Sykes Creek Conservation Area
Management Plan
July 2024

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Endangered Lands Program
Central Region - Land Management Superintendent

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Contents

EXECUTIVE SUMMARY

The Sykes Creek Management Plan incorporates three Sanctuaries within the Brevard County Environmentally Endangered Lands Program's Central Region. These properties include the Johnson Sanctuary, Kabboord Wildlife Sanctuary, and the Ulumay Wildlife Sanctuary. The three sanctuary locations are depicted in **Figure 1**.

The Johnson Sanctuary (**Figure 2**), Kabboord Wildlife Sanctuary (**Figure 3**), and Ulumay Wildlife Sanctuary (**Figure 4**) are part of the sanctuary network established by the Environmentally Endangered Lands Program in Brevard County. As stated in the Environmentally Endangered Lands Program's **Sanctuary Management Manual**, one of the goals of the program is to acquire environmentally sensitive lands as a first step "towards long-term protection of essential natural resources, open space, green space, wildlife corridors and maintenance of natural ecosystem functions." The program also establishes a network of public lands to provide passive recreation and environmental education programs to Brevard County residents and visitors.

The Sykes Creek Management Plan consists of acreage owned by Brevard County. All lands within these boundaries are managed by the Brevard County Environmentally Endangered Lands Program. The Environmentally Endangered Lands Program acquired these properties using Environmentally Endangered Lands funds or through land transfers with other County entities. **Figure 5** delineates Sykes Creek Management Plan sites into these acquisition types.

The Brevard County Environmentally Endangered Lands Program is funded pursuant to voter referendums in 1990, 2004 and 2022. In addition to lands acquired with the referendum funding, additional lands have been donated through private development mitigation, interagency land transfers, and state funded projects such as Florida Forever and Florida Communities Trust (FCT).

These Environmentally Endangered Lands managed tracts will be open to the public during designated daylight hours where public access can be safely established, and will provide opportunities for scientific research and guided or self-guided interpretive tours featuring the site's ecological diversity. The Brevard County Environmentally Endangered Lands Program does not allow pets within the Sanctuary boundaries due to the potential risk of pet diseases being transferred to wildlife populations and per Brevard County Ordinance 78-116(b).

Figure 1 (Long Description 1)

