RED BUG SLOUGH PRESERVE MANAGEMENT PLAN

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PRESERVE AT A GLANCE

Size	71 acres
Location	Sarasota
Management Priority	protect, restore and maintain natural resources onsite while providing recreational opportunities for visitors.
Management Challenge	balancing public recreation with resource needs.
Primary Habitats	upland mixed forest mesic flatwoods slough forested wetlands
Imperiled Species	American alligator gopher tortoise wood stork little blue heron tricolored heron reddish egret least tern roseate spoonbill Florida sandhill crane ceraunus blue butterfly cassius blue butterfly American royal fern giant air plant
Cultural Resources	Red Bug Slough (8SO5275) Red Bug Feeder Ditch (8SO5276)
Land Use	passive, nature-based public recreation

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EXECUTIVE SUMMARY

Significance, size, location

Red Bug Slough Preserve is a 71-acre natural area preserve located in Township 37 south, Range 18 east, Section 9 southeast of the City of Sarasota in Sarasota County. The preserve contains native habitats representative of southwest Florida and is home to more than a dozen imperiled species of plants and animals. This remnant piece of natural Florida is surrounded by roads and residential neighborhoods comprised predominantly of single-family homes, condominiums, and a rental apartment complex. Portions of the site are adjacent to Beneva Road on the east, Proctor Road on the north and Lockwood Ridge Road on the west. Several commercial and retail establishments are also located within one to two miles of the preserve and The Suncoast Technical College (formerly Sarasota County Technical Institute) and Suncoast Polytechnical High School are situated a short distance north of the preserve.

Acquisition history

The two connected parcels that make up the preserve were acquired through the County's Environmentally Sensitive Lands Protection Program, protecting the site from imminent residential development. The first 50-acres and the more southerly parcel (known as the Schwartz parcel) was acquired in 2000. The following year, another 21 acres (the VanLede parcel) were added to the northwest. Sarasota County Parks, Recreation and Natural Resources Department, division of Natural Area and Trails (NAT) is responsible for management of the preserve. The slough itself and associated wetlands are managed in coordination with the Sarasota County Stormwater Environmental Utility.

Important habitats and species

The preserve is comprised primarily of upland mixed forest with areas of mesic flatwoods, slough (Red Bug Slough itself), and other assorted wetland habitats. It is home to at least 13 imperiled species, including 11 species of birds and two species of plants. Ecologically, the site is important because it protects upland habitats for migratory songbirds and common wildlife species, as well as wetland habitats for wading birds, native fishes, river otters, American alligators, and other wetland species. The protection of Red Bug Slough and associated upland habitats helps to maintain the water quality of waterbodies downstream, including Phillippi Creek and Sarasota Bay.

Natural and cultural resource management goals

Healthy native habitats are necessary for the continued existence of the preserve's threatened and endangered species. Maintaining natural site hydrology and controlling invasive exotic species, which impact native plants and animals, are management priorities. The primary invasive exotic plants onsite include, but are not limited to, Brazilian pepper (*Schinus terebinthifolius*), air potato (*Dioscorea bulbifera*), guinea grass (*Panicum maximum*), rosary pea (*Abrus precatorius*), arrowhead vine (*Syngonium podophyllum*), carrotwood (*Cupaniopsis anacardioides*), Caesarweed (*Urena lobata*), tuberous sword fern (*Nephrolepis cordifolia*), shoebutton ardisia (*Ardisia elliptica*) and wedelia (*Sphagneticola trilobata*).

Protection of known cultural resources is also of utmost importance. Soil disturbance or physical alteration of identified historical features are not permitted. Buried waterlines are co-located beneath the historical drainage ditch along the south property boundary and any temporary disturbance or alteration resulting from maintenance or repairs will be promptly restored once work is complete.

Historical and current uses and facilities

From the late 1800s until the mid- to late-1900s, the area was predominantly native range. Turpentine extraction also occurred in the vicinity. Red Bug Slough and the associated feeder ditch along the preserve's south boundary were dredged sometime in the period between the 1940s and 1960s, providing better drainage and creating arable acreage for agriculture. Most of the upland areas of the site remained largely in a natural state. After acquisition by Sarasota County, it was officially named Red Bug Slough Preserve in January 2004 and opened to the public on October 15, 2004. Facilities and amenities include two kiosks, a small playground, a restroom building, marked nature trails, boardwalks, interpretive signs, two picnic shelters, picnic tables and benches, and a fishing dock. The preserve is on-leash dog-friendly and open 365 days a year.

Use and facilities management goals

Management goals are to continue existing, non-consumptive, ecologically benign uses, including hiking, bicycling, fishing, nature photography, nature study, bird watching, meditation, and other similar activities. Off-road motorized vehicles and drones are not permitted.

The preserve has become extremely popular and parking availability is a major issue during the high season, between October and April. Parking expansion, a new playground, and an ADA accessible trail are being designed and are scheduled for construction beginning in late 2022.

Purpose of plan

The purpose of this plan is to preserve the health and function of natural systems, protect historical resources that are part of Sarasota County's heritage, as well as provide nature-based recreational opportunities for the public. The management strategies outlined herein are intended as guidelines to be used to address the complex management needs of the preserve. This plan will be updated in ten years to incorporate the most current methodologies and technological advances as they apply to resource needs and management of the preserve. Costs described in this plan are estimated for current conditions, assuming cost escalations for salary and some known funding opportunities, but not based on future optimal conditions or optimal staffing.

This plan will guide management of upland and wetland habitats in the preserve and will be used to coordinate onsite management conducted by other County departments, contractors, volunteers, and Sarasota County Parks staff. Sarasota County Stormwater Environmental Utility is the lead for management of the slough system and associated wetlands onsite. In addition, maintenance staff from Sarasota County Parks, Recreation and Natural Resources do routine mowing and provide maintenance services for amenities and infrastructure.

MANAGEMENT STRATEGY OVERVIEW

NATURAL RESOURCES	**GOAL 1**	**Restore and maintain native habitats and communities.**
	OBJECTIVE 1.1	Identify impacted upland habitat areas and implement actions to enhance and/or restore to more natural conditions.
	OBJECTIVE 1.2	Investigate and implement hydrologic restoration measures.
	OBJECTIVE 1.3	Eliminate FLEPPC Category I and II plants and if not possible, reduce to levels too low to alter the natural habitats' systems, composition, and assemblage.
	OBJECTIVE 1.4	Continue to explore, consider, and facilitate reintroduction of prescribed fire to manage fire-dependent habitats.
	OBJECTIVE 1.5	In the absence of fire, manage height and density of understory vegetation in fire-dependent habitats to mitigate wildfire threat.
CULTURAL RESOURCES	**GOAL 2**	**Protect, preserve, and maintain cultural resources.**
	OBJECTIVE 2.1	Follow Sarasota County History Center protocol when ground disturbance is possible.
	OBJECTIVE 2.2	Document and record discoveries of any previously unknown cultural or historical sites.
LAND USES	**GOAL 3**	**Maintain public access and passive recreational opportunities without adversely impacting native habitats and communities.**
	OBJECTIVE3.1	Provide public pedestrian access to the preserve.
	OBJECTIVE 3.2	Provide and maintain a trail system.
	OBJECTIVE 3.3	Provide picnic tables and benches.
	OBJECTIVE 3.4	Provide a clean environment for visitors.
	OBJECTIVE 3.5	Assess visitor impacts to natural habitats to maintain habitat health, function, species composition, and assemblage.
	GOAL 4	**Provide nature based educational and interpretive opportunities.**
	OBJECTIVE 4.1	Provide interpretive signs.
	OBJECTIVE 4.2	Provide a combination of onsite and offsite interpretive and recreational programs.
OPERATIONS	**GOAL 5**	**Provide administrative and fiscal support.**
	OBJECTIVE 5.1	Continue current administrative support at current levels.

1 INTRODUCTION

1.1 LOCATION AND SETTING

Red Bug Slough Preserve is a 70.9-acre natural area preserve located in North Sarasota County (Exhibits 1–3). Areas surrounding the preserve are predominantly residential. Proctor Road runs along the north boundary with the Unity Church of Sarasota and the Aravilla Condominiums across the street. A combination of single-family residential neighborhoods, the Crooked Creek Condominiums, the L'Estancia Apartment complex and Beneva Road adjoin the preserve's eastern boundary. A drainage ditch, a Florida Power and Light right-of-way and the western terminus of Ashton Road run along the preserve's south boundary, with the Lake Arrowhead Condominiums, Lakehouse West Assisted Living complex and residential neighborhoods immediately adjacent to the preserve boundary. Lockwood Ridge Road and associated residential neighborhoods adjoin the western edge of the preserve. The site contains representative areas of upland mixed forest, mesic flatwoods, slough, and various wetland habitats typical of the region, in a matrix of suburban neighborhoods.

LAND ACQUISITION PROGRAMS

The Environmentally Sensitive Lands Protection Program (ESLPP) protects lands through public acquisition of fee simple title and conservation easements from willing sellers. The program is funded by a 0.25 mill *ad valorem* tax passed by referendum in March 1999. The selection criteria are based on connectivity, water quality, manageability, and habitat rarity and quality (Resolution No. 92-272, Criteria for Evaluating Environmentally Sensitive Lands). All proposed acquisitions must be approved by the Board of County Commissioners prior to initiating a contract for purchase.

1.2 SITE SIGNIFICANCE AND PROTECTION PRIORITY

Ecologically, the site is important because it contains remnant examples of intact upland mixed forest, mesic pine flatwoods, slough, and other natural and restored wetland habitats typical of southwest Florida. Mature live oaks and a closed-canopy forest occur throughout most of the preserve. It is also home to two imperiled species of plants and 11 imperiled animal species. The site is dog-friendly and provides protection and conservation of native habitats and the opportunity for non-consumptive, ecologically benign public recreation and access.

1.3 ACQUISITION HISTORY

The southern 50-acre parcel was purchased from the Schwartz family on October 2, 2000, and the northern 21-acre parcel was purchased from Robert and Sheila VanLede on February 9, 2001 through Sarasota County's Environmentally Sensitive Lands Protection Program (Appendix A).

1.4 MANAGEMENT AUTHORITY AND RESPONSIBILITY

Management is the responsibility of Sarasota County Division of Natural Areas and Trails (NAT) in the Department of Sarasota County Parks, Recreation and Natural Resources (PRNR) (Appendix B). The Environmentally Sensitive Lands Protection Program Ordinance No. 99-004, as amended later by Ordinance No. 2013-028 (Appendix C) and the provisions stated within, protects the preserve from development

GOVERNING DOCUMENTS

Management authority is given by the following County Codes and governing documents (see Appendix C):

1. The Sarasota County Comprehensive Plan (2016)
2. Ordinance No. 97-024
3. Ordinance No. 98-045
4. Ordinance No. 98-096
5. Ordinance No. 99-004
6. Sarasota County Land Management Master Plan (2004)

1.5 FUTURE PLANS FOR THE SITE

As of September 2022, an expansion of existing parking areas, along with a new and improved playground and an ADA trail are in the design phase, with construction planned to begin in late 2022. Future recreational activities will continue to be limited to passive nature-based public recreation. All current and future activities will be planned in an environmentally sensitive manner to minimize impacts to native habitats and natural systems.

Natural Resources Management Philosophy

Sarasota County's habitat management approach seeks to restore and maintain a natural balance which preserves the quality of diverse landscapes for the benefit of wildlife and visitors. As part of this effort, Sarasota County's environmental professionals apply a variety of specialized methods, including mechanical treatment of vegetation, prescribed fire, invasive plant and animal management, hydrologic restoration, and restoration of natural communities. Regular monitoring of wildlife and habitats enables us to gauge our effectiveness and develop responsive and proactive approaches.

With a focus on natural systems management, primary emphasis is placed on restoring and maintaining the natural processes that formed the structure, function, and species composition of Sarasota County's diverse natural communities as they occurred in pre-development. Single species management for imperiled species is appropriate in County parks and preserves when the maintenance, recovery, or restoration of a species or population is difficult due to the requirement of long-term restoration efforts, unnaturally high mortality, or insufficient habitat. Single species management should be compatible with the maintenance and restoration of natural processes and should not imperil other native species or compromise the preserve's values.

Prescribed fire is an essential component in natural systems management in Florida. Prescribed fire is used to mimic natural lightning-set fires, which are one of the primary natural forces that shaped Florida's ecosystems. Prescribed burning increases the abundance and health of many wildlife species. Many of Florida's imperiled plant and animal species are dependent on periodic fire for their continued existence. Fire-dependent natural communities gradually accumulate flammable vegetation; therefore, prescribed fire reduces wildfire hazards by reducing these wild land fuels. Recreation and Natural Resources (PRNR) makes every effort to return fire to its natural role in fire-dependent natural communities. Sarasota County Fire Mitigation Specialists lead a burn team to restore fire back into the natural system. All prescribed burns in Florida are conducted with authorization from the Florida Department of Agriculture and Consumer Services, Florida Forest Service (FFS). The preserve contains several natural communities, including mesic flatwoods, scrubby flatwoods, and scrub, that rely on fire to maintain its plant composition and structure.

Invasive exotic plants and animals are a serious concern for the management of natural systems. Due to Florida's warm climate, non-native plants and animals are able to thrive. Many invasive exotic species outcompete, displace, or inhibit growth of native species and can alter natural habitats. If left unchecked without natural controls from their native origin, invasive exotic plants and animals alter the character, productivity, and conservation values of the natural areas they infest. The Florida Exotic Pest Plant Council (FLEPPC) supports the management of invasive exotic plants in Florida's natural areas. FLEPPC compiles invasive species lists that are revised every two years. Invasive exotic plants are termed Category I species when they alter native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives. Category II species are characterized as having increased in abundance or frequency but have not yet altered Florida plant communities to the extent shown by Category I species (https://www.fleppc.org/). It is the aim of PRNR to eliminate, or if not possible, to reduce FLEPPC Category I and II invasive exotic plants to low ecological impact levels. PRNR utilizes the FLEPPC classification system to determine management priorities when managing invasive exotic plants.

Invasive exotic animal species include non-native wildlife species, free-ranging domesticated pets or livestock, and feral animals. Because of the negative impacts to natural systems attributed to invasive exotic animals, PRNR actively removes them from County parks and preserves, with priority being given to those species causing the greatest ecological damage.

2 NATURAL RESOURCE MANAGEMENT COMPONENT

2.1 NATURAL RESOURCE INVENTORY

2.1.1 Topography

Elevations onsite range from 12–26 feet above sea level and generally increase toward the northeast and to the southwest with increasing distance away from Red Bug Slough. Highest elevations are in the southeast portion of the preserve (Exhibit 4). Many areas with elevations less than 20 feet are frequently inundated, especially during the summer rainy season and after extended periods of heavy rain.

2.1.2 Soils

Four major soil types occur onsite (Exhibit 5, Table 1, USDA 1991). EauGallie and Myakka Fine Sands is the most common type, with smaller areas of Felda Fine Sand and depressional soils associated with the slough and other wetland areas.

Table 1. Soil types in the preserve.

Soil Type	Associated Habitat	Drainage Characteristics
EauGallie and Myakka fine sands	Mesic flatwoods and upland mixed forest	Moderately well drained
Felda fine sand	Upland mixed forest	Moderate to poor
Floridana and Gator soils, depressional	Forested wetland	Poor
Manatee loamy fine sand, depressional	Upland mixed forest	Moderate to poor

2.1.3 Hydrology

Channelization of the slough has changed historical hydrologic conditions in the preserve. Historical aerial photos show that the slough was once a series of isolated wetlands that were only connected and flowing as a slough during the summer rainy season or after extended periods of heavy rainfall. Although water levels do fluctuate, there is flowing water in the slough year-round now. Depressional soils occur in adjacent areas and typically remain inundated for several months during the summer rainy season (June–October), with a high water table for the remainder of the year (Exhibit 6).

2.1.4 Natural Communities

Natural communities are identified using the Florida Natural Area Inventory (FNAI 2010) classification system. The site is comprised primarily of upland mixed forest, with smaller areas of mesic flatwoods, slough, and forested wetlands. In addition, a retention pond and ruderal/disturbed areas occupy a small portion of the preserve (Table 2, Exhibits 7a–b).

These habitats support a variety of plants (Appendix D) and animals (Appdendix E).

Table 2. Florida Natural Area Inventory (FNAI) communities present in the preserve (FNAI 2010).

FNAI Communities	Acres	% of Preserve
upland mixed forest (includes areas being restored)	34.72	48.97%
mesic flatwoods	15.81	22.30%
disturbed areas (includes stormwater pond)	10.81	15.25%
slough	5.57	7.86%
forested wetlands	3.96	5.59%

2.1.5 Imperiled Species

The preserve supports 13 imperiled flora and fauna species (Table 3, Appendices D and E, Wunderlin 1998).

Flora

Giant airplants (*Tillandsia utriculata*) are a rare occurrence on tree limbs in upland mixed forest areas. Giant airplant is state listed as Endangered, due to the invasion of the Mexican bromeliad weevil (*Matamasius callizona*). Adult weevils feed on airplant leaves. Weevil larvae tunnel into the growing tissue in the heart of the plant, killing the plant. The weevil was first documented in Florida in 1989 and has no natural enemies here. The Mexican bromeliad weevil has been found onsite and is a major threat to the continued survival of giant airplants in Red Bug Slough Preserve.

Royal fern (*Osmunda regalis* var. *spectabilis*) isn't common onsite but can occasionally be found in forested wetland areas. This species is designated as Commercially Exploited in the State of Florida due to habitat alteration, over collection, and removal of wild plants from natural areas.

Fauna

Eleven listed animal species occur in the preserve, including seven species of birds, two species of reptiles and two species of insects (FWC 2021). State threatened birds include little blue heron, reddish egret, roseate spoonbill, tricolored heron, Florida sandhill crane and least tern. An additional species, wood stork, is federally listed as threatened. Other listed species present include American alligator, listed as Federally threatened due to similarity of appearance, gopher tortoise, listed as State threatened, and two insect species, the ceraunus blue and cassius blue butterflies, both listed as Federally threatened due to similarity of appearance.

