T. MABRY CARLTON, JR. MEMORIAL RESERVE MANAGEMENT PLAN

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RESERVE AT A GLANCE

Size	24,565 acres
Location	Central portion of Sarasota County south of State Road 72 and east of Interstate 75
Management Priority	Restore natural fire frequency and reduce invasive exotic species populations
Management Challenge	Maintaining proper fire intervals and finding resources to address invasive exotic species encroachment
Primary Habitats	mesic flatwoods mesic hammocks dry prairie basin marsh depression marsh
Imperiled Species	Audubon's crested caracara tricolored heron wood stork Florida sandhill crane roseate spoonbill Florida panther gopher tortoise indigo snake pine lily cardinal air plant giant wild pine Tampa vervain
Cultural Resources	Carlton Reserve Archaeological Sites (8SO422, 8SO423, 8SO424, 8SO425, 8SO426, 8SO427, 8SO428, 8SO429, 8SO612, 8SO613, 8SO614)
Land Use	Nature-based public recreation, conservation, wellfield operations

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EXECUTIVE SUMMARY

Significance, size, location

The T. Mabry Carlton, Jr. Memorial Reserve (Carlton Reserve) encompasses 24,565 acres (38 square miles) in the central portion of Sarasota County. The reserve is located south of State Road 72 and east of Interstate 75. Adjacent features include Myakka River State Park to the north, the Myakka River to the west, a mix of public and private land and the City of North Port to the south, and the Sarasota County/Southwest Florida Water Management District (SWFWMD) jointly owned Big Slough Preserve to the east. The Carlton Reserve is an integral part of a matrix of natural lands known as the "Myakka Island" which includes many other privately and publicly-owned protected tracts, including Myakka River State Park, Pinelands Reserve, Schewe Tract, and the Deer Prairie Creek Preserve. In all, over 100,000 acres of protected, contiguous parcels of environmental land make up the Myakka Island in the Myakka River Watershed.

Acquisition history

The 24,565-acre Carlton Reserve was acquired in three purchases from 1982 to 1994. Using voter-approved general obligation bonds, Sarasota County purchased the initial 16,074 acres from the John D. and Catherine T. MacArthur Foundation for water supply, conservation, and recreation. In 1987, the County added 8,238 acres to the reserve. The final 253 acres were acquired in 1994 through a land swap with SWFWMD, which purchased the remaining land from MacArthur Foundation. In 2007, the 67-acre Embry parcel was acquired under the Environmentally Sensitive Lands Protection Program (ESLPP) from Wild Turkey, Inc.

Important habitats and species

The reserve is comprised mainly of mesic flatwoods, mesic hammocks, and dry prairie with numerous interspersed freshwater wetlands. These natural communities provide habitat for diverse flora and fauna, including 18 plants listed by state or federal agencies as Endangered, Threatened, or some similar status, and five confirmed listed animals. In addition, the reserve protects important cultural resources, including archaeological and historical sites.

Natural and cultural resource management goals

Restoring natural fire frequency during appropriate seasons will be the primary method used to revitalize the reserve's natural communities. Invasive exotic species management is also a priority. Invasive exotic species include, melaleuca (*Melaleuca quinquenervia*), Brazilian peppertree (*Schinus terebinthifolia*), West Indian marsh grass (*Hymenachne amplexicaulis*), cogon grass (*Imperata cylindrica*), climbing fern (*Lygodium* spp.), and feral hogs (*Sus Scrofa).* Controlling these species is necessary to minimize adverse impacts on native plants and animals.

Historical and current uses and facilities

There are 11 archaeological sites on Carlton Reserve. Among these, evidence of historic campsites suggests that Indigenous People, thought to be from the Uzita tribe, dwelled in the area prior to European settlement. Post European settlement, historic uses of the reserve consisted primarily of cattle ranching and turpentining. Pine tar was also produced in the turpentine camp. Current land use in the reserve allows for nature-based public recreation, conservation, and water treatment and wellfield

operations. Facilities on site at the public park include a log cabin visitors center, composting restroom facility, potable water treatment facility, picnic pavilion, maintenance sheds, and pole barn.

Use and facilities management goals

Healthy natural systems are necessary for the continued existence of the reserve's threatened and endangered species. All current and future activities, including wellfield development and construction of public facilities, will be planned in an environmentally sensitive manner to minimize impacts to existing natural communities and associated flora and fauna.

Purpose of plan

The purpose of this land management 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 Plan's management strategies are intended to be used as guidelines to be used to address the complex management needs of the reserve. Sarasota County Parks, Recreation and Natural Resources will oversee management of the reserve and assure coordination with other County departments by meeting with representatives from each stakeholder department on an as needed basis. 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 be updated in 2030 to incorporate the most current methodologies and technological advances as they apply to the resource needs and management of the reserve.

MANAGEMENT STRATEGY OVERVIEW

NATURAL RESOURCES	**GOAL 1**	**Restore and maintain native habitats and communities.**
	OBJECTIVE 1.1	During 2020–2030, maintain the mean Florida Wildfire Hazard and Risk Assessment score at less than 50.
	OBJECTIVE 1.2	On an annual basis, create a Burn Plan for burning management zones, based on the natural communities contained or potentially contained in each management zone.
	OBJECTIVE 1.3	By 2030, burn 100 percent of dry prairies at 1–2-year intervals, with at least 50% of these burns occurring during the growing season.
	OBJECTIVE 1.4	By 2030, burn 100 percent of mesic flatwoods at 2–4-year intervals.
	OBJECTIVE 1.5	By 2030, reduce exotic plant abundance and extent by 50 percent using targeted coordinated management.
	OBJECTIVE 1.6	During the period 2020–2030, reduce the feral hog population by 30 percent annually.
	OBJECTIVE 1.7	On an annual basis, create an action plan for monitoring endangered bromeliads.
	OBJECTIVE 1.8	By 2030, restore the historic hydrologic regime in the reserve to the greatest amount feasible.
CULTURAL RESOURCES	**GOAL 2**	**Protect, preserve, and maintain cultural resources.**
	OBJECTIVE 2.1	By 2023, develop preservation and interpretive plans for two of the known historical sites (Farmstead Site, Windy Sawgrass Camp).
LAND USES	**GOAL 3**	**Maintain public access and passive recreational opportunities without adversely impacting native habitats and communities.**
	OBJECTIVE3.1	By 2021, highlight primitive camping opportunities on the County website and social media.
	OBJECTIVE 3.2	By 2022, improve access and parking areas for canoe and kayak launch.
	OBJECTIVE 3.3	By 2022, create a Trail Plan that evaluates existing trails and travel ways and identifies those trails for restoration, upgrading, rerouting, use restrictions, or closing.
	OBJECTIVE 3.4	By 2024, relocate 20 percent of existing trails (including firelines, access, utility, and pedestrian trails) passing through wetlands or wetland ecotones (“Wetland Trails”) to uplands.

	GOAL 4	**Provide nature based educational and interpretive opportunities.**
	OBJECTIVE 4.1	By 2024, improve existing interpretive signs.
OPERATIONS	**GOAL 5**	**Provide administrative and fiscal support.**
	OBJECTIVE 5.1	By 2022, develop and maintain infrastructure and amenities.
	GOAL 6	**Manage and support volunteer program.**
	OBJECTIVE 6.1	Provide opportunities for volunteers to support operations and natural systems.

1 INTRODUCTION

1.1 LOCATION AND SETTING

The T. Mabry Carlton, Jr. Memorial Reserve (Carlton Reserve) is a 24,565-acre environmentally significant site located in central Sarasota County immediately east of the Myakka River in an area between State Road 72 and Interstate 75 (Exhibit 1). The Carlton Reserve is also the location of Sarasota County's largest wellfield, supplying a substantial portion of the County's drinking water. Much of the surrounding lands are publicly-owned conservation and preservation areas or privately owned ranchland. A notable exception is the City of North Port, which adjoins the Carlton Reserve along a 3-mile stretch of the reserve's southeastern boundary.

1.2 SITE SIGNIFICANCE AND PROTECTION PRIORITY

Located inland of highly populated coastal areas of west-central Florida, the Carlton Reserve, together with several other conservation lands known collectively as the "Myakka Island," form a regionally significant conservation and recreation area in the Myakka River watershed (Exhibit 2). The reserve includes more than 100 miles of hiking, biking, and equestrian trails along with picnicking, primitive camping, interpretive trails, and an historic cabin which serves as a visitor center. Numerous wetlands provide suitable habitat for a wide variety of wading birds and a host of other species. Zoned Government Use and Open Use Estate (Exhibit 3), the reserve is adjacent to the Myakka River, which is protected by state statute and local code.

In 1985, the Florida legislature designated the Myakka River, from County Road 780 south to the Sarasota/Charlotte County line, a Florida Wild and Scenic River. The Myakka River Wild and Scenic Designation and Preservation Act (Section 258.501, Florida Statutes) provided for the permanent preservation, management, and administration of this designated segment of the Myakka River. The Myakka River Management Coordinating Council was established to provide interagency and intergovernmental coordination in the management of the river. The Myakka Wild and Scenic River Management Plan (Appendix C) guides the management, administration, and protection of the designated segment of the Myakka River. The entire river portion flowing through the Carlton Reserve is included in this Wild and Scenic River designation and comprises almost six miles of river frontage in the reserve.

The portion of the Myakka River that flows through the reserve is classified as a Class 1 water resource (Potable Water Supplies), according to Section 62-302.400(16)(b), Florida Statutes. The Myakka Wild and Scenic River Segment has been designated as an Outstanding Florida Water under Florida Statute Section 62-302.700(9)(i)(40)(j)(2). The Myakka River is also protected under Sarasota County Ordinance No. 2011-077, the Consolidated Myakka River Protection Code (Appendix C).

1.3 ACQUISITION HISTORY

In 1982, Sarasota County voters approved a referendum authorizing general obligation bonds to purchase land for a potable water supply source as well as conservation and recreation. The County purchased 16,074 acres in central Sarasota County from the John D. and Catherine T. MacArthur

Foundation for approximately $18.5 million. In 1987, an additional 8,238 acres were purchased for $4.9 million, bringing the total acreage up to 24,312 acres. In 1994, funds available through the Save Our Rivers program enabled SWFWMD to purchase the remaining 8,249 acres owned by the MacArthur Foundation. As a condition of purchase, a land swap between SWFWMD and Sarasota County Government resulted in the addition of 253 acres to the Carlton Reserve. The most recent addition to the Carlton Reserve was the 67-acre Embry parcel along the Myakka River, purchased from Wild Turkey, Inc. under the ESLPP program. At present, the Carlton Reserve encompasses 24,565 acres or 38 square miles (Exhibit 2). Title to the reserve is held in fee simple by Sarasota County through the Board of County Commissioners (Appendix A). There are easements and encumbrances affecting the reserve related to the wellfields and water supply (Appendix B).

1.4 Management Authority and Responsibility

Land management authority is the responsibility of Sarasota County Parks, Recreation and Natural Resources (PRNR) in cooperation with Sarasota County Public Utilities and Sarasota County Emergency Services. PRNR will implement this plan and coordinate with staff and outside agencies as required. This management plan replaces the June 1994 Carlton Reserve Land Management Plan.

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.

Sarasota County Resolution 82-200 provides for the protection and management of native habitats balanced with the need for resource-based, ecologically benign, and non-consumptive recreational activities in the reserve. Certain consumptive uses may be allowed if they support the overall objective of ecosystem management. Examples include activities deemed necessary for resource management or research purposes, including, but not limited to, timber thinning and the removal of exotic invasive plants and animals.

A conservation easement was established by Florida Department of Environmental Protection in 1990 to offset impacts to wetlands during construction of the Mabry Carlton Parkway. The easement protects all wetlands in Section 28, Township 38S, Range 20E. No construction, excavation, dumping, or removal of trees and vegetation is allowed. Also prohibited are any activities detrimental to drainage, flood control, water conservation, erosion control, soil conservation, or fish and wildlife habitat preservation.

Sarasota County's Consolidated Myakka River Protection Code (Ordinance No. 2011-077) protects the Myakka River through the creation of a 220-foot-wide Myakka River Protection Zone that applies to the entire river portion flowing through the Carlton Reserve. The Myakka River Protection Code facilitates protecting and the river and maintaining its ecological, fish, wildlife, and recreational value while promoting land development in the zone consistent with the Sarasota County Comprehensive Plan.

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. Sarasota County Land Management Master Plan (2004)
3. Sarasota County Ordinance 82-94
4. Sarasota County Resolution 82-200
5. Sarasota County Ordinance 97-024
6. Sarasota County Ordinance 98-045
7. Sarasota County Ordinance 2011-077

1.5 FUTURE PLANS FOR THE SITE

Future plans for the reserve include enhancing primitive camping opportunities, improving access to the canoe and kayak launch, assessing needs for future hiking and/or single-track bicycle trail, actively recruiting volunteers to increase education and outreach activities, and promoting nature-based events that are compatible with the site. Parks, Recreation and Natural Resources will also coordinate with the Sarasota County Utilities Department for site assessments of any future wellfield expansion.

Natural Resources Management Philosophy

Sarasota County's habitat management approach seeks to restore and maintain a natural balance which preserves the quality of these 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 native habitats and communities 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 reserve'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. Parks, 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 reserve 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 have 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.

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 exotic animals, PRNR actively removes exotic animals 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

The reserve is located in the physiographic region of the Gulf Coast Lowlands. Isolated swamps and marshes that connect into sloughs and meandering streams characterize the generally flat topography. Depressions in the landscape seasonally fill with water and form ephemeral ponds. Series of ponds often link together during heavy rains to create shallow and slow-moving waterways, while streams may form when flow, volume, and velocity increase. This topography results in a very slow rate of stormwater runoff. The land surface dips gently to the west-southwest, with elevations in the northeast corner of the Carlton Reserve approaching 32 feet above mean sea level and only five feet above mean sea level to the west, along the east bank of the Myakka River (Exhibit 4).

2.1.2 Soils

Carlton Reserve is dominated by poorly drained soils with sandy and loamy layers typical of mesic flatwoods, mesic hammocks, and marshes (Exhibit 5).

Table 1. Soil types in the reserve.

Soil Type	Associated Habitat	Drainage Characteristics
Eaugallie and Myakka fine sands; Holopaw fine sand; Pineda fine sand	flatwoods and dry prairie	poorly drained and very poorly drained
Wabasso fine sand; Eaugallie fine sand; Felda fine sand	hammocks	poorly drained and very poorly drained
Felda fine sand; Holopaw fine sand; Delray fine sand	depressions and sloughs	very poorly drained
Delray fine sand; Felda fine sand; Pompano	floodplains	very poorly drained and poorly drained

2.1.3 Hydrology

Rainfall

Rainfall in west-central Florida follows a pattern of wet and dry seasons. The dry season typically occurs from October through May with average rainfall of 2–3 inches per month and the wet season generally occurs between June and September with average rainfall 8–10 inches per month. Based on the period of record at the Carlton Reserve, wet season rainfall typically comprises 65 percent of the annual rainfall on this site and generally occurs in a pattern of localized, heavy thunderstorms that may lead to significant differences in rainfall between the measuring stations located in the reserve. Dry season rainfall is typically a result of large frontal weather patterns and tends to be more broadly distributed than summer thunderstorms. Telemetry data collected from 1993–2017 by Sarasota County Public Utilities reports an average annual rainfall total of 57 inches in the reserve with large interannual variability for any given month.

Surface Water

Surface water features are dominated by the Myakka River and its tributaries, and the multitude of wetlands spread across the landscape (Exhibit 6). The Myakka River is the western boundary of the reserve. The channel is incised in a nearly flat, heavily vegetated floodplain. Its headwaters are in eastern Manatee County and the river flows in a southerly direction through Manatee, Sarasota, and Charlotte Counties before emptying into Charlotte Harbor.

Deer Prairie Slough extends through the Carlton Reserve from the northeast corner and exits the property at a point approximately three miles from the southeast corner of the reserve. Its headwaters are also in eastern Manatee County, just north of the Myakka River State Park boundary.

Deer Prairie Slough becomes a blackwater creek known as Deer Prairie Creek on the County-owned Oak Cathedral Preserve in the ESLPP Deer Prairie Creek Priority Protection Site, south of the Carlton Reserve. The slough was channelized in the late 1940s and early 1950s to drain the area for agriculture, altering the natural hydrology and ecology of the slough system. A restoration project initiated in 2001 removed approximately 8.4 miles of ditches and enhanced approximately 1,370 acres of hydric and mesic hammock and 740 acres of herbaceous marsh. Deer Prairie Creek flows into the Myakka River approximately 10 miles upstream from the mouth of Charlotte Harbor.

THREE AQUIFERS

There are three aquifer systems in the vicinity of the reserve: the surficial aquifer system (SAS), the intermediate aquifer system (IAS), and the Floridan aquifer system.

The SAS in the Carlton Reserve area consists of an unconfined aquifer composed of quartz sands approximately 25 to 35 feet in thickness with varying amounts of clay and shell that generally yield small volumes of water.

The IAS is a confined aquifer that consists of those water-bearing units between the bottom of the SAS and the top of the Floridan aquifer. The IAS water that is pumped at the Carlton Reserve for potable supply requires extensive treatment before it can be consumed.

The Floridan aquifer system is the deepest and is subdivided into the upper Floridan aquifer system (UFAS) and the lower Floridan aquifer system. Water quality in the UFAS decreases with depth, and the Carlton Reserve area is the southern limit of potable water from the UFAS.

2.1.4 Natural Communities

The natural communities of Carlton Reserve are identified using the Florida Natural Area Inventory (FNAI 2010) classification system (Table 2). The condition and management recommendations for each habitat are detailed in the Natural Resource Management Section of this plan.

In general, the reserve is dominated by upland communities with imbedded wetlands, both of which historically burned every few years due to lightning strikes (Exhibit 7a). These lands have been affected by human manipulation, including interference with the timing of burns during the early cattle era followed by fire suppression and exclusion as Sarasota County became increasingly urbanized (Exhibit 7b). Because of this manipulation, natural communities in the reserve are no longer in pristine condition. The goal of our land management activities is to focus on reversing some of these impacts.

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

FNAI Communities	Acres	Percent of Reserve
mesic flatwoods	10,484	43
depression marsh	3801	15
mesic hammock	3693	1.5
basin marsh	2486	10
dry prairie	1910	8
slough	848	3
hydric hammock	164	0.7
wet prairie	139	0.5
floodplain swamp	127	0.5
scrubby flatwoods	99	0.4
basin swamp	80	0.3
blackwater stream	50	0.2
artificial ponds	47	0.2

2.1.5 Imperiled Species

Flora

Currently, 18 species of plants in the reserve are listed as threatened, endangered, or commercially exploited (Table 3).

See Appendix D for a full list of documented plant species.

Fauna

As many as eight wildlife species in the reserve are considered imperiled (FWC 2017) (Table 3), including the Florida panther. An uncollared male Florida panther roamed the reserve and surrounding areas from 1999 until the spring of 2005. His presence was documented by both the United States Fish and Wildlife Service (USFWS) and the Florida Fish & Wildlife Conservation Commission (FWC). In February 2010, another uncollared panther was spotted in the reserve and documented by plaster casts made of the tracks. Three weeks later more tracks were located in the reserve, but none were found subsequently.

See Appendix E for a full list of documented animal species.

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. Listed flora and fauna in the reserve.

	Common Name	Scientific Name	Status
Plant	pine lily	*Lilium catesbaei*	Threatened (State)
	giant air plant	*Tillandsia utriculata*	Endangered (State)
	cardinal air plant	*Tillandsia fasciculata*	Endangered (State)
	reflexed wild pine	*Tillandsia balbisiana*	Threatened (State)
	Tampa mock vervain	*Glandularia tampensis*	Endangered (State)
	many-flowered grass-pink	*Calopogon multiflorus*	Threatened (State)
	blue-flowered butterwort	*Pinguicula caerulea*	Threatened (State)
	yellow butterwort	*Pinguicula lutea*	Threatened (State)
	butterfly orchid	*Encyclia tampensis*	Commercially Exploited
	royal fern	*Osmunda Regalis var. spectabilis*	Commercially Exploited
	cinnamon fern	*Osmundastrum cinnamoneum*	Commercially Exploited
	Simpson's zephyrlily	*Zephyranthes simpsonii*	Threatened (State)
	angular milkvine	*Gonolobus suberosa*	Threatened (State)
	lowland loosestrife	*Lythrum flagellare*	Endangered (State)
	Jameson's waterlily	*Nymphaea jamesoniana*	Endangered (State)
	long-lip ladies'-tresses	*Spiranthes longilabrus*	Threatened (State)
	giant orchid	*Orthochilus ecristatus*	Threatened (State)
	golden polypody	*Phlebodium aureum*	Threatened (State)
Bird	Audubon's crested caracara	*Polyborus plancus*	Threatened (Fed/State)
	tricolored heron	*Egretta tricolor*	Threatened (State)
	wood stork	*Mycteria americana*	Threatened (Fed/State)
	Florida sandhill crane	*Grus canadensis pratensis*	Threatened (State)
	roseate spoonbill	*Ajaia ajaja*	Threatened (State)
Reptile	gopher tortoise	*Gopherus polyphemus*	Threatened (State)
	indigo snake	*Drymarchon corais couperi*	Threatened (Fed/State)
Mammal	Florida panther	*Puma concolor coryi*	Endangered (Fed/State)

2.2 Natural Resource Management

This section assesses the current condition of each of the natural communities in the reserve and describes their desired optimal condition. Once a natural community reaches the desired optimal condition, it is considered to be in "maintenance condition." Required actions for achieving and sustaining a community's maintenance condition may include: establishing and maintaining optimal fire return intervals for fire dependent communities, ongoing control of exotic invasive plant and animal species, maintaining water quality and natural hydrology, including historic water flows, preserving biodiversity and vegetative structure, protecting viable populations of plant and animal species (including those that are imperiled or endemic), and preserving intact ecotones that interconnect natural communities across the landscape.

2.2.1 Mesic Flatwoods

There are approximately 10,484 acres of mesic flatwoods in Carlton Reserve. Mesic Flatwoods is the most extensive natural community on site, covering more than 43 percent of the reserve. Soil conditions vary seasonally, alternating between wet and dry. Mesic flatwoods in the reserve are often inundated during the summer rainy season and are mostly dry during the winter months. Long leaf pine (*Pinus palustris*) is not known to occur naturally in the reserve. A few known occurrences near the South

Powerline Grade were planted in the 1980s and 1990s. South Florida slash pine (*P. elliottii* var. *densa*) is usually the dominant overstory tree with a saw palmetto understory in most areas. A variety of woody, herbaceous and grass species form the remainder of the understory.

Fire is a natural, frequent occurrence in mesic flatwoods. Naturally occurring plant species in mesic flatwoods have adaptations that allow them to survive fire and recover quickly. Several species depend on fire to reproduce. Fire helps encourage pine regeneration and minimize invasion by woody species such as oaks (*Quercus spp*.). When maintained under proper conditions, either naturally or through management, mesic flatwoods communities contain one of the highest species diversities of any habitat type in Florida. Historically, fire intervals occurred on average every 2–4 years.

Table 4. Common plant species of mesic flatwoods.

Common Name	Scientific Name
Florida slash pine	*Pinus elliottii* var. *densa*
saw palmetto	*Serenoa repens*
fetterbush	*Lyonia lucida*
gallberry	*Ilex glabra*
wax myrtle	*Myrica cerifera*
winged sumac	*Rhus copallina*
runner oak	*Quercus elliottii*
shiny blueberry	*Vaccinium myrsinites*
bluestem grasses	*Andropogon spp.*

Current Conditions

Current conditions of mesic flatwoods communities vary from poor to very healthy. Many areas receive fire on a regular interval and have a healthy ratio of pine, palmetto, shrub, and herbaceous components. Approximately 25 percent of the flatwoods community in the reserve is in “restoration” condition. These areas have not received fire on a regular interval and have dense coverage of palmetto and woody shrubs shading out the herbaceous ground cover. A combination of prescribed fire and past timber thinning has resulted in a healthy, mixed growth canopy of slash pine over most of the reserve.

Optimal Conditions

Optimally, an open canopy should consist predominantly of slash pine (*Pinus elliotii)*. The basal area of pines should be between 10–50 ft^2 per acre. The groundcover/shrub layer should be low and dense and consist of shrubs, grasses, and forbs. Native herbaceous groundcover should cover at least 50 percent of the area and be less than three feet tall. Saw palmetto (*Serenoa repens*) should comprise no more than 50 percent of the total shrub cover and be no more than two feet tall, with few if any large trunks running along the ground. Shrub species may include saw palmetto, gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), runner oak (*Quercus elliottii*), dwarf live oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), and dwarf huckleberry (*Gaylussacia dumosa*). The herbaceous component should consist of many grasses like wiregrass (*Aristida stricta var. beyrichiana*), dropseed (*Sporobolus curtissii* and *S. floridanus*), panicgrasses (*Dichanthelium* and *Panicum spp*.) and broomsedge

(*Andropogon spp*.), and a large number of showy forbs. The optimal fire return interval for this community is 2–4 years.

Management Guidelines

Prescribed fire is the most important tool used to keep mesic flatwoods in a healthy, biologically diverse condition. Applying fire during the growing season to the reserve's flatwoods every 2–4 years is a primary goal. In overgrown areas that have not received regular burning, mechanical treatment, such as roller chopping, may be required to reduce the height of vegetation to a more manageable level prior to reestablishing a burn regime. In areas with dense pine canopies, timber thinning may be required to open the canopy and provide the ideal basal area per acre.