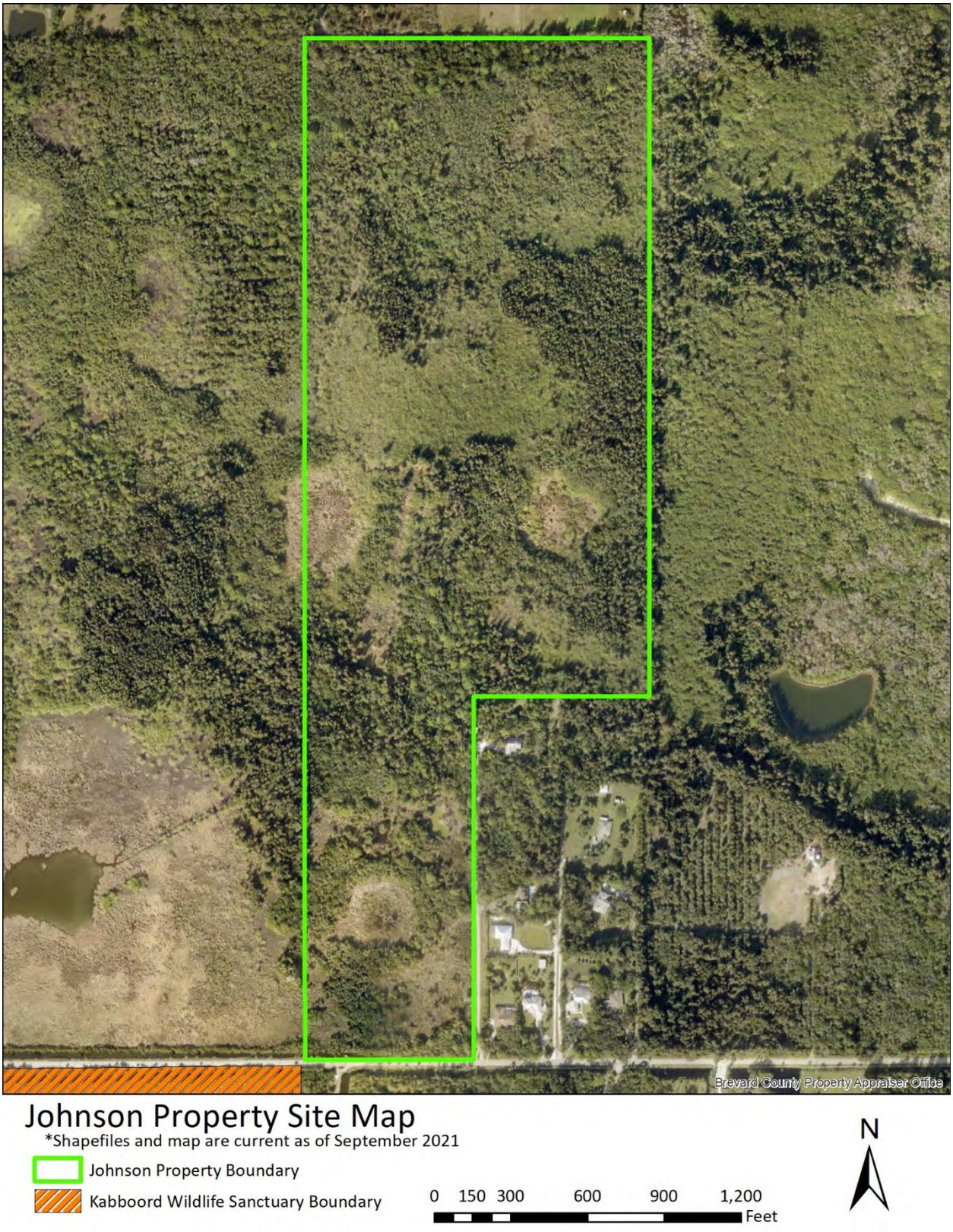


Figure 2 (Long Description 2)