FLORIDA'S NATURAL COMMUNITIES

The Florida Natural Areas Inventory (FNAI) provides a detailed guide to the standard classification system of 81 natural communities (FNAI 2010). The premise of this system is that physical factors such as climate, geology, soil, hydrology, and fire frequency determine the species configuration of an area. Areas that are similar with respect to those factors will tend to have natural communities with similar species compositions. Differences in species composition can occur, however, despite similar physical conditions and the reverse can occur. Some physical influences, such as fire frequency, may vary from FNAI's descriptions for certain natural communities in this plan.

Table 3. Imperiled flora and fauna in the preserve.

	Common Name	Scientific Name	Status
Plant	American royal fern	*Osmunda regalis*	Commercially Exploited (State)
	giant air plant; giant wild pine	*Tillandsia utriculata*	Endangered (State)
Animal	American alligator	*Alligator mississippiensis*	Threatened due to similarity of appearance (Federal)
	cassius blue butterfly	*Leptotes cassius*	Threatened due to similarity of appearance (Federal)
	ceraunus blue butterfly	*Hemiargus ceraunus*	Threatened due to similarity of appearance (Federal)
	Florida sandhill crane	*Grus canadensis pratensis*	Threatened (State)
	gopher tortoise	*Gopherus polyphemus*	Threatened (State)
	least tern	*Sterna antillarum*	Threatened (State)
	little blue heron	*Egretta caerulea*	Threatened (State)
	reddish egreat	*Egretta rufescens*	Threatened (State)
	roseate spoonbill	*Platalea ajaja*	Threatened (State)
	tricolored heron	*Egretta tricolor*	Threatened (State)
	wood stork	*Mycteria americana*	Threatened (Federal)

2.2 Natural Resource Management

Once a natural community reaches the desired optimal condition, it is considered to be in a "maintenance condition." Required actions for achieving and sustaining a community's maintenance condition may include ongoing control of non-native plant and animal species, maintaining natural hydrologic functions (including historical water flows and water quality), preserving a community's biodiversity and vegetative structure, protecting viable populations of plant and animal species (including those that are imperiled or endemic), and preserving intact ecotones that link natural communities across the landscape.

2.2.1 Upland Mixed Forest

The preserve has approximately 29.62 acres of upland mixed forest and 5.1 acres of a former Brazilian pepper monoculture that are being restored to upland mixed forest. FNAI describes this habitat type as well-developed, closed-canopy forests of upland hardwoods on rolling hills (FNAI 2010). Soils are generally sandy clays or clayey sands with substantial organic and often calcareous components. These areas rarely burn due to sparse ground cover and oak leaf litter that tends to retain moisture.

Table 4. Common plants of Upland Mixed Forest.

Common Name	Scientific Name
live oak	*Quercus virginiana*
water oak	*Quercus nigra*
laurel oak	*Quercus laurifolia*
cabbage palm	*Sabal palmetto*
wild coffee	*Psychotria spp.*
beautyberry	*Callicarpa americana*
sugarberry	*Celtis laevigata*

Current Conditions

Upland mixed forest areas are in generally fair condition. The overstory consists primarily of native trees but midstory and understory vegetation is a mixture of native species and invasive exotic species. Proximity to residential areas and hydrologic alteration resulting from dredging of the slough have likely facilitated invasion by several invasive exotic species.

Florida Exotic Pest Plant Council Category I species that are impacting upland mixed forest habitat include but are not limited to air potato (*Dioscorea bulbifera*), arrowhead vine (*Syngonium podophyllum*), rosary pea (*Abrus precatorius*), shoebutton ardisia (*Ardisia elliptica*), carrotwood (*Cupaniopsis anacardioides*), Brazilian pepper (*Schinus terebinthifolius*), tuberous sword fern (*Nephrolepis cordifolia*), octopus tree (*Schefflera actinophylla*), Java plum (*Syzygium cumini*) and caesarweed (*Urena lobata*).

Optimal Conditions

Optimally, the upland mixed forest should be free of invasive exotic plants, but a realistic goal is to maintain this habitat with overall infestation levels of less than five percent. Restoration of the historical hydroperiods would also be beneficial but may not be possible given the amount of residential development in surrounding areas and associated stormwater management.

Management Guidelines

Continue follow-up treatments of invasive exotic species. Systematic and ongoing treatment of invasive exotic plants is key to optimal management of the upland mixed forest habitat onsite. Complete ongoing development of the draft comprehensive Integrated Pest Management Plan. The plan should cover classes by management zone and treatment frequency, timing, and methods recommended for each species. Should hydrologic restoration be considered in the future, undertake research into natural hydroperiods and produce a feasibility assessment to determine which methods can be used without adversely impacting surrounding neighborhoods. If such a project is considered, work closely with the Sarasota Bay Estuary Program, the Southwest Florida Water Management District, and the U.S. Army Corps of Engineers to develop and implement necessary hydrologic restoration work.

2.2.2 Mesic Flatwoods

The preserve has approximately 15.81 acres of mesic flatwoods habitat. FNAI describes mesic flatwoods as an open canopy forest of widely spaced pine trees with little or no understory but a dense ground cover of herbs and shrubs. Nearly all pines in the preserve are south Florida slash pines (*Pinus elliottii* var. *densa*) but a few longleaf pines (*Pinus palustris*) also occur in the southeastern portion of the preserve. Mesic flatwoods occur on relatively flat, moderately or poorly drained areas. Fire is an important natural component necessary to maintain mesic flatwoods in optimal condition. Fire return interval in these areas is specified at 1–8 years, but anecdotal evidence suggests these areas may burn more frequently, on the order of once every 2–4 years in southwest Florida (personal communication, Robert Dye, retired Park Manager, FL Park Service). Mesic flatwoods is the most common native habitat type in the state, occupying an estimated 30–50 percent of Florida's undeveloped upland acreage (Table 5, FNAI 2010).

Table 5. Common plants of mesic flatwoods.

Common Name	Scientific Name
South Florida slash pine	*Pinus elliottii var. densa*
wax myrtle	*Morella cerifera*
saw palmetto	*Serenoa repens*
fetterbush; shiny lyonia	*Lyonia lucida*
partridge pea	*Chamaecrista fasciculata*
Chapman's goldenrod	*Solidago odora var. chapmanii*

Current Conditions

Mesic flatwoods areas are generally in fair condition in the preserve. All areas of flatwoods onsite have no recent fire history, except for a small lightning strike wildfire near the western boundary in the early 2000s. Lack of fire and adverse impacts resulting from invasive exotic plants are the primary threats to the preserve's mesic flatwoods. At present, an estimated 50–75 percent of mesic flatwoods areas are moderately to severely impacted by invasive exotic plants. The primary Florida Exotic Pest Plant Council Category I species include but are not limited to air potato (*Dioscorea bulbifera*), Brazilian pepper (*Schinus terebinthifolius*), cogongrass *(Imperata cylindrica*), rosary pea (*Abrus precatorius*), carrotwood (*Cupaniopsis anacardioides*), and caesarweed (*Urena lobata*).

Optimal Conditions

Ideally, mesic flatwoods should be managed with prescribed burning to reduce pine density, reduce hardwood and woody shrub invasion, and maintain a diverse herbaceous understory of low grasses and forbs. Under optimal conditions, mesic flatwoods should be free of invasive exotic plants. Since complete eradication may not be possible, a more realistic target is to maintain mesic flatwoods areas with less than five percent invasive exotic plant coverage.

Management Guidelines

Prescribed burning would be extremely beneficial for restoration of the preserve's mesic flatwoods areas but is not likely to occur due to the proximity of residential areas and busy roadways on all sides of this site. At a minimum, an extensive public education campaign, a patchwork of small burn units, and careful smoke management would all be necessary to attempt fire management at Red Bug Slough Preserve. In the absence of fire, conduct periodic mechanical understory reduction and pine and possible hardwood thinning and removal. These actions are required to maintain these areas and reduce the threat of wildfire to neighboring residential areas.

Conduct systematic, ongoing treatment of invasive exotic plants. Initial treatments have been completed, but continued follow-up treatments are required to further reduce invasive exotic plant impacts and ultimately to maintain mesic flatwoods in optimal condition.

Complete ongoing development of the draft comprehensive Integrated Pest Management Plan. The plan should cover classes by management zone and treatment frequency, timing, and methods recommended for each species.

2.2.3 Disturbed

The preserve has approximately 9.21 acres of disturbed habitat.

Table 6. Common plants in disturbed areas.

Common Name	Scientific Name
bahia grass	*Paspalum notatum*
Mexican clover	*Richardia grandiflora*
Spanish needles	*Bidens alba var. radiata*
caesarweed	*Urena lobata*
beggar's ticks	*Desmodium incanum*
Virginia pepperweed	*Lepidium virginicum*

Current Conditions

Disturbed areas of the preserve are located along trails, service roads, and in areas maintained as lawns. These areas are primarily bahia grass (*Paspalum notatum*) and weedy species such as Mexican clover (*Richardia grandiflora*), wedelia (*Sphagneticola trilobata*), Virginia pepperweed (*Lepidium virginicum*), beggar's ticks (*Desmodium incanum*), and Spanish needles (*Bidens alba*). Paths along well traveled trails and heavily used service roads are bare soil or sand in spots.

Optimal Conditions

Restoring disturbed areas to native habitat is not likely due to access needs. For this reason, optimal conditions will be to maintain and/or enhance existing ground cover, address any erosion issues, and limit further spread of invasive exotic plants.

Management Guidelines

Maintain ground cover. Address erosion where needed. Treat Florida Exotic Pest Plant Council Category I invasive plants to limit coverage. Complete ongoing development of the draft comprehensive Integrated Pest Management Plan. The plan should cover classes by management zone and treatment frequency, timing, and methods recommended for each species.

2.2.4 Slough

There are approximately 5.57 acres of slough in the preserve. Historical aerial photos show the slough was a series of isolated wetlands within a linear depressional area that would overflow and fill the channel only during the rainy season or after extended periods of heavy rainfall. Sometime between the 1940s and 1960s the primary flow way of the slough was channelized, resulting in continuous flow throughout the year.

Table 7. Common plants in slough habitat.

Common Name	Scientific Name
pickerelweed	*Pontederia cordata*
duck potato	*Sagittaria lancifolia*
spatterdock	*Nuphar advena var. advena*
dotted smartweed	*Persicaria punctatum*
water lettuce	*Pistia stratiotes*
water hyacinth	*Pontederia crassipes*
crested floating-heart	*Nymphoides hydrophylla*

Current Conditions

Slough areas in the preserve are in fair condition. Since channelization, the slough flows continuously throughout the year instead of intermittently after extended periods of heavy rain and during the traditional summer wet season (June – September). A concrete weir downstream (north) of the main area of the preserve maintains elevated water levels, particularly in the dry season (October–May). The slough originates in Gull Lake, approximately 0.75 mile southeast of the preserve and flows northwestward through residential and commercial areas prior to entering the preserve. In addition, a prominent drainage ditch along the south boundary of the preserve carries a large volume of stormwater runoff from the Country Place neighborhood, located east of the preserve, into Red Bug Slough. An additional small feeder ditch from neighborhoods to the west empties into a small stormwater pond in the preserve located to the west of the main slough. The pond contains an outfall structure connected to a culvert that feeds into the slough when water levels are high. During the dry season, runoff remains in the pond, allowing nutrients to be absorbed by aquatic plants sediments to settle out prior to discharge into the slough. Despite the limited amount of treatment resulting from the onsite stormwater pond, most of the runoff from east and south of the preserve contains elevated nutrient levels. As a result, higher than desired chlorophyll levels are an issue in the preserve portion of the slough (water quality sampling data, Sarasota County Stormwater Environmental Utility). High nutrient levels also contribute to a proliferation of invasive and nuisance exotic aquatic and shoreline plants, including water hyacinth (*Eichhornia crassipes*), crested floating heart (*Nymphoides cristata*), torpedograss (*Panicum repens*), creeping oxeye (*Sphagneticola trilobata*), and aggressive native species including water lettuce (*Pistia stratiotes*) and cattails (*Typha* sp.). Sarasota County Stormwater Environmental Utiilty maintains the drainage channel and treats invasive plants in the primary slough and southern drainage ditch. As floating aquatic plants are treated and eventually sink to the bottom, they accumulate on the substrate and are contribute to eutrophication.

Optimal Conditions

Optimally, natural historical hydrologic conditions would exist at the preserve. Unfortunately, this condition is unlikely to be accomplished due to hydrologic alterations upstream and in the preserve where channelization has diverted surface runoff into the slough. More realistically, optimal conditions include restoration of shorter, historical hydroperiods and restoration of depression marsh systems in the slough drainageway.

Management Guidelines

Continue ongoing control of invasive exotic aquatic plants. Quickly identify and address any new erosion issues. Capitalize on opportunities for restoration of natural slope along altered stretches of the bank and add native shoreline plantings where needed. Complete ongoing development of the draft comprehensive Integrated Pest Management Plan. The plan should cover classes by management zone and treatment frequency, timing, and methods recommended for each species.

2.2.5 Forested Wetlands

There are 3.96 acres of forested wetland habitat in the preserve. Most areas have a hydroperiod of 3–6 months, primarily during the summer rainy season (June – September).

Table 8. Common plants in forested wetlands.

Common Name	Scientific Name
red maple	*Acer rubrum*
golden canna	*Canna flaccida*
swamp fern	*Telematoblechnum serrulatum*
buttonbush	*Cephalanthus occidentalis*
American elm	*Ulmus americana*

Current Conditions

Forested wetland areas in the preserve are generally in good condition. Some invasive species are present, but initial treatments have significantly reduced the occurrence of invasive plants. Changes in sheet flow resulting from development of areas outside the preserve and channelization of the slough have likely resulted in altered hydroperiods in forested wetland habitats.

Optimal Conditions

Optimally, natural historical hydroperiods would exist. Unfortunately, this condition is unlikely to be accomplished due to hydrologic alterations upstream and in the preserve where channelization has diverted surface runoff into the slough. Invasive exotic species should be maintained at minimum levels.

Management Guidelines

Continue treating Florida Exotic Pest Plant Council Category I invasive plants. Complete ongoing development of the draft comprehensive Integrated Pest Management Plan. The plan should cover classes by management zone and treatment frequency, timing, and methods recommended for each species. Monitor and prevent human disturbance and impacts. Avoid forested wetlands when planning future amenities or infrastructure. If impacts are unavoidable, mitigation measures should be required to restore, enhance, or create other wetland areas.

2.2.6 Stormwater Pond

The preserve has a 1.6-acre stormwater pond. The pond was created in 2013 as part of a comprehensive wetland restoration and enhancement project and is located just west of the slough channel in the central portion of the preserve. Historically, the area was a small basin marsh associated with Red Bug Slough but had become heavily infested with Brazilian pepper trees. Brazilian pepper trees and 8–12” of surface soils were removed and native wetland trees, shoreline plants, and an outfall structure were installed. The pond collects stormwater runoff from neighborhoods immediately west of the preserve and provides passive stormwater treatment before overflow is discharged into the slough.

Table 9. Common plants in the stormwater pond.

Common Name	Scientific Name
pop ash; carolina ash	*Fraxinus caroliniana*
fireflag	*Thalia geniculata*
Nexican primrosewillow	*Ludwigia octovalvis*
string lily	*Crinum americanum*
duckweed	*Lemna minor*
water spangles	*Salvinia minima*

Current Conditions

The stormwater pond is in good condition. Some invasive species are present, but ongoing contracted maintenance treatments have resulted in control of aggressive natives and invasive exotic plants. Turtles, wading birds, and migratory waterfowl are routinely observed using the pond. Maintenance of the pond is the primary responsibility of the Sarasota County Stormwater Environmental Utility and designated contractors.

Optimal Conditions

Optimally, the stormwater pond will have open water habitat with native emergent and floating plants.

Management Guidelines

Continue to monitor and treat Florida Exotic Pest Plant Council Category I invasive plants. Complete ongoing development of the draft comprehensive Integrated Pest Management Plan. The plan should cover classes by management zone and treatment frequency, timing, and methods recommended for each species. Monitor embankments around the stormwater pond to address erosion and human impacts resulting in damage to native shoreline vegetation. Periodically maintain metal grates atop the outfall structure to remove accumulated vegetation and debris following high water events.

2.2.7 Management Zones

To coordinate management efforts and maintain historical data pertaining to invasive exotic plant and animal control and other land management activities, the preserve is divided into ten management zones (Exhibit 8, Tables 10a–c).

Table 10a. Management Zones used to track management and restoration activities.

Zone	Acres
1	7.4
2	6.1
3	7.6
4	6.1
5	6.7
6	8.8
7	2.7
8	7.6
9	7.4
10	7.5

Table 10b. Annual burn plan intervals and targets.

Natural Community	Acres	Burn Interval (years)	Annual Target (acres)
mesic flatwoods	15.81	2–4	N/A
upland mixed forest	34.72	>100	0
forested wetlands	3.96	>100	0
disturbed areas	10.81	N/A	N/A
slough	5.57	N/A	N/A

Table 10c. Annual IPM rotation intervals and targets.

Invasive Plant Management Treatment Zones	Acres Surveyed and Treated (where needed)	3-Year Rotation
Zones 1, 2 and 3	21.1	Due 2023, 2026, 2029
Zones 4, 5 and 6	21.6	Due 2024, 2027, 2030
Zones 7, 8, 9 and 10	25.2	Due 2022, 2025, 2028, 2031

2.2.8 Special Considerations

Fire

FNAI indicates that mesic flatwoods historically burned every 1–8 years. Personal observations and anecdotal evidence from other local land managers suggests that an interval of 2–4 years is recommended. Other habitats found in the preserve are fire-influenced, but not fire-adapted.

Invasive Exotic Species

The preserve has a history of extensive invasive exotic plant infestation. Continued follow-up is required to prevent widespread reinfestation.

