STOKES LANDING CONSERVATION AREA
LAND MANAGEMENT PLAN

ST. JOHNS COUNTY, FLORIDA

ST. JOHNS RIVER WATER MANAGEMENT DISTRICT

JULY 11, 2023


Northwest Florida
Water Management District
Suwannee River
Water Management
District
St. Johns
River Water
Management
District
Southwest
Florida Water
Management
District
South Florida
Water Management
District
ST. JOHNS RIVER
WATER MANAGEMENT DISTRICT

EXECUTIVE SUMMARY

MANAGEMENT AREA SIZE: 281 acres

DATE OF ACQUISITION: Acquisition of parcels within Stokes Landing Conservation Area (SLCA or the Conservation Area) began in 1992.
DATE OF PLAN: July 11, 2023
MAJOR BASIN: Northern Coastal
PLANNING BASIN: Tolomato River

LOCATION: The SLCA is located in St. Johns County, east of U.S. Highway (U.S.) 1, off Lakeshore Drive, approximately 3 miles north of the Northeast Florida Regional Airport and 7 miles north of the City of St. Augustine.

FUNDING SOURCE: The acquisition funding source for the Conservation Area was Preservation 2000.

MANAGEMENT PARTNERS: The St. Johns River Water Management District (District) is the lead manager for the SLCA.

VISION STATEMENT: The management focus for Stokes Landing Conservation Area is the continued protection of water resources, wetlands, cultural resources, and wildlife habitat. The area provides vital linkages to several nearby public lands. The management activities that will occur on the uplands of Stoke Landing Conservation Area will focus on the maintenance or improvement of the natural communities found on-site by the application of prescribed fire, mechanical fuels treatments, invasive species management.

RESOURCE PROTECTION AND MANAGEMENT:

- **WATER RESOURCES** – Water resources are largely undisturbed; most protection was accomplished with acquisition. The most significant surface hydrological feature of the SLCA is the Tolomato River. The Conservation Area protects approximately 1.5 miles of the Tolomato River shoreline.
- **FOREST MANAGEMENT AND RESTORATION** – The pine flatwoods within the Conservation Area are natural pine, and silvicultural activities are not known to have occurred on the SLCA. These areas are maintained through the implementation of prescribed fire.
- **FIRE MANAGEMENT** – Implementation of prescribed burns occurs in accordance with annual burn plans and individual unit prescriptions with an annual acreage goal of 26 acres treated.
- **FLORA AND FAUNA** – The SLCA provides quality habitat for various wading birds, painted buntings (*Passerinia ciris*), as well as various birds of prey. Along with avian habitats and foraging areas, the SLCA provides critical habitat for a diverse array of reptiles and amphibians. Invasive plant and animal species occurring on the Conservation Area include moderate populations of Chinese tallow (*Triadica sebifera)* and air potato (*Disocorea*

bulbifera). The District regularly monitors for the presence of invasive plants and animals and executes appropriate management actions.

- **CULTURAL AND HISTORICAL RESOURCES** – There are two Florida Master File sites on the Conservation Area. If any additional sites are located, District staff will document and report the sites to the Division of Historical Resources.

LAND USE MANAGEMENT:

- **ACCESS** – One public access point to the SLCA exists off Lakeshore Drive.
- **RECREATION** – The District has developed and implemented a marked trail system throughout the SLCA. The Conservation Area also contains a pavilion and an observation tower. The District continues to seek to enhance recreational opportunities consistent with the ecological needs of the Conservation Area.
- **SECURITY** – Maintenance of signage, fence lines, parking areas, gates, and locks is conducted as needed. The District maintains contact with the Florida Fish and Wildlife Conservation Commission and local law enforcement for security needs.

ADMINISTRATION:

- **REAL ESTATE ADMINISTRATION** – There are no planned acquisitions around the SLCA at this time. However, the District may consider purchasing parcels near the Conservation Area that become available and that will aid in the conservation of water resources within the Tolomato River and Stokes Creek Basins. The District may also pursue acquisition of parcels or property exchanges with neighbors to improve and provide additional access to the Conservation Area.
- **COOPERATIVE AND SPECIAL USE AGREEMENTS, LEASES, AND EASEMENTS** –The District administers two special use authorizations for the Conservation Area.
- **MANAGEMENT COSTS AND REVENUES** – Management costs at the Conservation Area were $99,550 from 2009 to 2022 and are projected at $95,550 from 2023 to 2033. The SLCA does not generate revenue.

Table of Contents

FIGURES

TABLES

APPENDICES

VISION STATEMENT

The management focus for Stokes Landing Conservation Area is the continued protection of water resources, wetlands, cultural resources, and wildlife habitat. The area provides vital linkages to several nearby public lands. The management activities that will occur on the uplands of Stoke Landing Conservation Area will focus on the maintenance or improvement of the natural communities found on-site by the application of prescribed fire, mechanical fuels treatments, invasive species management.

OVERVIEW

This document provides the goals and strategies to guide land management activities at the Stokes Landing Conservation Area (SLCA or Conservation Area) over the next ten years. This land management plan was developed in accordance with Section 373.1391 and Section 373.591, Florida Statutes. This is a revision of the August 2009 land management plan.

The St. Johns River Water Management District (District) owns or manages over 780,000 acres of land, acquired for the purposes of water management, water supply, and the conservation and protection of water resources.

LOCATION

The SLCA consists of 281 acres in eastern St. Johns County, Florida. The SLCA includes three contiguous parcels located in several Sections of Township 6 South and Range 27 East in the Public Lands Survey System. The Conservation Area is located approximately 3 miles north of the Northeast Florida Regional Airport, off Lakeshore Drive, east of U.S. Highway (U.S.) 1. The Conservation Area is bordered to the north by Stokes Creek and to the east by the Tolomato River and its associated estuarine wetlands (Figures 1 and 2).

The Conservation Area is part of the Northern Coastal Basin (NCB) located along the northern Atlantic coast of Florida. The NCB extends nearly 100 miles from lower Duval County, just south of the urban center of Jacksonville, Florida, southward through the coastal watersheds of St. Johns, Flagler, and Volusia counties to Ponce de Leon Inlet, near the city of New Smyrna Beach. The NCB encompasses over 680 square miles of coastal lowlands interspersed with numerous creeks and small rivers draining east to form a series of shallow bays and lagoons.

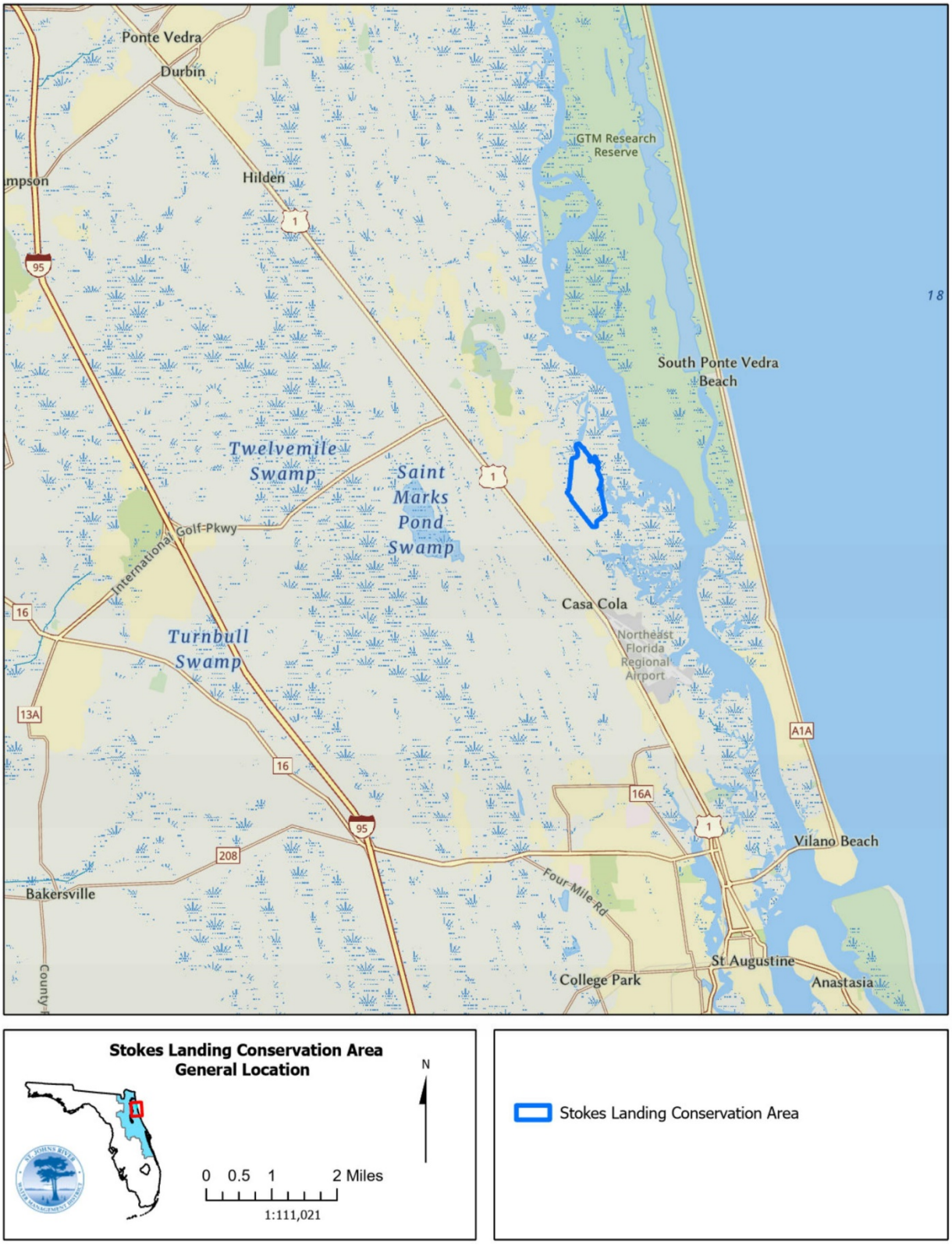

Figure 1: General Location

Figure 2: Aerial Imagery

REGIONAL SIGNIFICANCE

The SLCA is a significant acquisition providing linkage within the Guana-Tolomato-Mantanzas National Estuarine Research Reserve (GTM Research Reserve). The GTM Research Reserve was established as a partnership between the Florida Department of Environmental Protection (DEP) and the National Oceanic and Atmospheric Administration (NOAA) to provide long-term research of the estuarine systems within the reserve. The GTM Research Reserve is further charged to provide public education and interpretation programs on estuarine communities.

The Conservation Area is an integral component of a larger network of publicly owned lands in St. Johns County. Figure 3 depicts the location and regional significance of the Conservation Area. In addition to connectivity with the GTM Research Reserve, other nearby conservation lands include Twelve Mile Swamp Conservation Area (21,142 acres), GTM Guana River Site (2,652 acres), Guana River Wildlife Management Area (9,143 acres), and Deep Creek State Forest (380 acres). These publicly owned and managed lands (Table 1) provide for the protection of water quality and storage, indigenous floral and faunal species, numerous cultural resource sites, and natural resource-based recreational opportunities.

Table 1: Proximate Conservation Areas

Lead Manager	Conservation Area
District	Gourd Island Conservation Area
District	Julington Durbin Preserve
District	Twelve Mile Swamp Conservation Area
Florida Department of Agriculture and Consumer Services, Florida Forest Service	Deep Creek State Forest
Florida Department of Agriculture and Consumer Services, Florida Forest Service	Watson Island State Forest
Florida Department of Environmental Protection, Division of Recreation and Parks	Anastasia State Park
Florida Department of Environmental Protection, Office of Resilience and Coastal Protection	Guana-Tolomato-Matanzas National Estuarine Research Reserve
Florida Fish and Wildlife Conservation Commission	Guana River Wildlife Management Area
North Florida Land Trust	Six Mile Creek Preserve
St. Johns County	McCullough Creek Conservation Area
St. Johns County	Nocatee Preserve
St. Johns County	Turnbull Conservation Area
St. Johns County	Terra Pines Conservation Easement

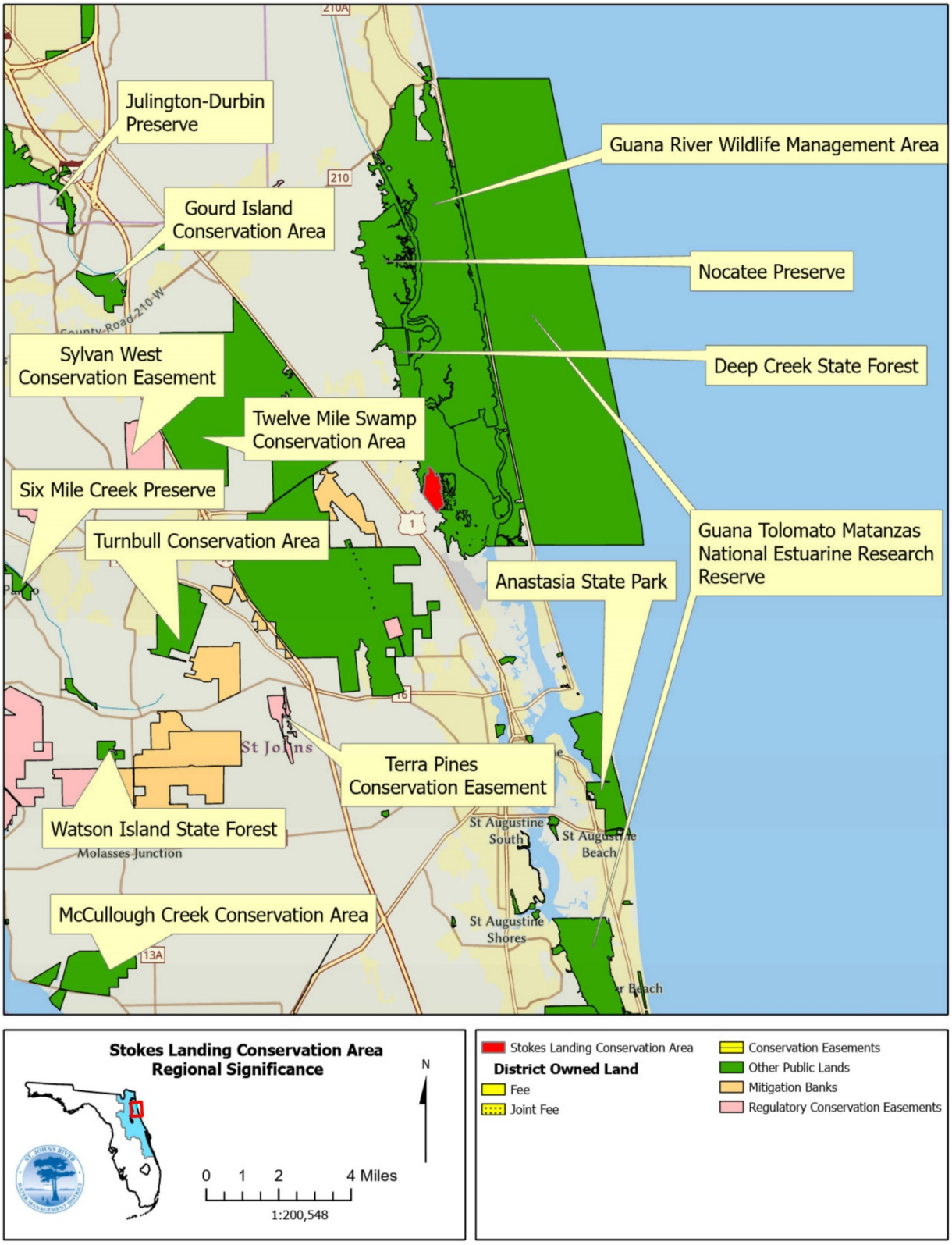

Figure 3: Regional Significance

ACQUISITION HISTORY

Acquisition of the parcels that the SLCA comprises provides for the protection of important water resources and ecological functions. This acquisition is consistent with the goals of the NCB projects set forth in the District's Land Acquisition and Management Five-Year Plan and the District's Surface Water Improvement and Management Plan (SWIM). These goals, as they apply to the SLCA, include:

- Improve water quality, maintain natural hydrological regimes, and maintain flood protection by preserving important wetland areas.
- Restore, maintain, and protect native natural communities and diversity.
- Maintain forested land cover.
- Provide opportunities for resource-based recreation where compatible with the above listed goals.

Acquisition of the SLCA began in 1992. The Conservation Area currently consists of the following four parcels totaling 281 acres, as derived from GIS calculations (Figure 4):

Land Services Group, Inc. (183 acres – west parcel) Land Acquisition number 1992-04-P1, the west parcel was acquired by the District on 12/09/1992, $352,063, Preservation 2000 funds.

Land Services Group, Inc. (91 acres – east parcel) Land Acquisition number 1992-04-P1, the east parcel was deeded to the District as a wetland mitigation project resulting from a development project undertaken by the former landowner.

Stokes Landing Addition (Roberts) (3 acres) Land Acquisition number 1992-04-P2, the Roberts parcel was conveyed to the District as part of a larger closing between Roberts and the Board of Trustees of the Internal Improvement Trust Fund (BTIITF) on 12/30/2003.

Stokes Landing Addition (Johnson) (4 acres) Land Acquisition number 2021-013-P1, the Johnson parcel was donated to the District on 8/31/21.

LOCAL GOVERNMENT AND LAND USE DESIGNATION

St. Johns County

According to the St. Johns County 2025 Comprehensive Plan, the future land use designation for the SLCA is Parks/Recreation (St. Johns County Growth Management Department, 2023). This designation allows for active and passive recreation areas or lands permanently maintained as Open Space.