Invasive exotic species like cogon grass (*Imperata cylindrica*) and Old-World climbing fern (*Lygodium microphyllum*) are present in flatwoods. Eradication of these species is difficult and requires a multi-layered approach. A combined strategy of leveraging state funding, in-house mapping and surveying, and contracting out treatment when funds are available may eventually make headway into reducing those species to manageable levels. Persistence is vital. To achieve success, efforts to control these species needs to be ongoing.

2.2.2 Depression Marshes

There are approximately 3,801 acres of depression marshes in Carlton Reserve. Depression marshes are seasonally wet depressions in pine flatwoods and dry prairie areas. These areas are very conspicuous in aerial photos and comprise approximately 15 percent of the total acreage in the reserve. Typical depression marshes are gradually deeper and wetter towards their center, resulting in concentric zones of vegetation based on plant hydrophilia. Hydroperiods in this area are the longest and generally decrease in duration as one moves outward toward the fringe of the marsh.

Periodic fires maintain depression marshes in an open state by burning accumulated peat, trees, and shrubs. Without fire, peat will accumulate and fill in the marsh's center, trees will begin to grow, and the depression marsh will evolve into a forested wetland.

Table 5. Common plant species of depression marshes.

Common Name	Scientific Name
pickerelweed	*Pontederia cordata*
sagittarias	*Sagittaria spp.*
spatterdock	*Nuphar luteum subsp. Macrophyllum*
fireflag	*Thalia geniculate*
water lilies	*Nymphaea spp.*
St. John's-worts	*Hypericum fasciculatum and other Hypericum spp.*
maidencane	*Panicum hemitomon*
sawgrass	*Cladium jamaicense*
spikerushes	*Eleocharis spp.*
yellow-eyed grasses	*Xyris spp.*
water-horn fern	*Ceratopteris spp.*
bladderworts	*Utricularia spp.*
coastal plain willow	*Salix caroliniana*

buttonbush	*Cephalanthus occidentalis*
wax myrtle	*Myrica cerifera*

Current Conditions

Currently, many reserve depression marshes are in less than optimal condition due to fire exclusion. Woody shrub encroachment is a problem in at least 40 percent of the wetlands embedded in or adjacent to the mesic flatwoods community. Because wetlands along management zone boundaries also make good firebreaks they frequently are not burned when the adjoining flatwoods are burned. Also, the invasive exotic torpedo grass (*Panicum repens*) has colonized many of the wetlands in the reserve. It creates an extremely thick thatch layer that prevents other wetland plants from spreading and forms a dense layer of dead vegetation that only burns well when conditions are very dry.

Optimal Conditions

Optimally, virtually no woody shrubs or trees would exist in the marsh if burning of surrounding natural communities occurs frequently enough, since fire will periodically pass through the marsh unless it is inundated. Ideally, at least 30 percent of the ground area would be covered in herbaceous species such as maidencane (*Panicum hemitomon*), panicgrass (*Panicum spp*.), beaksedge (*Rhynchospora spp*.), and St. John's-wort (*Hypericum spp*.), with bare ground less than 20 percent of the area. Depression marshes should serve as important breeding habitat for several species of frogs and salamanders and feeding habitat for numerous bird species in the reserve. The fire return interval will depend on the frequency of fire in the surrounding communities, but the optimal interval is 2–5 years.

Management Guidelines

To improve the health of depression marshes that have gone beyond the maximum burn interval, we should prioritize their inclusion when burning adjacent flatwoods rather than using them to stop fires. Using fire may also be more effective at reducing the rapid spread of torpedo grass. Using herbicide is not advisable given the density and scope of coverage. Other actions that would improve the health of wetlands would be to reroute trails, where possible, that currently utilize wetland edges. Prompt restoration of plow lines created during wildfires is also crucial to avoid impacting surficial hydrologic flow. Continued feral hog (*Sus scrofa*) removal will greatly benefit depression marshes.

2.2.3 Hydric Hammocks

There are approximately 164 acres of hydric hammocks in Carlton Reserve. Hammock areas along the river and sloughs are referred to as hydric hammocks due to their proximity to wet areas, open understory, and their susceptibility to extended flooding during the rainy season. Hydric hammocks mainly occur in a relatively narrow, semi-continuous band along the banks of the Myakka River. These hammocks are picturesque because of the open understory and the many cabbage palms that lean out gracefully over the river. Fires rarely occur in the reserve's hammock areas.

Table 6. Common plant species of hydric hammocks.

Common Name	Scientific Name
cabbage palms	*Sabal palmetto*
laurel oaks	*Quercus laurifolia*
pop ash	*Fraxinus caroliniana*
water locust	*Gleditsia aquatica*
buttonbush	*Cephalanthus occidentalis*
groundsel tree	*Baccharis spp.*
Walter's viburnum	*Viburnum obovatum*
buckthorn	*Bumelia spp.*
wild coffees	*Psychotria spp.*
Spanish moss	*Tillandsia usneoides*
ball moss	*Tillandsia recurvata*
grass-leaved air plant	*Tillandsia setacea*
cardinal air plant	*Tillandsia fasciculata*
giant wild pine	*Tillandsia utriculata*
butterfly orchid	*Encyclia tampensis*
golden polypody	*Phlebodium aureum*
shoestring fern	*Vittaria lineata*
resurrection fern	*Polypodium polypodioides var. michauxianum*
wild grape vines	*Vitis spp.*
catbrier vines	*Smilax spp.*

Current Conditions

Hydric hammocks in the reserve are mainly in healthy condition except for a major decline in the endangered giant wild pine air plant. In the last 20 years, an exotic invasive insect, the Mexican bromeliad weevil (*Metamasius callizona*), has devastated populations of this bromeliad in both mesic and hydric hammocks throughout the reserve. A biological control agent, the Franki fly (*Lixadmontia franki*), was released in 2007 but as of Spring 2021 has not reduced populations of the weevil. Impacts to the air plant are unknown, as no baseline population information has been gathered. No monitoring of the giant wild pine has been done in hydric hammocks along the river, but has begun in a few, scattered mesic hammocks to assess the extent of damage from the weevil. The weevil also feeds on cardinal air plants, but predation and resulting impacts do not seem to be as severe.

Optimal Conditions

Though many hydric hammocks in the reserve have not burned for over 20 years, ideally, fuels do not buildup because floodwaters scour the hammocks during summer wet season on a regular basis and remove most ground litter. Restoring the giant wild pine is the most critical element in restoring the hammocks to their optimal conditions.

Management Guidelines

Support reserve volunteers in their efforts to monitor and protect giant wild pine populations. To maintain the health of the community, continue monitoring for invasive exotic plants and continue removing feral hogs.

2.2.4 Basin Marsh

There are approximately 2,486 acres of basin marsh in Carlton Reserve. Basin marshes are regularly inundated large freshwater herbaceous wetlands that may occur in a variety of situations. In contrast to depression marshes, they are not small or shallow inclusions in a fire-maintained community. Species composition is heterogeneous within and among marshes but can generally be grouped from deepest to shallowest into submersed, floating-leaved, emergent, and grassy zones. Shrub patches may be present in any of these zones.

Basin marshes occur in a variety of mostly isolated depressions. Some basin marshes in the reserve are large, deep inclusions in fire-adapted upland communities. They also can be part of non-fire adapted communities such as hardwood forests or basin swamps. They are regularly inundated with water originating from localized rainfall.

Table 7. Common plant species of basin marshes.

Common Name	Scientific Name
pickerelweed	*Pontederia cordata*
waterlily	*Nymphaea odorata*
yellow pondlily	*Nuphar advena*
bulltongue arrowhead	*Sagittaria lancifolia*
southern cattail	*Typha domingensis*
sawgrass	*Cladium jamaicense*
softstem bulrush	*Scirpus tabernaemontani*
maidencane	*Panicum hemitomon*
smooth beggarticks	*Bidens laevis*
dotted smartweed	*Polygonum punctatum*
sand cordgrass	*Spartina bakeri*
sweetscent	*Pluchea odorata*
spadeleaf	*Centella asiatica*
lemon bacopa	*Bacopa caroliniana*
coastalplain willow	*Salix caroliniana*
buttonbush	*Cephalanthus occidentalis*
elderberry	*Sambucus nigra ssp. Canadensis*
wax myrtle	*Myrica cerifera*

Current Conditions

Like depression marshes in the reserve, basin marshes are also frequently used as firebreaks during prescribed burns. Some have not burned in many years, allowing the encroachment of woody shrubs like wax myrtle, buttonbush, and Carolina willow. An increasing problem is the spread of Old World climbing fern into isolated tree islands in these large marshes and along the transition zone from wetland to hammock. The remoteness of the areas where the invasive Old World climbing fern occurs makes control efforts logistically difficult and time consuming. Other invasive exotics that have encroached on several basin marshes in the reserve include torpedo grass (*Panicum repens*), Peruvian primrose willow (*Ludwigia peruviana*), and West Indian marshgrass (*Hymenachne amplexicaulis*).

Though these three species are widespread across the reserve, as of Spring 2021, they are not being treated with herbicide.

Optimal Conditions

Similar to depression marshes, regular fire every 3–6 years is important to burn off excess peat and inhibit woody shrub encroachment. The optimal species variety includes an herbaceous layer greater than 25 percent of the area with no saw palmetto or canopy trees and woody shrubs limited to five percent of the overall area and less than three feet in height.

Management Guidelines

Burn at regular burn intervals to help reduce further encroachment of invasive exotic plants. Avoid any hydrologic impacts or mitigate them as much as possible to maintain natural surface water flow.

2.2.5 Dry Prairie

Designated a globally imperiled habitat (FNAI 2010), dry prairies are similar to pine flatwoods but contain virtually no pine trees. There are approximately 1,910 acres of dry prairie in the reserve. Though habitats resembling Florida's dry prairie occur elsewhere in the world, similar plant associations don't exist outside of Florida. Characteristically, Florida's dry prairies appear as vast prairie-like expanses of saw palmettos, grasses, herbaceous plants, and low shrubs. Trees are conspicuously absent but do occur at very low densities in some areas. Where they do occur, trees in the reserve are generally scattered South Florida slash pines and occasional cabbage palms. Frequent fires during the growing season are important to prevent invasion by trees. Other factors may also limit tree densities, though the reasons for this are not yet fully understood.

Pine lily (*Lilium catesbaei*) is a state threatened wildflower living in dry prairie and mesic flatwoods in the reserve. Both the Florida burrowing owl (*Athene cunicularia floridana*) and Audubon's crested caracara (*Polyborus plancus audubonii*), two species that exist nowhere east of the Mississippi River except Florida, require healthy dry prairie to survive. There have been no documented burrowing owl sightings, but caracara have been observed frequently in the reserve.

Table 8. Common plant species of dry prairies.

Common Name	Scientific Name
dwarf live oak	*Quercus minima*
saw palmetto	*Serenoa repens*
dwarf huckleberry	*Gaylussacia dumosa*
gallberry	*Ilex glabra*
fetterbush	*Lyonia lucida*
slash pine	*Pinus elliottii*
cabbage palm	*Sabal palmetto*
pine lily	*Lilium catesbaei*

Current Conditions

Due to fire exclusion, most of the dry prairie community is fragmented and overgrown and is in poor to fair condition. Approximately 30 percent is in good, but not optimal condition and burned on a regular fire interval between 18 months and three years. Saw palmetto is lower than three feet and is less than 50 percent in density, giving herbs, grasses and shrubs space to grow. The remaining 70 percent is not within the desired fire regime. Density of saw palmetto is greater than 50 percent and height is greater than three feet. Most of these areas also have a low to medium density of slash pines. Some have encroaching hardwoods and woody shrubs like live oak and wax myrtle. Cogon grass (*Imperata cylindrica*) is the most prolific invasive exotic species. Eradication is difficult and requires a multi-year approach.

Optimal Conditions

Ideally, South Florida slash pine should be present, but in very low densities. Saw palmetto height should be less than three feet with coverage of 25–50 percent. Shrub layers should be less than three feet in height, with an average coverage of 25 percent or less. Herbaceous ground cover should be 50–75 percent coverage with a high diversity and species richness that includes forbs and grasses.

Management Guidelines

Prescribed fire is the most important tool used to keep dry prairie in a healthy, biologically diverse condition. Burn dry prairie every 18–24 months, mainly during growing season.

Eradication of Cogon grass is difficult and requires a multi-year approach of tracking and treatment. Develop and utilize a tracking database with GIS support for both initial and follow-up treatments.

2.2.6 Sloughs

There are approximately 848 acres of sloughs in the reserve. Sloughs are seasonal creeks or connected freshwater wetlands with a broad, ill-defined channel that may dry up completely during extended droughts. Deer Prairie Slough, a large slough system in the reserve, drains an area of approximately 33.2 square miles, comprising much of the eastern half of the property (Duerr and Wolansky 1986). Extensive channelization of the southern two-thirds of Deer Prairie Slough during the 1940s and 1950s significantly altered hydrologic regimes and associated natural communities. In 2001, work began to restore the original hydrologic flow to the system by backfilling the channel to the original grade. By 2003, most of the Slough in the reserve was successfully restored.

Normal hydroperiods fluctuate greatly from wet to dry season. Although emergent vegetation will burn while standing water is in the wetland, regular dry season fires capitalize on the dead thatch layer burning down to the soil layer and providing nutrients for new growth of native species.

Table 9. Common plant species of sloughs.

Common Name	Scientific Name
pickerelweed	*Pontederia cordata*
sagittarias	*Sagittaria spp.*
sawgrass	*Cladium jamaicense*
maidencane	*Panicum hemitomon*
spatterdock	*Nuphar luteum subsp. macrophyllum*
water lily	*Nymphaea spp.*
St. John's-worts	*Hypericum fasciculatum and other Hypericum spp.*
coinwort	*Centella asiatica*
beak rush	*Rhynchospora tracyi*

Current Conditions

Deer Prairie Slough is in similar condition to the reserve's depression marshes. A major portion of it is in poor condition due to fire exclusion, which increasingly allows woody shrub encroachment. Because wetlands and sloughs along management zone boundaries also make good firebreaks, they frequently are not burned when the adjoining flatwoods are burned. Also, the invasive exotic West Indian marsh grass has colonized many of the wetlands in the reserve. Its size and aggressive growth prevents other native wetland plants from spreading and forms a dense layer of dead vegetation, similar to torpedo grass, that only burns well when conditions are very dry.

Optimal Conditions

Optimally, slough marshes would include a diverse herbaceous layer not dominated by exotic West Indian marsh grass and without excessive buildup of torpedo grass thatch at the edge of slough systems. Ideally, the encroachment of woody shrubs around the margin would be limited.

Management Guidelines

Burn every four to six years to prevent woody encroachment and prevent an excessive buildup of torpedo grass thatch at the edge of slough systems. Prioritize inclusion of areas that have gone beyond the maximum burn interval when burning adjacent flatwoods rather than using them to stop fires. Use fire rather than herbicide to reduce the rapid spread of torpedo grass and West Indian marsh grass given the density and scope of coverage required. Promptly restore plow lines created during wildfires to avoid impacts to hydroperiods and the natural flow of groundwater.

2.2.7 Mesic Hammocks

There are approximately 3,693 acres of mesic hammocks in the reserve. Mesic hammock is a well-developed evergreen hardwood and palm forest on soils that are rarely inundated. Mesic hammocks in the reserve are occasionally inundated for short periods of time in wet season. The canopy is typically closed and dominated by live oak (*Quercus virginiana*) and laurel oak (*Q. laurifolia*), with cabbage palm generally common in the canopy and subcanopy. Mesic hammocks may occur as islands on high ground in basin or floodplain wetlands, as patches of oak or palm forest in dry prairie or flatwoods communities, or in ecotones between wetlands and upland communities. Mesic hammocks are important to wildlife for cover, nesting, and food. Occasional, infrequent fire can clear dead vegetation and allow understory

shrubs to grow. This helps provide for a healthy mix of hardwoods, cabbage palm, mid canopy shrubs and groundcover.

Table 10. Common plant species of mesic hammocks.

Common Name	Scientific Name
coffee plant	*Psychotria nervosa*
American beautyberry	*Callicarpa americana*
sparkleberry	*Vaccinium arboreum*
common persimmon	*Diospyros virginiana*
yaupon holly	*Ilex vomitoria*
wax myrtle	*Myrica cerifera*
panic grasses	*Panicum spp.*
witchgrasses	*Dichanthelium spp.*
sedges	*Cyperaceae*
bracken fern	*Pteridium aquilinum*
partridgeberry	*Mitchella repens*
toothpetal false rein orchid	*Habenaria floribunda Lindl.*
live oak	*Quercus virginiana*
water oak	*Quercus nigra*
laurel oak	*Quercus laurifolia*
cabbage palm	*Sabal palmetto*
Spanish moss	*Tillandsia usneoides*
cardinal air plant	*Tillandsia fasciculata*
giant wild pine	*Tillandsia utriculata*
resurrection fern	*Polypodium polypodioides var. michauxianum*
golden polypody	*Phlebodium aureum*
shoestring fern	*Vittaria lineata*
muscadine	*Vitis rotundifolia*
greenbriers	*Smilax spp.*
eastern poison ivy	*Toxicodendron radicans*
Virginia creeper	*Parthenocissus quinquefolia*

Current Conditions

Over the last several decades, mesic hammocks have intruded into pine flatwoods and expanded their coverage considerably due to fire exclusion or suppression. Most mesic hammocks are in a healthy condition and although the structure and variety remain diverse, a growing problem is the serious decline of the giant wild pine air plant. Due to impacts from the Mexican bromeliad weevil, the numbers of the giant wild pine air plant have declined by approximately 70 percent. Widespread rooting by feral hogs causes severe soil disturbance.

Optimal Conditions

Optimally, the canopy should be dominated by live oak (*Quercus virginiana*) and laurel oak (*Q. laurifolia*), with cabbage palm generally common in the canopy and subcanopy. Ideally, the shrubby understory should be dense or open, tall, or short. The herb layer should be sparse or patchy and consist

of various grasses as well as various ferns and forbs with occasional ground orchids. Also, abundant vines and epiphytes on live oaks and cabbage palms should be a common and characteristic feature.

Management Guidelines

Monitor populations of giant wild pine air plant and continue efforts to protect and support seed production. Survey and treat Old World climbing fern in the hammock/flatwoods ecotones where it is likely to grow. Minimize soil disturbance by controlling the feral hog population and allow fire to burn naturally into hammocks to prevent further succession into the flatwoods.

2.2.8 Scrubby Flatwoods

Only 99 acres (0.4 percent) of scrubby flatwoods are present in the reserve. Though small, this natural community is important as it could provide suitable habitat for the threatened Florida scrub-jay and many other scrub-dependent species. Small patches of scrubby flatwoods occur near the southern entrance and on the higher sandy ridges along the eastern bank of the Myakka River. Fire is important natural process in maintaining the shrublike hardwood layer. It is important to maintain the proper height and structure of the hardwood component in this community as well as ensuring the continuance of open sandy patches.

Table 11. Common plant species of scrubby flatwoods.

Common Name	Scientific Name
nodding pinweed	*Lechea cernua*
prickly pear cactus	*Opuntia humifusa*
Chapman's oak	*Quercus chapmanii*
myrtle oak	*Quercus myrtifolia*
staggerbush	*Lyonia fruticosa*

Current Conditions

Much of the scrubby flatwoods along the river corridor is overgrown and has not been burned in the last 10–15 years. The scrubby flatwoods area in the southwest corner of the reserve is also overgrown, but still retains the elements of scrubby flatwoods. Unless fire is reintroduced soon, mechanical restoration will be necessary to help return it to a healthy condition. Cogon grass has invaded this natural community and should be treated prior to any mechanical treatment.

Optimal Conditions

Optimally, species composition in scrubby flatwoods should be a diverse mixture of species that live in both scrub and pine flatwoods habitats. Understory species should generally be more typical of scrub habitats. Often a scattering of scrub oak species and shrubs should comprise the midstory layer. Also, the deep, porous sandy soils and elevations slightly higher than the surrounding areas generally should not permit inundation, even during the wettest periods.

Management Guidelines

Restore the long-unburned management zones containing scrubby flatwoods with roller chopping, followed by prescribed fire on a 4–6-year interval to maintain the low scrub oak structure and allow understory species to expand. Control feral hogs and invasive exotic plants such as cogon grass and Natal grass to maintain optimal conditions.

2.2.9 Basin Swamp

There are approximately 80 acres of basin swamp in the reserve. Basin swamp is a basin wetland vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. Basin swamps are highly variable in size, shape, and species composition They are generally still water swamps but can flow during periods of high water. The interior of basin swamps may go without fire for decades or even centuries while the exposed outer edges can be more susceptible to frequent fire. Without fire, bays and hardwoods increase in density and peat accumulates more rapidly.

Table 12. Common plant species of basin swamps.

Common Name	Scientific Name
Florida slash pine	*Pinus elliottii*
swamp laurel oak	*Quercus laurifolia Michx.*
common buttonbush	*Cephalanthus occidentalis*
pop ash	*Fraxinus caroliniana*
red maple	*Acer rubrum*
dahoon holly	*Ilex cassine*
swamp bay	*Persea palustris*
American elm	*Ulmus americana*
Carolina willow	*Salix caroliniana*
swamp dogwood	*Cornus foemina*
fetterbush	*Lyonia lucida*
wax myrtle	*Myrica cerifera*
maidencane	*Panicum hemitomon*
Virginia chain fern	*Woodwardia virginica*
arrowheads	*Sagittaria spp.*
lizard's tail	*Saururus cernuus*
false nettle	*Boehmeria cylindrica*
beaksedges	*Rhynchospora spp.*
bladderworts	*Utricularia spp.*
royal fern	*Osmunda regalis var. spectabilis*

Current Conditions

Basin swamps are generally in healthy condition. Invasive exotic species (both plant and animal) have the largest impacts. Old World climbing fern has gained a foothold in some swamps where it is growing in the tree canopy. Feral hogs disturb the soil and muck layer with their rooting. They also create large wallows that fill with mud and water and alter the herbaceous species cover.

Optimal Conditions

While mixed species canopies are common, the dominant trees in basin swamps in the reserve should be swamp laurel oak, common buttonbush, and pop ash. Naturally fluctuating hydroperiods should support a diverse canopy and subcanopy. Depending on hydrology and fire history, shrubs may exist throughout a basin swamp or they may be concentrated around the perimeter. The herbaceous layer should also be variable and include a wide array of species.

Management Guidelines

Increased exposure to prescribed fires during different levels of hydroperiods would benefit the many levels of basin swamps. Apply different fire techniques and wind directions to surrounding upland communities to reduce the fire shadow effect that can occur along the edge of embedded wetland features. Consider removing the encroaching pine overstory in areas that lack fire history. Evaluate additional basin swamps for canopy reduction to open the area up for a lush herbaceous layer. Assess and restore historic plow lines that tend to lead to or cut through basin swamps to restore the natural flow of surface water. Reduce invasive species populations.

2.2.10 Floodplain Swamps

There are approximately 127 acres of floodplain swamp in the reserve. Floodplain swamp occurs primarily in the western portion of the reserve adjacent to the Myakka River. It is a closed-canopy forest of hydrophytic trees occurring on frequently flooded hydric soils adjacent to stream and river channels and in depressions and oxbows in floodplains. Trees are often buttressed, and the understory and groundcover are sparse. Along the Myakka River, floodplain swamp is isolated from the main river channel by riverbank levees and is restricted to oxbows, overflow channels, and old stream beds.

Table 13. Common plant species of floodplain swamps.

Common Name	Scientific Name
coastal plain willow	*Salix caroliniana*
laurel oak	*Quercus laurifolia Michx.*
buttonbush	*Cephalanthus occidentalis*
popash	*Fraxinus caroliniana*
red maple	*Acer rubrum*
climbing aster	*Aster carolinianus*
hemp vine	*Mikania scandens*
pepper vine	*Ampelopsis arborea*
Virginia creeper	*Parthenocissus quinquefolia*
swamp mallow	*Hibiscus grandiflorus*
dog fennel	*Eupatorium spp.*
camphorweed	*Pluchea rosea*
fireweed	*Erechtites hieracifolia*

Current Conditions

Floodplain swamp in the reserve is mainly in good condition. Fire is infrequent in floodplain swamp and the open understory does not support fuel buildup. Summer flood events clear away detritus build-up and maintain the open understory. Invasive plant species like Old World climbing fern are present but not in high densities. Feral hogs live in the floodplain swamp areas where they disturb the soil both by rooting and creating wallows to lie in.

Optimal Conditions

Optimally, regular seasonal flooding should be an important factor in maintaining the proper hydroperiod and the health of floodplain swamp. Invasive plant and animal species should be managed to reduce impacts. The canopy should be dense and closed with few openings as large mature trees die. Flood tolerant ferns and herbs may cover portions of the forest floor. Some shrubs may be supported in isolated areas that are less flooded during higher water times.

Management Guidelines

Survey and treat invasive exotic plants during the dry season, especially to reduce densities of species like Old World climbing fern, para grass, and West Indian marsh grass. Remove feral hogs to help minimize soil disturbance. Monitor and discourage illegal camps along the Myakka River as this community is highly sensitive to land use and alteration.