A combination of methods and funding strategies have been used to combat invasive exotic plants in the preserve, dating to the early 2000s. Contracted invasive exotic plant control has been funded from Sarasota County Park's budget and augmented with supplemental funding from the Florida Fish and Wildlife Commission's Upland Invasive Plant Management Program. In addition, in-house staff, school groups, and other volunteers have participated in invasive exotic plant control efforts. Sarasota County staff continue to monitor the site to identify and map new infestations and monitor, map, and coordinate treatment of existing infestations. Each year, approximately one third of the preserve will be assessed for the presence of invasive exotic plants and a combination of staff, volunteers, and/or contractors will be used to maintain maximum control.

Current invasive exotic plant infestation levels are estimated at 40–50 percent of the site. Primary species include air potato vine (*Dioscorea bulbifera*), guineagrass (*Panicum maximum*), arrowhead vine (*Syngonium podophyllum*), wedelia (*Sphagneticola trilobata*), Caesarweed (*Urena lobata*), rosary pea (*Abrus precatorius*), cogongrass (*Imperata cylindrica*), Brazilian pepper tree (*Schinus terebinthifolius*), carrotwood (*Cupaniopsis anacardioides*), tuberous sword fern (*Nephrolepis cordifolia*), Java plum (*Syzygium cumini*), flamegold (*Koelreuteria elegans*), shoebutton ardisia (*Ardisia elliptica*), and golden pothos (*Epipremnum aureum*) (Florida Invasive Species Council 2019).

On two previous occasions, green iguanas have been reported in the preserve. Both occurrences were single individuals and the first one reported was captured in a live trap and adopted by a local reptile enthusiast. The second animal was reported by a preserve visitor and was never located or reported again. At present, the preserve contains no other known invasive exotic animal species that require special control measures.

2.2.9 Research and Monitoring

Locations of imperiled plants will be geolocated using GPS and mapped into a Sarasota County GIS database. Species previously undocumented in Sarasota County will be reported to the FNAI and voucher specimens will be collected for Selby and USF herbaria.

3 CULTURAL RESOURCE MANAGEMENT COMPONENT

3.1 CULTURAL RESOURCE INVENTORY

3.1.1 Archeological Sites

The preserve was surveyed for archeological or historical sites in March 2005. Both the slough and the associated feeder ditch were identified as historical sites and recorded in the Florida Master Site File (ACI 2005). Red Bug Slough is labeled as site #SO5275 and the Red Bug Slough Feeder Ditch is labeled as site #SO5276.

3.1.2 Historical Structures and Uses

According to early land surveys conducted by Sam Reid (1843) and A. H. Jones (1847), most of the area where the preserve is located was classified as "3rd rate pine land" and "rough pine" interspersed with a few sawgrass ponds. At the time of these surveys there were no manmade features documented in the area.

In 1881, Hamilton Disston purchased four million acres of land deemed "swamp and overflow land" by the federal government which had been turned over to the State of Florida in 1880. Disston, along with English investor Sir Edward James Reed eventually split up these holdings and deeded massive tracts of land to several private corporations (Matthews 1989). All of Section 9 within Township 37 South, Range 18 East, including present day areas of Red Bug Slough Preserve were deeded to the Florida Land and Improvement Company on February 3, 1883 (State of Florida, undated).

Through the years, the Red Bug Slough Preserve area has been known by various names. Jason S. Alford was an early settler in the area and owned property adjacent to the present day preserve. Alford was a member of a vigilante group known as the Sara Sota Vigilance Committee. Alford and other committee members were suspicious of Sarasota resident Charles Abbe's land dealings and political preferences (Marth 1973 and Matthews 1989). Alford was a suspect in Abbe's eventual homicide but was later exonerated.

From the late 1800s until the mid- to late-1900s, the area was predominantly native range. Turpentine extraction also occurred in the vicinity and one old "cat-faced" pine remains today in the southwestern area of the preserve.

Historical aerial photos show that Red Bug Slough and the associated feeder ditch along the preserve's south boundary were dredged sometime in the period between the 1940s and 1960s, providing better drainage and creating arable acreage for agriculture. Citrus groves dotted areas nearby during this period, but many of the groves were eventually sold and converted to residential and commercial uses.

In more recent years, the preserve area was referred to as "Skeeter Drain" by local residents. According to long-time neighbors, the preserve's dense woods and footpaths became a hangout for teens, BMX bicyclists, and motorcycle riders. Unfortunately, the area became a popular dumping area, as well. Despite these abuses, most of the upland areas of the site remained largely in a natural state.

3.2 Cultural Resource Management

3.2.1 Considerations for Protection

Existing historical sites will be protected from impacts associated with public use, installation of future amenities or infrastructure, and routine land management activities. If additional cultural or historically significant resources are discovered, they will be geolocated with GPS, mapped, and recorded in Sarasota County's GIS database and the Florida Master Site File. Any future sites discovered will also be protected to prevent intentional looting or accidental damage from visitors and land management activities.

4 LAND USE COMPONENT

4.1 CURRENT LAND USES, AMENITIES, AND FACILITIES

4.1.1 Agriculture

Not applicable.

4.1.2 Public Access and Recreational Uses

Hiking, dog walking, picnicking, nature photography, bicycling, bird watching, nature study, and meditation are primary public uses of the preserve (Exhibit 9). A parking area, public restrooms, playground, interpretive kiosks, and a picnic shelter are located near the main entrance on Beneva Road. An additional picnic shelter and fishing dock are located near the slough. A series raised boardwalk bridges cross wetland areas in the northern part of the preserve. A network of nature trails marked with numbered trail markers and several interpretive signs exist throughout the park. A pervious paver block sidewalk passes through a portion of the preserve along the south boundary. Several wooden benches and picnic tables are located near the playground and are placed strategically in scenic locations around the slough. Two-rail wood mortise fencing delineates the main parking lot and most of the preserve's boundary. Facilities and amenities are in various maintenance conditions (Table 11) and several known unauthorized uses and potential unauthorized uses have been identified (Table 12).

Table 11. Current condition and maintenance requirements of facilities and amenities.

Type	Improvement	Condition Assessment	Maintenance Goal
public	nature trails	good; seasonally flooded	trim encroaching vegetation, as needed and assess annually dry season to repair ruts or erosion
	signs	good	assess monthly and repair and replace, as needed
	benches	fair	assess quarterly and repair and replace, as needed
	picnic tables	fair	assess quarterly and repair and replace, as needed
	picnic shelters	good	assess annually and repair or replace, as needed
	restrooms	fair	cleaning 6 days a week, repair or replace damaged fixtures and remove vandalism, as needed
	kiosks	good	assess annually and replace, as needed
	fishing dock	good	assess annually; minor repairs, as needed
	boardwalks	good	assess annually; minor repairs, as needed
	parking lot	fair	assess quarterly; replace damaged or missing parking bumpers and fill ruts as needed
support	fencing	fair to good	assess annually for replacement needs; minor repairs as needed

Table 12. Potential or known unauthorized uses. Potential unauthorized uses or activities are set forth in the County Facility Rules, in addition to applicable rules in Chapter 90 of the Sarasota County Code of Ordinances.

Unauthorized Use	Potential	Known
poaching of plants	X	
release of wildlife or pets	X	
dogs off leash		X
overnight camping		X
unauthorized vehicles, atvs, utvs, dirt bikes		X

4.1.3 Outreach and Education

Two interpretive kiosks are located near the main entrance on Beneva Road and several novalloy interpretive signs are located strategically along nature trails and near important natural features. In addition, regular environmental educational events are led by staff and volunteers. Popular topics and themes include plant and animal identification, adaptive land management in an urban preserve, birdwatching hikes, evening and nighttime programs (full moon walks and meteor watching events), and yoga and meditation walks. In addition, a passive visitor engagement and education program about the invasive air potato vine has been ongoing since 2020. It encourages visitors to collect and dispose of air potatoes using specially labeled “spud buckets” that feature interesting facts about air potatoes and the importance of controlling this invasive exotic plant.

4.1.4 Land Use on Adjacent Lands

Areas surrounding the preserve are primarily residential neighborhoods with some commercial uses. Proctor Road is located along the north boundary of the preserve with residential areas, a Unity church, and the Suncoast Technical College just north of Proctor Road. Beneva Road, Crooked Creek Condominiums, L’Estancia Garden Apartments, and residential neighborhoods are located adjacent to the east boundary of the preserve. A Florida Power and Light right-of-way, drainage ditch, Lake Arrowhead Condominiums, the Lakehouse Retirement Complex, and residential neighborhoods are located immediately south of the preserve. Lockwood Ridge Road and associated residential neighborhoods border the western side of the preserve.

The proximity of several busy roadways and the density of residential and commercial areas surrounding the preserve make some land management activities difficult, including the use of prescribed fire and herbicide application for invasive exotic plant control. All areas immediately adjacent to the preserve are zoned as residential (Exhibit 3).

4.2 Proposed Land Uses, Amenities, and Facilities

The highest and best use for this site is protection and preservation of native habitats and enhancement and restoration of impacted areas while providing non-consumptive, ecologically benign public recreational opportunities. Activities include, but are not limited to hiking, bicycling, picnicking, nature photography, nature study, bird watching, meditation, and other similar activities. Key management activities necessary to provide for the highest and best uses of this site include an ongoing invasive exotic plant management strategy, maintenance activities to keep facilities clean and to remove litter

and illegal homeless camps, and replacement of fencing, benches, trail markers, and other amenities as needed.

As of September 2022, parking expansion, a new playground, and an ADA accessible trail are in the design phase, with construction scheduled to begin in fall–winter 2022.

4.3 Current and Proposed ADA Components

As of September 2022, official parking is a gravel surface parking lot with concrete parking bumpers located inside the main entrance on Beneva Road. There is also limited on-street parking at the Lockwood Ridge and Gypsy Street entrance and limited unimproved parking at the Ashton Road entrance. Public restrooms located adjacent to the main parking lot are ADA accessible. In addition, a future ADA trail is in the design phase and slated for construction beginning in fall–winter 2022. All pedestrian access points meet ADA entry requirements, but existing trails are natural surface trails. As such, trails are sometimes flooded, have uneven surfaces and occasional areas of exposed tree roots, and may be subject to ground disturbance through erosion, wildlife activity, and general use. The County will continue to look for opportunities to provide reasonable accessibility while balancing the need for security and maintaining the integrity of the natural environment.

4.4 Visitor Use Management And Carrying Capacity

The preserve is designated as an on-leash, dog-friendly site and welcomes a wide range of users including, but not limited to, hikers, runners, bicyclists, bird watchers, fishers, meditation groups, and school and educational groups. Dogs running off leash and conflicting uses can sometimes be an issue, but generally the trail system and open space areas are expansive enough to accommodate a variety of uses simultaneously. User complaints arise occasionally and are addressed promptly by County staff or the Sarasota County Sheriff's Department. If a specific use or activity has a negative effect on the natural habitat, wildlife, or the experience of other preserve visitors, that use or activity will be reviewed and may be deemed inappropriate for the preserve. If this occurs, there may be limitations placed on the use or activity or it may no longer be permitted. As of 2022, the carrying capacity of the preserve for visitor use has not been identified. Understanding carrying capacity is useful for avoiding negative impacts to native plants and animals and the visitor experience.

5 OPERATIONS COMPONENT

Land management activities are accomplished using a combination of County staff and resources, outside contractors, and volunteers. Sarasota County is responsible for all maintenance activities onsite. Key activities include administrative duties, trash removal, trail and fence maintenance, upkeep of facilities and recreational amenities and, most importantly, habitat management. PRNR staff or their designee will provide property maintenance activities on a semi-weekly basis.

5.1 CURRENT STAFF

Sarasota County is responsible for staffing the operation and maintenance of the preserve. It is assigned an Environmental Specialist position as manager of the preserve. The attention of the manager is divided among five preserves and two conservation easement sites. In addition to the manager, the NAT Division employs an operations team with a staff of six people to service NAT areas. Operations team responsibilities include, but are not limited to, fence and gate installation and repair, invasive exotic plant management, assistance with prescribed fire, and fire-line preparation.

5.2 OPTIMAL STAFF

More land management staff time is necessary to address maintenance, natural resource management, and security of the preserve. NAT staff requires two additional staff members for the Land Manager Section and two for the Operations Section. Additional staff will also augment the prescribed fire team and the invasive exotic plant management teams.

5.3 AGENCY AND NGO PARTNERS

- The Florida Communities Trust program provided funds to offset site acquisition costs and continues to have oversight to ensure that grant award conditions pertaining to site management, site development, and visitor use are being met.
- Sarasota County Sheriff's Office assists with homeless outreach and enforcement.
- The Florida Fish and Wildlife Conservation Commission has provided financial assistance through the Upland Invasive Plant Management Program, grant funding for native shoreline plantings, fisheries monitoring and management (i.e., periodic stocking with channel catfish as part of their Urban Fisheries Program), and assistance with wildlife violation issues.
- The Sarasota Bay Estuary Program has offered technical assistance related to water quality issues and habitat improvement and offers habitat restoration grant opportunities.
- The Southwest Florida Water Management District may be an important partner to provide technical expertise and assist Sarasota County with future hydrologic restoration work.
- The University of Florida, Institute of Food and Agriculture Sciences Extension (UF/IFAS) has augmented interpretive educational programs on this site and other Sarasota County preserves.
- Marie Selby Botanical Gardens staff assisted with a recent plant bioblitz onsite and their staff botanists and herbaria are important local resources.
- The Sarasota Audubon Society has led bird surveys onsite and continues to provide updates to the preserve's bird species list.

Relationships with these Agencies and other NGO partners are expected to continue.

5.4 Volunteers

The preserve has no dedicated volunteer help. NAT staff will continue working closely with the Sarasota County Parks, Recreation and Natural Resources Volunteer Coordinator to identify volunteer projects and recruit volunteers for assistance with land management, data collection, and general site management.

5.5 Law Enforcement and Security

Sarasota County is responsible for providing security at the preserve. Our vandalism deterrence strategy depends on providing a visible presence during the course of visits and activities. Signage is used to inform the public about hours of operation and County ordinances governing appropriate use and behavior at the preserve. All illegal activities are immediately reported to the Sarasota County Sheriff's Department, which is responsible for providing regular patrols and enforcing trespass ordinances.

5.6 Funding

Primary funding for site maintenance of the preserve comes from the ESLPP, which provides about $40,000 annually for management. The County will continue to pursue grant opportunities and cooperative management strategies with public and private stakeholders to maximize funding opportunities for site improvement and management.

5.7 Costs

Rough cost estimates in this plan are taken from current actual expenditures through February 2022 (Appendix F). In all but salaries, costs were slightly increased to account for inflation, but escalators were not applied. Salaries are fully loaded, and escalators are built in for the 10-year estimates. Site managers estimated the amount of time each staff position would spend on the natural area and divided annual salary accordingly to determine salary costs for given natural areas.

	ACTIVITY	ESTIMATED 10-YR COST
NATURAL RESOURCES	integrated pest management surveys	$70,000
	integrated pest management treatment	$400,000
	hydrologic restoration	$15,000
	mechanical vegetation management	$100,000
	plants for butterfly gardens and parking area	$5,000
	plants for habitat restoration and enhancement	$15,000
	TOTAL COSTS	**$605,000**

CULTURAL RESOURCES	surveying	$0
	monitoring	$3,500
	TOTAL COSTS	**$3,500**
LAND USES	*Maintenance*	
	fencing	$50,000
	trail markers	$1,200
	benches	$5,000
	tools	$0
	parking lots	$7,500
	road repairs	$0
	restrooms (funded by facilities mgmt.)	$10,000
	portable toilets	$0
	grills	$0
	tables	$5,000
	pavilions	$0
	fishing dock	$5,000
	boardwalks and bridges	$7,500
	paver block walkway	$2,000
	camp sites	$0
	grounds mowing	$0
	power washing	$3,500
	building maintenance	$7,500
	Recreation and Visitor Services	
	kiosks	$3,500
	brochures	$0
	maps	$0

	programs, guided and self-guided	$1,000
	events	$0
	playgrounds	$10,000
	nature centers	$0
	trails	$7,500
	TOTAL COSTS	**$126,200**
OPERATIONS	salary of Supervisor	$20,160
	salary of Land Manager (ES III)	$194,677
	salary of Crew Leader	$0
	salary of Park Attendant	$0
	salary of Trades Worker	$87,500
	salary of Administrative Assistant	$15,000
	office equipment	$0
	utilities (water, sewer, electric)	$120,000
	contracted restroom cleaning and trash removal	$60,000
	offices	$0
	security	$0
	alarm monitoring	$0
	fleet (UTVs and trucks)	$66,200
	TOTAL COSTS	**$563,537**

Notes:

1. Current loaded salary is based on FY 21.
2. Salary multiplier is 2.5%.
3. Average hourly rate for salary is based on 2080 total hours per year.