The property immediately north and east of the SLCA has a future land use designation as Conservation while areas to the south and west are designated as Residential B. The Conservation designation includes areas with sensitive environmental qualities such as wetlands and tidal marsh which are limited to only very low- intensity uses (i.e., passive outdoor recreation). The

Residential B designation allows for neighborhood commercial and community commercial uses, approved pursuant to the Planned Development land development regulations, and on a size and scale compatible with the surrounding residential area.

The SLCA falls within the Anastasia Mosquito Control District (AMCD) of St. Johns County. Currently, the AMCD does not have a specific Arthropod Control Program or Arthropod Management Plan for the Conservation Area. The District has entered into a Special Use Agreement (SUA) with the AMCD to provide vehicular access for site inspections, surveillance, and chemical application/treatment of areas within the Conservation Area found to contain mosquito larvae.

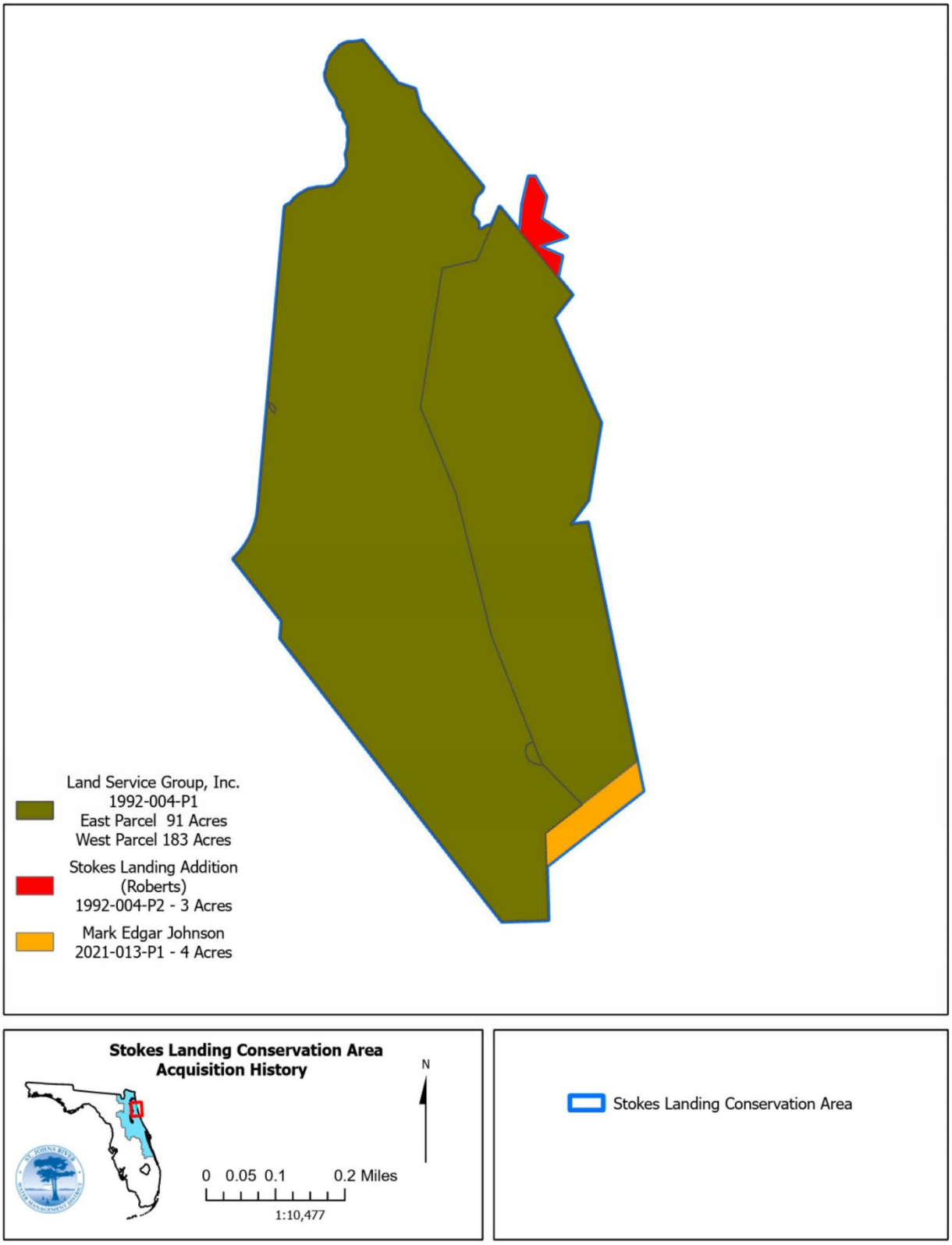

Figure 4: Acquisition History

NATURAL RESOURCES

WATER RESOURCES

The SLCA does not include any Outstanding Florida Water Bodies and is not located within an Aquatic Preserve or an Area of Critical State Concern (Section 380.05, Florida Statutes). The most significant surface hydrological feature of the Conservation Area is the Tolomato River (Figure 2). The Conservation Area protects approximately 1.5 miles of the Tolomato River shoreline. The SLCA lies within the southern central portion of the Tolomato River Planning Unit (Figure 5). The portions of the Tolomato River that border the Conservation Area support large areas of undisturbed salt marsh systems and are designated Class II shellfish waters by the DEP. Additionally, the Conservation Area encompasses a small portion of Stokes Creek. The southern fork of Stokes Creek receives water from swamps and wet flatwoods to the west of the Conservation Area. Stokes Creek meanders north and northeast, across the northern tip of the Conservation Area to the main creek channel and continues to drain towards the east to the confluence of the Tolomato River.

There are three Section 303(d) impaired waterbodies which interact with SLCA, including St Marks Pond Estuary (Water body ID [WBID] 2457A), Tolomato River (shellfish portion, WBID 236312), and Casa Cola Creek (WBID 2468). Impairments, parameters not meeting attainments, include fecal coliform and iron.

As an adaptation to sea level rise, coastal wetland ecosystems will migrate landward into adjacent freshwater wetlands and upland ecosystems, changing the structure and composition of existing wetlands (Miller, Rodriguez, and Bost, 2021). The SLCA is particularly susceptible to wetland migration due to its proximity to the coast, broad drainage patterns, and low elevation which ranges from sea level to 11.6 feet North American Vertical Datum of 1988 (NAVD88). The SLCA contains 125 acres of wetlands or 44% of the total coverage of the Conservation Area. To track these changes, the District will remap natural communities during the subsequent ten-year updates to the Conservation Area management plans.

GEOMORPHOLOGY

The SLCA lies within the Atlantic Coastal Complex Province of the Barrier Island Sequence District (Williams, Scott, and Upchurch, 2022). The Atlantic Coastal Complex Province consists of Quaternary barrier islands, beach ridges, dunes, and estuaries. Most of the province is a strand plain. Many of the beach ridges and dunes in the Atlantic Coastal Complex Province are coast-parallel, although complex beach ridge patterns occur on the Cape Canaveral/Merritt Island cuspate-foreland complex. Many of the province's rivers, creeks, and wetlands developed in the swales between the beach ridges. Holocene tidal marshes occur in the north, along the estuarine coastlines and transition to mangrove swamps in the south.

The Barrier Island Sequence District is characterized by beach ridges, dunes, terraces, and former lagoons or embayments. Strand plains occur in several provinces of the Barrier Island Sequence District. Elevations in the Barrier Island Sequence District range from sea level in the Sea Islands, Atlantic Coastal Complex, and Lower St. Johns River Valley provinces, to approximately 264 feet

NAVD88 in the southern part of the Trail Ridge Province. Higher elevations occur in the Trail Ridge Province on spoil piles from heavy mineral sand mining. Ninety percent (90%) of the elevations in the District lie between 8.6 and 94 feet NAVD88. The median elevation is approximately 29 feet NAVD88. Elevations within the SLCA range from sea level to 11.6 feet NAVD88 (Figure 6).

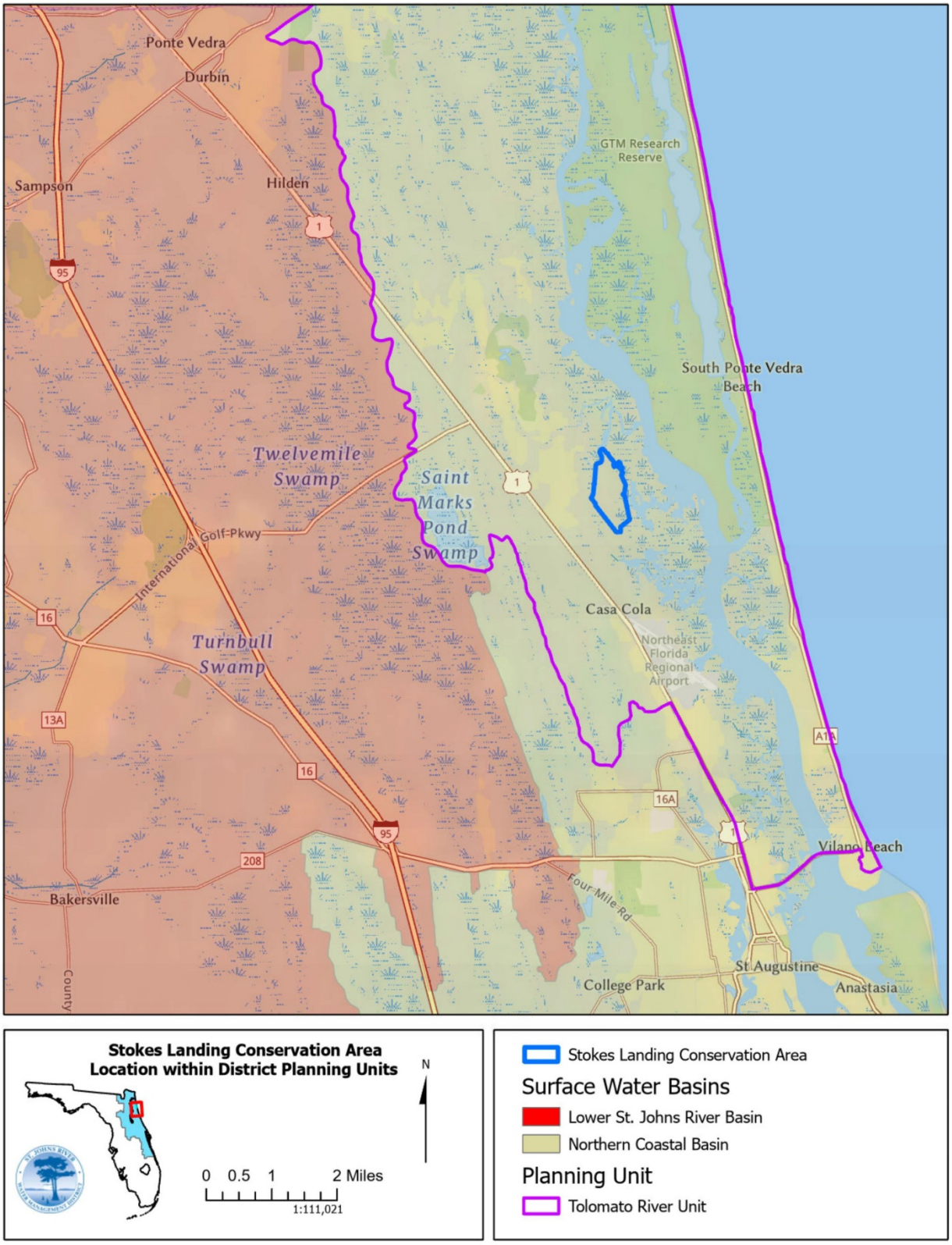

Figure 5: Location within the District's Planning Units

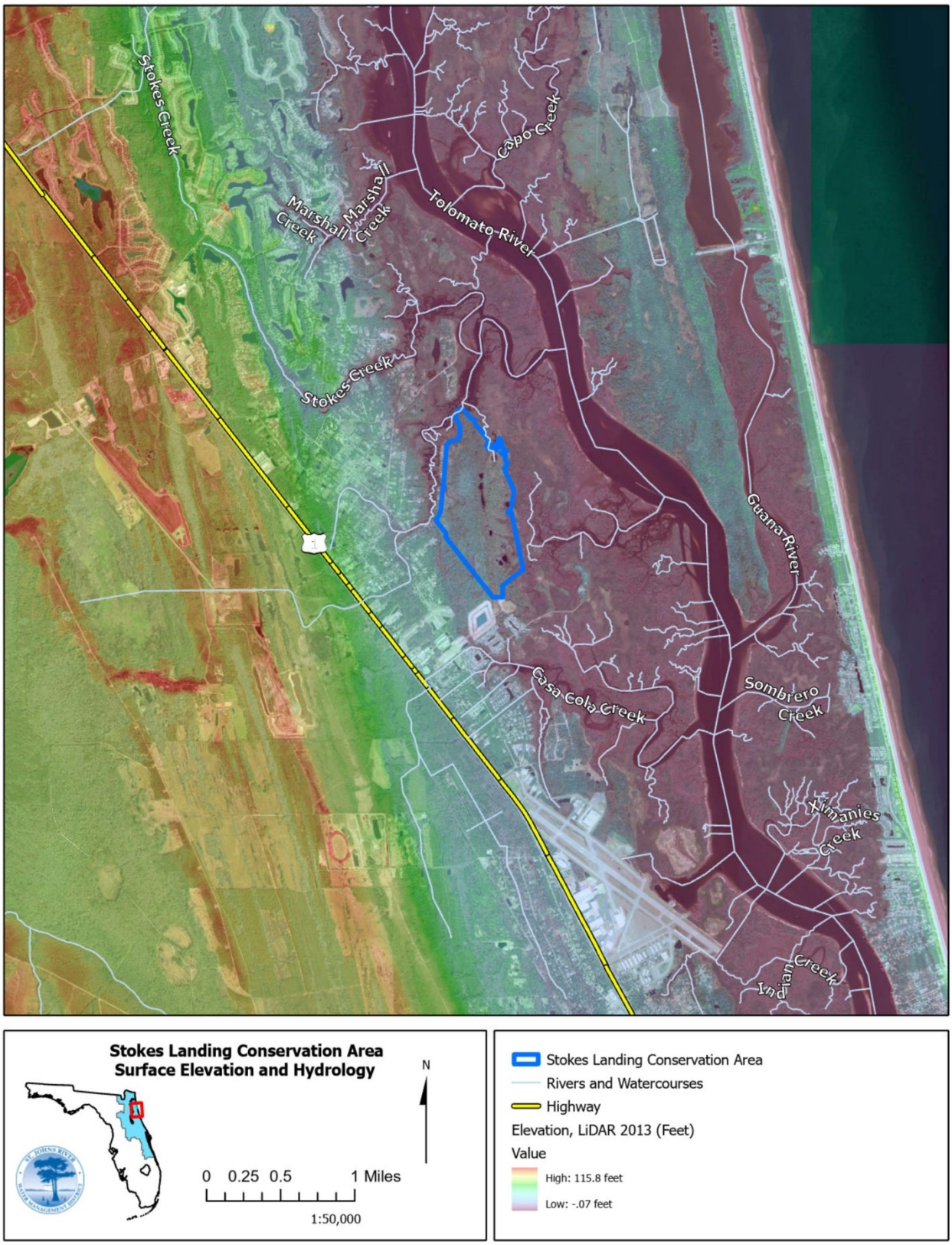

Figure 6: Surface Elevation and Hydrology

WATER ELEVATIONS

The District has an active upper Floridan Aquifer groundwater monitoring well, station number SJ2574 Guana State Park (WL) FA, located east-northeast of the SLCA off Guana River Road. Water levels recorded from January 1, 2009, to November 20, 2022, are depicted on Figure 7.

