

Buttonwood Preserve



Land Stewardship Plan 2014

Buttonwood Preserve Land Management Plan

Pine Island Road NW
St. James City, Florida 33956



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

Approved by the Lee County Board of County Commissioners: 8-5-2014

Acknowledgements

We would like to thank the following for their assistance in the development of this document: The Conservation 20/20 Land Acquisition and Stewardship Advisory Committee, Cathy Olson, and other Lee County staff for carefully reviewing this Land Management Plan. Additional thanks to Jessica Lowery and Kharli Rose for assistance with field work and research for preparation of this plan.

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List of Acronyms

ATV	all-terrain vehicle
BP	Buttonwood Preserve
C20/20	Conservation 20/20
FDACS	Florida Department of Agriculture and Consumer Services
FDEP	Florida Department of Environmental Protection
FLU	future land use
FNAI	Florida Natural Areas Inventory
FWC	Florida Fish and Wildlife Conservation Commission
GPIWA	Greater Pine Island Water Association
HPT	Heron Pond Tract
IRC	Institute for Regional Conservation
LCDCD	Lee County Department of Community Development
LCPR	Lee County Parks and Recreation
LCEC	Lee County Electric Cooperative
LMP	Land Management Plan
LSOM	Land Stewardship Operations Manual
LiDAR	Light Detecting and Ranging
MU	Management Unit
SFWMD	South Florida Water Management District
ORV	Off-Road Vehicle
STRAP	Section-Township-Range-Area-Block.Lot (Parcel)
USFWS	United States Fish and Wildlife Service

VISION STATEMENT

It is the vision of the Lee County Parks and Recreation Department and the Conservation 20/20 Program to conserve, protect, and restore Buttonwood Preserve to a productive, functional, and viable ecosystem. The primary stewardship objective will be to improve their ecosystems through exotic plant removal and prevention of harmful public access. Implementation of stewardship activities will protect the site's hydrologic features and enhance habitat and foraging opportunities for wildlife.

I. EXECUTIVE SUMMARY

Buttonwood Preserve (BP) is located in western Lee County within Sections 27 and 34, Township 44 South, Range 22 East, on Pine Island. Currently this Preserve is accessed on foot by County Staff from Pine Island Road and there is no legal access to the upland communities for vehicles to access the property, however the Greater Pine Island Water Association is currently allowing staff access through their property which is adjacent on the south end of the Preserve.

Nomination 276-2 was acquired on February 13, 2012 through the Conservation 20/20 Program (C20/20) at a cost of \$772,000 with a \$20,000 contribution for acquisition from the Calusa Land Trust and Nature Preserves of Pine Island. That portion of the BP was 218.8 acres, which equates to approximately \$3,528 per acre. Two years later, Nomination 276-2B was purchased for \$30,000 for 48.8 acres (\$615 per acre). This nomination had been separated from the portion south of Pine Island Road due to title issues. C20/20 was established in 1996 after Lee County voters approved a referendum that increased property taxes by up to 0.5 mil for the purpose of purchasing and protecting environmentally sensitive lands.

The 5.4 acre Heron Pond Tract (HPT) of the Buttonwood Preserve was donated to Lee County on October 11, 1989 by the First Baptist Church of St. James City, Florida Inc.

This Lee County Preserve totals 273 acres. The eastern portion of BP is adjacent to Pine Island Creek which separates Pine Island from Little Pine Island, a 4,700 acre mitigation bank. A mixture of public and private properties borders the other three boundaries. BP is bisected by Pine Island Road.

The natural elevations range from 6 - 8 feet above sea level on a berm located on the central west boundary and slope in a general easterly direction down to sea level at Pine Island Creek.

BP contains six different soil types. The soils within the Preserve have all been identified as having severe physical limitations; either wetness, being too sandy or for having too much humus. Hallandale Fine Sand, Tidal and Peckish Mucky Fine Sand are the most common soil types for BP and cover 42% of the Preserve. Hallandale Fine Sand, Tidal makes up over 89% of the soil at HPT.

HPT is located within the South Pine Island subbasin of the South Florida Water Management District's Lower West Coast Region. The rest of the Preserve is split between the North Pine Island and South Pine Island subbasins. BP lies in the South Charlotte Harbor Watershed.

Hydrological alterations have been made on and directly adjacent to the Preserve which affect the natural sheet flow across the lands. The existing ditches, berms, ponds and plow lines all influence the water flow on the site by either interrupting sheet flow or holding water for extended periods in some areas, while excessively draining other areas.

BP contains a combination of wetland and upland communities which serve as important habitat for a variety of birds, mammals, reptiles and amphibians. There are seven natural or altered plant communities described by the Florida Natural Areas Inventory. Mangrove swamp and disturbed mesic flatwoods are the most common plant communities on these BP. Over 75% of the Preserve is classified as wetlands.

The 1944 aerials show that, with the exception of several shallow ditches which cut across BP, the property is otherwise largely in a natural and untouched condition. However, as time went on, invasive exotic plants grew in the uplands and in 1972 the pond on HPT was excavated.

Due to ditches and guardrails along Pine Island Road and the sensitive wetlands and soils, there is no reasonable vehicular access to the Preserve. Public amenities will not be provided because of the sensitive communities, lack of practical public access and proximity to other public lands with public access. As with all C20/20 preserves, groups requesting guided walks will be accommodated by staff as time and site conditions allow.

The goal of this land management plan is to identify the resources of BP, develop strategies to protect the resources and to define restoration activities to restore the Preserve to productive, functional and viable ecosystems while ensuring they will be managed in accordance with Lee County Parks and Recreation's Land Stewardship Operations Manual.

Restoration and management activities will focus on controlling invasive exotic plant and animal species, prevention of illegal vehicle access, protecting listed species, removing debris and enhancing wildlife habitat. A Management Action Plan outlines restoration and stewardship goals. This plan outlines these goals and strategies, explains how the goals will be accomplished, and provides a timetable for completion. Any future additions to the Preserve will be managed similarly to this land management plan. This plan will be revised in ten years (2024).

II. INTRODUCTION

The majority of Buttonwood Preserve (BP) was acquired through the Conservation 20/20 (C20/20) Program for a total cost of \$802,000 for 267.6 acres. The portion south of Pine Island Road was purchased on February 12, 2012. The portion north of Pine Island Road was purchased on March 27, 2014.

The Calusa Land Trust and Nature Preserves of Pine Island contributed \$20,000 towards the acquisition of the southern portion of BP. Nomination 276 was initially considered for purchase in 2004 but was withdrawn due to a third party contract.

The 5.3 acre Heron Pond Tract (HPT) of Buttonwood Preserve was donated to Lee County on October 11, 1989 by the First Baptist Church of St. James City, Florida Inc. HPT is managed by Lee County Parks and Recreation (LCPR) without C20/20 funding, since it was not acquired through the C20/20 program.

The Preserve contains wetland and upland communities which serve as important habitat for a variety of wildlife. The Preserve contains seven natural or altered plant communities; the majority of which consists of mangrove swamp and disturbed mesic flatwoods. Approximately 30% of the Preserve has been categorized as disturbed communities, primarily due to an abundance of invasive exotic species, off-road vehicle (ORV) usage, lack of fire and hydrologic alterations. Over 75% of the Preserve falls into a wetland category.

The plant communities serve as important habitat for a variety of wildlife. Several listed species utilize the Preserve, including gopher tortoise (*Gopherus polyphemus*) and white ibis (*Eudocimus albus*). The wildlife and overall ecosystem will benefit from enhancement of plant communities through invasive exotic plant removal/control and elimination of vehicle traffic across the salt flats and salt marsh.

The purpose of this management plan is to define conservation goals for the Preserve that will address the above concerns. It will serve as a guide for LCPR to use best management practices to ensure proper stewardship and protection of BP. It also serves as a reference guide because of the field studies and research of scientific literature and historic records conducted by C20/20 staff.

III. LOCATION AND SITE DESCRIPTION

BP is located in western Lee County on Pine Island within Section 27 and 34, Township 44, Range 22 E on the north western boundary of the City of St. James. The Preserve consists of STRAP#s 27-44-22-00-00001.0000, 27-44-22-00-00001.1000, 27-44-22-00-00001.0020, 27-44-22-00-00001.2000, and 34-44-22-00-00001.0000. HPT is located adjacent to the main portion of BP on the south side of Pine Island Road. The STRAP# for is 27-44-22-00-00000.1001A.

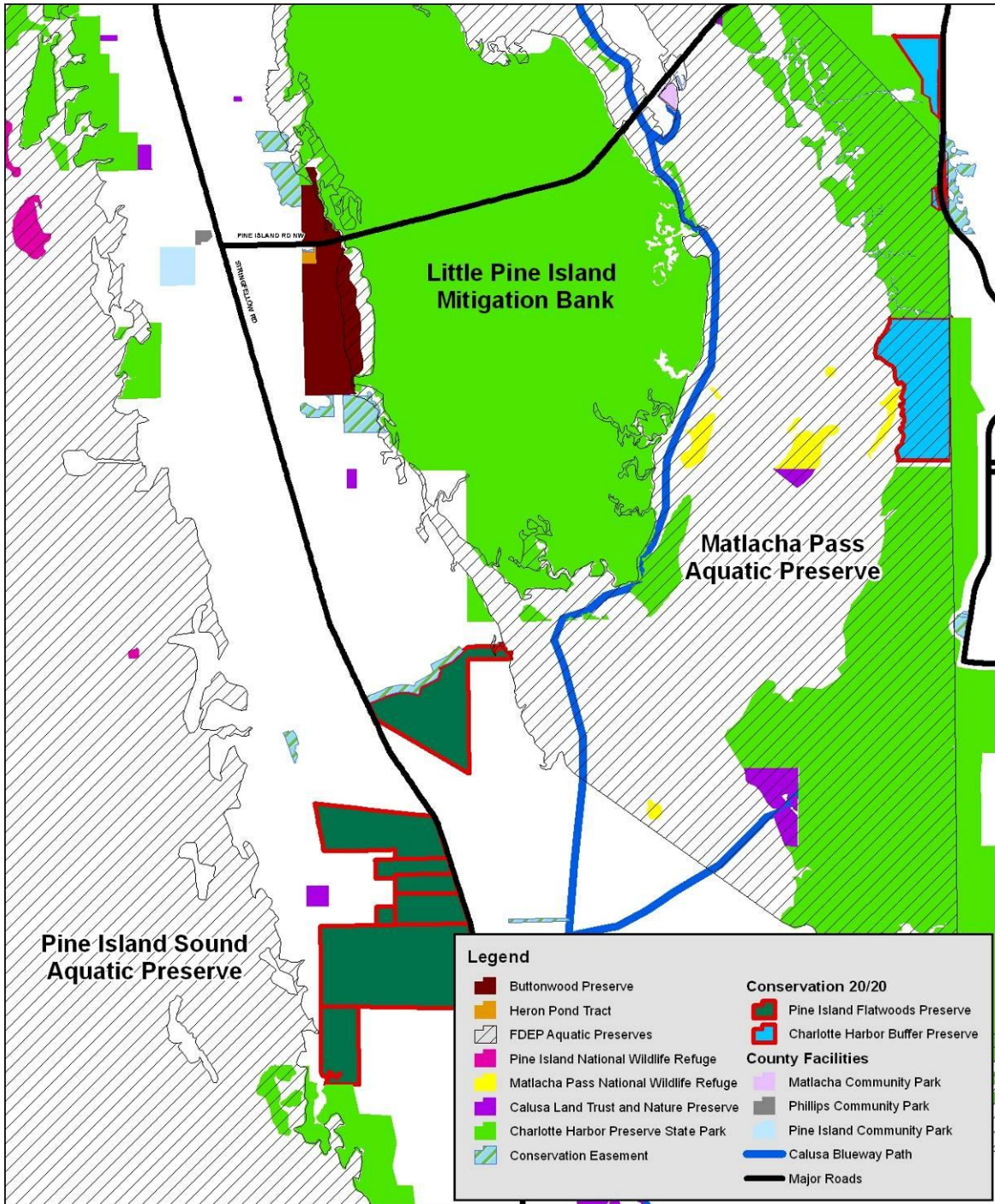
BP is located directly across Pine Island Creek from the Little Pine Island Mitigation Bank, owned by the state of Florida as part of the Charlotte Harbor Preserve State Park. The southeastern portion is adjacent to Florida Department of Environmental Protection (FDEP)'s Matlacha Pass Aquatic Preserve. The southern boundary is adjacent to two undeveloped properties owned by the

Greater Pine Island Water Association (GPIWA) and the Lee County Electric Cooperative (LCEC). A portion of the BP's western boundary is adjacent to property owned by the Lee County Mosquito Control District and to undeveloped privately owned property. Pine Island Road bisects the Preserve.

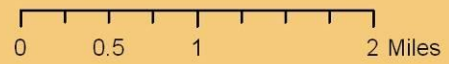
BP is approximately 273 acres in size. The parcel is comprised of 135 acres of mangrove wetlands along Pine Island Creek, 44 acres of submerged (creek bottom) land in Pine Island Creek and 53 acres of disturbed flatwoods. Mangroves are important as a nursery for juvenile fish and filter water pollutants before they reach Pine Island Creek. The uplands are currently vegetated primarily with the invasive exotic tree species melaleuca (*Melaleuca quinquenervia*) and Australian pine (*Casuarina equisetifolia*).

Figure 1 shows the location of BP while Figure 2 identifies the boundaries of the Preserve in a 2013 aerial photograph.

Figure 1: Location Map



Buttonwood Preserve

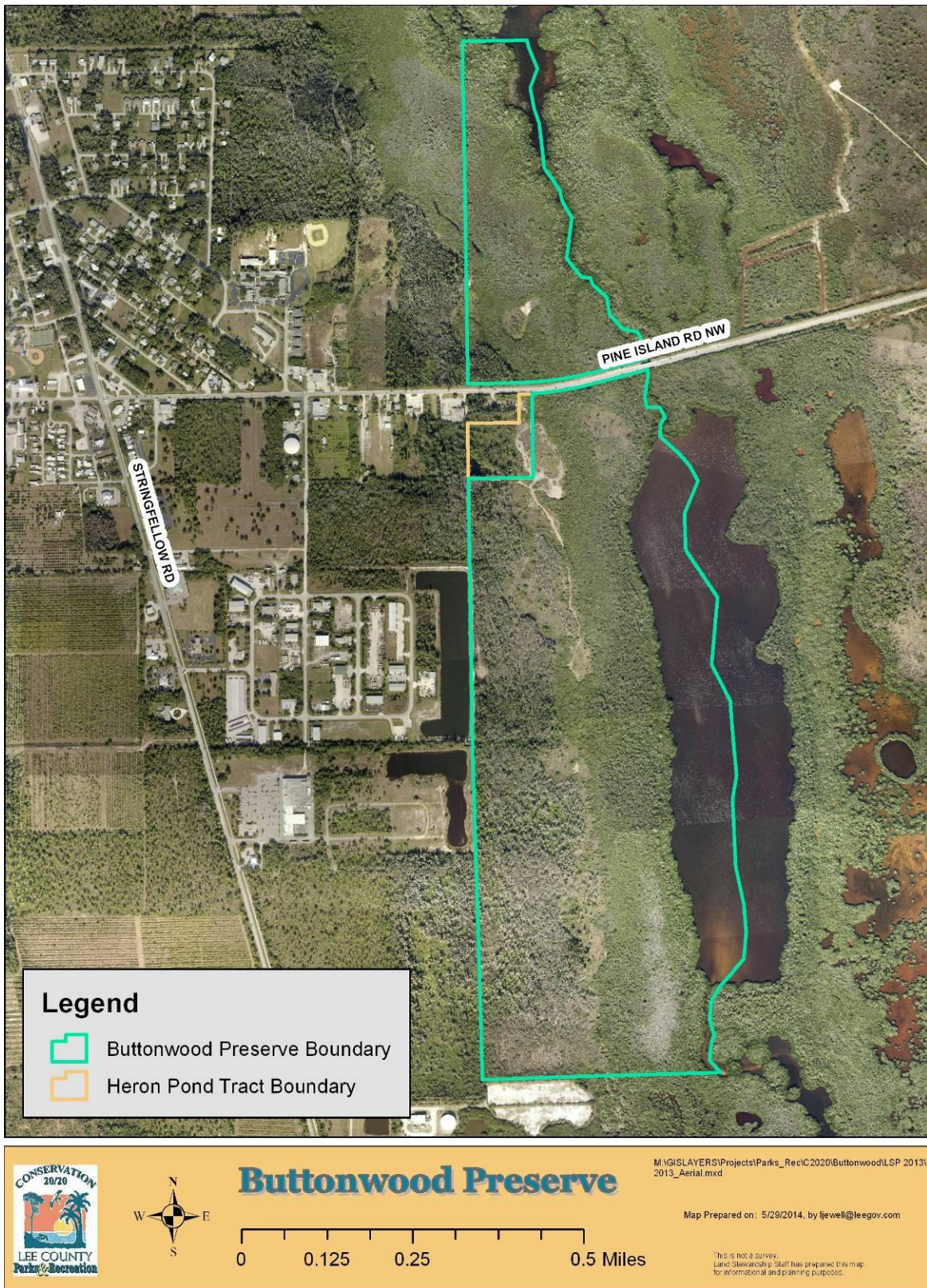


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Map Prepared on: 5/30/2014, by ljewell@lee.gov.com