6 GOALS, OBJECTIVES, AND ACTIONS IMPLEMENTATION MATRIX

	GOALS / OBJECTIVES / ACTIONS		MEASURE (metric)	TARGETS 2022	2024	2026	2028	2030
NATURAL RESOURCES	**GOAL 1**	**Restore and maintain native habitats and communities.**						
	OBJECTIVE 1.1	Identify impacted upland habitat areas and implement actions to enhance and/or restore to more natural conditions.						
	Action	Survey site to identify impacted areas.	Survey 4–5 mgmt. zones/year	4–5 zones/yr	4–5 zones/yr	4–5 zones/yr	4–5 zones/yr	4–5 zones/yr
	Action	Include habitat restoration and remediation in annual work plan.	Identify target areas annually in work plan	X	X	X	X	X
	Action	Identify funding source(s) to implement restoration.	Completed budget for each project	TBD	TBD	TBD	TBD	TBD
	Action	Complete annual Firewise assessment and annual burn plan.	Update annually	X	X	X	X	X
	OBJECTIVE 1.2	Investigate and implement hydrologic restoration measures.						
	Action	Identify potential funding source(s), assess the ecological benefits, potential offsite impacts, and feasibility of hydrologic restoration actions onsite,	Feasibility study			X		

OBJECTIVE 1.3	Eliminate FLEPPC Category I and II plants and if not possible, reduce to levels too low to alter the natural habitats' systems, composition, and assemblage.							
Action	Annually survey and GPS FLEPPC Category I invasive exotic species.	Completed survey	3–4 zones/yr	3–4 zones/yr	3–4 zones/yr	3–4 zones/yr	3–4 zones/yr
Action	Annually treat FLEPPC Category I invasive exotic species.	Completed treatment	3–4 zones/yr	3–4 zones/yr	3–4 zones/yr	3–4 zones/yr	3–4 zones/yr
Action	Write scopes of work and manage outside contractor as needed for larger infestations and difficult access.	# acres treated	TBD	TBD	TBD	TBD	TBD
Action	Update plant list annually with newly discovered invasive exotic species.	Update annually	TBD	TBD	TBD	TBD	TBD
OBJECTIVE 1.4	Continue to explore, consider, and facilitate reintroduction of prescribed fire to manage fire-dependent habitats.						
Action	Discuss feasibility of prescribed fire management in mesic flatwoods habitats onsite.	Annual discussion as part of Firewise assessment	X	X	X	X	X
Action	Develop annual burn plan, if feasible.	Annual burn plan	TBD	TBD	TBD	TBD	TBD
OBJECTIVE 1.5	In the absence of fire, manage height and density of understory vegetation in fire-dependent habitats to mitigate wildfire threat.						
Action	Survey the height and density of vegetation in management zones that contain mesic flatwoods habitat.	Surveys completed for all zones where mesic flatwoods is present	X	X	X	X	X
Action	Employ mechanical treatment in identified zones.	# acres of identified zones treated	0–4 acres/yr	0–4 acres/yr	0–4 acres/yr	0–4 acres/yr	0–4 acres/yr
Action	Conduct pre- and post-disturbance photo point and vegetation response monitoring.	Monitoring completed annually, as needed	TBD	TBD	TBD	TBD	TBD

CULTURAL RESOURCES	**GOAL 2**	**Protect, preserve, and maintain cultural resources.**						
	OBJECTIVE 2.1	Follow Sarasota County History Center protocol when ground disturbance is possible.						
	Action	Inform Sarasota County History Center of ground disturbance activity in the preserve outside of normal management parameters.	Documentation of communication	TBD	TBD	TBD	TBD	TBD
	Action	Evaluate condition of known and newly-discovered sites.	Annual evaluation	X	X	X	X	X
	OBJECTIVE 2.2	Document and record discoveries of previously unknown cultural or historical sites.						
	Action	Coordinate with Sarasota County History Center if any new cultural artifacts or new sites are discovered.	Coordinate, as needed	TBD	TBD	TBD	TBD	TBD
LAND USES	**GOAL 3**	**Maintain public access and passive recreational opportunities without adversely impacting native habitats and communities.**						
	OBJECTIVE 3.1	Provide public pedestrian access to the preserve.						
	Action	Maintain established entry points and trailheads.	Ongoing maintenance, as needed	X	X	X	X	X
	OBJECTIVE 3.2	Provide and maintain a trail system in the preserve.						
	Action	Maintain marked nature trail network.	Ongoing maintenance, as needed	X	X	X	X	X
	Action	Evaluate trail network to assess and repair trail conditions, as needed.	Annual evaluation	X	X	X	X	X

	Action	Survey trail system for vegetation growing over or obstructing the path and trim where needed.	Ongoing maintenance, as needed	X	X	X	X	X
	Action	Monitor condition of boardwalks and make repairs and/or replace as needed.	Annual evaluation	X	X	X	X	X
	Action	Monitor trail network to identify and correct adverse impacts to native habitats.	Annual evaluation	X	X	X	X	X
	OBJECTIVE 3.3	Provide picnic tables and benches.						
	Action	Monitor condition of picnic tables and benches and make repairs or request replacement, as needed.	Ongoing maintenance, as needed	X	X	X	X	X
	OBJECTIVE 3.4	Provide a clean environment for visitors.						
	Action	Survey the parking area, trail system, and picnic areas for trash. Pickup and remove trash.	Ongoing maintenance, as needed	X	X	X	X	X
	Action	Supply trash and recycle receptacles and replace, as needed.	Ongoing maintenance, as needed	X	X	X	X	X
	OBJECTIVE 3.5	Assess visitor impacts to natural habitats to maintain habitat health, function, species composition, and assemblage.						
	Action	Establish and implement monitoring protocols to assess the effects of recreational activities on the health of the natural habitats.	Protocol developed			X		
	Action	Determine recreational carrying capacity.	Assessment method developed				X	

	GOAL 4	**Provide nature based educational and interpretive opportunities.**						
	OBJECTIVE 4.1	Provide interpretive signs.						
	Action	Survey for repair needs to current interpretive signs.	Ongoing maintenance, as needed	X	X	X	X	X
	OBJECTIVE 4.2	Provide a combination of onsite and offsite interpretive programs.						
	Action	Coordinate staff, outside department, and/or volunteer-presented interpretive programs and hikes.	# programs	Min 6 per yr	Min 6 per yr	Min 6 per yr	Min 6 per yr	Min 6 per yr
	Action	Advertise interpretive programs and/or hikes through County media.	Annual events guide and social media	X	X	X	X	X
	Action	Maintain data including date of event, subject, presenter, and number of people attending.	Monthly accomplishments	each month	each month	each month	each month	each month
OPERATIONS	**GOAL 5**	**Provide administrative and fiscal support.**						
	OBJECTIVE 5.1	Continue administrative support at current levels.						
	Action	Process purchase order, payment of invoices, as needed.	Administrative support	X	X	X	X	X