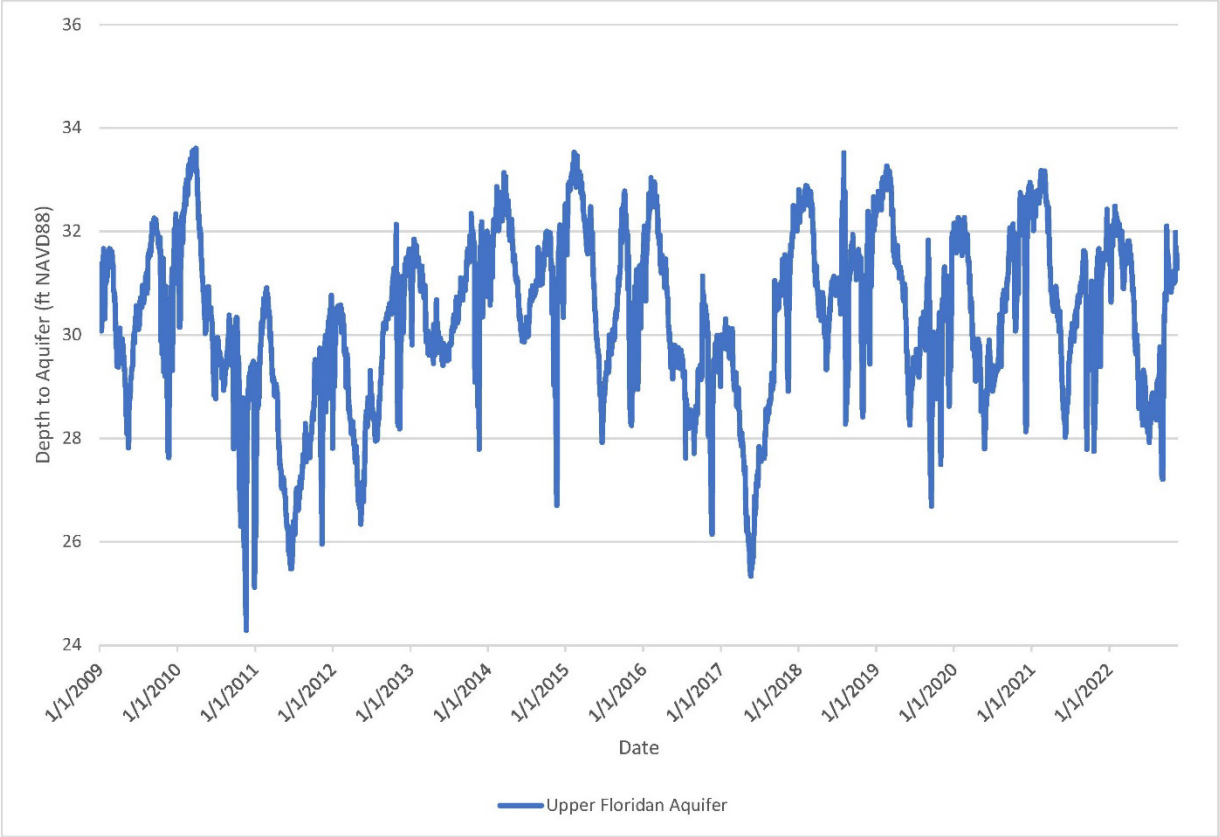

Figure 7: Hydrograph from Upper Floridan Aquifer groundwater monitoring well station number SJ2574 at Guana State Park

WATER CHEMISTRY

The water quality monitoring network at the District was initially designed and implemented in the early 1980s. The current network consists of over 200 surface water sampling stations located throughout the District's 18-county service area. Water quality status is an indication of the condition of a water body for a given analyte or parameter (for example, color or total phosphorus). The District's 2022 Status and Trends Report is a 15-year assessment that uses data from January 1, 2007, to December 31, 2021. Water quality trends indicate whether a series of analyte or parameter values is increasing or decreasing over time (https://www.sjrwmd.com/data/water-quality/#status-trends).

Status is evaluated over the most recent five years, with the requirement that data be available for the last year and two of the other five years. For surface water, the status of a given station is determined by the ranking of the median of its annual medians relative to similar values for all

other stations (i.e., low implies below the 25th percentile, medium implies between the 25th and 75th percentiles, and high implies above the 75th percentile). Importantly, these relative rankings are not related to a standard or target for water quality. Trend is evaluated over the most recent fifteen years, with the requirement that data be available for the last year and nine of the other fifteen years. When possible, data are adjusted so that each year has the same number of samples. A statistical test was used to determine if monthly values differed significantly. If the values did, then the test for trend was adjusted to account for this variation.

Surface water chemistry data are collected at one site connected to the Conservation Area's watershed: Station JXTR17 is located downstream from the SLCA at the convergence of the Tolomato and Guana Rivers (Figure 8). Field data including water temperature, potential of hydrogen (pH), specific conductivity, salinity, water clarity (transparency, color and total suspended solid), and dissolved oxygen (DO) were collected, as well as grab samples analyzed for nutrients and minerals.

Surface water chemistry parameters discussed in this section include total nitrogen (nitrogen), total phosphorus (phosphorus), specific conductivity, DO, pH, color, and chlorophyll-*a* (Chl-a).

The following parameters are discussed in relative terms for the past 5 years for status and 15 years for trends as described in the 2022 Status and Trends Report (SJRWMD, 2022).

Station JXTR17
Nitrogen is in the low-range and stable; phosphorus is in the medium-range and stable; DO is in the medium-range and stable; pH is in the medium-range and stable; color is in the medium-range and stable; and Chl-a is in the medium-range and stable. Specific conductivity is in the high-range and decreasing at 0.7% annually.

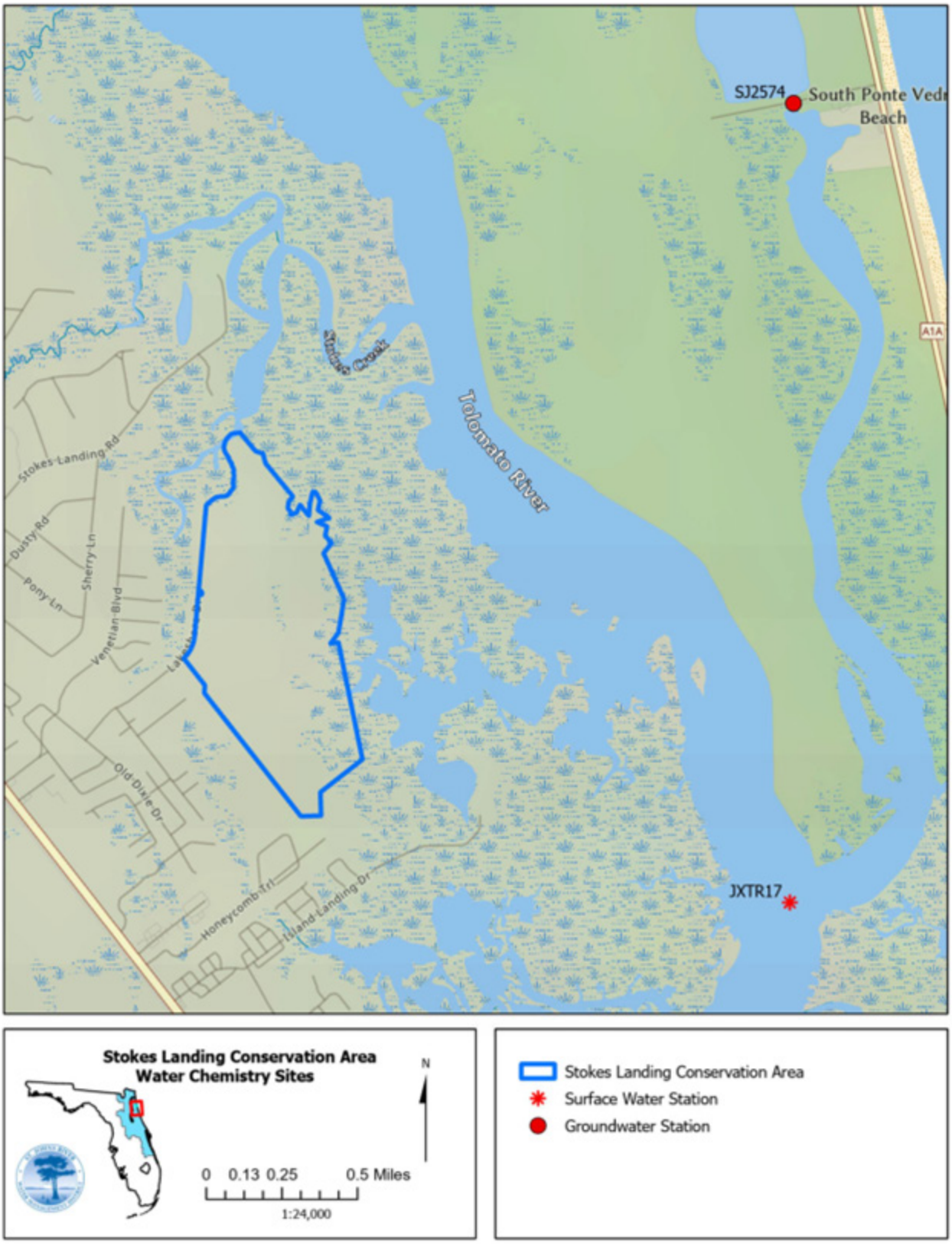

Figure 8: Water Chemistry Sites

NATURAL COMMUNITIES

The SLCA comprises 281 acres that consist primarily of mesic flatwoods, maritime hammock, and estuarine salt marsh (Figure 9). Information pertaining to the natural communities at the Conservation Area was derived from several sources including personal observations by District staff. Natural communities have been characterized using descriptions published in the *Guide to the Natural Communities of Florida* (Florida Natural Areas Inventory and Florida Department of Natural Resources, 2010). Additionally, information specific to the salt marsh and maritime hammock systems are further characterized referencing *Ecosystems of Florida.* Natural community and species ranking definitions are listed in Appendix 1.

Natural community refinement and reclassification may occur throughout the Conservation Area as fire management activities progress.

Mesic Flatwoods (154 acres, 56%)
Soils that support mesic flatwoods communities are generally poorly drained, acidic, and sandy soils deposited on ancient, shallow seabeds. Many flatwoods communities have clay or organic hardpan. Hardpan soils become saturated during the rainy season. The presence of the hardpan translates to extreme seasonal fluctuations in the amount of water available to support plant life. These seasonal hydroperiods are essential in the maintenance of the flatwoods system.

Intact mesic flatwoods typically have a layered appearance, with a distinct, high, discontinuous canopy, low shrub layer, and diverse herbaceous layer. The canopy densities are variable and may include (depending on location) longleaf pine (*Pinus palustris*), slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*), or pond pine (*Pinus serotina*). The shrub layer may include a mixture of species or be dominated by species such as saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), and numerous Ericaceous plants. The herbaceous coverage may be dominated by wiregrass (*Aristida stricta*); however, species abundance and diversity are often dictated by the density of the shrub and canopy layers.

The flatwoods communities within the SLCA vary in levels of disturbance but are largely in good condition with site-appropriate species composition. The dominant pine species within the SLCA include slash and pond pine. Natural pine regeneration is markedly absent across the flatwoods, likely due to excessive competition from saw palmetto and Ericaceous shrub components. Management in these areas will focus on the continued use of prescribed fire and other appropriate restoration techniques, such as thinning or roller-chopping.

Fire is an important physical factor associated with the shaping and maintenance of this community type. The District targets natural fire frequency intervals of approximately every two to four years within the mesic flatwoods, which is consistent with the FNAI 2010 description. Fires in well-maintained mesic flatwoods tend to burn quickly and at relatively low temperatures while areas of prolonged fire exclusion, altered hydrology, or hardwood encroachment typically have higher soil and fuel moistures and may require more extreme conditions to facilitate a fire.

Maritime Hammock (76 acres, 27%)
Maritime hammocks are typically characterized as a narrow band of hardwood forest lying just inland of the coastal strand community. Live oak, cabbage palm (*Sabal palmetto*), and red bay (*Persea palustrus*) generally combine to form a dense, wind-pruned canopy whose streamlined profile deflects winds and generally prevents hurricanes from uprooting the trees. Other typical plants of this community type and documented within the Conservation Area include southern red cedar (*Juniperus virginiana*), southern magnolia (*Magnolia grandiflora*), and American holly (*Ilex opaca*).

The maritime hammock natural community is the terminal stage of succession in coastal areas with a fire return interval of no more than 26 to 100 years. Nutrient cycling is achieved through detrital organisms rather than fire. This community type is ranked G3/S2.

The maritime hammocks occurring within the SLCA are found on the northern half of the Conservation Area. They are adjacent to and embedded within salt marsh systems of the Conservation Area. Aerial imagery from the 1940s reveals an area of maritime hammock in the northern reaches of the Conservation Area that was cleared. This area was likely utilized in cattle ranching and farming operations.

Salt Marsh (39 acres, 14%)
Salt marsh is an herbaceous community located in the coastal zone that is sheltered from large waves. This area is determined by the slope of the shore and the tidal range, resulting in a varying width of the intertidal zone. Plants that are commonly found in the salt marsh are saltmarsh cordgrass (*Spartina alterniflora*), needle rush (*Juncus roemerianus*), Carolina sea lavender (*Limonium carolinianum*), perennial saltmarsh aster (*Symphyotrichum tenuifolium*), wand loosestrife (*Lythrum lineare*), marsh fimbry (*Fimbristylis spadicea*), and shoreline seapurslane (*Sesuvium portulacastrum*). The landward edge of the marsh is influenced by freshwater influx from the uplands, with species such as needle rush, sawgrass (*Cladium ja*maicense), saltmeadow cordgrass (*Spartina patens*), Gulf cordgrass (*Spartina spartinae*), and sand cordgrass (*Spartina bakeri*). Additionally, a border of salt-tolerant shrubs, such as groundsel tree (*Baccharis halimifolia*), saltwater falsewillow (*Baccharis angustifolia*), marshelder (*Iva frutescens*), and christmasberry (*Lycium carolinianum*) may be present.

Areas of high marsh salt flats are embedded within the salt marshes on the SLCA. Prominent plant species found within this plant community at the SLCA include black needle rush, saltmeadow cordgrass and smooth cordgrass. These plants are distributed throughout the marsh in zones where one of the species will dominate. These areas provide important winter foraging and loafing habitat for a wide array of resident and migratory birds.

Other typical plants and animals of the salt marsh documented within the Conservation Area include saltwort (*Batis maritima*), Atlantic blue crab (*Callinectes sapidus*), sand fiddler crab (*Uca pugilator*), and numerous shore birds and wading birds.

Depression Marsh (7 acres, 3%)
A depression marsh or ephemeral pond is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation. Depression marshes are typically found on flat landscapes throughout Florida. They develop when the overlying sand has slumped into a depression in the limestone underlayment. Soils are typically depressional phases of fine sands. Depression marshes are maintained against woody shrub invasion through the combined effects of seasonal water fluctuations and fire. These seasonal ponds are important habitat for numerous species of wildlife but are particularly important for many amphibians that require breeding sites that are free of predatory fish (Moler, 1987).

There are numerous depression marshes embedded within the mesic flatwood communities of the Conservation Area. Natural hydrologic conditions vary with most depression marshes drying in most years. Hydroperiods can range from 50 to 200 days per year. Fire is important in maintaining this community type by restricting the invasion of shrubs and trees and the formation of peat. Fire return intervals in depression marshes are determined by vegetation characteristics and the surrounding matrix community.

Altered Landcover Types (.82 acre, <1%)
Less than 1% of the SLCA is spoil area where dredge or spoil has been deposited; these areas may be recolonized by plants.

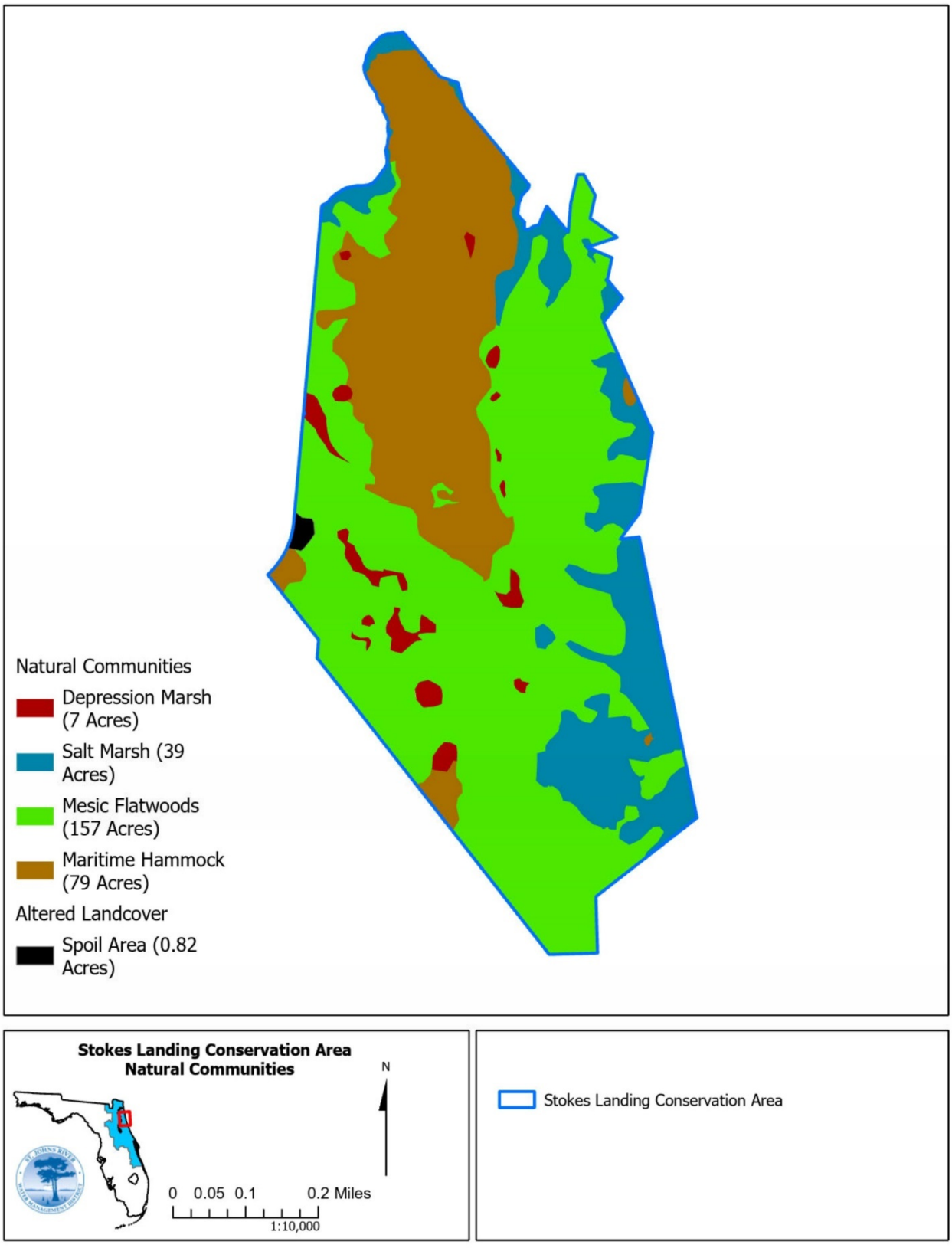

Figure 9: Natural Communities

SOILS

According to the USDA Soil and Conservation Service, six different soil types are within the Conservation Area. The St. Johns County Soil Survey provided information used to develop descriptions of the predominant soil series found within the Conservation Area. The soil descriptions and map are provided in Appendix 2.