2.2.11 Wet Prairie

There are approximately 139 acres of wet prairies in the reserve. Wet prairies often exist in flat to gently sloping areas between depression marshes and flatwoods or dry prairie. They are distinguished from marshes by the reduced frequency and intensity of inundation and by the dominant coverage of grass and sedge species.

Table 14. Common plant species of wet prairies.

Common Name	Scientific Name
wiregrass	*Aristida stricta*
cutthroat grass	*Panicum abscissum*
nutrush	*Scleria spp.*
blue maidencane	*Amphicarpum muhlenbergianum*
wiry beaksedges	*Rhynchospora spp.*

Current Conditions

Wet prairies are mainly in good condition. They are maintained within the proper fire intervals which will help avoid encroachment of slash pine and wax myrtle.

Optimal Conditions

Optimal species variety should include mainly herbaceous groundcover with only occasional shrubs or stunted slash pines. Moisture content should vary seasonally to allow fire to burn in the dry season and

keep the herbaceous component. Water levels during the wet season should be lower than adjoining depression marshes.

Management Guidelines

Avoid impacts by vehicle traffic and fire plow lines to maintain natural surface water flow. Manage feral hog populations to reduce soil disturbance. Maintain fire intervals of 3–5 years to reduce pine and wax myrtle encroachment and to trigger flowering of some herbaceous species. Monitor for invasive plant infestations like torpedo grass.

2.2.12 Blackwater Stream (the Myakka River)

There are approximately 15 acres of blackwater streams in the reserve, namely the Myakka River that forms the reserve's western boundary. The Myakka's dark, tannin-stained water and sandy bottom typifies a blackwater stream (FNAI 2010). This river system is especially significant because it drains much of the western half of the reserve and is Sarasota County's only river. A substantial portion has been designated a State Wild and Scenic River by the Florida State Legislature, including the entire portion running through the reserve.

Table 15. Common plant species of blackwater streams.

Common Name	Scientific Name
marsh pennywort	*Hydrocotyle umbellata*
duckweed	*Lemna spp.*
water spangles	*Salvinia minima*
cattails	*Typha spp.*
frog's-bit	*Limnobium spongia*
water hyacinth	*Eichhornia crassipes*
various bulrushes	*Scirpus spp.*
sedges	*Cyperus spp.*

Current Conditions

The blackwater stream where it flows through the reserve is in good condition. High banks and oxbows are common. Seasonal floods cause partial blockages from treefall. Cogon grass on the high banks and Old-World climbing fern closer to the water line are present but infrequent. Invasive exotic fish including blue tilapia, brown hoplo, and walking catfish are well established in the river. The island apple snail also lives in the river. Florida manatees are observed annually during high water events in the river. Human impacts from illegal camping and cutting of vegetation are present but not extensive. Idle speed regulations are rarely enforced, and speeding motorboats frequently travel upriver creating large wakes that impact the banks. Fossil hunters are common when river levels are lower, and kayakers have been known to remove endangered bromeliads from trees hanging low over the river.

Optimal Conditions

Optimal conditions for the Myakka River include a fairly open blackwater stream, devoid of exotic vegetation and exotic fish and wildlife. The river should contain both emergent and floating aquatic

vegetation along shallower and slower moving sections, but their presence should be reduced because of typically steep banks and considerable seasonal fluctuations in water level.

Management Guidelines

Regularly survey and treat invasive species to help keep populations to a minimum. Monitor for the presence of para grass (*Brachiaria mutica*), which occurs just upriver in Myakka River State Park's segment of the Myakka River. Increase patrolling of the river and the riverbanks by law enforcement, state, and county staff to curtail illegal camping, violation of no-wake zones, and collecting of artifacts and biological specimen.

2.2.13 Artificial Ponds

There are approximately 47 acres of artificial ponds in the reserve. Artificial Ponds include the many borrow pits and stormwater ponds created during the construction of the wellfield.

Table 16. Common plant species of artificial ponds.

Common Name	Scientific Name
pickerelweed	*Pontederia cordata*
saggitaria	*Saggitaria spp.*
spatterdock	*Nuphar luteum subsp. macrophyllum*
water lilies	*Nymphaea spp.*

Current Conditions

Most of the manmade ponds are in a healthy, undisturbed condition. In 2020, the banks of the two stormwater ponds near the entrance to the water plant facility were cleared of excess vegetation, both invasive and aggressive native plants. Banks were replanted with native species during a joint project involving Parks, Recreation and Natural Resources and Public Utilities staff.

Two mitigation wetlands (P4 and P5) were treated for an overgrowth of cattails in the spring of 2020. P5 has a dense population of remaining cattails that will require future phased treatments. P4 will require less intensive treatment but will need follow-up treatments to keep cattail from returning.

Optimal Conditions

The optimal condition of the ponds includes a healthy balance of open water with aquatic and emergent plants along the littoral zone to provide optimal habitat for aquatic species.

Management Guidelines

Avoid further human impacts other than treating for invasive species to maintain the health of ponds and mitigation wetlands. Continue to monitor and treat wetlands P4 and P5 to reduce dense cattail populations.

2.2.14 Management Zones

To coordinate management efforts and maintain data history pertaining to prescribed fire and invasive exotic control, the reserve is divided into 110 management zones (Exhibit 8). Each year, management

zones are selected to create the annual burn plan based on the recommended fire return interval for the pyrogenic natural communities (Table 17). Annual burn target acreage of the entire reserve is 4,421–8,795 acres. Zones are selected to burn in a way that maintains rotation and removes others from backlog.

Table 17a. Annual burn plan intervals and targets.

Natural Community	Acres	Burn Interval (years)	Annual Burn Target (acres)
mesic flatwoods	10,484	2–4	2,621–5,242
depression marsh	3801	2–5	760–1,900
basin marsh	2486	5–7	497–355
dry prairie	1910	2–4	477–955
scrubby flatwoods	99	3–8	12–33
basin swamp	80	2–10	8–40
wet prairie	139	2–3	46–70

For the purposes of IPM, the reserve is divided into four regions with a four-year rotation (Table 17b, Exhibit 9). Techniques and chemicals used are dependent on the plant and current best management practices. The regions will be surveyed for invasive exotic plants on a four-year rotation minimum. GPS coordinates of plants will be recorded, followed by treatment.

Table 17b. Annual invasive exotic plant management rotation intervals and targets.

Invasive Plant Treatment Regions	Acres to be Surveyed and Treated (as needed)	Rotation Year
Region 1: River Corridor	4,999	2021, 2025, 2029
Region 2: Central Reserve	8,510	2022, 2026, 2030
Region 3: South of South Powerline Rd	4,218	2023, 2027, 2031
Region 4: Deer Prairie Slough	6,702	2024, 2028, 2032

2.2.15 Special Considerations

Prescribed Fire Strategies

The long-term management goal for pine flatwoods and dry prairie communities is to restore and maintain their natural conditions by utilizing prescribed fire, mechanical vegetation reduction, and selective timber thinning where necessary. These land management tools will help create a more open pine canopy in the flatwoods by reducing the density of trees to historical levels and by reducing saw palmetto density in both the flatwoods and dry prairie to allow for greater coverage of native forbs and grasses. Of these land management tools, prescribed fire remains the most natural, cost effective, and preferred method of maintenance.

The current burn program has continued to evolve as a result of wildfires in 2000 and 2001. Early in the program, the focus was on wildfire mitigation, but as more progress was made in bringing more

management zones into a maintenance phase, the focus has shifted more to ecological burning and maintaining a more natural fire regime.

Prescribed burning is conducted under the direction of the Sarasota County Fire Department Fire Mitigation Team. Management zones are assessed for wildfire danger using the Florida Wildfire Hazard and Risk Assessment, wherein they are given a numerical score based on criteria such as fuel height, distance to a water drafting source, and width of firebreaks. The higher the score, the greater the wildfire threat. A score of 50 or less represents a "low hazard," whereas scores of 50–74 represent "moderate hazards," and 75–99, "high hazards." The most recent assessment of wildfire threat yielded an average score of 45 across all burn zones, a significant improvement compared to a score of 63 in 2002.

Wildfire Mitigation

A successful wildfire mitigation strategy along with an aggressive prescribed burning program will greatly reduce the cost of fire suppression and associated environmental impacts resulting from plowlines. To date, wildfire mitigation has been accomplished using roller chopping, prescribed fire, and selective timber thinning. A roller chopped buffer approximately 400-feet-wide has been created and regularly maintained along the three-mile boundary of the reserve and the City of North Port. These areas of lower fuel greatly reduce the possibility of wildfires crossing from the reserve into neighboring property.

Timber Thinning

In order to maintain the health of the natural communities at the reserve, it may be necessary at times to remove timber.

In March 2003, Sarasota County entered into a Memorandum of Agreement with the Florida Forest Service (f/k/a Florida Division of Forestry) to assist the County with planning, administering, and supervising the harvest of timber on County lands.

The FFS has established Best Management Practices (BMPs) for Silviculture in Florida. These practices are designed as the minimum actions necessary for protecting and maintaining the State's water quality as well as certain wildlife habitat values during forestry activities. All timber thinning operations in the reserve will conform to these BMPs. Any potentially harmful activities, such as driving heavy machinery through saturated soils, will be avoided or mitigated.

A timber thinning project in 2009–2010 reduced slash pine canopies in approximately 10,000 acres of mesic flatwoods. No timber thinning will occur in areas where timber has been previously thinned. While timber thinning can be a source of revenue, timber thinning in the reserve is pursued as a means to restore overgrown flatwoods and not for the purposes of generating income, given the original mandate in the governing ordinance, Resolution 82-200.

Invasive Exotic Plant Control

Invasive exotic plants continue to create severe problems in disturbed areas such as trails and utility easements, as well as along the Myakka River and Deer Prairie Slough corridors. This management plan contemplates a systematic program of invasive exotic plant reduction and elimination. The first step in this program will be to map the abundance and location of invasive plants and, in turn, to identify the

most problematic species. Concurrently, managers will try to establish regional cooperation for weed management. This is necessary because the Carlton is surrounded by other lands—most notably Myakka River State Park to the north—which contain invasive exotic plants. These plants can move freely across park boundaries, so coordinated management across the entire landscape is needed to stop their spread.

The next step in this program will be to treat pest plants. This will be conducted by in-house staff when possible, while larger projects will be outsourced to qualified contractors. Staff will use herbicides in accordance with the County's Integrated Pest Management (IPM) program, which promotes sustainable pest management methods that minimize health, environmental, and economic risks. Furthermore, staff will focus on equipment and personnel decontamination procedures, which will reduce the transfer of invasive organisms from sites of treatment to unpopulated areas. This is especially important when dealing with invasive exotic plants, which may easily spread to new areas through transportation of seeds on equipment and clothing. Annual applications for state funding have helped subsidize costs utilizing qualified state contractors.

The IPM Strategy Plan (Exhibit 9) outlines actions to consider when developing an annual work plan.

Mexican Bromeliad Weevil

The Mexican bromeliad weevil has had a disastrous effect on the native, endangered giant wild pine air plant. Although the weevil arrived in Florida sometime in the late 1980s, negative impacts were not immediately discovered and, over time, the weevil has succeeded in devastating populations of air plants all throughout south and central Florida. A volunteer monitoring program began in the reserve in 2015 and great efforts have been made to protect air plants and enhance their seed distribution. As there is currently no viable biocontrol of the weevil, protection efforts focus on protecting mature air plants before they go to seed to help propagate future generations.

Feral Hog Control

A control program needs to annually remove a large proportion of the hog population—estimated at 65 percent or more—for the population to substantially decrease over the long term. An ongoing live trapping program has employed certified contractors to remove hogs since 1998, but removal of 65 percent would need to combine other methods to be successful.

To achieve any set level of removal, baseline population information and annual monitoring would be necessary. Research would determine the baseline population, territories, movements, and environmental impact of hogs. Once this information is available, staff would better understand how to eliminate hogs and hog damage and could pursue best management practices.

Because feral hogs prefer to bed in areas with dense understory vegetation (Belden and Frankenberger 1977), an aggressive prescribed burning program will be used in conjunction with continuous live trapping efforts to help achieve the greatest level of control. With regular burning, understory vegetation will be maintained at lower densities, creating fewer areas for them to find cover.

As technology develops, other forms of control may be utilized. Any additional measures required to supplement trapping activities must be reviewed, authorized, and approved by staff before

implementation. If 65 percent annual population removal is not possible, then efforts should be focused on the worst problem areas.

Hydrologic Restoration Strategies

Activities in this management plan focus on restoring surface irregularities to improve surface water flow. First, land management staff will map topographic alterations following fire, since fire removes brush from the landscape and makes visually identifying surface features easier. After creating a map of surface alterations, staff will assess which features are most damaging to hydrology and the feasibility of restoring these features. Finally, the highest priority alterations will be restored as funding allows.

Mitigation Sites

Several permitted mitigation sites exist in the reserve. All were considered successful and released from further monitoring by permitting agencies. The County is required to manage all released sites under the same management guidelines as other natural wetlands in the reserve in perpetuity.

Permitted sites include:

- P2 – Mitigation for the construction of the Mabry Carlton Pkwy
- P4 – Mitigation for Myrtle St (Sarasota)
- P5 – Mitigation for the construction of the Mabry Carlton Pkwy
- Tumapo/Wetland 29 – Mitigation for Laurel Road
- DEP wetlands – Mitigation for impacts from Wellfield Road
- Center Road Mitigation Wetland – Mitigation for Center Road in Venice located east of Deer Prairie Slough near trail marker #37.

2.2.16 Research and Monitoring

Adaptive management is a process wherein lessons learned from previous management are applied to future management decisions. In order to practice adaptive management, land managers must understand the effects of past management, and this knowledge usually comes from monitoring natural communities for changes in diversity, total populations, and demographics of resident fauna. Monitoring wildlife in these communities lets managers know if they are providing the habitat that each community should contain when in a natural, healthy state.

Baseline inventory data are lacking for certain key species. For example, the gopher frog may inhabit the reserve, but no surveys have been done and no sightings have been recorded. This species may be inventoried by sound during the breeding season and by using a gopher tortoise burrow scope. The scope may also be used to inventory other gopher tortoise commensals.

A general species inventory is also needed for the site and would include surveys for species diversity and populations in major groups, such as birds, reptiles or amphibians (herps), small mammals, and large mammals. A variety of methods may be used, including track plots and live traps to inventory herps and small mammals. Track plots and remote cameras are recommended to inventory large mammals. Currently, volunteers with Friends of the Carlton Reserve use trail cameras to monitor wildlife in the reserve, and they provide bird survey information from nature walks and birding excursions. The trail cameras purchased by the group are regularly monitored and photo data are entered into a

spreadsheet to provide a photo record of resident wildlife. Over time, this information may assist in determining trends in population dynamics.

Proposed Research

Proposals for research in the reserve are welcomed and will be reviewed to determine whether the research would benefit land management goals. All outside research proposals must be submitted for approval and receive a research permit through Sarasota County Resource Management. Research opportunities that would enhance the County's ability to manage this and other natural areas include:

- Survey and map ditches and other hydrologic impacts on the site and provide an assessment of restoration options.
- Aurally survey exotic and native frog and toad species to determine the extent to which exotic species intrude into natural areas. The Frog Listening Network has conducted studies of this type in the area and the local chapter presents a possible volunteer source for such a project.
- Other monitoring programs that track the effectiveness of any future mitigation or management efforts especially targeting listed species or other species of concern.

3 CULTURAL RESOURCE MANAGEMENT COMPONENT

3.1 CULTURAL RESOURCE INVENTORY

3.1.1 Archeological Sites

The first known humans in Florida were nomadic hunters and gatherers believed to have entered the New World from East Asia over 12,000 years ago. The nomadic hunters who eventually settled in the Florida region and thrived from 7500 B.C. to 500 B.C. are classified as the Archaic peoples. Evidence of their lives may be seen in prehistoric sites in the reserve.

While the Spanish never explored the area now designated as Sarasota County and therefore did not provide a written account of the names of tribes in the Sarasota area, the Uzita tribe is well described from 1500 A.D. to 1700 A.D. in the Manatee County area. Thus, it is possible that the historic campsites in the reserve were left by the Uzita.

Since the acquisition of the property, five archaeological surveys have been conducted and one historical report produced (Jones 1978, Austin 1987, Almy 1998a and 1998b, Burger 2004). Of the archaeological surveys, only the Piper Archaeology survey (Austin 1987) was designed to cover the vast area of the reserve and identifies all currently known resources. The other four were limited in both scope and area. The survey conducted by Archaeological Consultants, Inc. provides a useful checklist for future research, planning, and interpretation (Almy 1998b).

The reserve contains 11 recorded archaeological sites: five prehistoric, three historic, and three others that have both a prehistoric and a historic component (Table 18). All 11 archaeological resource sites contribute important information to the County's archaeological record. Further, the location of the prehistoric sites on protected public land provides an ideal opportunity for the interpretation of prehistoric subsistence.

Table 18. Carlton Reserve Documented Archaeological Resources

State ID	Name
8SO422	Vicker's Head #1 Site (Historic & Prehistoric)
8SO423	Vicker's Head #2 Site (Historic & Prehistoric)
8SO424	Hot Shot Site (Prehistoric)
8SO425	South Power Line Site (Prehistoric)
8SO426	Turpentine Camp #2 Site (Historic & Prehistoric)
8SO427	Venice Arcadia #1 Site (Prehistoric)
8SO428	Venice Arcadia #2 Site (Prehistoric)
8SO429	Honey Bee Site (Prehistoric)
8SO612	Resin Collection Site (Historic)
8SO613	Windy Sawgrass Camp (Historic)
8SO614	Farmstead Site (Historic)

Available information suggests that nine of the 11 archaeological sites are not eligible for listing in the National Register of Historic Places (NRHP). However, two sites, Vicker's Head #2 (8SO423) and

Turpentine Camp #2 (8SO426), appear to be eligible for the NRHP and the Sarasota County Local Register of Historic Places (SCLRHP).

In addition to identified archaeological sites, there may be undocumented cultural resources. Since the completion of the Piper survey (Austin 1987), the importance of additional cultural resources has been acknowledged. Furthermore, since the original survey there have been significant improvements in archaeological site detection. It is probable that archaeological sites exist that were not evaluated in the past. Finally, a single mound is indicated on an early survey plat of the area. Attempts have been made to relocate this mound but have not been successful.

3.1.2 Historical Structures and Uses

Historical uses of the Carlton Reserve consisted primarily of cattle ranching and turpentining. The earliest known cattle were brought into the County in 1847 by William Harvey Whitaker, who brought ten cows and calves to start a herd. Cow herds grew through the region, often supplemented by wild cows caught to form a new herd. By the 1900s, the Sarasota cattle industry was thriving with thousands of cattle roaming the native range. In 1914, the Palmers bought a large ranch on the Myakka River, bringing national attention to the area.

The most important change in the industry occurred in 1923 when all cattle were required by law to be dipped every 14 days for ticks in a mixture of "8 pounds arsenic, 24 pounds washing soda, and one gallon pine tar for every five hundred gallons of water" (Newman et al. 2002). Prior to this, Florida cattle were referred to as "Tickey Cattle" due to the Texas Fever Tick, which produced fever and prevented weight gain. It was no longer legal for wild cows to be rounded up; instead, they were to be shot on sight.

This meant that Sarasota herds could no longer roam freely. This ultimately led to fencing and the creation of many small ranch stations throughout the region where round ups and dipping activities could be centralized. Today, a single dipping vat is known to exist in the reserve at the Windy Sawgrass Cow Camp. To minimize contamination, the dipping vat and area around it have been covered in a layer of topsoil so the vat itself is no longer visible but remains protected as an historical feature.

Turpentine production was also a major regional industry around the turn of the century. In 1910, there were five working turpentine camps in southern Manatee County (later to become Sarasota County in 1921). The Hall & Cheney camp was near Fruitville; R.T. Hall & Company Prison Camp was near Sandy, in southeastern Manatee County; Williams's camp was near Venice; Hall and Harrison camp was west of Cow Pen Slough; and an unnamed camp operated in the present Carlton Reserve area. The camp at the Carlton Reserve was also used to produce pine tar. By the 1920s, trees had been in production for ten years and many of the turpentine camps were closing or converting into timber mills.

3.2 Cultural Resource Management

3.2.1 Considerations for Protection

Historical resources are an important part of the interpretation of the Carlton Reserve and resources such as the Windy Sawgrass Camp and the Turpentine Camp should be maintained and protected from activities that may cause damage.

Complete avoidance of known sites is currently recommended, particularly at Vicker's Head (8SO422) and Turpentine Camp #2 (8SO426), which are considered regionally significant cultural resources. Ground-disturbing activities such as grading, borrowing, filling, tree removal, or ground vegetation removal should be avoided in all high probability areas until an updated survey can be completed.

All the archaeological sites in the reserve appear to be in a stable state and in fair condition. Most sites are in remote locations not frequented by reserve visitors and are not obvious even to professional archaeologists. Site preservation is facilitated by the distance of most sites from public-use areas, reserve staff's sensitive natural resource management in cultural resources areas, and regular site inspections.

4 LAND USE COMPONENT

4.1 CURRENT LAND USES, AMENITIES, AND FACILITIES

There are approximately 562 acres of developed land in the reserve. Developed areas include the water treatment plant grounds, wellfield infrastructure, pipelines, powerlines, maintenance areas, trails, and the public park (Exhibit 10).

4.1.1 Agriculture

Not applicable.

4.1.2 Public Access and Recreational Uses

Sarasota County is required by County Ordinance 82-94, Resolution 82-200 and the Sarasota County Comprehensive Plan, to provide for public use of the Carlton Reserve in an ecologically benign manner. John J. Whelan developed a public use plan in 1986, which was revised by County Natural Resources staff in 1992.

A phased development approach was proposed under the previous plans. Currently, approximately 20 acres are developed as a public park with a historic reconstructed log cabin serving as the visitor reception building (Photo 1), a composting restroom facility, a potable water treatment facility, a large picnic pavilion (Photo 2), maintenance sheds, pole barn, and designated parking areas for both cars and horse trailers.

The log cabin visitors center, originally built in the 1930's and donated to the County, was moved from its original location in Sarasota, near Stickney Point Rd and Sarasota Bay. The cabin was dismantled, stored for two years, and then rebuilt on its current site in 2002.

The Clivus Multrum composting restroom, a self-contained recycling toilet system was installed in 1999. Running water for sinks is provided by a small potable water treatment plant close by. No septic system is required for the restroom as there are no flush toilets. The restroom is serviced on a quarterly basis by a local contractor.

Photo 1. A historic reconstructed cabin.

Photo 2. Picnic pavilion

The park has a picnic area, short interpretive loop nature trails, and longer marked day hiking loop trails. A primitive tent camping site known as the Cabbage Palm Loop Campsite is near the picnic area and restrooms. Each site has a table, grill, and fire ring.

Across the reserve, a network of approximately 100 miles of trails and roads are available for use by hikers, equestrians, and bicyclists. In a joint effort between the State and the County, the 18-mile Myakka Island Wilderness Trail was established from the north entrance of Myakka River State Park to the south end of the reserve. Some sections of the Myakka Island Wilderness Trail are multi-use and others separate hikers and bicyclists from equestrian users. Beginning in 2014, approximately 10 miles of single-track bicycle trail has been built and maintained by the volunteer group Sarasota County Off-Road Riders (SCORR).

Currently, there is a primitive canoe and kayak launch on the Myakka River at a separate entrance off Border Road near the Myakka River bridge. The launch requires users to portage their kayak or canoe a short distance to access a small tributary that is immediately adjacent to the river. Other activities that visitors can enjoy include geocaching, birdwatching, trail running, and picnicking. Open space and pavilion rentals are available for parties and events like orienteering, off-road biking, and trail races.

In addition to Cabbage Palm Loop Campsite in the developed park area, there are also two designated primitive back country camping sites. The Homestead Campsite is the only site adjacent to the river and can be reached by water or by land. The historic Windy Sawgrass Camp, also known as the Cowboy Camp, is located eight miles from the park entrance and is the only site open to both hikers and equestrian users. The site is a complex of restored and recreated historic buildings completed in 2006, including a cook shack, bunkhouse, and a 12-stall horse stable constructed in 2004 by County staff and volunteers. A windmill and horse trough are nearby to provide drinking water for horses.

The Turpentine Camp may be restored as directed by the History Center with interpretive signs and picnic tables to make this area a hiking destination. Turpentine Camp #2 (8SO426) and the Windy Sawgrass Camp (8SO434) are particularly amenable to public display and interpretation of Sarasota County's history and economic development.

Table 19. Current condition and maintenance requirements of onsite facilities and amenities.