7 REFERENCES

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8 EXHIBITS

EXHIBIT 1 – LOCATION MAP

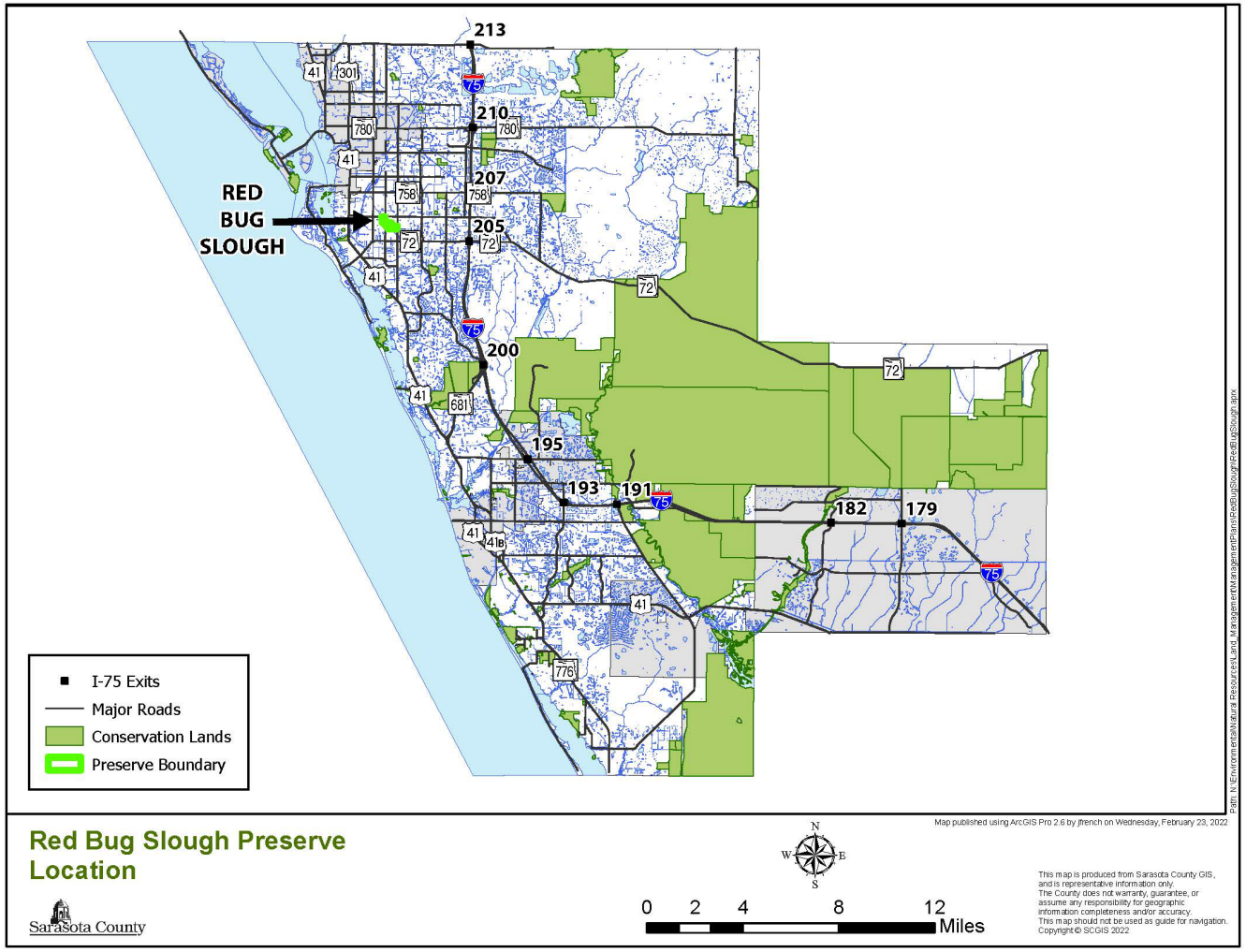


EXHIBIT 2 – PRESERVE BOUNDARY

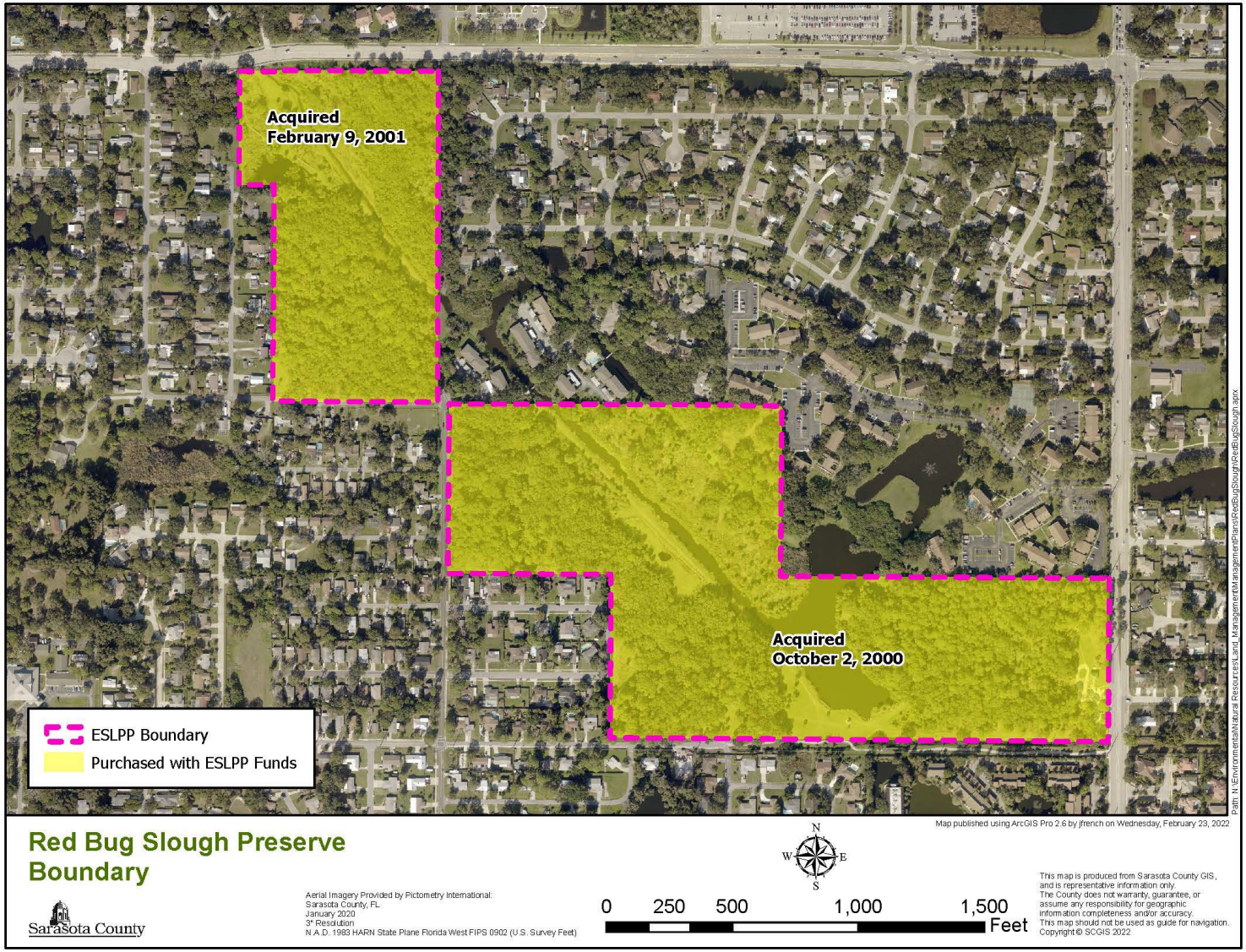


EXHIBIT 3 – ZONING MAP

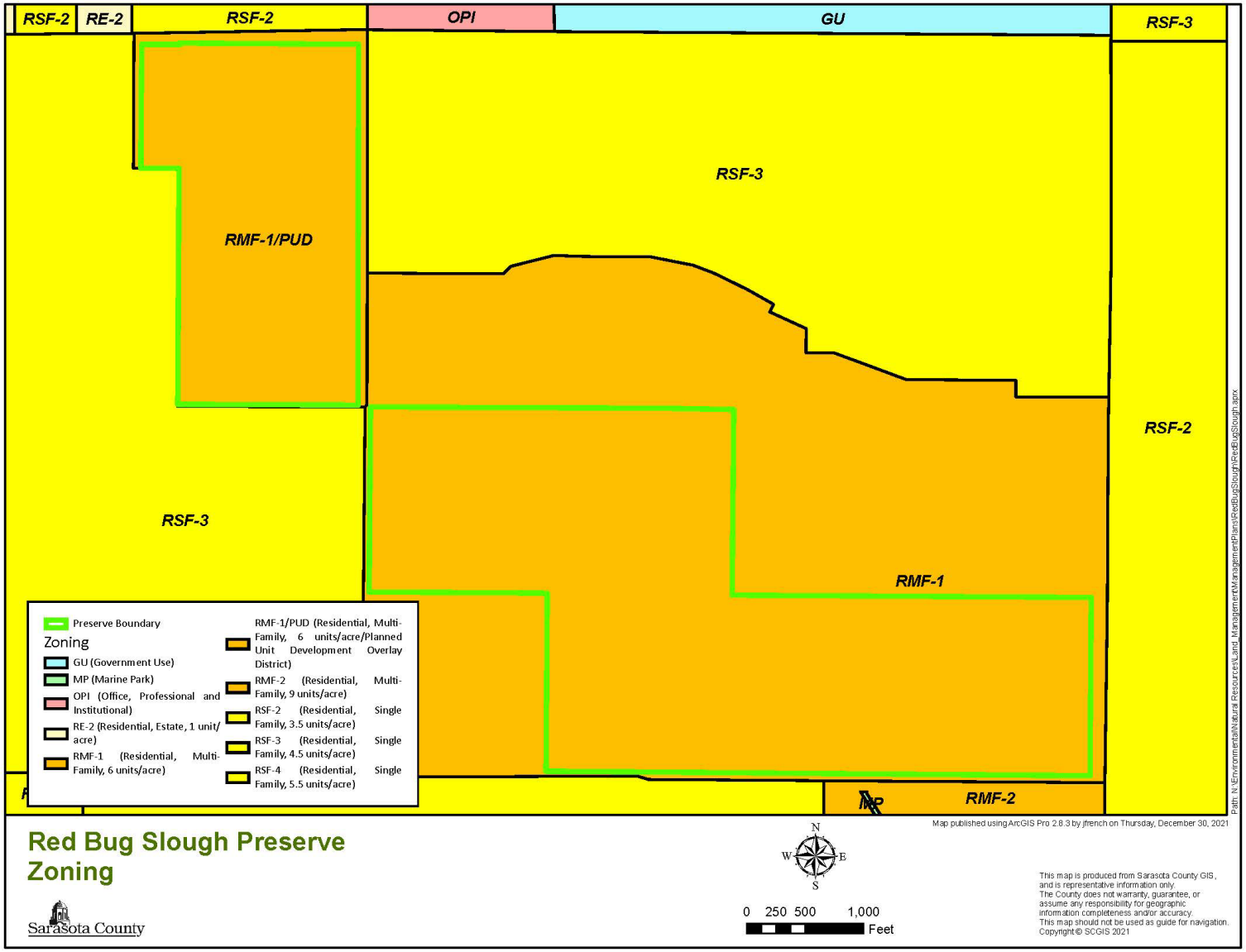


EXHIBIT 4 – ELEVATION MAP

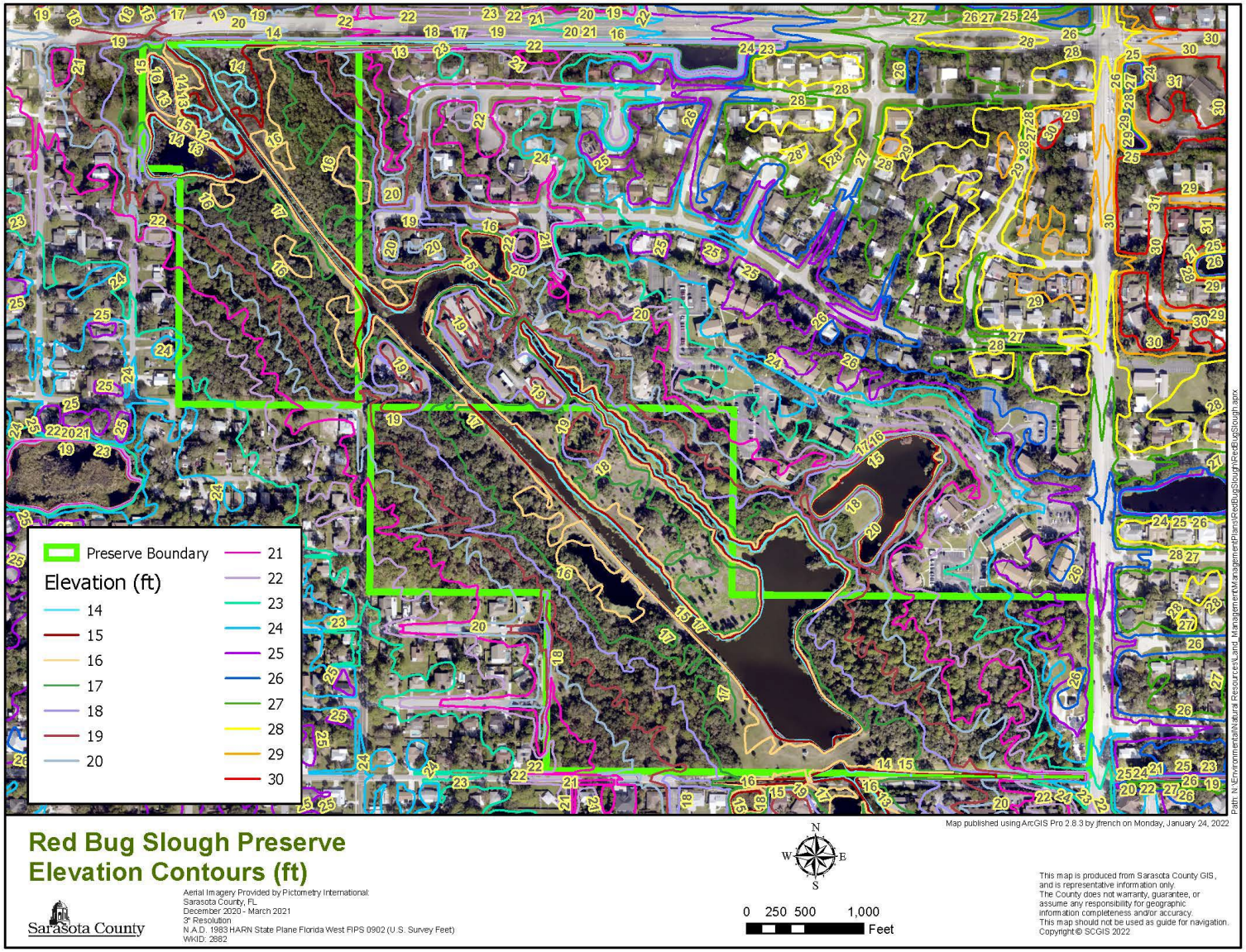


EXHIBIT 5 – SOILS MAP

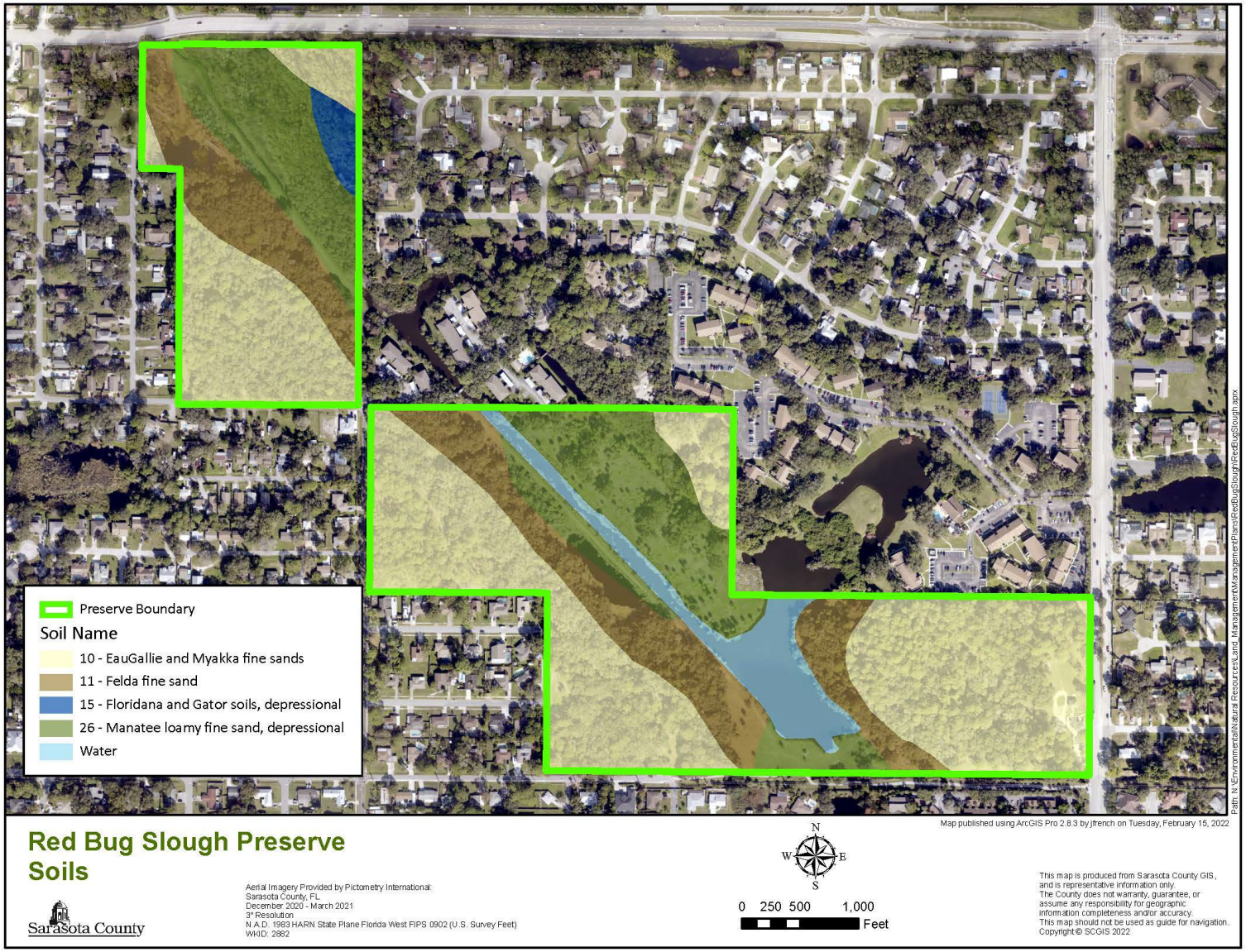


EXHIBIT 6 – FLOOD MAP

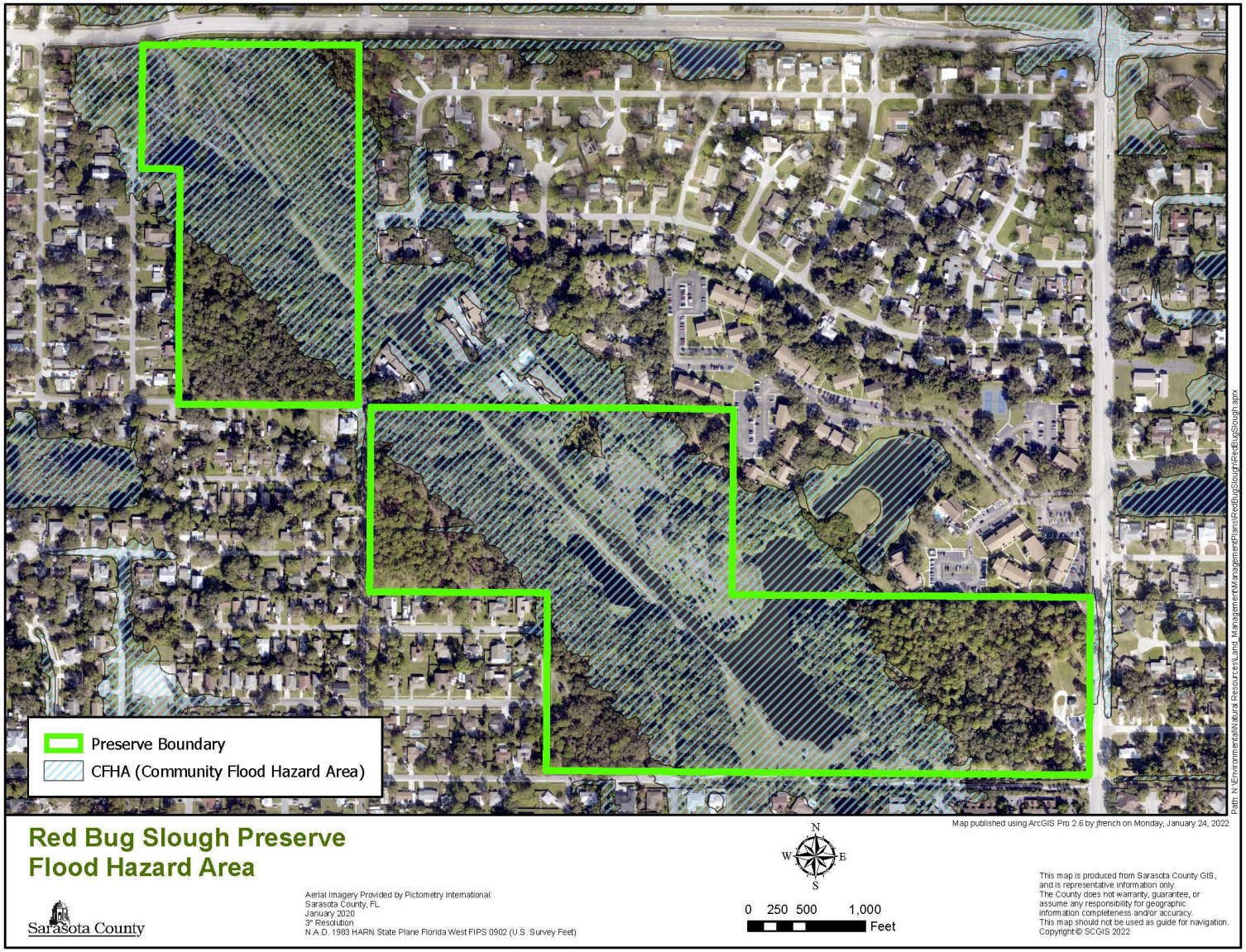


EXHIBIT 7A – HABITAT MAP

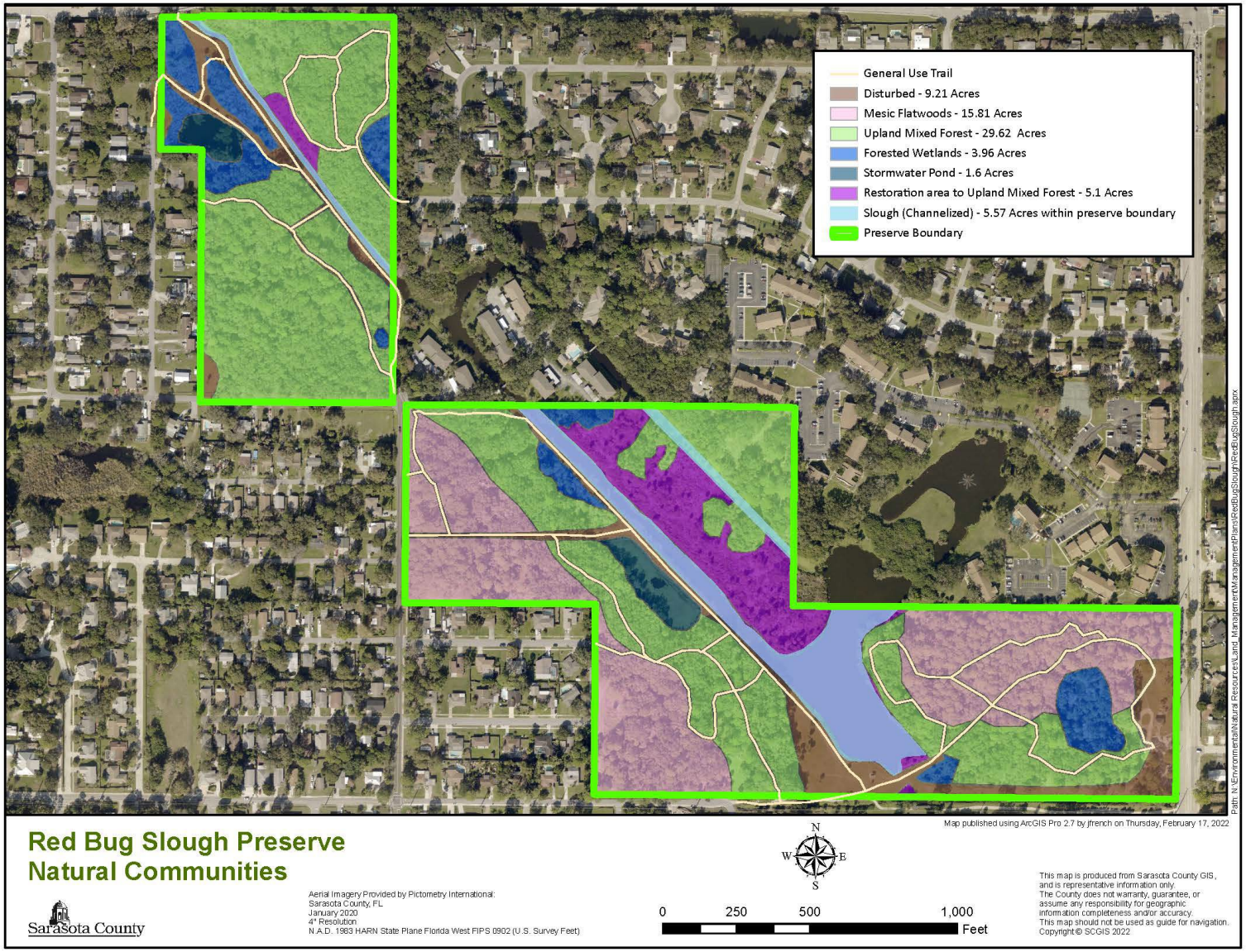


EXHIBIT 7B – HISTORICAL AERIAL

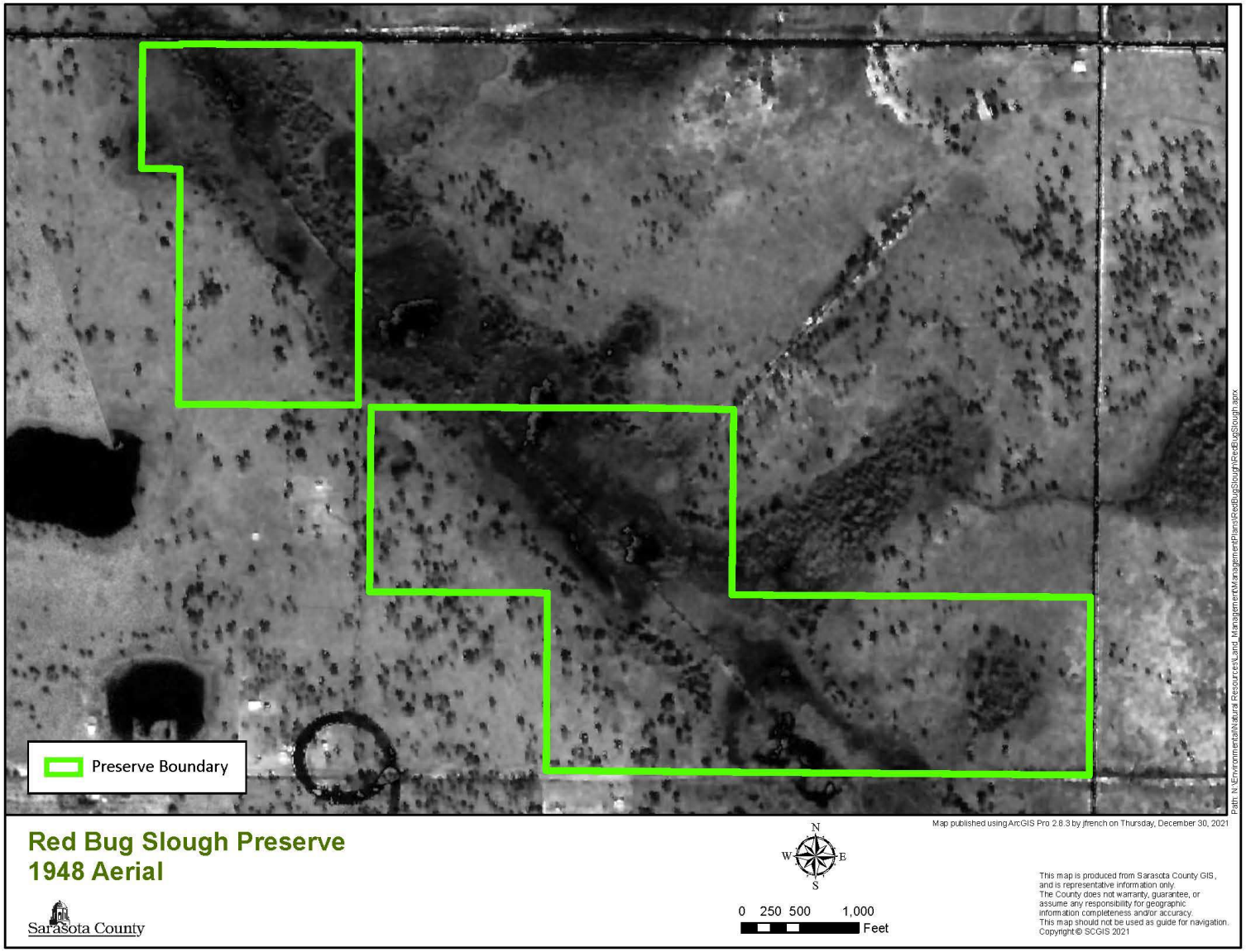
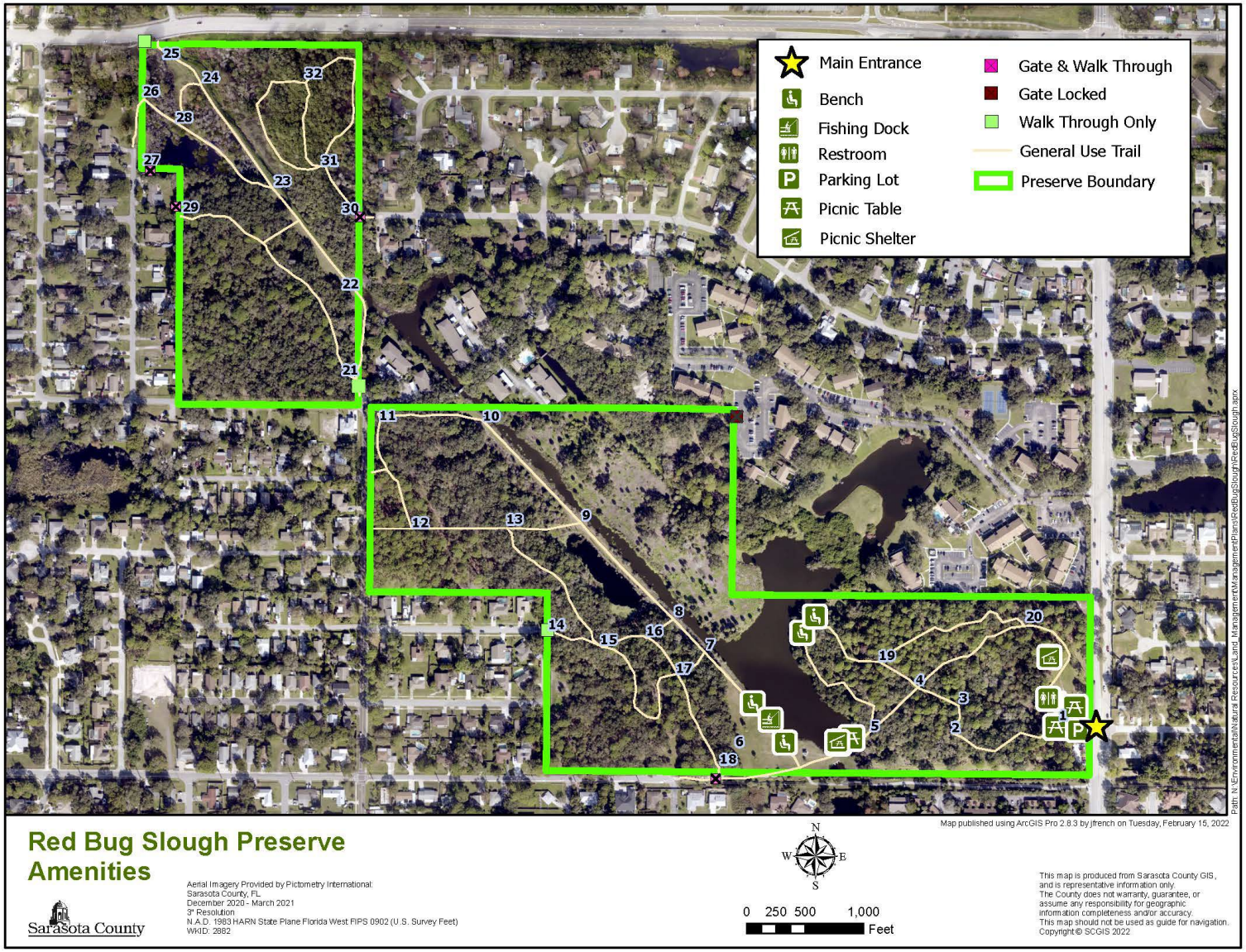


EXHIBIT 8 – MANAGEMENT ZONE MAP

EXHIBIT 9 – FACILITIES, IMPROVEMENTS AND PUBLIC ACCESS AMENITIES MAP



9 APPENDICES

APPENDIX A – ACQUISITION DOCUMENTS

Deeds of Sale

Schwartz Parcel Warranty Deed dated October 2, 2000
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=2000127980

VanLede Parcel Warranty Deed dated February 9, 2001
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=2001018438

APPENDIX B – LAND USE AGREEMENTS AND EASEMENTS

NONE

APPENDIX C – GOVERNING DOCUMENTS AND ORDINANCES

1. The Sarasota County Comprehensive Plan (2016) to provide for the protection and management of the county's native habitats balanced with the need for public resource-based, ecologically benign, and non-consumptive recreation.
   https://www.scgov.net/government/planning-and-development-services/planning-and-zoning/planning/

2. Ordinance No. 97-024: Adopted 11 March 1997, amending Ordinance 90-01 to include carrotwood, Chinese tallow and beach naupaka as invasive exotic plant species to be controlled. (Sarasota County Invasive Plant Species Ordinance)
   https://library.municode.com/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH54EN NARE_ARTXIXEXPL

3. Ordinance No. 98-045: Adopted 5 May 1998 with sunset provision 31 May 2005, to prohibit unauthorized removal or destruction of property on parks, beaches, recreation areas, or other public lands with a second-degree misdemeanor penalty for violations. (Use of Parks, Beaches, and Public Land)
   https://library.municode.com/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH90PA REPULA_ARTIIUSPABEPULA

4. Ordinance No. 98-096: Adopted 1998, to increase up to .25 mill in ad valorem taxes for 20 years and authorize general obligation bonds up to $53,000,000 (maturity deadline date, 31 December 2019), both subject to referendum, to acquire, protect and manage environmentally sensitive lands.

5. Ordinance No. 99-004: Adopted 1999, to create 9-member Environmentally Sensitive Lands Oversight Committee to submit proposed protection priority sites to the Board for approval and provide recommendations to the Board on the management, restoration and/or public use of each property; to provide policies for such lands. (Environmental Sensitive Lands Protection Ordinance)
   https://library.municode.com/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH54EN NARE_ARTIVENSELA

6. Sarasota County Land Management Master Plan (2004) to provide guidelines to those managing natural areas for conservation or preservation in Sarasota County.
   https://www.scgov.net/Home/ShowDocument?id=1306

APPENDIX D – LIST OF PLANT SPECIES

The preliminary plant list has been compiled for the preserve as a partial listing of known species. As new species are discovered, their identification will be confirmed according to Wunderlin (1998) and added to the existing species list. Survey information on the occurrence of listed plant species will be forwarded to the Florida Natural Areas Inventory (FNAI) in accordance with their procedures.

FAMILY	SCIENTIFIC NAME	COMMON NAME(S)	STATUS
Acanthaceae	*Ruellia blechum*	green shrimp plant; Browne's blechum	non-native
Acanthaceae	*Ruellia simplex*	Mexican petunia; Britton's wild petunia	non-native
Acanthaceae	*Thunbergia fragrans*	whitelady	non-native
Acanthaceae	*Thunbergia grandiflora*	skyvine; clockvine; Bengal trumpet	non-native
Aceraceae	*Acer rubrum*	red maple	
Agavaceae	*Sanseveria hyacinthoides*	mother-in-law's tongue; snake plant;	non-native
Agavaceae	*Yucca aloifolia*	bowstring hemp Spanish bayonnet	
Alismataceae	*Sagittaria lancifolia*	duck-potato; bulltongue arrowhead	
Alismataceae	*Sagittaria latifolia*	duck-potato; broadleaf arrowhead	
Amaranthaceae	*Alternanthera philoxeroides*	alligatorweed	non-native
Amaranthaceae	*Amaranthus australis*	southern amaranth	
Amaranthaceae	*Gomphrena serrata*	prostrate globe amaranth; arrasa con todo	non-native
Amaryllideae	*Crinum americanum*	string lily	
Amaryllideae	*Hippeastrum* sp.	Amaryllis	non-native
Anacardiaceae	*Rhus copallinum*	winged sumac; shining sumac	
Anacardiaceae	*Schinus terebinthifolius*	Brazilian pepper tree	non-native
Anacardiaceae	*Toxicodendron radicans*	poison ivy	
Annonaceae	*Annona glabra*	pond apple	
Annonaceae	*Asimina retuculata*	pawpaw	
Apiaceae	*Eryngium baldwinii*	Baldwin's eryngo; snakeroot	
Apiaceae	*Ptilimnium capillaceum*	mock bishopweed; herbwilliam	
Apiaceae	*Spermolepis divaricata*	roughfruit scaleseed	
Aquifoliaceae	*Ilex cassine*	dahoon holly	
Aquifoliaceae	*Ilex glabra*	gallberry; inkberry	
Araceae	*Epipremnum pinnatum*	golden pothos	non-native
Araceae	*Lemna minor*	common duckweed	
Araceae	*Pistia stratiotes*	water lettuce	
Araceae	*Syngonium podophyllum*	American evergreen; arrowhead vine	non-native
Araliaceae	*Hydrocotyle ranunculoides*	floating pennywort	
Araliaceae	*Schefflera actinophylla*	schefflera; Australian umbrella tree	non-native
Arecaceae	*Livistona chinensis*	Chinese fan palm	non-native
Arecaceae	*Sabal palmetto*	cabbage palm; sabal palm	

Arecaceae	*Serenoa repens*	saw palmetto	
Asclepiadaceae	*Asclepias curassavica*	tropical milkweed	non-native
Asclepiadaceae	*Asclepias incarnata*	pink swamp milkweed	
Asclepiadaceae	*Asclepias perennis*	swamp milkweed	
Asteraceae	*Ageratina jacunda*	hammock snakeroot	
Asteraceae	*Ambrosia artemisiifolia*	common ragweed	
Asteraceae	*Ampelaster carolinianum*	climbing aster; Carolina aster	
Asteraceae	*Baccharis halimifolia*	saltbush; salt myrtle	
Asteraceae	*Bidens alba* var. *radiata*	Spanish needles	
