt water and typically include open ocean and coastline areas subject to tides and currents, and can extend from the ocean inland to the seaward limit of the estuarine system. ORP features a mixture of both marine and estuarine systems because it is located at the convergent point of the oceanic salt water tide moving upstream in the Caloosahatchee River from the Gulf of Mexico, and the freshwater flowing from the headwaters of the Orange River toward the Caloosahatchee River.

Both the estuarine and marine systems have low-energy wave action, meaning that the water is generally slow-moving, and the water chemistry is influenced by tides, precipitation, freshwater runoff from land areas, and evaporation. Historically, the Orange River experienced natural seasonal fluctuations in salinity from the oceanic tidal saltwater flowing upstream into the Caloosahatchee during the dry season and heavy dilution from freshwater rainfall runoff flowing down the tributary in the wet season.

This natural flow was first interrupted in 1887 when a canal was completed to connect the headwaters of the Caloosahatchee River and Lake Okeechobee. This connection allowed a drainage flow way for freshwater to be released into the Caloosahatchee River to relieve floodwaters along the banks of the lake, or to block the canal and retain water in the lake during the dry season. When freshwater was released, it diluted the salinity of the Caloosahatchee River and estuary, and when the water was held back it allowed the tidal saltwater to reach further upstream into the river and into tributaries. These impacts were magnified in 1912 and 1927 when the Caloosahatchee was dredged and straightened, and

the natural fluctuations were more heavily impacted by the retention and release of freshwater from Lake Okeechobee.

The primary hydrologic influence on ORP is the Orange River, and the water quality within the lower portions of the river is affected by the water quality in the Caloosahatchee River. The Orange River is a tributary of the Caloosahatchee River which flows into the Gulf of Mexico, causing both rivers to rise and fall with the tide. This tidal influence has the potential to carry many pollutants into the Orange River, and also makes a significant portion of the preserve periodically inundated with water. There are various canals and ditches that also flow into the Orange River that could impact the water quality of the Orange River and, therefore, the shores of the preserve.

Figure 5: Watersheds

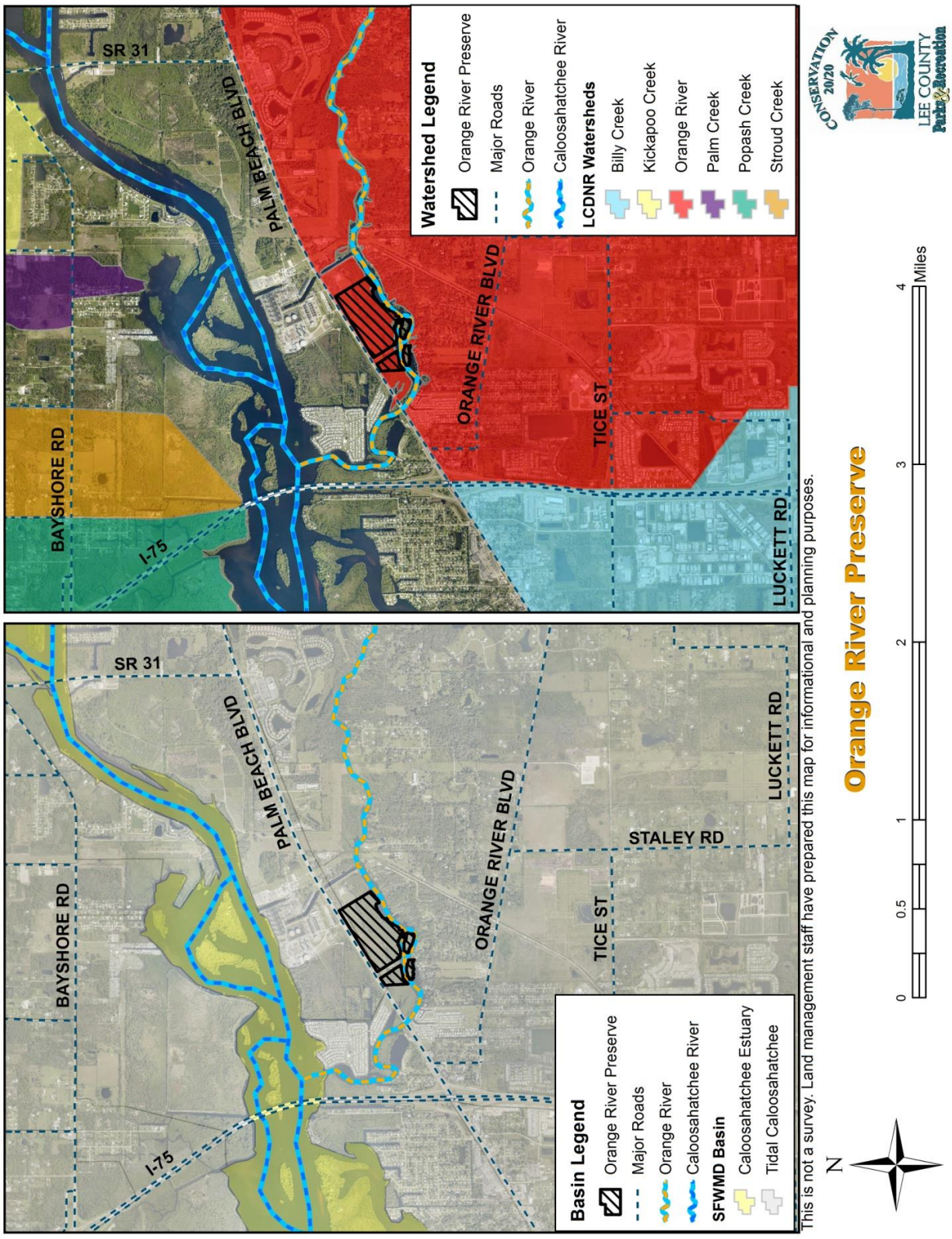
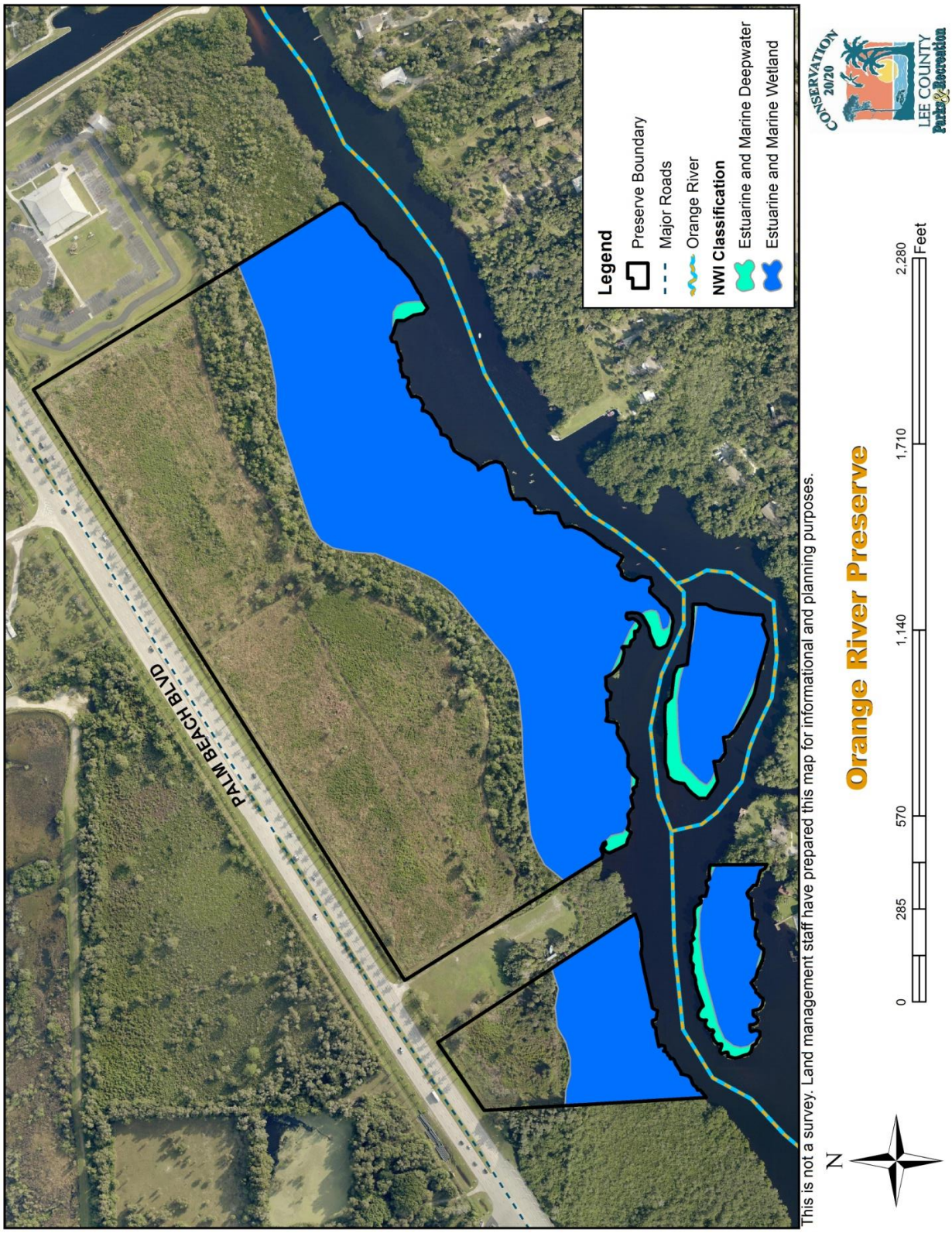


Figure 6: Wetlands



B. Biological Resources

i. Ecosystem Function

Lee County's preserves contain a diversity of plant communities that provide habitat for numerous plant and animal species. Individual preserves are not islands of habitat, but are pieces of a larger conservation effort striving to create and maintain a healthy and viable ecosystem. Ecosystem function information is located in the LSOM Land Stewardship Plan Development and Supplemental Information Section.

ii. Natural Plant Communities

ORP contains three plant communities (Figure 7) that have been identified and defined using the 2010 updated edition of the "Guide to the Natural Communities of Florida" prepared by the FNAI and the FDEP, formerly known as the Florida Department of Natural Resources. To date, the plant communities within the preserve have not been greatly impacted by surrounding land uses, but the upland portion has been altered by interior activities such as historic clear-cutting and recent invasive exotic plant removal projects.

The following includes a brief description of the dominant plants, characteristic wildlife, and physical attributes for each plant community found at the preserve. Due to the interior alterations, the upland plant community presents slightly different from the natural community description and has been categorized as a disturbed version of the naturally occurring community. Appendix B contains a list of plant species identified to date at ORP, and additional plant species will be added to the database on a seasonal basis and reflected in the next edition of the Land Management Plan. Further plant community descriptions and information are located in the LSOM Land Stewardship Plan Development and Supplemental Information section.

<u>Mesic Hammock</u>

7.0 acres with 11.1% total coverage

The smallest plant community at ORP contains mesic hammock qualities and is located between the mesic flatwoods community and the riverside mangrove swamp. It presents as a hardwood forest with both an open and closed canopy in areas, and is dominated by oak species (*Quercus sp.*) and cabbage palm (*Sabal palmetto*). A variety of epiphytes can be found growing on many of the trees throughout the community, and the understory is shrubby and inconsistent in density and height with saw palmetto (*Serenoa repens*), beautyberry (*Callicarpa americana*), giant leather fern (*Acrostichum danaeifolium*), and wax myrtle (*Myrica cerifera*). The soils are sand mixed with organic matter.

This community naturally occurs in the form of an edge or in small patches on the border of a swamp or marsh. Wildlife found within the mesic hammocks at ORP includes the southern black racer (*Coluber constrictor*) and pileated woodpecker (*Dryocopus pileatus*).

Disturbed Mesic Flatwoods

26.2 acres with 41.4% total coverage

Located within the roadside portion of the preserve with higher elevation, this community contains an open canopy with scattered slash pine trees (*Pinus elliottii*) and an understory dominated saw palmetto and scattered dwarfed live oak (*Quercus minima*), runner oak (*Quercus elliottii*), and myrtle oak (*Quercus myrtifolia*) tree species. This community exists at a slightly higher elevation than the mesic hammock and contains sandy soils. Documented wildlife found within mesic flatwoods includes the eastern cottontail (*Sylvilagus floridanus*) and nine-banded armadillo (*Dasypus novemcinctus*).

At ORP, this community is considered disturbed because signs of the historical land use have not yet been erased from the landscape; the pine canopy is sparse due to the historical land clearing and infestation of exotic invasive trees, and hardwoods have grown into the canopy from a lack of fire at the site. To date, C20/20 staff has cleared the area of exotics, planted slash pine saplings, and conducted prescribed burns in the larger portion of this community in 2008 and 2014 in an effort to re-establish the native plant community status. Fire and brush reduction are important management tools for maintaining this community by restricting the succession of shrubs and hardwood tree species to keep an open canopy and healthy habitat for wildlife. A burn unit continues to be assigned to this community because the vegetation will need to receive prescribed fire to prevent a build-up of burnable fuels, reduce the threat of wildfire, maintain an open canopy, and to maintain wildlife habitat.

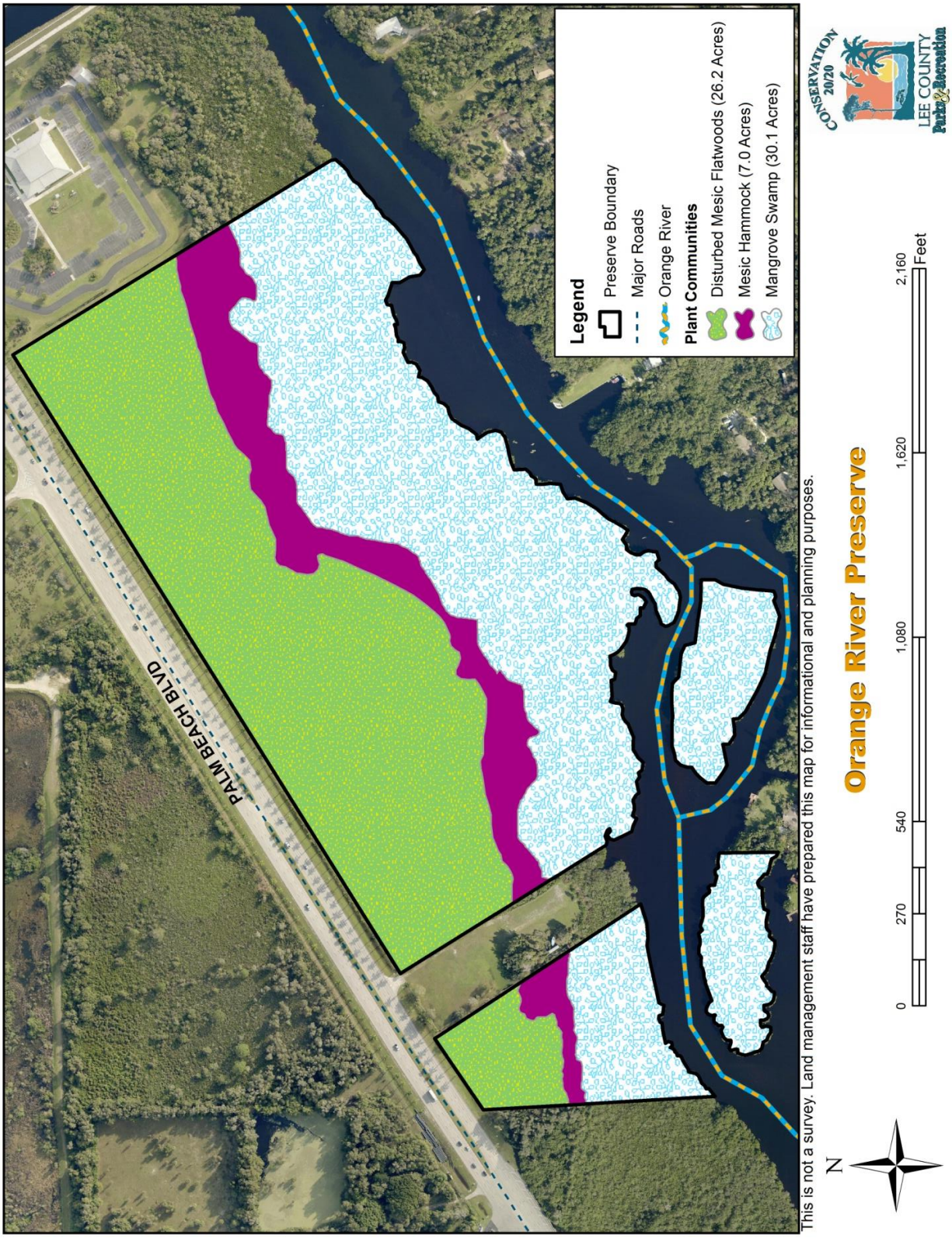
Mangrove Swamp

30.1 acres with 47.5% total coverage

The largest plant community at ORP contains a typically dense canopy constructed of mangrove species including the red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). The dominant species of mangrove found in different areas within the swamp is dependent on abiotic factors such as tidal flushing and salinity. The understory is mostly sparse, but occasionally contains giant leather ferns and mangrove vine (*Rhabdadenia biflora*) along the edges or shoreline. This community exists along the flat, low wave energy, marine and estuarine shoreline of the Orange River. Wildlife found within the mangrove swamp at ORP includes the West Indian manatee (*Trichechus manatus*) and yellow-crowned night heron (*Nyctanassa violacea*).

This plant community provides habitat for marine fish and invertebrates' reproduction, shields the shoreline from severe storm impact, and helps filter water pollutants. However, water temperature, salinity, tidal fluctuation, and wave energy are factors that influence the health of the mangrove swamp. While mangroves are well adapted to survive periods of inundation, storm surges, and changes in salinity levels, extended reoccurrences of these stressors can cause tree mortality and a thinning of the canopy.

Figure 7: Natural Plant Communities



iii. Fauna

ORP is a small and heavily segmented preserve that is broken up by a private property inholding and the Orange River. The preserve is also bordered to the north and south by heavily trafficked travel routes, the Orange River and Palm Beach Boulevard. These factors create barriers for large wildlife, excluding birds, to utilize the site. As a result, the diversity and number of wildlife found at ORP are not as large when compared to other C20/20 preserves. However, a healthy diversity of wildlife species has still been documented at ORP, including several designated wildlife species categorized as threatened or endangered, as well as species listed as exotic or invasive. All of the wildlife was recorded during tri-annual site inspections conducted at the preserve since acquisition, and the species list will continue to be added upon or modified as future site inspections occur. Appendix C contains the complete list of wildlife documented on the preserve, and the Designated Species section of this plan will discuss and listed species observed at the time of writing this management plan edition. Exotic species observed at ORP are also included in the species list, and have been compiled into Table 2.

Table 2: Exotic Wildlife Observed at ORP

	Common Name	Scientific Name
Mammals	nine-banded armadillo	*Dasypus novemcinctus*
Reptiles	brown anole	*Anolis sagrei*
Amphibians	greenhouse frog	*Eleutherodactylus planirostris*
	Cuban treefrog	*Osteopilus septentrionalis*

Land management staff will continue to take steps to control the exotic wildlife species and provide opportunities for native species to succeed. Wildlife management at the preserve will focus on providing optimal habitat for native species by restoring disturbed areas, controlling invasive exotic plants, and conducting prescribed burns. ORP is also part of a countywide tri-annual site inspection which allows staff to monitor for any impacts or changes to the preserve and compile a list of all wildlife and plant species observed. When a new species is observed during one of the inspections, they will be added to the preserve's species list and land managers will take proper management measures to protect and promote the population. If a species of high concern, such as the exotic feral hog (*Sus scrofa*), is observed at the preserve, land managers will add them to the species list and take proper management measures to control the population.