Type	Improvement	Condition Assessment	Maintenance Goal
Public	parking areas	good	coordinate with Maintenance Services for regular grading of parking areas; coordinate with contractor for regular mowing; maintain parking bumpers and ADA signs
	trails and roads Paver block trail	good trails and roads fair paver block	replace fill, grade, mow, and trim; paver block trail improvements to include raised walkway to improve drainage away from trail.
	log cabin visitor center	good	coordinate with Maintenance Services for regular routine maintenance of building; volunteers and site manager responsible for cleaning interior
	picnic pavilion	good	coordinate with Maintenance Services maintenance of pavilion; blow off debris and pressure wash

	composting restroom	good	coordinate with SC Facility Maintenance and contractor maintenance for repair and cleaning of restroom on a regular schedule
	campsites	good	site manager and trades worker check and clean grills, tables, and site markers; coordinate with contractor for mowing
	signs and kiosks	fair to good	replace kiosk inserts as needed; replace site marker signs as needed.
	Canoe and kayak launch	good	coordinate with maintenance services for regular grading work; site manager and trades workers remove trash
	horse stables (large) horse stables (small)	good fair	annually assess large stables for deterioration; annually assess small stables and replace rotting boards
	feed barn (only remaining original building)	Poor condition but left there that way for historical value.	annually assess for cultural resource site updates
	windmill	good	prevent grass from growing underneath windmill and horse trough
	cook shack	good	annually assess for cleaning needs and potential deterioration
	bunkhouse	good	annually assess for cleaning needs and potential deterioration
Support	tool shed	fair	replace metal tool shed in the next five years
	garage shed	fair	replace rotten wood as needed
	pole barn	good	annually assess for repairs
	domestic water plant	fair	remove trash and non-working items; coordinate with Facilities for needed work; facilities contractor does weekly testing on site

Table 20. Potential or known unauthorized uses. Potential unauthorized uses and 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
unauthorized vehicles, atvs, utvs, dirt bikes		X
poaching or hunting		X
cultural resource damage and removal	X	
unauthorized camping and fires		X
pets, except trained service dogs		X
removal of plants	X	
littering		X
fossiling		X

4.1.3 Water Treatment Facility and Wellfield

The Carlton wellfield is accessed on a seven-mile shell roadway that is maintained in a partnership between Utilities and Parks, Recreation and Natural Resources Departments of Sarasota County. Currently, there are 16 production wells on the Carlton Reserve. Each well site includes the well, a standby generator, fuel tank, and a 120-square-foot building containing the motor control equipment (Photo 4). Each well site is approximately 4,200 square feet and is enclosed by an eight-foot fence. There is one entrance gate that is locked at all times. Each enclosure has a 15-foot cleared buffer area surrounding it for fire protection. The 24-inch diameter raw water collection pipeline delivers raw groundwater from the 16 production wells to the Carlton Water Treatment Facility. It follows the wellfield access road approximately seven miles and enters the treatment facility on the northeast corner of the site.

Photo 3. Production well building.

The 75,625-square-foot Carlton Water Treatment Facility is situated on approximately 30 acres of land (Photos 4 and 5). It is located two miles due north of the Border Road entrance. The facility site is comprised of several components, including the main process building, pre and post treatment, brine disposal, and three five-million-gallon ground storage tanks. Security features include high security fencing around the perimeter of the facility, constant video surveillance, and controlled ingress and egress.

Photo 4. Aerial of Carlton WTF.

Photo 5. Carlton WTF

The Carlton Water Treatment Facility provides potable water to the distribution system through a 42-inch diameter water transmission pipeline. It extends from the west side of the facility and along a small portion of the main roadway before turning west toward the water distribution system. The 18-inch diameter pipeline for brine disposal runs parallel to the water line and both lines extend approximately 1.5 miles through the reserve. Sarasota County Utilities has a 30-foot easement and there is a 100-foot cleared path for these pipelines that is used as a firebreak. The dual pipelines cross the River Trail and pass under the Myakka River. Construction has been completed on the installation of a new pipeline in the existing pipeline corridor to add additional capacity for Sarasota County and eventually provide a link to Manatee County.

The 42-inch diameter pipeline delivers potable water from the Peace River Water Treatment Facility in DeSoto County to the Carlton Water Treatment Facility. This 23-mile-long pipeline extends approximately ten miles into the reserve from the eastern boundary. This pipeline follows the Florida Power and Light access road up to the Mabry Carlton Parkway where it turns north and runs parallel to the Parkway and up to the treatment facility. There is a 50-foot easement along this pipeline that is also utilized as a firebreak. The Peace River Manasota Regional Water Supply Authority (PR/MRWSA) owns and maintains this pipeline up to the above ground meter assembly (Photo 6) located inside the treatment facility's perimeter. Coordination with PR/MRWMA on long-term management of pipeline rights-of-way is crucial in managing invasive exotic plants and other disturbances caused by pipeline installation and maintenance.

Photo 6. Above-ground meter assemble pipe.

Water Production and Treatment Facility Expansion

The Carlton Water Treatment Facility currently contains multiple treatment structures located on a 30-acre portion of the reserve. As the demand for potable water increases, facility expansion may be

contemplated in order to increase treatment capacity and meet demands. Under such a scenario, space outside the current boundaries of the treatment facility may be used for treatment structures such as storage tanks, additional buildings, and basins.

If expansion were to occur, a new perimeter would be established for the facility to properly secure all the structures in a single compound. The targeted areas consist mainly of mesic flatwoods and depression marshes and any impacts would be evaluated and mitigated if necessary.

Expansion of the Carlton Wellfield would increase the capacity and enhance the ability to rotate groundwater wells to minimize impacts to water quality and levels. Modeling of additional drawdown potential was completed and suggested that up to three new production wells may be added to the existing 16 wells currently in production. The additional production wells may necessitate having additional monitoring wells and stations depending on special conditions in the water use permit.

A pilot study is planned to determine whether the Carlton Water Treatment Facility can be refurbished to blend and treat both the surface water and ground water. The Dona Bay project will capture water from Cow Pen Slough in the rainy season when run off is abundant and store this water in ground reservoirs off site at Pinelands Reserve and/or Venice Minerals sites. The surface water could potentially by utilized as a drinking water source. The timeline for this project is between 5–10 years.

Sarasota County Resolution 82-200 requires that potable water from the reserve is obtained in an environmentally acceptable manner. Water consumptive use plans have been adopted only after completion of environmental, archaeological, and historical sensitivity studies.

4.1.4 Outreach and Education

Sarasota County Parks, Recreation and Natural Resources hosts the annual Fire Fest festival every year to help promote and educate park visitors about the benefits of prescribed burning.

4.1.5 Land Use on Adjacent Lands

The entire north boundary of the reserve is protected by Myakka River State Park (Exhibit 3). The entire east boundary of the reserve is protected by the County/SWFWMD jointly owned Big Slough Preserve. The city of North Port's North Port Estates Subdivision borders the southeast portion, and the remainder of the south boundary is a mix of other protected lands owned by both the County and the Southwest Florida Water Management District, as well as a few rural ranchette parcels.

West of the Myakka River is the Venetian Golf and River Club subdivision and north of that is the Myakka River Trust parcel purchased with ESLPP funding and the County-owned Pinelands Reserve. A handful of small land-locked inholdings owned by private citizens border the Myakka River boundary. The parcels are included in a designated Priority Site that ESLPP has ranked on environmental criteria including connectivity, water quality, habitat rarity, land quality, and manageability. Properties in ESLPP Priority Sites are eligible for purchase using ESLPP funds.

Very little of the reserve's boundary could be subject to further development. North Port Estates is mostly built out with a few undeveloped 3–5-acre lots remaining. The small handful of private ranchettes bordering the south boundary are zoned rural and not likely to be further developed. Lack of access would prevent any of the inholdings along the river to build or develop. All other adjacent lands are county or state protected natural lands.

4.2 Proposed Land Uses, Amenities, and Facilities

Any future proposed public uses will be reviewed by the ESLOC advisory board and ESLOC's recommendations will be considered by the Board of County Commissioners for approval or denial in light of the governing ordinances to promote ecologically benign, non-consumptive, resource based recreational and educational uses.

Potential future uses and amenities may include an expansion of the single-track trail system, timber thinning if needed for habitat restoration, improving the canoe and kayak launch, enhancement of existing primitive campsites, and the creation of interpretive signs for the Turpentine Camp #2 and the Windy Sawgrass Camp archeological sites.

Planning for trail management shall occur during development of annual work plans. It will evaluate existing trails—including firelines, access, utility, and pedestrian trails—and identify those trails for restoration, upgrading, rerouting, use restrictions, or closing. Many of the existing trails were constructed through wetlands or their ecotones. Whenever possible, existing trails through wetlands or wetland ecotones will be diverted around the wetlands and new trails will avoid impacting wetlands.

Wetland areas near the public park area could be identified for educational opportunities and ADA accessible boardwalks could be constructed for bird viewing and nature study. Boardwalks should have areas for seating and possibly a covered area or blind for personal protection from the sun and to reduce wildlife impacts.

Certain trails, such as Vicker's Head Trail, Stockade Trail, Rocky Ford Trail, and Turpentine Trail are important historical resources and should be protected. These trails shall be identified by their correct names on signs and reference maps. In addition, locations could be identified for the development of future hiking trail segments specifically designed for foot traffic only and single-track bicycle trail segments.

The Windy Sawgrass/Venice-Arcadia Grade needs to be maintained so that it is usable year-round as an all-weather road. It is a main road through the reserve for staff and contractor vehicles and also serves to provide access to the interior of the reserve for hikers, bicyclists, and equestrians. Coordination with Myakka River State Park is crucial, as the northern section of the Windy Sawgrass Trail is located on the Myakka Prairie that is owned by SWFWMD and managed by Myakka River State Park.

4.3 Current and Proposed ADA Components

Except for the disabled parking area there are no ADA compliant facilities or amenities available. The trails are composed of natural soil substrate and are subject to ground disturbance through erosion, wildlife activity, and use. Some members of the public may not be able to enjoy the benefits of the reserve due to limited mobility and ability to use trails. 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.

An upgraded road, possibly the Wellfield Road and South Powerline Trail, could be utilized as a tramway that would provide access for more park users and further improve ADA compliance. Potentially, a private concessionaire could run this under agreement with the County.

4.4 Visitor Use Management And Carrying Capacity

The current level of visitor use varies widely from winter to summer. A vehicle counter could be installed to count vehicles and help create a baseline of usage for future planning. As development density in the area increases, visitor usage will increase. Areas that will need to be monitored for carrying capacity are the canoe and kayak launch and single-track bicycle trails. As of 2020, the carrying capacity of the reserve 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 contractors. Sarasota County is responsible for all property maintenance activities including administration, trash removal, trail and fence maintenance, recreational amenities upkeep, and habitat management. PRNR staff or their designee will provide weekly property maintenance.

5.1 Current Staff

Current staffing includes one full-time land manager, who is responsible for the management and operation of all areas outside the Carlton Water Treatment Facility, one part time trades worker, assistance from the Division Operations and Maintenance Unit, and a small number of seasonal volunteers. In addition to the manager, the Natural Areas and Trails (NAT) Division of PRNR employs an operations team with a staff of six people to service NAT areas. Operations team responsibilities include, but are not limited to, fence installation and repair, gate installation and repair, invasive exotic plant management, assistance with prescribed fire, and fire-line preparation.

5.2 Optimal Staff

Optimal staffing would include a full-time land manager, a full-time parks naturalist, a full-time spray technician, and a full-time trades worker with continued support from the Division Operations and Maintenance Unit. Additional staffing needs exist for recreational activities, volunteer management, on-site security and maintenance, in-house invasive exotic plant control, and contractor oversight. As visitor use of the reserve increases, more staff will be needed to help manage impacts.

5.3 Agency and NGO Partners

Land management activities in the reserve routinely involve interagency and public coordination. Prescribed burns, invasive exotic plant control, and other major projects will continue to require careful coordination with adjoining public and private landowners, including Florida Park Service, SWFWMD, and City of North Port to ensure efficiency and, on occasion, to request assistance.

Coordinating partners include:

- Sarasota County Utilities;
- local fire departments and emergency services;
- Florida Forest Service;
- Florida Park Service;
- SWFWMD;
- City of North Port; and
- Myakka River Management Coordinating Council (Myakka River Council).

5.4 Volunteers

Supportive groups like Friends of the Carlton Reserve, under the supervision of PRNR, actively promote the reserve through public outreach, education, and volunteer opportunities. The Friends of the Carlton Reserve sponsor special events, promote responsible land stewardship, provide recreational

opportunities, and assist with management of the site. Activities include monitoring wildlife using trail cameras, helping to protect listed species, and assisting with site and trail maintenance.

The volunteer-managed trail camera program monitors areas of the reserve for occurrences of endangered species, like the Florida panther, or unusual occurrences of animals not normally seen in Sarasota County, like the Florida black bear. It also provides valuable management decision information for the Carlton Reserve Land Manager regarding habitat and wildlife population fluctuations. Photos from trail cameras are used in various publications, maps, kiosks, and articles to illustrate to the public what types of wildlife occur on Sarasota County's natural lands and to educate the public about the value of public lands in protecting and preserving wild places and wildlife.

5.5 Law Enforcement and Security

A security company is contracted to open and close the gates each day. Additional staffing is needed to resolve ongoing vandalism and theft.

5.6 Funding

Carlton Reserve is funded from the County's General Fund. Additional funding comes from the Utilities Department and the remaining funds in the Timber Fund. This was created in 2008 when a large amount of acreage received timber thinning for habitat restoration, and the proceeds were earmarked to be used for land management purposes.

5.7 Costs

The costs listed in the tables below are rough estimates taken from current actual expenditures in August 2020 (see Appendix F). In all but the 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. See Appendix F for the annualized cost schedule for NAT.

	ACTIVITY	ESTIMATED 10-YR COST
NATURAL RESOURCES	prescribed fire preparation	$275,000
	prescribed fire	$2,800,000
	prescribed fire monitoring	$10,000
	integrated pest management surveying	$600,000
	integrated pest management treatment	$1,250,000
	hydrologic restoration	$240,000
	mechanical vegetation management	$750,000
	TOTAL COSTS	**$3,067,400**

CULTURAL RESOURCES	interpretive	$4000
	monitoring	$3000
	restoration	$8,000
	TOTAL COSTS	**$15,000**
LAND USES	*Maintenance*	
	fencing – board	$10,150
	fencing – wire	$158,400
	trail markers	$3,200
	benches	$3,200
	tools	$40,000
	parking lots - aggregate material	$48,000
	parking lots - grass	$25,000
	road repairs	$1,200,000
	restrooms	$45,000
	portable toilets	$14,400
	grills	$1,000
	tables	$10,000
	pavilions	$24,000
	camp sites	$9,000
	grounds mowing	$120,000
	power washing	$16,000
	building maintenance	$60,000
	Recreation and Visitor Services	
	kiosks and signs - replacement costs	$10,000
	brochures	$12,000
	events (fire fest)	$35,000
	visitors center (staffing and contents)	$40,000
	camping	$12,000
	permitted events	$16,000
	TOTAL COSTS	**$921,150**
OPERATIONS	salary of land manager	$977,600
	salary of supervisor	$104,000
	salary of administrative assistant	$15,600
	office equipment	$20,000
	utilities	$30,000

	offices	$50,000
	security	$130,000
	fleet	$40,000
	TOTAL COSTS	**$1,367,200**

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)	ANNUAL TARGETS 2022	2024	2026	2028	2030
NATURAL RESOURCES	**GOAL 1**	**Restore and maintain native habitats and communities.**						
	OBJECTIVE 1.1	During 2020–2030, maintain the mean Florida Wildfire Hazard and Risk Assessment score at less than 50.						
	Action	Perform the Florida Wildfire Hazard and Risk Assessment for all management zones every August, prior to creating the next annual burn plan.	# management zones assessed	110	110	110	110	110
	Action	Prepare all Reserve boundary firelines annually; prepare interior firelines as required by annual burn plans.	# miles of firelines prepared	50	50	50	50	50
	Action	Implement mechanical vegetation reduction where necessary to reduce wildfire risk and enhance prescribed burning.	# acres of mechanical vegetation reduction	250	250	250	250	250
	Action	Treat each management zone with a combined area totaling 6,000–8,000 acres with prescribed fire each year.	Average # acres burned	7000	7000	7000	7000	7000
	OBJECTIVE 1.2	Annually, create a Burn Plan for management zones, based on the natural communities contained or potentially contained in each management zone.						

	Action	Burn freshwater wetlands adjacent to pyrogenic natural communities at natural frequencies.	# of acres of marsh or sloughs burned	1000	1000	1000	1000	1000
	Action	Update GIS data of management zones no less than annually with the following information for each management zone: the last burn date, elapsed time since last burn, and whether or not the elapsed time since last burn exceeds the optimal fire return interval for any natural community in that management zone.	GIS data updated annually	TBD	TBD	TBD	TBD	TBD
	Action	Treat management zones according to the annual Burn Plan, targeting mesic flatwoods and dry prairie communities in management zones, and allowing fire to spread naturally through adjacent natural communities, such as depression marshes, wet prairies, floodplain marshes, basin swamps and basin marshes.	Track and update burn plan strategies as management zones are treated	TBD	TBD	TBD	TBD	TBD
	OBJECTIVE 1.3	By 2030, burn 100 percent of dry prairies at 1–2-year intervals, with at least 50 percent of these burns occurring during the growing season.						
	Action	Prior to creating each annual Burn Plan, assess the last burn date for all management zones containing dry prairie and update GIS data with this information. Also assess the percent of dry prairie that has been burned during the growing season since 2020.	GIS data updated annually					

	Action	Develop the annual Burn Plan in a way that seeks to return fire to dry prairies at 1–2-year intervals and to burn dry prairies during the growing season. Burn Plans should prioritize burning management zones containing dry prairies that have not been burned during the past year.	% acres of dry prairie burned during growing season	25%	45%	55%	75%	100%
OBJECTIVE 1.4	By 2030, burn 100 percent of mesic flatwoods at 2–4-year intervals.							
	Action	Prior to creating each annual Burn Plan, assess the last burn date for all management zones containing mesic flatwoods and update GIS data with this information.	GIS data updated annually					
	Action	Develop the annual Burn Plan in a way that seeks to return fire to mesic flatwoods at 2–4-year intervals; prioritize the burning of management zones containing mesic flatwoods that have not been burned in the past three years.	% mesic flatwoods in appropriate fire interval	40%	60%	70%	80%	100%
	Action	Develop the annual Burn Plan to emphasize growing season burns in mesic flatwoods.	% acres of mesic flatwoods burned during growing season	40%	60%	70%	80%	100%
OBJECTIVE 1.5	By 2030, reduce invasive exotic plant abundance and extent by 50 percent using targeted, coordinated management.							
	Action	By 2022, identify and map priority invasive exotic plant species (“Priority Species”). Mapping should include percent plant abundance and extent.	GIS database and mapping completed	100%				

	Action	Collaborate with other land managers to conduct surveys of nearby managed lands to determine the extent of Priority Species distribution and geo-reference and map all known locations.	Schedule working group meetings to share data	2	2	2	2	2
	Action	Develop an Integrated Pest Management overall strategy plan.	IPM strategy plan created	100%				
	Action	Develop and implement regional Integrated Pest Management action plans and treatment schedules for Priority Species.	Annual IPM action plan created	100%				
	Action	Seek funding, as needed, to implement action plans.	Apply for state funding through the Upland Invasive Program					
	OBJECTIVE 1.6	During 2020–2030, reduce the feral hog population by 30 percent annually.						
	Action	Continue to employ contractors to remove a minimum of 800 feral hogs per year.	# feral hogs removed annually	800	850	900	950	1000
	Action	Implement additional feral hog removal activities to supplement contractor removal.	Employ USDA Wildlife Services to trap and/or shoot feral hogs on a part-time basis					
	OBJECTIVE 1.7	On an annual basis, create an action plan for monitoring endangered bromeliads						
	Action	Manage and support volunteer bromeliad monitoring program.	Provide volunteers with help and logistical support to continue monitoring and preservation efforts					
	OBJECTIVE 1.8	By 2030, restore the historic hydrologic regime in the reserve to the greatest amount feasible.						

	Action	Immediately following fires, geo-reference topographic alterations in burned areas that may be restored and create a map of these features by management zone. Features may include fire plow lines, drainage ditches, spoil mounds, and incised roads.	# areas identified and mapped annually	TBD	TBD	TBD	TBD	TBD
	Action	Evaluate and prioritize features identified in Action 1.8.1 according to their probable impact on hydrology.	# acres restored annually	TBD	TBD	TBD	TBD	TBD
CULTURAL RESOURCES	**GOAL 2**	**Protect, preserve, and maintain cultural resources.**						
	OBJECTIVE 2.1	By 2023, develop preservation and interpretive plans for two of the known historical sites (Farmstead Site, Windy Sawgrass Camp).						
	Action	By 2022, develop a prioritized Preservation and Interpretive Plan for the two historical sites.		100%				
	Action	Seek funding and implement the Preservation and Interpretive Plan by 2023.		50%	100%			
LAND USES	**GOAL 3**	**Maintain public access and passive recreational opportunities without adversely impacting native habitats and communities.**						
	OBJECTIVE 3.1	By 2021, highlight primitive camping opportunities on the County website and social media						
	Action	By 2021, include information regarding campsites in Reserve materials and promotions.	Brochure and website information updated to include camping information	100%				
	OBJECTIVE 3.2	By 2022, improve access and parking areas for canoe and mkayak launch.						
	Action	Improve driveway to launch and widen parking area.		100%				

OBJECTIVE 3.3	By 2022, create a Trail Plan that evaluates existing trails and travel ways and identifies those trails for restoration, upgrading, rerouting, modifying use restrictions, or closing.							
Action	Update the GIS trail data at least once per year.		1	1	1	1	1	
Action	Manage trail and road conditions for intended uses, including recreation, fire control, and utility access.							
OBJECTIVE 3.4	By 2024, relocate 20 percent of existing trails (including firelines, access, utility, and pedestrian trails) passing through wetlands or wetland ecotones ("Wetland Trails") to uplands.							
Action	Identify trails that pass-through wetlands or through wetland ecotones and assess the difficulty of relocating each trail in the trail plan.	# trails identified and mapped	10	20				
Action	Include Wetland Trail relocation in annual work plans and relocate trails.	% trails relocated	10	20				
GOAL 4	**Provide nature based educational and interpretive opportunities.**							
OBJECTIVE 4.1	By 2024, improve existing interpretive signs.							
Action	Assess and repair metal Novalloy signs on nature trails.	# of signs improved, repaired, or replaced	3	3				
Action	Update interpretive content in display kiosk and visitors center.	Interpretive display updated	2	6				
Action	Update parking lot kiosk if needed.	Kiosk updated	1					

	Action	Update all four Myakka Island Wilderness Trail kiosks by 2022.	Kiosks updated by 2022	4
	Action	Add Myakka Wild and Scenic River information at canoe launch by 2022.	Materials designed - brochure box or kiosk installed by 2022	1
OPERATIONS	**GOAL 5**	**Provide administrative and fiscal support.**		
	OBJECTIVE 5.1	By 2022, develop and maintain infrastructure and amenities.		
	Action	Maintain the GIS database of physical improvements and public use amenities.	Update information as needed	
	Action	Coordinate the early participation of principal stakeholders in the planning of any new Utilities Department infrastructure or Parks, Recreation & Natural Resources infrastructure.	Communicate on a regular basis with Utilities and PRNR staff on planning and development needs	
	Action	Annually identify infrastructure maintenance and development needs.	Inspect and document issues and submit service requests for needed repairs	
	Action	Coordinate with Utilities Department on wellfield maintenance.	Coordinate on annual Utilities budget with Utilities staff	
	Action	Provide input on Water Use Permit environmental monitoring of wellfield impacts.	Review WUP annual report	
	Action	Coordinate with Utilities Department on new well installations.	Coordinate as needed	

	Action	Coordinate with Utilities Department in phased removal of abandoned monitoring wells.	% wells removed per year	20%	40%	60%	80%	100%
	GOAL 6	**Manage and support volunteer program.**						
	OBJECTIVE 6.1	Provide opportunities for volunteers to support operations and natural systems.						
	Action	Support and schedule volunteer participation in operations, wildlife monitoring, and natural systems management.	Schedule regular volunteer workdays and Friends of Carlton Reserve meetings					
	Action	Recruit volunteers for specific reserve needs (invasive species, trail camera program, resource monitoring, and restoration).	Advertise specific job descriptions in County volunteer program					

7 REFERENCES

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Belden, RC and WB Frankenberger. 1977. Management of feral hogs in Florida—past, present, and future. Pp 5–10 in: GW Wood (ed.) *Research and management of wild hog populations: Proceedings of a symposium*. Georgetown, SC, USA.

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Duerr, AD and RM Wolansky. 1986. *Hydrogeology of the surficial and intermediate aquifers of central Sarasota County, Florida*. USGS Survey Water Resources Investigations Report 86-4068. 48 pp.

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FNAI (Florida Natural Areas Inventory). 2010. *Guide to the natural communities of Florida: 2010 edition*. Florida Natural Areas Inventory, Tallahassee, FL. 278 pp.

Jones, C. 1978. *Annual progress report of the cooperative agreement between the Florida Department of Transportation and the Division of Archives, History, and Records Management Florida Department of State.*

Newman, C, P Vojnovski, and B Swann. 2002. *Ticky Cattle Make Inferior Beef-Recording Cattle Sites in Florida*. Manuscript on file at the Sarasota County History Center.