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

Figure 2: 2013 Aerial



IV. NATURAL RESOURCES DESCRIPTION

A. Physical Resources

i. Climate

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

ii. Geology

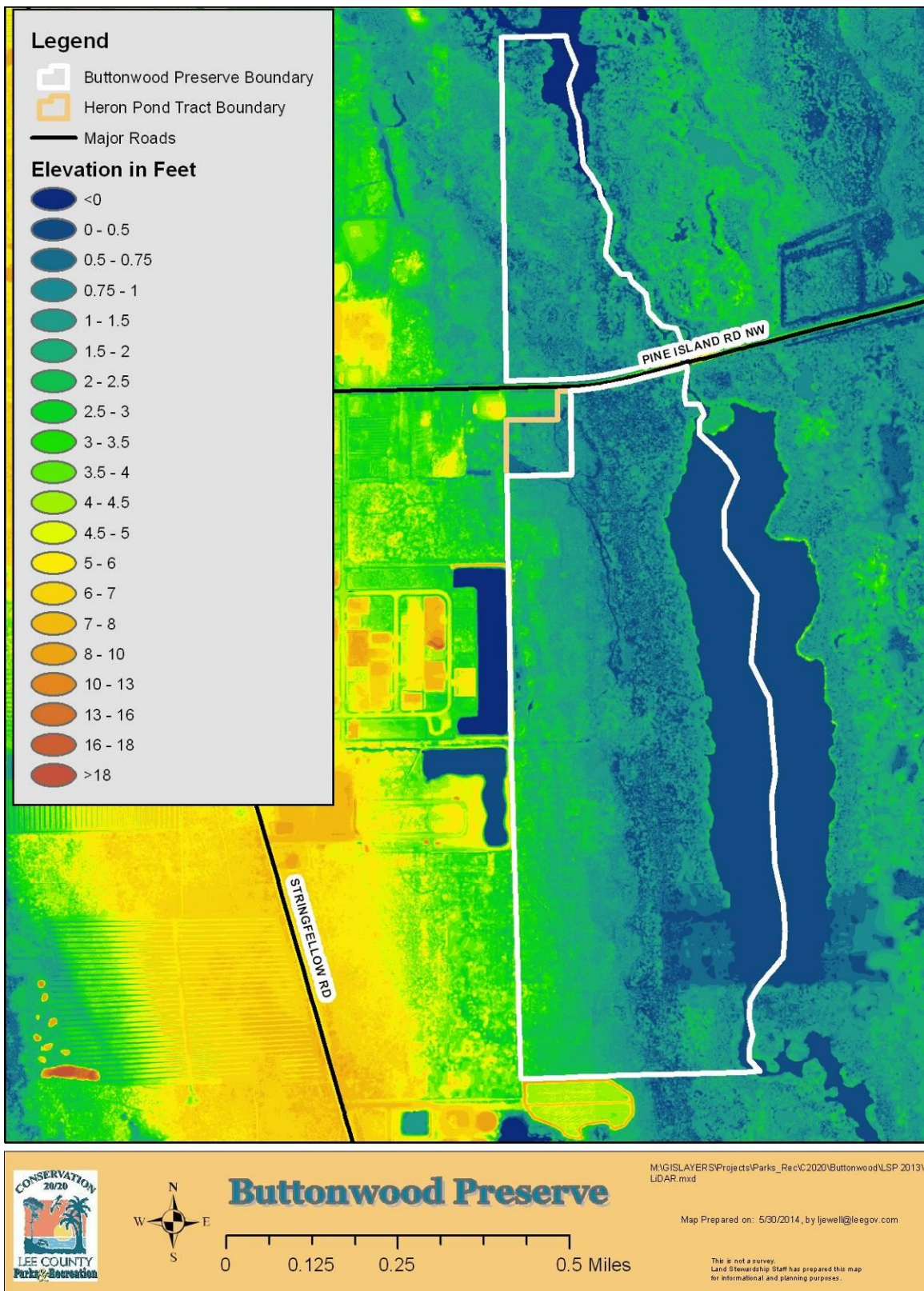
Specific information on the geologic features such as physiographic regions, formations and maps can be found in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

iii. Topography

Natural elevations on BP range from 2-3 feet on the western edge, south of Pine Island Road to sea level on the eastern boundary. North of Pine Island Road, the Preserve elevation consists of a low, (~2'), central ridge that drops to less than one foot on both sides. The highest portion of the BP is located on the west boundary, where a berm for a pond was constructed. Pine Island Road, which bisects BP, is between four and six feet above sea level.

The following topographic map (Figure 3) uses light detecting and ranging (LiDAR) data, which is an optical remote sensing technology that measures properties of scattered light to find range and/or other information of a distant target. These data were collected in 2007 and represent the published 5-foot digital elevation model.

Figure 3: LiDAR Map

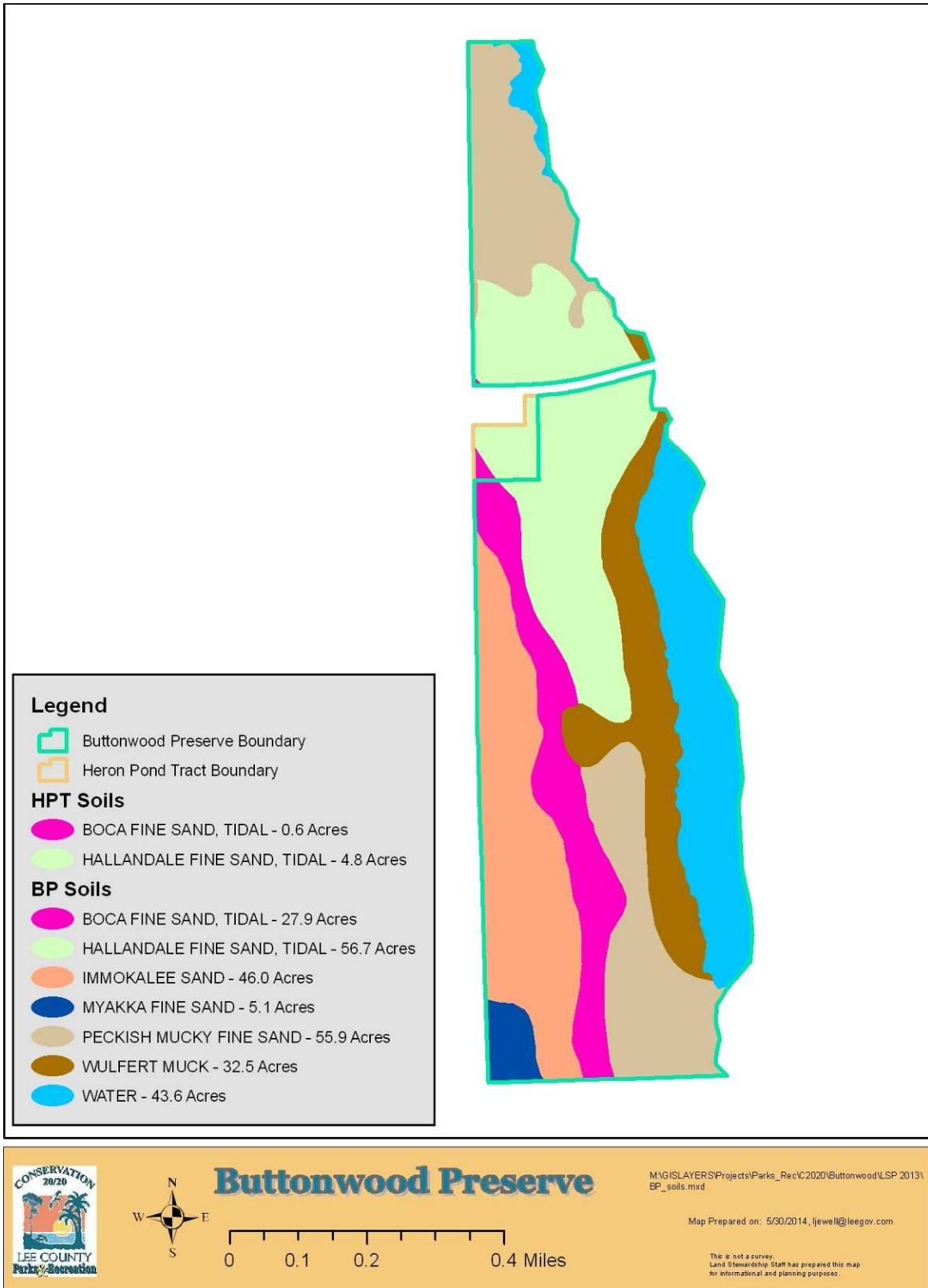


iv. Soils

BP contains a total of six different soil types. Acreage, soil types and descriptions are provided in Appendix A and Figure 4. Since 43.6 acres or 16% of BP is classified as water, soil type percentage of the Preserve does not add up to 100% in Appendix A.

Refer to the LSOM's Land Stewardship Plan Development and Supplemental Information section for additional information on soil types and limitation.

Figure 4: Soils Map



v. Hydrologic Components and Watershed

HPT is located within the South Pine Island subbasin of the South Florida Water Management District's (SFWMD) Lower West Coast Region. The rest of the Preserve is split between the North Pine Island and South Pine Island subbasins. The entire Preserve lies in the South Charlotte Harbor Watershed (Figure 5).

Figure 6 shows wellfield protection zones, which staff will need to be aware of when planning exotic plant treatments or contracting work. Further information on wellfield protection zones can be found in the Other Legal Constraints section of this Land Management Plan (LMP).

Figure 6 also shows several old agricultural ditches identified during fieldwork for this LMP and two artificial ponds. In addition to these larger features, multiple two-track trails traverse the site and act as shallow ditches. Some of this ditching may be related to plow line installation in areas where past wildfire activity occurred. The unnatural features will be discussed more fully in the Internal Influences section of this plan.

In 1974 the United States Fish and Wildlife Service (USFWS) directed its Office of Biological Services to conduct an inventory of the nation's wetlands. Wetlands were identified on aerial photography by vegetation, visible water features and geography, and subsequently classified in general accordance with the Classification of Wetlands and Deep Water Habitats of the United States (Cowardin et al. 1979). The majority of BP is classified as wetlands. More information about the different classifications can be found there, or in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

Figure 5: SFWMD Subbasin Map

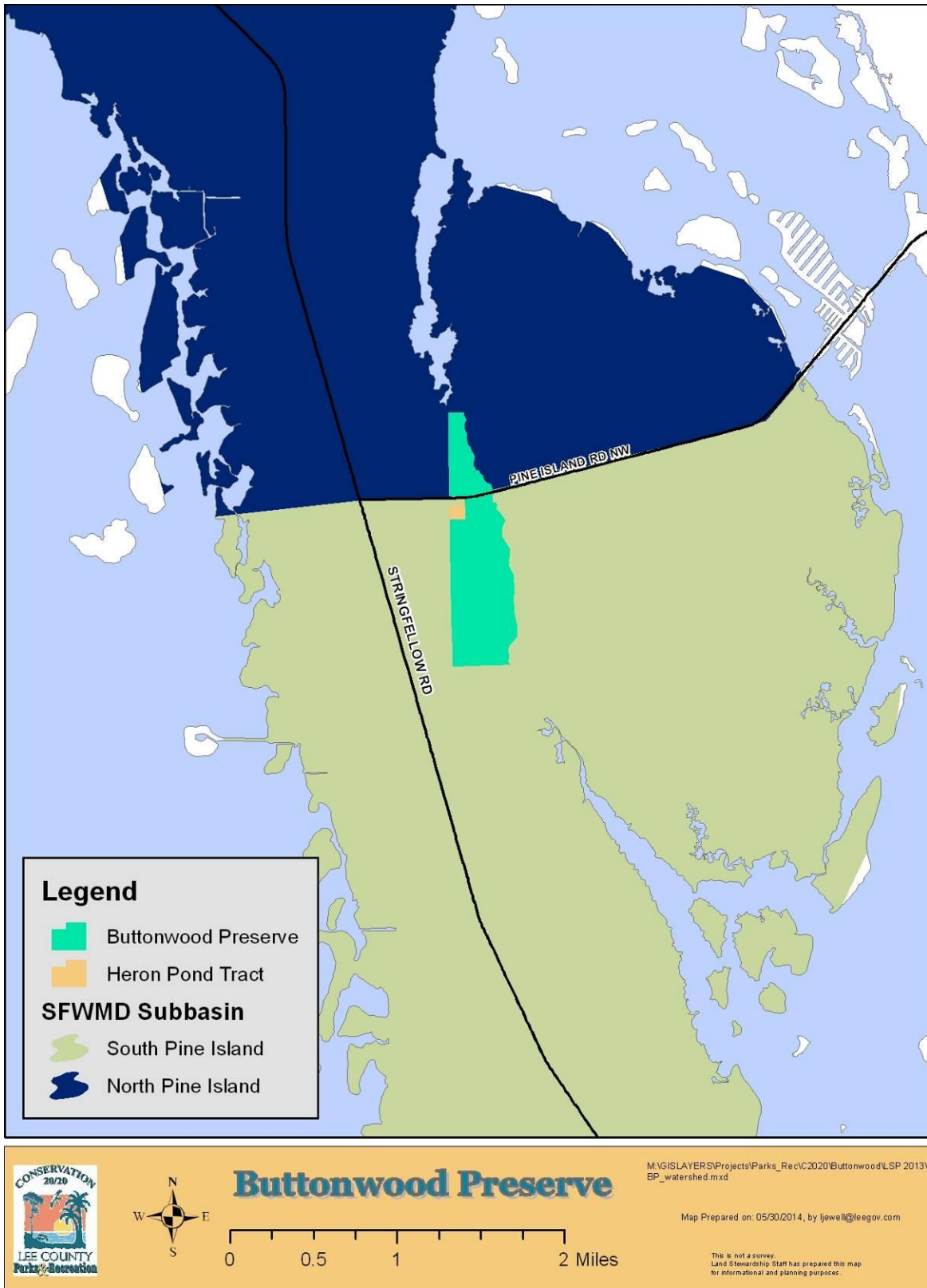
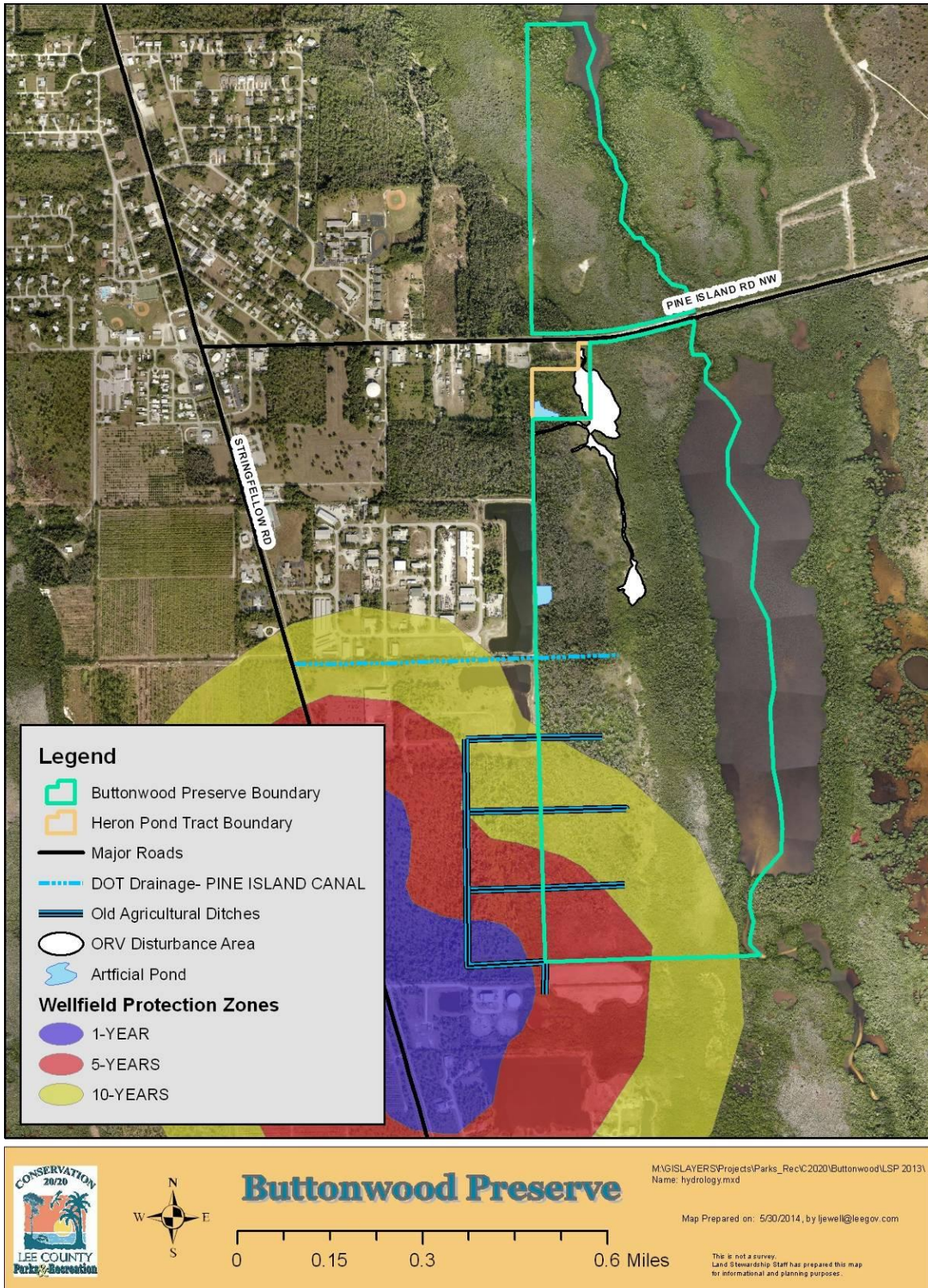


Figure 6: Hydrologic Features Map



B. Biological Resources

i. Ecological Function

BP has both upland and wetland communities. Although the Preserve is relatively small in size, when combined with adjacent conservation easements and public conservation lands (Figure 1) they provide contiguous habitat for a wide variety of wildlife.