A species which has received a county-wide methodology is the feral cat. While not observed or established at ORP, C20/20 preserves will follow the Florida Fish and Wildlife Conservation Commission (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). 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. C20/20 staff will continue to work with the Animal Services staff to prevent the establishment of feral cat colonies on or adjacent to the preserve. Additional information about the wildlife on all C20/20 preserves can be found in the LSOM Land Stewardship Plan Development and Supplemental Information section.

iv. Designated Species

There are a variety of designated animal and plant species found at ORP. Although all native plant and animal species found at the preserve have some protection due to the preservation of this property, certain species demand additional protection. Imperiled species have been primarily identified under a federal listing created by the USFWS, and additional species have been listed by state agencies when identified as being local imperiled species. For management purposes, all plants and animals listed by the USFWS, FWC, Florida Department of Agriculture and Consumer Services (FDACS), the Institute for Regional Conservation (IRC), and the FNAI will be given special consideration when considering recreation and hydrological projects. If additional animal or plant species are documented at the preserve in the future, they will be added to the lists.

Wildlife

The following are brief summaries of select federally designated and state listed wildlife species, and reasons for their decline. Unless otherwise stated, causes of decline and management recommendations (if available) were obtained from "Field Guide to the Rare Animals of Florida" (Hipes et al. 2001).

West Indian Manatee (Federally and State Endangered)

Manatees (*Trichechus manatus*) are known to swim in the Caloosahatchee and Orange Rivers, particularly in the cooler months when they are attracted to the warmer water being discharged from the FPL power plant to the northeast of the preserve; see Figure 18 and External Influences section of this plan for more information on this influence. The slow moving foraging behavior of these animals also makes them susceptible to collisions with the boats that travel on both rivers. While the species' overall population appears steady, it is threatened by expanding development and increasing boat traffic.

The specific population of manatee that have become dependent on the power plant's warm water discharge face an additional threat of a loss of cold weather refuge if the power plant shuts down or ceases to operate the cooling system which produces the warm water byproduct. Despite their size, manatees have relatively low levels of body fat and cannot keep themselves warm when the air and water temperatures drop. The animals become cold-stressed if they are unable to find warmer waters, which can ultimately lead to death. C20/20 staff will contact FWC if an injured, dead, or cold-stressed manatee is observed or reported.

Wood Stork (Federally and State Threatened)

This bird species, *Mycteria americana*, is easily identified by the large size, white body feathers, and iconic head with dark-gray coloration and scaly texture. Its range covers most of peninsular Florida, and it forages in shallow freshwater areas where falling water levels concentrate fish and invertebrates. Unnaturally high water levels during nesting season and extended droughts are both threats to the wood stork. Management recommendations for the protection of this species will be to protect wetland water levels, improve water quality, closely monitor hydroperiods, and remove invasive exotic plants from wetland areas. This species has been observed foraging at ORP, but has not utilized the preserve for nesting.

Herons, Egrets, and Ibises (State Species of Special Concern)

The loss of freshwater wetlands and alteration of natural hydroperiods have heavily affected the little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), and snowy egret (*Egretta thula*). There is also some indication that pesticides and heavy metal contamination may affect these species. Historically, these birds experienced a dramatic population decline due to plume hunting, but are now facing reduction of foraging habitat as a result of urban development and the draining of wetlands.

Similar to the herons and egrets listed above, the white ibis (*Eudocimus albus*) is declining throughout its range due to the reduction and degradation of wetlands and human disturbances to their rookeries. All four of these species of wading birds are seen regularly at the preserve. The management practices that benefit wood storks will also benefit these species.

Audubon's Crested Caracara (Federally and State Threatened)

A sub-species of the Crested Caracara (*Polyborus plancus*) which has become geographically isolated to south-peninsular Florida, the *Polyborus plancus audubonii* is a large nonmigratory raptor with a white head and neck, red-orange face, black-brown colored body feathers, yellow legs, and a distinct black cap on top of its head. The species may be confused with larger bald eagles when in flight. However, the scavenging method of foraging for this species makes it more likely to be seen with vultures. Foraging and nesting activities take place in pastures, prairies, shallow wetlands or sloughs, and hammocks with open canopies. While occasionally seen soaring above the preserve, this species is unlikely to be observed perched on the preserve. Management recommendations for the protection of this species will be to restore water quality, remove invasive exotic plants, and implement prescribed burning to maintain the open canopy in the mesic flatwoods and mesic hammock plant communities.

American Alligator (Federally and State Threatened for Similar Appearance)

Habitat loss and overhunting once brought the *Alligator mississippiensis* population to extremely low numbers in the 1950s. Through federal protection and conservation efforts, the species made a healthy recovery and can now be found in freshwater wetlands throughout the southeastern United States. The

alligator is no longer federally designated for the protection of the population, but has remained on the list as “Threatened for Similar Appearance” because of the similarities to other members of the family Crocodylia. Populations of alligators in some areas are stable enough that the FWC and FWS are able to allow regulated harvest, but there is no hunting or trapping of alligators permitted on C20/20 preserves.

Pollution, human feeding, and destruction of wetlands continue to be threats to this species. Management recommendations for the protection of this species will be to protect wetlands from ditching, filling, and pollution. Land management staff will continue to monitor and prosecute any people who have been found to be feeding alligators, and staff will monitor for nesting activity when conducting exotic plant treatments along the riverside portions of the preserve.

Plants

In addition to designated wildlife, ORP 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 ORP.

- 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).

- Continue to utilize prescribed fire in fire-dependent communities as a management tool for the protection of many rare plants.
- Divide the fire-dependent communities so the entire area is not burned during the same year.

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 ORP, including designated species, can be found in Appendix B.

Cardinal and Giant Airplants (FDACS Endangered Status)

Also known as the stiff-leaved wild pine, cardinal airplants (*Tillandsia fasciculata var. densispica*) are typically found in hammocks, cypress swamps, and pinelands; this species has been documented within the mesic hammock plant community at ORP. 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 grows in hammocks and pinelands. Human-caused threats to this species include illegal collecting and habitat destruction. Conservation of the mesic hammock plant community should provide much-needed habitat for this species.

v. Biological Diversity

General information on biological diversity and measures used to promote biological diversity can be found in the LSOM Land Management Plan Development and Supplemental Information section. The integrity and diversity of ORP 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 regular maintenance to provide more suitable habitat for native aquatic and terrestrial species.
- Maintain boundaries with signs to eliminate illegal access to the preserve and protect fragile ecosystems.
- Continue to monitor the site for illegal off-road vehicle use and install fencing or other barriers if necessary.
- Install and maintain “no berry picking” signs to inform palmetto pickers it is illegal to harvest them on the preserves.
- Prevent and prosecute poaching and illegal removal activities (e.g. palmetto berry harvesting, illegal hunting, pine cone/straw removal, and orchid collection).
- Remove any debris and prevent future dumping within the boundary line.

- Conduct on-going species surveys to catalog and monitor diversity.
- Reduce canopy cover in appropriate habitats to promote herbaceous plant diversity.
- Use adaptive management if monitoring of restoration techniques indicates a change may be necessary.
- Maintain an on-going prescribed fire program to closely mimic the natural fire regimes for different plant communities to increase plant diversity and ensure the canopies remain open.

C. Cultural Resources

i. Archaeological Features

In 1987, Piper Archaeological Research, Inc. (PARI) conducted an archaeological site inventory of Lee County. They were able to identify an additional 53 sites increasing the total number of known archaeological sites in Lee County to 204. PARI created a site predictive model and archaeological sensitivity map for the county that highlighted potential areas likely to contain additional archaeological sites. ORP and all the land along the banks of the Orange River lie within the study's "Sensitivity Level 2" area (Figure 8). The study defines this level as:

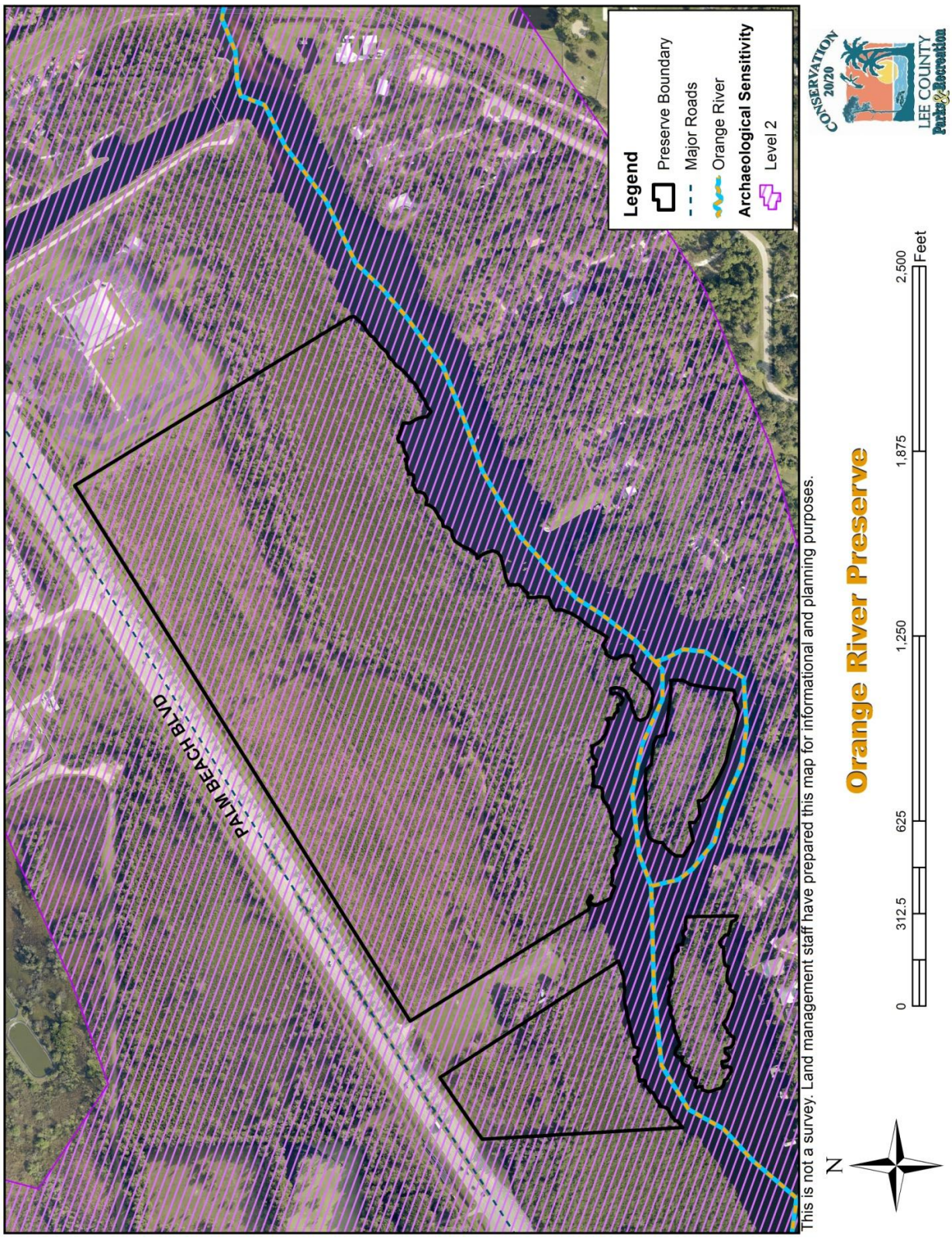
> "Areas that contain known archaeological sites that have not been assessed for significance and/or conform to the site predictive model in such a way that there is a high likelihood that unrecorded sites of potential significance are present. If these areas are to be impacted, then they should be subjected to a cultural resource assessment survey by a qualified professional archaeologist in order to 1) determine the presence of any archaeological sites in the impact area and/or 2) assess the significance of these sites" (Austin 1987).

There has already been some soil disturbance at ORP in areas that were once cleared for agriculture and later cleared and divided for what land managers believe was preparation for subdividing or developing the property. These disturbances primarily occurred in the upland portions of the preserve, still within the "Sensitivity Level 2" archaeological zone.

In the event of a restoration project at ORP requiring any major soil disturbance, a professional archaeologist will be hired to conduct a survey of the area to be impacted. If evidence of shell middens or other artifacts are found in the area, Florida's Division of Historical Resources (DHR) will be immediately contacted and protection procedures will comply with the provision of Chapter 267, Florida Statutes, Sections 267.061 2(a) and (b). Collection of artifacts and/or any disturbance of the archaeological site will be prohibited unless prior authorization has been obtained from the DHR. Any potential site will be managed in coordination with recommendations from the DHR 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 may be incorporated into a public education program. General information on archaeological features in Lee County can be found in the LSOM.

Figure 8: Archaeological Features



ii. Land Use History

The preserve has remained relatively unchanged since aerial photography was first used in Lee County in 1953. Despite its close proximity to the Orange and Caloosahatchee Rivers, and rapid early residential development in surrounding areas, the property experienced minimal ecosystem manipulation and development. The small changes that took place at the site were recorded over the past 60 years through aerial photography, and have enabled land management staff to track the historical land uses and plant community modifications.

The earliest historical aerial imagery available for the area was photographed from airplanes in 1953 (Figure 9). At this time, Palm Beach Boulevard had been constructed along the northern border of the preserve property and a large Lee County Department of Transportation (LCDOT) utility canal was dug to the southeast. The land south of the Orange River had minimal development that mainly consisted of clearing for cattle grazing and agricultural lands which would later be developed into residential neighborhoods. The preserve property experienced clearing for cattle grazing in the upland portion, but was otherwise undeveloped or disturbed.

By 1968 (Figure 10), the surrounding area was significantly more developed with residential complexes west of the preserve, including what appear to be residential complexes constructed on filled-in wetlands to the northwest, and sparse housing built south of the Orange River. Construction of the FPL Fort Myers power plant and Orange River Substation had begun on the north side of Palm Beach Boulevard, and the canals carrying water inflow from the Caloosahatchee River and outflow into the Orange River from the power plant's cooling system were also dug by this time. Smaller LCDOT drainage canals and drainage ditches were dug along the residential developments and flowed into the Orange River.

The preserve property remained undeveloped without disturbances until the 1972 aerial, when a series of jeep trails are visible (Figure 11). The jeep trails are still visible in the 1975 aerial (Figure 12), and the private parcel between parts of the preserve property had been cleared into the mangroves. Residential development has continued over the years, and the FPL power plant appears to have been completely constructed and even expanded to include a retention pond by 1986 (Figure 13). At this time, the preserve had also experienced more disturbances and appears to have been cleared and divided into parcels for subdividing or developing the property, or for drainage purposes. Five cleared lines stretch from Palm Beach Boulevard to the mangrove fringe as well as one running parallel to the road approximately 350 feet inside the preserve boundary.

These cleared lines within the preserve boundary, and the private parcel between parts of the preserve had begun to fill in with melaleuca and other invasive exotics by 1996 (Figure 14). At this time, Palm Beach Boulevard was expanded, the neighboring eastern parcel was cleared for construction of a church, and LCPR constructed Manatee Park to the east of the preserve property

and along the FPL outflow canal. Color imagery available in 2002 shows the intensity of the exotic infestation on the preserve property, and also shows the completed church construction to the east and FPL expansion to the north (Figure 15). ORP was acquired in March 2002, and land managers began developing plans to treat the invasive exotic plants dominating the property.

The aerial image taken in 2010 shows the positive effects from the exotic plant treatments, prescribed burns, and brush reduction that C20/20 staff had been able to complete a few years earlier (Figure 16). These techniques have continued to be utilized at ORP to maintain the preserve at maintenance level for exotic plants, and to prevent succession of the native plant communities.

Figure 9: Historical Aerial (1953)

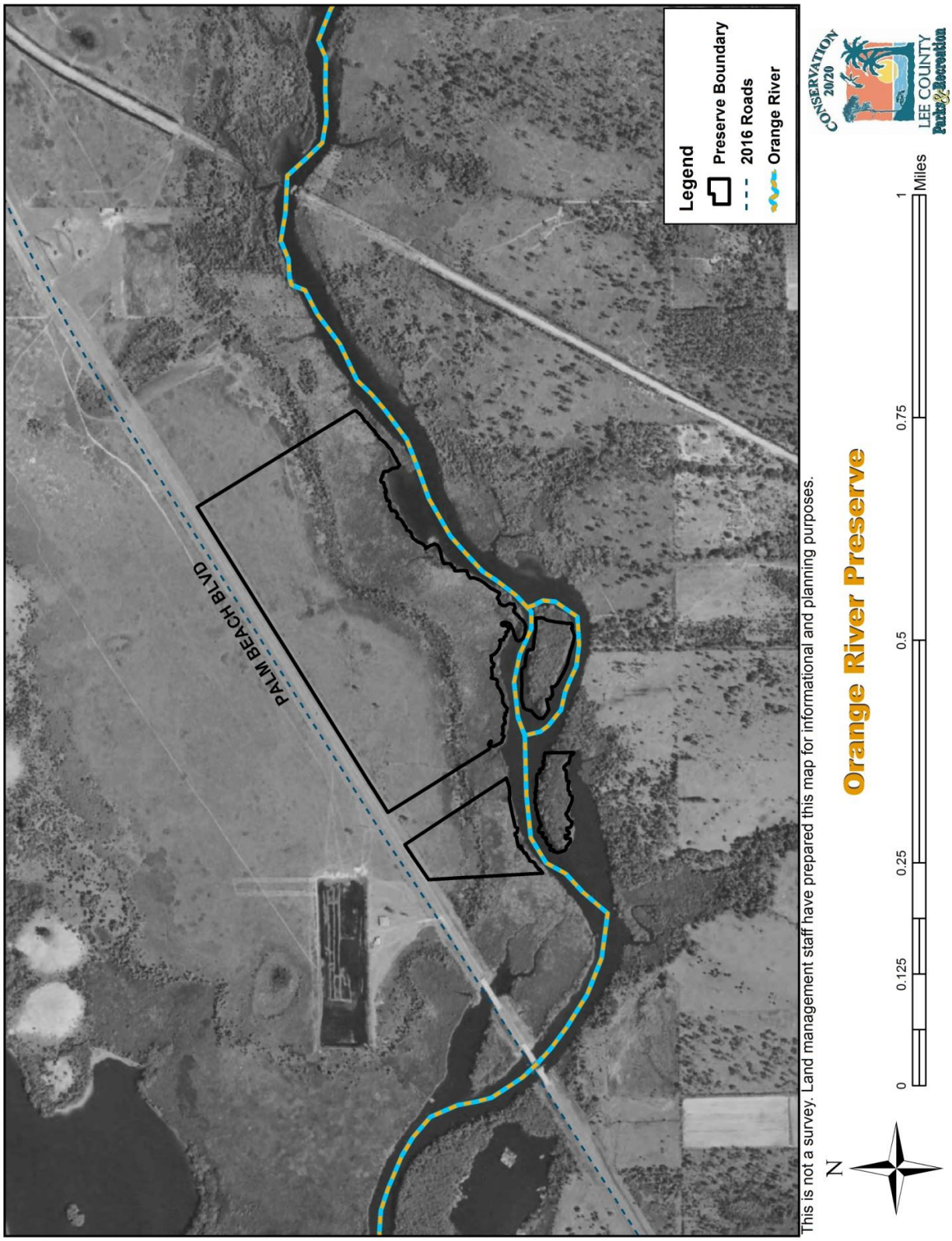


Figure 10: Historical Aerial (1968)