Asteraceae	*Calyptocarpus vialis*	straggler daisy	non-native
Asteraceae	*Cirsium nuttallii*	Nuttall's thistle	
Asteraceae	*Conyza canadensis*	dwarf horseweed; Canadian horseweed	
Asteraceae	*Cyanthillium cinereum*	little ironweed	non-native
Asteraceae	*Eclipta prostrata*	false daisy	
Asteraceae	*Emilia fosbergii*	Florida tasselflower	non-native
Asteraceae	*Emilia sonchifolia*	lilac tasselflower	non-native
Asteraceae	*Erechtites hieracifolia*	fireweed	
Asteraceae	*Erigeron quercifolius*	oakleaf fleabane	
Asteraceae	*Eupatorium capillifolium*	dog fennel	
Asteraceae	*Eupatorium compositifolium*	yankeeweed	
Asteraceae	*Eupatorium leptophyllum*	falsefennel	
Asteraceae	*Eupatorium mohrii*	Mohr's thoroughwort	
Asteraceae	*Eupatorium rotundifolium*	roundleaf thoroughwort; false horehound	
Asteraceae	*Eupatorium serotinum*	lateflowering thoroughwort	
Asteraceae	*Euthamia caroliniana*	flat-topped goldenrod	
Asteraceae	*Gamochaeta pensylvanica*	Pennsylvania cudweed; Pennsylvania everlasting	
Asteraceae	*Gnaphalium* sp.	Everlasting	
Asteraceae	*Helianthus annuus*	sunflower	non-native
Asteraceae	*Hieracium megacephalon*	coastalplain hawkweed	
Asteraceae	*Mikania cordifolia*	Florida Keys hempvine	
Asteraceae	*Mikania scandens*	climbing hempvine	
Asteraceae	*Pluchea carolinensis*	cure-for-all	non-native
Asteraceae	*Pluchea odorata*	sweetscent	
Asteraceae	*Pluchea rosea*	rosy camphorweed	
Asteraceae	*Pterocaulon pycnostachyum*	blackroot	
Asteraceae	*Solidago fistulosa*	pinebarrens goldenrod	
Asteraceae	*Solidago odora* var. *chapmanii*	Chapman's goldenrod	
Asteraceae	*Sonchus asper*	spiny sowthistle	non-native
Asteraceae	*Sonchus oleraceus*	common sowthistle	non-native

Asteraceae	*Sphagneticola trilobata*	wedelia; creeping oxeye	non-native
Asteraceae	*Tridax procumbens*	tridax daisy; coatbuttons	non-native
Asteraceae	*Verbesina virginica*	frostweed; crownbeard	
Asteraceae	*Vernonia blodgettii*	Florida ironweed	
Asteraceae	*Youngia japonica*	Oriental false hawksbeard	non-native
Asteraceae	*Impatiens walleriana*	garden impatiens; bizzy-lizzy	non-native
Asteraceae	*Campsis radicans*	trumpet creeper; trumpet vine	
Asteraceae	*Telmatoblechnum serrulatum*	swamp fern; toothed midsorus fern	
Asteraceae	*Woodwardia virginica*	Virginia chain fern	
Asteraceae	*Lepidium virginicum*	Virginia pepperweed	
Asteraceae	*Tillandsia recurvata*	ball moss	
Asteraceae	*Tillandsia setacea*	grass-leaved air plant; southern needleleaf	
Asteraceae	*Tillandsia usneoides*	Spanish moss	
Asteraceae	*Tillandsia utriculata*	giant air plant; giant wild pine	E (FDA)
Cactaceae	*Acanthocereus tetragonus*	triangle cactus	non-native
Cannaceae	*Canna flaccida*	yellow canna	
Caprifoliaceae	*Sambucus canadensis*	elderberry	
Caprifoliaceae	*Viburnum obovatum*	Walter's viburnum; small-leaf viburnum	
Caprifoliaceae	*Viburnum* sp.	Viburnum	non-native
Caricaceae	*Carica papaya*	papaya	
Caryophyllaceae	*Drymaria cordata*	Drymary; West Indian chickweed	
Chrysobalanaceae	*Licania michauxii*	gopher apple	
Clusiaceae	*Hypericum hypericoides*	St. Andrew's cross	
Clusiaceae	*Hypericum tetrapetalum*	fourpetal St. John's wort	
Commelinaceae	*Commelina diffusa*	common dayflower	
Commelinaceae	*Commelina erecta*	whitemouth dayflower	
Commelinaceae	*Murdannia nudiflora*	nakedstem dewflower	non-native
Convolvulaceae	*Cuscuta pentagona*	fiveangled dodder	
Convolvulaceae	*Ipomoea alba*	moonflowers; tropical white morningglory	
Convolvulaceae	*Ipomoea cordatotriloba*	tievine	
Cucurbitaceae	*Melothria pendula*	creeping cucumber	
Cucurbitaceae	*Momordica charantia*	wild balsam apple; balsampear; bitter melon	non-native
Cupressaceae	*Juniperus virginiana*	red cedar	
Cyperaceae	*Bulbostylis stenophylla*	sandyfield hairsedge	
Cyperaceae	*Cladium jamaicensis*	sawgrass	
Cyperaceae	*Cyperus croceus*	Baldwin's flatsedge	
Cyperaceae	*Cyperus involucratus*	umbrella plant	non-native
Cyperaceae	*Cyperus ligularis*	swamp flatsedge	
Cyperaceae	*Cyperus odoratus*	fragrant flatsedge	

Cyperaceae	*Cyperus polystachyos*	bunchy flatsedge	
Cyperaceae	*Cyperus retrorsus*	pinebarren flatsedge	
Cyperaceae	*Cyperus virens*	green flatsedge	
Cyperaceae	*Eleocharis interstincta*	knotted spikerush	
Cyperaceae	*Rhynchospora colorata*	starrush whitetop	
Cyperaceae	*Rhynchospora latifolia*	giant whitetop; sandswamp whitetop	
Cyperaceae	*Schoenoplectus tabernaemontani*	soft-stemmed bulrush	
Cyperaceae	*Scirpus tabernaemontani*	softstem bulrush	
Cyperaceae	*Scleria triglomerata*	tall nutgrass; whip nutgrass	
Dioscoreaceae	*Dioscorea bulbifera*	air potato; devil's potato	non-native
Ericaceae	*Lyonia fruticosa*	coastalplain staggerbush	
Ericaceae	*Lyonia lucida*	fetterbush	
Ericaceae	*Vaccinium* sp.	Blueberry	
Ericaceae	*Vaccinium stamineum*	deerberry	
Euphorbiaceae	*Acalypha gracilens*	slender three-seeded mercury	
Euphorbiaceae	*Chamaesyce hypericifolia*	graceful sandmat	
Euphorbiaceae	*Chamaesyce* sp.	Sandmat	
Euphorbiaceae	*Cnidoscolus stimulosus*	tread-softly; finger-rot	
Euphorbiaceae	*Euphorbia graminea*	grassleaf spurge	
Euphorbiaceae	*Euphorbia hypericifolia*	graceful spurge	
Euphorbiaceae	*Euphorbia hyssopifolia*	hyssop spurge	
Euphorbiaceae	*Phyllanthus urinaria*	chamber bitter	non-native
Euphorbiaceae	*Poinsettia cyathophora*	painted leaf; wild poinsettia; fire-on-the-mountain	
Euphorbiaceae	*Poinsettia heterophylla*	fiddler's spurge; Mexican fireplant	
Euphorbiaceae	*Ricinus communis*	castorbean	non-native
Fabaceae	*Abrus precatorius*	rosary pea	non-native
Fabaceae	*Apios americana*	groundnut	
Fabaceae	*Chamaecrista fasciculata*	partridge pea	
Fabaceae	*Chamaecrista nictitans*	sensitive pea	
Fabaceae	*Crotalaria pallida*	streaked rattlebox	non-native
Fabaceae	*Desmodium incanum*	beggar's ticks; zarzabacoa comun	
Fabaceae	*Desmodium* sp.	Beggar's ticks; ticktrefoil	
Fabaceae	*Erythrina herbacea*	eastern coralbean; Cherokee bean	
Fabaceae	*Galactia elliottii*	Elliott's milkpea	
Fabaceae	*Galactia regularis*	eastern milkpea	
Fabaceae	*Indigofera hirsuta*	hairy indigo	
Fabaceae	*Medicago lupulina*	black medic	
Fabaceae	*Melilotus albus*	white sweet clover	non-native
Fabaceae	*Melilotus officinalis*		
Fabaceae	*Mimosa strigillosa*	sunshine mimosa	