Pine flatwoods provide essential cover and forage material for a variety of birds, small mammals, reptiles and amphibians and some large mammals including gopher tortoise, eastern indigo snake and Florida black bear (*Ursus americanus floridanus*). Birds find shelter in the palmetto understory, nest in the tall pines and forage in the grasses. Oak toads (*Bufo quercicus*) will dig burrows in the sandy soil and hunt for spiders and insects. There are a number of rare wildlife species that primarily occur in the flatwoods, as well as numerous rare plants, including some endemic species. During the wet season, these communities provide dry refuge for non-aquatic animals. During a severe flood, the flatwoods serve as a water storage area to help protect adjacent land from flooding (Tiner 1998).

The other community that dominates BP is an extensive mangrove swamp. Mangrove swamps are significant because they function as a nursery ground for most of Florida's commercially and recreationally important fish and shellfish. Occurring in flat coastal areas, the soils are generally saturated with brackish water at all times, and at high tides the soils are usually inundated with standing water. In older areas, the sands and mud are usually covered by a layer of peat that builds up from detritus (decaying plant material). Temperature, salinity, tidal fluctuation, substrate and wave energy are five physical factors influencing the size and extent of these communities.

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

Mangrove swamps also provide breeding grounds for substantial populations of wading birds, shorebirds and other animals (FNAI 1990). Mangrove cuckoos

(*Coccyzus minor*), black-whiskered vireos (*Vireo altiloquus*) and gray kingbirds (*Tyrannus dominicensis*) may utilize the mangrove swamps found throughout Lee County's preserves for nesting. These three species are dependent on mangroves and their numbers are jeopardized by the fragmentation of mangroves. There are several wildlife species that are found exclusively in mangrove swamps, including mangrove salt marsh snakes (*Nerodia clarkii compressicauda*) and at least two butterfly species. The mangrove skipper (*Phocides pigmalion*) and the black mangrove buckeye (*Junonia evarete*) both depend on mangroves as a larval food source. Additionally, mangroves can produce up to 80% of the total organic material available in the aquatic food web through the continuous shedding of their leaves and other plant components (FNAI 1990).

ii. Natural Plant Communities

BP consists of seven natural or altered plant communities; the majority of which consist of mangrove swamp and disturbed mesic flatwoods. Approximately 30% of BP has been categorized as disturbed communities, primarily due to an abundance of invasive exotic species, ORV usage and lack of fire or hydrologic alterations. Nearly 75% of the Preserve is wetlands. The plant communities (Figure 7) are defined using the Guide to the Natural Communities of Florida (2010) prepared by the Florida Natural Areas Inventory (FNAI).

Acreages and percentage cover for each community are listed below. A complete list of plant species identified during site inspections of BP can be found in Appendix B. This list will be updated on a seasonal basis to identify plants in their inflorescence phase. Descriptions of the plant communities and characteristic animals found within each community, as well as management suggestions, can be found in the LSOM.

Mangrove Swamp – 135.7 acres, 49.7% coverage of BP

This plant community is primarily an undisturbed and intact mangrove system. The land slopes gently from the west to the east where it meets the water of Pine Island Creek.

Salt Marsh – 12.82 acres, 4.7% coverage of BP

This plant community is located between the mangrove swamp and the uplands. Native plants such as shoreline seapurslane (*Sesuvium portulacastrum*), bushy seaside oxeye (*Borrchia frutescens*), and saltwort (*Batis maritima*) are thriving in this plant community.

Salt Marsh (Disturbed) – 7.14 acres, 2.6% coverage of BP

This community has been heavily impacted by the numerous ORV trails. Prevention of ORV use should help to promote the recovery of this plant community.

Invasive Exotic Monoculture – 19.3 acres, 7.0% coverage of BP

Melaleuca, Brazilian pepper (*Schinus terebinthefolius*) and Australian pine are a few of the invasive exotic species that are causing the disturbance in this primarily upland plant community. Exotic plants will be treated in order to allow native plants to repopulate this portion of the Preserve.

Mesic Flatwoods (Disturbed) – 53.95 acres, 19.8% coverage of BP

This community contains saw palmettos (*Serenoa repens*), south Florida slash pines (*Pinus elliottii* var. *densa*), and wax myrtles (*Myrica cerifera*). It is located along the western boundary, which is the highest and driest portion of the property. Exotic plants are scattered throughout this plant community. A ditch, wildfire plow lines, and the exotic plants within this community are the major disturbances.

Unconsolidated Substrate – 43.9 acres, 16.1% coverage of BP

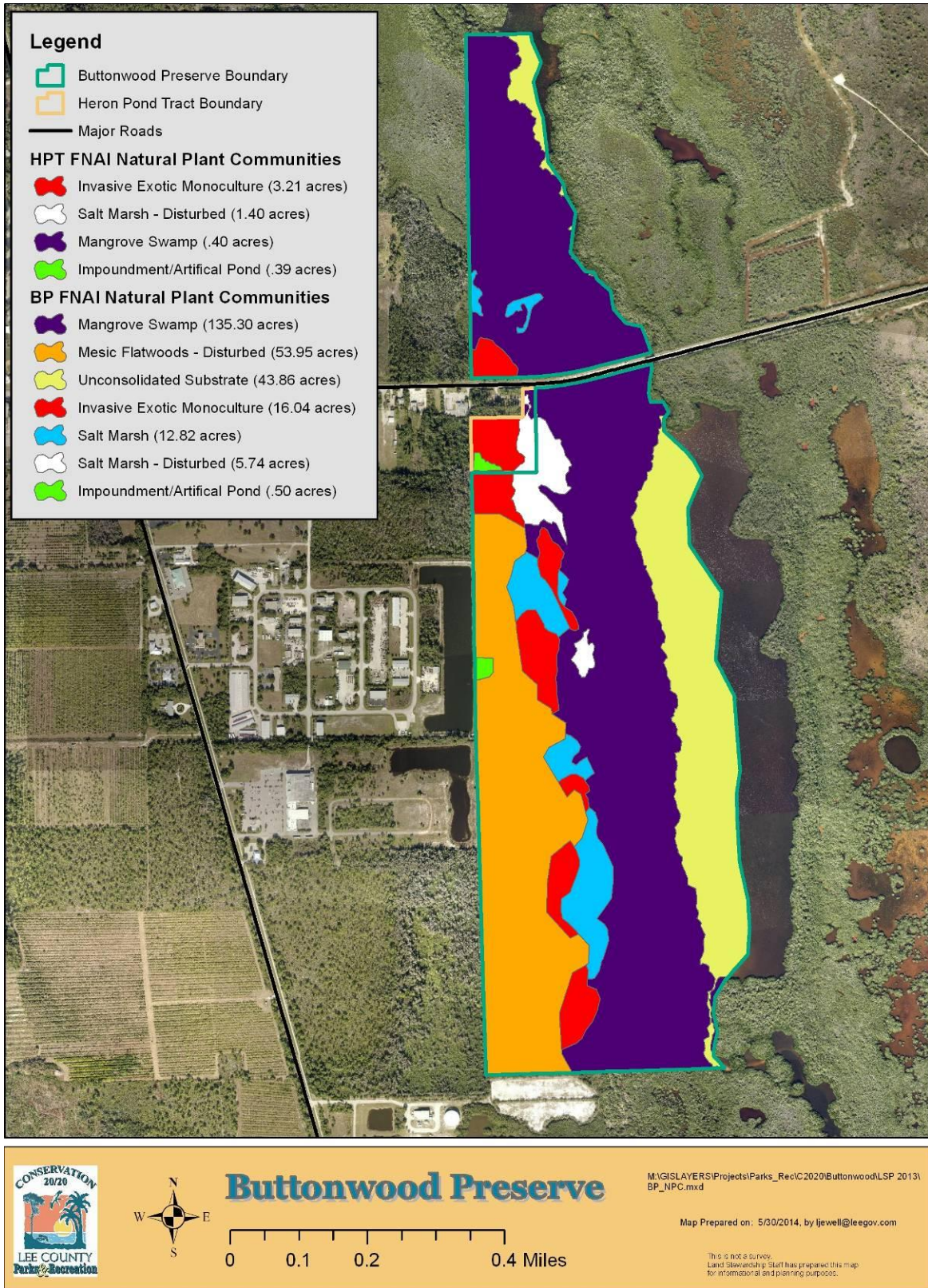
The portion of BP that includes Pine Island Creek along the eastern boundary of the property makes up this community. This is an aquatic plant community which consists primarily of the creek bottom.

Altered Landcover Types:

Impoundment/Artificial Pond – 0.9 acres, 0.3% coverage of BP

There are two small borrow ponds on the western property boundary. Wading birds, turtles, smaller fish and an American alligator (*Alligator mississippiensis*) have been noted in the ponds.

Figure 7: Plant Communities Map



iii. Fauna

BP provides a variety of habitats for wildlife, including those that are state and federally listed. Four exotic wildlife species have been documented on the Preserve. Appendix C contains the complete list of wildlife documented on the Preserve at the time of writing this LMP; as recorded through staff field work and site inspections.

Stewardship goals will focus on maintaining healthy, functioning ecosystem processes to provide optimal habitat for native wildlife (including listed species). Restoration of the disturbed areas and control of invasive exotic plants and animals will be critical components in providing the best possible habitat for native wildlife.

Additional general information about fauna on all C20/20 preserves can be found in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

iv. Designated Species

There are a variety of designated animal and plant species on the Preserve. Although all native plant and animal species found on the Preserve have some protection due to the preservation of this property, certain species need additional attention. For management purposes, all plants and animals listed by the USFWS, Florida Fish and Wildlife Conservation Commission (FWC), Florida Department of Agriculture and Consumer Services (FDACS), the Institute for Regional Conservation (IRC) and FNAI will be given special consideration for possible recreation and restoration projects. If additional listed species are documented on the Preserve, they will be added to the lists in Appendices B or C.

The following are brief summaries of designated wildlife species and reasons for their decline. Unless stated otherwise, the reasons for the species' decline and the management recommendations, if available, were obtained from Hipes et al. (2001).

Gopher Tortoise

Gopher tortoises are in decline throughout their range due to loss and degradation of habitat. As a species dependant on dry, upland communities, much of their habitat has been lost to urban and residential development, agriculture, citrus groves, mining and pine plantations. Additional threats include a highly contagious respiratory disease and human consumption.

Exotic plant removal, pine tree thinning, brush reduction, and prescribed burning will benefit this species. Until an access is constructed through the GPIWA

property, prescribed burning and any thinning or brush reduction will not be possible on BP. When access is established for equipment, restoration activities that utilize heavy equipment Staff will take into account areas with high burrow density. Depending on the time of year and concentration of burrows, staff may flag individual burrows or larger areas and advise equipment operators to avoid any damage to the individual burrows or the entire area marked off. High intensity chopping should be planned for winter months when gophers will be less active outside of the burrow.

White Ibis

The white ibis is declining throughout its range due to the reduction and degradation of wetlands as well as human disturbances to their rookeries.

Plant Species

In addition to designated wildlife, BP may provide habitat for plant species listed by the IRC or FDACS. The following are brief summaries of the FDACS designated plant species explaining reasons for their decline and typical communities where they are located.

Cardinal and Giant Airplants

Cardinal airplants (*Tillandsia fasciculata* var. *densispica*) and giant airplants (*Tillandsia utriculata*) are found in hammocks, cypress swamps and pinelands. Threats to these plants include illegal collecting, habitat destruction and the Mexican bromeliad weevil (Save 2004). Now listed as Endangered by the FDACS, these airplants were once considered common before the arrival of the weevil in Florida in the late 1980s.

Golden Leather Fern

Golden leather fern (*Acrostichum danaeifolium*) is a state threatened plant found in mangrove swamps, saltwater and brackish marshes and coastal hammocks. Its range is restricted to the southern coastal regions of Florida.

IRC, which is not a regulatory agency, also maintains a listing of threatened plant species. IRC's designation is either obtained from their book Rare Plants of South Florida: Their History, Conservation and Restoration, (Gann 2002) or internet website (www.regionalconservation.org). Scientists working for this Institute have conducted a tremendous amount of field work and research documenting plants occurring in conservation areas throughout Florida's 10 southernmost counties. This initial floristic inventory allowed the IRC to rank plant species in order to indicate how rare/common these plants are in protected areas. Rare plants are defined as being either very rare and local throughout their range in south Florida (21-100 occurrences, or less than 10,000 individuals),

or found locally in a restricted range. IRC only ranks those taxa as rare when there are fewer than 100,000 individuals. Imperiled plants are those that are imperiled in south Florida because of rarity (6-20 occurrences, or less than 3,000 individuals) or because of vulnerability to extinction. This can be due to some natural or human factors. IRC only ranks taxa as imperiled if there are fewer than 10,000 individuals. Critically Imperiled plants are defined as being either extremely rare (5 or fewer occurrences, or fewer than 1,000 individuals), or extremely vulnerable to extinction from natural or human factors. IRC only ranks those taxa as critically imperiled with 10,000 or fewer individuals.

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

- Prohibit recreational activities, such as ORV use, to avoid impacts to rare plant populations.
- Prevent illegal poaching of rare plants.
- Prosecute poachers to the fullest extent of the law.
- Implement an ongoing exotic pest plant control program.
- Educate exotic plant control crews about the rare plants to ensure they avoid non-target damage.
- Trap wild hogs, which can completely destroy the above ground vegetation and disturb all the soil in an area where they are feeding.
- Initiate prescribed fire regimes in communities that are fire adapted since this management tool is extremely critical for the protection of many rare plants.
- Divide the site so the entire area is not burned during the same year to also help protect these communities.
- Ensure that management activities do not negatively impact rare plant populations.

v. Biological Diversity

General information on biological diversity can be found in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

The integrity and diversity of BP must be protected when and wherever possible. Land Stewardship staff will perform the following actions in this regard:

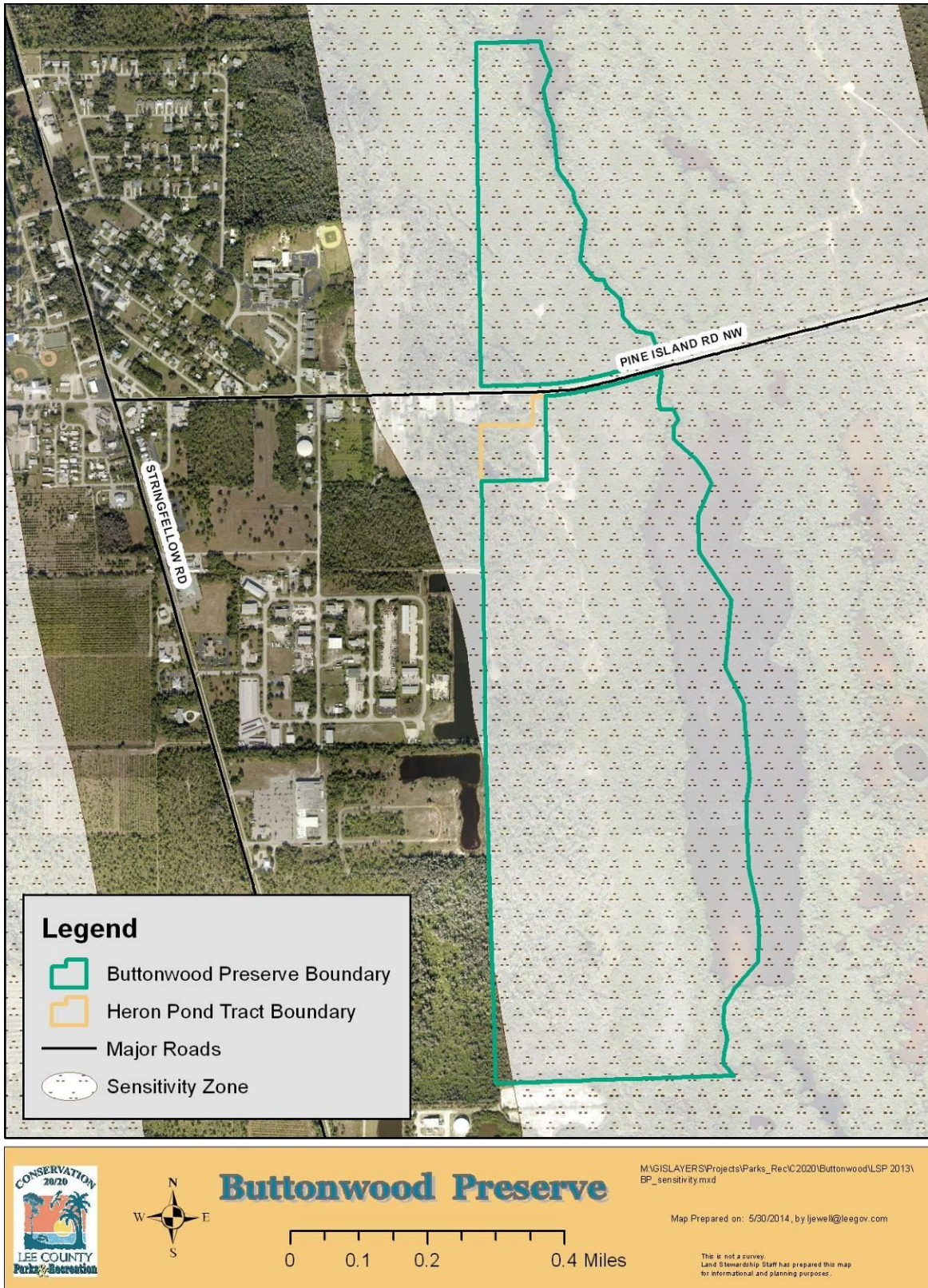
- Control of invasive, exotic vegetation, followed by annual maintenance, to provide more suitable habitat for native aquatic and terrestrial species.
- Control of invasive exotic animal populations to reduce their impacts on the herbaceous plants, native animals and soils.
- Maintain boundary signs to eliminate illegal access to the BP and protect fragile ecosystems. Continue to monitor the site for illegal ORV use and install fencing if necessary.
- Install and maintain "no berry picking" signs to inform palmetto berry pickers it is illegal to harvest them on the Preserve.
- Implement a prescribed fire program to closely mimic the natural fire regimes for different plant communities. This may increase plant diversity and ensure the canopies remain open.
- Where necessary, install perimeter fire breaks to protect resources on the Preserve and surrounding neighbors in the event of wildfires.
- Remove any debris and prevent future dumping on-site.
- Conduct ongoing surveys by utilizing volunteers and staff to catalog and monitor species diversity.
- Use adaptive management if monitoring of restoration techniques indicates a change may be necessary.
- Prevent and prosecute poaching and removal activities (e.g. palmetto berries, illegal hunting, pine cone and orchid collection).