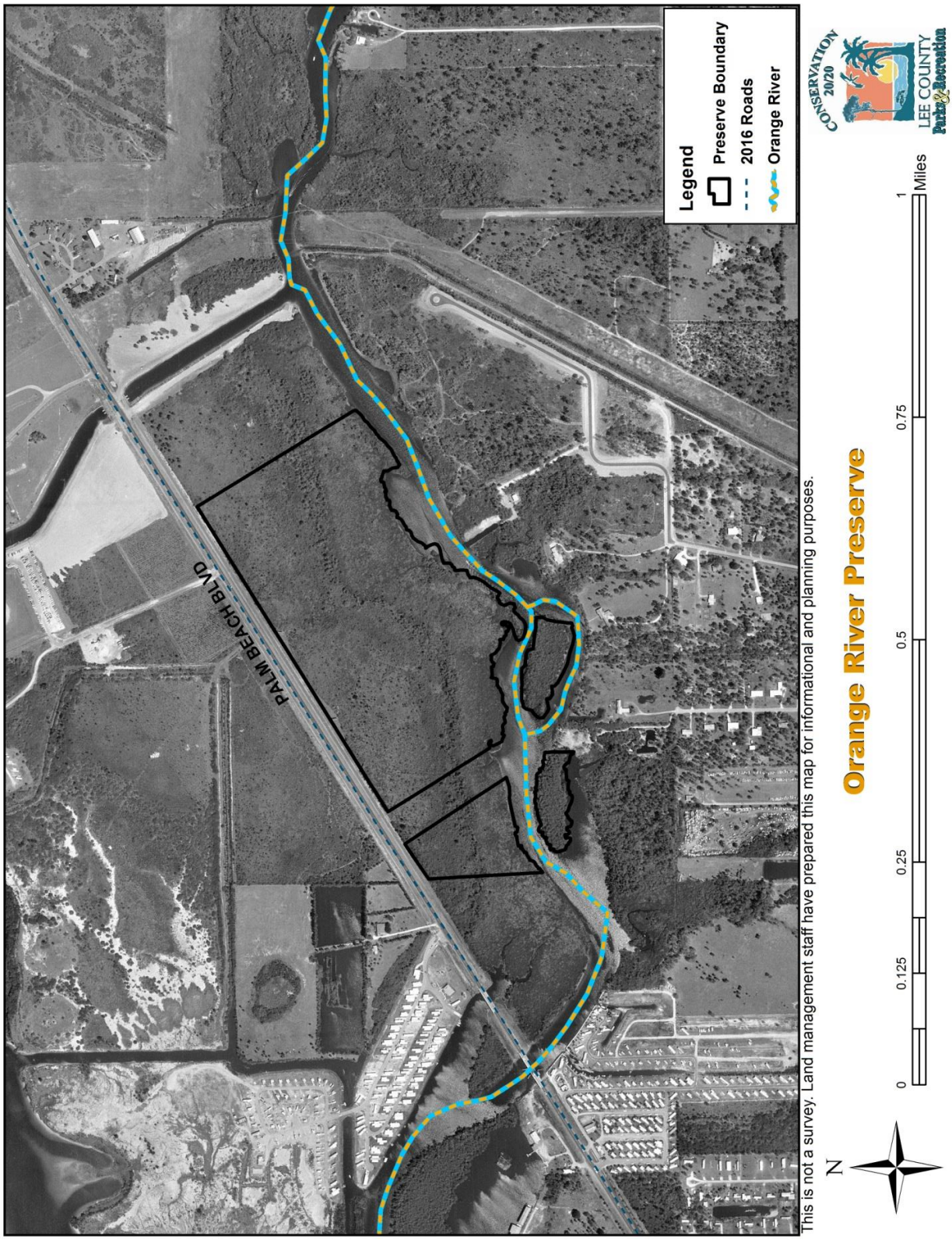


Figure 11: Historical Aerial (1972)

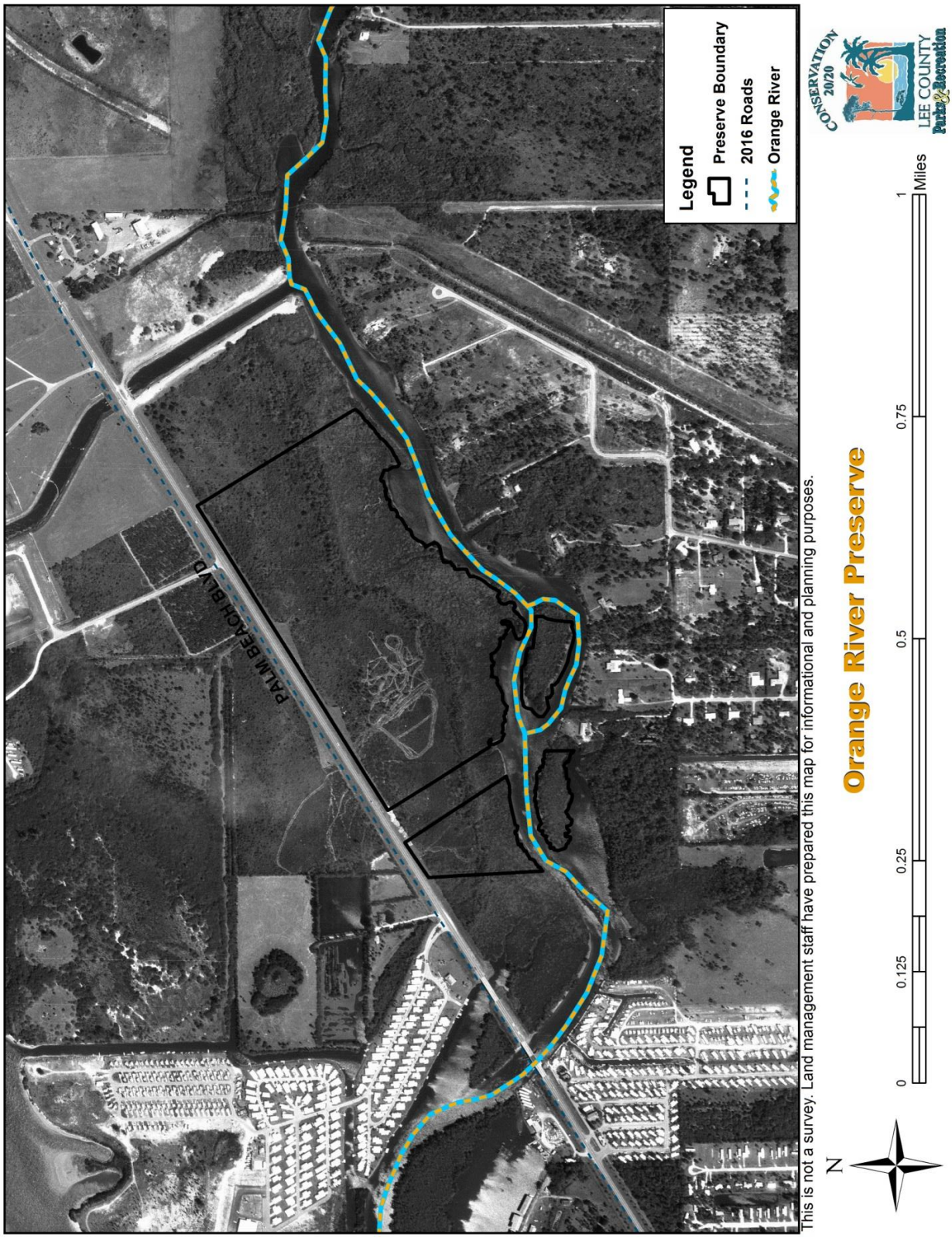


Figure 12: Historical Aerial (1975)

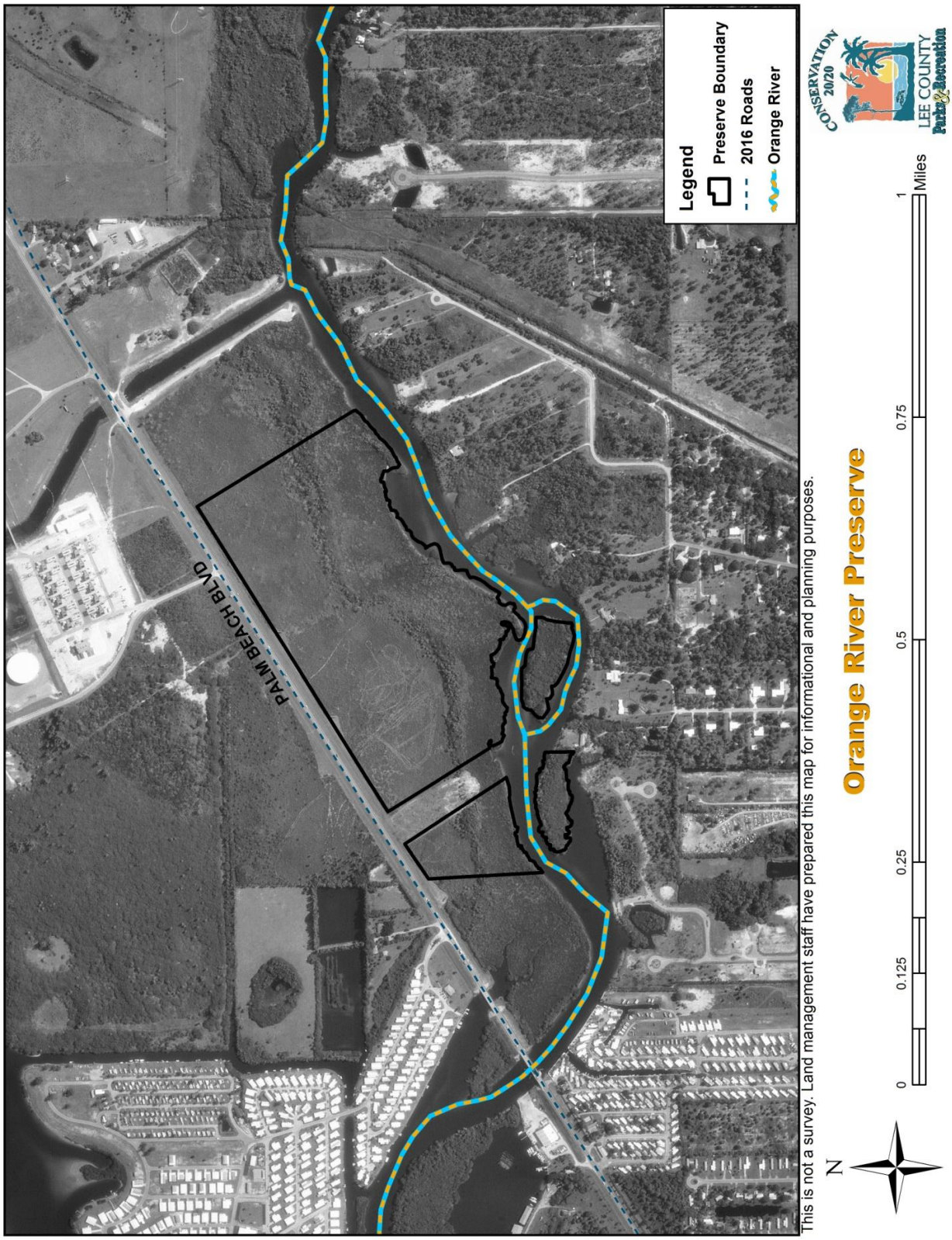


Figure 13: Historical Aerial (1986)

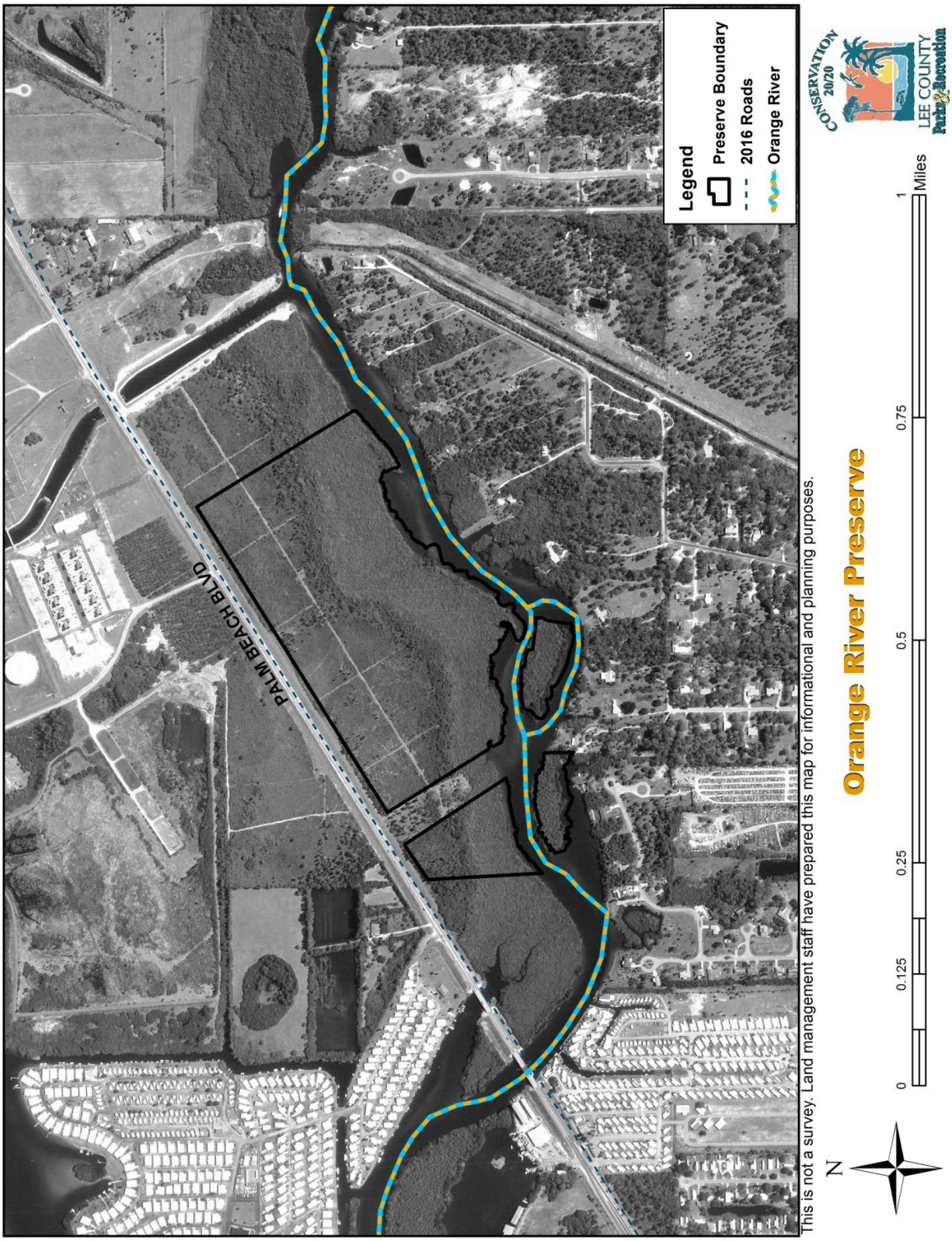


Figure 14: Historical Aerial (1996)

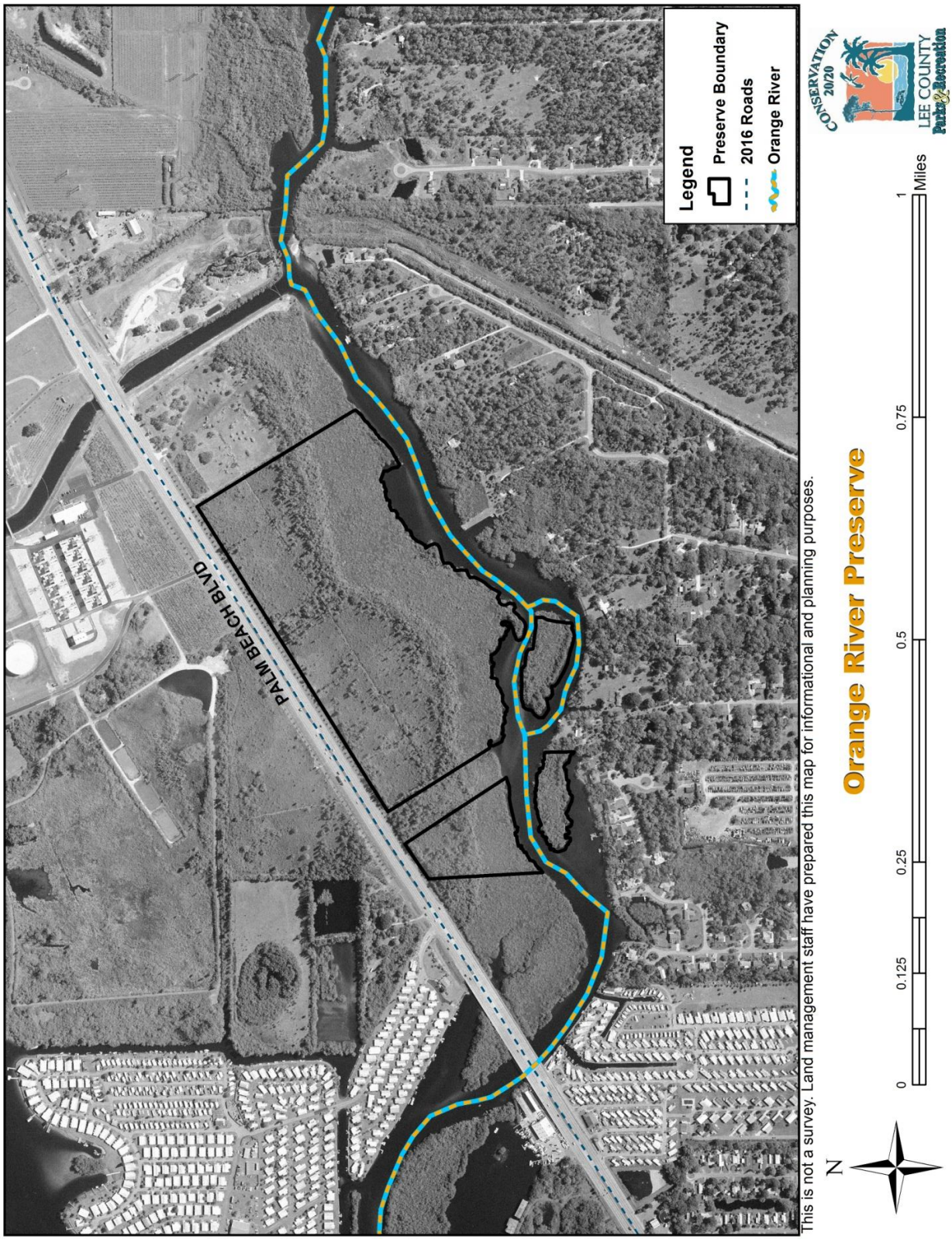


Figure 15: Historical Aerial (2002)