8 EXHIBITS

EXHIBIT 1 – LOCATION MAP

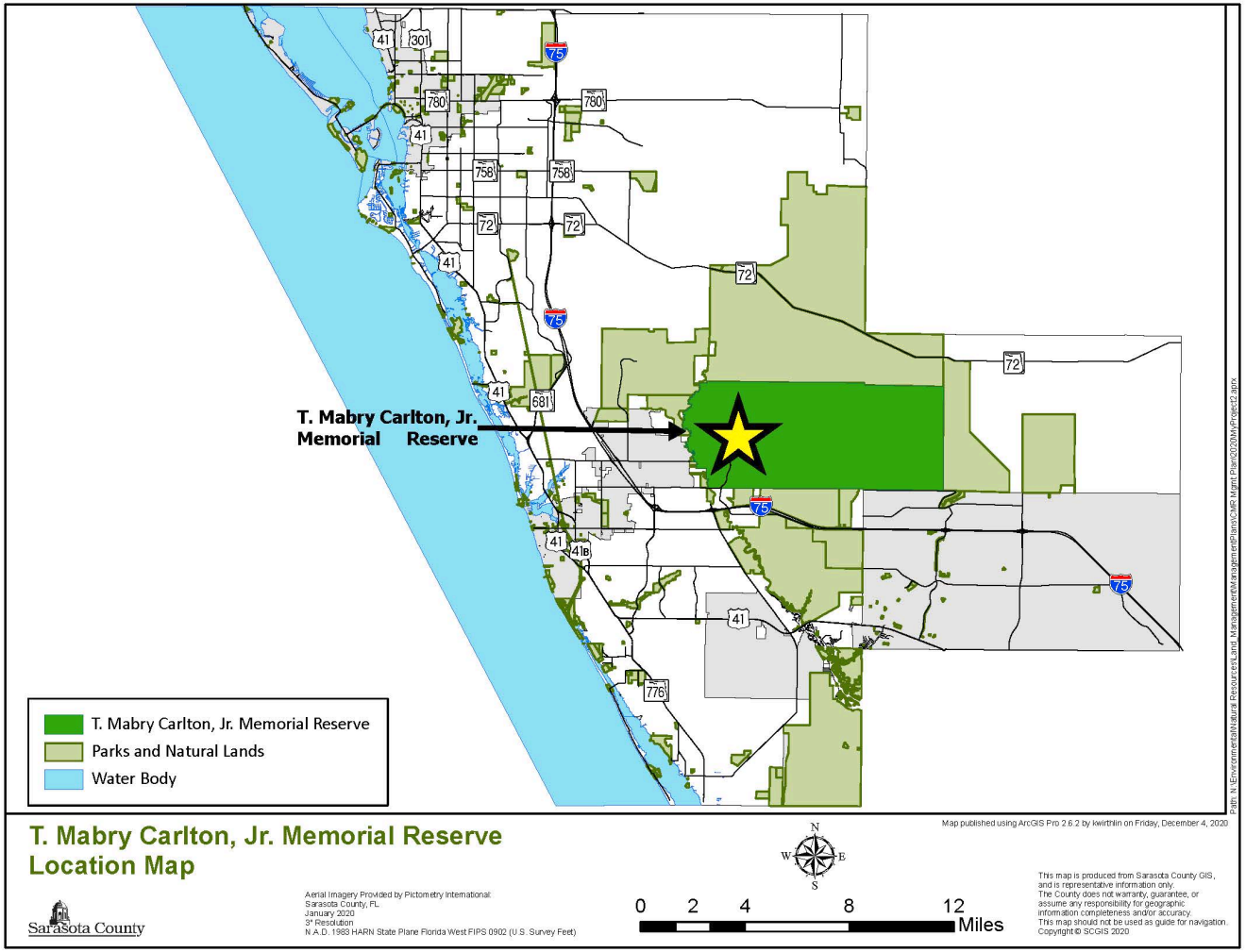


EXHIBIT 2 – RESERVE BOUNDARY

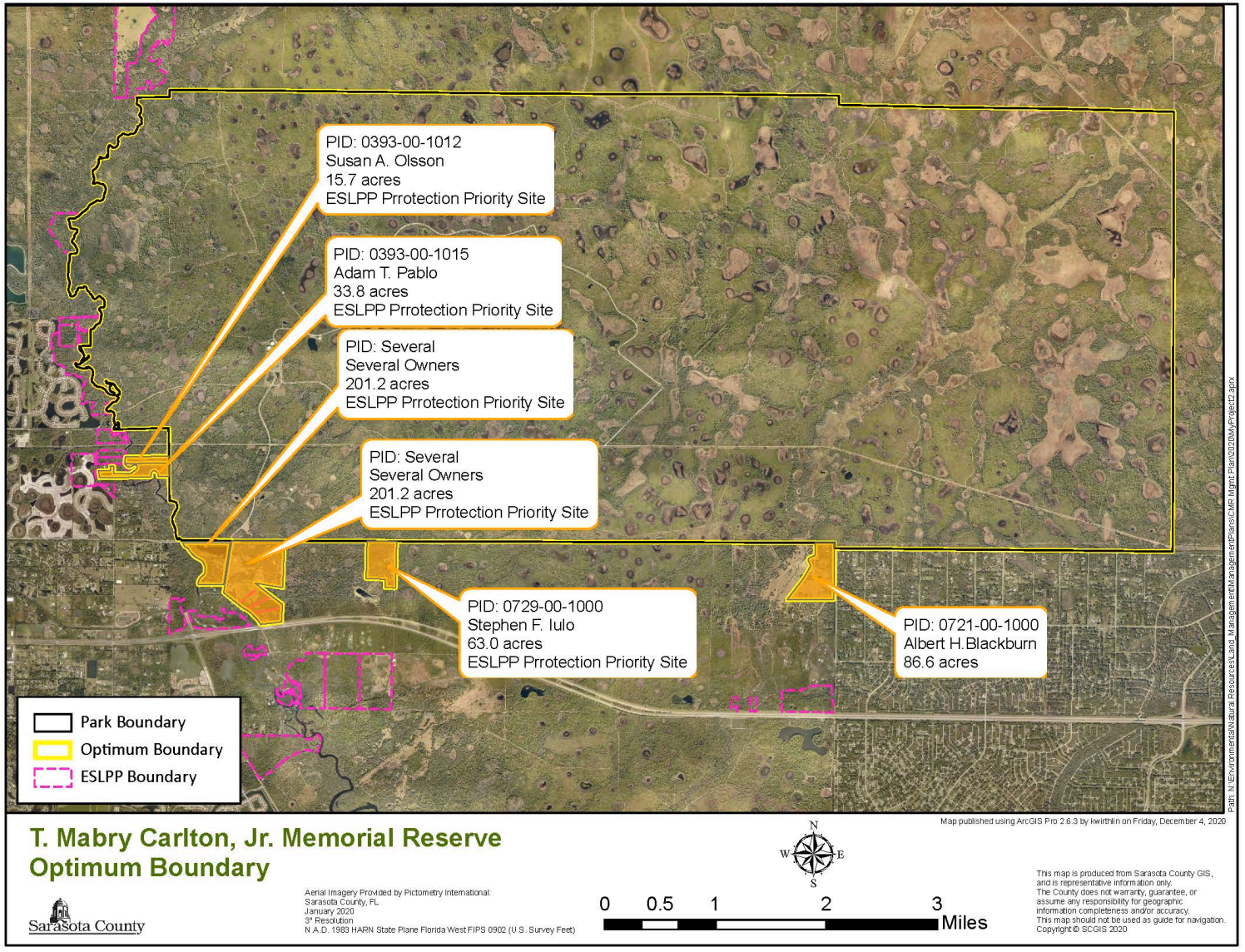


EXHIBIT 3 – ZONING MAP

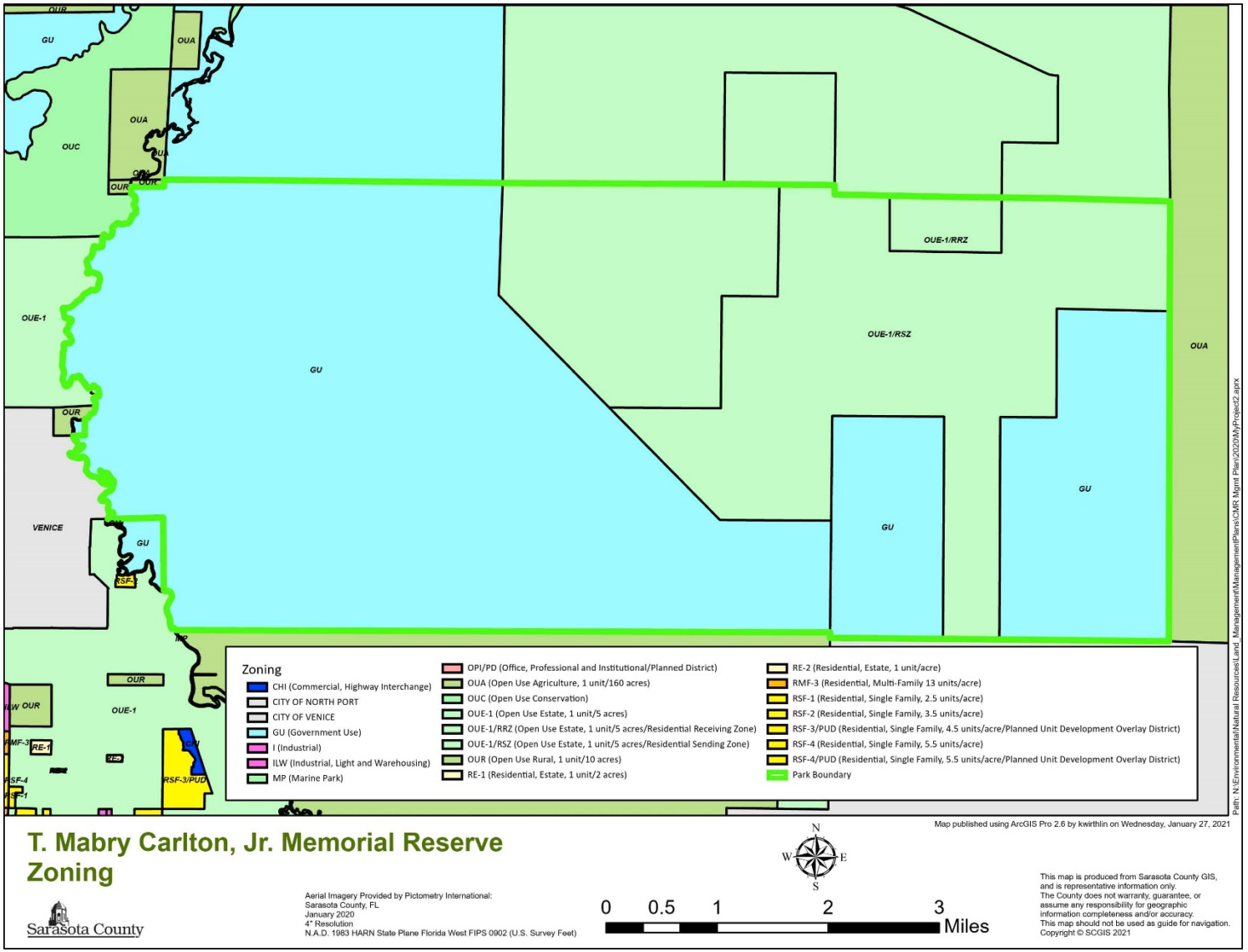


EXHIBIT 4 – ELEVATION MAP

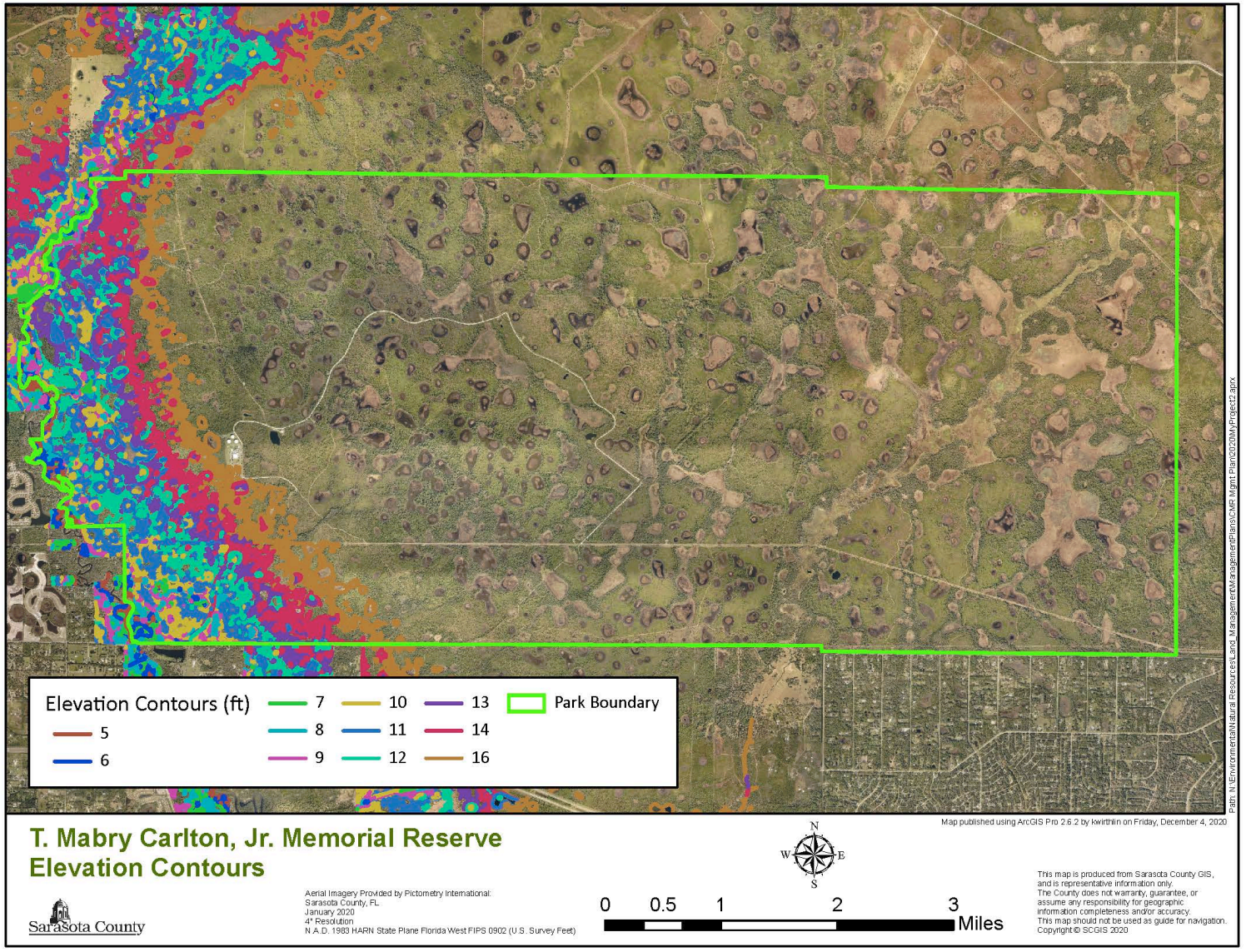


EXHIBIT 5 – SOILS MAP

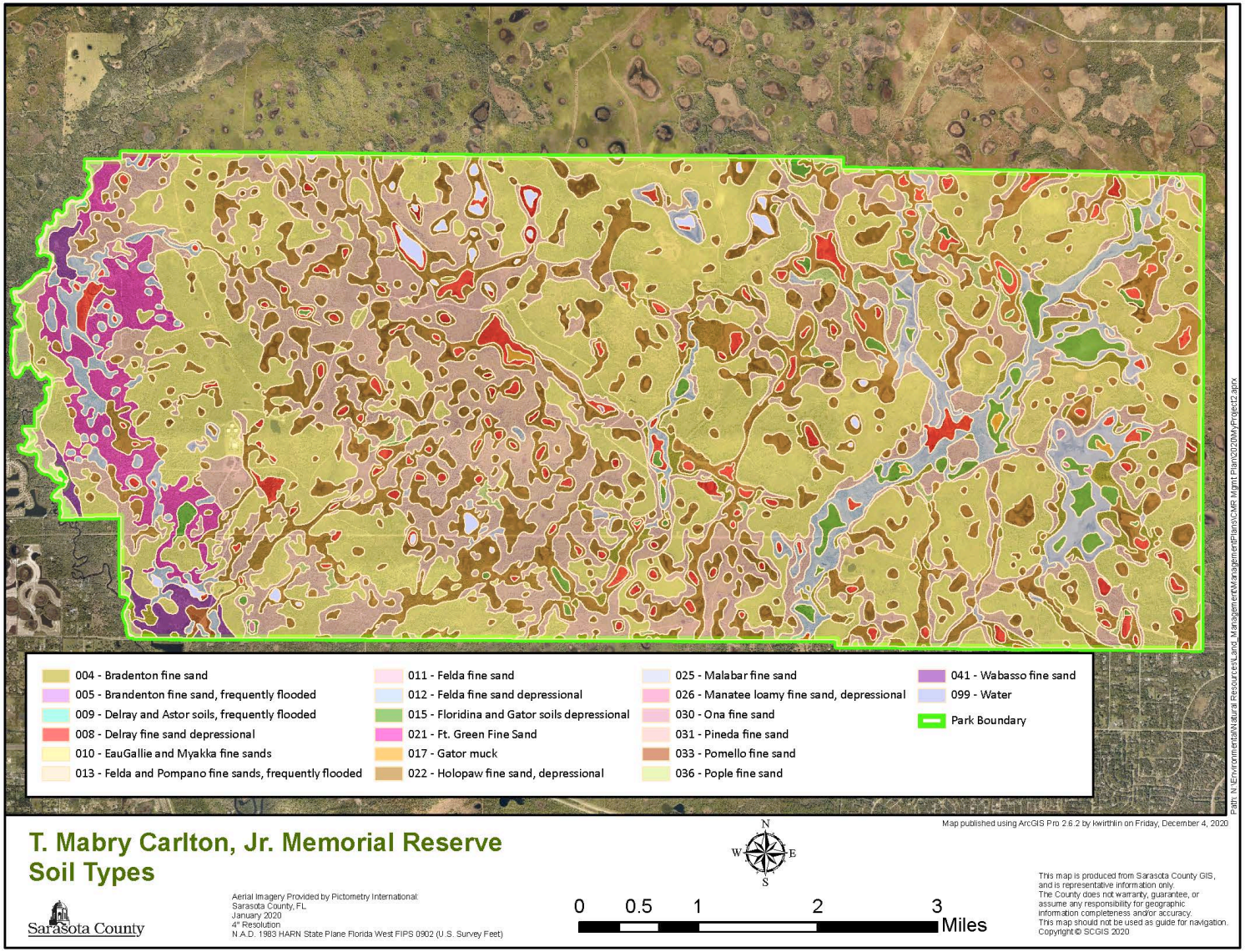


EXHIBIT 6 – FLOOD MAP

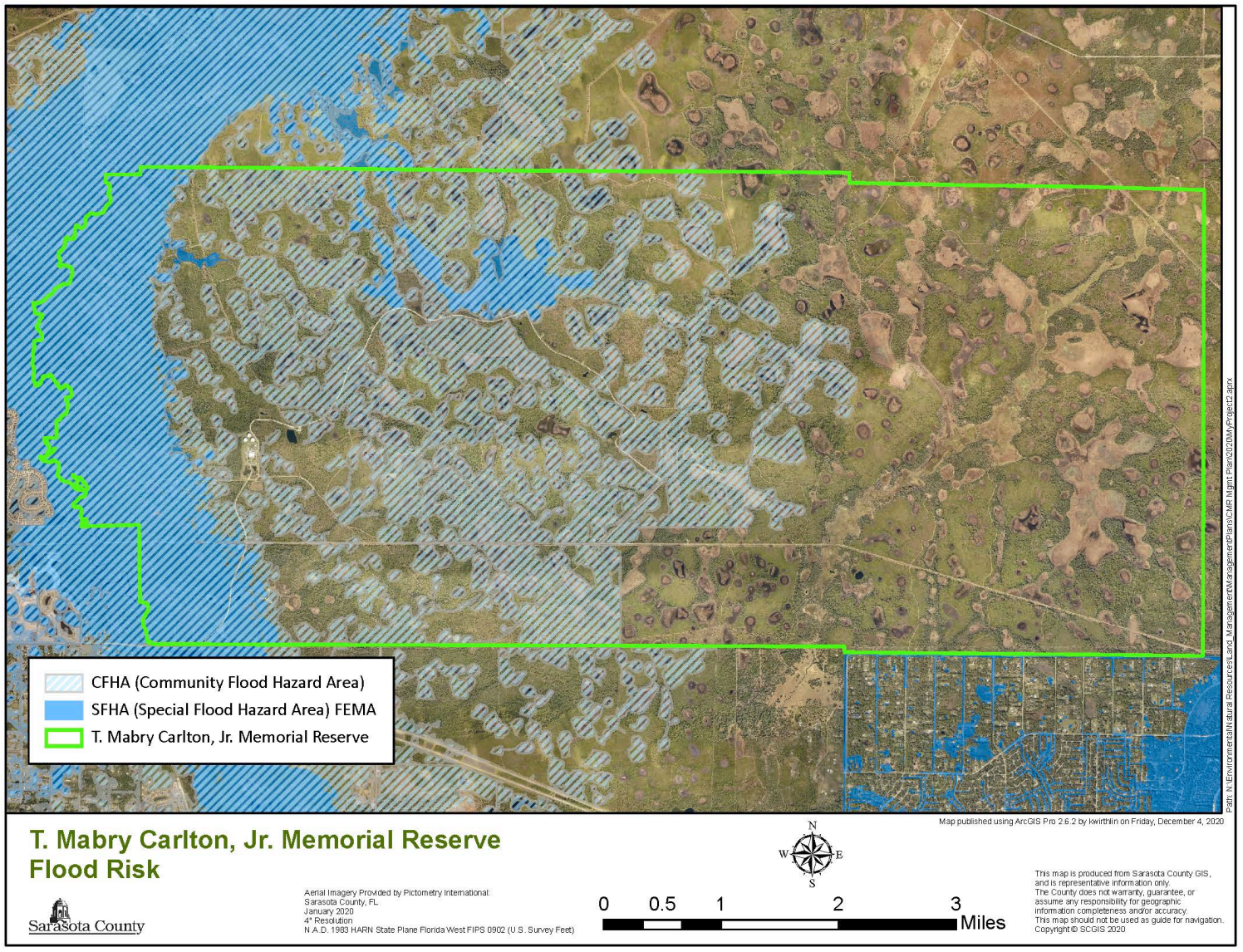


EXHIBIT 7A – HABITAT MAP

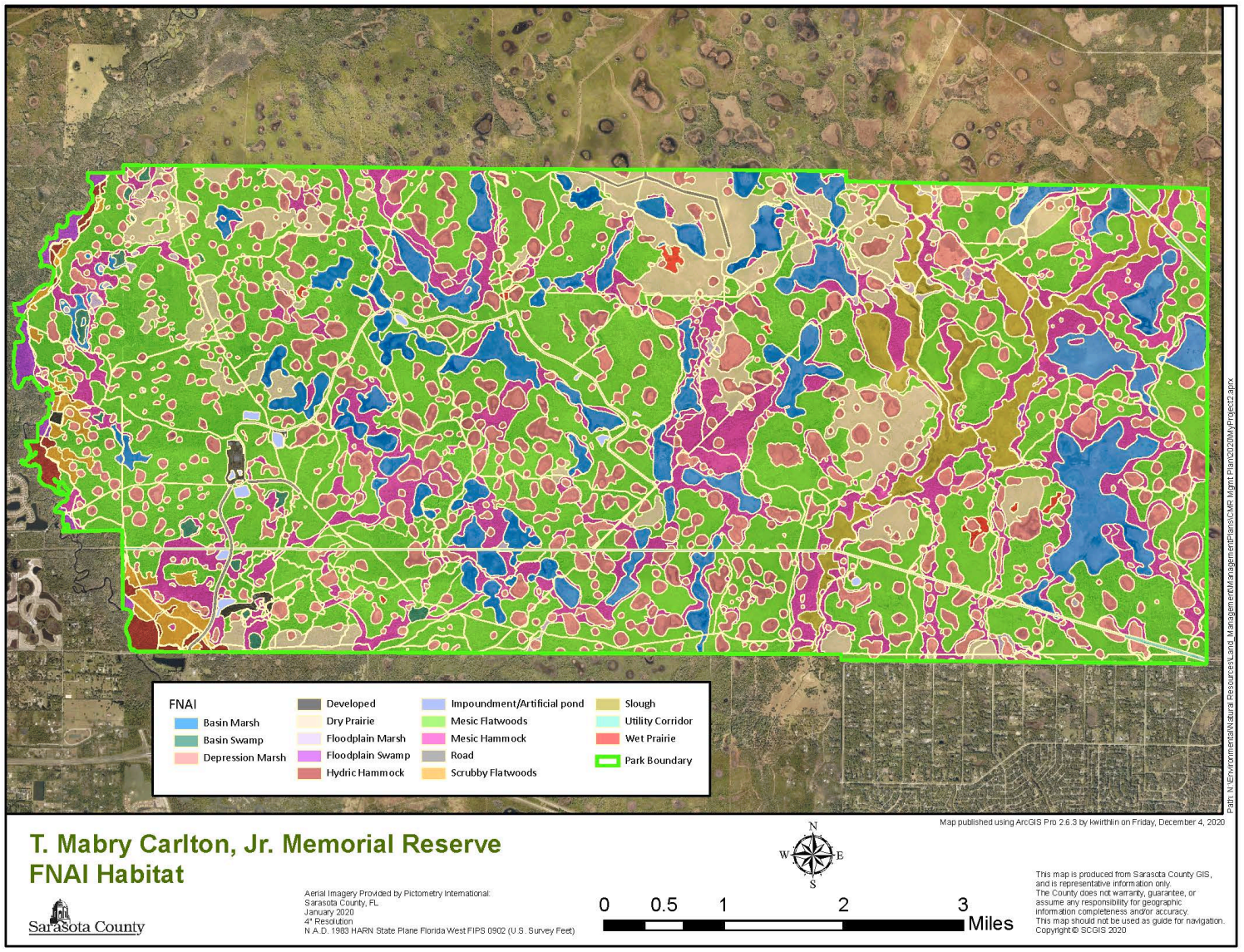


EXHIBIT 7B – HISTORICAL AERIAL

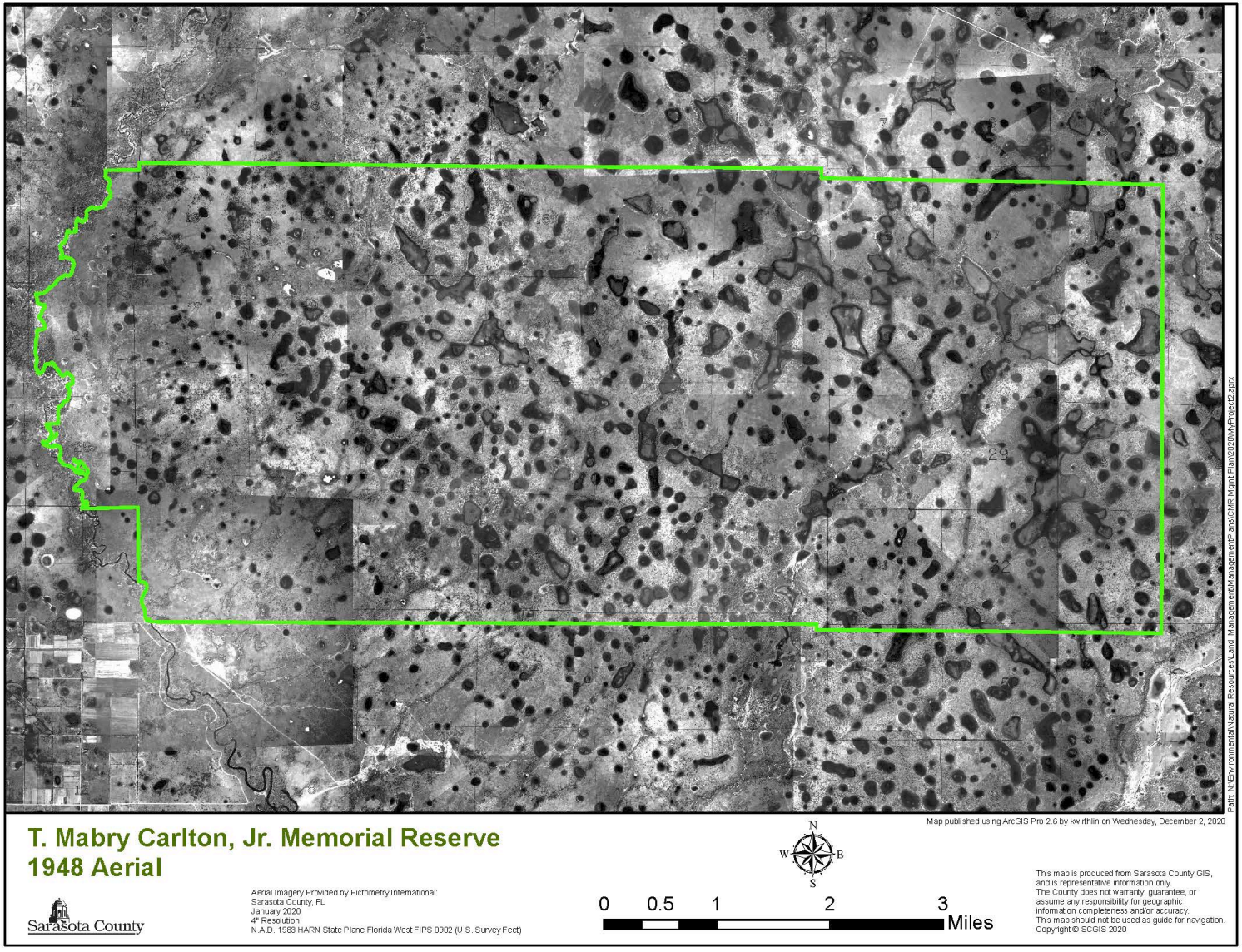
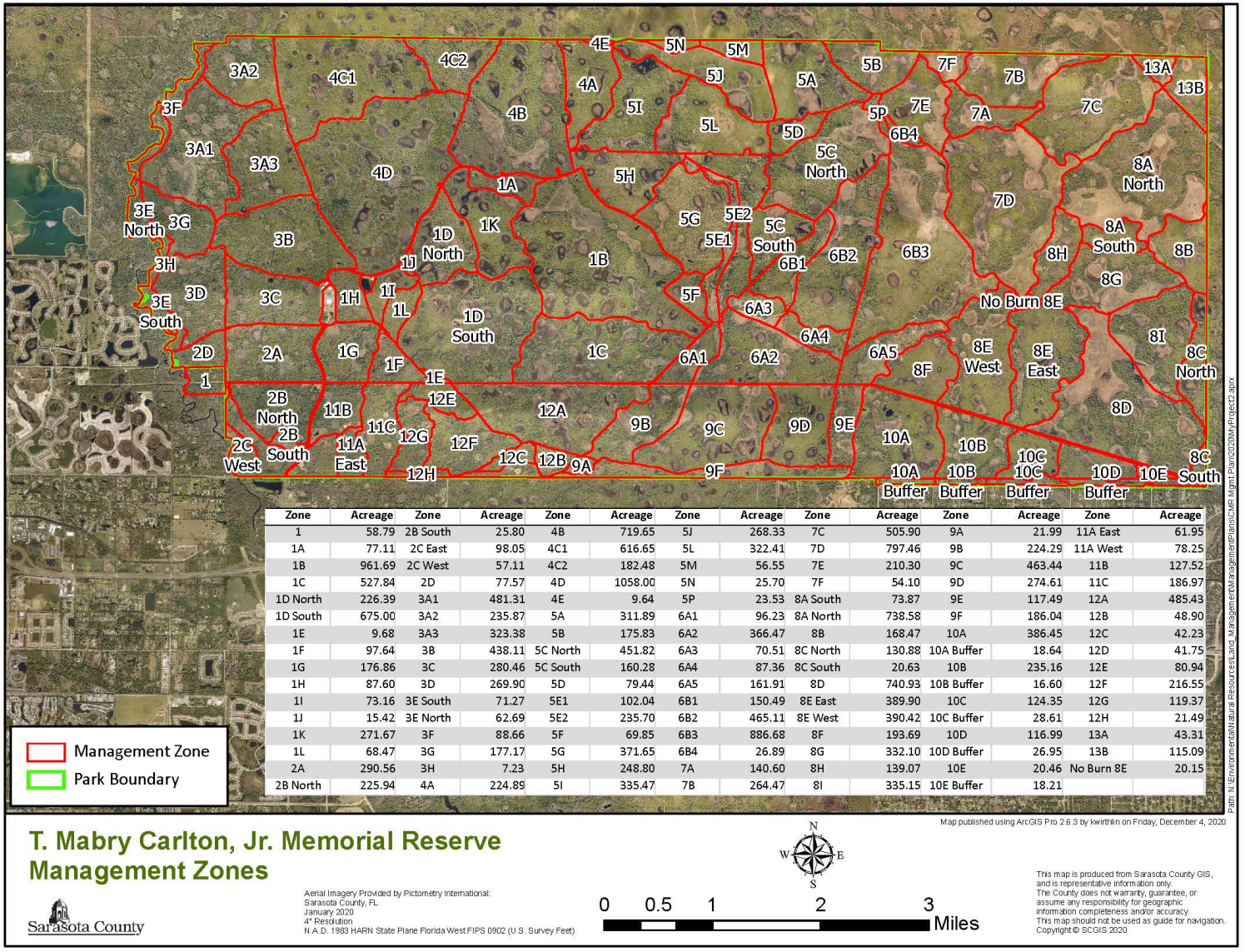


EXHIBIT 8 – MANAGEMENT ZONE MAP



Zone	Acreage	Zone	Acreage	Zone	Acreage	Zone	Acreage	Zone	Acreage	Zone	Acreage	Zone	Acreage
1	58.79	2B South	25.80	4B	719.65	5J	268.33	7C	505.90	9A	21.99	11A East	61.95
1A	77.11	2C East	98.05	4C1	616.65	5L	322.41	7D	797.46	9B	224.29	11A West	78.25
1B	961.69	2C West	57.11	4C2	182.48	5M	56.55	7E	210.30	9C	463.44	11B	127.52
1C	527.84	2D	77.57	4D	1058.00	5N	25.70	7F	54.10	9D	274.61	11C	186.97
1D North	226.39	3A1	481.31	4E	9.64	5P	23.53	8A South	73.87	9E	117.49	12A	485.43
1D South	675.00	3A2	235.87	5A	311.89	6A1	96.23	8A North	738.58	9F	186.04	12B	48.90
1E	9.68	3A3	323.38	5B	175.83	6A2	366.47	8B	168.47	10A	386.45	12C	42.23
1F	97.64	3B	438.11	5C North	451.82	6A3	70.51	8C North	130.88	10A Buffer	18.64	12D	41.75
1G	176.86	3C	280.46	5C South	160.28	6A4	87.36	8C South	20.63	10B	235.16	12E	80.94
1H	87.60	3D	269.90	5D	79.44	6A5	161.91	8D	740.93	10B Buffer	16.60	12F	216.55
1I	73.16	3E South	71.27	5E1	102.04	6B1	150.49	8E East	389.90	10C	124.35	12G	119.37
1J	15.42	3E North	62.69	5E2	235.70	6B2	465.11	8E West	390.42	10C Buffer	28.61	12H	21.49
1K	271.67	3F	88.66	5F	69.85	6B3	886.68	8F	193.69	10D	116.99	13A	43.31
1L	68.47	3G	177.17	5G	371.65	6B4	26.89	8G	332.10	10D Buffer	26.95	13B	115.09
2A	290.56	3H	7.23	5H	248.80	7A	140.60	8H	139.07	10E	20.46	No Burn 8E	20.15
2B North	225.94	4A	224.89	5I	335.47	7B	264.47	8I	335.15	10E Buffer	18.21		

EXHIBIT 9 – IPM ROTATION MAP

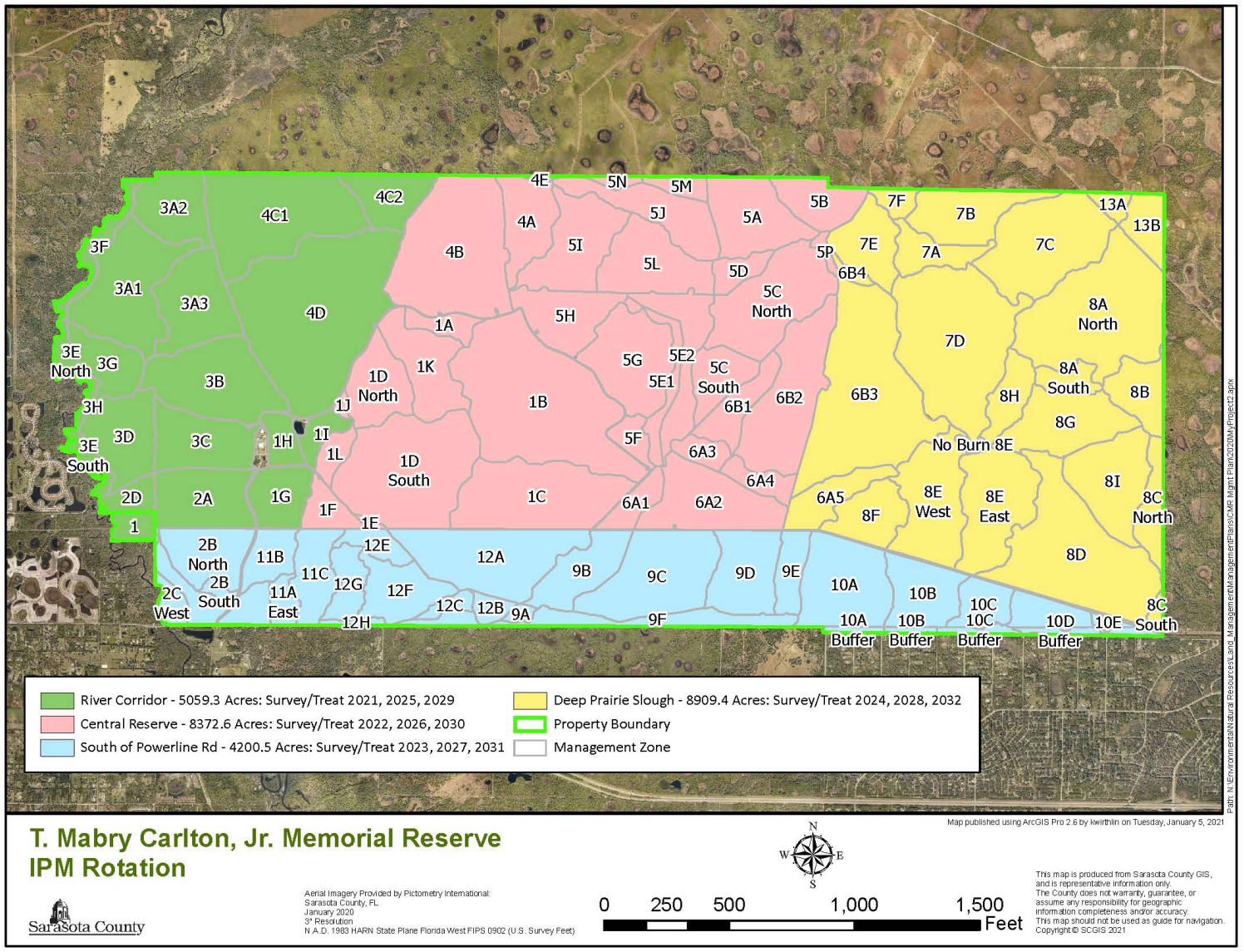
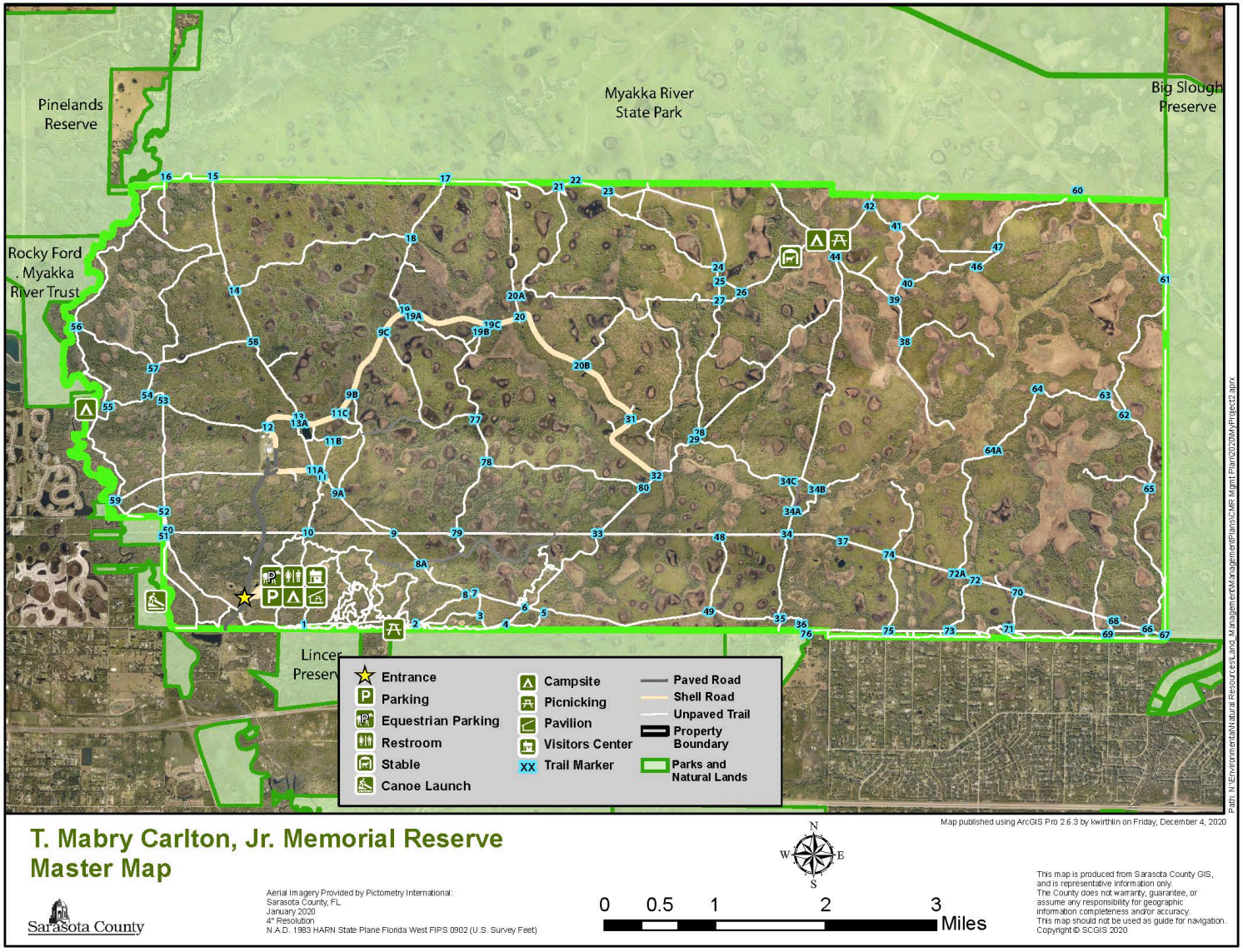


EXHIBIT 10 – FACILITIES, IMPROVEMENTS AND PUBLIC ACCESS AMENITIES MAP



9 APPENDICES

APPENDIX A – ACQUISITION DOCUMENTS

Deeds of Sale

1. Purchase Date 2/22/1983
   16,074 acres
   Document can be accessed and viewed via Smartsheet.
2. Purchase Date 6/27/1989
   8,238 acres
   Document can be accessed and viewed via Smartsheet.
3. Purchase Date 4/28/1994
   253 acres
   https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=94053155
4. Purchase Date 6/12/2007
   67 acres
   https://secure.sarasotaclerk.com/viewtiff.aspx?intrnum=2007095031

APPENDIX B – LAND USE AGREEMENTS AND EASEMENTS

Peace River/Manasota Regional Water Supply Authority-Pipeline Easements
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=1999163584
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=2015018465
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=2015018534
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=2015018462
https://secure.sarasotaclerk.com/viewTiff.aspx?intrnum=2015018466

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. 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

3. Ordinance No. 82-94: Adopted 1982, to utilize 50 percent of the $0.01 sale tax increase and authorize general obligation bonds up to $30,000,000, for acquisition of the Ringling-McArthur Tract as a potable water supply source and for recreational and open space.

4. Resolution No. 82-200: Adopted 1982, to commit protection and conservation of the Ringling-McArthur Tract in an environmental sensitive manner while securing a viable water supply for Sarasota County. Water supply will not be exported out of Sarasota County, nor will it stimulate growth outside of purview of the Board.

5. 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_CH54ENNARE_ARTXIXEXPL

6. 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_CH90PAREPULA_ARTIIUSPABEPULA

7. Ordinance No. 2011-077: Adopted 14 December 2011, amending Ord 2008-002 to consolidate the existing ordinances that protect the Myakka River into the Myakka River Protection Code with allowance for variances.
   https://library.municode.com/fl/sarasota_county/codes/code_of_ordinances?nodeId=PTIICOOR_CH54ENNARE_ARTXXXIIIMYRIPRCO