CULTURAL AND HISTORICAL RESOURCES

A review of the Department of State, Division of Historical Resources (DHR) Florida Master Site File data indicates the presence of two registered cultural sites within the boundaries of the Conservation Area. These sites are classified as prehistoric mounds or middens. District staff with the assistance of the Florida Public Archaeology Network conducted a thorough survey of these areas (February 2023). No new sites were identified.

IMPLEMENTATION

The following sections outline land management strategies for resource protection and management, land use, and administration for the SLCA over the next ten years.

RESOURCE PROTECTION AND MANAGEMENT

WATER RESOURCES

Goal: Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition.

Strategy:

- Include depression marshes and other wetland edges in fire management activities.
- Regularly inspect roads, firelines, and trails for erosion problems and maintenance and repair needs.

Water resource protection within the Conservation Area will continue to focus on the Tolomato River, Stokes Creek, and associated salt marshes. Salt marshes are important for storm surge protection, pollutant filtering, and are highly biologically productive. Salt marshes support an array of wildlife including invertebrates, fish, and birds.

While many salt marsh systems in Florida are lost or degraded, the marsh system associated with the Conservation Area remains largely intact. Most water resource protection of the Conservation Area was accomplished through acquisition. Appropriate management of wetlands across the Conservation Area will further enhance and maintain the water quality in Stokes Creek and the Tolomato River. Depression marshes and other wetland edges will be included in prescribed fire activities conducted in associated fire management units (FMUs).

Roads and firelines exist within the Conservation Area, providing access for both management and recreation. The District has made improvements to roads within the Conservation Area, helping to

reduce the potential for erosion. District staff will continue to inspect roads and trails for erosion problems and maintenance and repair needs.

FLORA AND FAUNA

Goal: Maintain, improve, or restore native and listed species populations.

Strategy:

- Conduct floral and faunal surveys and further develop species lists.
- Continue to monitor for the presence of listed species.
- Contract with FNAI for natural communities mapping update to monitor for sea level induced wetland migration.

Native Species

While there are no listed species requiring special management, the Conservation Area provides significant habitat for several species of protected wading birds and a variety of floral and faunal species lists are provided in Appendix 1. Some notable species documented from within the Conservation Area are detailed below.

Bald Eagle

The bald eagle (*Haliaeetus leucocephalus*) is a bird of prey native to North America. It is a large raptor with a wingspan of up to 7 feet (2.1 meters) and a body length of up to 3 feet (0.9 meters). Adults have a distinctive white head and tail, a dark brown body, and yellow beak and eyes. Juveniles are mostly brown with some white speckles and do not develop the characteristic white head and tail until they are around 5 years old. Typically, bald eagles are found near large bodies of water, such as lakes, rivers, and coastal areas. They prefer to nest in tall trees that are near the water's edge and provide good visibility of their surroundings. One bald eagle nest was observed within SCLA and recorded by FWC (Nest ID SJ043). FWC recommends a management buffer zone of at least 330 feet (100 meters) around an active nest during the nesting season, with larger buffer zones required for some activities such as timber harvest.

Indigo Snake

The eastern indigo snake (*Drymarchon couperi*) is a non-venomous, large, shiny, and black-colored snake native to the southeastern United States. Indigo snakes are primarily found in longleaf pine forests, pine flatwoods, and coastal dunes in Florida. They prefer to live in areas with a lot of cover, such as brush piles, fallen logs, and other debris. They are also known to inhabit wetland areas, such as swamps, marshes, and creek bottoms. The indigo snake is listed as an endangered species with both state and federal protections. (Endangered Species Act 1978). While the last confirmed observation of an indigo snake on the Conservation Area was in the mid-1970's, there is a possibility this species is still present due to the aforementioned habitat requirements being maintained.

Painted bunting

Painted buntings (*Passerina ciris)* are a brightly colored songbird whose breeding range includes the Atlantic coastline from peninsular Florida to North Carolina. Males of this species "defend

their territory by singing from a high perch, often hidden in the foliage of a tree" (Lowther 2009). Favorable habitat within the Conservation Area includes the open areas of the estuarine salt marsh systems and the adjacent edges maritime hammocks and uplands that include a shrubby component (Lowther 2009). District staff have observed several singing males in the forested edge of the estuarine salt marsh along the eastern boundary of the Conservation Area. This territorial behavior coupled with additional observations of females in the area, indicates likely nesting within the Conservation Area.

Painted buntings, while not a listed species, are thought to be in decline, likely resulting from habitat loss. This species is provided some protection through the Migratory Bird Treaty Act (MBTA) and is listed in the U.S. Fish and Wildlife Service (USFWS) Birds of Conservation Concern 2021. This document was produced by the Division of Migratory Bird Management to "identify species…and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act of 1973" (USFWS 2021).

Wading birds

The Conservation Area provides desirable nesting and foraging habitat for several protected wading birds including little blue heron (*Egretta caerulea*), reddish egret (*Egretta rufescens*), roseate spoonbill (*Platalea ajaja*), and tricolored heron (*Egretta tricolor*). These species rely on wetlands and small islands for nesting, foraging, and sheltering. The District will adhere to the guidelines established in the Species Conservation and Permitting Guidelines, 2019.

SLCA lies within the core foraging area for a nesting colony of the federally threatened wood stork (*Mycteria americana*). The rookery is documented approximately 10 miles south of the Conservation Area at the St. Augustine Alligator Farm (Wood Storks, 2019), and the entire Conservation Area lies within the foraging area radius limits established for north Florida wood stork rookeries. The 2019 count showed 80 birds in this rookery. The District will adhere to the guidelines established in the January 1990 U.S. Fish and Wildlife Service (FWS) Habitat Management Guidelines for the Wood Stork in the Southeast Region.

Indian pipe

Indian pipe (*Monotropa uniflora*), also known as ghost plant because of its white color, is a member of the Ericaceae family. This unusual and relatively rare plant lacks chlorophyll. Rather than sunlight, the Indian pipe is parasitic, deriving energy from fungus present in the soil. This plant, documented within the Conservation Area, can be found in the heavily forested areas of the maritime hammocks with heavy detrital accumulations.

Wetland Migration

As sea level rises, wetland ecosystems will invade low-lying uplands as well as change the structure and composition of existing wetlands (Miller, Rodriguez, and Bost, 2021). The Conservation Area is particularly susceptible to wetland migration due to its broad drainage and low elevation (1 to 11.6 feet NAVD88). To track these changes, the District will remap natural communities during the subsequent ten-year updates to the Conservation Area management plans.

This task will be contracted to FNAI. Through its acquisition, the Conservation Area acts as a buffer to the impacts of sea level rise on the surrounding land uses (Linhoss *et al.*, 2015).

FIRE MANAGEMENT

Goal: Implement a prescribed burning program in accordance with the District's Fire Management Plan.

Strategy:

- Burn at least 26 acres of fire-maintained natural communities annually or 79 acres every three years.
- Introduce growing season burns, where applicable.
- In the absence of fire, conduct mechanical and chemical treatments to mimic fire effects.
- Maintain firelines twice annually.
- Prepare annual burn plans.
- Implement prescribed fire activities in accordance with the SLCA Land Management Plan and the SLCA Fire Management Plan.

Fire is a vital factor in managing the character and composition of vegetation in many of the natural communities in Florida. The District's primary use of fire is to mimic natural fire regimes to encourage the perpetuation of native pyric plant communities and dependent wildlife. Additionally, the application of fire aids in the reduction of fuels and minimizes the potential for catastrophic and damaging wildfires. Many of the natural communities at the Conservation Area are fire-adapted, making prescribed fire an important tool for use in the restoration and maintenance of plant communities within the Conservation Area. Since 2009, District staff have applied prescribed fire to 149 acres within the SLCA. Table 2 describes the prescribed fire history on the SLCA since 2009.

Table 2: Prescribed Fire History on the SLCA (2009 to present)

Fire Management Unit #	**Acres**	**Burn Dates**
42110	14	3/23/2010
4212	8	3/23/2010
42111	2	3/23/2010
4217	47	2/11/2013
4218	14	2/11/2013
42116	15	2/11/2013
4211	19	2/11/2013
4216	13	2/11/2013
4215	17	2/11/2013
Total	**149**	

A factor narrowing the window of opportunity for the application of prescribed fire on the portions of the Conservation Area is the proximity to critical smoke sensitive areas. These areas include suburban residential development, the Northeast Florida Regional Airport, and U.S. 1, making smoke management paramount. Any burns will be conducted to minimize off-site impacts, by maneuvering smoke plumes away from smoke sensitive areas and ensuring adequate smoke dispersal. Consideration also will be given to the smoke management concerns posed by the potential down drainage effects of Stokes Creek and the Tolomato River.

Weather parameters necessary for burning within the Conservation Area are limited to only those with wind directions including a westerly component. The proximity to the ocean and the strong influence of afternoon easterly sea breezes further restricts opportunities for burning, particularly in the growing season.

There are approximately 157 acres of fire-maintained natural communities within the Conservation Area (56% of the Conservation Area). With the target of a three-year burn rotation for these natural communities, the goal is to burn at least 26 acres annually or 79 acres every three years at SLCA, which is half the ecological objective of the entire Conservation Area at 52 acres annually. For FMUs which have two or more burns applied to them within the past ten years, timing of future prescribed fires should focus on growing season application but not exclude any opportunity to conduct a prescribed fire during our typical prescribed fire season of December to August.

While prescribed fire is the preferred tool for restoration and maintenance within the Conservation Area, implementation of alternative methods will at times, and in certain areas, be necessary. During periods of extended drought conditions or in areas where implementing prescribed fire safely is not feasible, the District may employ management methods such as selective herbicide treatments, mowing, roller chopping, and overstory manipulation. In 2021, the District completed a wildfire fuel mitigation mowing project on the SLCA. The project included the rotary or mulch mowing of 135 acres of pine flatwoods and hardwood hammock with a goal of reducing the wildfire threat to surrounding communities. Firelines are maintained a minimum of once annually and are disced to mineral soil. In addition to maintaining firelines, District staff will continue mowing vegetation adjacent to firelines along the southwest boundary. This vegetation management will aid in the implementation of prescribed fire and provide some additional measures of safety to neighboring landowners.

A system of condition class measures was originally developed by The Nature Conservancy and the U.S. Forest Service in 2003 as an effort to assess ecosystem health. It was designed as Fire Regime Condition Class (FRCC) and is based on a relative measure describing the degree of departure from the historical natural fire regime of a given system. This departure results in changes to one or more of the following ecological components: species composition, structural stages, stand age, canopy closure, or mosaic pattern. The District adapted the system in 2008 to measure ecosystem health and, therefore, land management effectiveness.

Annually, each burn zone is assigned a condition class score based upon the most recent disturbance and the fire frequency recommended for that natural community by the FNAI. If the FNAI recommends a fire return interval of three to five years, a natural community that has

benefited from disturbance in the past five years is in condition class 1. If it has been more than five years but less than ten years, or two cycles, the zone is in condition class 2. If it has been more than two times the fire return interval, but can still be recovered by fire, it would fall into condition class 3. If the natural community has gone without disturbance so long that fire alone can no longer restore the area, it is in condition class 4. The District staff will make annual condition class assessments and incorporate them into annual burn planning and work planning processes. SLCA has approximately 39 acres that are not maintained by fire or disturbance which are not included in the Condition Class report (Figure 10).

All implementation of prescribed fire within the Conservation Area will be conducted in accordance with the SLCA Fire Management Plan (Appendix 3), the District Fire Management Plan, and the annual burn plan for the Conservation Area.

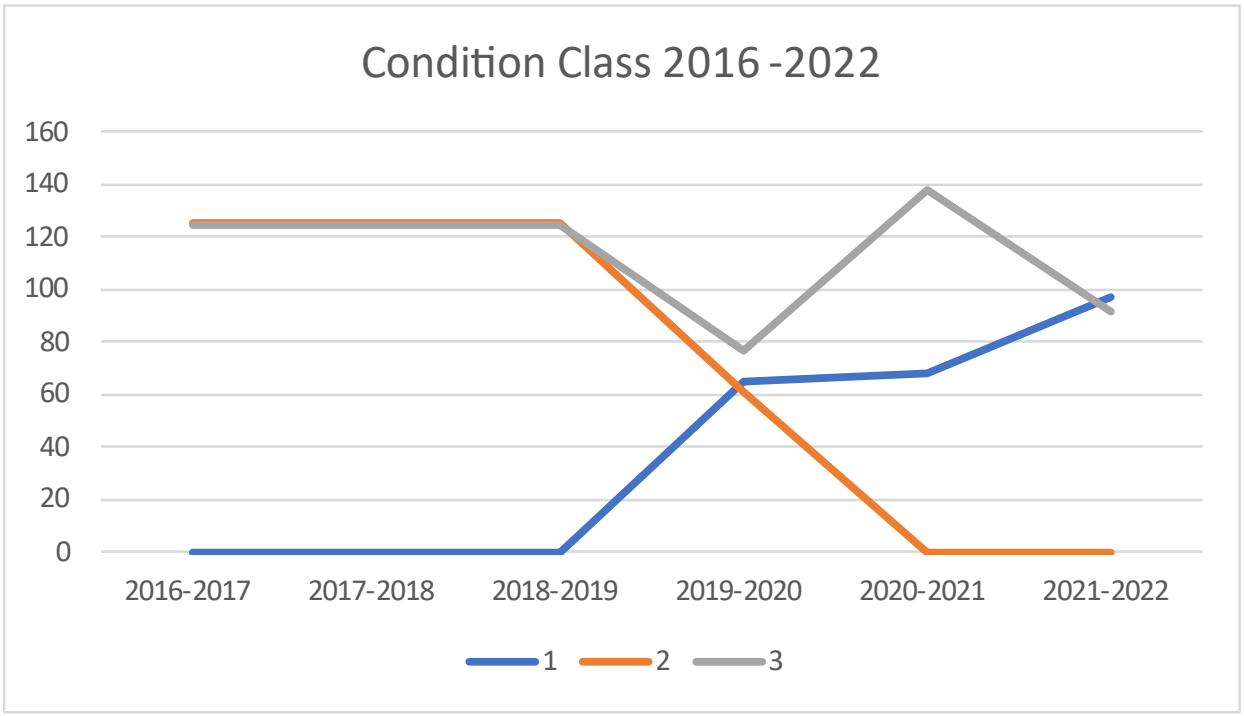

Figure 10: Stokes Landing Conservation Area Condition Class Report for years 2016-2022

FOREST MANAGEMENT

Goal: Maintain, improve, and restore forest resources.

Strategy:

- Manage flatwoods with prescribed fire, mechanical manipulations, and chemical treatments to promote species diversity.

Section 253.036, Florida Statutes, requires the lead agency of state lands to prepare a forest resource analysis, "…which shall contain a component or section…which assesses the feasibility of managing timber resources on the parcel for resource conservation and revenue generation purposes through a stewardship ethic that embraces sustainable forest management practices if the lead management agency determines that the timber resource management is not in conflict with the primary management objectives of the parcel." The District will employ a variety of forest management strategies over the term of this Plan. The forest management objectives of this Conservation Area will focus primarily on natural pine regeneration through prescribed fire and mechanical treatments and will likely not include harvest operations except in the event of loss due to wildfire, disease, or insect infestation.

In 2021, the District completed a wildfire fuel mitigation mowing project on the SLCA. The project included the rotary or mulch mowing of 135 acres of pine flatwoods and hardwood hammock with a goal of reducing the wildfire threat to surrounding communities. The area contained a mix of trees, shrubs and palmettos needing mowing to reduce fuel heights and mitigate wildfire risk. The northern part of the mowed area was burned in 2013 while the southern portion of the area was burned in 2005.

A forest resource assessment was recently conducted (February 2023) to determine if the timber resources on SLCA warrant timber stand improvement. It was determined that the conditions of the timber resources on the Conservation Area are not in need of timber stand improvement due to low, but ecologically appropriate stocking density and difficult operability. District staff will evaluate timber management as needed during this planning period. All forest resource work on the SLCA is restorative in nature and designed to aid in the promotion of species diversity and overall natural community health and vigor.

The District will abide by Florida Silviculture Best Management Practices (BMPs), Florida Forestry Wildlife BMPs for State Imperiled Species, and will target the achievement of appropriate overstory species in proper stand densities as described in the District Forest Management Plan. In addition to planned forest management activities, the District will remove trees as needed in the case of insect infestations, disease, and damage from severe weather, wildfire, or other occurrences that could jeopardize the overall health of natural communities.

Invasive Species
Goal: Remove invasive plants and animals.

Strategy:

- Treat at least 1.3 acres of invasive plants annually

- Continue to monitor invasive plant and wildlife species and implement appropriate action.

Several invasive plants occur within the Conservation Area including camphor tree (*Cinnamomum camphora*), Chinese tallow (*Triadica sebifera*), air potato (*Dioscorea bulbifera*), and cat's claw vine (*Macfadyena unguis-cati*).

Each of these invasive plants are listed by the Florida Invasive Species Council (FISC) as a Category 1 species (FISC, 2019). This categorization includes invasive species, which are "altering native plant communities by displacing native species, changing community structures or ecological functions, or hybridizing with natives" (Florida Exotic Pest Plant Council, 2019).