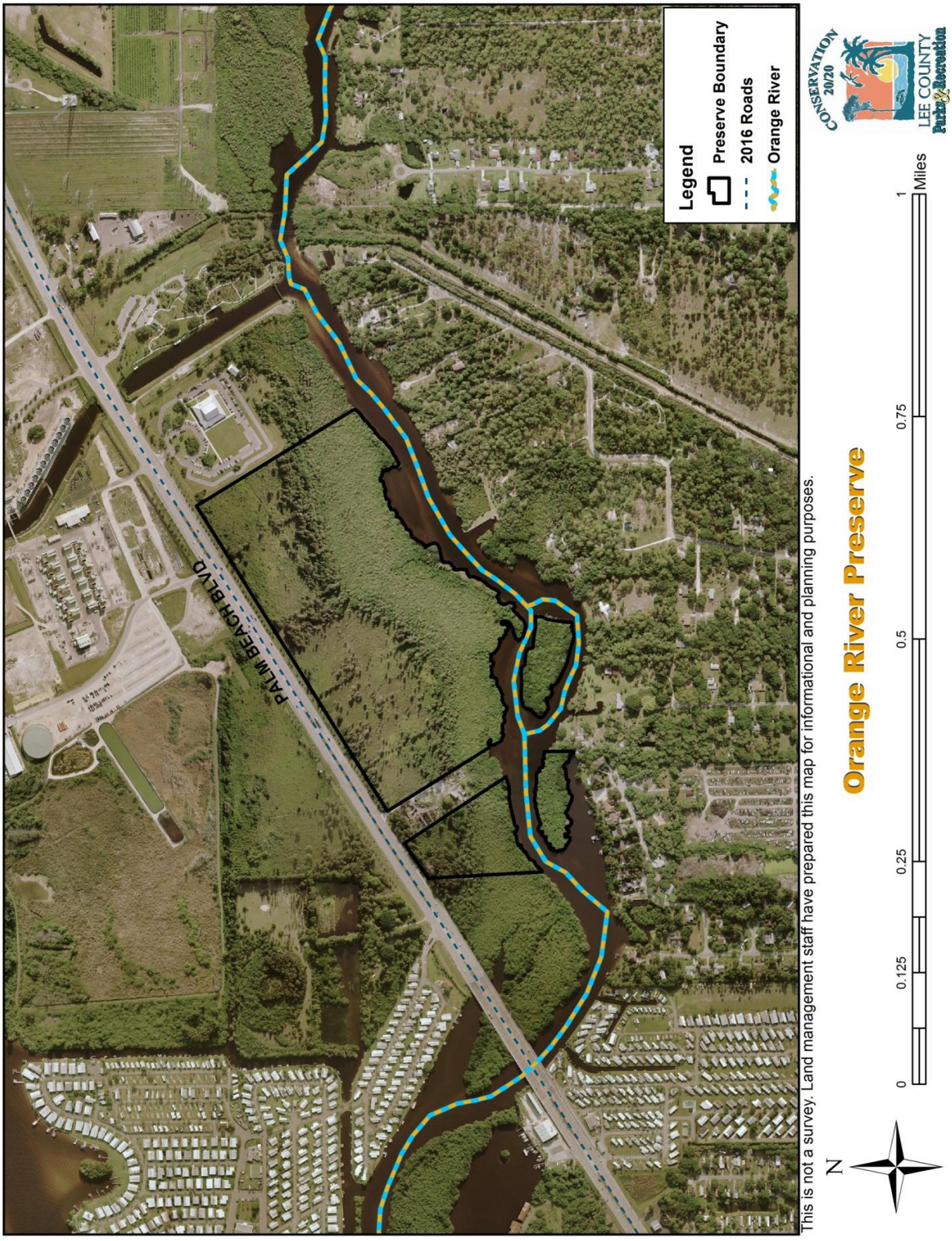
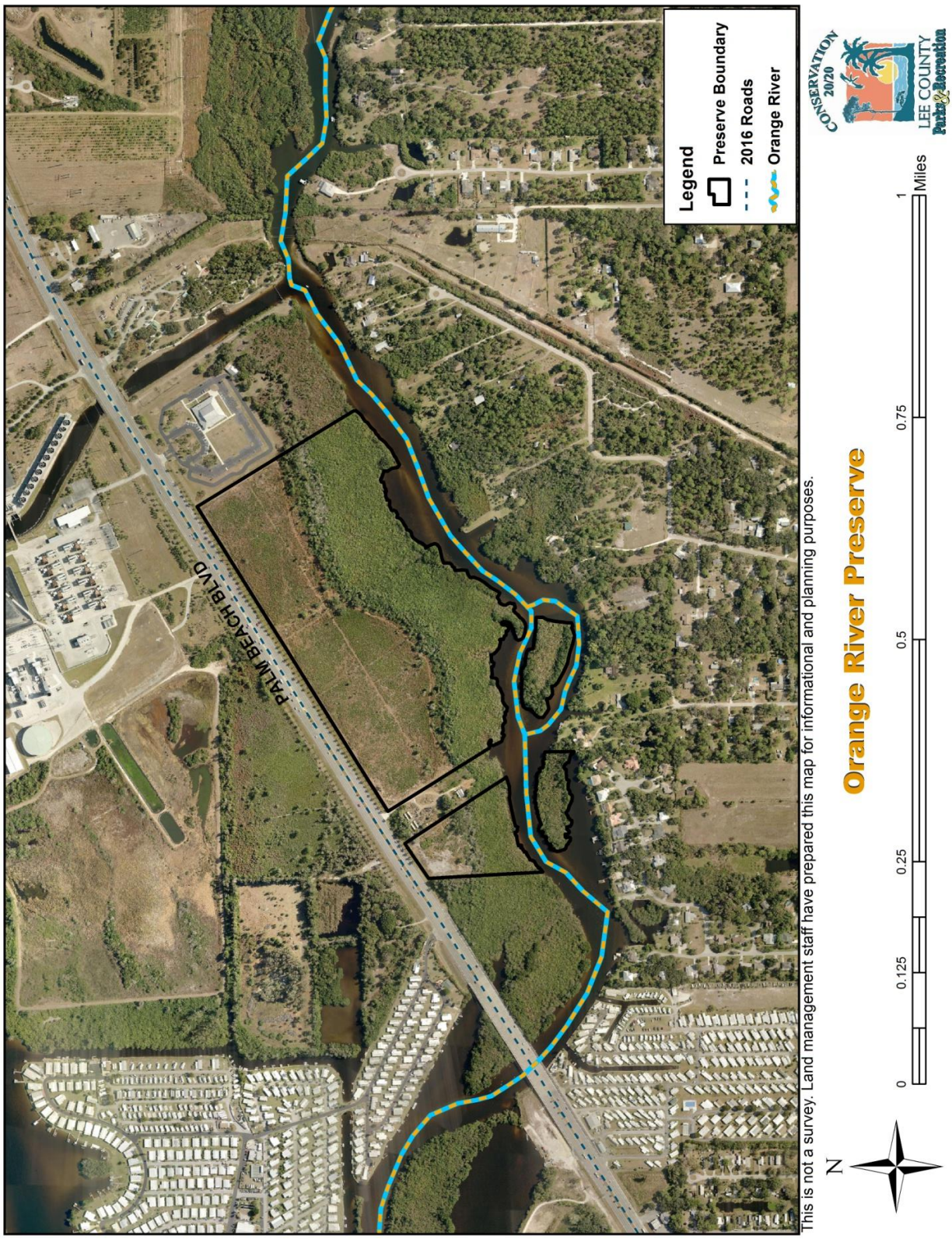


Figure 16: Historical Aerial (2010)



iii. Public Interest

ORP was purchased primarily for the preservation of environmentally sensitive lands and to provide a buffer for the Orange River. There has been minimal contact by the public concerning the property since its acquisition. The preserve is open to bird watching, hiking, nature study/photography, and watercraft recreational opportunities such as kayaking, canoeing, and paddle boarding. There is no boat launch available at the preserve, but visitors may utilize a boat launch at Manatee Park for non-motorized watercraft. Similarly, a kayak rental concessioner operates from the Manatee Park boat launch, providing visitors without personal kayaks an opportunity to rent a vessel and discover the riverside portions of the preserve. Information on this and all C20/20 preserves can be found on the website (www.conservation2020.org) along with copies of their associated management plans, as available.

V. Factors Influencing Management

A. Natural Trends and Disturbances

Natural trends and disturbances influencing native communities and management at ORP include hurricanes, wildfire, occasional freezes, and the pattern of wet and dry seasons. Implementation of the Management Action Plan will take all of these factors and their influence on projects at the preserve into consideration. For example, a tropical storm or hurricane could damage large amounts of vegetation which would need to be removed or mulched if the debris caused negative impacts to wildlife habitat or public safety from a wildfire.

One of the most frequent natural occurrences in Florida is wildfire caused by lightning strikes. Staff in the Florida Forest Service (FFS) Caloosahatchee District has been provided a map of all C20/20 preserves, including ORP, which shows the location of water sources, firebreaks, management units, and gates (if available on other preserves) to utilize in the event of a wildfire. This information exchange helps to reduce the amount of disturbance to a site during a wildfire, such as the creation of redundant plow lines to contain a fire. Additional fire breaks will only be created during a wildfire if there is a threat to property or persons outside the preserve boundary.

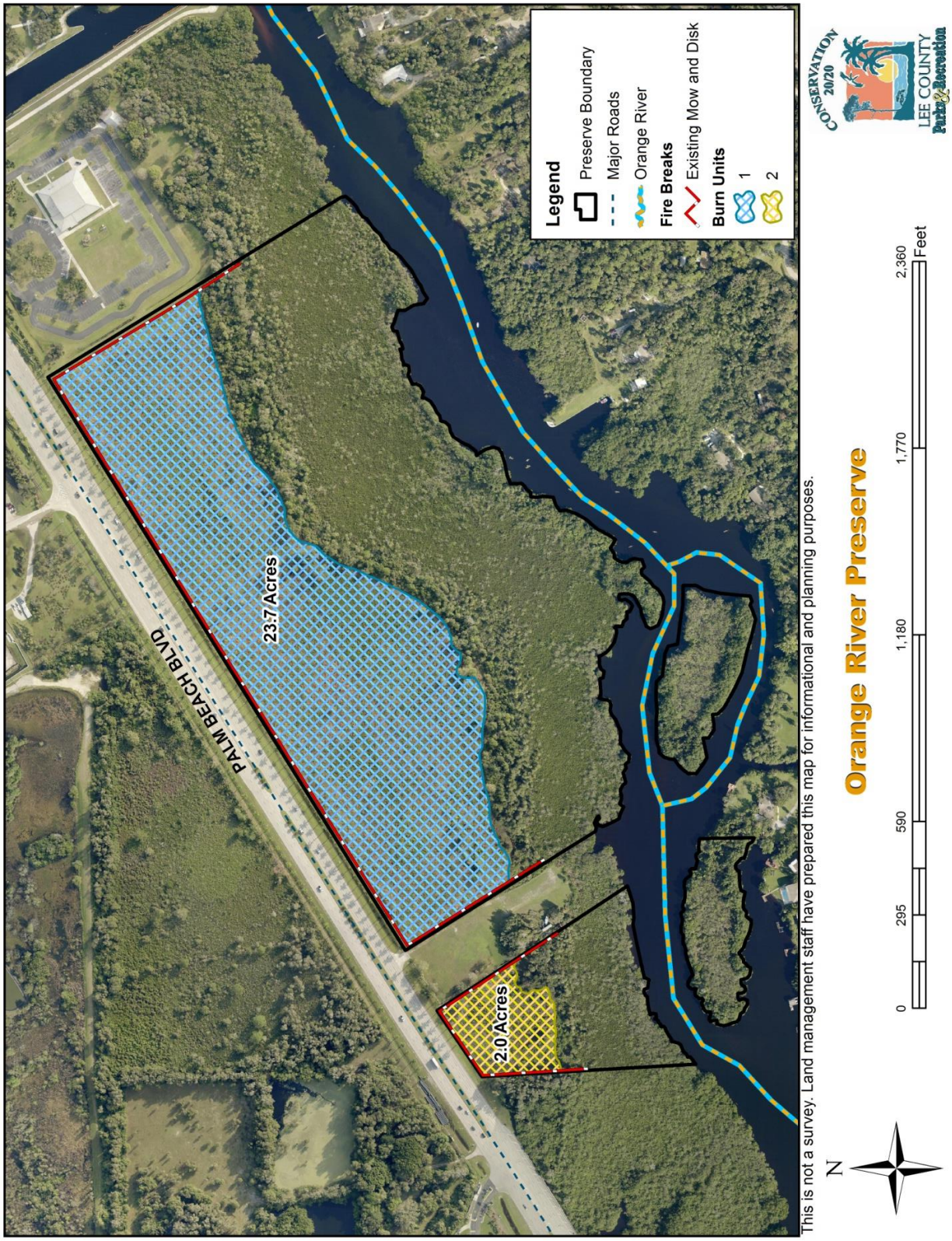
Prescribed burning is one of the techniques that will be used by land managers at ORP to help reduce the threat of wildfires. One burn unit (BU) was established shortly after acquisition of the property to isolate the burnable fire-dependent plant community, the mesic flatwoods. Since a large portion of the preserve is composed of native plant communities that are not burnable, fire breaks were initially only installed around the northern perimeter and through the middle of the BU. These fire breaks were extended by the FFS prior to a prescribed burn in 2008 to encompass the entire perimeter of the BU (Figure 17) and have since been maintained by C20/20 staff.

The smaller portion of the preserve located west of the established BU also features a mesic flatwoods plant community and minimal fire breaks, but had not previously been assigned its own BU due to accessibility issues. In 2016, this

unit was assigned a BU and added to the prescribed burn schedule. A regular burn regime will be introduced to the new unit, identified at BU 2, which will match the regime already established in the unit that received prescribed burns in 2008 and 2014 identified as BU 1. Allowing fire to return to the mesic flatwoods plant community will reduce fuels and the threat of wildfire, and will help to cycle nutrients through the ecosystem.

The timing of management projects, including prescribed burns and exotic plant treatments, will be influenced by seasonal hydroperiods and weather. The use of heavy equipment will be limited to the dry season for the majority of the site to prevent negative impacts to the plant communities. Land management staff will lead periodic site visits and tri-annual site inspections to monitor the condition of the fire breaks, and will schedule mowing and disking a minimum of once per year to keep them clear of debris. General information on natural trends and disturbances influencing native communities and management is included in the LSOM Land Stewardship Plan Development and Supplemental Information section.

Figure 17: Burn Units



B. Internal Influences

ORP has minimal internal influences due to the limited historical alterations to the site. The mesic flatwoods plant community within the uplands portion of the preserve had been clear-cut for cattle grazing, scarred by jeep trails, and segmented in what appeared to be preparation for development. These alterations created an opportunity for invasive exotic plant species to establish within the preserve, and the uplands quickly became overgrown with invasive melaleuca trees and Brazilian pepper.

Shortly after acquisition of the site, C20/20 staff worked with contractors and partnership agencies to remove the invasive exotic plants and began restoration projects to restore the native plant communities. Roller-chopping, prescribed burns and exotic plant treatments were conducted at the site to reduce fuels and promote native plants to recruit into the areas once occupied by the exotics. Donated slash pine trees were planted by C20/20 staff and volunteers within two areas of the mesic flatwoods plant community to help fill in the empty canopy caused by the removal of the melaleuca, and regular exotic treatments have been conducted at the preserve to control the re-growth of invasive exotic species.

While the mesic hammock and mangrove swamp plant communities were able to quickly recover from the invasive exotic plant removal, the mesic flatwoods had been more intensely altered and have been slower to recover. As stated in the Natural Plant Communities section of this plan, the mesic flatwoods community is still considered a “disturbed” variety of the natural community classification because the historical alterations still affect the site. These effects will continue to influence the mesic flatwoods until a pine canopy is established, a fire regime is upheld within the entire community, and the edge created by the historical clear-cutting between the mesic flatwoods and hammock is lessened to a natural succession zone. Once complete, these changes will allow the mesic flatwoods to classify as a native plant community, and will also create healthier habitat for wildlife at the preserve.

Two internal influences at the preserve which have been caused and maintained by C20/20 are the preserve identification signs and perimeter fire breaks. Perimeter boundary signs have been placed around the preserve to inform visitors and neighbors about the preserve’s location and the C20/20 program. Two additional identification signs, an informational identification sign and an interpretive restoration sign, have been placed along the northern boundary to inform visitors about the permitted recreational opportunities and the on-going restoration projects at the preserve. Perimeter fire breaks were installed around the mesic flatwoods to define the preserve’s burn units and to reduce the threat of wildfire to neighboring properties. The preserve’s signs are checked and replaced as needed during the tri-annual site inspections, and the fire breaks are maintained annually.

Since the preserve does not currently have perimeter fencing, sporadic illegal use of the preserve occurs, including littering and saw palmetto berry picking.

These problems have been reduced with the patrol of C20/20 rangers who are able to respond quickly to problems observed at the site. C20/20 staff removes debris that has been dumped on the roadside portions of the site or monofilament line caught in the mangroves on the southern boundary during tri-annual inspections. A map of the internal influences has been combined with the external influences, and can be found in Figure 18 following the External Influences section of this plan.

C. External Influences

There are a number of external influences at ORP that have the potential to impact the management activities at the preserve. Primarily, the access to the preserve has been limited by Palm Beach Boulevard (State Road 80), which runs parallel to the northern boundary. A small strip of land lies between the road and the preserve boundary that is owned and maintained by the Florida Department of Transportation (FDOT) as a buffer for the road. Access to the preserve for C20/20 staff is currently provided through an informal agreement with the Crossroads Baptist Church along the eastern boundary of the preserve, but no access for the public has been established. The heavily-trafficked road also creates a large barrier for wildlife to access the preserve, limiting the diversity and population size of the species able to survive at the site.

Similarly, the Orange River runs along the southern boundary of the larger portion of the preserve and restricts access for wildlife and visitors. The smaller portions of the preserve, the island and peninsula on the southern shoreline, also have the Orange River restricting access. However, these areas of the preserve are composed entirely of mangrove swamp and would only require access by C20/20 staff or contractors for exotics treatments.

The Orange River and Palm Beach Boulevard also create a corridor for pollutants to enter the preserve. Garbage debris from passing vehicles blows from the roadside into the northern portion of the preserve, and debris floating in the river gets entangled in the root system of the mangroves. Pollutants are also a threat to the wildlife and plant species at the preserve, and can originate from the Caloosahatchee River, drainage ditches and canals, and neighboring residential areas.

As previously mentioned in the Hydrologic Components section, the Orange River is tidally influenced and flows into the Caloosahatchee River; this connection causes the water quality within the mouth of the Orange River to be susceptible to pollutants in the Caloosahatchee River. Similarly, there are several drainage canals and ditches in the area which drain into the Orange River, potentially impacting the water quality. These drainage flow ways concentrate the runoff that would otherwise be absorbed into the ground to recharge the aquifer or flow toward the Orange River in a slow, shallow sheetflow. Pollutants are washed into the flow ways with the runoff and are unable to be filtered out within the short period of time it takes for the water to reach the river.