C. Cultural Resources

i. Archaeological Features

Figure 8 illustrates that approximately 99% of BP falls into the Archaeological Sensitivity Level 2 category. General information on archaeological features in Lee County can be found in the LSOM.

Figure 8: Archaeological Map



ii. Land Use History

Human presence on Pine Island dates back 12,000 years ago with the Pre-Calusa Indians. The Calusa occupied the land until at least the middle of the 16th century.

C20/20 staff has reviewed available historical aeriels; however, only a few representative ones are placed within this LMP.

According to interpretations based on aerial photography dating back to 1944 (Figure 9), the property was largely untouched by humans. The exception is four shallow agricultural ditches that were created in the southern half of BP from adjacent agricultural fields to the west and Pine Island Road, bisecting BP.

By 1968, (Figure 10), construction of additional roads and buildings occurred west of BP and on the northern side of Pine Island Road. The agricultural endeavor fields are fallow and the related ditches have become overgrown with vegetation. The ditch, currently called Pine Island Canal has been dug from Stringfellow Road into the Preserve. The salt flats on the eastern side of BP show the beginnings of a tree canopy, most likely mangroves.

The 1972 aerial (Figure 11) shows substantial clearing and pond creation on HPT. The rest of BP, and the land around it remained relatively unchanged.

By 1975 (Figure 12) most of the cleared area of HPT started to revegetate. The rest of BP remained unaltered, with the exception of the appearance of Australian pines in HPT and the land, including BP to the north of Pine Island Road (Figure 12 inset).

The 1979 aerial (Figure 13) shows the retention pond and clearing for the commercial property on western boundary of BP and a network of roads was constructed to the west.

By 1986 (Figure 14) the road network and retention ponds on the western boundary of BP were completed and warehouse structures and homes have been built. It appears that either the ditch currently known as Pine Island Canal was cleaned out or a trail was opened along it. BP is more heavily wooded. Based on the size of the Australian pine and other invasive exotic trees on-site today, the trees in 1986 were likely the non-natives becoming established.

With the exception of increased vegetation, any other changes occurred outside of the Preserve boundary. More buildings were constructed on adjacent lands but no major ditching or roadways were added. Figure 15 shows a close up of the dramatic increase in invasive exotic plants between 1990 and 1999.

Figure 9: 1944 Aerial

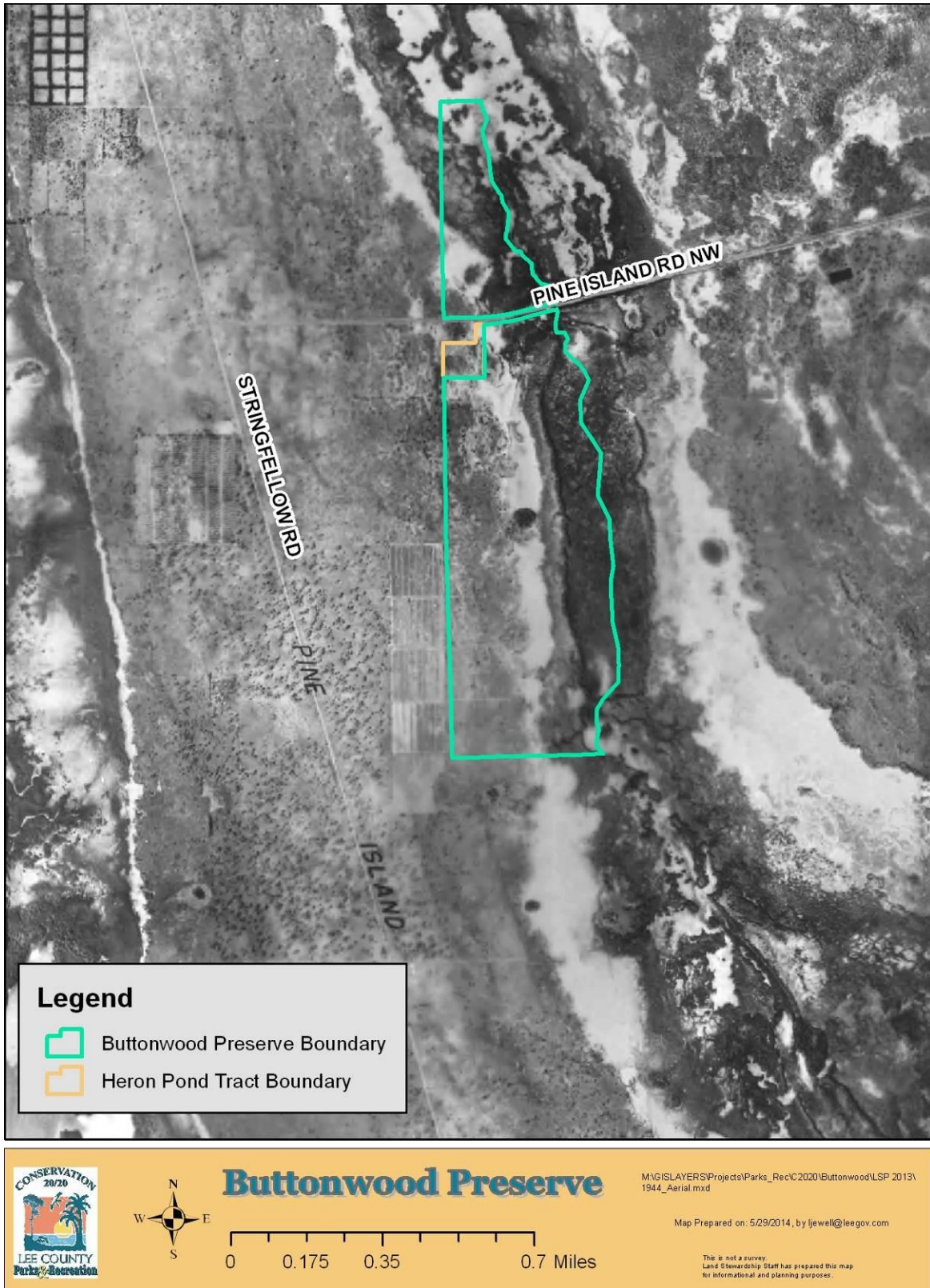
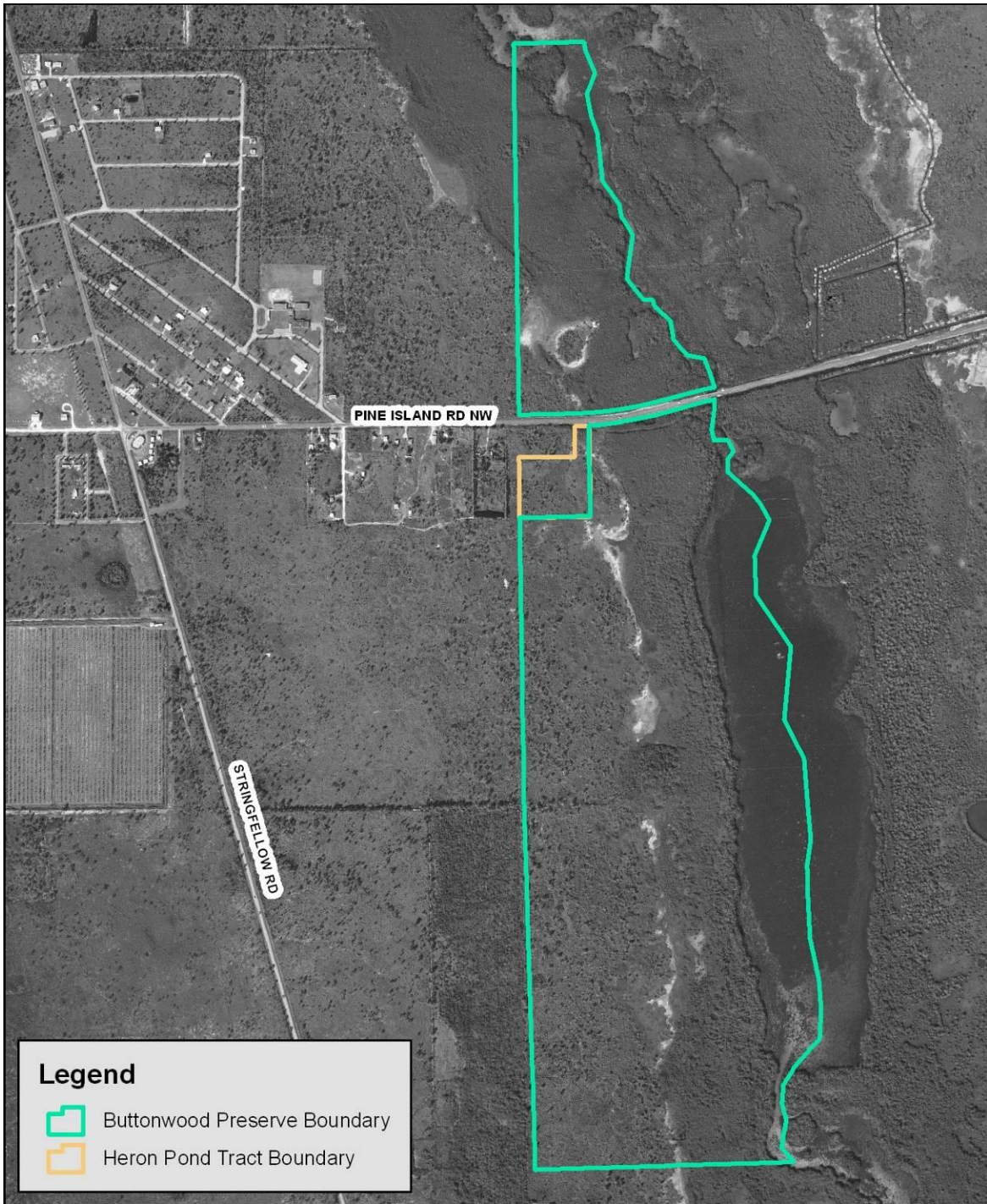