Invasive species control is necessary to inhibit the continued proliferation of invasive plants and is integral in the maintenance and restoration of natural plant communities. The District uses a variety of techniques including fire, mechanical, biological, and chemical treatments utilizing both staff and contractors. Herbicide is applied per label rates using the most appropriate method of application for the target species. In the past 10 years, 13 acres of invasive plants have been treated. Using this treatment history as a guide, a goal of treating 1.3 acres of invasive plants annually will be established.

While it is unlikely that the District will entirely eradicate invasive plants within the Conservation Area, depending on species and level of infestation, maintaining control, or achieving maintenance control of such species is targeted within the scope of this Plan. At this level, the Conservation Area will be regularly monitored and treated as necessary.

Invasive wildlife species known to occur within the Conservation Area include feral hogs (*Sus scrofa*), Cuban brown anoles (*Anolis sagreii*) and nine-banded armadillos (*Dasypus novemcinctus*). Soil disturbance from feral hog activity on the Conservation Area is minimal. The Conservation Area will continue to be monitored for increasing hog activity. If necessary, the District will issue an SUA for feral hog removal to an approved agent.

CULTURAL RESOURCE PROTECTION

Goal: Identify, protect, and maintain any cultural resources found on the Conservation Area.

Strategy:

- Monitor the two cultural sites on the SLCA.
- Identify and report newly discovered sites to the DHR.
- Identify and report any detrimental activities to the sites to the DHR and law enforcement.

A review of the Department of State, DHR, Florida Master Site File data indicates two registered cultural sites within the Conservation Area. If any additional sites are located, District staff will document and report the sites to the DHR. District land management activities that may impact these resources will be evaluated and modified to eliminate disturbance. To further protect the cultural resources, the location of the sites is not identified on public maps.

District staff with the assistance of the Florida Public Archaeology Network conducted a thorough survey of these areas (February 2023). No new sites were identified.

LAND USE MANAGEMENT

ACCESS

Goal: Evaluate opportunities to provide public access**.**

Strategy:

- Maintain parking areas, signs, gates, trails, and roads.

One public parking area is located off Lakeshore Drive along the western boundary of the Conservation Area. The parking area is fenced and has a walkthrough providing recreational access. Additional public access is available from the water near the pavilion located at a landing on Stokes Creek. An informative kiosk is provided at the parking area.

Currently, four gates provide management access to the Conservation Area. These gates are monitored regularly for maintenance and/or repair needs from normal wear and tear and vandalism.

Several interior management roads traverse the Conservation Area; some are incorporated into a multiuse trail system. In order to manage road maintenance, the District utilizes a roads classification system. This system includes the following classifications:

A. Paved Road – Any road that is paved.
B. Primary Road – Any road that requires routine maintenance of any kind.
C. Secondary Road – Any road that does not require routine maintenance, only periodic or no maintenance.

District staff will update the roads database to reflect changes to the road network within the Conservation Area, as necessary. Roads will be regularly inspected and receive maintenance and repair as necessary and may be subject to closure during these times. Additionally, activities such as prescribed fire, wildfires, timber harvesting, and other mechanical activities may result in temporary road closures.

RECREATION

Goal: Provide recreational opportunities consistent with the ecological needs of the Conservation Area.

Strategy:

- Maintain trails through contract.
- Maintain picnic area and observation platform.
- Maintain current information on the District website, trail guides, and kiosks.

Recreational opportunities within the Conservation Area are geared toward dispersed resource-based activities. The Conservation Area includes a trailhead with designated parking area, information kiosk, and access to the land using trails that are primarily interior roads, and fire lines that are currently maintained for land and water management purposes. The trail system is used predominantly for hiking and off-road bicycling and incorporates scenic vistas overlooking the estuarine salt marshes of the Tolomato River. Recreational fishing is available, and the Conservation Area includes a picnic area with pavilion at Stokes Creek Landing and an observation platform located along the marshes of the Tolomato River.

The trail system and pavilion were constructed by student volunteers from Allen D. Nease High School's Center for Environmental and Architectural Design program through the District's Legacy program in 1994. The pavilion has been used by the school as an outdoor classroom, a covered picnic area and inclement weather shelter for other recreators.

The recreation infrastructure is well established within the Conservation Area and is actively maintained. Approximately 2.1 miles of trails are maintained through a trail maintenance contract. Grassy trails and road edges are mowed four times yearly, as is the parking area. Additionally, the trails are blazed and trimmed of overhanging branches as needed. Figure 11 depicts the location of recreational amenities found within the Conservation Area.

The District will evaluate the need for further recreational development as visitor usage increases. Any changes to the recreational infrastructure will be updated on the District's recreation section on the website, which can be viewed online at https://www.sjrwmd.com/lands/recreation/.

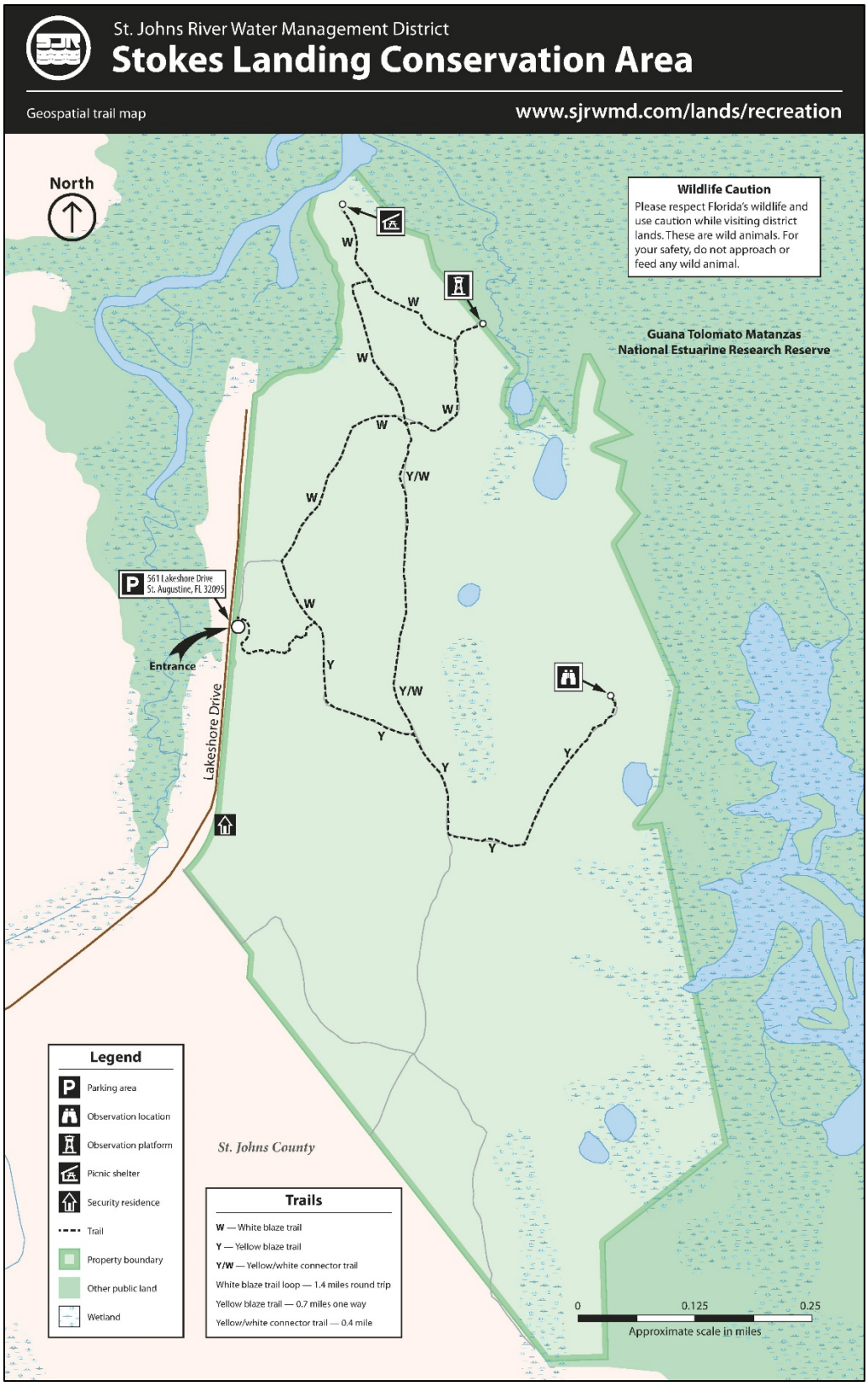

Figure 11: SLCA Recreational Amenities

SECURITY

Goal: Provide and maintain security.

Strategy:

- Maintain signage, fencing, gates, and locks.
- Continue coordination with Florida Fish and Wildlife Conservation Commission (FWC) and local law enforcement.

Most of the boundaries of the Conservation Area were marked and posted soon after the original survey work was complete. The primary security concerns include illegal motorized vehicle access. Portions of the west boundary fence near the parking area are frequently vandalized, and illegal vehicular access is problematic in this area. To deter mechanized entry to the Conservation Area in this location and minimize disturbance to the sensitive marshes, District staff installed stainless steel braided cable secured to fence posts with cable clamps. Vehicular access to the Conservation Area is managed through a system of gates and locks.

Law enforcement for the Conservation Area is administered by the District, primarily through coordination with the FWC and local law enforcement. Additionally, the District coordinates with GTM Research Reserve regarding security and patrolling needs.

ADMINISTRATION

REAL ESTATE ADMINISTRATION

Pursuant to section 373.139, F.S., occasionally the District may explore and pursue the surplus of portions of its land ownership. The District's interest in surplusing land may arise from a variety of considerations, including but not limited to:

- The property purchased as part of a larger acquisition and surplus portion is not needed for District purposes but was required to complete the larger acquisition.
- Original project for which the property was purchased was ultimately not built.
- The property is part of a patchwork of conservation ownership, managed by another agency or local government and the surplus is to transfer the ownership to the entity managing the property.
- Actions by adjacent owners which lower the property's conservation values or increase management costs.

When surplussing a property, the District commonly retains a conservation easement over the property and/or the deed contains a reverter clause. This provides for the future conservation of the property and the ability for the District to regain ownership if conservation or preservation is threatened in the future.

As with all decisions associated with land ownership, any surplus of District-owned property requires the approval of the District's Governing Board. If the property in question was originally

purchased for conservation purposes, the Governing Board shall determine that the land is no longer needed for conservation purposes and may then change ownership of the land by two thirds vote (§ 373.089, F.S.).

There are no anticipated surpluses or acquisitions associated with the Conservation Area over the next ten years (Figure 12). Given that the Conservation Area is bounded on three sides by conservation lands and roads on the other, the optimal boundary may be the current boundary.

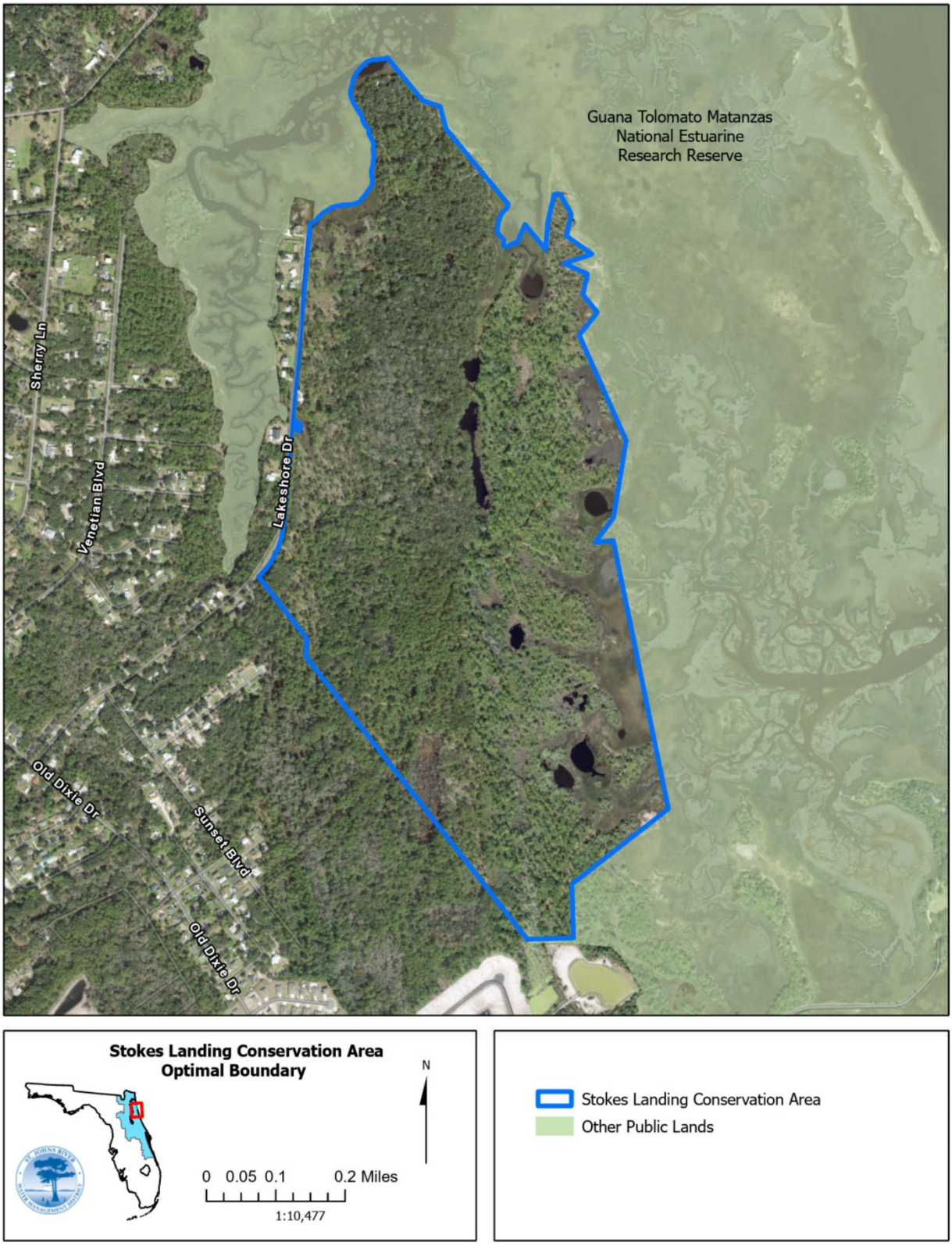

Figure 12: Optimal Boundary

COOPERATIVE AGREEMENTS, LEASES, EASEMENTS, AND SPECIAL USE AUTHORIZATIONS

Goal: Evaluate and pursue cooperative opportunities.

Strategy:

- Administer easements, agreements, leases and SUAs.

Section 373.1391, Florida Statutes, authorizes and encourages the District to enter into cooperative land management agreements with state agencies or local governments to provide for the coordinated and cost-effective management of lands to which the water management districts, the Board of Trustees of the Internal Improvement Trust Fund, or local governments hold title. In addition to Florida Statutes, District Policy #820, promotes the District entering into agreements with other agencies and private parties for cooperation and coordination of management of the District's lands. In addition, the District is authorized to enter into Cooperative Agreements, Cooperative Management Leases, Leases, Easements and SUAs to protect the District's water management interests and to enhance the management and public value of the land. Leases can be a useful tool to accomplish land management objectives and will be evaluated and implemented where appropriate. Common examples include cattle grazing and apiaries, and the District remains open to considering other types of leases which help achieve management goals. Currently there are no revenue generating leases on the Conservation Area. Table 3 details the agreements, leases, and SUAs in effect during the writing of this Plan.

Table 3: Cooperative Agreements, Leases and Special Use Authorizations

Agreement Number	Type/Purpose	Agreement Name	Term
1686	SUA/Research-Sampling	Anastasia Mosquito Control District	June 20, 2019 – June 19, 2020, renews automatically for four (4) consecutive one (1) year terms, terminating on June 19, 2024
2268	SUA/Research-Sampling	Department of Biological Sciences, Kent State University	September 13, 2021 – September 12, 2022, renews automatically for four (4) consecutive one (1) year terms, terminating on September 12, 2026

MANAGEMENT REVENUES AND COSTS

Goal: Analyze and report projected and actual costs and revenues.

Strategy:

- Analyze and report revenues.
- Analyze and report land management costs.

Revenue Generation

SLCA does not generate any revenue. Protection of the SLCA provides ecosystem services, which are the combination of the goods and services provided by the functions (habitat, biological properties, or processes) of an ecosystem. Ecosystem goods (such as raw materials) and services (such as water supply protection) represent some of the benefits human populations derive, directly or indirectly, from ecosystem functions. Using metrics developed by Costanza *et al.* (1997) and Blair *et al.* (2015), the ecosystem services provided by the 39 acres of wetlands within the Conservation Area can be valued at approximately $5.85 million annually. These benefits are produced by disturbance regulation, water supply protection, water quality improvements, and tourism and recreation opportunities amongst many others.

Conservation Area Costs

Since the last land management update of the Conservation Area in 2009, management costs have totaled $99,550 (Table 4).

Table 4: Management Costs from 2009 to 2022

Activity	**Annual Number of Units**	**Units**	**Annual Cost**	**Total Cost (Since 2009)**
Invasive plant control	2.5	Acres	$285	$3,705
Staff Time	80	Hours	$2200	$28,600
Prescribed Fire	149	$25/Acre	$287	$3,725
Mowing	-	$100/year	$100	$1,300
Mowing (trails)	-	$80/month	$960	$12,480
Service Mowing	6	Acres	$240	$3,120
Fireline Disking	-	Miles	$990	$12,870
Mowing Project (2021)	-	-	NA	$33,750
Total Cost Since 2009			**$5,062**	**$ 99,550**

Projected Management Costs

Projected management costs for the SLCA from 2023 to 2033 are $95,550 (Table 5).