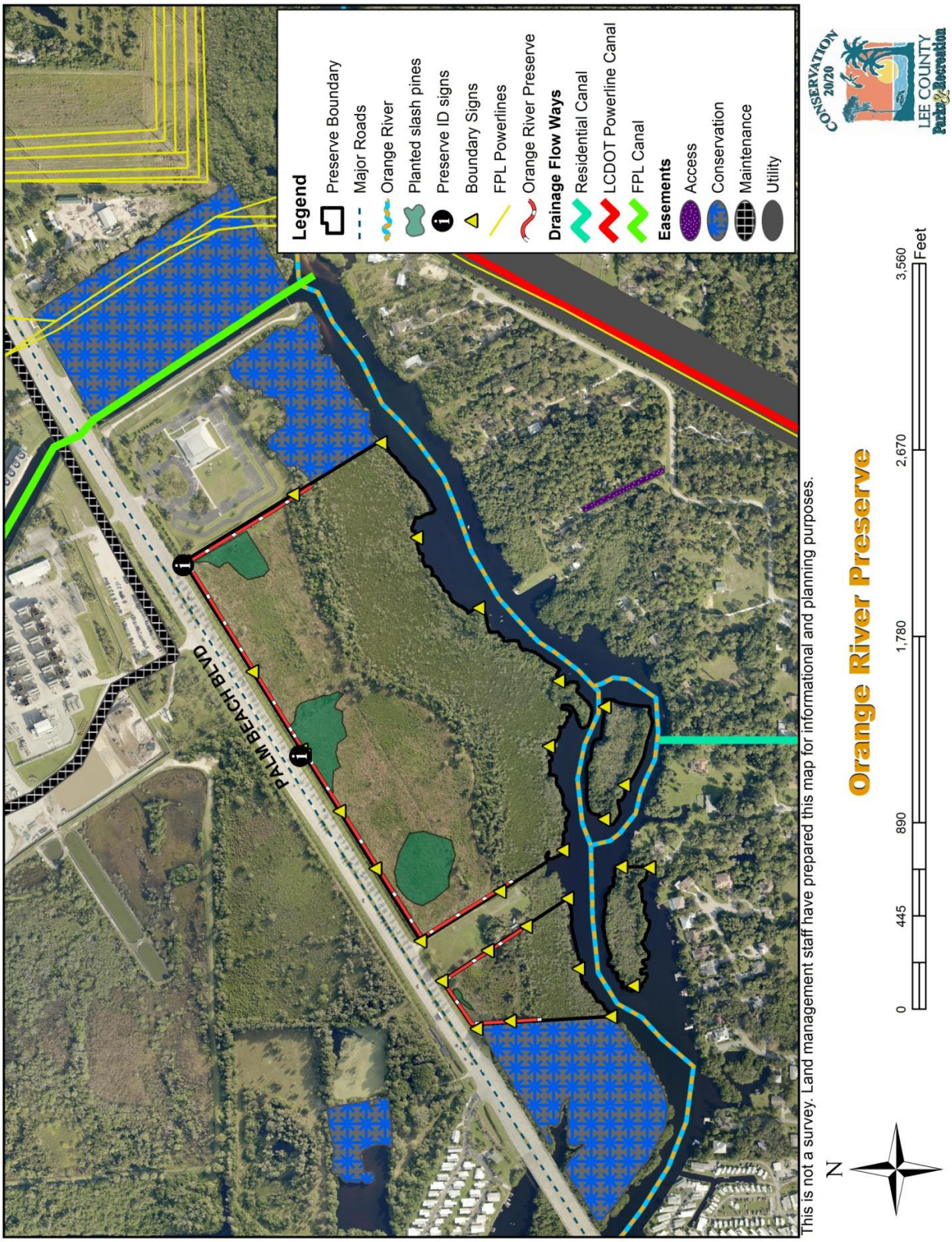
One canal in particular, the FPL outflow canal, contains water discharge from the facility’s condensing cooling system and presents a different water quality issue.

This water was used to cool turbines, a process which transfers the heat to the water and is resolved by sending the discharge through cooling towers. These towers cool the water to a temperature that is within the government safety requirements to prevent damaging the ecosystem, but is still higher than the naturally occurring water temperature. This warmer water has created an attraction for manatees seeking the warmer water during the cooler months, and provides an artificial environment to which the manatees have acclimated and now rely upon for seasonal refuge.

Fortunately, several conservation easements have been established along the Orange River and around the preserve to provide habitat for wildlife and natural buffers from development. The private parcel on which the Crossroads Baptist Church was built along the preserve's eastern boundary and a privately owned parcel along the preserve's western boundary have maintained conservation easements to serve as wetland buffers for the Orange River, and connect with ORP to create continuous habitat. Other easements exist around the preserve that serve different purposes, but also serve as a buffer between the natural areas and development. A maintenance easement has been established around the FPL power plant to the north of the preserve to guarantee space for plant maintenance needs, and utility easement has been placed around the large LCDOT and FPL canals to the southeast of the preserve which allow access for utility maintenance vehicles and expansion.

Neighboring privately owned parcels connected to the preserve also provide a buffer, but are not currently part of easement category. A private inholding located between units of the larger portion of the preserve has maintained sections of the mangrove swamp plant community in the southern portion of the property, which contributes to the continuity of habitat for plants and animals along the Orange River. The FDOT parcel along the northern border of the preserve and southern side of Palm Beach Boulevard, previously discussed as an access barricade, also serves as a buffer between the heavy traffic on the road and the natural area. The parcel is mowed regularly and has been planted with royal palms (*Roystonea regia*). The corridor helps to improve roadside visibility for motorists, and helps to keep wildlife away from the road by presenting an open edge with no cover for protection. A map of these external influences, combined with the internal influences found at the preserve, has been illustrated in Figure 18.

Figure 18: Internal & External Influences



D. Legal Obligations and Constraints

i. Permitting

Land management activities at ORP may involve obtaining permits from several regulatory agencies. Any proposed hydrologic improvements to the site may require obtaining permits from the Florida Department of Environmental Protection (FDEP), the U.S. Army Corps of Engineers, and SFWMD. Exotic plant species removal in the mangrove swamp community may require obtaining a permit from the FDEP due to the possibility of injury to mangroves. Hydrological and habitat restoration projects requiring heavy equipment or tree removal may require notification to the Lee County Department of Community Development (LCDCD). The use of prescribed fire will require authorization from the FFS. Lastly, restoration or management projects that cause soil disturbance within the Archaeological Sensitivity Zone will require a “Certificate to Dig” permit from LCDCD and notification to Florida’s DHR.

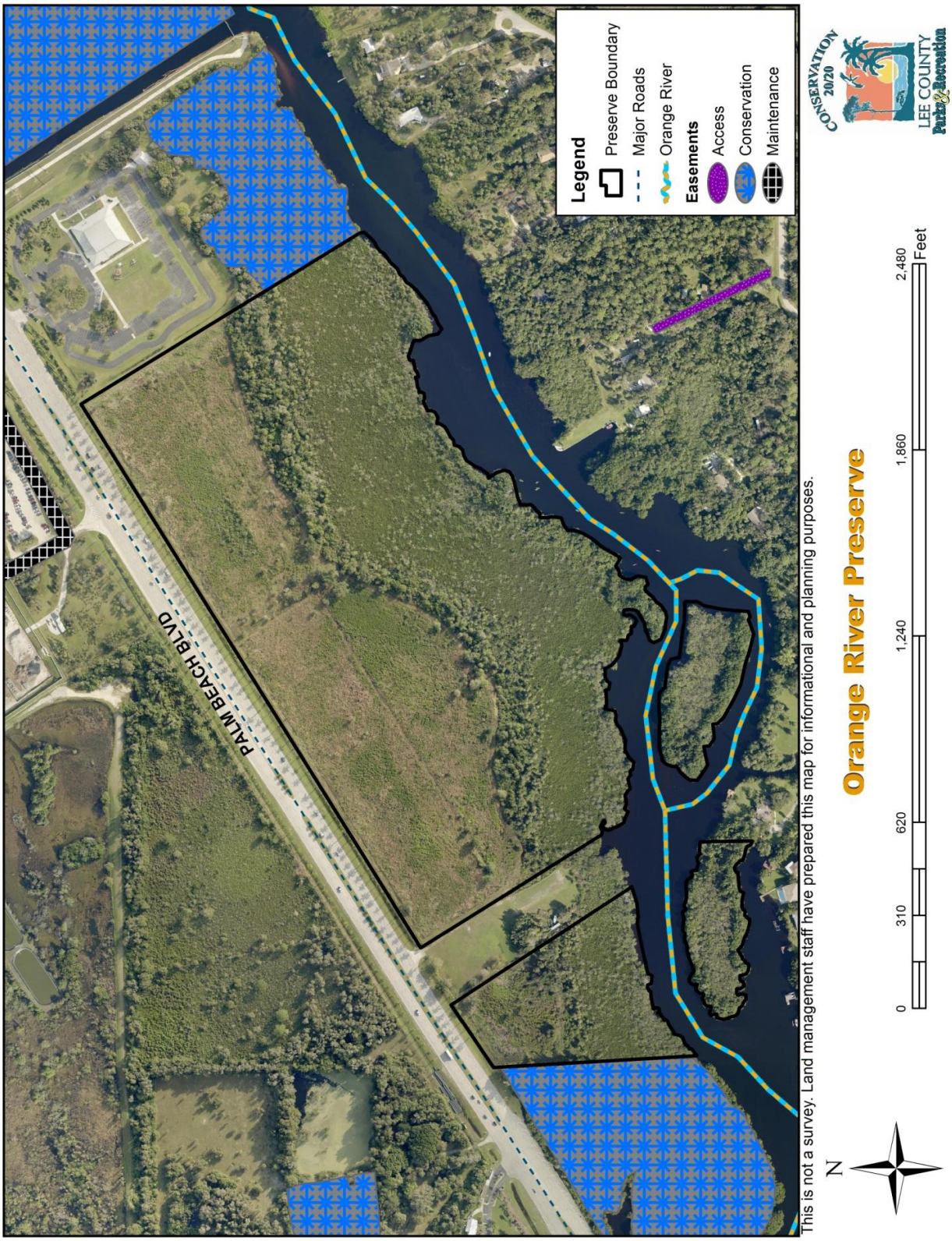
ii. Other Legal Constraints

Due to ORP’s location between Palm Beach Boulevard and the Orange River, there is minimal development in the immediate area around the preserve. The FPL Fort Myers power plant facility is located north of Palm Beach Boulevard, but the easements and associated infrastructure does not directly impact the preserve (Figure 19). However, the noise pollution from the power plant impacts the preserve, and land managers received multiple requests from private property owners south of the Orange River to maintain a vegetation buffer within the preserve to reduce the noise at the previous land management plan public meeting.

ORP has few neighbors which directly connect to the preserve, and these neighboring properties are taken into consideration when planning management activities. The private parcel on which the Crossroads Baptist Church was built to the east of the preserve has created and maintained a conservation easement on the southern portion of their property, and another conservation easement was recently created on a privately owned parcel to the west of the preserve. These easements serve as wetland buffers for the Orange River, and connect with ORP to create continuous habitat. A private inholding located between units of the larger portion of the preserve has also maintained sections of the mangrove swamp plant community in the southern portion of the property, which also contributes to a continuous habitat for plants and animals along the Orange River.

One neighboring parcel that is not intended to provide habitat is the narrow FDOT parcel located along the northern border of ORP. This stretch of land is mowed regularly and planted with royal palms, and serves to provide a buffer between the natural area and the heavy traffic on Palm Beach Boulevard. The corridor helps to improve roadside visibility for motorists, and helps to keep wildlife away from the road by presenting an open edge with no cover for protection.

Figure 19: Easements



iii. Relationship to Other Plans

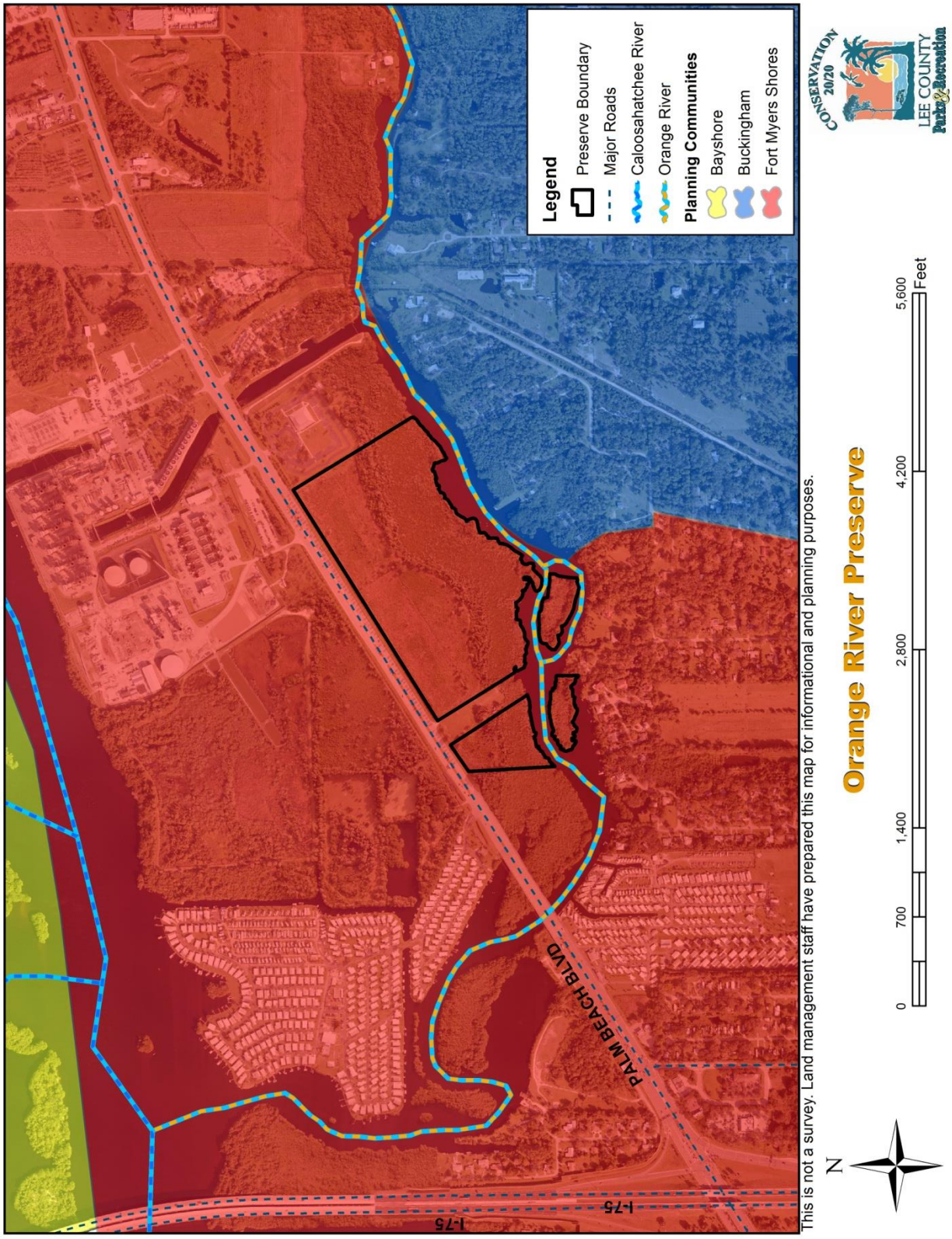
The Lee Plan, Lee County's comprehensive plan, is written to depict Lee County as it will appear in the year 2030. Several themes have been identified as having "great importance as Lee County approaches the planning horizon" (LCDCD 2016). These themes are:

- 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.

A special section of the Lee Plan (Goal 21) was created to discuss a planning community known as Caloosahatchee Shores, a subset of the broader Fort Myers Shores planning community, in which ORP is included and illustrated in Figure 20. Administrated by the East Lee County Council that is overseen by the Board of County Commissioners (BoCC), the Fort Myers Shores region was created to restrict population density and protect the historically rural identity of the area through moderation of commercial development. The Council coordinated the creation of the "Caloosahatchee Shores Community Plan", which further outlines the vision and future goals of the community. This Community Plan can be found online at: https://www.leegov.com/dcd/Documents/Planning/CommunityPlans/CaloosahatcheeShores/PlanNarrative.pdf.

Figure 20: Lee County Planning Communities



E. Management Constraints

The principle management constraints for ORP include funding, exotic plant control, the brief dry season for conducting land management activities, and increasing urbanization pressures surrounding the preserve. Although C20/20 has funding allocated each year by the 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.

Completing restoration activities, or simply accessing the site by vehicle, are also made more difficult by the lack of vehicular access into the preserve. Although the entire northern boundary of ORP lies along Palm Beach Boulevard, there is no vehicular access into the preserve due to the narrow parcel owned by FDOT which separates the preserve from the roadside. Since there is currently no legal access to the preserve from the road through the FDOT parcel, there is no designated public access currently available or planned at ORP. At this time, C20/20 staff is able to gain access to conduct management activities through an informal agreement with the Crossroads Baptist Church to the east of the preserve. Access from the river is also very limited due to the sensitivity of the wetlands and mangroves along the shoreline, and the closest kayak and canoe launch site is at Manatee Park less than a quarter mile to the east.

The location of the preserve contributes to management constraints when planning prescribed burns, and extra care must be taken when writing burn prescriptions. Palm Beach Boulevard, Interstate 75, and Orange River Boulevard are roadways which experience heavy volumes of traffic and would be considered “smoke sensitive areas”. Similarly, the FPL power plant to the north, the Crossroads Baptist Church and Manatee Park to the east, and private residential neighbors surrounding the Orange River to the south of the preserve would be taken into consideration for smoke management during a prescribed burn.

The safety and intensity of a prescribed burn will also be taken into consideration by land managers. Fuel loads, fuel moisture, and weather will be monitored closely prior to a burn, and fire breaks installed around the exterior perimeter of the burn units will be disked to expose bare mineral soil or saturated to create wet fire break lines to contain a prescribed fire. Surrounding residents will be notified about the burn and signs will be posted along Palm Beach Boulevard to warn motorists of potential smoke. Prescribed fire parameters may become more restrictive with expanding residential and commercial development, and land management staff will take this into consideration when planning prescribed burns in the future.

F. Public Access and Resource-Based Recreation

ORP has been classified as a Limited Use Preserve in accordance with the LSOM due to the lack of public access, trail system, and general size of the property. Recreation opportunities at the preserve are limited to hiking without a trail system, nature study and photography, and bird watching. From the Orange

River, visitors are able to paddle watercraft around the mangrove swamp communities, but there are no landings along the preserve's shoreline and the closest kayak or canoe launch is located at Manatee Park less than a quarter mile to the east of ORP.

In the previous management plan, LCPR explored the possibility of constructing a designated public hiking trail system and boardwalk connected to Manatee Park with a bridge over the FPL canal in an effort to increase the recreation opportunities at the preserve. However, due to the abundance of recreational opportunities at neighboring parks and preserves, the ORP trail construction plans were decidedly not a priority and have ultimately been removed from the projected development of the preserve.

Preliminary discussions have been held with the landowner of a neighboring inholding parcel to develop additional recreational opportunities at the preserve, but no tangible plans have been developed. Since there is currently no legal access to the preserve from the road through the FDOT parcel, there is no designated public access currently available or planned at ORP. A number of other parks and preserves in the surrounding area provide designated public access and a variety of recreational opportunities. This preserve will remain a limited use preserve to protect habitat for wildlife and plant species along the increasingly developed Orange River shoreline.

G. Acquisition

The first portion of ORP was acquired through the C20/20 program in March 2002 as nomination #142 for a total cost of $1,750,000, and includes the large portion of land on the north shore of the Orange River and the island on the river. This nomination was purchased to provide a buffer for the Orange River and consists of approximately 61 acres containing mesic flatwoods, mesic hammock, and mangrove swamp. There are three STRAP numbers associated with this acquisition (35-43-25-00-00004.0000, 35-43-25-00-00006.0000, and 35-43-25-00-00008.0000), which indicate that the site is divided within Section 35-Township 43 South-Range 25 East and has 4 individual Parcel numbers (Figure 21).

A second acquisition occurred in March 2012 as nomination #470, which was purchased for a total cost of $5,000 and consists of one parcel (STRAP 35-43-25-00-00006.0000) made entirely of a mangrove swamp plant community. The parcel is a 2.3 acre peninsula joined to the southern shore of the Orange River, and has not been historically developed or heavily disturbed. This second nomination brought the total acreage of ORP to 63.3 acres, but the preserve is occasionally recorded as consisting of 60.5 surveyed acres because the island and mangrove fringes from nomination #142 as well as the peninsula from nomination #470 were never included in an official land survey.