Figure 10: 1968 Aerial



  **Buttonwood Preserve** M:\GISLAYERS\Projects\Parks_Rec\2020\Buttonwood\LSP 2013\1968_Aerial.mxd

Map Prepared on: 5/29/2014, by ljewell@leegov.com

0 0.1 0.2 0.4 Miles

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

Figure 11: 1972 Aerial



Figure 12: 1975 Aerial

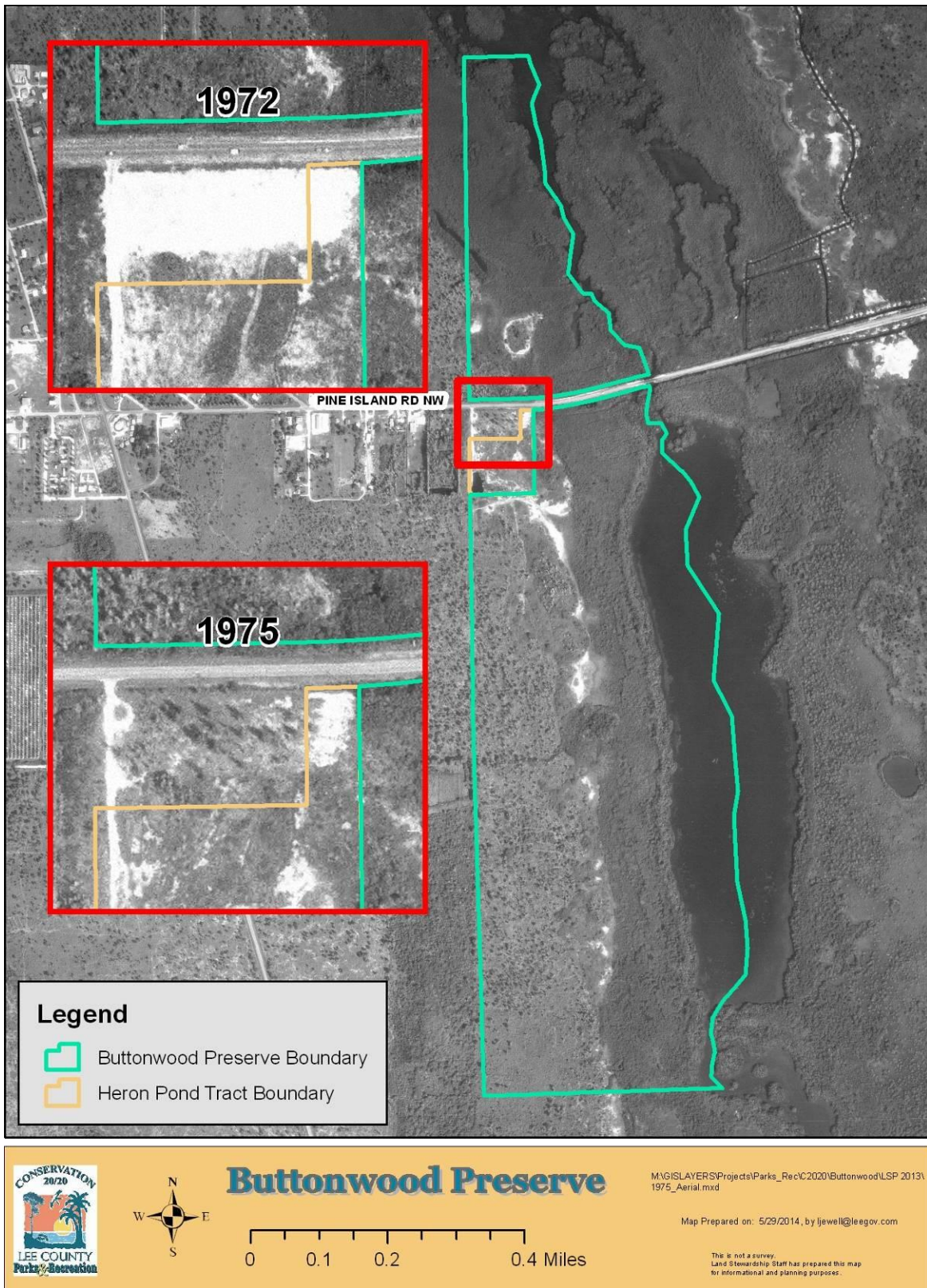


Figure 13: 1979 Aerial

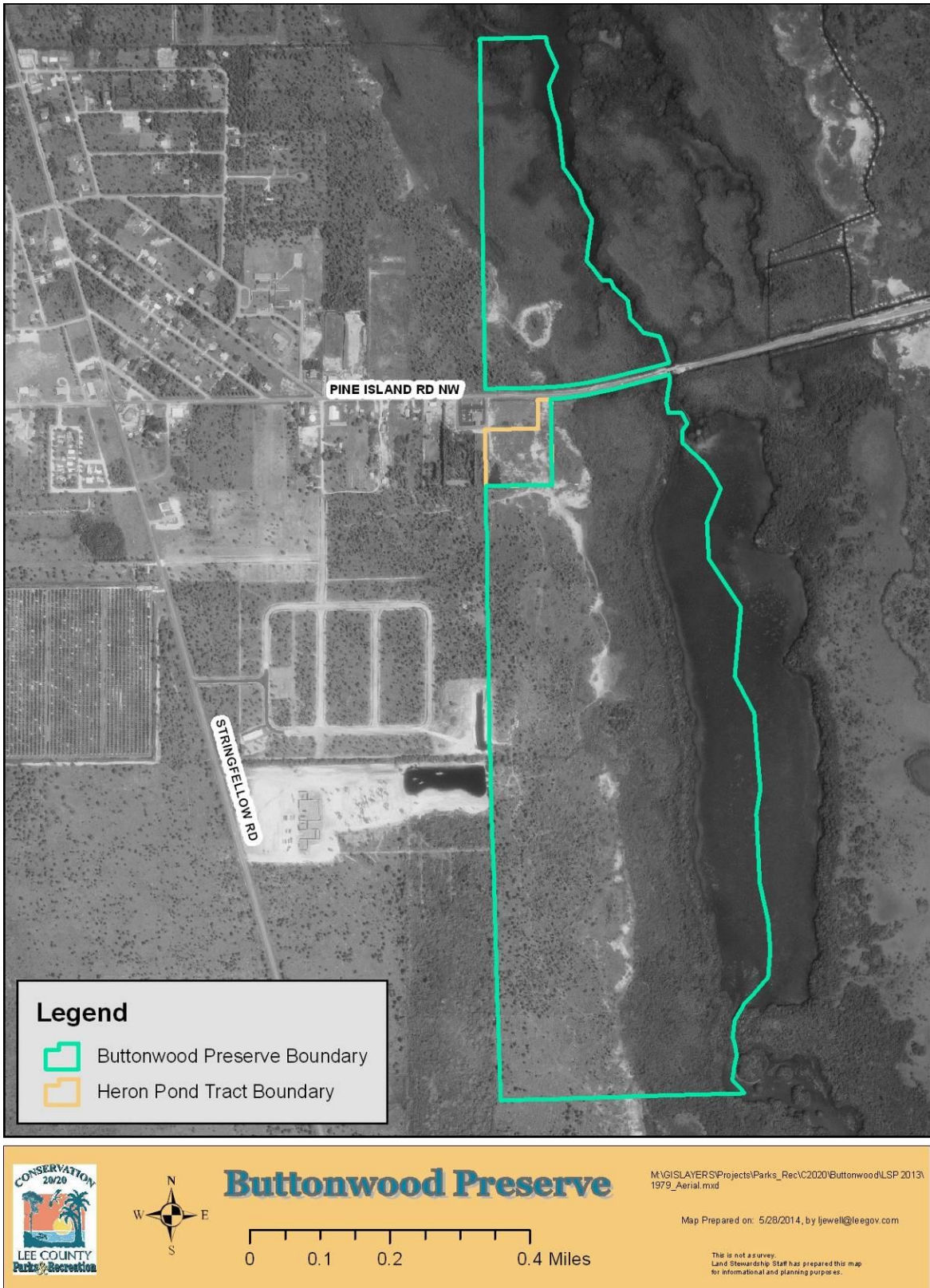


Figure 14: 1986 Aerial

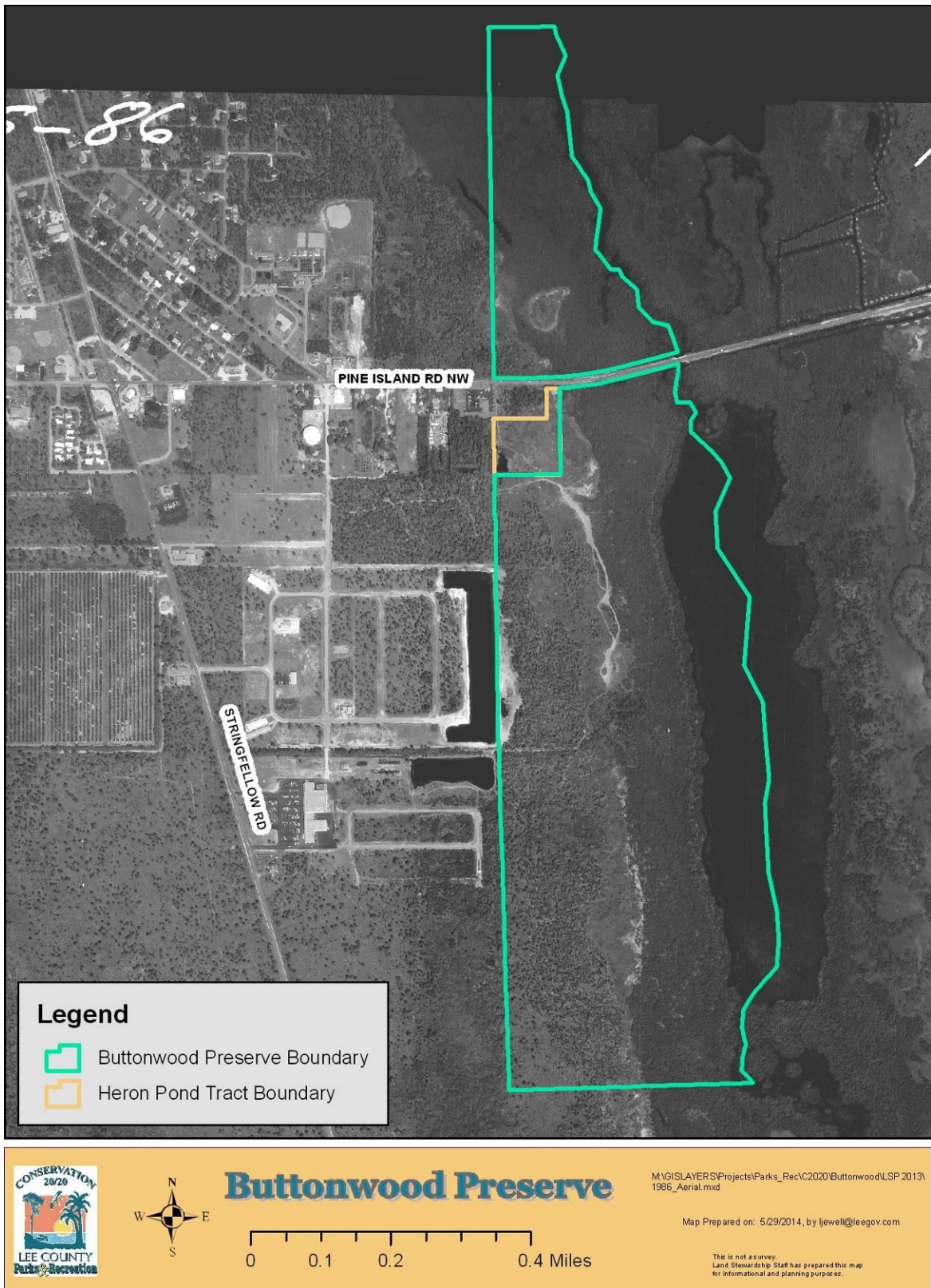
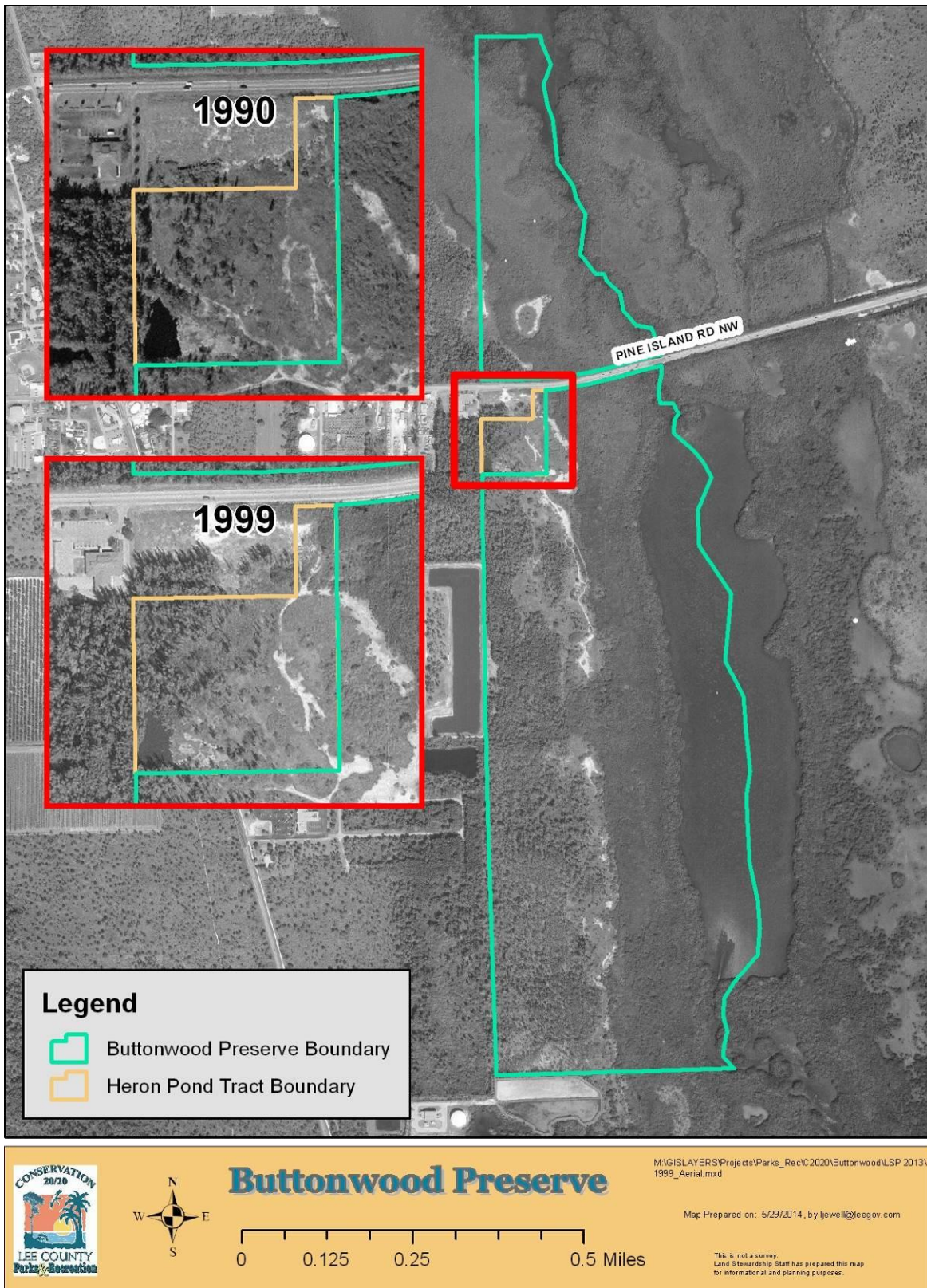


Figure 15: 1999 Aerial



iii. Public Interest

BP was purchased for the preservation of environmentally sensitive lands, its high probability for listed species, the Preserve's groundwater recharging capability, and to protect Pine Island's coastal and fishing resources.

Staff has not received requests from the public for access into the Preserve. Should any such requests come forward, staff may lead group site visits.

Information concerning this and all C20/20 preserves can be found on the website (www.conservation2020.org). Staff may mail newsletters to the Preserve's neighbors when management activities are scheduled.

V. FACTORS INFLUENCING MANAGEMENT

A. Natural Trends and Disturbances

Natural trends and disturbances can include hurricanes, flooding, wildfires, 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 BP into consideration. General information on natural trends and disturbances influencing native communities and stewardship at BP can be found in the LSOM's Land Stewardship Plan Development and Supplemental Information section.

More specific to this site is the major impact of Hurricane Charley a Category 4 Hurricane that passed over the site in August of 2004. The eye of the storm passed within five miles of the Preserve. The conditions of the Preserve before (Figure 16), five months after (Figure 17) and in January 2010 (Figure 18) show the rapid recovery of the plant communities.

Figure 16: Before Hurricane Charley

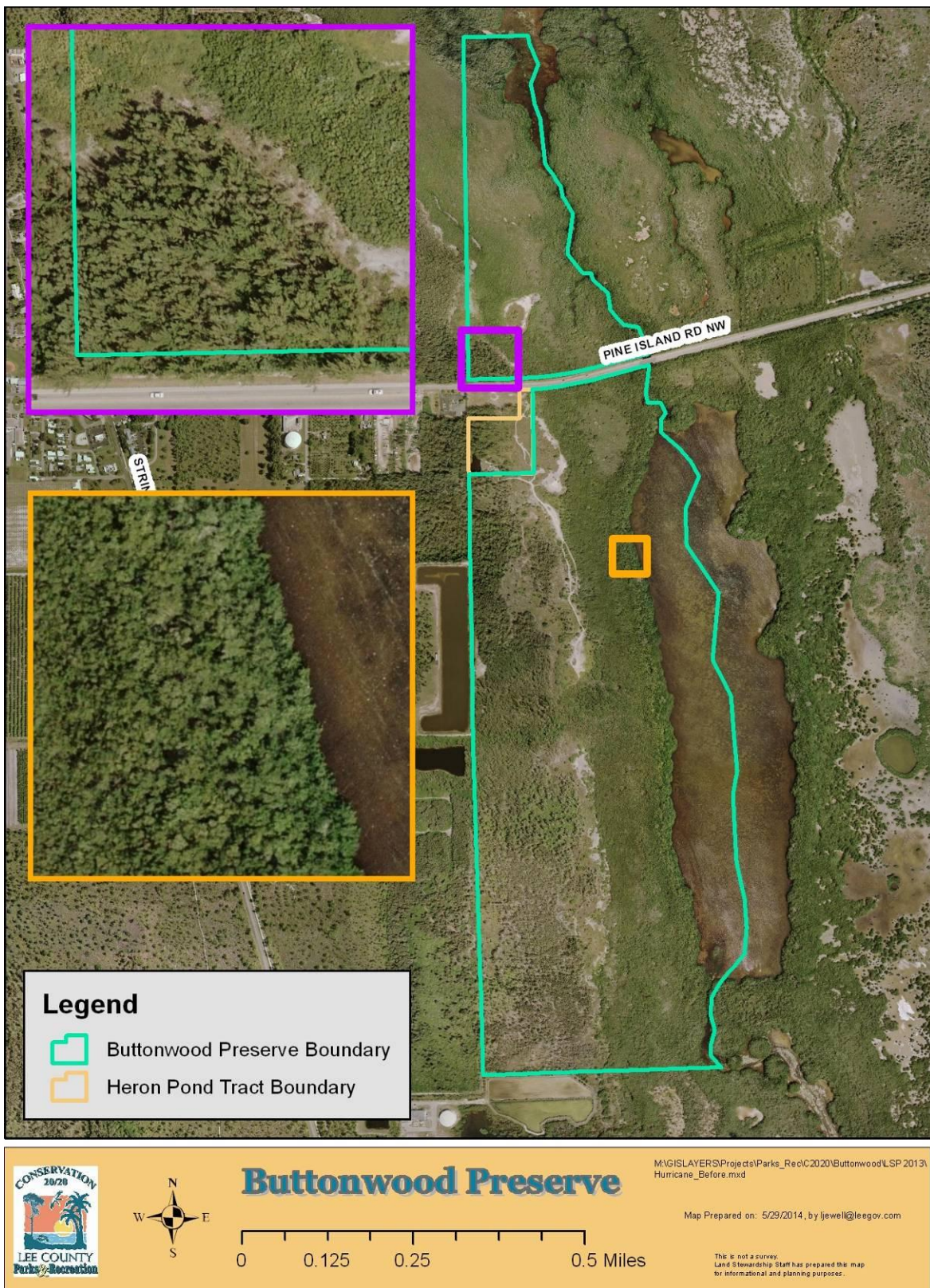
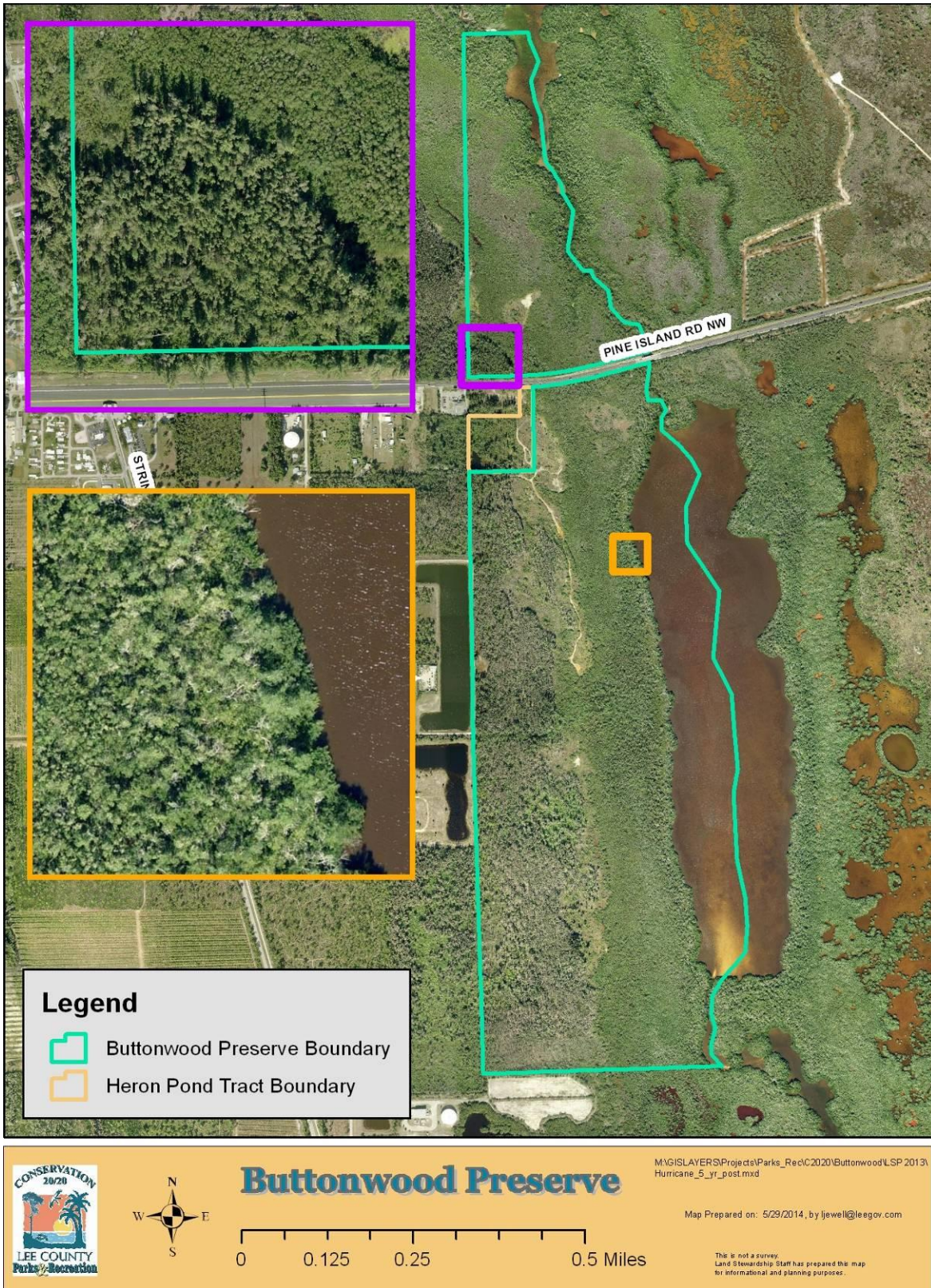


Figure 17: After Hurricane Charley



Figure 18: January 2010 Aerial



B. Internal Influences

Few anthropogenic activities have impacted the Preserve. Remnant old agricultural ditches from the 1940s remain in the southwestern portion of BP. They are shallow and heavily overgrown with invasive exotic vegetation and are unlikely to drain water onto the site from adjacent property. A DOT drainage canal originating at Stringfellow Road transitions into BP as an overgrown ditch which is deeper than the others on site. Both of these features are illustrated in Figure 6.