8. Myakka Wild and Scenic Management Plan (2011) for the management, administration, and protection of the designated segment of the Myakka River.
   http://www.myakkarivermanagement.org/MRWSMP.html

APPENDIX D – LIST OF PLANT SPECIES

The preliminary plant list has been compiled for the reserve as a partial listing of currently 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	*Dyschoriste oblongifolia*	oblongleaf twinflower	
Acanthaceae	*Justicia angusta*	pineland water willow	
Acanthaceae	*Justicia ovata*	looseflower water willow	
Acanthaceae	*Ruellia caroliniana*	wild petunia	
Aceraceae	*Acer rubrum*	red maple	
Alismataceae	*Sagittaria graminea*	Arrowhead	
Alismataceae	*Sagittaria lancifolia*	bulltongue arrowhead	
Alismataceae	*Sagittaria latifolia*	duck potato	
Alismataceae	*Sagittaria subulata*	awl leaf arrowhead	
Amaranthaceae	*Alternanthera philoxeroides*	alligator-weed	non-native
Amaranthaceae	*Alternanthera spp.*	joyweeds	
Amaranthaceae	*Amaranthus spinosus*	spiny amaranth	
Amaranthaceae	*Gomphrena serrata*	globe amaranth	
Amaranthaceae	*Iresine diffusa*	Juba's bush	
Amaryllidaceae	*Crinum americanum*	string lily; swamp lily	
Amaryllidaceae	*Hymenocallis crassifolia*	coastal plain spider lily	
Amaryllidaceae	*Hymenocallis palmeri*	alligator lily	
Amaryllidaceae	*Zephyranthes simpsonii*	Simpson's zephyrlily	T (FDACS)
Anacardiaceae	*Rhus copallina*	winged sumac; shining sumac	
Anacardiaceae	*Toxicodendron radicans*	poison ivy	
Anacardiaceae	*Schinus terebinthifolius*	Brazilian peppertree	non-native
Annonaceae	*Asimina reticulata*	netted pawpaw	
Apiaceae	*Centella asiatica*	coinwort	
Apiaceae	*Cicuta maculata*	spotted water hemlock	
Apiaceae	*Eryngium aromaticum*	fragrant eryngo	
Apiaceae	*Eryngium baldwinii*	Balwin's eryngo	
Apiaceae	*Eryngium yuccifolium*	button rattlesnakemaster	
Apiaceae	*Hydrocotyle bonariensis*	large leafed marsh pennywort	
Apiaceae	*Hydrocotyle umbellata*	manyflowered marsh pennywort	
Apiaceae	*Ptilimnium capillaceum*	mock bishop's-weed	
Apiaceae	*Tiedemannia filiformis*	water cowbane	
Aquifoliaceae	*Ilex cassine*	dahoon holly	

Aquifoliaceae	*Ilex glabra*	gallberry; inkberry	
Aquifoliaceae	*Ilex vomitoria*	yaupon holly	
Araceae	*Peltandra virginica*	green arum	
Araceae	*Pistia stratiotes*	water-lettuce	non-native
Arecaceae	*Sabal palmetto*	cabbage palm; sabal palm	
Arecaceae	*Serenoa repens*	saw palmetto	
Asclepiadaceae	*Asclepias feayi*	Florida milkweed(endemic)	
Asclepiadaceae	*Asclepias incarnata*	swamp milkweed	
Asclepiadaceae	*Asclepias lanceolata*	fewflower milkweed	
Asclepiadaceae	*Asclepias pedicellata*	pedicellate milkweed, savannah milkweed	
Asclepiadaceae	*Asclepias perennis*	aquatic milkweed	
Asclepiadaceae	*Asclepias tuberosa*	butterfly milkweed	
Asclepiadaceae	*Funastrum clausum*	white twinevine	
Asclepiadaceae	*Gonolobus suberosa*	angularfruit milkvine; angle pod	T (FDACS)
Aspidiaceae	*Thelypteris interrupta*	swamp shield fern	
Aspidiaceae	*Thelypteris kunthii*	southern shield fern	
Asteraceae	*Sonchus oleraceus*	common sow thistle	non-native
Asteraceae	*Ageratina jucunda*	hammock snakeroot	
Asteraceae	*Ambrosia artemisiifolia*	common ragweed	
Asteraceae	*Arnoglossum ovatum*	indian plantain	
Asteraceae	*Baccharis glomeruliflora*	silverling	
Asteraceae	*Baccharis halimifolia*	groundsel tree; sea myrtle	
Asteraceae	*Bidens alba* var. *radiata*	Spanish needles	
Asteraceae	*Bidens laevis*	burmarigold	
Asteraceae	*Bidens mitis*	begger-ticks	
Asteraceae	*Bigelowia nudata*	rayless goldenrod	
Asteraceae	*Boltonia diffusa*	doll's daisy	
Asteraceae	*Carphephorus corymbosus*	Florida paintbrush	
Asteraceae	*Carphephorus odoratissimus*	vanilla plant	
Asteraceae	*Chaptalia tomentosa*	pineland daisy	
Asteraceae	*Chrysopsis mariana*	goldenaster	
Asteraceae	*Cirsium horridulum*	horrid thistle	
Asteraceae	*Cirsium nuttallii*	bull thistle	
Asteraceae	*Conoclinium coelestinum*	mistflower	
Asteraceae	*Conyza canadensis* var. *pusilla*	dwarf horseweed	
Asteraceae	*Coreopsis floridana*	Florida tickseed; coreopsis	
Asteraceae	*Coreopsis leavenworthii*	Leavenworth's tickseed; coreopsis	
Asteraceae	*Eclipta prostrata*	false daisy	
Asteraceae	*Elephantopus elatus*	Florida elephant's-foot	
Asteraceae	*Erechtites hieracifolia*	fireweed	