The future land use (FLU) and zoning categories for ORP are mixed due to the timing of the acquisitions. Nomination #142 was rezoned from AG-2 (Agriculture) to EC (Environmentally Critical), and the FLU category was adjusted to "Conservation Wetland" and "Conservation Upland" to better reflect the goals of

C20/20 and protect the conservation of the property into the future. Nomination #470 was purchased in 2012, after the FLU changes and rezoning hearing, and has not yet been rezoned. The zoning category for this parcel is AG-2 (Agriculture) and the FLU is listed as “Wetlands”. One of the management tasks in the near future will be to rezone and change the FLU for this parcel to match the remainder of the preserve. Figure 22 shows the zoning categories for ORP and surrounding areas, and Figure 23 shows the FLU.

Additional properties recommended to the C20/20 program are shown on Figure 24. The 3.5 acre privately owned inholding, which divides acquired nomination #142, was once presented to the C20/20 program as nomination #143. However, the parcel was withdrawn when the landowner entered an agreement with another buyer. Nomination #192, an 11.4 acre parcel to the west of the preserve, was presented to the program to provide continuous wetland and mangrove habitat along the north shore of the Orange River. This nomination was withdrawn because the asking selling price was much higher than the market value and the owner decided to retain ownership. The property is now held as a conservation easement and remains undeveloped.

Other nominations in the vicinity of ORP which were not acquired include #132 that contained three parcels (22.0 acres) to the east of the preserve along the north shore of the Orange River, and #409 (80.6 acres) to the east of the preserve along the south shore of the Orange River. Nearby nominations which did not move beyond initial review include #491 (12.1 acres) to the southwest along Orange River Boulevard and #507 (2.3 acres) to the southeast along the south shore of the Orange River. Additional nominations along the Orange River, or re-nominations of these parcels could extend the boundary of ORP.

There are a number of other protected or public areas in the vicinity of ORP which have been acquired by various conservation groups. Manatee Park to the east of the preserve, Morse Shores Preserve to the northwest, as well as Shandler Hall and Shandler Park to the southwest of the preserve are four of the nearby LCPR properties which provide recreational opportunities to the public. Caloosahatchee Creeks Preserve, another C20/20 property located north of ORP, consists of 1,296 acres along the north shore of the Caloosahatchee River and provides conservation land and recreational opportunities for the public. The Florida Audubon Society, FDEP, and USFWS have also acquired properties to the northwest of the preserve to conserve vital wetlands along the Caloosahatchee and Orange Rivers.

Figure 21: STRAP Numbers

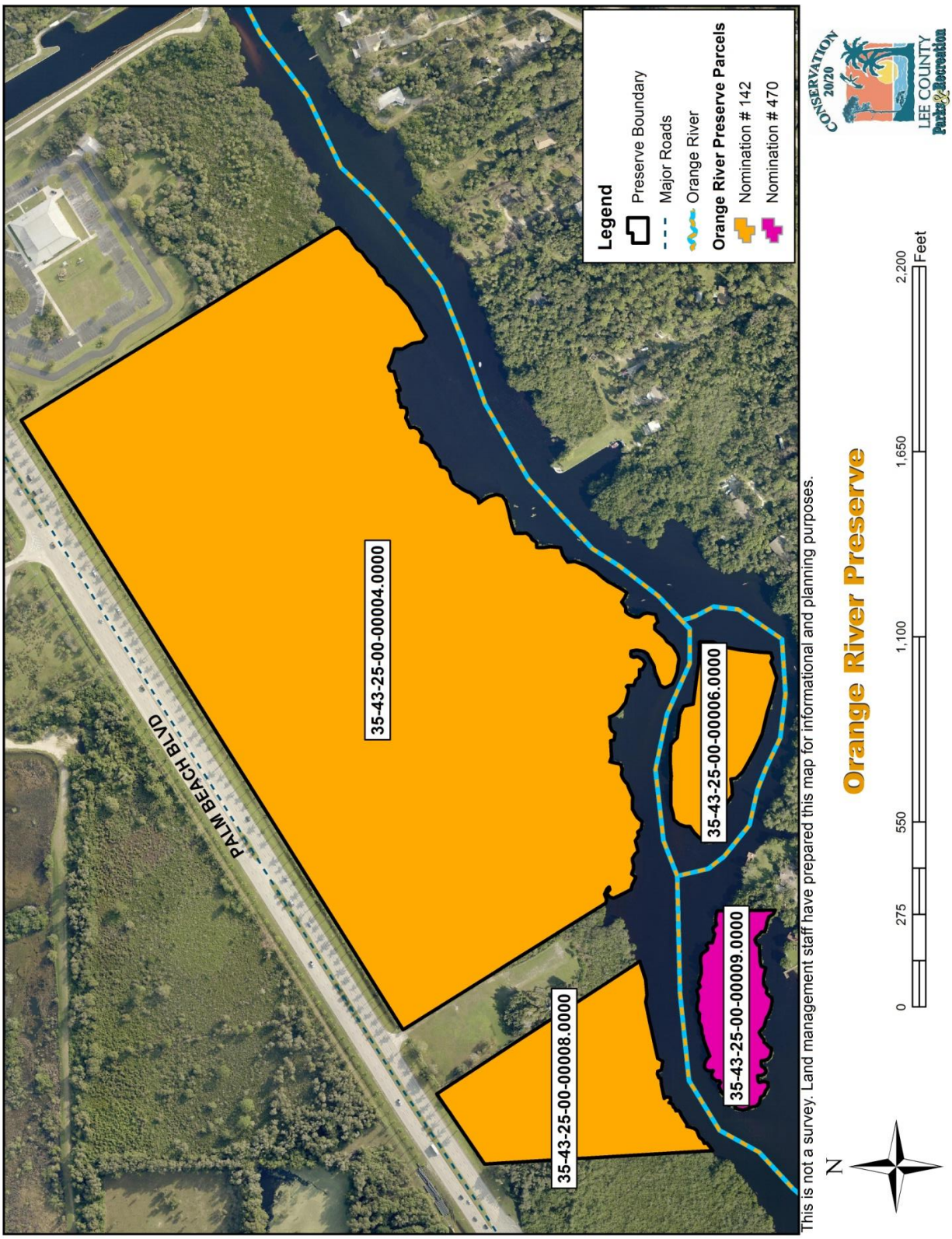


Figure 22: Zoning Categories

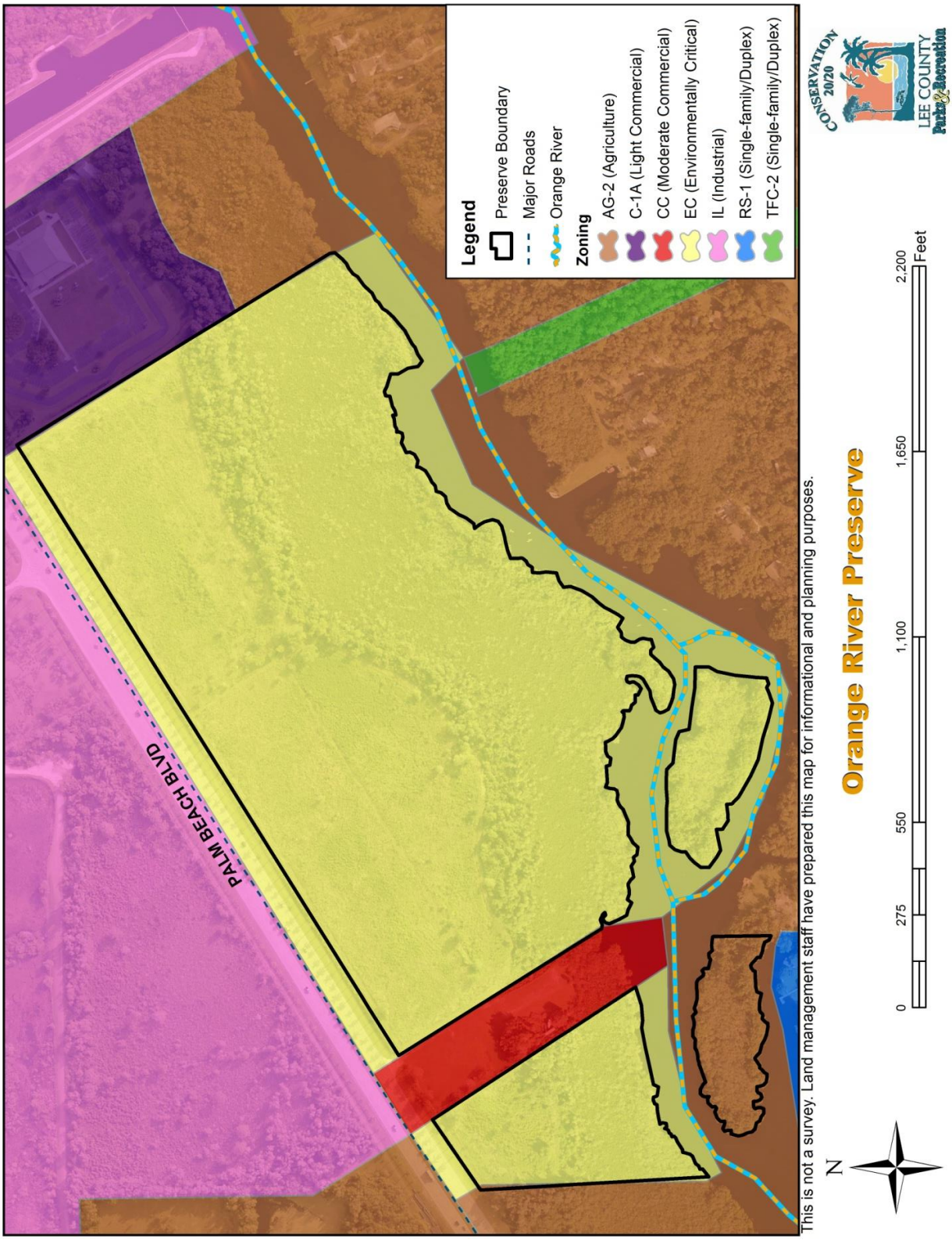


Figure 23: Future Land Uses

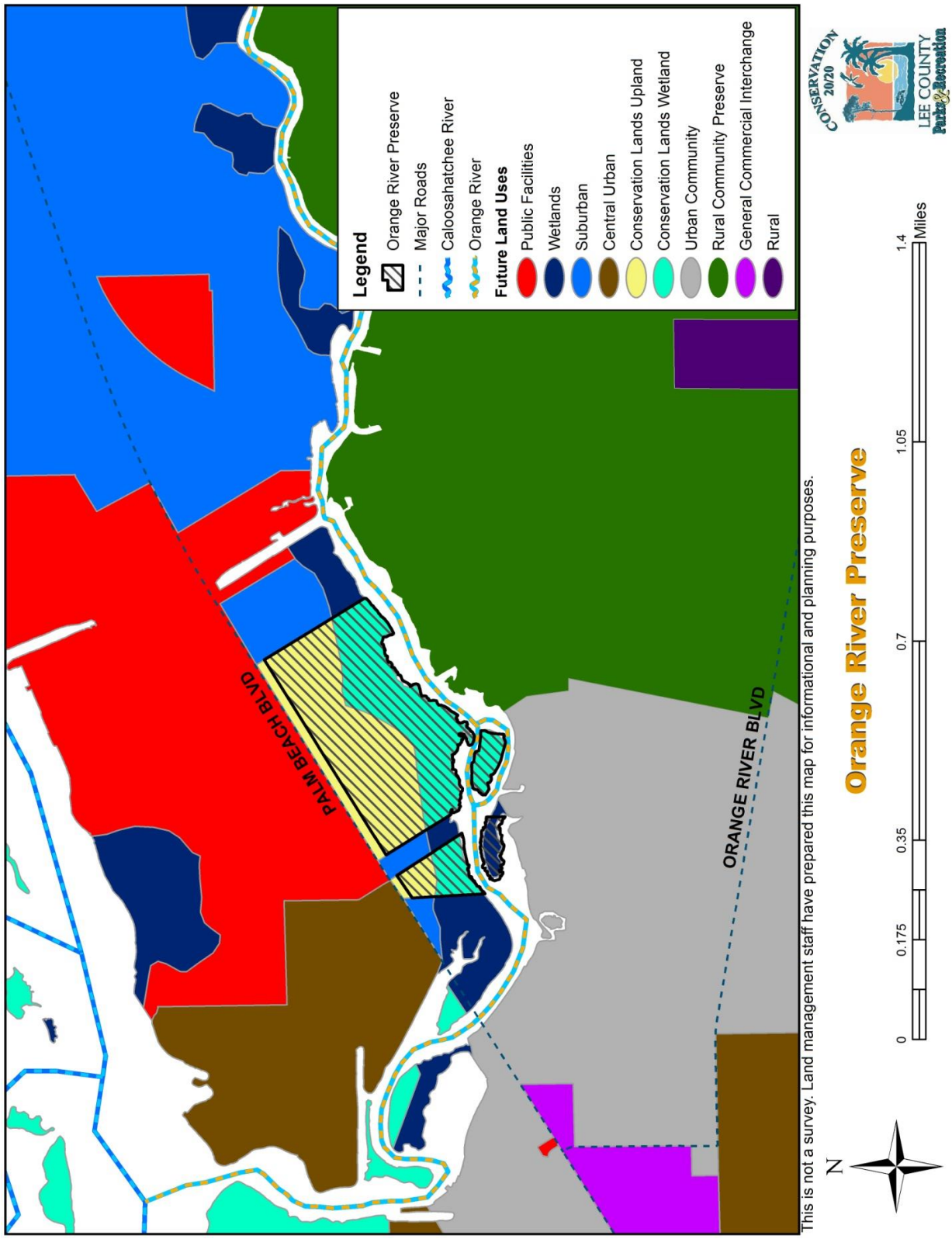
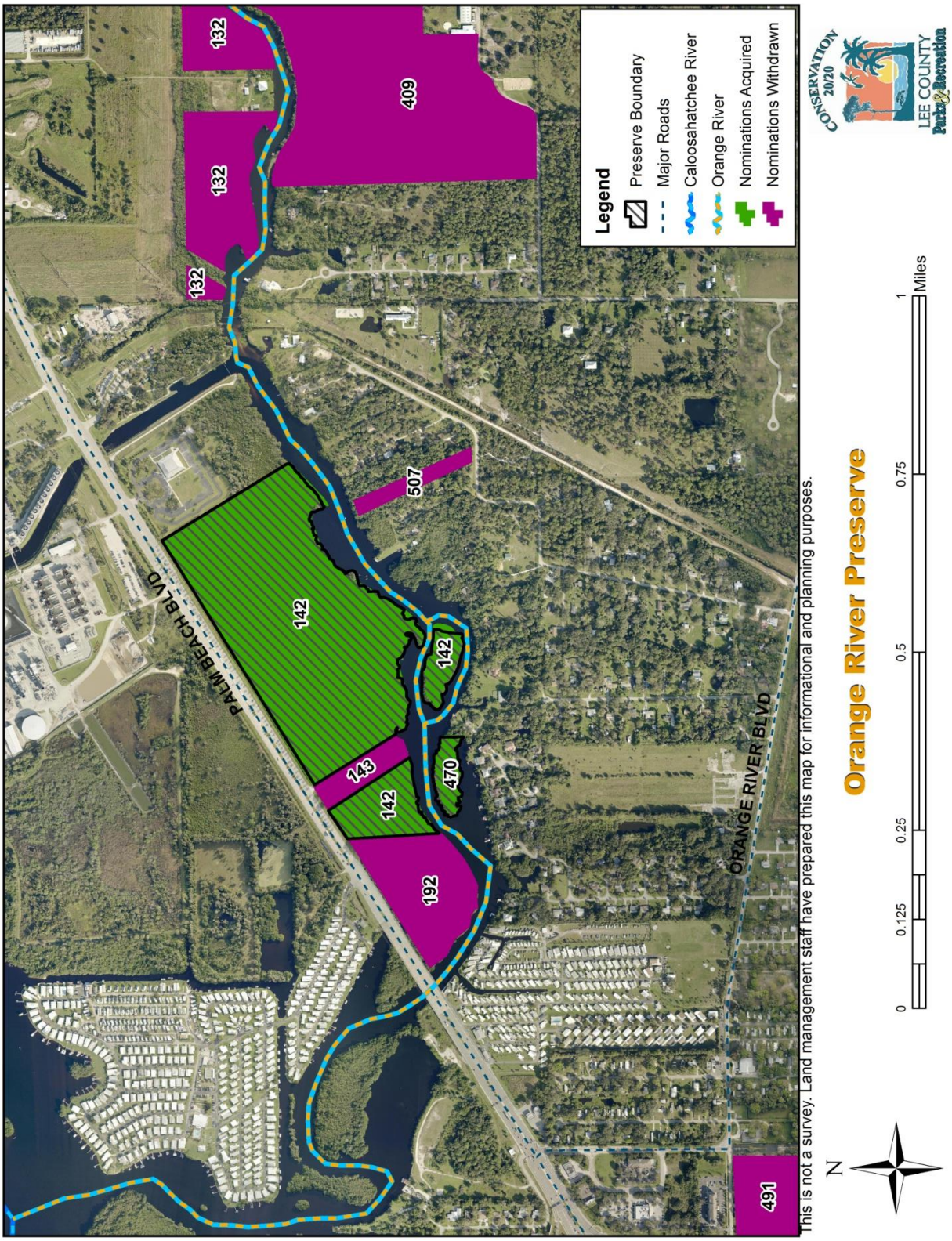


Figure 24: C20/20 Nominations



VI. Management Action Plan

A. Management Unit Descriptions

ORP has been divided into four management units (MU) to better organize and achieve management goals. Figure 25 delineates the MUs that were created based on preserve boundaries, existing trails, and plant communities.

Management Unit 1 – 6.0 acres

Consisting of the northwestern portion of the preserve, this unit contains a combination of all three plant communities found at ORP: mesic flatwoods, mesic hammock, and mangrove swamp. It is bordered to the east and west by private property, to the north by Palm Beach Boulevard, and to the south by the Orange River. Due to the small size of the mesic flatwoods community and the isolation from the remainder of the preserve, this unit had not been assigned a BU in the past, but was assigned BU 2 in 2016 and added to an identical burn regime as BU 1. Management activities within this unit will focus on exotic plant control, shoreline protection, introducing prescribed fire, and mechanical fuel reduction.

Management Unit 2 – 52.3 acres

Located on the eastern side of the preserve, this unit is the largest and contains all three plant communities found at ORP: mesic flatwoods, mesic hammock, and mangrove swamp. It is bordered to the north by Palm Beach Boulevard, the Crossroads Baptist Church to the east, the Orange River to the south, and a privately owned inholding to the west. This unit was previously divided into two separate MUs delineated by a fire break, but was merged in 2016 when this line was eliminated.

The MU still has fire breaks around the external perimeter of the mesic flatwoods plant community, which is also assigned to BU 1 and is the only portion of the preserve to have received prescribed fire in 2008 and 2014. This plant community also underwent intensive melaleuca and Brazilian pepper removal between 2008 and 2010, and received donated slash pine plantings in an effort to fill the cleared canopy. The mesic hammock and mangrove swamp communities have also undergone invasive exotic plant treatments and are at maintenance level for exotic species. Management activities in this unit will continue to focus on exotic plant control, shoreline protection, fuel reduction, and conducting prescribed burns.