Table 5: Projected Management costs from 2023 to 2033

Activity	Number of Units (annual)	Units	Annual Cost	10 Year Total Cost
Invasive plant control	2.5	Acres	$285	$2,850
Staff Time	80	Hours	$2,200	$22,000
Prescribed Fire	26	$30/Acre	$780	$7,800
Mowing	-	$100/year	$100	$1,000
Mowing (trails)	-	$80/month	$960	$9,600
Service Mowing	6	Acres	$240	$2,400
Fireline Disking	-	Miles	$990	$9,900
Mechanical Fuels Treatment (2028)	-	-	-	$30,000
Natural Communities Mapping	-	-	-	$10,000
Total cost over 10 years			**$5,555**	**$95,550**

RESOURCE PROTECTION AND MANAGEMENT

Water Resources			
Goal	**Protect water quality and quantity, restore hydrology to the extent feasible, and maintain the restored condition**	**Measure**	**Planning Period**
Strategy A	Include depression marshes and other wetland edges in fire management activities.	Depression marshes and wetland edges burned	Annually by September 1
Strategy B	Regularly inspect roads, firelines, and trails for erosion problems and maintenance and repair needs.	Roads, firelines, and trails inspected	Annually by September 1
Forest Management and Restoration			
Goal	**Maintain forest resources for water quality, water supply, flood protection and natural resource benefit.**	**Measure**	**Planning Period**
Strategy A	Manage flatwoods with prescribed fire, mechanical manipulations, and chemical treatments to promote species diversity.	Number of acres burned, mechanically manipulated, or treated chemically.	Ongoing

Fire Management			
Goal	**Maintain forest resources for water quality, water supply, flood protection and natural resource benefit.**	**Measure**	**Planning Period**
Strategy A	Introduce growing season burns, where applicable.	Acres burned in growing season	Ongoing
Strategy B	In the absence of fire conduct mechanical and chemical treatments to mimic fire effects.	Number of acres mowed, or roller chopped	Annually by September 1 as fire return intervals become tardy
Strategy C	Maintain firelines twice annually.	Firelines maintained	Spring and Fall
Strategy D	Prepare annual burn plans.	Burn plan	Annually by September 1
Strategy E	Implement prescribed fire activities in accordance with the SLCA Land Management Plan and the SLCA Fire Management Plan.	Acres burned	Ongoing
Flora and Fauna			
Goal	**Maintain, improve, or restore native and listed species populations**	**Measure**	**Planning Period**
Strategy A	Conduct floral and faunal surveys and further develop species lists.	Updates to species list	Upon discovery and updated annually by September 1
Strategy B	Continue to monitor for the presence of listed species and update management actions appropriately.	Updates to species list and adjusted management actions	Ongoing
Strategy C	Monitor for sea level induced wetland migration	Natural Community Mapping	Every 10 years
Goal	**Remove invasive plants and animals**	**Measure**	**Planning Period**
Strategy A	Continue to monitor for invasive plant and wildlife species and implement appropriate actions.	Mapping and treatment of new infestations	Ongoing

Cultural Resource Protection			
Goal	**Identify, protect, and maintain any cultural resources found on the Conservation Area**	**Measure**	**Planning Period**
Strategy A	Monitor the two cultural sites on the SLCA.	Existing sites visited and evaluated	At least once during planning period
Strategy B	Identify and report newly discovered sites to the Florida Department of Historical Resources (DHR).	Sites identified and reported	Upon discovery
Strategy C	Identify and report any detrimental activities to the sites to the DHR and law enforcement.	Sites identified and reported	Upon discovery

LAND USE MANAGEMENT

Access			
Goal	**Evaluate opportunities to provide public access**	**Measure**	**Planning Period**
Strategy A	Maintain parking areas, signs, gates, trails, and roads.	Parking areas, signs, gates, trails, and roads maintained	Ongoing
Recreation			
Goal	**Provide recreational opportunities consistent with the ecological needs of the Conservation Area.**	**Measure**	**Planning Period**
Strategy A	Maintain trails through contract.	Trails maintained	Every 4 months
Strategy B	Maintain picnic area and observation platform.	Picnic area and observation platform maintained	Annually by September 1
Strategy C	Maintain current information on the District website, trail guides, and kiosks.	Up-to-date online status	Annually by September 1

Security			
Goal	**Provide and maintain security**	**Measure**	**Planning Period**
Strategy A	Maintain signage, fencing, gates and locks.	Signs, fences, gates, and locks maintained	Annually by September 1
Strategy B	Continue to coordinate with FWC and local law enforcement.	Secure Conservation Area	Monthly

ADMINISTRATION

Real Estate Administration			
Goal	**Explore opportunities for adjacent property acquisition**	**Measure**	**Planning Period**
Strategy A	Evaluate adjacent properties for potential acquisition.	Properties evaluated	Annually by September 1
Cooperative Agreements, Leases, Easements, and Special Use Authorizations			
Goal	**Evaluate and pursue cooperative opportunities**	**Measure**	**Planning Period**
Strategy A	Administer easements, agreements, leases, and SUAs.	Agreements administered	Ongoing
Management Revenues and Costs			
Goal	**Analyze and report projected and actual costs and revenues**	**Measure**	**Planning Period**
Strategy A	Analyze and report revenues.	Annual report	Annually by November
Strategy B	Analyze and report land management costs.	Annual report	Annually by November

WORKS CITED

Blair, S., C. Adams, T. Ankersen, M. McGuire, D. Kaplan. 2015. *Ecosystem Services Valuation for Estuarine and Coastal Restoration in Florida*. EDIS Publication TP-204. Institute of Food and Agricultural Sciences. Gainesville: University of Florida.

Costanza, R., R. d'Arge, R. de Groot, S. Rarber, M. Grasso, B. Hannon, K. Limburg, S. Naeem, R. O'Neill, J. Paruelo, and R. Raskin. 1997. *The Value of the World's Ecosystem Service and the Natural Capital.* Nature 387:253–260.

Florida Exotic Pest Plant Council (FLEPPC). 2019. *Florida Exotic Pest Plant Council's 2019 List of Invasive Plant Species*. http://bugwoodcloud.org/CDN/fleppc/plantlists/2019/2019_Plant_List_ABSOLUTE_FINAL.pdf

Florida Invasive Species Council (FISC). 2019. *2019 FISC List of Invasive Plant Species*. http://floridainvasivespecies.org/plantlist.cfm.

Florida Natural Areas Inventory and Florida Department of Natural Resources. 2010. *Guide to the Natural Communities of Florida*. [Last Accessed January 2020]. www.fnai.org.

Linhoss, A.C., G. Kiker, M. Shirley, and K. Frank. 2015. *Sea-level rise, inundation, and marsh migration: simulating impacts on developed lands and environmental systems.* Journal of Coastal Research 31(1), 36-46.

Lowther, P.E. 2009. Painted Bunting. (C.L. Ornithology, Editor) Retrieved September 10, 2009, the Birds of North America Online: http://bna.birds.cornell.edu/bna/species/398/articles/habitat

Miller, C.B., A.B. Rodriguez and M.C. Bost. 2021. *Sea-level rise, local subsidence, and increased storminess promote saltmarsh transgression across low-gradient upland areas.* Quaternary Science Reviews, 265.

Montague, C.L., & R.G. Wiegert. 1990. Ecosystems of Florida. (R.L. Myers, & J.J. Ewel, Eds) Orlando: University of Central Florida Press.

St. Johns River Water Management District (SJRWMD). 2022. Status and Trends Report. https://www.sjrwmd.com/data/water-quality/#status-trends.

St. Johns County Growth Management Department. 2023. St. Johns County 2025 Comprehensive Plan. http://www.co.st-johns.fl.us/LongRangePlanning/2025GOP.aspx [Last Accessed January 2023]

U.S. Fish and Wildlife Service (USFWS). 2021. Birds of Conservation Concern 2021. U.S. Fish and Wildlife Service, Migratory Birds Program. https://fws.gov/media/birds-conservation-concern-2021pdf.

Williams, C.P., T.M. Scott, and S.B. Upchurch. 2022. Florida Geomorphology Atlas: Florida Geological Survey Special Publication 59.

APPENDIX 1: STOKES LANDING CONSERVATION AREA SPECIES LIST

Plants

Scientific name	Common Name (Conservation Status)
Acer rubrum	red maple
Acrostichum danaefolium	giant leather fern
Ambrosia artemisiifolia	common ragweed
Amorpha fruticosa	false indigobush
Andropogon virginicus var *glaucus*	chalky bluestem
Aristida stricta	Wiregrass
Aralia spinosa	devil's walking stick
Asclepias pedicellata	Savannah milkweed
Asclepias perennis	swamp milkweed
Asimina parviflora	small-flower pawpaw
Asimina pygmea	gopher-berry
Baccharis angustifolia	saltwater false willow
Baccharis hamlifolia	groundsel tree
Baccharis glomeruliflora	Silverling
Bacopa caroliniana	lemon bacopa
Bacopa monnieri	herb-of-grace
Batis maritima	Saltwort
Bejaria racemosa	Tarflower
Bidens alba	Beggarticks
Callicarpa americana	Beautyberry
Campsis radicans	American trumpet vine
Canna flaccida	golden canna
Carex stipata	awl-fruited sedge
Carpinus caroliniana	American hornbeam
Carphephorus odoratissimus	Vanillaleaf
Cartrema americanum	wild olive
Carya aquatica	water hickory
Carya glabra	pignut hickory
Celtis laevigata	Sugarberry
Cephalanthus occidentalis	Buttonbush
Chamaecrista fasciculata	partridge pea
Chasmanthium laxum	slender woodoats
Citrus sp.	citrus tree*
Cladium jamaicense	sawgrass
Commelina diffusa	climbing dayflower
Cornus foemina	stiff dogwood
Crocanthemum corymbosum	pine barren frostweed
Cuphea carthagenensis	Colombian waxweed
Dichanthelium sp.	Witchgrass

Dichanthelium patulum	hemlock witchgrass
Dichondra carolinensis	Carolina ponysfoot
Dioscorea bulbifera	air potato*
Echinochloa crus-galli	Barnyardgrass
Edrastima uniflora	clustered mille grains
Eleocharis sp	spikerush
Eleocharis vivipara	viviaparous spikerush
Elephantopus nudatus	smooth elephants foot
Eragrostis atrovirens	Thalia lovegrass
Erythrina herbacea	coral bean
Eryngium baldwinii	Baldwin's eryngo
Eupatorium capilifolium	dogfennel
Eupatorium rotundifolium	round leaved boneset
Eupatorium serotinum	late boneset
Esustachys glauca	saltmarsh finger grass
Euthamia weakleyi	Weakley's goldentop
Fraxinus caroliniana	pop ash
Fraxinus pennsylvanica	green ash
Fimbristylis castanea	marsh fimbry
Galactia elliottii	elliott's milkpea
Galium tinctorium	stiff marsh bedstraw
Gaylussacia dumosa	dwarf huckleberry
Gaylussacia tomentosa	blue huckleberry
Gelsemium sempervirens	yellow jessamine
Geobalanus oblongifolius	gopher apple
Gonolobus suberosus	angle pod (ST)
Gordonia lasianthus	loblolly bay
Guzmania monostachia	west indian tufted airplant
Helianthus floridanus	Florida sunflower
Hibiscus grandiflorus	swamp rosemallow
Hydrocotyle umbellata	manyflower marshpennywort
Hypericum cistifolium	roundpod St. John's wort
Hypericum galioides	bedstraw St. John's wort
Hypericum hypericoides	St. John's cross
Hypericum virginicum	Virginia marsh St. John's wort
Hyptis alata	musky mint
Ilex ambigua	Carolina holly
Ilex cassine	dahoon holly
Ilex glabra	Gallberry
Ilex opaca	American holly
Ilex vomitoria	yaupon holly
Indigofera spicata	creeping (or trailing) indigo

Ipomoea cordatotriloba	morning glory
Ipomea sagitata	saltmarsh morning-glory
Iris savannarum	savanna iris
Iva frutescens	marsh elder
Juncus dichotomus	forked rush
Juncus elliottii	Elliott's rush
Juncus marginatus	grass-leaved rush
Juncus megacephalus	bighead rush
Juncus roemerianus	needlegrass rush
Juniperus virginiana	eastern redcedar
Landoltia punctata	dotted duckweed
Lantana camara	Common lantana
Liatris sp.	blazing-star
Licania michauxii	gopher apple
Liquidambar styraciflua	sweetgum
Limonium carolinianum	Carolina sea lavender
Lycium carolinianum	Christmas berry
Lycopus amplectens	clasping water horehound
Lyonia ferruginea	rusty staggerbush
Lyonia fruticosa	coastal plain staggerbush
Lyonia lucida	Fetterbush
Magnolia virginiana	Sweetbay
Magnolia grandiflora	southern magnolia
Melia azedarach	Chinaberrytree*
Melinis repens	rose natalgrass*
Mikania scandens	climbing hempvine
Monarda punctata	spotted beebalm
Morella cerifera	wax myrtle
Morella pumila	dwarf bayberry
Morus rubra	red mulberry
Muhlenbergia capillaris	hairawn muhly
Nephrolepis exaltata	wild Boston fern
Nyssa aquatica	water tupelo
Nyssa biflora	swamp tupelo
Oplismenus hirtellus	basket grass
Opuntia humifusa	devil's tongue
Osmunda regalis	royal fern
Ostrya virginiana	eastern hophornbeam
Oxalis debilis	largeflower pink-sorrel
Panicum hemitomon	Maidencane
Parthenocissus quinquefolia	virginia creeper
Paspalum notatum	bahia grass

Paspalum urvillei	vasey grass
Persea palustrus	red bay
Persicaria hydropiperoides	mild waterpepper
Phanopyrum gymnocarpon	savannah panicum
Phasseolus polystachios	thicket bean
Phlebodium aureum	golden polypody fern
Phyla nodiflora	turkey tangle fogfruit
Pinguicula pumila	small butterwort
Pinus elliottii	slash pine
Pinus clausa	sand pine
Pinus serotina	pond pine
Pityopsis graminifolia	narrowleaf silkgrass
Plantanus occidentalis	American sycamore
Pleopeltis polypodioides var. michauxiana	resurrection fern
Pluchea longifolia	longleaf camphorweed
Polygala lutea	orange milkwort
Polygonum sp.	Smartweed
Pontederia cordata	Pickerelweed
Proserpinaca pectinata	combleaf mermaidweed
Pseudognaphalium obtusifolium	rabbit tobacco
Psychotria nervosa	wild coffee
Psychotria sulzneri	shortleaf wild coffee
Pteridium aquilinum	bracken fern
Pterocaulon pycnostachyum	Blackroot
Quercus geminata	sand live oak
Quercus laurifolia	laurel oak
Quercus myrtifolia	myrtle oak
Quercus nigra	water oak
Quercus shumardii	shumard's oak
Quercus virginiana	live oak
Rhapidophyllum hystrix	needle palm
Rhus copallinum	winged sumac
Rhynchospora colorata	whitetop sedge
Rhynchospera corniculata	short bristled horned beaksedge
Rhynchospora inundata	narrowfruit horned beaksedge
Rubus cuneifolius	sand blackberry
Rubus pensilvanicus	Pennsylvania blackberry
Ruppia maritima	Widgeongrass
Sabal palmetto	cabbage palm
Sagittaria graminea	grass-leaved arrowhead
Salicornia ambigua	perennial glasswort
Salix carolinana	carolina willow

Salvinia minima	water spangles
Saururus cernuus	lizard's tail
Schinus terebinthifolius	Brazilian pepper*
Scleria triglomerata	whip nutrush
Scutellaria integrifolia	helmet skullcap
Sesbania vesicara	bladder pod
Serenoa repens	saw palmetto
Sesuvium portulacastrum	sea purslane
Seriocarpus tortifolius	dixie aster
Setaria sp.	Foxtail
Seymeria pectinata	combleaf blacksenna
Sideroxylon tenax	tough bully
Sisyrinchium rosulatum	annual blue-eyed grass
Smilax auriculata	earleaf greenbrier
Smilax bona-nox	saw greenbrier
Smilax glauca	sawbrier
Smilax pumila	sarsaparilla vine
Smilax taminoides	bristly greenbrier
Smilax walteri	coral greenbrier
Solanum viarum	tropical soda apple*
Solidagoodora var. Chapmanii	Chapman's goldenrod
Spartina alterniflora	sand cordgrass
Symphyotrichum simmondsii	Simmond's aster
Symphyotrichum subulatum	annual saltmarsh aster
Symphiotrichum tenufolium	perennial saltmarsh aster
Stellaria media	common chickweed
Taxodium ascendens	pond cypress
Taxodium distichum	bald cypress
Thalia geniculata	Alligatorflag
Tilia americana	Carolina basswood
Tillandsia bartramii	Bartram's air-plant
Tillandsia simulata	Florida air-plant
Tillandsia usneoides	Spanish moss
Tillandsia utriculata	giant airplant
Torenia crustacea	brittle false pimpernel
Trichstema dichtomum	blue curls
Triglochin striata	three-ribbed arrowgrass
Triadica sebifera	Chinese tallow*
Typha latifolia	broadleaf cattail
Ulmus americana	American elm
Urena lobata	Caesar weed*

Vaccinium myrsinites	shiny blueberry
Vaccinium stamineum	deerberry
Verbensina virginica	frostweed
Viburnum obovatum	Walter's viburnum
Vicia acutifolia	fourleaf vetch
Viola edulis	salad violet
Viola primulifolia	primrose-leaf violet
Viola sororia	common blue violet
Vitis rotundifolia	Grapevine
Vitis vulpina	frost grape
Vittaria lineata	shoestring fern
Woodwordia virginica	Virginia chainfern
Zanthoxylum clava-herculis	toothache tree