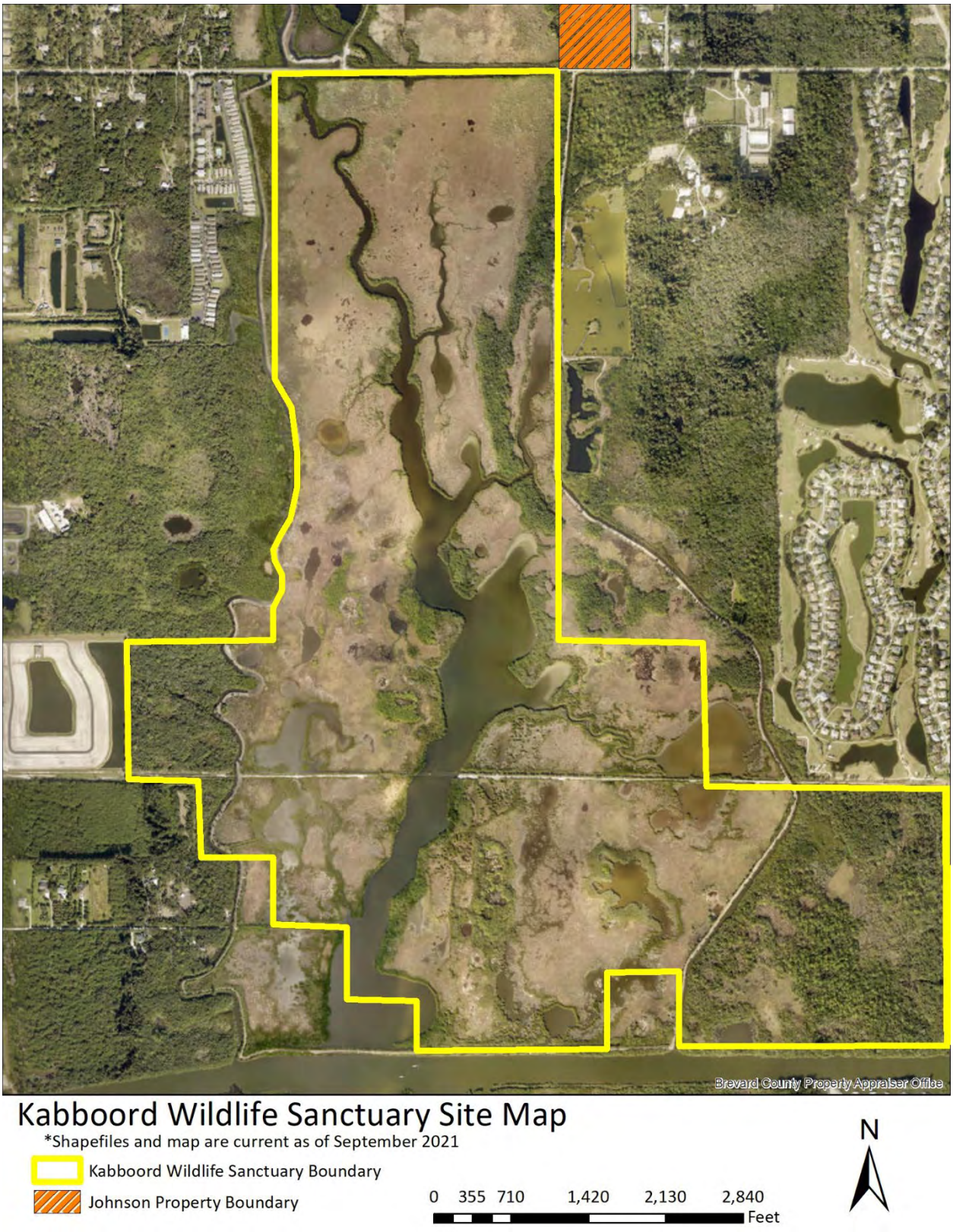


Figure 3 (Long Description 3)