Management Unit 3 – 2.7 acres

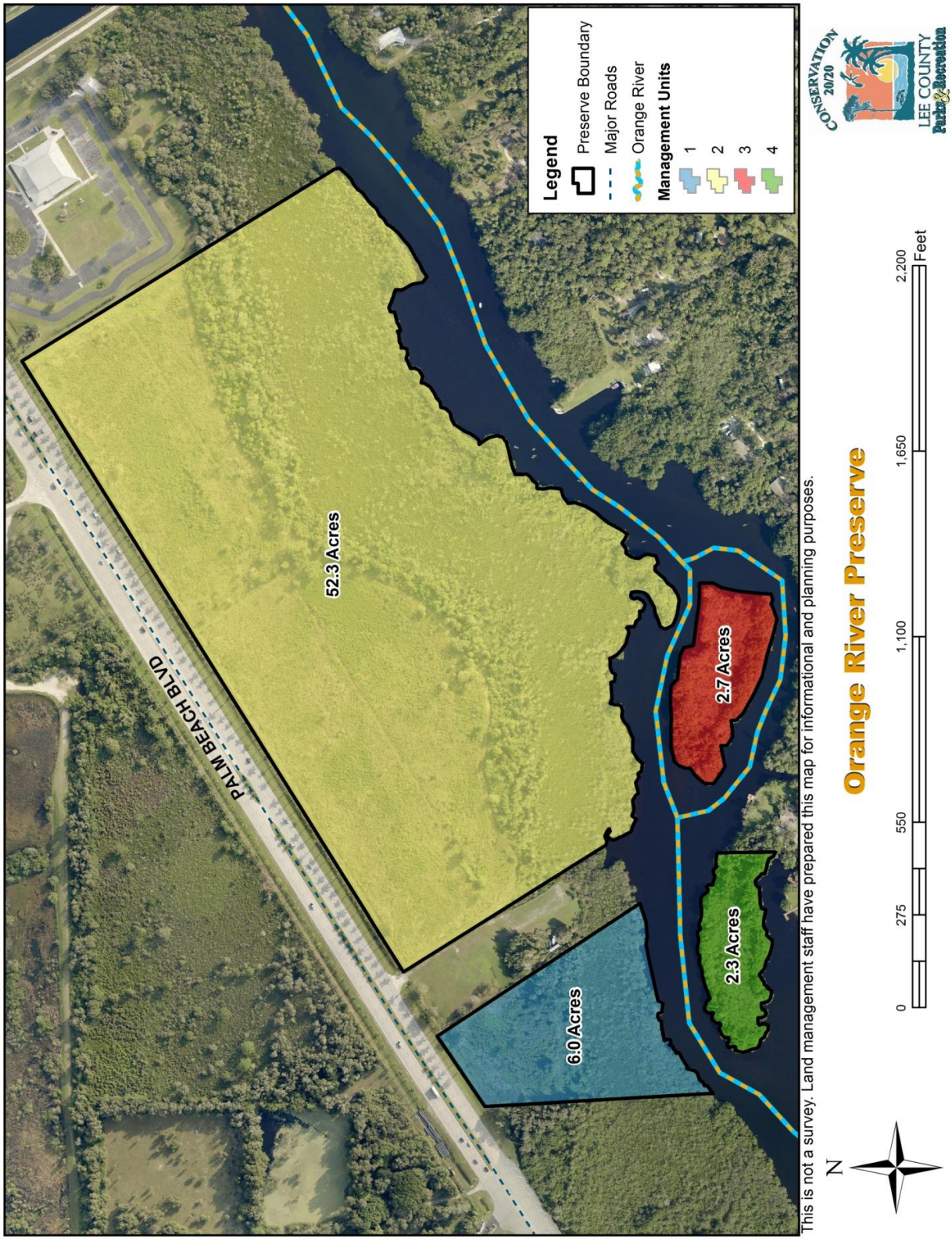
Composed entirely of mangrove swamp, this island parcel is located on the Orange River to the south of MU 2 and was acquired as nomination #142 with the mainland portions of the preserve. Management activities in this unit will focus on exotic plant control and shoreline protection.

Management Unit 4 – 2.3 acres

Acquired as a separate nomination, #470, this mangrove swamp peninsula is a part of the southern shore of the Orange River and was added to ORP in 2012. The parcel is located to the south of MU 1 and will receive management focused

on exotic plant control and shoreline protection. Land managers will also work to change the zoning and FLU categories for this parcel which have not yet been changed to match the remainder of the preserve.

Figure 25: Management Units



B. Management Work to Date

Projects that have been completed at ORP since acquisition include natural resource management, site clean-up, and overall protection. While the property had not been developed or heavily altered by historical land uses, the disturbances that did occur within the upland plant communities provided opportunities for invasive exotic plants to become introduced. Land managers have worked to restore these disturbed areas, remove debris, and control the exotic plant species since the acquisition of the preserve.

In 2006, work began by installing a fire break along the eastern boundary of MU 2 to reduce the risk of a wildfire outbreak event to the neighboring church property. Fuel reduction and restoration projects began in 2008 when C20/20 staff conducted intensive roller chopping of the saw palmetto in MU 2 and multiple exotic plant treatment projects began. A partnership with Lee Timber was initiated in which the company would remove invasive exotic melaleuca trees for use as mulch, and approximately 10 acres of the non-native tree were removed in March 2008.

C20/20 staff also participated in the Southwest Florida Invasive Species Working Group (ISWG), a collective workgroup established by the FDEP, which provided funding for exotic control projects and coordinated use of shared equipment and workforces among local agencies. The Florida Department of Corrections participated in this workgroup and provided manpower to treat approximately nine acres of Brazilian pepper, melaleuca, and Java plum (*Syzgium cumini*) within MU 2 from May to July in 2008. Around the same time, a contractor was hired to conduct treatments on the exotics within MU 1. An interpretive sign was installed within the treatment area at this time to educate visitors about the restoration project and the management goal for the preserve, and boundary signs were installed around the perimeter of the entire preserve to designate the property lines.

Invasive exotic plant control treatments by C20/20 staff and hired contractors continued through the fall and winter months of 2008, and focused on melaleuca, Java plum, and Brazilian pepper removal. In-house and contracted general sweep exotic plant treatments continued from 2009 to 2011, at which time the contracted treatments shifted to an “as needed” basis. General sweeps of all Category 1 and 2 species identified by the most current Florida Exotic Pest Plant Council’s (FLEPPC) “List of Invasive Species” were conducted in 2013 and 2014 at the preserve. A smaller general sweep exotics treatment contract was conducted in 2016 to only the mesic flatwoods community of MU 2 for treatment of woody invasive species re-growth. Staff treatments have occurred on an “as needed” basis as well, and are generally focused on the exotic grasses which invade the mesic flatwoods plant community.

As part of the effort to restore the mesic flatwoods after the exotics removal, donated slash pines were planted over 4 acres within the uplands of MU 1 and 2 to help encourage native plant recruitment. C20/20 staff worked with volunteer groups to plant the donated pine saplings in March and May of 2010.

Prescribed burning occurred in October of 2008, when the FFS partnered with C20/20 to conduct a prescribed burn to BU 1. At this time, additional fire breaks were installed between the mesic flatwoods and mesic hammock plant communities of MU 2, creating a complete perimeter around BU 1. The prescribed fire successfully burned approximately 24.7 acres and was conducted in one day. Prescribed fire was again used by C20/20 land managers to maintain the mesic flatwoods community within BU 1 in 2014. The prescribed fire successfully burned approximately 25 acres and was conducted in one day by C20/20 staff.

A burn rotation of 3-4 years for BU 1 has been identified to maintain the open canopy and fire-dependant plant species within the community. BU 2 was assigned to the mesic flatwoods community within MU 1 in 2016 in an effort to restore and maintain the same conditions as BU 1, and this unit has been scheduled to receive an initial prescribed burn in the 2017 or 2018 burn season. The fire breaks of both BUs are maintained by C20/20 staff on an annual basis.

Debris removal has been on-going since acquisition of the nomination #142 and #470 as buried debris is uncovered, revealed by restoration activities, or observed during tri-annual site inspections. Illegal debris dumping is an occasional issue experienced at the preserve because the boundaries remain unfenced, but the issue has not been severe enough to warrant installation of fencing. A larger source of debris at the preserve is the litter that comes from the heavily traveled Palm Beach Boulevard to the north, either thrown from vehicles or blown from the roadway onto ORP, and a small amount of debris also washes up onto the preserve from the Orange River. C20/20 staff and volunteers work to remove all litter as it is observed.

Land management staff has also completed projects related to the legal status of the preserve since the acquisition of ORP. Nomination #142 was rezoned from “Agriculture” to “Environmentally Critical”, and the FLU category was changed to “Conservation Uplands” and “Conservation Wetlands”. Nomination #470 was acquired in 2012 and has not yet been rezoned nor received a new FLU category. The process to complete these changes has been initiated and will be completed by the LCDCD.

C. Goals and Strategies

The primary management objectives for ORP will be continued natural community improvements, continued treatment of exotic plant species, and prescribed fire management in the mesic flatwoods plant community. Grants and monies budgeted for mitigation of any governmental infrastructure project in Lee County may be used to supplement the operations budget to meet goals in a timely manner. Work will be prioritized in order of importance and ease of accomplishment, and include the following tasks:

Natural Resource Management

- Exotic plant control and maintenance

Once heavily infested with invasive exotic plants, treatments began within the upland portions of the preserve in 2008. Stands of melaleuca and large growths of Brazilian pepper were removed from MU 1 and 2 by C20/20 staff, contractors, and the Department of Corrections working under the Southwest Florida ISWG. These projects were followed-up by staff and contracted treatments for the invasive grasses and herbaceous exotics which appeared once the canopy was opened.

The mesic flatwoods now contains sporadic to light levels (below 25%) of exotic vegetation cover and hand removal will be utilized for control of these species. Specific methodology will depend on stem size, plant type, and season; generally, the stem will be cut near the ground and sprayed with appropriate herbicide, or a foliar application will be made to the entire plant (particularly with grasses and broadleaf plants). Hand pulling will be utilized when possible with appropriate species in order to minimize herbicide use. Some species may receive basal bark treatments, such as small clusters of Brazilian pepper. The mesic hammock and mangrove swamp also contain sporadic to light levels of exotic vegetation cover and will require similar management as the uplands. Hand crews will either hand pull, basal bark, foliar, or cut-stump treat the exotics with the appropriate herbicide during the dry season. No replanting will be needed due to significant presence of native vegetation and the native seed bank.

The most current FLEPPC “List of Invasive Species” (FLEPPC 2015) will be consulted in determining the invasive exotic plants to be controlled in each MU. 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 bring the entire preserve closer to a maintenance level, defined as having less than 5% invasive exotic plant coverage. Contracted treatments have been included in the projected financial considerations to occur three times over the next ten years to treat wood 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.

- Exotic and feral animal removal

Populations of invasive exotic snails have not yet been documented within the mangrove swamp and mesic hammock of the preserve. However, the barriers that have previously prevented these snails from becoming established at ORP may become obsolete as the salinity and water quality fluctuations within the Caloosahatchee and Orange Rivers continue to be altered by drought, floods,

and man-made channels used to relieve flooding effects upstream. 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 ORP.

Although feral hogs have not yet been observed at the preserve, efforts will be taken to remove animals if a population becomes established. Preserve boundaries and plant communities will continue to be monitored for signs of the animals foraging at the preserve. Similarly, feral cats have not been observed or established at ORP, 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.

- Prescribed fire management

Prescribed fire will continue to be used on the preserve to enhance the fire-dependent native plant community: the mesic flatwoods. The preserve is currently assigned two BUs around the mesic flatwoods within MU 1 and 2, and both are scheduled in a 3-4 year burn rotation. Timing of future prescribed burning will be influenced by seasonal rain, listed species requirements, ability of vegetation within the designated BU to carry fire, and wind patterns. Land management staff will alter the BUs on the preserve and conduct prescribed burns if fuel levels are determined to be too high, or if unwanted plant succession is occurring. The projected financial considerations for ORP have calculated to include three prescribed burns over the next ten years.

- Mechanical brush reduction

Between prescribed burn rotations and within the MUs that are not assigned a BU, C20/20 staff may conduct mechanical brush reduction. This will reduce the fuel load of the preserve and reduce the risk of wildfires, as well as maintain the native plant communities that require thinner canopies or understories. If conditions during the burn season do not permit a prescribed burn to be conducted within the BUs of the mesic flatwoods, mechanical brush reduction will be used to reduce the fuels within the unit and maintain the open canopy of the plant community. The projected financial considerations for ORP have been calculated to include two mechanical reduction treatments over the next ten years.

- Monitor and protect listed species

As discussed in the Designated Species section of this plan, listed plant and wildlife species will continue to influence management decision at the preserve.

Efforts will be taken to manage the preserve for listed plant species with activities including exotic plant treatments and prescribed burns. During management activities, staff will take precautions to minimize any negative impacts to listed species documented at the preserve.

ORP is part of a county-wide tri-annual site inspection program conducted at all C20/20 preserves, which allow staff to monitor for impacts and/or changes to the site including plant and wildlife sightings. If, during one of these inspections, staff finds a FNAI listed species, the occurrence will be reported using the appropriate forms. A copy of the site inspection form is available in the LSOM.

Overall Protection

- Debris removal and prevention of dumping

Debris removal will be an on-going effort at ORP due to the close proximity of Palm Beach Boulevard and the Orange River. During tri-annul site inspections, small objects that are encountered will be removed. C20/20 rangers will also assist with removing small items when they are on patrol at the preserve. Land management staff recognizes that new debris may be dumped in the preserve periodically, such as the landscaping material dumped by the FDOT contractor from the corridor along Palm Beach Boulevard or fishing line tangled in mangrove limbs.

- Boundary sign maintenance

Signs placed around the boundary of the preserve disappear periodically, and staff will continue to monitor the boundary and replace damaged or missing signs. ORP also has a preserve identification sign and a restoration activity interpretive sign along the northern boundary of MU 2 that help explain to the public about the purpose and recreational opportunities at the preserve. Staff will continue to monitor these signs for damages during site inspections.

There is currently no fence installed along the perimeter of ORP. The boundary signs have been placed every 200-300 feet along the roadside, and every 500 feet around the remainder of the preserve to identify the property lines. Unless unauthorized access becomes an issue, no fence will be installed. Should the need for fences arise, they will only be installed in the uplands. To date, there has not been a significant amount of unauthorized access documented at the preserve.

- Maintain fire breaks

Fire breaks were installed around a portion of the preserve prior to the site's first prescribed burn in 2008 by FFS, and have continued to be maintained by C20/20 staff. Fire breaks around the exterior perimeter of the mesic flatwoods in MU 1 and 2 are maintained annually. Prior to a prescribed burn, these lines will be disked to ensure a safety buffer of bare mineral soil. These fire breaks will reduce the potential damage to areas outside the preserve from a wildfire or prescribed fire.

Fire breaks have not been installed within or around the mesic hammock and mangrove swamp because they are sensitive habitats that could easily be damaged by such activity, the equipment will not operate under the conditions typically found in such a habitats, the plant communities are not fire dependent, and it is extremely improbable that a fire would break out in such moist soil conditions.

- Change zoning and FLU

Staff will coordinate with the LCDCD to discuss the zoning and FLU category of nomination #470 within ORP. The zoning should be changed from AG-2 (Agriculture) to EC (Environmentally Critical). The FLU category will also need to be changed from “Wetlands” to “Conservation Lands Wetland” to further protect the parcel from future development.

Volunteers

- Assist volunteer groups

If there is interest from the community to form a volunteer group, staff will work with them to assist with the many diverse management activities that will be associated with this preserve, such as boundary sign maintenance, debris removal, wildlife monitoring, and other land management projects.

VII. Projected Timetable for Implementation

The following timetable is 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. Details on each management activity are found in the Management Action Plan section.

Table 3: Timetable for Implementation

Management Activity	Jan 2017	Apr 2017	Jul 2017	Oct 2017	Jan 2018	Apr 2018	Jul 2018	Oct 2018	Jan 2019	Apr 2019	Jul 2019	Oct 2019	Jan 2020	Apr 2020	Jul 2020	Oct 2020	Jan 2021	Apr 2021	Jul 2021	Oct 2021	Jan 2022	Apr 2022	Jul 2022+
Natural Resource Management																							
Exotic Species Control																							
Follow-up exotic plant treatments (contract & in-house)		X				X				X				X				X				X	On-going →
Release exotic plant bio-control agent	To be determined as research develops																						
Exotic animal removal	Conducted as needed																						
Prescribed Fire																							
Mechanical brush reduction													X										On-going →
Conduct prescribed burn					X																X		On-going →
Monitor Listed Species																							
Conduct tri-annual site inspections	X		X	X	X		X	X	X		X	X	X		X	X	X		X	X	X		On-going →
Overall Protection																							
Maintain fire breaks	X				X				X				X				X				X		On-going →
Change zoning & FLU category of Nomination #470	Course of action has been initiated, and is carried out by the LCDCD																						
Boundary sign maintenance	On-going	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Debris removal	On-going	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Volunteers																							
Assist volunteer groups	On-going	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→

➔ = project continues

VIII. Financial Considerations

The Conservation 20/20 program is funded through Lee County's general fund in accordance with ordinance 15-08 (as amended). This annual allocation funds restoration, maintenance of the preserves, and C20/20 staff costs. Funds not used in the annual allocation will roll over to the following year for maintenance and restoration.

Other possible funding for exotic plant treatments and restoration projects may be requested through grants from agencies such as SFWMD, FDEP, FWC, and USFWS or include additional mitigation opportunities. However, projected costs for ORP are relatively minor and land management staff believes that the C20/20 management fund should be able to cover these costs. Projected and expended costs with funding sources are listed in Appendix D.

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X. Appendices

Appendix A: Legal Descriptions

Appendix B: Plant Species List

Appendix C: Wildlife Species List

Appendix D: Financial Considerations

Appendix A: Legal Descriptions

Appendix A: Legal Descriptions

Nomination #142

LEGAL DESCRIPTION

A tract or parcel of land lying in Government Lots 4 and 5 and part of the Northeast quarter of Section 35, Township 43 South, Range 25 East, Lee County, Florida, said tract or parcel being described as follows:

From the intersection of the Southeasterly Right-of-Way line of State Road No. 80 (150 feet wide) with the East line of said Section 35, run Southwesterly along said Right-of-Way line along the arc of a curve to the left of radius 5,654.53 feet for 439.2 feet to a point of tangency; thence continue along said Right-of-Way line South 57°57' West for 932 feet to the Point of Beginning. From said Point of Beginning continue South 57°57' East, West along said Right-of-Way line for 2800 feet; thence run South 32°03' East, perpendicular to said Right-of-Way line, along the Northeasterly line of lands conveyed by deed recorded in Deed Book 223, at page 282 of the Public Records of said Lee County for 1,150 feet more or less to the center of the main channel of the Orange River; thence run Southeasterly, Easterly and Northeasterly along the centerline of said channel to an intersection with the Southeasterly prolongation of a line bearing South 32°03' East and passing through the Point of Beginning. Thence run North 32°03' West along said prolongation and the Southwesterly line of Parcel 5 as described in deed recorded in Deed Bond 271, at page 181, of the Public Records for 1200 feet more or less to the Point of Beginning. LESS AND EXCEPT the East 660.00 feet thereof.

Together with, a tract or parcel of land lying in Government Lot 4, Section 35, Township 43 South, Range 25 East, Lee County, Florida, which tract is described as follows:

From the intersection of the Southeasterly Right-of-Way line of State Road 80 (150 feet wide) with the East line of said Section 35 run Southwesterly along said Right-of-Way line along the arc of a curve to the left of radius 5,654.53 feet for 439.2 feet to a point of tangency; thence continue along said Right-of-Way line South 57°57' West for 3,932 feet to the Point of Beginning. From said Point of Beginning continue South 57°57' West along said Right-of-Way line for 250 feet more or less to an intersection with the West line of said Lot 4; thence run Southerly along said West line for 800 feet more or less to the centerline of the main channel of the Orange River; thence run Northeasterly along the centerline of said channel to an intersection with the Southeasterly prolongation of a line bearing South 32°03' East and passing through the Point of Beginning; thence run North 32°03' West along said prolongation and along the Southwesterly line of said lands conveyed by deed recorded in Deed Book 223, at page 282, of the Public Records of Lee County, for 850 feet more or less to the Point of Beginning.