Evidence of past ORV traffic including trucks, all terrain vehicles (ATVs) and dirt bikes includes a well used path traverses the salt flat/marsh that bisects BP. A second trail leads to the berm on the western boundary associated with the adjacent retention ponds. During field work for this LMP, staff also encountered several old plow lines and burn marks on trees, indicating at one point a wildfire burned a portion of BP.

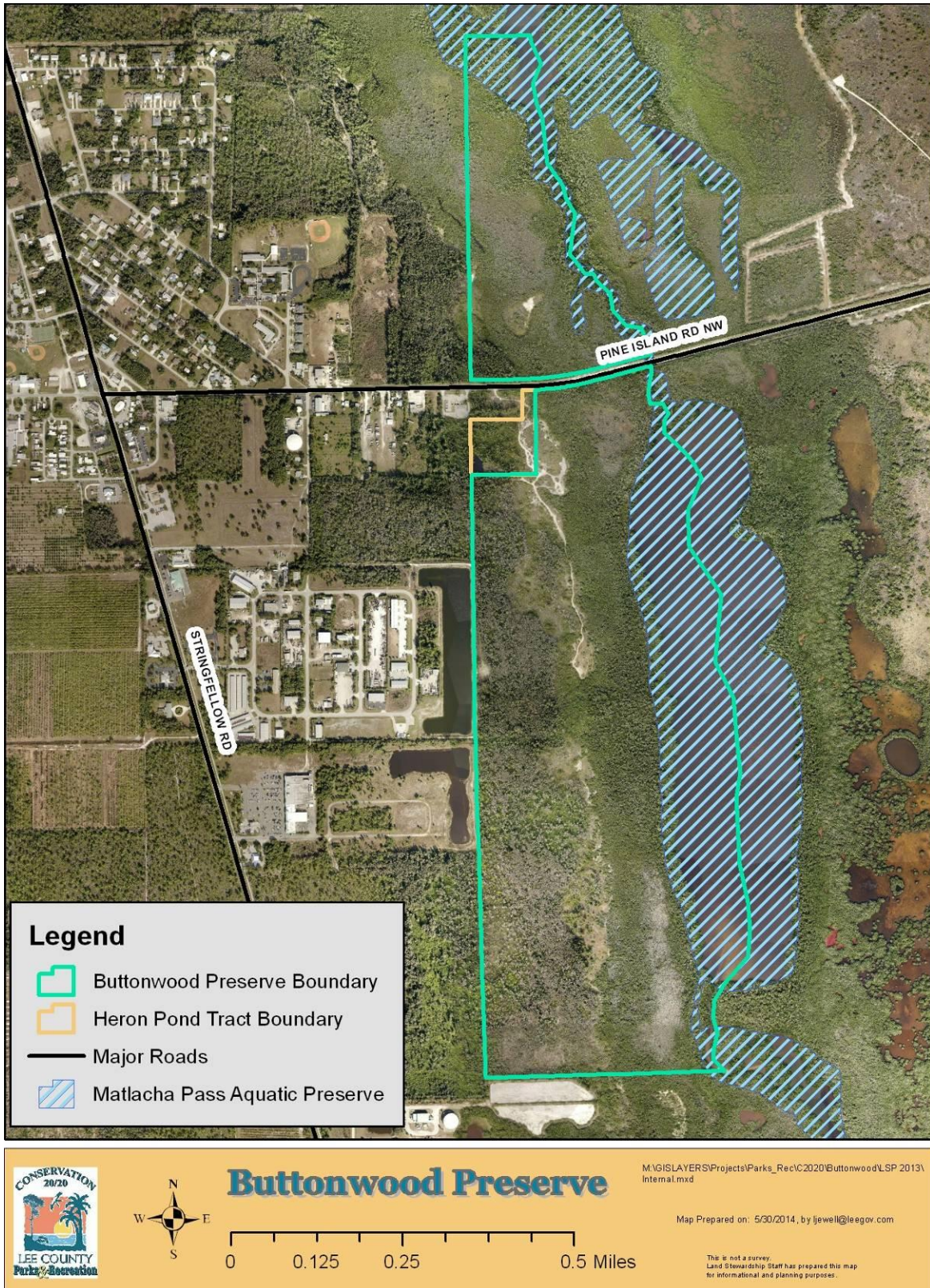
During high tide, water spreads from Pine Island Creek westward across the majority of BP. This tidal water hinders access into the southern portion of BP from the Pine Island Road.

Portions of BP fall into the wellfield protection zone (Figure 6) which restricts use of certain chemicals. This is discussed in detail in the Legal Obligations and Constraints section of this plan.

The eastern portion of BP falls within the Matlacha Pass Aquatic Preserve. In Florida, Aquatic Preserves are considered submerged lands that are owned and managed by the State (FDEP).

Figure 19 illustrates the internal influences within BP not shown in Figure 6.

Figure 19: Internal Influences Map



C. External Influences

Pine Island Road, a two-lane paved roadway with guardrails, borders the northern boundary bisects BP. Existing roads influence water patterns, create difficulty for wildlife movement and increase wildlife mortality.

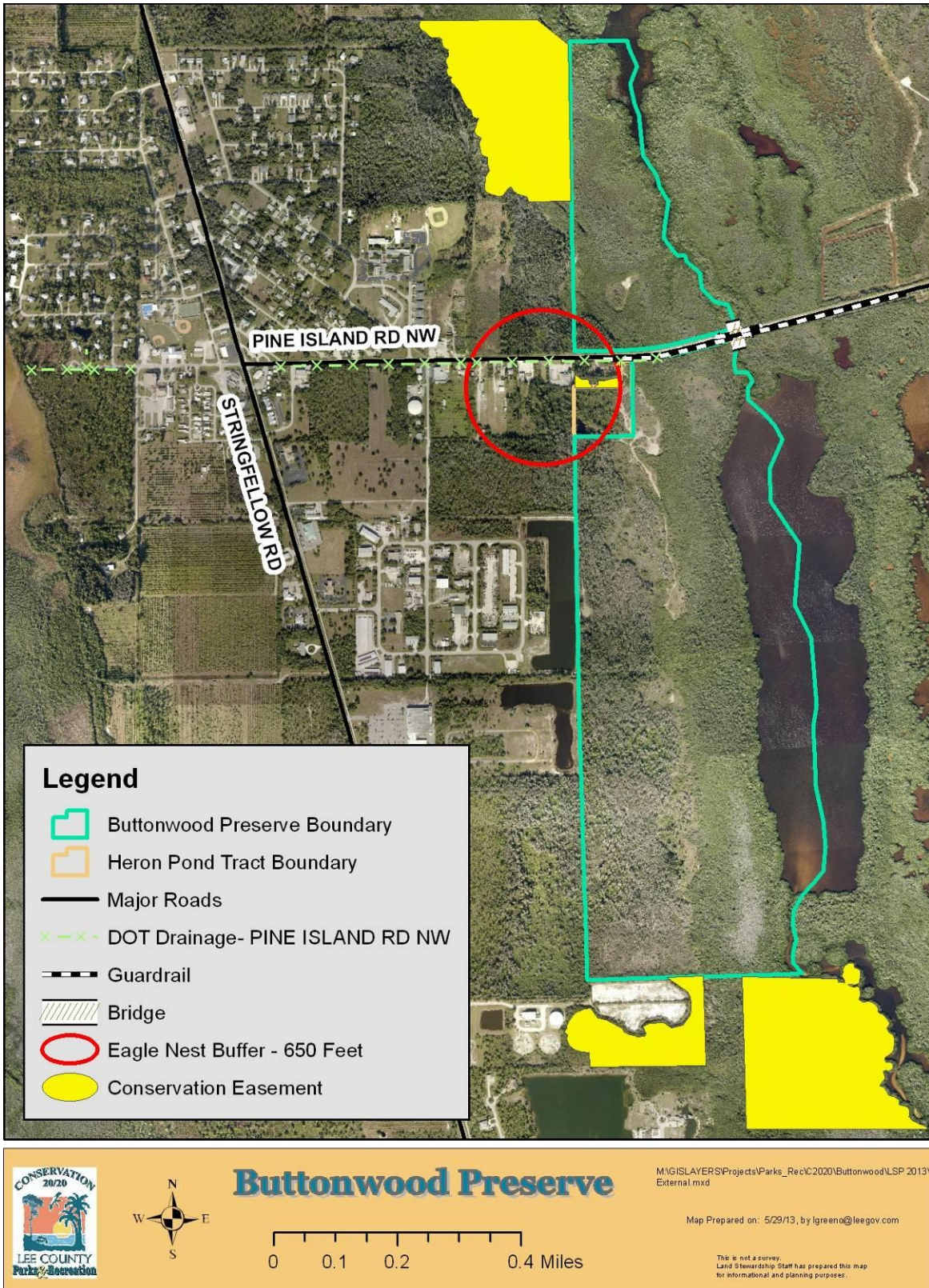
Most of HPT and the disturbed corner of BP fall within an eagle nest buffer zone. Any work occurring in this area will be during non-nesting season if possible. Otherwise, staff will work with Lee County Environmental Sciences staff to obtain permission to conduct work during nesting season in compliance with state and federal regulations.

Conservation easements are in place for LCEC and the GPIWA on two parcels adjacent to the southern boundary of BP and an additional privately maintained conservation easement is adjacent to the northwest boundary. There are also three conservation easements granted to Lee County Environmental Sciences, adjacent to HPT.

Remnants of old agricultural ditching from the 1940s exist west of BP and connect into the internal remnant agricultural ditches (Figure 6). The external ditches are overgrown and shallow, with collapsed banks. They are not likely to convey large amounts of water onto BP. A portion of the western boundary of BP is adjacent to a bermed lake. This high berm impedes access to the site and alters water drainage patterns.

The external influences not illustrated in Figure 6 which affect the BP are shown on Figure 20.

Figure 20: External Influences Map



D. Legal Obligations and Constraints

i. Permitting

Land stewardship activities conducted on the entire Preserve may involve obtaining permits from regulatory agencies. Habitat restoration projects requiring heavy equipment or tree removal will require notification to the Lee County Department of Community Development (LCDCD). Burn authorization from the Florida Forest Service (FFS) is required for all prescribed burns on the Preserve.

ii. Other Legal Constraints

Currently, there is no legal access in the upland plant communities to the portions of BP south of Stringfellow Road. Staff is working to construct an access for Land Stewardship staff and contractors through the GPIWA facility located to the south of the Preserve.

As mentioned in the Internal Influences section, FDEP Aquatic Preserves are sovereign submerged lands that are owned and managed by the State of Florida. There are no restoration plans that would affect this portion of BP, but in the future any activities in this area would need to be coordinated with FDEP.

Lee County's Wellfield Protection Ordinance 07-35 (amended 95-01) establishes protection for the "existing public potable water supply wells from the potentially irreversible and adverse effects of bacterial and chemical contamination from abandoned wells and to control the storage, handling and use of hazardous or toxic substances within certain distance from wellfields." The southern portion of BP falls within the Wellfield Protection Zone (see Figure 6). The zones are based on groundwater modeling showing the approximate travel time from their location to the existing or proposed water supply. Section 14-213 of Ordinance 07-35 delineates the specific regulated substances that are only to be used in limited quantities, if at all, in these protection zones and cannot be stored within these zones. It is unlikely that any of these chemicals (restricted use pesticides, petroleum-based products, etc.) would be used for stewardship activities at the Preserve. However, the Ordinance does provide a special exemption for the application of herbicides in recreation and aquatic weed control activities as long as certain guidelines (Section 14-209b) are followed. Contractors will be advised of the protection zone and will not be allowed to store any regulated substances (which includes petroleum based products) in the area.

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 2010). These themes are:

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

The entire Lee Plan can be found on the Internet at: www.leegov.com/gov/dept/dcd/Planning/Documents/LeePlan/Leeplan.pdf. The sections of the Lee Plan which may pertain to C20/20 Preserves have been identified in the LSOM.

New Horizon 2035 is a comprehensive review and update of the Lee Plan that began in 2010. Although still under review through 2014, this new *sustainable vision for growth and development through the year 2035* will be the basis for updating the Lee Plan's goals, objectives and policies (<http://leegov.com/gov/dept/dcd/Planning/NewHorizon/Pages/default.aspx>).

E. Management Constraints

The principle management constraints for BP include the exceptionally wet conditions, external easement constraints and impacts, increasing urbanization pressures, limited funding and lack of access for equipment off of Stringfellow Road. Although C20/20 has a management fund, it is inadequate to fulfill the restoration and management activities for this and the other preserves. Efforts to obtain additional funding through grants and/or monies budgeted for mitigation of public infrastructure projects will be pursued to supplement the operations budget to meet the restoration goals in a timely manner.

Restoration activities in the bald eagle nest zone will be restricted to between May 16th and September 30th (outside of nesting season) and mainly during the dry season, which varies from year to year.

Nearly 75% of the Preserve is wetland communities. The remaining plant communities are typically driest between February and May, so most stewardship activities will be conducted during these months. If access is

necessary for management activities when water levels are high, vehicles such as ATVs may be used; otherwise staff will travel on foot.

Site access will be a problem due to the lack of upland road frontage. Staff needs to construct an access for contractors on the GPIWA property. There is a privately owned parcel adjacent to HPT (27-44-22-00-00001.0010). This parcel contains an existing access that does not impact the mangrove swamp community. C20/20 is a willing seller program that does not typically contact land owners. However, it may be beneficial in the future to inform the current landowners about the program.

Part of the western boundary of BP is adjacent to a manmade lake owned by the Lee County Mosquito Control District. BP's boundary runs down the middle of the berm that was created around the perimeter of this lake. This may create a fence installation problem and may require the Preserve fence to be installed well inside the property boundary in order for it to be located off of this berm, if a fence is ever determined to be necessary.

Any utility maintenance or improvement projects conducted by other agencies (Lee County Department of Transportation, LCEC, and GPIWA) related to their various easements may affect future stewardship activities.

F. Public Access and Resource-Based Recreation

Historically, minimal activity has occurred on the Preserve. Most has been from ORV users, hunting and illegal dumping. The Parks and Recreation Ordinance, 06-26 (<http://www.lee-county.com/gov/bocc/ordinances/Ordinances/06-26.pdf>) prohibits these activities.

In accordance with the LSOM, BP is classified as Resource Protection & Restoration Preserve. This designation allows for guided field trips by staff, if there is a public interest, when there are no safety concerns and it is compatible with protecting the animals and plant communities found at the Preserve.

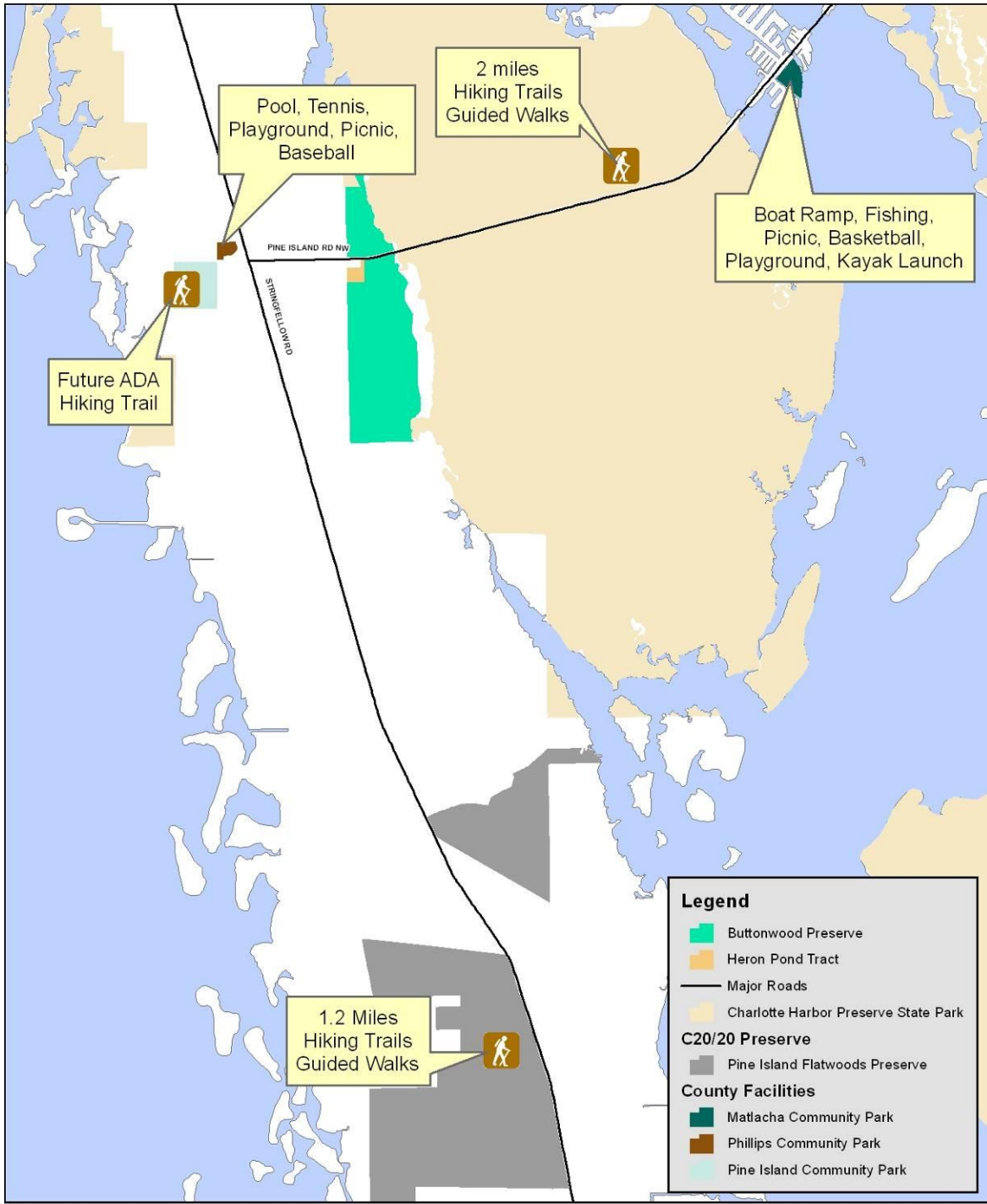
Many things are taken into consideration when determining resource-based activities that will be offered at C20/20 preserves, including but not limited to, acreage of the site, viable access, presence of similar facilities nearby, plant communities, listed species utilization, soil constraints, hydrologic components, and archaeological/cultural resources. Restoration/stewardship activities can also impact resource-based activity offerings in designated areas of a preserve.