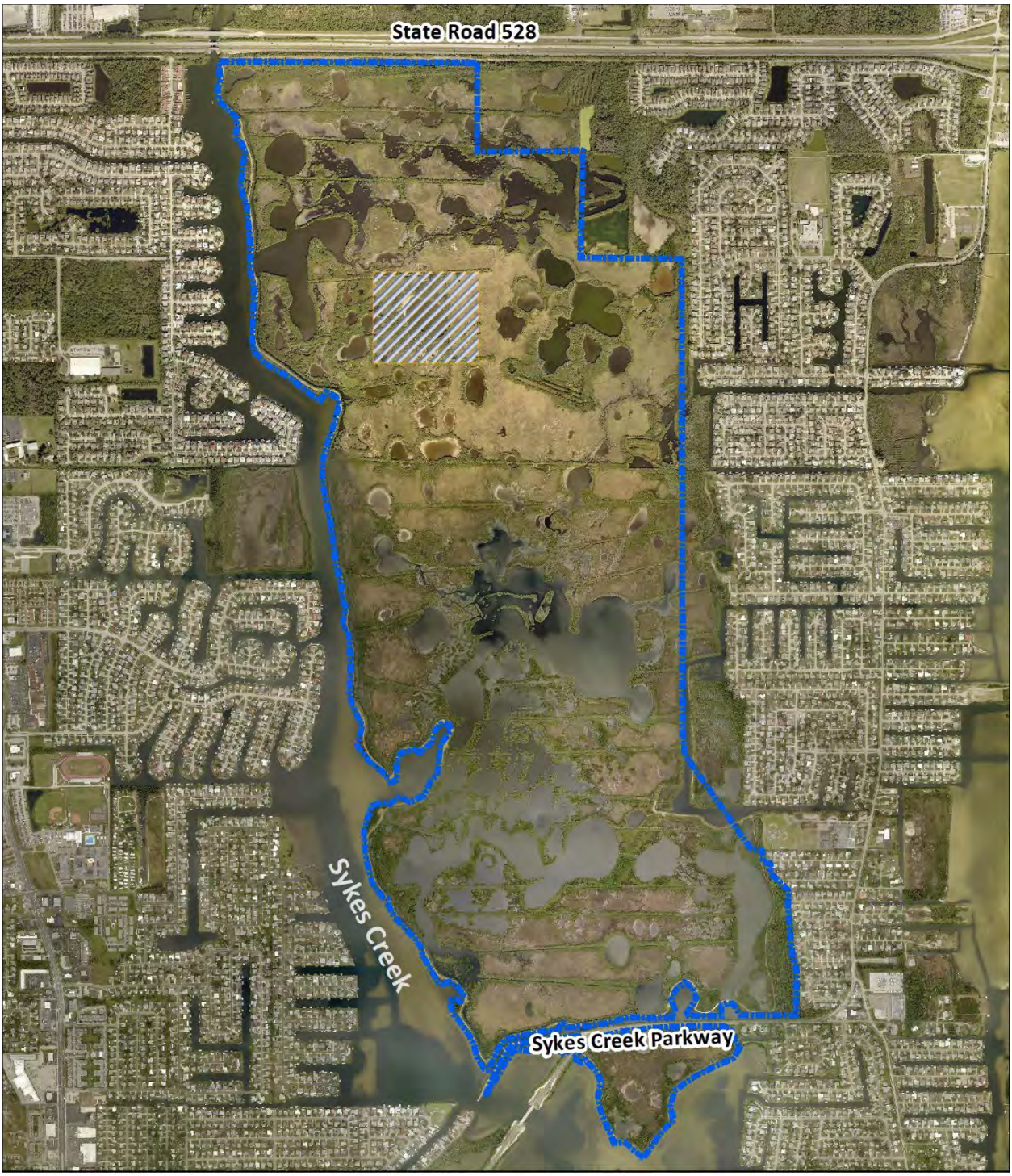


Figure 4 (Long Description 4)