Birds

Specific Name	**Common Name (Conservation Status)**
Blackbirds, Orioles, etc.	
Agelaius phoeniceus	Red-winged Blackbird
Molothrus ater	Brown-headed Cowbird
Cardinals, Grosbeaks, and Allies	
Cardinalis cardnalis	Northern Cardinal
Catbirds, Mockingbirds, and Thrashers	
Dumetella carolinensis	Gray Catbird
Mimus polyglottos	Northern Mockingbird
Cuckoos and Allies	
Coccyzus americanus	Yellow-billed Cuckoo
Cormorants, Anhingas, etc.	
Anhinga anhinga	Anhinga
Nannopterum auritum	Double-crested Cormorant
Crows, Ravens, Jays, etc.	
Coragyps atratus	Fish Crow
Corvus brachyrhynchos	American Crow
Cyanocitta cristata	Blue Jay
Quiscalus major	Boat-tailed Grackle
Quiscalus quiscula	Common Grackle
Falcons	

Falco columbarius	Merlin
Falco peregrinus	Peregrine Falcon
*Falco sparverius***	American Kestrel (ST) (G5, T4, S3)

Flycatchers

Contopus virens	Eastern Wood-Peewee
Myiarchus crinitus	Great Crested Flycatcher
Tyrannus tyrannus	Eastern Kingbird

Finches, Sparrows, Buntings, etc

Ammospiza caudacuta	Saltmarsh Sparrow
Ammospiza maritima	Seaside Sparrow
Ammospiza nelson	Nelson's Sparrow
Haemorhous mexicanus	House Finch
Passerina ciris	Painted Bunting
Passerina cyanea	Indigo Bunting
Pheucticus ludovicianus	Rose-breasted Grosbeak
Pipilo erythrophthalmus	Eastern Towhee
Melospiza georgiana	Swamp Sparrow
Melospiza melodia	Song Sparrow
Spinus tristus	American Goldfinch
Spizella passerina	Chipping Sparrow

Gnatcatchers

Corthylio calendula	Ruby-crowned Kinglet
Polioptila caerulea	Blue-gray Gnatcatcher

Grebes

Podilymbus podiceps	Pied-billed Grebe

Grouse, Quail, and Allies

Colinus virginianus	Northern Bobwhite

Gulls and Terns

Hydroprogne caspia	Caspian Tern
Larus argentatus	Herring Gull
Larus delawarensis	Ring-billed Gull
Leucophaeus atricilla	Laughing Gull
Thalasseus maximus	Royal Tern
Thalasseus sandvicensis	Sandwich Tern
*Rynchops niger***	Black Skimmer (ST, G5, S3)
Sterna forsteri	Forster's Tern
*Sternula antillarum***	Least Tern (ST) (G4, S3)

Herons, Ibis, and Allies

Ardea alba	Great Egret
Ardea herodias	Great Blue Heron
Bubulcus ibis	Cattle Egret
Butorides virescens	Green heron
Egretta thula	Snowy egret
*Egretta caerulea***	Little Blue Heron (G5, S4, ST, FN)
*Egretta rufescens***	Reddish Egret (ST, G4, S2)
*Egretta tricolor***	Tricolored heron (G5, S4, ST, FN)
Eudocimus albus	White Ibis
Nycticorax nycticorax	Black-crowned Night-heron
Nyctanassa violacea	Yellow-crowned Night-heron
*Platalea ajaja***	Roseate spoonbill (G5, S2, ST, FN)
Plegadis falcinellus	Glossy Ibis
Hummingbirds	
Archilochus colubris	Ruby-throated Hummingbird
Kingfishers	
Megaceryle alcyon	Belted kingfisher
Mockingbirds and Thrashers	
Dumetella carolinensis	Gray Catbird
Toxostoma rufum	Brown Thrasher
Nightjars	
Choreiles minor	Common Nighthawk
Antrostomus carolinensis	Chuck-will's Widow
Nuthatches	
Sitta pusilla	Brown-headed Nuthatch
Owls	
Bubo virginianus	Great Horned Owl
Megascops asio	Eastern Screech Owl
Strix varia	Barred Owl
Oystercatchers	
*Haematopus palliates***	American Oystercatcher (ST) (G5, S2)
Pelicans	
Pelecanus erythrorhyncos	American White Pelican
Pelecanus occidentalis	Brown Pelican
Plovers	
Arenaria interpres	Ruddy Turnstone

Charadrius semipalmatus	Semipalmated Plover
Pluvialia squatarola	Black-bellied Plover
Pigeons and Doves	
Columba livia	Rock Pigeon
Columbina passerina	Common Ground Dove
Zenaida macroura	Mourning Dove
Sandpipers, Snipe, Phalropes	
Actitis macularius	Spotted Sandpiper
Calidris alpina	Dunlin
Calidris Himantopus	Stilt Sandpiper
Calidris mauri	Western Sandpiper
Calidris minutilla	Least Sandpiper
Catoptrophorus semipalmatus	Willet
Charadrius vociferus	Killdeer
Limnodromus griseus	Short-billed Dowitcher
Numenius phaeopus	Whimbrel
Tringa flavipes	Lesser Yellowlegs
Tringa melanoleuca	Greater Yellowlegs
Tringa solitaria	Solitary Sandpiper
Smaller Wading Birds	
Rallus crepitans	Clapper Rail
Rallus limicola	Virginia Rail
Storks	
*Antigone canadensis***	Sandhill Crane (ST, G5, T2, S2)
*Mycteria americana***	Wood Stork (G4, S2, ST, FT)
Swallows (incl. Swifts)	
Chaetura pelagica	Chimney Swift
Hirundo rustica	Barn Swallow
Petrochelidon pyrrhonota	Cliff Swallow
Progne subis	Purple Martin
Tachycineta bicolor	Tree Swallow
Tanagers	
Piranga striata	Scarlet Tanager
Piranga rubra	Summer Tanager
Thrushes	
Catharus guttatus	Hermit Thrush
Catharus minimus	Gray-cheeked Thrush
Catharus ustulatus	Swainson’s Thrush

Parkesia noveboracensis	Northern Waterthrush
Sialia sialis	Eastern Bluebird
Turdus migratorius	American Robin

Tits, Chickadees, and Titmice

Poecile carolinensis	Carolina Chickadee
Baeolophus bicolor	Tufted Titmouse
Mniotilta varia	Black-and-white Warbler
Parula americana	Northern Parula

Tyrant Flycatchers: Pewees, Kingbirds, and Allies

Contopus virens	Eastern Wood-Pewee
Sayornis phoebe	Eastern Phoebe
Myiarchus crinitus	Great Crested Flycatcher

Vireos

Vireo olivaceus	Red-eyed Vireo
Vireo flavifrons	Yellow-throated Vireo
Vireo griseus	White-eyed Vireo
Vireo solitarius	Blue-headed Vireo

Vultures, Hawks, and Allies

Accipiter cooperi	Cooper's Hawk
Buteo lineatus	Red-shouldered Hawk
Buteo jamaicensis	Red-tailed Hawk
Coragyps atratus	Black Vulture
Cathartes aura	Turkey Vulture
Circus hudsonius	Northern Harrier
Elanoides forficatus	Swallow-tailed Kite
Haliaeetus leucocephalus	Bald eagle
Pandion haliaetus	Osprey

Waterfowl

Anas platyrhynchos	Mallard
Aix sponsa	Wood Duck
Branta canadensis	Canada Goose
*Cairina moschata**	Muscovy Duck
Gavia immer	Common Loon
Lophodytes cucullatus	Hooded Merganser
Mergus serrator	Red-breasted Merganser

Warblers

Dendroica palmarum	Palm Warbler
Dendroica pinus	Pine Warbler
Dendroica discolor	Prairie Warbler

Dendroica coronata	Yellow-rumped Warbler
Geothlypis trichas	Common Yellowthroat
Helmitheros vermivorum	Worm-eating Warbler
Leiothlypis celata	Orange-crowned Warbler
Leiothlypis peregrina	Tennessee Warbler
Mniotilta varia	Black-and white Warbler
Protonotaria citrea	Prothonotary Warbler
Setophaga americana	Northern Parula
Setophaga caerulescens	Black-throated Blue Warbler
Setophaga coronata	Yellow-rumped Warbler
Setophaga dominica	Yellow-throated Warbler
Setophaga discolor	Prairie Warbler
Setophaga fusca	Blackburnian Warbler
Setophaga pensylvanica	Chestnut-sided Warbler
Setophaga petechia	Yellow Warbler
Setophaga pinus	Pine Warbler
Setophaga striata	Blackpoll Warbler
Setophaga tigrina	Cape May warbler
Seiurus aurocapilla	Ovenbird

Waxwings

Bombycilla cedrorum	Cedar Waxwing

Woodpeckers

Colaptes auratus	Northern Flicker
Picoides pubescens	Downy Woodpecker
Dryocopus pileatus	Pileated Woodpecker
Melanerpes carolinus	Red-bellied Woodpecker
Sphyrapicus varius	Yellow-bellied Sapsucker

Wrens

Cistothorus stellaris	Sedge Wren
Cistothorus palustrus	Marsh Wren
Troglodytes aedon	House Wren
Thryothorus ludovicianus	Carolina Wren

Amphibians

Specific Name	**Common Name (Conservation Status)**
Acris gryllus dorsalis	Florida cricket frog
Anaxyrus quercicus	Oak toad
Anaxyrus terrestris	Southern toad
Arcis gryllus	Southern cricket frog
Hyla femoralis	Pinewoods Treefrog

Lithobates grylio	Pig frog
Lithobates sphenocephalus	Southern leopard frog
Pseudacris nigrita	Southern chorus frog
Pseudacris ocularis	Little grass frog

Mammals

Specific name	Common Name (Conservation Status)
Dasypus novemcinctus	Nine-banded Armadillo
Didelphis virginiana	Virginia Opossum
Odocoileus virginianus	White-tailed deer
Procyon lotor	Racoon
Sciurus carolinensis	Eastern gray squirrel
*Sus scrofa**	Feral hog
Didelphis virginiana	Virginia opossum
Sylvilagus floridanus	cottontail rabbit
Canis latrans	coyote

Reptiles

Specific Name	Common Name (Conservation Status)
Alligator mississippiensis	American alligator
Agkistrodon conanti	Florida cottonmouth
Anolis carolinensis carolinensis	Green anole
*Anolis sagrei**	Brown anole
Aspidoscelis sexlineata	Six-lined racerunner
Coluber constrictor priapus	Southern black racer
Crotalus adamanteus	Eastern diamondback rattlesnake
Deirochelys reticularia	Chicken turtle
*Gopherus polyphemus***	Gopher tortoise (ST, G3, S3)
Kinosternon baurii	Striped mud turtle
Masticophis flagellum flagellum	Eastern coachwhip
Nerodia fasciata pictiventris	Florida watersnake
Pantherophis guttatus	Corn snake
Sternotherus odoratus	Common musk turtle
Terrapene carolina	Florida box turtle
Thamnophis saurita	Ribbon snake

Fish

Specific Name	Common Name (Conservation Status)

Anchoa mitchilli	Bay Anchovy
Dasyatis sabina	Bay Anchovy
Elassoma evergladei	Everglades pygmy sunfish
Etropus crossotus	Fringed Flounder
Esox americanus	Redfin pickerel
Gambusia holbrooki	Mosquito fish
Harengula jaguana	Scaled Sardine
Menidia spp	Menidia Silversides
Menticirrhus americanus	Southern Kingfish
Menticirrhus littoralis	Gulf Kingfish
Mugil curema	White Mullet
Prionotus scitulus	Leopard Searobin
Synodus foetens	Inshore Lizardfish

Invertebrates

Order	Specific Name	Common Name (Conservation Status)
Coleoptera	*Phanaeus vindex*	Green Dung beetle
Diplopoda	*Anadenobolus monilicornis*	Yellow-banded millipede
Hemiptera	*Ranatra sp.*	Water Scorpion
Heteroptera	*Lethocerus sp.*	Giant Water Bug
Hymenoptera	*Apis millifera*	Western Honeybee
Hymenoptera	*Bombus impatiens*	Common eastern bumble bee
Hymenoptera	*Camponotus floridanus*	Carpenter ant
Hymenoptera	*Dasymutilla occidentalis*	Velvet ant
Lepidoptera	*Danaus gilippus*	Zebra Swallowtail
Lepidoptera	*Megisto cymela*	Little Wood Satyr
Lepidoptera	*Papilio paamedes*	Palamedes Swallowtail
Lepidoptera	*Satyrium favonius*	Oak Hairstreak
Lepidoptera	*Thyridopteryx ephemeraeformis*	Bagworm
Lepidoptera	*Thorybes sp.*	Skippers
Odonata	*Anax junius*	Common Green Darner
Odonata	*Ischnura hastata*	Citrine Forktail
Odonata	*Libellula axilena*	Bar-winged skimmer
Orthoptera	*Scudderia sp.*	Scudder's bush katydids

***Exotic**
**** Listed – Status descriptions below**
FNAI GLOBAL RANKING
G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
G3 = 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 from other factors.

G4 = Apparently secure globally (may be rare in parts of range).
G5 = Demonstrably secure globally.
G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).

FNAI STATE RANKING
S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
S4 = Apparently secure in Florida (may be rare in parts of range).
S5 = Demonstrably secure in Florida.

STATE and FEDERAL LEGAL STATUS
C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service
FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service
FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service
FXN = Federal listed as an experimental population in Florida
FT(S/A) = Federal Threatened due to similarity of appearance
ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.
SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

Appendix 2: STOKES LANDING CONSERVATION AREA SOILS

Below is a description of the soils at the SLCA and an accompanying map (Figure 1).

Adamsville
The Adamsville series consists of very deep, somewhat poorly drained, rapidly permeable soils on broad flats, low knolls, and lower side slopes. They formed in thick sandy marine sediments in central and southern Florida. With adequate water control, many areas are used for citrus. Some areas are in improved pasture. Natural vegetation consists of pines, laurel, and water oaks with a ground cover of saw palmetto, pineland threeawn, indiangrass, bluestem grasses, and several low panicums.

Moultrie
The Moultrie series consists of very deep, very poorly drained, rapidly permeable soils in salt marshes along the Atlantic Coast in Peninsular Florida. They formed in thick deposits of sandy marine sediments. Moultrie soils are used mainly for wildlife habitat. The native vegetation consists of seashore saltgrass, bushy sea-oxeye, glasswort, big leaf sumpweed, and a few red mangroves.

Myakka
The Myakka series consists of deep and very deep, poorly to very poorly drained soils formed in sandy marine deposits. These soils are on flatwoods, high tidal areas, flood plains, depressions, and gently sloping to sloping barrier islands. Most areas are used for commercial forest production or native range. Large areas with adequate water control measures are used for citrus, improved pasture, and truck crops. Native vegetation includes longleaf and slash pines with an undergrowth of saw palmetto, running oak, inkberry, wax myrtle, huckleberry, chalky bluestem, pineland threeawn, and scattered fetterbush.

Pellicer
The Pellicer series consists of very deep, very poorly drained, very slowly permeable soils in salt marshes along the Atlantic Coast of Peninsular Florida. They formed in loamy and clayey marine sediments. Pellicer soils are used to provide habitat for wetland wildlife. The native vegetation consists of seashore saltgrass, needlegrass rush, smooth and marsh hay cordgrass, bushy sea-oxeye, and glasswort.

Smyrna
The Smyrna series consists of very deep, poorly to very poorly drained soils formed in thick deposits of sandy marine materials. Natural vegetation consists of longleaf and slash pines with an undergrowth of saw palmetto, running oak, gallberry, wax myrtle, and pineland three awn.

Tavares
The Tavares series consists of very deep, moderately well drained, rapidly or very rapidly permeable soils on lower slopes of hills and knolls of the lower Coastal Plain. They formed in sandy marine or eolian deposits. In most places the natural vegetation consists of slash pine, longleaf pine, a few scattered blackjack oak, turkey oak, and post oak with an undercover of

pineland threeawn. In some places natural vegetation consists of turkey oak, blackjack oak, and post oak with scattered slash pine and longleaf pine. The Tavares series consists of very deep, moderately well drained, rapidly or very rapidly permeable soils on lower slopes of hills and knolls of the lower Coastal Plain. They formed in sandy marine or eolian deposits. In most places the natural vegetation consists of slash pine, longleaf pine, a few scattered blackjack oak, turkey oak, and post oak with an undercover of pineland threeawn. In some places natural vegetation consists of turkey oak, blackjack oak, and post oak with scattered slash pine and longleaf pine.