The main limiting factor for BP, besides funding, is access to the site. Public recreational use is not being proposed for this Preserve due to the lack of appropriate access, along with the sensitivity of plant communities, and soil types throughout the Preserve. Currently, the only access to HPT and the southern

portion of BP is in mangrove and salt marsh communities. To provide public access would both negatively impact these ecosystems and be costly. Luckily, there are numerous recreational opportunities between $\frac{3}{4}$ of a mile to 5 miles away from the Preserve (Figure 21). These include more developed facilities maintained by LCPR: Phillips Community Park, Pine Island Community Park and Matlacha Community Park, as well as preserves with hiking trails: Pine Island Flatwoods Preserve and Little Pine Island (Charlotte Harbor Preserve State Park).


Recreational opportunities will be reexamined during the next revision of this plan (2023).

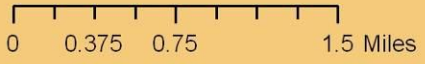
Figure 21: Nearby Recreational Opportunities





Buttonwood Preserve





0 0.375 0.75 1.5 Miles

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Map Prepared on: 5/30/2014, ljswell@leegov.com

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

G. Acquisition

Nomination 276-2 was acquired on February 13, 2012 through the Conservation 20/20 Program (C20/20) at a cost of \$772,000 for 218.8 acres with a \$20,000 contribution for acquisition from the Calusa Land Trust and Nature Preserves of Pine Island. This equates to approximately \$3,528 per acre. Two years later, Nomination 276-2B was purchased for \$30,000 for 48.8 acres (\$615 per acre). This nomination had been separated from the portion south of Pine Island Road due to title issues.

BP consists of STRAP # 27-44-22-00-00001.0000, 27-44-22-00-00001.0020, 27-44-22-00-00001.1000, 27-44-22-00-00001.2000, and 34-44-22-00-00001.0000. Figure 22 shows each piece of the property identified by STRAP number. The legal descriptions are located in Appendix D.

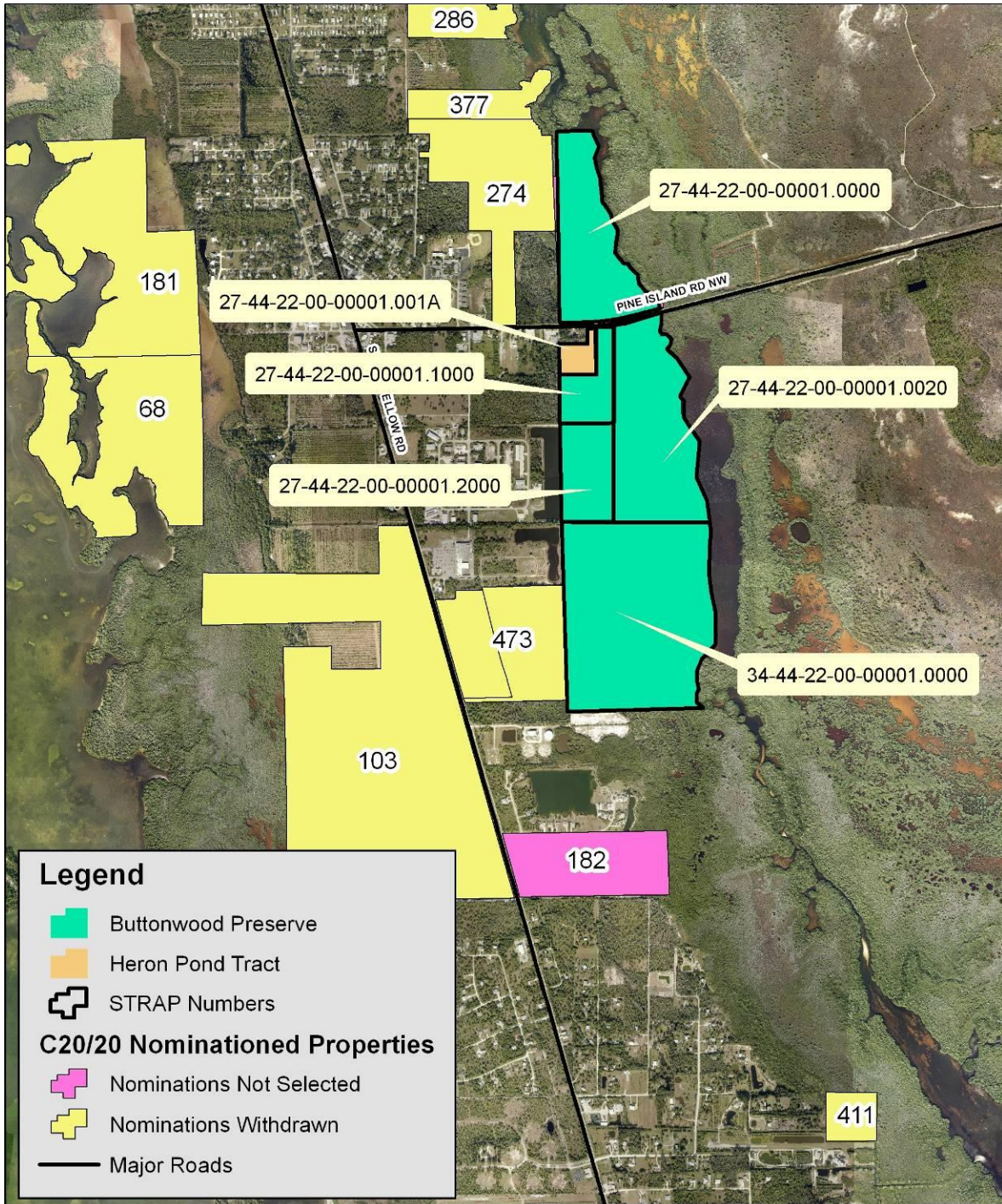
The 5.3 acre HPT was donated to Lee County on October 11, 1989 by the First Baptist Church of St. James City, Florida Inc. The STRAP # is 27-44-22-00-00001.001A. HPT is located within a Resource Protection Zone, which restricts development of the site.


Figure 22 also illustrates nominated parcels to the C20/20 Program located near the Preserve. In December of 2011, the most recent nomination (473-2), which shares part of the western boundary with BP, was withdrawn by the owners from consideration for purchase.


BP consists of three Future Land Use (FLU) categories that are shown in Figure 23. Over half of the Preserve is listed as Wetlands while the remaining acreage, is listed as Conservation Lands Wetland, Urban Community and Coastal Rural. C20/20 Staff will coordinate with Lee County staff to change the FLU for BP to "Conservation Lands Upland" and "Conservation Lands Wetland."

Currently, the Preserve is zoned as agriculture "AG-2" (Figure 24). Land C20/20 staff will coordinate with LCDCD to change the zoning to "Environmentally Critical."

Figure 22: Acquisitions, Nominations & STRAP Map



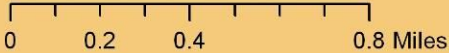




Buttonwood Preserve

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Map Prepared on: 5/30/2014, by ljewel@leegov.com



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

Figure 23: Future Land Use Map

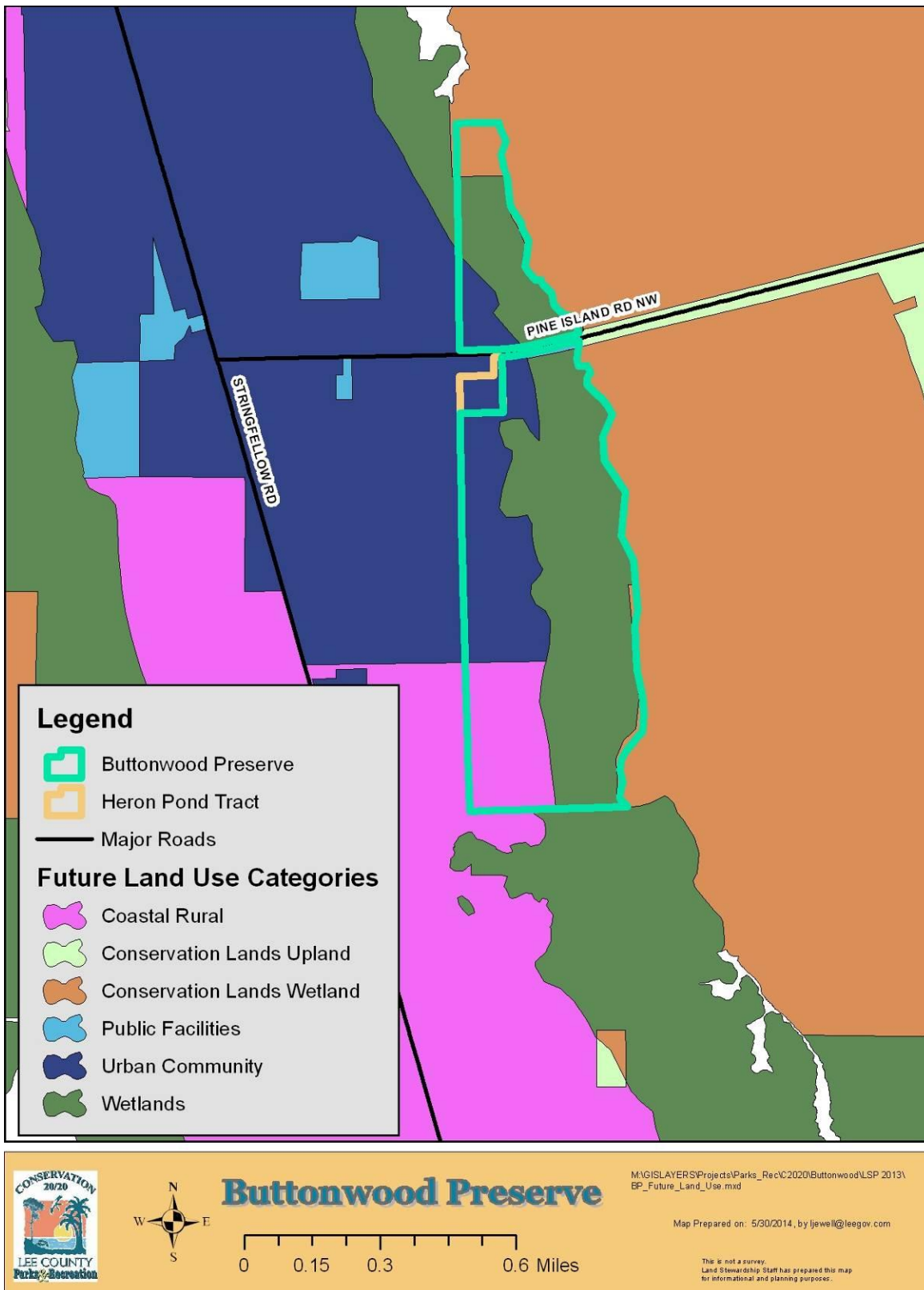
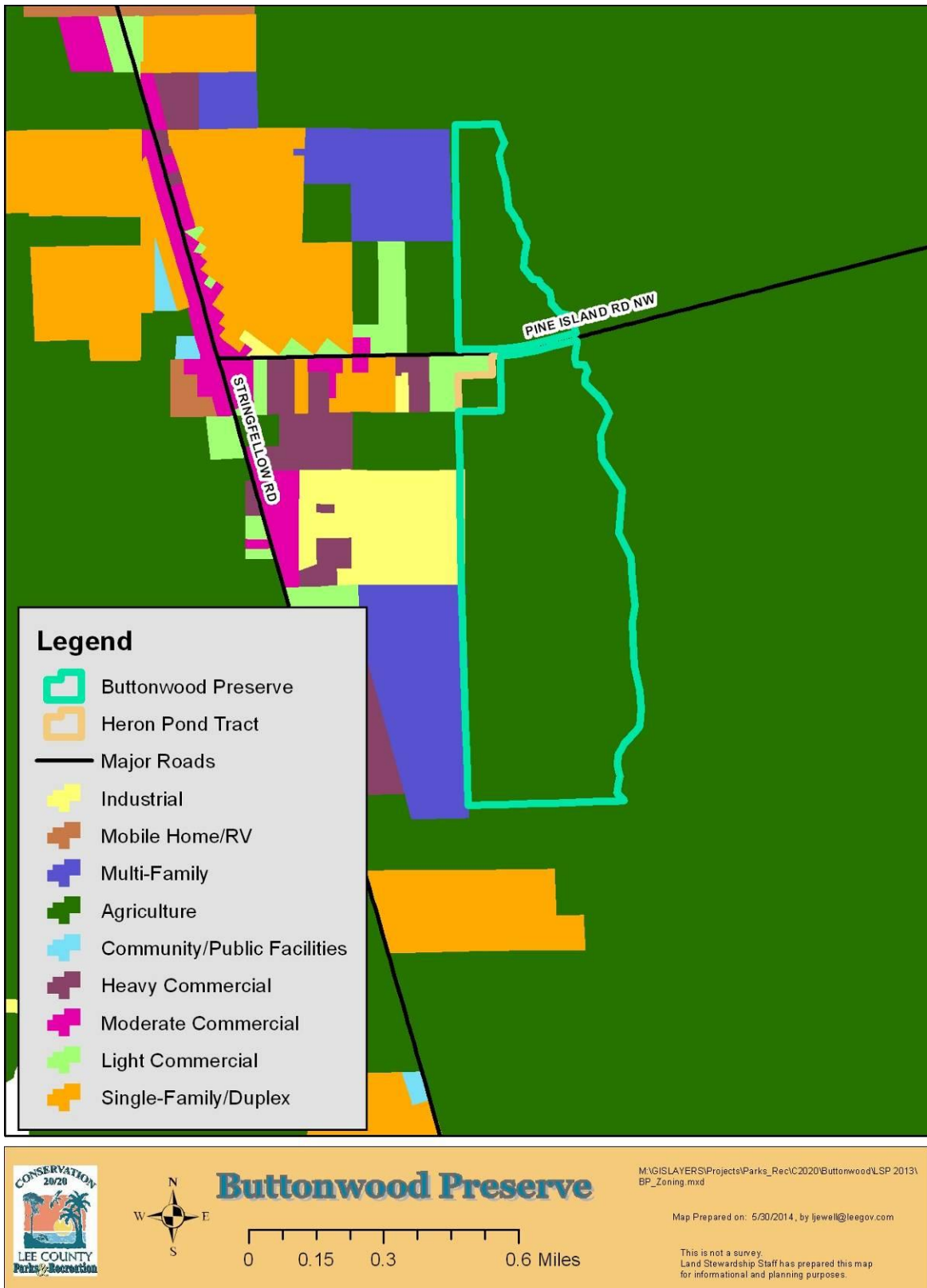


Figure 24: Zoning Map



VI. MANAGEMENT ACTION PLAN

A. Management Unit Descriptions

BP has been divided into four management units (MU) to better organize and achieve management goals. Figure 25 delineates the units that were created based on existing trails and plant communities. The open water on the east side of BP was not included in a MU. Due to its small size, HPT was not divided into MUs. Acreage for all units has been rounded to the nearest tenth of an acre.

MU 1 (86.6 acres) is located in the eastern half of BP, adjacent to Pine Island Creek and spans from Pine Island Road to the southern boundary. It contains a relatively intact mangrove swamp.

Scattered red mangrove, black mangrove, and buttonwood are mixed into this predominantly white mangrove ecosystem. Exotic plant intrusion has been minimal.

MU 2 (37.2 acres) is located in the western side of BP, spanning from the Pine Island Road to the middle of the Preserve. This MU includes the gradual elevation climb from the disturbed salt marsh and mangrove plant communities up into the mesic flatwoods and invasive exotic monocultures.