Asteraceae	*Erigeron quercifolius*	southern fleabane	
Asteraceae	*Erigeron vernus*	fleabane	
Asteraceae	*Eupatorium capillifolium*	dog fennel	
Asteraceae	*Eupatorium leptophyllum*	falsefennel	
Asteraceae	*Eupatorium mikanioides*	semaphore eupatorium	
Asteraceae	*Eupatorium mohrii*	boneset; Mohr's thoroughwort	
Asteraceae	*Eupatorium rotundifolium*	roundleaf thoroughwort; false hoarhound	
Asteraceae	*Euthamia caroliniana*	flat-topped goldenrod	
Asteraceae	*Flaveria linearis*	yellowtop	
Asteraceae	*Gnaphalium obtusifolium*	cudweed	
Asteraceae	*Helenium amarum*	Spanish daisy; bitterweed	
Asteraceae	*Helenium pinnatifidum*	Southeastern sneezeweed	
Asteraceae	*Helianthus agrestis*	southeastern sunflower	
Asteraceae	*Helianthus angustifolius*	narrowleaf sunflower; swamp sunflower	
Asteraceae	*Heterotheca subaxillaris*	camphorweed	
Asteraceae	*Hieracium gronovii*	queen devil; hawkweed	
Asteraceae	*Iva microcephala*	piedmont marshelder	
Asteraceae	*Liatris garberi*	Garber’s gayfeather	
Asteraceae	*Liatris savannensis*	Savanna gayfeather (endemic)	
Asteraceae	*Liatris tenuifolia*	Shortleaf gayfeather	
Asteraceae	*Lygodesmia aphylla*	roserush	
Asteraceae	*Melanthera nivea*	snow squarestem	
Asteraceae	*Mikania cordifolia*	Florida Keys hempvine	
Asteraceae	*Mikania scandens*	climbing hempvine	
Asteraceae	*Oclemena reticulata*	whitetop aster; pine barren aster	
Asteraceae	*Packera glabellus*	butterweed; golden ragwort	
Asteraceae	*Pityopsis graminifolia*	narrowleaf silk aster; narrowleaf silkgrass	
Asteraceae	*Pluchea baccharis*	rosy camphorweed	
Asteraceae	*Pluchea foetida*	stinking camphorweed	
Asteraceae	*Pluchea odorata*	sweetscent	
Asteraceae	*Pterocaulon pycnostachyum*	blackroot	
Asteraceae	*Rudbeckia hirta*	black-eyed Susan	
Asteraceae	*Sericocarpus tortifolius*	whitetop aster; dixie aster	
Asteraceae	*Solidago fistulosa*	pinebarren goldenrod	
Asteraceae	*Solidago odora var. chapmanii*	Chapman's goldenrod	
Asteraceae	*Solidago stricta*	wand goldenrod	
Asteraceae	*Solidago tortifolia*	twistedleaf goldenrod	
Asteraceae	*Symphyotrichum adnatum*	scaleleaf aster	

Asteraceae	*Symphyotrichum carolinianum*	climbing aster	
Asteraceae	*Symphyotrichum dumosum*	rice button aster	
Asteraceae	*Verbesina virginica*	frostweed	
Asteraceae	*Vernonia blodgettii*	Florida ironweed; Blodgett's ironweed	
Bignoniaceae	*Campsis radicans*	trumpet creeper	
Blechnaceae	*Blechnum serrulatum*	swamp fern	
Blechnaceae	*Woodwardia virginica*	Virginia chain fern	
Boraginaceae	*Heliotropium polyphyllum*	pineland heliotrope	
Brassicaceae	*Cardamine spp*.	bittercress	
Brassicaceae	*Rorippa teres*	southern marsh yellowcress	
Bromeliaceae	*Tillandsia balbisiana*	reflexed wild pine; northern needleaf	T (FDACS)
Bromeliaceae	*Tillandsia bartramii*	Bartram's air plant	
Bromeliaceae	*Tillandsia fasciculata*	cardinal air plant	E (FDACS)
Bromeliaceae	*Tillandsia recurvata*	ball moss	
Bromeliaceae	*Tillandsia setacea*	grass-leaved air plant	
Bromeliaceae	*Tillandsia simulata*	Florida air plant	
Bromeliaceae	*Tillandsia usneoides*	Spanish moss	
Bromeliaceae	*Tillandsia utriculata*	giant air plant; giant wild pine	E (FDACS)
Cactaceae	*Opuntia austrina*	Eastern prickly pear; devil's-tongue	
Campanulaceae	*Campanula floridana*	Florida bellflower	
Campanulaceae	*Lobelia feayana*	bay lobelia	
Campanulaceae	*Lobelia glandulosa*	glade lobelia	
Campanulaceae	*Lobelia homophylla*	pineland lobelia (endemic)	
Campanulaceae	*Lobelia paludosa*	white lobelia	
Campanulaceae	*Triodanis perfoliata*	clasping Venus' looking-glass	
Cannaceae	*Canna flaccida*	golden canna	
Caprifoliaceae	*Sambucus canadensis*	elderberry	
Caprifoliaceae	*Viburnum obovatum*	Walter's viburnum; small-leaf viburnum	
Caryophyllaceae	*Drymaria cordata*	West Indian chickweed	
Caryophyllaceae	*Stipulicida setacea*	wire plant	
Ceratophyllaceae	*Ceratophyllum spp*.	hornwort	
Chenopodiaceae	*Chenopodium ambrosioides*	Mexican tea	
Chrysobalanaceae	*Geobalanus oblongifolius*	gopher apple	
Commelinaceae	*Callisia ornata*	Florida scrub roseling (endemic)	
Commelinaceae	*Commelina diffusa*	common dayflower	
Commelinaceae	*Commelina erecta*	whitemouth dayflower	
Commelinaceae	*Murdannia nudiflora*	naked stem dewflower	non-native
Convolvulaceae	*Dichondra caroliniensis*	pony-foot	

Convolvulaceae	*Evolvulus sericeus*	silver dwarf morning-glory	
Convolvulaceae	*Ipomoea sagittata*	saltmarsh morning-glory; glades morning-glory	
Cornaceae	*Cornus foemina*	swamp dogwood	
Cucurbitaceae	*Melothria pendula*	creeping cucumber	
Cycadaceae	*Zamia integrifolia*	Florida arrowroot; coontie	
Cyperaceae	*Bulbostylis ciliatifolia*	capillary hairsedge	
Cyperaceae	*Bulbostylis stenophylla*	sandyfield hairsedge	
Cyperaceae	*Carex albolutescens*	greenwhite sedge	
Cyperaceae	*Carex lupulina*	hop sedge	
Cyperaceae	*Cladium jamaicense*	sawgrass	
Cyperaceae	*Cyperus articulatus*	jointed flatsedge; nutgrass	
Cyperaceae	*Cyperus blepharoleptos*	Cuban bulrush	non-native
Cyperaceae	*Cyperus compressus*	poorland flatsedge; nutgrass	
Cyperaceae	*Cyperus croceus*	Baldwin's flatsedge; nutgrass	
Cyperaceae	*Cyperus distinctus*	swamp flatsedge; nutgrass	
Cyperaceae	*Cyperus erythrorhizos*	redroot flatsedge; nutgrass	
Cyperaceae	*Cyperus haspan*	Haspan flatsedge; nutgrass	
Cyperaceae	*Cyperus neotropicalis*	American halfchaff sedge	
Cyperaceae	*Cyperus odoratus*	fragrant flatsedge; nutgrass	
Cyperaceae	*Cyperus ovatus*	pinebarren flatsedge; nutgrass	
Cyperaceae	*Cyperus polystachyos*	manyspike flatsedge; nutgrass	
Cyperaceae	*Cyperus strigosus*	strawcolored flatsedge; nutgrass	
Cyperaceae	*Cyperus surinamensis*	tropical flatsedge; nutgrass	
Cyperaceae	*Eleocharis baldwinii*	Baldwin's spikerush; roadgrass	
Cyperaceae	*Eleocharis cellulosa*	gulf coast spikerush	
Cyperaceae	*Eleocharis elongata*	slim spikerush	
Cyperaceae	*Eleocharis equisetoides*	jointed spikerush	
Cyperaceae	*Eleocharis fallax*	creeping spikerush	
Cyperaceae	*Eleocharis interstincta*	knotted spikerush	
Cyperaceae	*Eleocharis vivipara*	viviparous spikerush	
Cyperaceae	*Fimbristylis annua*	forked fimbry	
Cyperaceae	*Fimbristylis puberula*	hairy fimbry	
Cyperaceae	*Fuirena pumila*	umbrellagrass	
Cyperaceae	*Fuirena scirpoidea*	southern umbrellasedge	
Cyperaceae	*Rhynchospora cephalantha*	bunched beaksedge	
Cyperaceae	*Rhynchospora colorata*	starrush whitetop	
Cyperaceae	*Rhynchospora corniculata*	shortbristle horned beaksedge	
Cyperaceae	*Rhynchospora fascicularis*	fascicled beaksedge	
Cyperaceae	*Rhynchospora filifolia*	threadleaf beaksedge	
Cyperaceae	*Rhynchospora inundata*	narrowfruit horned beaksedge	

Cyperaceae	*Rhynchospora latifolia*	giant whitetop; sandswamp whitetop	
Cyperaceae	*Rhynchospora microcarpa*	southern beaksedge	
Cyperaceae	*Rhynchospora miliacea*	millet beaksedge	
Cyperaceae	*Rhynchospora nitens*	shortbeak beaksedge; baldrush	
Cyperaceae	*Rhynchospora plumosa*	plumed beaksedge	
Cyperaceae	*Rhynchospora pusilla*	fairy beaksedge	
Cyperaceae	*Rhynchospora tracyi*	Tracy's beaksedge	
Cyperaceae	*Schoenoplectus americanus*	American bulrush	
Cyperaceae	*Schoenoplectus tabernaemontani*	softstem bulrush	
Cyperaceae	*Scleria ciliata*	fringed nutrush	
Cyperaceae	*Scleria reticularis*	netted nutrush; reticulate nutrush	
Davalliaceae	*Nephrolepis spp*.	Boston fern; sword fern	
Droseraceae	*Drosera brevifolia*	dwarf sundew	
Droseraceae	*Drosera capillaris*	pink sundew	
Ebenaceae	*Diospyros virginiana*	persimmon	
Ericaceae	*Befaria racemosa*	tarflower	
Ericaceae	*Gaylussacia dumosa*	dwarf huckleberry	
Ericaceae	*Lyonia fruticosa*	staggerbush	
Ericaceae	*Lyonia lucida*	fetterbush	
Ericaceae	*Vaccinium arboreum*	sparkleberry; farkleberry	
Ericaceae	*Vaccinium corymbosum*	highbush blueberry	
Ericaceae	*Vaccinium darrowii*	Darrow's blueberry	
Ericaceae	*Vaccinium myrsinites*	shiny blueberry	
Ericaceae	*Vaccinium stamineum*	deerberry	
Eriocaulaceae	*Eriocaulon compressum*	flattened pipewort; hatpins	
Eriocaulaceae	*Eriocaulon decangulare*	tenangle pipewort; hatpins	
Eriocaulaceae	*Lachnocaulon anceps*	whitehead bogbutton	
Eriocaulaceae	*Syngonanthus flavidulus*	yellow hatpins	
Euphorbiaceae	*Acalypha gracilens*	slender threeseed mercury	
Euphorbiaceae	*Chamaesyce spp*.	spurge	
Euphorbiaceae	*Cnidoscolus stimulosus*	tread-softly	
Euphorbiaceae	*Croton argyranthemus*	silver croton	
Euphorbiaceae	*Crotonopsis linearis*	rushfoil	
Euphorbiaceae	*Stillingia sylvatica*	queen's delight	
Fabaceae	*Amorpha fruticosa*	bastard indigo	
Fabaceae	*Amorpha herbacea*	wild indigo	
Fabaceae	*Apios americana*	groundnut	
Fabaceae	*Chamaecrista fasciculata*	partridge pea	
Fabaceae	*Chamaecrista nictitans*	sensitive pea	
Fabaceae	*Crotalaria purshii*	Pursh's rattlebox	

Fabaceae	*Crotalaria retusa*	rattleweed	non-native
Fabaceae	*Crotalaria rotundifolia*	rabbitbells	
Fabaceae	*Dalea feayi*	Feay's prairieclover	
Fabaceae	*Desmodium paniculatum*	panicled ticktrefoil	
Fabaceae	*Desmodium tenuifolium*	slimleaf ticktrefoil	
Fabaceae	*Desmodium triflorum*	threeflower ticktrefoil	non-native
Fabaceae	*Erythrina herbacea*	cherokeebean; coralbean	
Fabaceae	*Galactia elliottii*	Elliot's milkpea	
Fabaceae	*Galactia volubilis*	eastern milkpea	
Fabaceae	*Gleditsia aquatica*	water-locust	
Fabaceae	*Indigofera caroliniana*	Carolina indigo	
Fabaceae	*Indigofera suffruticosa*	anil de pasto	non-native
Fabaceae	*Macroptilium lathyroides*	macroptilium	non-native
Fabaceae	*Mimosa strigillosa*	mimosa	
Fabaceae	*Senna ligustrina*	privet wild sensitive plant	
Fabaceae	*Sesbania herbacea*	danglepod	
Fabaceae	*Sesbania vesicaria*	bladderpod	
Fabaceae	*Tephrosia hispidula*	sprawling hoarypea	
Fabaceae	*Trifolium repens*	white clover	non-native
Fabaceae	*Vicia acutifolia*	fourleaf vetch; sand vetch	
Fabaceae	*Vigna luteola*	hairypod cowpea	
Fagaceae	*Quercus chapmanii*	Chapman oak	
Fagaceae	*Quercus geminata*	sand live oak	
Fagaceae	*Quercus incana*	bluejack oak	
Fagaceae	*Quercus laurifolia*	laurel oak	
Fagaceae	*Quercus minima*	dwarf live oak	
Fagaceae	*Quercus myrtilfolia*	myrtle oak	
Fagaceae	*Quercus nigra*	water oak	
Fagaceae	*Quercus pumila*	running oak	
Fagaceae	*Quercus virginiana*	live oak	
Gentianaceae	*Nymphoides aquatica*	big floatingheart	
Gentianaceae	*Sabatia brevifolia*	shortleaf rosegentian	
Gentianaceae	*Sabatia calycina*	coastal rosegentian	
Gentianaceae	*Sabatia decandra*	Bartram's rosegentian	
Gentianaceae	*Sabatia grandiflora*	largeflower rosegentian	
Gentianaceae	*Sabatia stellaris*	rose-of-plymouth	
Haemodoraceae	*Lachnanthes caroliniana*	Carolina redroot; bloodroot	
Haloragaceae	*Myriophyllum spp.*	milfoil	
Haloragaceae	*Proserpinaca palustris*	marsh mermaidweed	
Haloragaceae	*Proserpinaca pectinata*	combleaf mermaidweed	
Hydophyllaceae	*Hydrolea corymbosa*	sky flower	

Hydrocharitaceae	*Limnobium spongia*	frog's-bit	
Hymenophyllaceae	*Lygodium microphyllum*	Old World climbing fern	non-native
Hypericaceae	*Hypericum brachyphyllum*	coastalplain St. John's-wort	
Hypericaceae	*Hypericum cistifolium*	roundpod St. John's-wort	
Hypericaceae	*Hypericum fasciculatum*	sandweed; peelbark St. John's-wort	
Hypericaceae	*Hypericum gentianoides*	pineweeds; orangegrass	
Hypericaceae	*Hypericum hypericoides*	St. Andrew's cross	
Hypericaceae	*Hypericum mutilum*	dwarf St. John's-wort	
Hypericaceae	*Hypericum myrtifolium*	myrtleleaf St. John's-wort	
Hypericaceae	*Hypericum tetrapetalum*	fourpetal St. John's-wort	
Hypericaceae	*Hypericum virginicum*	Virginia marsh St. John's-wort	
Hypoxidaceae	*Hypoxis curtissii*	common yellow stargrass	
Hypoxidaceae	*Hypoxis juncea*	fringed yellow stargrass	
Iridaceae	*Iris hexagona* var. *savannarum*	prairie iris	
Iridaceae	*Sisyrinchium atlanticum*	blue-eyed grass	
Juncaceae	*Juncus dichotomus*	forked rush	
Juncaceae	*Juncus effusus*	soft rush	
Juncaceae	*Juncus marginatus*	shore rush; grassleaf rush	
Juncaceae	*Juncus megacephalus*	bighead rush	
Juncaceae	*Juncus polycephalus*	manyhead rush	
Juncaceae	*Juncus repens*	lesser creeping rush	
Lamiaceae	*Clinopodium brownei*	Browne's savory	
Lamiaceae	*Hyptis alata*	musky mint	
Lamiaceae	*Lycopus rubellus*	water hoarhound	
Lamiaceae	*Physostegia purpurea*	false dragonhead; obedient plant	
Lamiaceae	*Piloblephis rigida*	pennyroyal	
Lamiaceae	*Salvia lyrata*	lyre-leaved sage	
Lamiaceae	*Scutellaria integrifolia*	rough skullcap	
Lamiaceae	*Teucrium canadense*	wood sage; wood germander	
Lamiaceae	*Trichostema dichotomum*	forked blue curls	
Lauraceae	*Persea palustris*	swampbay	
Lemnaceae	*Lemna obscura*	little duckweed	
Lemnaceae	*Lemna valdiviana*	valdivia duckweed	
Lemnaceae	*Spirodela* polyrhiza	common duckweed	
Lemnaceae	*Wolffiella gladiata*	Florida mudmidget	
Lentibulariaceae	*Pinguicula caerulea*	blue butterwort	T (FDACS)
Lentibulariaceae	*Pinguicula lutea*	yellow butterwort	T (FDACS)
Lentibulariaceae	*Pinguicula pumila*	small bladderwort	
Lentibulariaceae	*Utricularia cornuta*	horned bladderwort	
Lentibulariaceae	*Utricularia floridana*	Florida bladderwort	

Lentibulariaceae	*Utricularia foliosa*	leafy bladderwort	
Lentibulariaceae	*Utricularia gibba*	humped bladderwort	
Lentibulariaceae	*Utricularia inflata*	floating bladderwort	
Lentibulariaceae	*Utricularia purpurea*	eastern purple bladderwort	
Lentibulariaceae	*Utricularia resupinata*	lavender bladderwort; small purple bladderwort	
Lentibulariaceae	*Utricularia simulans*	fringed bladderwort	
Lentibulariaceae	*Utricularia subulata*	zigzag bladderwort	
Liliaceae	*Aletris lutea*	yellow colicroot	
Liliaceae	*Lilium catesbaei*	pine lily; Catesby's lily	T (FDACS); S3 (FNAI)
Liliaceae	*Zigadenus densus*	crow-poison	
Loganiaceae	*Mitreola petiolata*	miterwort	
Loganiaceae	*Polypremum procumbens*	rustweed	
Loranthaceae	*Phoradendron serotinum*	mistletoe	
Lythraceae	*Cuphea carthagenensis*	cuphea	
Lythraceae	*Decodon verticillatus*	willowherb; swamp loosestrife	
Lythraceae	*Lythrum flagellare*	lowland loosestrife; creeping loosestrife	C2 (USFWS); S2, S3 (FNAI)
Magnoliaceae	*Magnolia virginiana*	sweet bay	
Malvaceae	*Hibiscus grandiflorus*	swamp hibiscus	
Malvaceae	*Kosteletzkya virginica*	Virginia saltmarsh mallow	
Malvaceae	*Urena lobata*	Caesar-weed	non-native
Marantaceae	*Thalia geniculata*	thalia; fireflag	
Melastomataceae	*Rhexia cubensis*	West Indian meadow beauty	
Melastomataceae	*Rhexia mariana*	pale meadow beauty	
Melastomataceae	*Rhexia nuttallii*	Nuttall's meadow beauty	
Melastomataceae	*Rhexia petiolata*	fringed meadow beauty	
Moraceae	*Morus rubra*	red mulberry	
Myricaceae	*Myrica cerifera*	wax myrtle	
Myrsinaceae	*Ardisia escallonoides*	marlberry	
Myrsinaceae	*Lysimachia minima*	false pimpernel; chaffweed	
Myrsinaceae	*Rapanea punctata*	myrsine	
Myrtaceae	*Melaleuca quinquenervia*	melaleuca; punk tree	non-native
Nymphaeaceae	*Nuphar lutea* subsp. *macrophylla*	spatterdock	
Nymphaeaceae	*Nymphaea jamesoniana*	Jameson's waterlily, nightblooming waterlily	E (FDACS)
Nymphaeaceae	*Nymphaea odorata*	white waterlily	

Nyssaceae	*Nyssa sylvatica* var. *biflora*	swamp black gum; swamp tupelo	
Oleaceae	*Chionanthus virginica*	fringe tree	
Oleaceae	*Fraxinus caroliniana*	pop ash; water ash	
Onagraceae	*Ludwigia arcuata*	Piedmont primrosewillow	
Onagraceae	*Ludwigia decurrens*	wingleaf primrosewillow	
Onagraceae	*Ludwigia leptocarpa*	anglestem primrosewillow	
Onagraceae	*Ludwigia linifolia*	southeastern primrosewillow	
Onagraceae	*Ludwigia maritima*	seaside primrosewillow	
Onagraceae	*Ludwigia microcarpa*	smallfruit primrosewillow	
Onagraceae	*Ludwigia octovalvis*	Mexican primrosewillow	
Onagraceae	*Ludwigia palustris*	marsh seedbox	
Onagraceae	*Ludwigia peruviana*	Peruvian primrosewillow	non-native
Onagraceae	*Ludwigia pilosa*	hairy primrosewillow	
Onagraceae	*Ludwigia repens*	creeping primrosewillow	
Onagraceae	*Ludwigia suffruticosa*	shrubby primrosewillow	
Orchidaceae	*Calopogon multiflorus*	manyflowered grasspink	T (FDACS); II (CITES)
Orchidaceae	*Calopogon pallidus*	pale grasspink	
Orchidaceae	*Corallorhiza wisteriana*	spring coralroot	
Orchidaceae	*Encyclia tampensis*	butterfly orchid	C (FDACS); II CITES
Orchidaceae	*Eulophia alta*	wild coco; ground	
Orchidaceae	*Habenaria floribunda*	toothpetal false reinorchid; mignonette orchid	
Orchidaceae	*Habenaria quinqueseta*	longhorn false reinorchid; Michaux's orchid	
Orchidaceae	*Habenaria repens*	waterspider false reinorchid	
Orchidaceae	*Oeceoclades maculata*	Aftrican spoted orchid	non-native
Orchidaceae	*Orthochilus ecristatus*	giant orchid; non-crested eulophia	T (FDACS); II (CITES); S2 (FNAI)
Orchidaceae	*Spiranthes longilabris*	long-lip ladies'-tresses; giantspiral ladiestresses	T (FDACS)
Orchidaceae	*Spiranthes praecox*	greenvein ladiestresses	
Orchidaceae	*Spiranthes vernalis*	spring ladiestresses	
Orchidaceae	*Zeuxine strateumatica*	lawn orchid; soldier's orchid	non-native
Orobonchaceae	*Seymeria pectinata*	Piedmont blacksenna	
Osmundaceae	*Osmunda cinnamomea*	cinnamon fern	

Osmundaceae	*Osmunda regalis*	royal fern	
Oxalidaceae	*Oxalis spp*.	wood sorrel	
Parkeriaceae	*Ceratopteris thalictroides*	water horn fern	non-native
Passifloraceae	*Passiflora* incarnata	purple passionflower	
Phytolaccaceae	*Phytolacca americana*	pokeweed; pokeberry	
Pinaceae	*Pinus elliottii var. densa*	South Florida slash pine	
Pinaceae	*Pinus palustris*	longleaf pine	
Plantaginaceae	*Agalinis filifolia*	seminole false foxglove	
Plantaginaceae	*Agalinis linifolia*	flaxleaf false foxglove	
Plantaginaceae	*Agalinis purpurea*	purple false foxglove	
Plantaginaceae	*Bacopa caroliniana*	blue hyssop; lemon bacopa	
Plantaginaceae	*Bacopa monnieri*	herb-of-grace	
Plantaginaceae	*Buchnera americana*	blueheart	
Plantaginaceae	*Gratiola ramosa*	branched hedgehyssop	
Plantaginaceae	*Gratiola virginiana*	roundfruit hedgehyssop	
Plantaginaceae	*Linaria canadensis*	blue toadflax	
Plantaginaceae	*Lindernia dubia*	yellowseed false pimpernel; moistbank pimpernel	
Plantaginaceae	*Lindernia grandiflora*	savannah false pimpernel	
Plantaginaceae	*Mecardonia acuminata*	mecardonia; axilflower	
Plantaginaceae	*Micranthemum umbrosum*	ahade mudflower	
Plantaginaceae	*Penstemon multiflorus*	manyflower beardtongue	
Plantaginaceae	*Scoparia dulcis*	sweet broom; licoriceweed	
Plantaginaceae	*Sophronanthe hispida*	rough hedgehyssop	
Plantaginaceae	*Torenia crustacea*	Malaysian false pimpernel	non-native
Poaceae	*Cynodon dactylon*	Bermudagrass	non-native
Poaceae	*Amphicarpum muhlenbergianum*	blue maidencane	
Poaceae	*Andropogon glomeratus*	bushy bluestem	
Poaceae	*Andropogon glomeratus var. glaucopsis*	purple bluestem	
Poaceae	*Andropogon ternarius*	splitbeard bluestem	
Poaceae	*Andropogon virginicus*	broomsedge bluestem	
Poaceae	*Andropogon virginicus var. glaucus*	chalky bluestem	
Poaceae	*Aristida berychiana*	wiregrass	
Poaceae	*Aristida lanosa*	longleaf threeawn	
Poaceae	*Aristida patula*	tall threeawn	
Poaceae	*Aristida purpurascens*	arrowfeather	
Poaceae	*Aristida spiciformis*	bottlebrush threeawn	
Poaceae	*Axonopus affinis*	common carpetgrass	
Poaceae	*Axonopus furcatus*	big carpetgrass	
Poaceae	*Chloris gayana*	rhodesgrass	non-native
Poaceae	*Coelorachis rugosa*	wrinkled jointtail	