Fabaceae	*Senna bicapsularis*	Christmas senna	non-native
Fabaceae	*Senna occidentalis*	septicweed	non-native
Fabaceae	*Senna obtusifolia*	coffeeweed; sicklepod	
Fabaceae	*Sesbania herbacea*	danglepod	
Fabaceae	*Vigna luteola*	hairypod cowpea	
Fagaceae	*Quercus laurifolia*	laurel oak	
Fagaceae	*Quercus myrtifolia*	myrtle oak	
Fagaceae	*Quercus nigra*	water oak	
Fagaceae	*Quercus virginiana*	live oak	
Fraxinaceae	*Fraxinus caroliniana*	Pop ash; Carolina ash	
Gentianaceae	*Sabatia grandiflora*	largeflower rosegentian; marsh pink	
Gentianaceae	*Sabatia stellaris*	rose-of-Plymouth	
Geraniaceae	*Geranium carolinianum*	Carolina cranesbill	
Haloragaceae	*Myriophyllum aquaticum*	parrot feather watermilfoil	non-native
Hydrocharitaceae	*Hydrilla verticillata*	hydrilla	non-native
Iridaceae	*Sisyrinchium angustifolium*	narrowleaf blue-eyed grass	
Iteacea	*Itea virginica*	Virginia willow; Virginia sweetspire	
Juncaceae	*Juncus megacephalus*	bighead rush	
Juncaceae	*Juncus scirpoides*	needlepod rush	
Lamiaceae	*Callicarpa americana*	American beautyberry	
Lamiaceae	*Clerodendrum x speciosissimum*	Javanese glorybower	non-native
Lamiaceae	*Hyptis mutabilis*	tropical bushmint	non-native
Lamiaceae	*Salvia lyrata*	lyreleaf sage	
Lamiaceae	*Salvia misella*	river sage	
Lamiaceae	*Stachys floridana*	Florida hedgenettle; Florida betony	
Lauraceae	*Cinnamomun burmannii*	Java cinnamon	non-native
Lauraceae	*Cinnamomum camphora*	camphor tree	non-native
Lauraceae	*Persea palustris*	swamp bay	
Liliaceae	*Asparagus densiflorus*	Sprenger's asparagusfern	non-native
Lythraceae	*Lythrum alatum* var. *lanceolatum*	winged loosestrife	
Magnoliaceae	*Magnolia grandiflora*	southern magnolia	
Magnoliaceae	*Magnolia virginiana*	sweetbay	
Malvaceae	*Hibiscus* sp.	Rosemallow	non-native
Malvaceae	*Kosteletzkya pentacarpos*	saltmarsh mallow	
Malvaceae	*Sida cordifolia*	llima	non-native
Malvaceae	*Sida rhombifolia*	Cuban jute; 49uscov hemp	
Malvaceae	*Urena lobata*	Caesarweed	non-native
Meliaceae	*Melia azedarach*	chinaberry	non-native
Menyanthaceae	*Nymphoides hydrophylla*	crested floating-heart	non-native
Myricaceae	*Myrica cerifera*	wax myrtle	
Myrsinaceae	*Rapanea punctata*	myrsine; colicwood	

Myrtaceae	*Eugenia uniflora*	Surniam cherry	non-native
Myrtaceae	*Melaleuca quinquenervia*	melaleuca; punk tree; paperbark tree	non-native
Myrtaceae	*Psidium cattleianum*	strawberry guava	non-native
Myrtaceae	*Syzygium cumini*	Java plum	non-native
Myrtaceae	*Syzygium jambos*	rose apple; Malabar plum	non-native
Nephrolepidaceae	*Nephrolepis cordifolia*	tuberous sword fern	non-native
Nephrolepidaceae	*Nephrolepis exaltata*	southern sword fern	
Nephrolepidaceae	*Nephrolepis* x *averyi*	sword fern	non-native
Nymphaeaceae	*Nuphar advena* var. *advena*	spatterdock	
Olacaceae	*Ximenia americana*	tallow wood; hog plum	
Onagraceae	*Ludwigia decurrens*	primrosewillow	
Onagraceae	*Ludwigia leptocarpa*	angle stem primrosewillow	
Onagraceae	*Ludwigia maritima*	seaside primrosewillow	
Onagraceae	*Ludwigia octovalvis*	Mexican primrosewillow	
Onagraceae	*Ludwigia peruviana*	Peruvian primrosewillow	non-native
Onagraceae	*Oenothera simulans*	southern beeblossom	
Orchidaceae	*Eulophia graminea*	Chinese crown orchid	non-native
Orchidaceae	*Habenaria floribunda*	rein orchid	
Orchidaceae	*Oeceoclades maculata*	monk orchid	non-native
Osmundaceae	*Osmunda regalis*	American royal fern	CE (FDA)
Osmundaceae	*Osmundastrum cinnamomea*	cinnamon fern	
Oxalidaceae	*Oxalis corniculata*	common yellow woodsorrel	
Oxalidaceae	*Oxalis debilis*	largeflower pink-sorrel	non-native
Oxalidaceae	*Oxalis intermedia*	Woodsorrel broadleaf woodsorrel	non-native
Passifloraceae	*Passiflora incarnata*	purple passionflower	
Phyllanthaceae	*Bischofia javanica*	bishopwood; Javanese bishopwood	non-native
Phytolaccaceae	*Phytolacca americana*	pokeweed; pokeberry	
Phytolaccaceae	*Rivina humilis*	rouge plant	
Pinaceae	*Pinus elliottii* var. *densa*	south Florida slash pine	
Pinaceae	*Pinus palustris*	longleaf pine	
Plantaginaceae	*Linaria canadensis*	blue toadflax	
Plantaginaceae	*Plantago major*	common plantain	non-native
Plumbaginaceae	*Plumbago zeylanica*	wild plumbago; doctorbush	
Poaceae	*Andropogon glomeratus* var. *pumilus*	bushy bluestem	
Poaceae	*Aristida berychiana*	wiregrass	
Poaceae	*Bambusa* sp.	Bamboo	non-native
Poaceae	*Cenchrus gracillimus*	slender sandbur	
Poaceae	*Cynodon dactylon*	Bermudagrass	non-native
Poaceae	*Dichanthelium ensifolium*	cypress witchgrass	
Poaceae	*Dichanthelium portoricense*	hemlock withchgrass	

Poaceae	*Echinochloa crus-galli*	barnyardgrass	non-native
Poaceae	*Echinochloa walteri*	coast cockspur	
Poaceae	*Eustachys petraea*	pinewoods fingergrass	
Poaceae	*Imperata cylindrica*	cogongrass	non-native
Poaceae	*Melinus repens*	rose natalgrass	non-native
Poaceae	*Oplismenus hirtellus*	woodsgrass; basketgrass	
Poaceae	*Panicum anceps*	beaked panicum	
Poaceae	*Panicum maximum*	guinea grass	non-native
Poaceae	*Panicum virgatum*	switchgrass	
Poaceae	*Paspalum notatum*	bahiagrass	non-native
Poaceae	*Paspalum setaceum*	thin paspalum	non-native
Poaceae	*Setaria parviflora*	yellow bristlegrass; knotroot foxtail	
Poaceae	*Setaria* sp.	Bristlegrass or foxtail	
Poaceae	*Sorghastrum secundum*	lopsided indiangrass	
Poaceae	*Spartina bakeri*	sand cordgrass	
Poaceae	*Sporobolus indicus*	smutgrass	non-native
Poaceae	*Stenotaphrum secundatum*	St. Augustine grass	
Poaceae	*Tripsacum dactyloides*	Fakahatchee grass; eastern gama grass	
Polygonaceae	*Persicaria hydropiperoides*	swamp smartweed	
Polygonaceae	*Persicaria punctatum*	dotted smartweed	
Polygonaceae	*Rumex verticillatus*	swamp dock	
Polypodiaceae	*Phlebodium aureum*	golden polypody; serpent fern	
Polypodiaceae	*Pleopeltis polypodioides* var. *michauxiana*	resurrection fern	
Pontederiaceae	*Pontederia crassipes*	water hyacinth	non-native
Pontederiaceae	*Pontederia cordata*	pickerelweed	
Portulacaceae	*Portulaca oleracea*	yellow purslane; little hogweed	
Portulacaceae	*Portulaca pilosa*	pink purslane; kiss-me-quick	
Proteaceae	*Grevillea robusta*	silkoak	non-native
Psilotaceae	*Psilotum nudum*	whisk fern	
Pteridaceae	*Acrostichum danaeifolium*	giant leather fern	
Pteridaceae	*Ceratopteris thalictroides*	watersprite	non-native
Pteridaceae	*Pteridium aquilinum*	common bracken	
Pteridaceae	*Pteridium aquilinum* var. *caudatum*	tailed bracken fern	
Rosaceae	*Prunus caroliniana*	Carolina laurelcherry	
Rosaceae	*Rubus argutus*	sawtooth blackberry	
Rosaceae	*Rubus trivialis*	southern dewberry	
Rubiaceae	*Cephalanthus occidentalis*	buttonbush	
Rubiaceae	*Diodia teres*	poor joe; rough buttonweed	
Rubiaceae	*Hamelia patens*	firebush	

Rubiaceae	*Hedyotis* sp.	Mille graine	
Rubiaceae	*Psychotria nervosa*	wild coffee	
Rubiaceae	*Psychotria sulzneri*	shortleaf wild coffee	
Rubiaceae	*Spermacoce remota*	woodland false buttonweed	
Rubiaceae	*Spermacoce verticillata*	shrubby false buttonweed	non-native
Rutaceae	*Citrus* sp.	Citrus	non-native
Rutaceae	*Severinia buxifolia*	Chinese box-orange	non-native
Salicaceae	*Salix caroliniana*	Carolina willow; Coastal plain willow	
Salviniaceae	*Salvinia minima*	water spangles	non-native
Samolaceae	*Samolus valerandi* subsp. *Parviflorus*	pineland pimpernel; seaside brookweed	
Sapindaceae	*Cupaniopsis anacardioides*	carrotwood	non-native
Sapotaceae	*Sideroxylon reclinatum*	Florida bully	
Schizaeaceae	*Lygodium sp.*	Climbing fern	non-native
Scrophulariaceae	*Bacopa monnieri*	herb-of-grace	
Scrophulariaceae	*Gratiola hispida*	rough hedgehyssop	
Scrophulariaceae	*Scoparia dulcis*	sweet broom	
Smilacaceae	*Smilax auriculata*	earleaf greenbrier; catbrier	
Smilacaceae	*Smilax bona-nox*	saw greenbrier	
Smilacaceae	*Smilax laurifolia*	laurel greenbrier; bamboo vine	
Solanaceae	*Physalis* sp.	Groundcherry	
Solanaceae	*Solanum americanum*	American black nightshade	
Solanaceae	*Solanum diphyllum*	twoleaf nightshade	non-native
Tetrachondraceae	*Polypremum procumbens*	rustweed; juniperleaf	
Theaceae	*Gordonia lasianthus*	loblolly bay	
Thelypteridaceae	*Cyclosorus interrupta*	Hottentot fern; Willdenow's fern	
Thelypteridaceae	*Thelypteris kunthii*	southern shield fern; widespread maiden fern	
Thelypteridaceae	*Thelypteris palustris*	marsh fern	
Typhaceae	*Typha* sp.	Cattail	
Ulmaceae	*Celtis laevigata*	sugarberry; hackberry	
Ulmaceae	*Ulmus americana*	American elm	
Urticaceae	*Boehmeria cylindrica*	false-nettle	
Urticaceae	*Pouzolzia zeylanica*	Pouzolz's bush	non-native
Verbenaceae	*Lantana camara*	lantana	non-native
Verbenaceae	*Phyla nodiflora*	frog-fruit; turkey tangle fruit	
Verbenaceae	*Stachytarpheta jamaicensis*	blue porterweed	
Verbenaceae	*Verbena brasiliensis*	Brazilian vervain	non-native
Verbenaceae	*Verbena scabra*	harsh vervain; sandpaper vervain	
Vitaceae	*Cissus verticillata*	possum grape; seasonvine	
Vitaceae	*Nekemias arborea*	peppervine	
Vitaceae	*Parthenocissus quinquefolia*	Virginia creeper; woodbine	

Vitaceae	*Vitis cinera floridana*	Florida grape	
Vitaceae	*Vitis rotundifolia*	southern fox grape; muscadine grape	
Xyridaceae	*Xyris caroliniana*	Carolina yellow-eyed grass	
Zingiberaceae	*Alpinia zerumbet*	shell ginger; shellflower	non-native

APPENDIX E – LIST OF WILDLIFE SPECIES

The preliminary animal list has been compiled for the preserve as a partial listing of known species.

	FAMILY	SCIENTIFIC NAME	COMMON NAME(S)	STATUS
ARTHROPODS				
	Araneidae	Gasteracantha cancriformis	spinybacked orbweaver	
	Acrididae	Dichromorpha viridis	short-winged green grasshopper	
	Acrididae	Paroxya clavuliger	olive-green swamp grasshopper; olive-green swamp locust	
	Aeshnidae	Anax junius	green darner dragonfly	
	Aeshnidae	Nasiaeschna pentacantha	Cyrano darner dragonfly	
	Apidae	Apis mellifera	European honeybee; western honeybee	non-native
	Apidae	Xylocopa micans	Southern carpenter bee	
	Bibionidae	Plecia nearctica	lovebug	non-native
	Calliphoridae	Chrysoma megacephala	oriental latrine fly; oriental blue fly	non-native
	Chrysomelidae	Lilioceris cheni	air potato leaf beetle	non-native
	Coccinellidae	Harmonia axyridis	Asian lady beetle	non-native
	Coccinellidae	Hippodamia convergens	convergent lady beetle	
	Coenagrionidae	Ischnura ramburii	Rambur's forktail damselfly	
	Crambidae	Pyrausta tyralis	coffee-loving pyrausta moth	
	Culicidae	Aedes tormentor	woodland floodwater mosquito	
	Curculionidae	Metamasius callizona	Mexican bromeliad weevil	non-native
	Cynipidae	Belonocnema treatae	oak gall wasp	
	Erebidae	Metria amella	live oak metria moth	
	Halictidae	Agapostemon splendens	brown-winged striped sweat bee	
	Hemiptera	Zelus longipes	milkweed assassin bug	
	Hesperiidae	Atalopedes campestris	sachem skipper	
	Hesperiidae	Calpodes ethlius	canna skipper; canna leafroller; Brazilian skipper	
	Hesperiidae	Copaeodes minima	Southern skipperling butterfly	
	Hesperiidae	Cymaenes tripunctus	three-spotted skipper	
	Hesperiidae	Ephyriades brunneus	Florida duskywing	
	Hesperiidae	Erynnis horatius	Horace's duskywing	
	Hesperiidae	Hylephila phyleus	fiery skipper	

	Hesperiidae	Pyrgus albescens	white-checkered skipper	
	Hesperiidae	Pyrgus oileus	tropical checkered skipper	
	Hesperiidae	Urbanus proteus	long-tailed skipper	
	Libellulidae	Brachymesia gravida	four-spotted pennant dragonfly	
	Libellulidae	Celithemis eponina	Halloween pennant dragonfly	
	Libellulidae	Crocothemis servilla	scarlet skimmer	non-native
	Libellulidae	Erythemis plebeja	pin-tailed pondhawk	
	Libellulidae	Erythemis simplicicollis	Eastern pondhawk; common pondhawk	
	Libellulidae	Erythemis vesiculosa	great pondhawk	
	Libellulidae	Miathyria marcella	hyacinth glider dragonfly	
	Libellulidae	Orthemis ferruginea	roseate skimmer dragonfly	
	Libellulidae	Pachydiplax longipennis	blue dasher dragonfly	
	Libellulidae	Perithemis tenera	Eastern amberwing dragonfly	
	Lycaenidae	Hemiargus ceraunus	ceraunus blue butterfly	FT S/A (FWC)
	Lycaenidae	Leptotes cassius	cassius blue butterfly	FT S/A (FWC)
	Lycaenidae	Parrhasius m-album	white M hairstreak butterfly	
	Membracidae	Umbronia crassicornis	thorn bug; thorn treehopper	
	Nymphalidae	Agraulis vanillae	Gulf fritillary butterfly	
	Nymphalidae	Anartia jatrophae	white peacock butterfly	
	Nymphalidae	Danaus gilippus	queen butterfly	
	Nymphalidae	Danaus plexippus	monarch butterfly	
	Nymphalidae	Heliconius charithonia	zebra longwing butterfly	
	Nymphalidae	Junonia coenia	common buckeye butterfly	
	Nymphalidae	Limenitis 55uscovy5555 floridensis	Florida viceroy butterfly	
	Papilionidae	Papilio cresphontes	giant swallowtail butterfly	
	Papilionidae	Papilio palamedes	55uscovy5555 swallowtail butterfly	
	Papilionidae	Papilio polyxenes	black swallowtail butterfly	
	Papilionidae	Papilio troilus	spicebush swallowtail butterfly	
	Pieridae	Eurema daira	barred sulphur butterfly	
	Pieridae	Eurema lisa	little sulphur butterfly	
	Pieridae	Phoebis philea	orange-barred sulphur butterfly	
	Pieridae	Phoebis sennae	cloudless sulfur butterfly	
	Scarabaeidae	Cotinis nitida	green June beetle; June bug; June beetle	