LESS AND EXCEPT that portion of Government Lot 4, Section 35, Township 43 South, Range 25 East, Lee County, Florida as deeded to the State of Florida Department of Transportation, in Official Records Book 1890, Page 1002, Public Records of Lee County, Florida, more particularly described as follows:

Commence at an iron rod with ink engineering cap marking the Southwest corner of said Section; thence North 00°53'51" West 749.47 feet along the West boundary of said Section to the survey line of SR 80; thence North 57°56'22" East 1541.81 feet to the West boundary of said Government Lot 4; thence South 00°59'35" East 87.56 feet along said West boundary to the Southerly existing Right-of-Way line SR 80 (Project 1202-{106}202); continue thence South 00°59'35" East 11.67 feet along said West boundary; thence North 57°56'22" East 127.81 feet; thence North 32°03'38" West 10.00 feet to said existing Right-of-Way line, thence South 57°56'22" West 121.79 feet along said existing Right-of-Way line to the Point of Beginning.

Bearings hereinabove mentioned are derived from centerline surveys of State Road No. 80.

Appendix A: Legal Descriptions

Nomination #470

LEGAL DESCRIPTION

Government Lot 7 of Section 35, Township 43 South, Range 25 East, Lee County, Florida, EXCEPTING THEREFROM the Easterly 600 feet as measured along the South line of said lot and the Westerly 643.5 feet as measured along said South line and conveyed by deed recorded in Deed Book 17 at page 327 of the Public Records of Lee County, Florida.

AND

A tract or parcel of land lying in the Northwest quarter (NW 1/4) of the Northwest quarter (NW 1/4) of Section 2, Township 44 South, Range 25 East which tract or parcel is described as follows:

From the Northeast corner of said quarter-quarter section run Westerly along the North line thereof for 165.0 feet to the Northwesterly corner of lands conveyed by deed recorded in Official Records Book 59, Page 331 of the Public Records of Lee County and the Point of Beginning. From said P.O.B. continue Westerly along said North line for 491 feet to a steel rifle barrel marking the Northeasterly corner of lands conveyed by deed recorded in Deed Book 223 at page 402 of said Public Records; thence run Southerly along the Easterly boundary of said lands parallel with the West line of said fraction of a section to the Northeasterly line (25 feet from the centerline) of Orange River Boulevard (State Road No. S-80-A); thence run Southeasterly along said Northeasterly line to an intersection with a line parallel with said West line of said fraction of a section passing through the Point of Beginning; thence run Northerly parallel with said West line along the Westerly boundary of said lands described in said Official Records Book 59 at page 331 to the Point of Beginning. LESS AND EXCEPT property deeded from Irving Hausbach, individually and as trustee, joined by his wife, Gertrue Hausbach to Tambling Construction Corp. by deed recorded in Official Records Book 1134, Page 903, Public Records of Lee County, Florida, AND those lands platted as Orange River Hills, a Subdivision as recorded in Plat Book 29, Pages 34 through 39, inclusive, Public Records of Lee County, Florida.

Appendix B: Plant Species List

Appendix B: Plant Species List

			Designated Status			
Scientific Name	**Common Name**	**Native Status**	**EPPC**	**FDACS**	**IRC**	**FNAI**
Family: Phallaceae (stinkhorn)						
Clathrus ruber	latticed stinkhorn	native				
Family: Blechnaceae (midsorus fern)						
Blechnum serrulatum	swamp fern	native				
Woodwardia virginica	Virginia chain fern	native			R	
Family: Dennstaedtiaceae (cuplet fern)						
Pteridium aquilinum var. *caudatum*	lacy bracken	native				
Family: Nephrolepidaceae (sword fern)						
Nephrolepis cordifolia	tuberous sword fern	exotic	I			
Family: Polypodiaceae (polypody)						
Pleopeltis polypodioides	resurrection fern	native				
Family: Pteridaceae (brake fern)						
Acrostichum danaeifolium	giant leather fern	native				
Family: Vittariaceae (shoestring fern)						
Vittaria lineata	shoestring fern	native				
Family: Pinaceae (pine)						
Pinus elliottii var. *densa*	south Florida slash pine	native				
Family: Araceae (arum)						
Colocasia esculenta	wild taro	exotic	I			
Family: Arecaceae (palm)						
Sabal palmetto	cabbage palm	native				
Serenoa repens	saw palmetto	native				
Syagrus romanzoffiana	queen palm	exotic	II			
Family: Bromeliaceae (pineapple)						
Tillandsia fasciculata var. densispica	cardinal airplant	native		E		
Tillandsia recurvata	ballmoss	native				
Tillandsia setacea	southern needleleaf	native				
Tillandsia usneoides	Spanish moss	native				
Tillandsia utriculata	giant airplant	native		E		
Family: Commelinaceae (spiderwort)						
Commelina diffusa	common dayflower	exotic				
Family: Cyperaceae (sedge)						
Cyperus erythrorhizos	redroot flatsedge	native				
Family: Dioscoreraceae (yam)						
Dioscorea bulbifera	air-potato	exotic	I			
Family: Eriocaulaceae (pipewort)						
Syngonanthus flavidulus	yellow hatpins	native				
Family: Orchidaceae (orchid)						
Habenaria floribunda	toothpetal false reinorchid	native				
Sacoila lanceolata var. *lanceolata*	leafless beaked ladiestresses	native			I	
Family: Poaceae (grass)						
Andropogon glomeratus var. glaucopis	purple bluestem	native			R	
Andropogon virginicus var. *glaucus*	chalky bluestem	native			R	
Aristida beyrichiana	wiregrass	native				
Dichanthelium ensifolium	cypress witchgrass	native				
Imperata cylindrica	cogongrass	exotic	I			
Panicum maximum	Guineagrass	exotic	I			
Setaria magna	giant bristlegrass	native			I	
Setaria parviflora	knotroot foxtail	native				

Appendix B: Plant Species List

			Designated Status			
Scientific Name	**Common Name**	**Native Status**	**EPPC**	**FDACS**	**IRC**	**FNAI**
Family: Smilacaceae (smilax)						
Smilax auriculata	earleaf greenbriar	native				
Family: Xyridaceae (yelloweyed grass)						
Xyris spp.	yelloweyed grass	native				
Family: Amaranthaceae (amaranth)						
Alternanthera philoxeroides	alligatorweed	exotic	II			
Amaranthus australis	southern amaranth	native			R	
Family: Anacardiaceae (cashew)						
Rhus copallinum	winged sumac	native				
Schinus terebinthifolius	Brazilian pepper	exotic	I			
Family: Annonaceae (custard-apple)						
Annona glabra	pondapple	native				
Asimina reticulata	netted pawpaw	native				
Family: Apocynaceae (dogbane)						
Cryptostegia madagascariensis	Madagascar rubbervine	exotic	II			
Rhabdadenia biflora	mangrovevine	native				
Sarcostemma clausum	white twinevine	native				
Family: Aquifoliaceae (holly)						
Ilex glabra	gallberry	native				
Family: Araliaceae (ginseng)						
Schefflera actinophylla	Australian umbrella tree	exotic	I			
Family: Asteraceae (aster)						
Ambrosia artemisiifolia	common ragweed	native				
Bidens alba	beggarticks	native				
Conoclinium coelestinum	blue mistflower	native				
Conyza canadensis var. pusilla	dwarf Canadian horseweed	native				
Elephantopus elatus	tall elephantsfoot	native			R	
Emilia fosbergii	Florida tasselflower	exotic				
Erechtites hieraciifolius	fireweed	native				
Eupatorium capillifolium	dogfennel	native				
Euthamia graminifolia	flattop goldenrod	native				
Mikania scandens	climbing hempvine	native				
Pluchea odorata	sweetscent	native				
Pterocaulon pycnostachyum	blackroot	native				
Sphagneticola trilobata	creeping oxeye	exotic	II			
Family: Avicenniaceae (black mangrove)						
Avicennia germinans	black mangrove	native				
Family: Clusiaceac (St. John's-wort)						
Hypericum hypericoides	St. Andrew's-cross	native				
Family: Combretaceae (combretum)						
Conocarpus erectus	buttonwood	native				
Laguncularia racemosa	white mangrove	native				
Family: Convolvulaceae (morning-glory)						
Ipomoea alba	moonflowers	native				
Family: Cucurbitaceae (gourd)						
Momordica charantia	balsampear	exotic	II			

Appendix B: Plant Species List

			Designated Status			
Scientific Name	**Common Name**	**Native Status**	**EPPC**	**FDACS**	**IRC**	**FNAI**
Family: Ericaceae (heath)						
Bejaria racemosa	tarflower	native			R	
Lyonia fruticosa	rusty staggerbush	native				
Lyonia lucida	fetterbush	native				
Vaccinium myrsinites	shiny blueberry	native				
Family: Fabaceae (pea)						
Acacia auriculiformis	earleaf acacia	exotic	I			
Crotalaria pallida	smooth rattlebox	exotic				
Galactia elliottii	Elliott's milkpea	native				
Indigofera hirsuta	hairy indigo	exotic				
Senna pendula	valamuerto	exotic	I			
Family: Fagaceae (beech)						
Quercus elliottii	running oak	native				
Quercus laurifolia	laurel oak	native				
Quercus minima	dwarf live oak	native			R	
Quercus myrtifolia	myrtle oak	native				
Quercus virginiana	live oak	native				
Family: Lamiaceae (mint)						
Callicarpa americana	beautyberry	native				
Family: Lauraceae (laurel)						
Persea palustris	swamp bay	native				
Family: Malvaceae (mallow)						
Hibiscus grandiflorus	swamp rosemallow	native				
Kosteletzkya virginica	Virginia saltmarsh mallow	native				
Urena lobata	caesarweed	exotic	II			
Family: Melastomataceae (melastome)						
Rhexia ssp.	meadowbeauty	native				
Family: Meliaceae (mahogany)						
Melia azedarach	Chinaberrytree	exotic	II			
Family: Moraceae (mulberry)						
Ficus aurea	strangler fig	native				
Ficus citrifolia	wild banyan tree	native				
Family: Myricaceae (bayberry)						
Myrica cerifera	wax myrtle	native				
Family: Myrsinaceae (myrsine)						
Ardisia elliptica	shoebutton	exotic	I			
Rapanea punctata	myrsine	native				
Family: Myrtaceae (myrtle)						
Eucalyptus torelliana	Torrell's eucalyptus, cadaga	exotic				
Eugenia axillaris	white stopper	native				
Melaleuca quinquenervia	punktree	exotic	I			
Syzygium cumini	Java plum	exotic	I			
Family: Nyctaginaceae (four-o'clock)						
Bougainvillea spp. Comm. ex Juss.	bougainvillea	exotic				
Family: Oleaceae (olax)						
Fraxinus caroliniana	pop ash	native			R	
Family: Polygalaceae (milkwort)						
Polygala nana	candyroot	native			R	

Appendix B: Plant Species List

			Designated Status			
Scientific Name	**Common Name**	**Native Status**	**EPPC**	**FDACS**	**IRC**	**FNAI**
Family: Rhizophoraceae (mangrove)						
Rhizophora mangle	red mangrove	native				
Family: Rubiaceae (madder)						
Spermacoce prostrata	prostrate false buttonweed	native				
Spermacoce verticillata	shrubby false buttonweed	exotic				
Family: Sapindaceae (soapberry)						
Acer rubrum	red maple	native				
Cupaniopsis anacardioides	carrotwood	exotic	I			
Family: Solanaceae (groundcherry)						
Physalis angulata	cutleaf groundcherry	native				
Family: Verbeneaceae (vervain)						
Lantana camara	lantana	exotic	I			
Family: Vitaceae (grape)						
Ampelopsis arborea	peppervine	native				
Parthenocissus quinquefolia	Virginia creeper	native				
Vitis cinerea var. floridana	Florida grape	native				
Vitis rotundifolia	muscadine grape	native				
Vitis shuttleworthii	Calusa grape	native			R	

Key:

FLEPPC (Florida Exotic Pest Plant Council)
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 vulnerbility 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 vulnerbility to extinction due to some natural or man-made factor.
3= Either very rare and local throughout its range (21-200 occurences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
4= Apparently secure
5= Demonstrably secure

Appendix C: Wildlife Species List

Appendix C: Wildlife Species List

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
MAMMALS				
Family: Dasypodidae (armadillos)				
Dasypus novemcinctus	nine-banded armadillo *			
Family: Trichechidae (manatees)				
Trichechus manatus	West Indian manatee	FE	E	G2/S2
Family: Sciuridae (squirrels and their allies)				
Sciurus carolinensis	eastern gray squirrel			
Family: Leporidae (rabbits and hares)				
Sylvilagus palustris	marsh rabbit			
Sylvilagus floridanus	eastern cottontail			
Family: Felidae (cats)				
Lynx rufus	bobcat			
Family: Procyonidae (raccoons)				
Procyon lotor	raccoon			
BIRDS				
Family: Ciconiidae (storks)				
Mycteria americana	wood stork	FT	T	G4/S2
Family: Phalacrocoracidae (cormorants)				
Phalacrocorax auritus	double-crested cormorant			
Family: Anhingidae (anhingas)				
Anhinga anhinga	anhinga			
Family: Ardeidae (herons, egrets, bitterns)				
Ardea herodius	great blue heron			
Ardea alba	great egret			G5/S4
Egretta thula	snowy egret	SSC		G5/S3
Egretta caerulea	little blue heron	SSC		G5/S4
Egretta tricolor	tricolored heron	SSC		G5/S4
Butorides virescens	green heron			
Nycticorax nycticorax	black-crowned night heron			G5/S3
Nyctanassa violacea	yellow-crowned night heron			G5/S3
Family: Threskiornithidae (ibises and spoonbills)				
Subfamily: Threskiornithinae				
Eudocimus albus	white ibis	SSC		G5/S4
Family: Cathartidae (new world vultures)				
Coragyps atratus	black vulture			
Cathartes aura	turkey vulture			
Family: Accipitridae (hawks, kites, accipiters, harriers, eagles)				
Elanoides forficatus	swallow-tailed kite			G5/S2
Hailaeetus leucocephalus	bald eagle			G5/S3
Family: Columbidae (pigeons and doves)				
Zenaida macroura	mourning dove			
Columbina passerina	common ground-dove			
Family: Alcedinidae (kingfishers)				
Ceryle alcyon	belted kingfisher			
Family: Picidae (woodpeckers)				
Subfamily: Picinae				
Melanerpes carolinus	red-bellied woodpecker			
Picoides pubescens	downy woodpecker			
Dryocopus pileatus	pileated woodpecker			
Family: Falconidae (falcons)				
Subfamily: Falconinae (caracaras)				
Polyborus plancus audubonii	Audubon's crested caracara	FT	T	
Family: Vireonidae (vireos)				
Vireo griseus	white-eyed vireo			

Appendix C: Wildlife Species List

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
Family: Corvidae (crows, jays, etc.)				
Cyanocitta cristata	blue jay			
Corvus brachyrhyncos	American crow			
Family: Hirundinidae (swallows)				
Subfamily: Hirundinidae				
Tachycineta bicolor	tree swallow			
Family: Troglodytidae (wrens)				
Thryothorus ludovicianus	Carolina wren			
Family: Polioptilidae				
Polioptila caerulea	blue-gray gnatcatcher			
Family: Turdidae (thrushes)				
Turdus migratorius	American robin			
Family: Mimidae (mockingbirds and thrashers)				
Dumetella carolinensis	gray catbird			
Mimus polyglottos	northern mockingbird			
Family: Parulidae (wood-warblers)				
Dendroica palmarum	palm warbler			
Dendroica coronata	yellow-rumped warbler			
Dendroica discolor	prairie warbler			
Family: Cardinalidae (cardinals, some grosbeaks, new world buntings, etc.)				
Cardinalis cardinalis	northern cardinal			
Family: Icteridae (blackbirds, orioles, etc.)				
Quiscalus quiscula	common grackle			
REPTILES				
Family: Alligatoridae (alligator and caiman)				
Alligator mississippiensis	American alligator	FT(SA)	T(SA)	G5/S4
Family: Polychridae (anoles)				
Anolis sagrei	brown anole *			
Family: Colubridae (colubrids)				
Coluber constrictor priapus	southern black racer			
AMPHIBIANS				
Family: Leptodactylidae (tropical frogs)				
Eleutherodactylus planirostris planirostris	greenhouse frog *			
Family: Hylidae (treefrogs and their allies)				
Hyla cinerea	green treefrog			
Hyla squirella	squirrel treefrog			
Osteopilus septentrionalis	Cuban treefrog *			
FISHES				
Family: Megalopidae (tarpons)				
Megalops atlanticus	tarpon			
Family: Muglidae (mullets)				
Mugil cephalus	striped (black) mullet			
INSECTS				
Family: Chrysomelidae (leaf beetles)				
Gratiana bolivian	spotted cucumber beetle			
Family: Pieridae (whites and sulphurs)				
Subfamily: Coliadinae (sulphurs)				
Phoebis philea	orange-barred sulphur			

Appendix C: Wildlife Species List

Scientific Name	Common Name	Designated Status		
		FWC	FWS	FNAI
Family: Nymphalidae (brushfoots)				
Subfamily: Heliconiinae (longwings)				
Agraulis vanillae	gulf fritillary			
Heliconius charitonius	zebra			
Subfamily: Nymphalinae (brushfoots)				
Anartia jatrophae	white peacock			
Family: Sphingidae (sphinx moths, hawk moths, hornworms)				
Eumorpha fasciatus	banded sphinx moth			

KEY:

FWS (U.S. Fish & Wildlife Service)
T - Threatened
E - Endangered
T(SA) - Threatened for Similar Appearance

FWC (Florida Fish & Wildlife Conservation Commission)
FT/FE - Federally Listed Threatened/Endangered
FT(SA) - Federally Threatened for Similar Appearance
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 - Demonstratebly secure
Q - Subspecies or variety questioned

* = Non-native

Appendix D: Financial Considerations

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Expended Costs 2000-2016

Natural Resource Management		
Item	Funding Source	Costs
Native Slash Pine Tree Plantings	Donation	Donation
Mechanical Brush Reduction	C20/20	$16,000.00
Exotic Plant Treatments:		
Contracted	C20/20	$52,837.00
Collective Workgroup	SwFISWG	$82.46
Partnership	Lee Timber	$0.00
In House	C20/20	$16,462.00
	Total	**$85,381.46**

Overall Protection		
Item	Funding Source	Costs
Contracted Fireline Installation	C20/20	$3,350.00
Fireline Maintenance	C20/20	$10,320.00
Prescribed Burns	C20/20, FFS	In House
Debris Removal	C20/20	In House
	Total	**$13,670.00**

Public Use		
Item	Funding Source	Costs
Preserve Signage	C20/20	$170.00
	Total	**$170.00**

ORP Total Expended Cost To Date **$99,221.46**

Appendix D: Financial Considerations

Projected Costs 2016-2026

Natural Resource Management			
Item	Funding Source	Costs	Occurrences
Exotic Plant Treatments	C20/20	In House	10 times
Contracted Exotic Plant Treatments	C20/20	$4,937.40	3 times
Prescribed Burns	C20/20	$872.00	3 times
Mechanical Brush Reduction	C20/20	$10,280.00	2 times

Overall Protection			
Item	Funding Source	Costs	Occurrences
Fireline Maintenance	C20/20	$344.00	10 times
Boundary Sign Replacement	C20/20	$20.00	1 time
Debris Removal	C20/20	$25.00	1 time

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 **$4,147.32 per year**.

Total projected annual management expense will be **$41,473.20 over 10 years.**

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