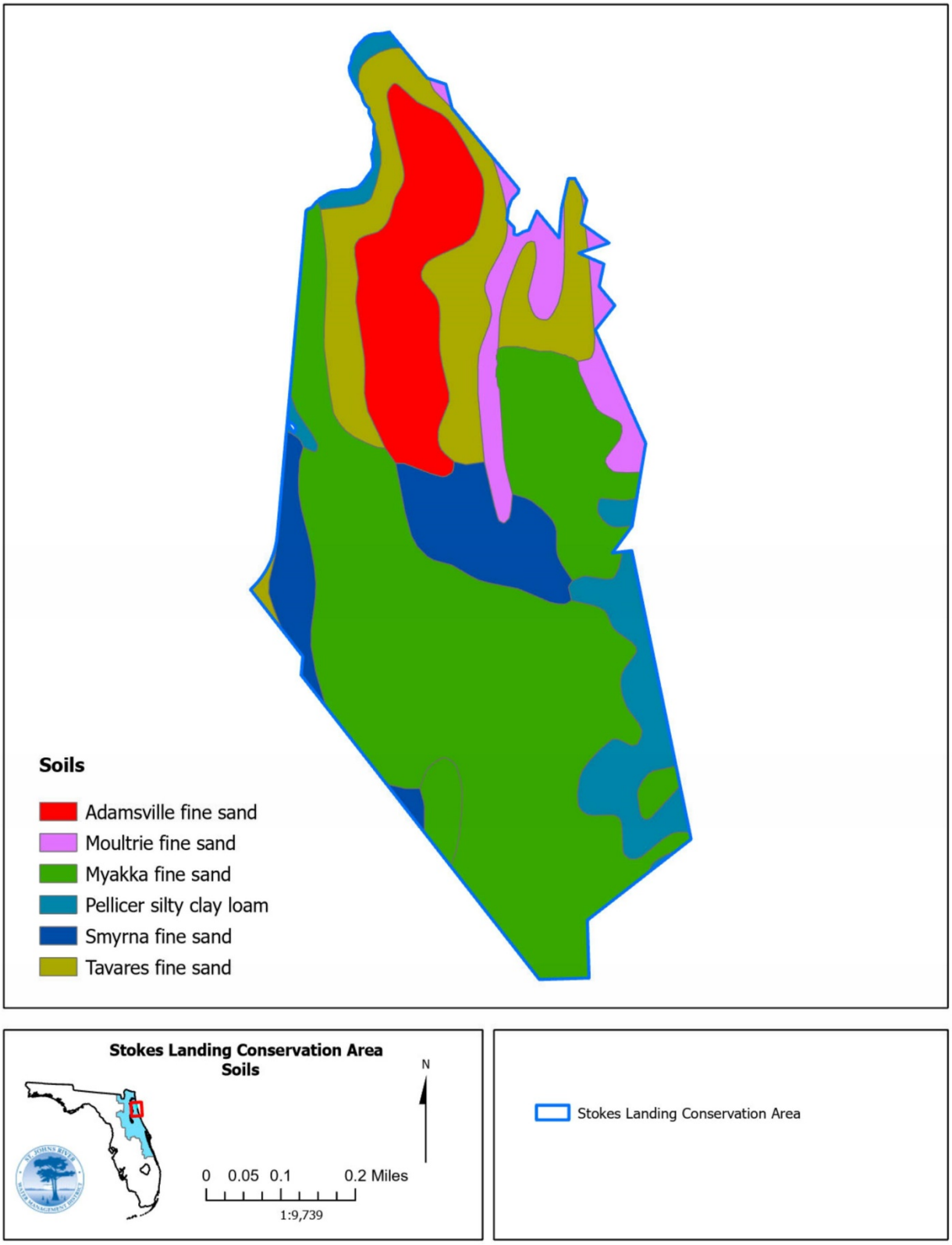

Figure 1: Soil Types at Stokes Landing Conservation Area.

Appendix 3: STOKES LANDING CONSERVATION AREA FIRE MANAGEMENT PLAN

The District Fire Management Plan provides general fire management information relative to policy, procedure, and reporting. This document provides the guidelines for the implementation of prescribed fire activities on the Stokes Landing Conservation Area (SLCA or Conservation Area).

Introduction and Objectives

The SLCA comprises approximately 281 acres in eastern St. Johns County. The SLCA includes three contiguous parcels located in several Sections of Township 6 South and Range 27 East. The Conservation Area is located approximately 7 miles north of St Augustine, off Lakeshore Drive, east of U.S. Highway (U.S.) 1. The Northeast Florida Regional Airport is approximately 3 miles south of the Conservation Area. The Conservation Area is bordered to the north by Stokes Creek and to the east by the Tolomato River and its associated estuarine wetlands. The District intends to burn at least 26 acres of fire-maintained natural communities annually or 79 acres every three years on the SLCA.

Historically, fires have played a vital role in the shaping and maintenance of many Florida natural communities. As such, most vegetative communities and associated wildlife are fire-adapted and in many instances fire dependent. Conversely, the exclusion of fire from an area allows for successional changes within the natural community. Fire exclusion leads to the excessive accumulation of fuel loads, which increases the risk for catastrophic wildfires. The objectives for the implementation of fire management activities within the Conservation Area include:

- Reduction of fuel loads through the application of dormant season burns to decrease potential risk of damaging wildfires.
- Introduction of growing season burns to encourage the perpetuation of native fire-adapted ground cover species.
- Mitigation of smoke management issues.
- Restoration and maintenance of a mosaic of natural plant communities and ecological diversity.
- Maintenance and restoration of ecotonal areas.

The achievement of these objectives requires the partitioning of the Conservation Area into manageable burn units prior to the application of prescribed fire within those units. The following sections summarize the considerations necessary for the safe and effective use of prescribed fire as a land management tool within the SLCA.

Fire Return Interval

The general frequency to which fire returns to a community type is termed its fire return interval. Some communities require frequent pyric disturbances to perpetuate themselves while others are not fire-adapted and subsequently do not require fire to maintain their characteristics. The following discussion of native plant communities occurring on the SLCA, and optimal fire return intervals were characterized in part using information from the 2010 Florida Natural Areas Inventory's *Guide to the Natural Communities of Florida* (Table 1).

Table 1: Fire Return Interval by Natural Community Type

Natural Community Type	**Fire Return Interval**
Mesic Flatwoods	2 to 4 years
Maritime Hammock	26 to 100 years
Salt Marsh	This community is not fire maintained
Depression Marsh (edges)	1 to 8 years in conjunction with associated flatwoods and depending on composition of edge species

The above-referenced fire return intervals relate to high quality natural communities. The fire return interval within degraded systems is variable. Prescribed fire will be applied as necessary to achieve restoration and management goals.

Mesic flatwoods are the most prevalent fire-adapted natural community type found within the Conservation Area. These plant communities at the time of acquisition were, as they are currently, relatively open canopied forests of primarily longleaf pine (*Pinus palustrus*) with some slash pine (*P. elliottii*) present. Restoration driven management techniques implemented within these areas includes prescribed burning. Groundcover and shrub layers in most of these areas are diverse and intact, consisting of site appropriate species. The primary carrier of fire within these units will include wiregrass (*Aristida stricta*), saw palmetto (*Serenoa repens*) pine litter, and other shrubs and groundcover species.

Depression marsh is a fire-adapted community. Though fire may not carry entirely through each marsh during every burn, it is an important factor in the maintenance and serves to restrict encroachment of woody plant species within surrounding ecotones. Natural fire regime would burn approximately every one to eight years as dictated by surrounding flatwood communities. In general, depression marsh fires are carried through the herbaceous layer. Many of these marshy areas have been disturbed by a prolonged absence of fire and are encroached by hardwoods, but all still provide habitat for numerous species of wildlife. Fire will be applied to these marshes any time surrounding natural communities are burned.

The maritime hammock is not a primary target for fire management at the SLCA; however, this natural community borders mesic flatwoods communities, which are fire dependent. Maritime hammocks are considered fire influenced, because while they do support fire at some frequency, fire has the potential to have extreme effects. Under normal hydrologic conditions, fire will burn the edges of this community type without carrying across. This is the desired effect of fire within the maritime hammock, as it will prohibit the expansion of hardwoods and shrubs into the adjacent flatwoods.

Seasonality and Type of Fire

Historically, most fires in Florida occurred in what is commonly referred to as the "growing season." The growing season usually spans from mid-March through July. Generally, fires during the growing season have significant ecological benefits as most fire-adapted flora is perpetuated by fire. Mimicking lightning-ignited natural fires by implementing prescribed fire during the growing

season provides benefits to natural systems by controlling shrub layers and encouraging diversity in groundcover species.

Dormant season burns, conducted from late November through mid-March, help to reduce fuel loads in overgrown areas or in areas of newly planted pines. Cooler conditions associated with dormant season burning are a consideration in areas of high fuel loads and where only minimal pine mortality is acceptable. Additionally, dormant season burning may result in fewer safety and smoke management issues due to higher fuel moisture and more consistent winds. District staff will continue to work to maintain fire return frequencies that are consistent with those identified by FNAI for the various communities within the Conservation Area.

Wildfire Policy
In the event of a wildfire, if conditions permit, suppression strategies will utilize existing fuel breaks to contain the wildfire. These fuel breaks may include previously burned areas, existing roads, trails, firelines, wetlands, and other water bodies. This is only possible with the agreement of local fire rescue, Florida Forest Service, District staff, and when all the following conditions are met:

1) Fuels within the area have been managed;
2) No extreme weather conditions are present or expected;
3) There are no other wildfires that may require action;
4) Sufficient resources are available to manage the fire to containment; and
5) The fire and the resulting smoke will not impact neighbors or smoke sensitive areas.

If any of these conditions are not met, direct suppression action will be taken.

As soon as possible following a fire in which firelines are plowed, a plan for fireline rehabilitation shall be developed and implemented.

Persons discovering arson or wildfires on the Conservation Area should report them to the Florida Department of Agriculture and Consumer Services, Florida Forest Service, the St. Johns River Water Management District, or by dialing 911.

Post Burn Reports
Burn reports must be completed after each prescribed burn or wildfire. These reports include detailed information regarding the acreage, fuel models, staff and equipment hours, cooperator hours, contractor hours, weather (forecasted and observed) and fire behavior. The timely completion of these reports is necessary for the compilation of information relative to the entire District burn program. Additionally, these reports provide a documented account of site-specific conditions which are helpful in the planning of future burns.

Smoke Management
A significant challenge to the implementation of any prescribed burn program is smoke management. Since the writing of the last plan in 2009, prescribed burns totaling 149 acres have occurred. Fuel loads (dead and live) across the flatwoods communities is moderate to high. This

accumulation of fuels has the potential to produce a tremendous amount of smoke as areas are burned. As the surrounding areas become increasingly urbanized, this problem will increase in magnitude, as there become fewer acceptable places to maneuver a smoke column from a prescribed fire.
The SLCA has a limited smoke shed in which to place a smoke column from a prescribed fire. Smoke-sensitive areas surround the Conservation Area and affect the smoke management of each burn unit. Smoke management is a limiting factor in the application of prescribed fire within the Conservation Area. The SLCA is bound on the west side by U.S. 1 and the Northeast Florida Regional Airport is 3 miles south of the Conservation Area. Additionally, other major roadways, schools, healthcare facilities, numerous residential areas are in the immediate vicinity and within critical smoke impact area. Figure 1 illustrates smoke sensitive areas in relation to the SLCA. As development increases, fire management will become more difficult. Increasing daily traffic on U.S. 1 and other highways and roads will further impair the District's ability to implement prescribed burns at the appropriate fire return intervals within the Conservation Area. Currently, portions of the Conservation Area still have an acceptable smoke shed within which to place a smoke column from a prescribed fire.

Depending on the arrangement and composition of fuels, fire spread will be through grasses and/or needle litter, the shrub layer, or logging slash. Areas within the Conservation Area having heavier shrub and mid-story fuel accumulation or logging slash can burn for long periods of time causing additional smoke management issues.

A fire weather forecast is obtained and evaluated for suitable burning conditions and smoke management objectives. A wind direction is chosen that will transport smoke away from urbanized areas and/or pose the least possible impact on smoke sensitive areas. When possible, the smoke plume from burns should be directed back through the Conservation Area. Smoke can then mix and loft into the atmosphere over uninhabited or rural land adequately enough to minimize off-site impacts.

On burn day, the ability of smoke to mix and disperse into the atmosphere should be good. The Dispersion index is a value that indicates the atmosphere's ability to "absorb and disperse" smoke. The higher the index value, the more the smoke dissipates. Dispersion indices should be above 30. Dispersions of greater than 75 will not be utilized unless other weather conditions mitigate expected fire behavior. Forecast mixing heights should be above 1,700 feet. Transport winds should be at least 9 miles per hour to effectively minimize residual smoke. Lower transport wind speeds can be utilized if the Dispersion index and mixing heights are above average. Burns will be conducted with a carefully plotted wind direction to limit and/or eliminate negative impacts from smoke to neighbors and urbanized areas.

Mechanical and Chemical Treatments
Short and long-term weather conditions and a fire management unit's proximity to urban areas become increasingly important when implementing a prescribed fire program. Should drought conditions become severe, or if smoke management becomes an insurmountable problem, the District may use mechanical methods, such as mowing or roller-chopping, as alternatives to prescribed fire.

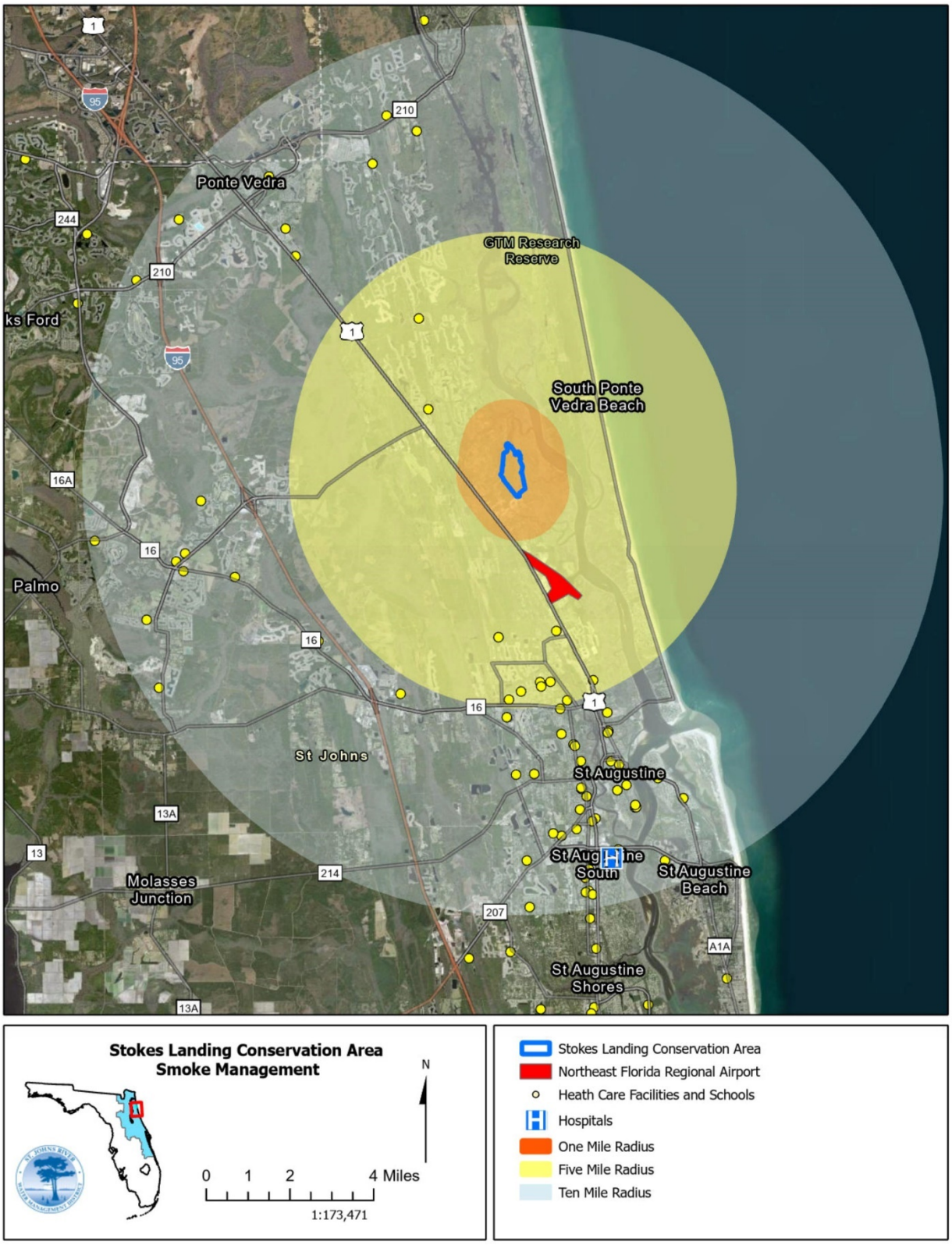

Figure 1: Smoke Management

Hazards
Common hazards include heat stress, venomous snakes, trip hazards or falling trees. Individual prescriptions address the hazards to consider when burning each unit and are discussed during the pre-burn briefing.

Legal Considerations
Only burn managers certified by Florida Forest Service will approve the unit prescriptions and must be on site while the burn is being conducted. Prescriptions and weather parameters will be approved up the burn manager's chain of command before a specific burn can be conducted. Certified burn managers adhering to the requirements of Section 590.125, Florida Statutes, are protected from liability for damage or injury caused by fire or resulting smoke, unless gross negligence is proven.

Fire Management Units
Fire management units (FMUs) have been delineated on the Conservation Area. Where logical, the District used existing roads and landscape features to delineate fire management units. Occasionally, multiple FMUs with similar fire needs will be burned simultaneously and roads and natural landscape features provide a break in fuels so that staff may burn smaller areas than initially planned, if needed.

Ideally, District staff would thoroughly address and describe each FMU in terms of its fire management needs. All FMUs are categorized into one of several fuel model (FM) descriptions. The 13 standard FMs (as described in Hal E. Anderson's *Aids to Determining Fuel Models for Estimating Fire Behavior*) were used as a basis for this categorization. The factors considered in determining each FM include amount, composition, and arrangement of available fuels within units; predicted fire behavior within each unit (under conditions acceptable to implement a prescribed burn); and resources necessary to regain management of a fire in extenuating circumstances. District staff anticipate the change of vegetative assemblages over time due to growth and/or restoration and understand that fuel characteristics, models, and resulting fire behavior will also change.