Poaceae	*Dichanthelium acuminatum*	tapered witchgrass	
Poaceae	*Dichanthelium commutatum*	variable witchgrass	
Poaceae	*Dichanthelium dichotomum*	cypress witchgrass	
Poaceae	*Dichanthelium ensifolium*	cypress witchgrass	
Poaceae	*Dichanthelium erectifolium*	erectleaf witchgrass	
Poaceae	*Dichanthelium laxiflorum*	openflower witchgrass	
Poaceae	*Dichanthelium sabulorum*	hemlock rosette grass	
Poaceae	*Digitaria serotina*	blanket crabgrass	
Poaceae	*Echinochloa crusgalli*	barnyardgrass	non-native
Poaceae	*Echinochloa walteri*	coast cockspur	
Poaceae	*Eragrostis atrovirens*	thalia lovegrass	non-native
Poaceae	*Eragrostis elliottii*	Elliott's lovegrass	
Poaceae	*Eragrostis hypnoides*	teal lovegrass	
Poaceae	*Eragrostis spectabilis*	purple lovegrass	
Poaceae	*Erianthus giganteus*	sugarcane plumegrass	
Poaceae	*Eustachys petraea*	fingergrass	
Poaceae	*Gymnopogon chapmanianus*	Chapman skeletongrass	
Poaceae	*Hydrochloa caroliniensis*	watergrass	
Poaceae	*Imperata cylindrica*	cogon grass	non-native
Poaceae	*Leersia hexandra*	southern cutgrass	
Poaceae	*Leptochloa fascicularis*	bearded spangletop	
Poaceae	*Leptochloa uninervia*	Mexican spangletop	
Poaceae	*Muhlenbergia capillaris*	muhly grass; purple hairgrass	
Poaceae	*Oplismenus setarius*	woodsgrass; basketgrass	non-native
Poaceae	*Panicum anceps*	beaked panicum	
Poaceae	*Panicum dichotomiflorum*	fall panicum	
Poaceae	*Panicum hemitomon*	maidencane	
Poaceae	*Panicum hians*	gaping panicum	
Poaceae	*Panicum repens*	torpedograss	non-native
Poaceae	*Panicum rigidulum*	redtop panicum	
Poaceae	*Panicum tenerum*	bluejoint panicum	
Poaceae	*Panicum virgatum*	switchgrass	
Poaceae	*Paspalidium geminatum*	Egyptian paspalidium	
Poaceae	*Paspalum conjugatum*	sour paspalum	
Poaceae	*Paspalum dissectum*	mudbank paspalum	
Poaceae	*Paspalum distichum*	seashore paspalum	
Poaceae	*Paspalum laeve*	field paspalum	
Poaceae	*Paspalum notatum*	bahiagrass	non-native
Poaceae	*Paspalum repens*	water paspalum	
Poaceae	*Paspalum setaceum*	thin paspalum	
Poaceae	*Paspalum urvillei*	vaseygrass	non-native

Poaceae	*Sacciolepis indica*	India cupscale	
Poaceae	*Sacciolepis striata*	American cupscale	
Poaceae	*Schizachyrium scoparium*	little bluestem	
Poaceae	*Setaria geniculata*	knotroot foxtail	
Poaceae	*Setaria magna*	giant foxtail	
Poaceae	*Sorghastrum secundum*	lopsided indiangrass	
Poaceae	*Spartina bakeri*	sand cordgrass	
Poaceae	*Sporobolus curtissii*	Curtis' dropseed	
Poaceae	*Sporobolus junceus*	pineywoods dropseed	
Poaceae	*Tripsacum dactyloides*	eastern gama grass	
Polygalaceae	*Polygala balduinii*	Baldwin's milkwort	
Polygalaceae	*Polygala boykinii*	Boykin's milkwort	
Polygalaceae	*Polygala cruciata*	drumheads	
Polygalaceae	*Polygala cymosa*	tall pinebarren milkwort	
Polygalaceae	*Polygala grandiflora*	large-flowered polygala	
Polygalaceae	*Polygala incarnata*	procession flower	
Polygalaceae	*Polygala lutea*	orange milkwort	
Polygalaceae	*Polygala nana*	candyroot	
Polygalaceae	*Polygala polygama*	racemed milkwort	
Polygalaceae	*Polygala ramosa*	low pinebarren milkwort	
Polygalaceae	*Polygala rugelii*	yellow batchelor's button	
Polygalaceae	*Polygala setacea*	coastalplain milkwort	
Polygonaceae	*Polygonum densiflorum*	smartweed	
Polygonaceae	*Polygonum hydropiperoides*	mild water-pepper	
Polygonaceae	*Polygonum punctatum*	dotted smartweed	
Polygonaceae	*Rumex verticillatus*	swamp dock	
Polypodiaceae	*Phlebodium aureum*	golden polypody; serpent fern; gold-foot fern	T (FDACS)
Polypodiaceae	*Pleopeltis michauxiana*	resurrection fern	
Pontederiaceae	*Eichhornia crassipes*	water hyacinth	non-native
Pontederiaceae	*Pontederia cordata*	pickerelweed	
Portulaccaceae	*Portulaca pilosa*	pink purslane	
Psilotaceae	*Psilotum nudum*	whisk fern	
Pteridaceae	*Pteridium aquilinum*	bracken fern	
Pteridaceae	*Vittaria lineata*	shoestring fern	
Ranunculaceae	*Clematis crispa*	leather flower	
Rhamnaceae	*Berchemia scandens*	rattan vine	
Rosaceae	*Rubus spp*.	blackberry, dewberry	
Rubiaceae	*Cephalanthus occidentalis*	buttonbush	
Rubiaceae	*Diodia teres*	poor Joe	
Rubiaceae	*Diodia virginiana*	buttonweed	

Rubiaceae	*Galium tinctorium*	bedstraw	
Rubiaceae	*Hedyotis procumbens*	innocense	
Rubiaceae	*Hedyotis uniflora*	hedyotis	
Rubiaceae	*Mitchella repens*	partridge berry; twinberry	
Rubiaceae	*Psychotria nervosa*	wild coffee	
Rubiaceae	*Psychotria tenuifolia*	short leaf wild coffee	
Rubiaceae	*Richardia brasiliensis*	Richardia	non-native
Rubiaceae	*Spermacoce spp*.	spermacoce	
Rutaceae	*Citrus sinensis*	sweet orange	non-native
Salicaceae	*Salix caroliniana*	coastal plain willow; Carolina willow	
Salviniaceae	*Azolla caroliniana*	mosquito fern	
Salviniaceae	*Salvinia minima*	water spangles	
Samolaceae	*Samolus valerandi parviflorus*	pineland pimpernel	
Sapotaceae	*Sideroxylon reclinatum*	Florida bully; buckthorn	
Smilacaceae	*Smilax auriculata*	earleaf greenbrier; catbrier	
Smilacaceae	*Smilax bona-nox*	saw greenbrier; catbrier	
Smilacaceae	*Smilax laurifolia*	laurel greenbriar	
Solanaceae	*Physalis angulata*	cutleaf ground cherry	
Solanaceae	*Physalis arenicola*	cypresshead ground cherry	
Solanaceae	*Solanum capsicoides*	soda-apple (native)	
Solanaceae	*Solanum nigrescens*	black nightshade	
Solanaceae	*Solanum viarum*	tropical soda apple	non-native
Styracaceae	*Styrax americana*	snowbells	
Theaceae	*Gordonia lasianthus*	loblolly bay	
Turneraceae	*Piriqueta caroliniana*	pitted stripeseed	
Typhaceae	*Typha latifolia*	common cattail	
Typhaceae	*Typha spp*.	cattail	
Ulmaceae	*Celtis laevigata*	hackberry	
Ulmaceae	*Ulmus americana*	American elm	
Urticaceae	*Boehmeria cylindrica*	false nettle; bog hemp	
Urticaceae	*Parietaria floridana*	Florida pellitory	
Verbenaceae	*Callicarpa americana*	beautyberry	
Verbenaceae	*Glandularia tampensis*	Tampa mock vervain	E (FDACS); C2 (USFWS)
Verbenaceae	*Lippia nodiflora*	frog-fruit; carpetweed	
Verbenaceae	*Verbena scabra*	harsh verbena	
Violaceae	*Viola lanceolata*	long-leaf violet; bog white violet	
Violaceae	*Viola palmata*	early blue violet	
Violaceae	*Viola sororia*	common blue violet	
Vitaceae	*Ampelopsis arborea*	pepper vine	

Vitaceae	*Parthenocissus quinquefolia*	Virginia creeper;	
Vitaceae	*Vitis aestivalis*	summer grape	
Vitaceae	*Vitis munsoniana*	scuppernong; muscadine grape	
Vitaceae	*Vitis rotundifolia*	wild grape	
Vitaceae	*Vitis shuttleworthii*	Calusa grape	
Xyridaceae	*Xyris brevifolia*	shortleaf yellow-eyed grass	
Xyridaceae	*Xyris caroliniana*	Carolina yellow-eyed grass	
Xyridaceae	*Xyris elliottii*	Elliot's yellow-eyed grass	
Xyridaceae	*Xyris jupicai*	Richard's yellow-eyed grass	
Xyridaceae	*Xyris smalliana*	Small's yellow-eyed grass	

APPENDIX E – LIST OF WILDLIFE SPECIES

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

	FAMILY	SCIENTIFIC NAME	COMMON NAME	STATUS
REPTILES				
	Alligatoridae	*Alligator mississippiensis*	American alligator	
	Bufonidae	*Bufo quercicus*	oak toad	
	Bufonidae	*Bufo terrestris*	southern toad	
	Chelydridae	*Chelydra serpentina*	Florida snapping turtle	
	Colubridae	*Coluber constrictor*	southern black racer	
	Colubridae	*Diadophis punctatus*	ringneck snake	
	Colubridae	*Drymarchon corais*	eastern indigo snake	T (FWC); T (USFWS)
	Colubridae	*Elaphe guttata*	corn snake	
	Colubridae	*Elaphe obsoleta*	yellow rat snake	
	Colubridae	*Farancia abacura*	eastern mud snake	
	Colubridae	*Nerodia fasciata*	banded watersnake	
	Colubridae	*Opheodrys aestivus*	rough green snake	
	Colubridae	*Pituophis melanoleucus mugitus*	Florida pine snake	Unconfirmed SSC (FWC)
	Colubridae	*Regina alleni*	striped crayfish snake	
	Colubridae	*Thamnophis sauritus*	ribbon snake	
	Colubridae	*Thamnophis sirtalis*	garter snake	
	Emydidae	*Deirochelys reticularia*	Florida chicken turtle	
	Emydidae	*Pseudemys floridana*	Florida cooter	
	Emydidae	*Pseudemys nelsoni*	Florida redbelly turtle	
	Emydidae	*Terrapene carolina*	box turtle	
	Hylidae	*Acris gryllus*	Florida cricket frog	
	Hylidae	*Hyla femoralis*	pinewoods treefrog	
	Hylidae	*Hyla gratiosa*	barking treefrog	
	Hylidae	*Pseudacris crucifer*	southern spring peeper	
	Hylidae	*Pseudacris nigrita*	Florida chorus frog	
	Hylidae	*Pseudacris ocularis*	little grass frog	
	Iguanidae	*Anolis carolinensis*	green anole	
	Iguanidae	*Anolis sagreii*	brown anole	Exotic
	Kinosternidae	*Kinosternon subrubrum*	Florida mud turtle	
	Kinosternidae	*Sternotherus odoratus*	stinkpot	
	Ranidae	*Amphiuma means*	two-toed amphiuma	
	Ranidae	*Rana capito*	gopher frog	Unconfirmed SSC (FWC)
	Ranidae	*Rana grylio*	pig frog	

	Ranidae	*Rana sphenocephala*	southern leopard frog	
	Ranidae	*Siren lacertina*	greater siren	
	Scincidae	*Eumeces inexpectatus*	southeastern five-lined skink	
	Varanidae	*Varanus niloticus*	Nile monitor lizard	Exotic
	Viperidae	*Agkistrodon piscivorus*	cottonmouth	
	Viperidae	*Crotalus adamanteus*	eastern diamondback rattlesnake	
	Viperidae	*Sistrurus miliarius*	dusky pygmy rattlesnake	
BIRDS				
	Accipitridae	*Accipiter cooperii*	cooper's hawk	
	Accipitridae	*Accipiter striatus*	sharp-shinned hawk	
	Accipitridae	*Buteo brachyurus*	short-tailed 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*	bald eagle	
	Alcedinidae	*Megaceryle alcyon*	belted kingfisher	
	Anatidae	*Aix sponsa*	wood duck	
	Anatidae	*Anas crecca*	green-winged teal	
	Anatidae	*Anas fulvigula*	mottled duck	
	Anatidae	*Anser caerulescens*	snow goose	
	Anatidae	*Aythya affinis*	lesser scaup	
	Anatidae	*Aythya collaris*	ring-necked duck	
	Anatidae	*Dendrocygna autumnalis*	black-bellied whistling-duck	
	Anatidae	*Lophodytes cucullatus*	hooded merganser	
	Anatidae	*Mergus serrator*	red-breasted merganser	
	Anatidae	*Spatula clypeata*	northern shoveler	
	Anatidae	*Spatula discors*	blue-winged teal	
	Anhingidae	*Anhinga anhinga*	anhinga	
	Apodidae	*Chaetura pelagica*	chimney swift	
	Aramidae	*Aramus guarauna*	limpkin	S3 (FNAI)
	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	T (FWC)
	Ardeidae	*Egretta thula*	snowy egret	S3 (FNAI)
	Ardeidae	*Egretta tricolor*	tricolored heron	T (FWC)

	Ardeidae	*Nyctanassa violacea*	yellow-crowned night-heron	
	Ardeidae	*Nycticorax nycticorax*	black-crowned night-heron	
	Bombycillidae	*Bombycilla cedrorum*	cedar waxwing	
	Caprimulgidae	*Antrostomus carolinensis*	chuck-will's-widow	
	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 semipalmatus*	semipalmated plover	
	Charadriidae	*Charadrius vociferus*	killdeer	
	Ciconiidae	*Mycteria americana*	wood stork	T (USFWS)
	Columbidae	*Columba livia*	rock pigeon	Exotic
	Columbidae	*Columbina passerina*	common ground-dove	
	Columbidae	*Streptopelia decaocto*	Eurasian collared-dove	Exotic
	Columbidae	*Zenaida asiatica*	white-winged dove	
	Columbidae	*Zenaida macroura*	mourning dove	
	Corvidae	*Aphelocoma coerulescens*	Florida scrub-jay	T (USFWS)
	Corvidae	*Corvus brachyrhynchos*	American crow	
	Corvidae	*Corvus ossifragus*	fish crow	
	Corvidae	*Cyanocitta cristata*	blue jay	
	Cuculidae	*Coccyzus americanus*	yellow-billed cuckoo	
	Falconidae	*Caracara cheriway*	crested caracara	
	Falconidae	*Falco sparverius*	American kestrel	
	Falconidae	*Falco columbarius*	merlin	
	Falconidae	*Falco peregrinus*	peregrine falcon	
	Fregatidae	*Fregata magnificens*	magnificent frigatebird	
	Fringillidae	*Spinus tristis*	American goldfinch	
	Gaviidae	*Gavia immer*	common loon	
	Gruidae	*Antigone canadensis pratensis*	Florida sandhill crane	T (FWC)
	Gruidae	*Grus americana*	whooping crane	Endangered Non-essential Experimental Population
	Hirundinidae	*Hirundo rustica*	barn 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	*Molothrus ater*	brown-headed cowbird	
	Icteridae	*Quiscalus major*	boat-tailed grackle	
	Icteridae	*Quiscalus quiscula*	common grackle	
	Icteridae	*Sturnella magna*	eastern meadowlark	
	Laniidae	*Lanius ludovicianus*	loggerhead shrike	
	Laridae	*Larus delawarensis*	ring-billed gull	
	Laridae	*Leucophaeus atricilla*	laughing gull	
	Laridae	*Sternula antillarum*	least tern	T (FWC)
	Mimidae	*Dumetella carolinensis*	gray catbird	
	Mimidae	*Mimus polyglottos*	northern mockingbird	
	Mimidae	*Toxostoma rufum*	brown thrasher	
	Odontophoridae	*Colinus virginianus*	northern bobwhite	
	Pandionidae	*Pandion haliaetus*	osprey	
	Paridae	*Baeolophus bicolor*	tufted titmouse	
	Parulidae	*Geothlypis formosa*	Kentucky warbler	
	Parulidae	*Geothlypis trichas*	common yellowthroat	
	Parulidae	*Helmitheros vermivorum*	worm-eating warbler	
	Parulidae	*Mniotilta varia*	black-and-white warbler	
	Parulidae	*Oreothlypis celata*	orange-crowned warbler	
	Parulidae	*Parkesia motacilla*	Louisiana waterthrush	
	Parulidae	*Parkesia noveboracensis*	northern waterthrush	
	Parulidae	*Seiurus aurocapilla*	ovenbird	
	Parulidae	*Setophaga discolor*	prairie warbler	
	Parulidae	*Setophaga palmarum*	palm warbler	
	Parulidae	*Setophaga striata*	blackpoll warbler	
	Parulidae	*Setophaga americana*	northern parula	
	Parulidae	*Setophaga caerulescens*	black-throated blue warbler	
	Parulidae	*Setophaga citrina*	hooded warbler	
	Parulidae	*Setophaga coronata*	yellow-rumped warbler	
	Parulidae	*Setophaga coronata*	yellow-throated warbler	
	Parulidae	*Setophaga fusca*	blackburnian warbler	
	Parulidae	*Setophaga pensylvanica*	chestnut-sided warbler	
	Parulidae	*Setophaga petechia*	yellow warbler	
	Parulidae	*Setophaga pinus*	pine warbler	
	Parulidae	*Setophaga ruticilla*	American redstart	
	Parulidae	*Setophaga tigrina*	cape may warbler	
	Passerellidae	*Melospiza georgiana*	swamp sparrow	
	Passerellidae	*Melospiza lincolnii*	Lincoln’s sparrow	

	Passerellidae	*Passerculus sandwichensis*	savannah sparrow	
	Passerellidae	*Peucaea aestivalis*	Bachman's sparrow	
	Passerellidae	*Pipilo erythrophthalmus*	eastern towhee	
	Passerellidae	*Spizella passerina*	chipping sparrow	
	Passeridae	*Passer domesticus*	house sparrow	Exotic
	Pelecanidae	*Pelecanus erythrorhynchos*	American white pelican	
	Pelecanidae	*Pelecanus occidentalis*	brown pelican	
	Phalacrocoracidae	*Phalacrocorax auritus*	double-crested cormorant	
	Phasianidae	*Meleagris gallopavo*	wild turkey	
	Picidae	*Colaptes auratus*	northern flicker	
	Picidae	*Dryobates villosus*	hairy woodpecker	
	Picidae	*Dryobates pubescens*	downy woodpecker	
	Picidae	*Dryocopus pileatus*	pileated woodpecker	
	Picidae	*Melanerpes carolinus*	red-bellied woodpecker	
	Picidae	*Melanerpes erythrocephalus*	red-headed woodpecker	
	Picidae	*Sphyrapicus varius*	yellow-bellied sapsucker	
	Podicipedidae	*Podilymbus podiceps*	pied-billed grebe	
	Polioptilidae	*Polioptila caerulea*	blue-gray gnatcatcher	
	Rallidae	*Fulica americana*	American coot	
	Rallidae	*Gallinula galeata*	common gallinule	
	Rallidae	*Porphyrio martinicus*	purple gallinule	
	Rallidae	*Rallus crepitans*	clapper rail	
	Rallidae	*Rallus elegans*	king rail	
	Recurvirostridae	*Himantopus mexicanus*	black-necked stilt	
	Regulidae	*Regulus satrapa*	golden-crowned kinglet	
	Regulidae	*Regulus satrapa*	ruby-crowned kinglet	
	Scolopacidae	*Actitis macularius*	spotted sandpiper	
	Scolopacidae	*Calidris mauri*	western sandpiper	
	Scolopacidae	*Calidris minutilla*	least sandpiper	
	Scolopacidae	*Gallinago delicata*	Wilson's snipe	
	Scolopacidae	*Limnodromus griseus*	short-billed dowitcher	
	Scolopacidae	*Limnodromus scolopaceus*	long-billed dowitcher	
	Scolopacidae	*Tringa flavipes*	lesser yellowlegs	
	Scolopacidae	*Tringa melanoleuca*	greater yellowlegs	
	Scolopacidae	*Tringa solitaria*	solitary sandpiper	
	Sittidae	*Sitta pusilla*	brown-headed nuthatch	
	Strigidae	*Bubo virginianus*	great horned owl	
	Strigidae	*Megascops asio*	eastern screech-owl	
	Strigidae	*Strix varia*	barred owl	
	Sturnidae	*Sturnus vulgaris*	European starling	Exotic
	Threskiornithidae	*Eudocimus albus*	white ibis	S4 (FNAI)

	Threskiornithidae	*Platalea ajaja*	roseate spoonbill	T (FWC)
	Threskiornithidae	*Plegadis falcinellus*	glossy ibis	
	Trochilidae	*Archilochus colubris*	ruby-throated hummingbird	
	Troglodytidae	*Cistothorus palustris*	marsh wren	
	Troglodytidae	*Cistothorus platensis*	sedge wren	
	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	*Sialia sialis*	eastern bluebird	
	Turdidae	*Turdus migratorius*	American robin	
	Tyrannidae	*Contopus virens*	eastern wood-pewee	
	Tyrannidae	*Empidonax minimus*	least flycatcher	
	Tyrannidae	*Empidonax virescens*	acadian flycatcher	
	Tyrannidae	*Myiarchus crinitus*	great crested flycatcher	
	Tyrannidae	*Sayornis phoebe*	eastern phoebe	
	Tyrannidae	*Tyrannus dominicensis*	gray kingbird	
	Tyrannidae	*Tyrannus tyrannus*	eastern kingbird	
	Tyrannidae	*Tyrannus verticalis*	western kingbird	
	Vireonidae	*Vireo flavifrons*	yellow-throated vireo	
	Vireonidae	*Vireo griseus*	white-eyed vireo	
	Vireonidae	*Vireo olivaceus*	red-eyed vireo	
	Vireonidae	*Vireo solitarius*	blue-headed vireo	
MAMMALS				
	Canidae	*Canis latrans*	coyote	Range Expansion
	Cervidae	*Odocoileus Virginianus*	white-tailed deer	
	Dasypodidae	*Dasypus novemcinctus*	nine-banded armadillo	Range Expansion**
	Felidae	*Lynx rufus*	bobcat	
	Felidae	*Puma concolor*	Florida panther	E (FWC); E (USFWS)
	Leporidae	*Didelphis virginiana*	Virginia opossum	
	Leporidae	*Sylvilagus floridanus*	eastern cottontail	
	Leporidae	*Sylvilagus palustris*	marsh rabbit	
	Molossidae	*Eumops glaucinus floridanus*	Florida mastiff bat	Unconfirmed E (FWC)
	Muridae	*Neofiber alleni*	Florida round-tailed muskrat	
	Muridae	*Neotoma floridana*	eastern woodrat	
	Muridae	*Oryzomys palustris*	marsh rice rat	
	Muridae	*Peromyscus gossypinus*	cotton mouse	

	Muridae	*Podomys floridanus*	Florida mouse	Unconfirmed SSC (FWC)
	Muridae	*Sigmodon hispidus*	hispid cotton rat	
	Mustelidae	*Lutra canadensis*	river otter	
	Procyonidae	*Procyon lotor*	raccoon	
	Sciuridae	*Glaucomys volans*	southern flying squirrel	
	Sciuridae	*Sciurus carolinensis*	gray squirrel	
	Sciuridae	*Sciurus niger shermanii*	Sherman's fox squirrel	Unconfirmed SSC (FWC)
	Soricidae	*Blarina carolinensis*	southern short-tailed shrew	
	Suidae	*Sus scrofa*	wild pig	Exotic
	Talpidae	*Scalopus aquaticus*	eastern mole	
	Trichechidae	*Trichechus manatus*	Florida (West Indian) manatee	E (FWC); E (USFWS)
	Ursidae	*Ursus americanus floridanus*	Florida black bear	T (FWC)

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 man-made 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 lots - 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 per year)	per acre	$ 600.00
power washing	per hour	$ 100.00
building maintenance	per structure	$ 500.00
RECREATION and VISITOR SERVICES		
kiosks and signs - 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