The salt marsh has been heavily impacted by vehicles and other ORVs. Much of the groundcover has been negatively impacted by vehicles driving through the open portions of the property. Securing all of the illegal entry points into the Preserve will need to be done before attempting to restore the salt marsh plant community. The invasive exotic plants in this MU consist of melaleuca, Australian pine, and Brazilian pepper. When access to the Preserve can be established through the uplands on the western boundary, then heavy equipment will be used to deal with the large size and amount of biomass of invasive exotic plants and hand crews will be utilized wherever heavy equipment would be inaccessible or be too destructive.

MU 3 (54.9 acres) is located to the south of MU 2 to the southern property boundary. This unit gradually increases in elevation from the salt marsh on the eastern side of the MU to the mesic flatwoods along the western boundary.

This MU does not have the impacts from the ORV therefore most of its salt marsh is healthy and intact. The hydric flatwood uplands have exotics, including melaleuca, Brazilian pepper, Australian pine, and cogongrass (*Imperata cylindrica*). Like MU 2, a combination of hand crews and heavy equipment will be used when access is established. The mesic flatwoods

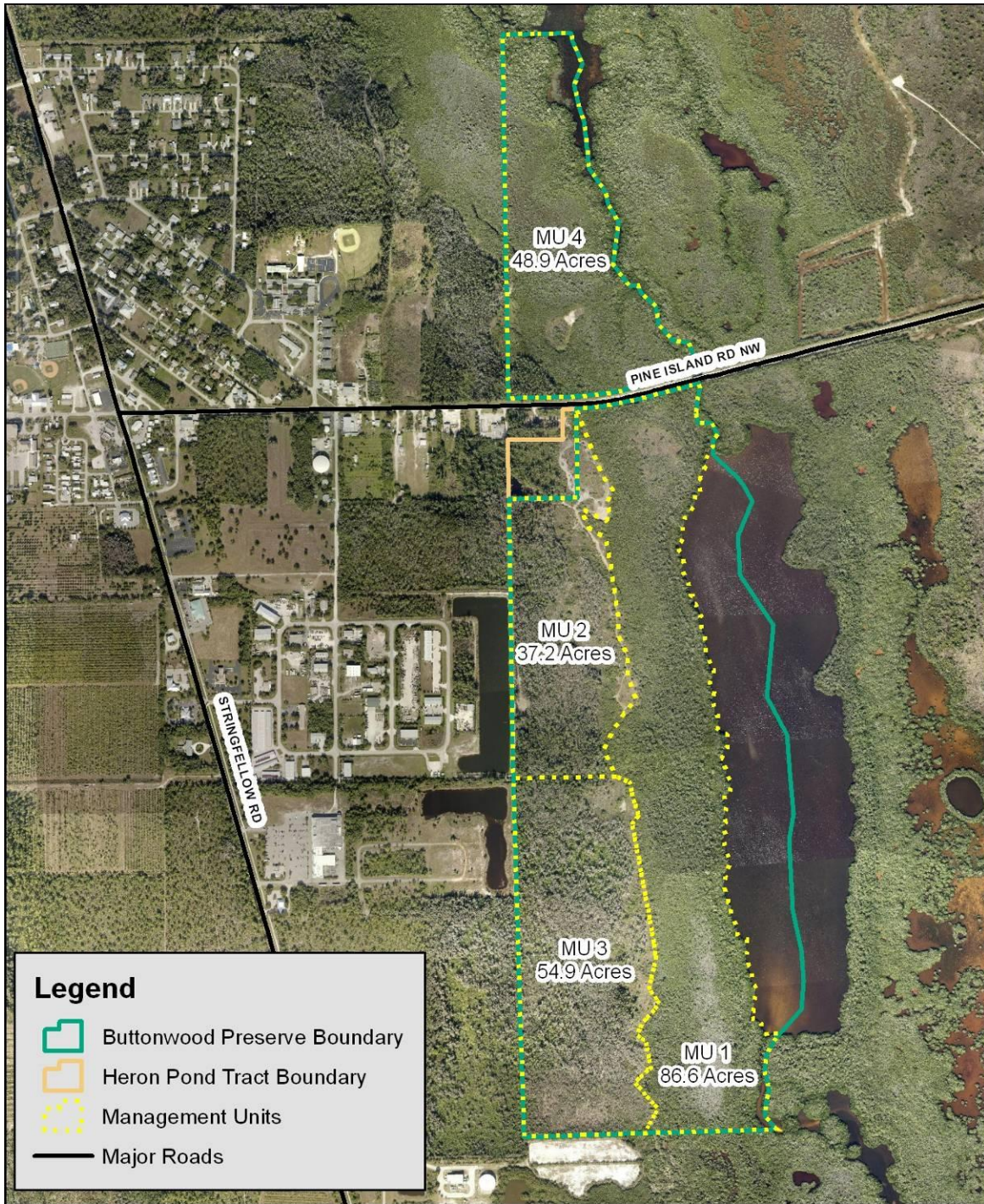
have also been disturbed by a plow line that meanders east-west through the center of the unit.

MU 4 (48.9 acres) is located in the portion of the Preserve north of Pine Island Road. This unit is primarily an intact mangrove swamp. There is a 1.8 exotic monoculture, mainly of Australian pines, in the southwest corner of this unit.

The invasive exotic monoculture is accessible by heavy equipment in this MU. The rest of the unit has minimal invasive exotics with scattered red mangrove, black mangrove, and buttonwood is mixed into this predominantly white mangrove ecosystem.

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Figure 25: Management Units Map





CONSERVATION 20/20
LEE COUNTY
Parks & Recreation



W N E S

Buttonwood Preserve



0 0.1 0.2 0.4 Miles

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Map Prepared on: 5/30/2014, by ljewell@leegov.com

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

B. Goals and Strategies

The primary management objectives are natural community improvements, removal and continued treatment of invasive exotic plants and resource protection. Because funding is currently not available to conduct all of these stewardship activities, tasks will be prioritized in order of importance and ease of accomplishment. If possible, grants and/or monies budgeted to mitigate public infrastructure projects will be used to supplement the operations budget to meet our goals in a timely manner. Management activities on the non-C20/20 HPT will be paid through the LCPR operations budget, grants or donations, while the C20/20 portions will be paid through the C20/20 management fund, grants or donations.

At this time, due to lack of practical access for vehicles, staff cannot conduct large scale exotics removal or provide access for exotic plant control contractors, prescribed fire equipment, or clearing equipment for fireline or fence installation on the Preserve. Because of these constraints, invasive exotics will be hand treated in the mangrove and salt marsh communities.

Once access is built through the GPIWA for use by contractors, staff will initiate management activities that include removing Australian pine and melaleuca, fence installation and fireline preparation as described below:

Natural Resource Management

- Exotic plant control/maintenance
- Monitor and protect listed species
- Exotic and feral animal removal
- Prescribed Fire Management

Overall Protection

- Boundary sign maintenance
- Boundary Fence installation
- Change Zoning and FLU categories
- Prevent dumping
- Install/maintain firebreaks

Volunteers

- Assist volunteer group(s)

The following is a description of how each of these goals will be carried out.

Natural Resource Management

Exotic plant control and maintenance

The most current Florida Exotic Pest Plant Council's List of Invasive Species will be consulted in determining the invasive exotic plants to be controlled in each MU. The goal is to remove/control these exotic species, followed with treatments of resprouts and new seedlings as needed. This goal will bring the entire Preserve to a maintenance level, defined as less than 5% invasive exotic plant coverage. At this time, invasive exotic plant control will be prioritized in the southwest corner of MU4 and wetland areas throughout the Preserve where hand crews can remove exotics.

Prior to each invasive exotic plant control project performed by contractors, a Prescription Form (located in the LSOM) will be filled out by the contractor(s), reviewed and approved by the Land Stewardship staff. Final project information will be entered into the GIS (Geographic Information System) database.

Uplands with light to moderate infestations:

In areas where invasive plants are sporadic and are below 50% of the vegetation cover, hand removal will be utilized for control, while heavy equipment may be used in more densely infested areas. Specific methodology will depend on stem size, plant type and season, but generally the stem will be cut near the ground and the stump will be sprayed with appropriate herbicide, or a foliar application will be applied to the entire plant. Hand pulling will be utilized when possible with appropriate species in order to minimize herbicide use. Basal bark treatment may be used at some locations. Areas with heavy equipment use will routinely receive follow up treatment. This will include an application of an appropriate herbicide mixture to the foliage of any resprouts or seedlings. Cut stems may be piled in order to facilitate future potential burning, chipping or removal from site. Replanting will not be needed due to significant presence of native vegetation and the native seed bank. Debris will not be piled in such a way as to block established flowways.

Uplands with moderate to heavy infestations:

In areas where exotics occur as monotypic stands or comprise more than 50% of the vegetation cover, the use of heavy equipment will be utilized in appropriate communities and during suitable seasons. Heavy equipment types will be chosen so that soil disturbance and compaction are minimized. In areas along ditches where the hydric soils may not be conducive for heavy equipment, hand crews will be utilized to cut down and remove these plants. Tree debris will either be pile burned or mulched. Follow-up treatment of these areas will include an application of an appropriate herbicide mixture to the foliage or stems of any resprouts or seedlings.

Wetlands with light to moderate infestations:

Hand crews will need to hike in and foliar, girdle, basal bark, or cut-stump treat the exotics with the appropriate herbicide. Follow-up treatments will need to be done on an annual basis, but may eventually decrease to every two years. Where feasible or necessary, biomass may be removed from wetland sites to be piled and burned and/or mulched.

Since the Preserve is tidally influenced, timing of work during dry season will be critical when planning mechanical work.

Prescribed fire management

A prescribed fire program will be implemented that closely mimics the natural fire regimes for the different plant communities to increase plant diversity and ensure tree canopies remain open. Once restoration projects are completed in management units that contain fire dependent communities, prescribed burns will be performed after the creation of appropriate fire lines/breaks. Prescribed fire may be utilized for exotic plant control of seedling/sapling in areas previously treated.

The timing of prescribed burning will be influenced by seasonal rain, staff and equipment availability, listed species requirements and wind patterns. The C20/20 Burn Team Coordinator has coordinated with the FFS and finalized the C20/20-wide Fire Management Plan that applies to all Preserves. C20/20 staff will inform adjacent neighbors of imminent burn plans.

Monitor and protect listed species

There are several listed species that have been documented on the Preserve, including gopher tortoise, white ibis, and both giant and cardinal airplants. An eagle nest buffer zone encompasses a portion of BP that will require coordination with Lee County Environmental Sciences if any large scale restoration projects are planned to occur during nesting season. During stewardship activities, efforts will be made to minimize negative impacts to listed species.

The Preserve is part of a countywide tri-annual site inspection program. The site inspection spreadsheet is available on the LCPR's computer server ("S" drive). These inspections allow staff to monitor for impacts and/or changes to each preserve and include lists of all animal sightings and plant species that are found. If staff finds FNAI listed species during an inspection, they will be reported using the appropriate forms.

Exotic and feral animal removal

Four exotic animal species have been recorded on the Preserve. They are noted with an “*” in Appendix C. Although melaleuca psyllids (*Boreioglycaspis melaleucae*) and weevils (*Oxyops vitiosa*) are non-native animals, they are beneficial biological control agents targeting the invasive melaleuca tree. C20/20 staff is primarily concerned with feral hogs (*Sus scrofa*). Currently, the only acceptable method of hog removal on C20/20 preserves is trapping, but more aggressive removal methods may be needed. Due to the lack of fencing and difficulty in preventing feral hogs from entering the site from adjacent waterways, feral hog trapping is not planned for the BP unless large scale destruction of the mangroves or salt flats is directly attributed to feral hog presence.

BP does not contain, nor will it support, feral cat colonies. FWC’s Feral and Free Ranging Cats policy is “*To protect native wildlife from predation, disease, and other impacts presented by feral and free-ranging cats*” (FWC 2003). Any feral cats will be trapped and taken to Lee County Animal Services.

Overall Protection

Boundary fence installation

Due to the large amount of work required to clear land for fence installation, staff does not anticipate fencing this property unless issues arise that make fencing a necessity.

Boundary sign maintenance

Boundary signs have been installed along the entire perimeter boundary to further protect the BP. Missing or damaged signs will be replaced periodically. C20/20 Rangers and staff will check for boundary signs during their patrols and replace them immediately. Boundary signs have been placed every 500 feet along the north, west and south property lines of BP south of Pine Island Road and on the south boundary of BP north of Pine Island Road.

Change Zoning and FLU categories

Staff will coordinate with LCDCD staff to change the zoning and FLU categories for the Preserve. All zoning designations will be changed to “Environmentally Critical” from “Agriculture” and FLU designations will be modified to either “Conservation Lands – Uplands” or “Conservation Lands - Wetlands.”

Prevent dumping

During tri-annual site inspections, any smaller objects that are encountered will be removed. C20/20 Rangers will also assist with removing small items when they are on patrol.

Install/maintain fire breaks

Perimeter and internal fire breaks need to be installed, where needed, to reduce the potential damage to areas outside the Preserve from a wildfire or prescribed fire. Wherever possible firebreaks will be installed on existing trails or other disturbed areas to minimize impact to plant communities or alter water flow. Once C20/20 staff has coordinated the installation of necessary fire breaks, staff will maintain these breaks on an annual basis by either mowing or disking.

Volunteers

Assist volunteer group(s)

The LSOM identifies the Land Stewardship Volunteer Program's mission statement as:

To aid in the management and preservation of Lee County resource-based public parks and preserves and to provide volunteers with rewarding experiences in nature.

If there is interest from the community to form a volunteer group, staff will work with them to assist with the many diverse stewardship activities that will be associated with BP, such as wildlife monitoring and other land stewardship projects.

The following "Prioritized Projected Timetable for Implementation" is based on obtaining necessary funding for remaining and on-going land management projects. Implementation of these (future) goals may be delayed due to changes in staff, budgetary constraints, extreme weather conditions or a change in priorities on properties managed by Lee County.

VII. PROJECTED TIMETABLE FOR IMPLEMENTATION

Management Activity	Jan-14	April-14	July-14	Oct-14	Jan-15	April-15	July-15	Oct-15	Jan-16	April-16	July-16	Oct-16	Jan-17	April-17	July-17	Oct-17	Jan-18	April-18	July-18	Oct-18	Jan-19	April-19	2019 or later	
Natural Resource Management																								
Exotic plant control/maintenance																								
Initial treatment													x											
Follow-up treatment																	x					x		
Prescribed fire management																								
Install firebreaks								x																
Conduct prescribed burning									On-going	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Maintenance (On-going/Annual)																								
Exotic animal removal																								x
Overall Protection																								
Trash removal	On-going	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→	→
Change Zoning or Land Use (LU) categories																							x	
Volunteers																								
Assist volunteer group	As needed																							

VIII. FINANCIAL CONSIDERATIONS

There is a management fund established in perpetuity for all C20/20 preserves. Monies from this fund primarily serve to meet the operational needs of the Management section of the C20/20 Program, but a certain amount of this fund will be set aside for planned restoration projects.

Like the other non-C20/20 preserves, HPT has a designated fiscal account string that can use a variety of budget lines for treatment of exotics or other land stewardship activities proposed by the site supervisor. The LCPR budget funds that are used for Land Stewardship purposes primarily come from Ad Valorem (property) taxes.

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

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X. APPENDICES

Appendix A: Soils Characteristics Table

Appendix B: Plant Species List

Appendix C: Wildlife Species List

Appendix D: Legal Descriptions

Appendix E: Expended Costs and Funding Sources

Appendix A: Soils Characteristics Table

Appendix A: Soil Characteristics Table

Buttonwood Soil Types	Map Symbol	Total Acres	% of Preserve	Habitats (Range Site)	Physical Attributes			Biological Attributes				Limitations for Recreational Paths & Trails
					Wetland Class (1)	Hydrologic Group (2)	% Organic Matter	Potential as habitat for wildlife in--				
								Openland	Woodland	Wetland	Rangeland	
Boca Fine Sand, Tidal	57	30.25	13.83	salt water marsh	F	D	1-3%	very poor	very poor	poor	very poor	Severe: wetness, too sandy
Hallandale Fine Sand, Tidal	8	37.39	17.09	salt water marsh	F	D	1-3%	very poor	very poor	poor	--	Severe: wetness, too sandy
Immokalee Sand	28	43.18	19.74	south Florida flatwoods		B/D	1-2%	poor	poor	poor	--	Severe: wetness, too sandy
Myakka Fine Sand	11	5.1	2.33	south Florida flatwoods		B/D	<2%	fair	poor	poor	--	Severe: wetness, too sandy
Peckish Mucky Fine Sand	16	29.69	13.57	salt water marsh	F	D	--	very poor	very poor	fair	--	Severe: wetness, too sandy
Wulfert Muck	23	24.79	11.33	salt water marsh	F	D	--	very poor	very poor	fair	--	Severe: wetness, excess humus

Heron Pond Soil Types	Map Symbol	Total Acres	% of Preserve	Habitats (Range Site)	Physical Attributes			Biological Attributes				Limitations for Recreational Paths & Trails
					Wetland Class (1)	Hydrologic Group (2)	% Organic Matter	Potential as habitat for wildlife in--				
								Openland	Woodland	Wetland	Rangeland	
Boca Fine Sand, Tidal	57	0.4	7.55	salt water marsh	F	D	1-3%	very poor	very poor	poor	very poor	Severe: wetness, too sandy
Hallandale Fine Sand, Tidal	8	4.90	92.45	salt water marsh	F	D	1-3%	very poor	very poor	poor	--	Severe: wetness, too sandy

Color Key:

Upland
Wetlands Rarely Present (Under 20%)
Wetlands Very Often Present (100%)

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

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

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

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

Appendix B: Plant Species List

Appendix C: Wildlife Species List

Appendix D: Legal Description

Appendix E: Expended and Projected Costs and Funding Sources