	Scarabaeidae	Pelidnota punctata	grapevine beetle; spotted June beetle; spotted pelidnota	
	Scoliidae	Dielis trifasciata	three-banded scoliid wasp	
	Vespidae	Vespula maculifrons	Eastern yellowjacket	
MOLLUSKS				
	Unionidae	Utterbackia imbecillis	paper pondshell	
FISH				
	Centrarchidae	Lepomis macrochirus	bluegill	
	Centrarchidae	Lepomis marginatus	dollar sunfish	
	Centrarchidae	Lepomis microlophus	redear sunfish	
	Centrarchidae	Micropterus salmoides	largemouth bass	
	Centrarchidae	Pomoxis nigromaculatus	black crappie	
	Cichlidae	Oreochromis aureus	blue tilapia	non-native
	Clupeidae	Dorosoma cepedianum	American gizzard shad	
	Clupeidae	Dorosoma petenense	threadfin shad	
	Ictaluridae	Ictalurus punctatus	channel catfish	
	Lepisosteidae	Lepisosteus platyrhincus	Florida gar	
	Loricariidae	Pterygoplichthys multiradiatus	56uscovy5656us; Orinoco sailfin catfish	non-native
	Poeciliidae	Gambusia holbrooki	Eastern mosquitofish	
	Poeciliidae	Poecilia latipinna	sailfin molly	
AMPHIBIANS				
	Bufonidae	Anaxyrus terrestris	Southern toad	
	Eleutherodactylidae	Eleutherodactylus planirostris	greenhouse frog	non-native
	Hylidae	Osteopilus septentrionalis	Cuban tree frog	non-native
	Ranidae	Lithobates grylio	pig frog	
REPITLES				
	Alligatoridae	Alligator mississippiensis	American alligator	FT S/A (FWC)
	Chelydridaea	Chelydra serpentina	common snapping turtle	
	Colubridae	Coluber constrictor priapus	Southern black racer	
	Colubridae	Nerodia fasciata pictiventris	Florida water snake; Florida banded water snake	
	Colubridae	Pantherophis alleghaniensis	yellow rat snake	
	Dactyloidae	Anolis carolinensis	Carolina anole; green anole	
	Dactyloidae	Anolis sagrei sagrei	Cuban brown anole	non-native
	Elapidaea	Micrurus fulvius	Eastern coral snake	
	Emydidae	Pseudemys peninsularis	peninsula cooter	

	Emydidae	Terrapene 57uscovy57 bauri	Florida box turtle	
	Emydidae	Trachemys scripta	common slider	
	Emydidae	Trachemys scripta elegans	red-eared slider	non-native
	Gekkonidae	Hemidactylus mabouia	tropical house gecko	non-native
	Scincidae	Plestiodon inexpectatus	Southeastern five-lined skink	
	Testudinidae	Gopherus polyphemus	gopher tortoise	ST (FWC) C2 (USFWS) S3 (FNAI)
	Trionychidae	Apalone ferox	Florida softshell turtle	
BIRDS				
	Accipitridae	Accipiter cooperi	Cooper's hawk	
	Accipitridae	Accipiter striatus	sharp-shinned hawk	
	Accipitridae	Buteo jamaicensis	red-tailed hawk	
	Accipitridae	Buteo lineatus	red-shouldered hawk	
	Accipitridae	Circus hudsonius	Northern harrier	
	Accipitridae	Elanoides forficatus	swallow-tailed kite	
	Accipitridae	Haliaeetus leucocephalus leucocephalus	Southern bald eagle	
	Alcedinidae	Megaceryle alcyon	belted kingfisher	
	Anatidae	Aix sponsa	wood duck	
	Anatidae	Anas discors	blue-winged teal	
	Anatidae	Anas fulvigula	mottled duck	
	Anatidae	Anas platyrhynchos	mallard hybrid	
	Anatidae	Aythya affinis	lesser scaup	
	Anatidae	Aythya collaris	ring-necked duck	
	Anatidae	Branta bernicla	brant	
	Anatidae	Branta canadensis	Canada goose	
	Anatidae	Bucephala albeola	bufflehead	
	Anatidae	Cairina moschata	57uscovy duck	non-native
	Anatidae	Dendrocygna autumnalis	black-bellied whistling duck	non-native
	Anatidae	Dendrocygna bicolor	fulvous whistling duck	
	Anatidae	Lophodytes cucullatus	hooded merganser	
	Anatidae	Mergus serrator	red-breasted merganser	
	Anhingidae	Anhinga anhinga	Anhinga	
	Apodidae	Chaetura pelagica	chimney swift	
	Aramidae	Aramus guarauna	limpkin	
	Ardeidae	Ardea alba	great egret	
	Ardeidae	Ardea herodias	great blue heron	
	Ardeidae	Botaurus lentiginosus	American bittern	
	Ardeidae	Bubulcus ibis	cattle egret	

	Ardeidae	Butorides virescens	green heron	
	Ardeidae	Egretta caerulea	little blue heron	ST (FWC)
	Ardeidae	Egretta rufescens	reddish egret	ST (FWC)
	Ardeidae	Egretta thula	snowy egret	
	Ardeidae	Egretta tricolor	tricolored heron	ST (FWC)
	Ardeidae	Ixobrychus exilis	least bittern	
	Ardeidae	Nyctanassa violacea	yellow-crowned night heron	
	Ardeidae	Nycticorax nycticorax	black-crowned night heron	
	Bombycillidae	Bombycilla cedrorum	cedar waxwing	
	Caprimulgidae	Chordeiles minor	common nighthawk	
	Cardinalidae	Cardinalis cardinalis	Northern cardinal	
	Cardinalidae	Passerina caerulea	blue grosbeak	
	Cardinalidae	Passerina ciris	painted bunting	
	Cardinalidae	Passerina cyanea	indigo bunting	
	Cardinalidae	Pheucticus ludovicianus	rose-breasted grosbeak	
	Cardinalidae	Piranga olivacea	scarlet tanager	
	Cardinalidae	Piranga rubra	summer tanager	
	Cathartidae	Cathartes aura	turkey vulture	
	Cathartidae	Coragyps atratus	black vulture	
	Charadriidae	Charadrius vociferus	killdeer	
	Ciconiidae	Mycteria americana	wood stork	FT (FWC) S2 (FNAI)
	Columbidae	Columba livia	pigeon; rock dove	non-native
	Columbidae	Columbina passerina	common ground dove	
	Columbidae	Streptopelia decaocto	Eurasian collared dove	non-native
	Columbidae	Zenaida asiatica	white-winged dove	
	Columbidae	Zenaida macroura	mourning dove	
	Corvidae	Corvus brachyrhynchos	American crow	
	Corvidae	Corvus ossifragus	fish crow	
	Corvidae	Cyanocitta cristata	blue jay	
	Cuculidae	Coccyzus americanus	yellow-billed cuckoo	
	Cuculidae	Coccyzus erythropthalmus	black-billed cuckoo	
	Estrildidae	Lonchura punctulata	scaly-breasted munia	non-native
	Falconidae	Falco peregrinus	peregrine falcon	
	Falconidae	Falco sparverius	American kestrel	
		Haemorhous mexicanus	house finch	non-native
	Fringillidae	Spinus tristis	American goldfinch	
	Gruidae	Grus canadensis pratensis	Florida sandhill crane	ST (FWC) S2 (FNAI)
	Hirundinidae	Hirundo rustica	barn swallow	
	Hirundinidae	Petrochelidon pyrrhonota	cliff swallow	

	Hirundinidae	Progne subis	purple martin	
	Hirundinidae	Stelgidopteryx serripennis	Northern rough-winged swallow	
	Hirundinidae	Tachycineta bicolor	tree swallow	
	Icteridae	Agelaius phoeniceus	red-winged blackbird	
	Icteridae	Dolichonyx oryzivorus	bobolink	
	Icteridae	Icterus galbula	Baltimore oriole	
	Icteridae	Icterus spurius	orchard oriole	
	Icteridae	Molothrus ater	brown-headed cowbird	
	Icteridae	Quiscalus major	boat-tailed grackle	
	Icteridae	Quiscalus quiscula	common grackle	
	Laniidae	Lanius ludovicianus	loggerhead shrike	
	Laridae	Hydroprogne caspia	Caspian tern	
	Laridae	Larus atricilla	laughing gull	
	Laridae	Larus delawarensis	ring-billed gull	
	Laridae	Larus smithsonianus	herring gull	
	Laridae	Sterna antillarum	least tern	ST (FWC)
	Laridae	Sterna forsteri	Forster's tern	
	Laridae	Sterna maxima	royal tern	
	Mimidae	Dumetella carolinensis	gray catbird	
	Mimidae	Mimus polyglottos	Northern mockingbird	
	Mimidae	Toxostoma rufum	brown thrasher	
	Pandionidae	Pandion haliaetus	osprey	
	Paridae	Baeolophus bicolor	tufted titmouse	
	Parulidae	Cardellina canadensis	Canada warbler	
	Parulidae	Dendroica coronata	yellow-rumped warbler	
	Parulidae	Dendroica discolor	prairie warbler	
	Parulidae	Dendroica dominica	yellow-throated warbler	
	Parulidae	Dendroica fusca	Blackburnian warbler	
	Parulidae	Dendroica palmarum	palm warbler	
	Parulidae	Dendroica pinus	pine warbler	
	Parulidae	Geothlypis formosa	Kentucky warbler	
	Parulidae	Geothlypis trichas	common yellowthroat	
	Parulidae	Helmitheros vermivorum	worm-eating warbler	
	Parulidae	Leiothlypis celata	orange-crowned warbler	
	Parulidae	Leiothlypis peregrina	Tennessee warbler	
	Parulidae	Mniotilta varia	black-and-white warbler	
	Parulidae	Oporornis agilis	Connecticut warbler	
	Parulidae	Parkesia motacilla	Louisiana waterthrush	
	Parulidae	Parkesia noveboracensis	Northern waterthrush	
	Parulidae	Protonotaria citrea	prothonotary warbler	
	Parulidae	Seiurus aurocapilla	ovenbird	

	Parulidae	Setophaga americana	Northern parula	
	Parulidae	Setophaga caerulescens	black-throated blue warbler	
	Parulidae	Setophaga castanea	bay-breasted warbler	
	Parulidae	Setophaga cerulea	cerulean warbler	
	Parulidae	Setophaga magnolia	magnolia warbler	
	Parulidae	Setophaga pensylvanica	chestnut-sided warbler	
	Parulidae	Setophaga petechia	yellow warbler	
	Parulidae	Setophaga ruticilla	American redstart	
	Parulidae	Setophaga striata	blackpoll warbler	
	Parulidae	Setophaga tigrina	Cape May warbler	
	Parulidae	Setophaga virens	black-throated green warbler	
	Parulidae	Vermivora chrysoptera	golden-winged warbler	
	Parulidae	Wilsonia citrina	hooded warbler	
	Passerellidae	Melospiza georgiana	swamp sparrow	
	Passerellidae	Melospiza lincolnii	Lincoln's sparrow	
	Passerellidae	Passerculus sandwichensis	savannah sparrow	
	Passerellidae	Spizella passerina	chipping sparrow	
	Passerellidae	Spizella pusilla	field sparrow	
	Passerellidae	Pipilo erythrophthalmus	Eastern towhee	
	Passeridae	Passer domesticus	house sparrow	
	Pelecanidae	Pelecanus erythrorhynchos	American white pelican	
	Pelecanidae	Pelecanus occidentalis	brown pelican	
	Phalacrocoracidae	Phalacrocorax auritus	double-crested cormorant	
	Picidae	Colaptes auratus	Northern flicker	
	Picidae	Dryocopus pileatus	pileated woodpecker	
	Picidae	Leuconotopicus villosus	hairy woodpecker	
	Picidae	Melanerpes carolinus	red-bellied woodpecker	
	Picidae	Picoides pubescens	downy woodpecker	
	Picidae	Sphyrapicus varius	yellow-bellied sapsucker	
	Podicipediformes	Podilymbus podiceps	pied-billed grebe	
	Psittacidae	Aratinga nenday	Nanday parakeet; Nanday conure; black-hooded parakeet	non-native
	Psittacidae	Myiopsitta monachus	monk parakeet	non-native
	Rallidae	Fulica americana	American coot	
	Rallidae	Gallinula galeata	common gallinule	
	Regulidae	Regulus calendula	ruby crowned kinglet	
	Scolopacidae	Actitis macularius	spotted sandpiper	
	Scolopacidae	Gallinago delicata	Wilson's snipe	
	Scolopacidae	Tringa flavipes	lesser yellowlegs	
	Scolopacidae	Tringa melanoleuca	greater yellowlegs	
	Scolopacidae	Tringa solitaria	solitary sandpiper	

	Strigidae	Bubo virginianus	great horned owl	
	Strigidae	Megascops asio	Eastern screech-owl	
	Strigidae	Strix varia	barred owl	
	Sturnidae	Sturnus vulgaris	European starling	non-native
	Sylviidae	Polioptila caerulea	blue-gray gnatcatcher	
	Threskiornithidae	Eudocimus albus	white ibis	
	Threskiornithidae	Platalea ajaja	roseate spoonbill	ST (FWC) S2 (FNAI)
	Threskiornithidae	Plegadis falcinellus	glossy ibis	
	Trochilidae	Archilochus colubris	ruby-throated humingbird	
	Troglodytidae	Thryothorus ludovicianus	Carolina wren	
	Troglodytidae	Troglodytes aedon	house wren	
	Turdidae	Catharus fuscescens	veery	
	Turdidae	Catharus guttatus	hermit thrush	
	Turdidae	Catharus minimus	gray-cheeked thrush	
	Turdidae	Catharus ustulatus	Swainson's thrush	
	Turdidae	Hylocichla mustelina	wood thrush	
	Turdidae	Sialia sialis	Eastern bluebird	
	Turdidae	Turdus migratorius	American robin	
	Tyrannidae	Contopus virens	Eastern wood pewee	
	Tyrannidae	Empidonax alnorum	Alder flycatcher	
	Tyrannidae	Empidonax flaviventris	yellow-bellied flycatcher	
	Tyrannidae	Empidonax virescens	Acadian flycatcher	
	Tyrannidae	Myiarchus crinitus	great-crested flycatcher	
	Tyrannidae	Sayornis phoebe	Eastern phoebe	
	Tyrannidae	Tyrannus tyrannus	Eastern kingbird	
	Vireonidae	Vireo flavifrons	yellow-throated vireo	
	Vireonidae	Vireo griseus	white-eyed vireo	
	Vireonidae	Vireo olivaceus	red-eyed vireo	
	Vireonidae	Vireo philadelphicus	Philadelphia vireo	
	Vireonidae	Vireo solitarius	blue-headed vireo	
MAMMALS				
	Canidae	Canis latrans	coyote	Naturalized
	Dasypodidae	Dasypus novemcinctus	nine-banded armadillo	Naturalized
	Didelphidae	Didelphis virginiana	Virginia opossum	
	Felidae	Lynx rufus	bobcat	
	Leporidae	Sylvilagus floridanus	Eastern cottontail	
	Leporidae	Sylvilagus palustris	marsh rabbit	
	Mustelidae	Lontra canadensis	North American river otter	
	Procyonidae	Procyon lotor	raccoon	
	Sciuridae	Sciurus carolinensis	Eastern grey squirrel	

KEY TO WILDLIFE LISTED STATUS		
Florida Fish and Wildlife Conservation Commission (FWC) Designations	E	endangered
	T	threatened
	SSC	species of special concern
United States Fish and Wildlife Service (USFWS) Designations	E	endangered
	T	threatened
	C2	candidate for listing with some evidence of vulnerability, but for which not enough information exists to justify listing
Convention on International Trade In Endangered Species of Wild Fauna And Flora (Cites) Designations	I	Appendix I species
	II	Appendix II species
Florida Natural Areas Inventory (FNAI) Designations	S2	imperiled within the state because of rarity (6–20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or manmade factor
	S3	either very rare and local throughout its range (21–100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction because of other factors
	S4	apparently secure within the state (may be rare in parts of state)

APPENDIX F – ANNUALIZED COST SCHEDULE

RESOURCE MANAGEMENT	Units	Cost per unit
Prescribed fire preparation	per mile	$ 250.00
Prescribed fire	per acre	$ 40.00
Prescribed fire monitoring	per hour	$ 50.00
Integrated pest management surveying	avg per acre	$ 30.00
Integrated pest management treatment	avg per acre	$ 125.00
Hydrologic restoration	per mile	$ 8,000.00
Mechanical vegetation management	per acre	$ 150.00
Cultural resource management	per site	$ 500.00
ADMINISTRATION and OPERATIONS		
Salary of land manager	per hour	$ 47.00
Salary of supervisor	per hour	$ 50.00
Salary of administrative assistant	per hour	$ 30.00
Annual cost of computers, printers, phone	per year	varies
Utilities	per year	varies
Offices	per year	varies
Security	per year	$ 13,000.00
Fleet	per year	$ 4,000.00
MAINTENANCE		
Fencing Board	1 linear foot	$ 29.00
Fencing Wire	1 linear foot	$ 12.00
Trail Markers	1 marker	$ 16.00
Benches	1 bench	$ 160.00
Tools	1 site	$ 4,000.00
Parking lots aggregate material	cost per parking spot	$ 60.00
Parking lot grass	cost per parking spot	$ 10.00
Road repairs	1/2 mile	$ 20,000.00
Restrooms	cost per toilet	$ 750.00
Portable toilets	cost per toilet	$ 1,440.00
Grills	1 grill	$ 400.00
Tables	1 table	$ 250.00
Pavilions	square foot	$ 1.00
Camp sites	per campsite	$ 300.00
Grounds mowing (x12 events annually)	per acre	$ 600.00
Power washing	per hour	$ 100.00
Building maintenance	per structure	$ 500.00
RECREATION and VISITOR SERVICES		
Kiosk/Sign replacement costs	per unit	$ 1,000.00
Brochures	per brochure	$ 5,000.00

Events (FireFest)	per event	$	3,500.00
Visitors Center (staffing and contents)	per year	$	4,000.00
Camping	per campsite	$	200.00
Permitted Events	per event	$	320.00

Notes:

1. Current Loaded Salary based on FY 21.
2. Assumed 2.5% multiplier for salary.
3. Divided salary total hours by 2080 for average hour rate