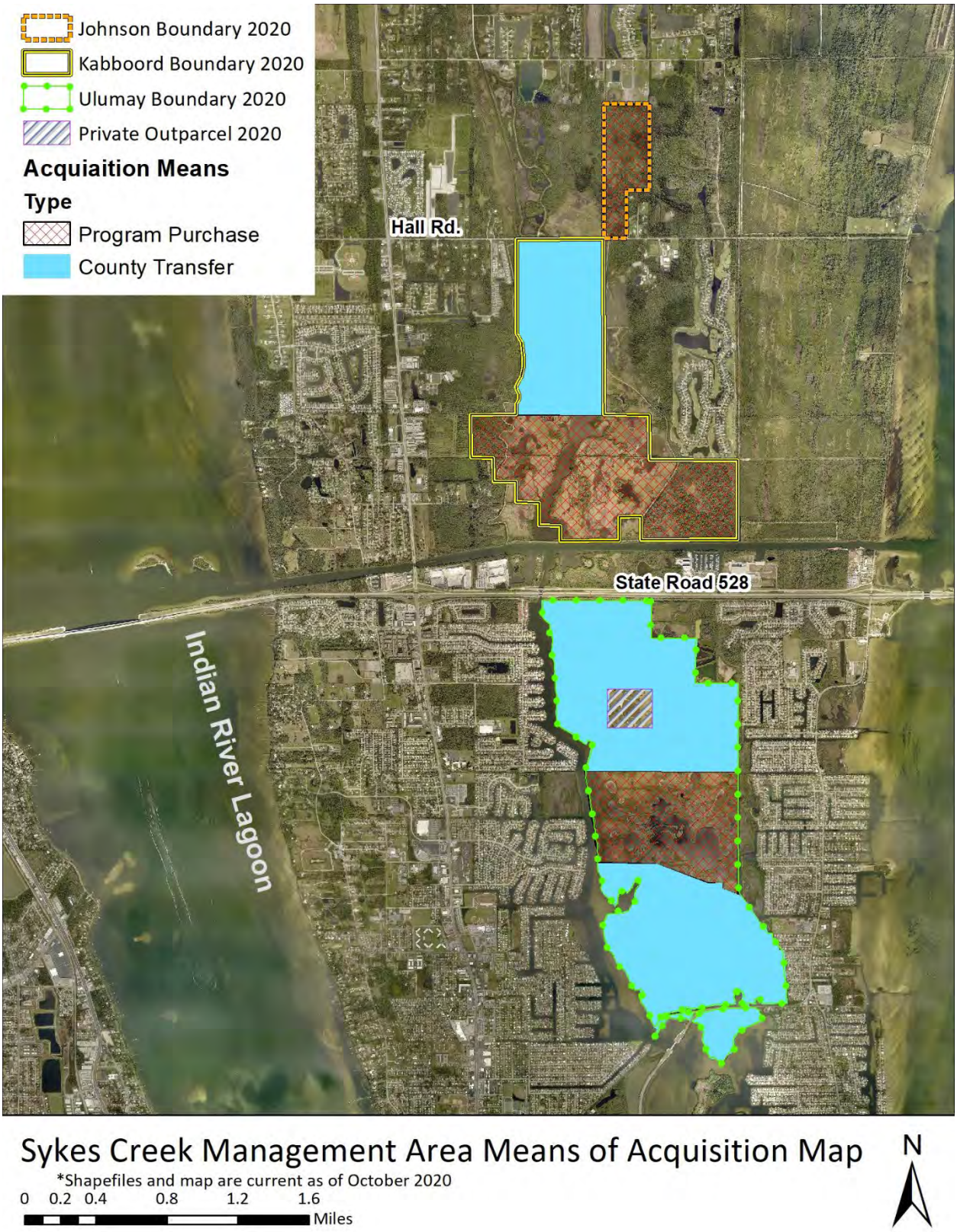


Figure 5 (Long Description 5)

The optimal management boundaries for these sites can be seen in **Figure 6**. These additional conservation lands and those of surrounding existing conservation areas, will provide wildlife corridors from Highway 520, north through the Merritt Island National Wildlife Refuge.

Adjacent Conservation Lands

The Merritt Island National Wildlife Refuge consists of 140,000 acres. Acquired by the National Aeronautics and Space Administration (NASA) in 1962, it is now managed by the Department of Interior, United States Fish and Wildlife Services. The Refuge's primary goals are to provide habitat for migratory birds, protection of threatened and endangered species, to maintain wildlife diversity, and to provide wildlife-dependent recreational opportunities.

The Sanctuaries included within the Sykes Creek Management Plan will be managed as a part of the Environmentally Endangered Lands Program's Central Region Management Area. The primary management goal for these three tracts is the conservation and restoration of ecosystem function. The collection and documentation of natural and cultural resource data are also important management goals. Public access to these tracts, where possible, encourages awareness of the County's natural assets, fosters a greater understanding of the balance between access and non-consumptive use of the sites' resources, and promotes environmental stewardship. This benefits both the local community and the Environmentally Endangered Lands Program. The Environmentally Endangered Lands Program provides educational opportunities to the Brevard County school system as well as to homeschooling parents where possible (as staff levels allow) and promotes the understanding and appreciation of the unique and valuable resources available in Brevard County and thereby promotes long-term preservation.

As described in the Environmentally Endangered Lands Program's **Sanctuary Management Manual**, these tracts are Category 2 sites. This means that these sites receive minimal capital improvements that may include limited trails, footbridges, and/or boardwalks.

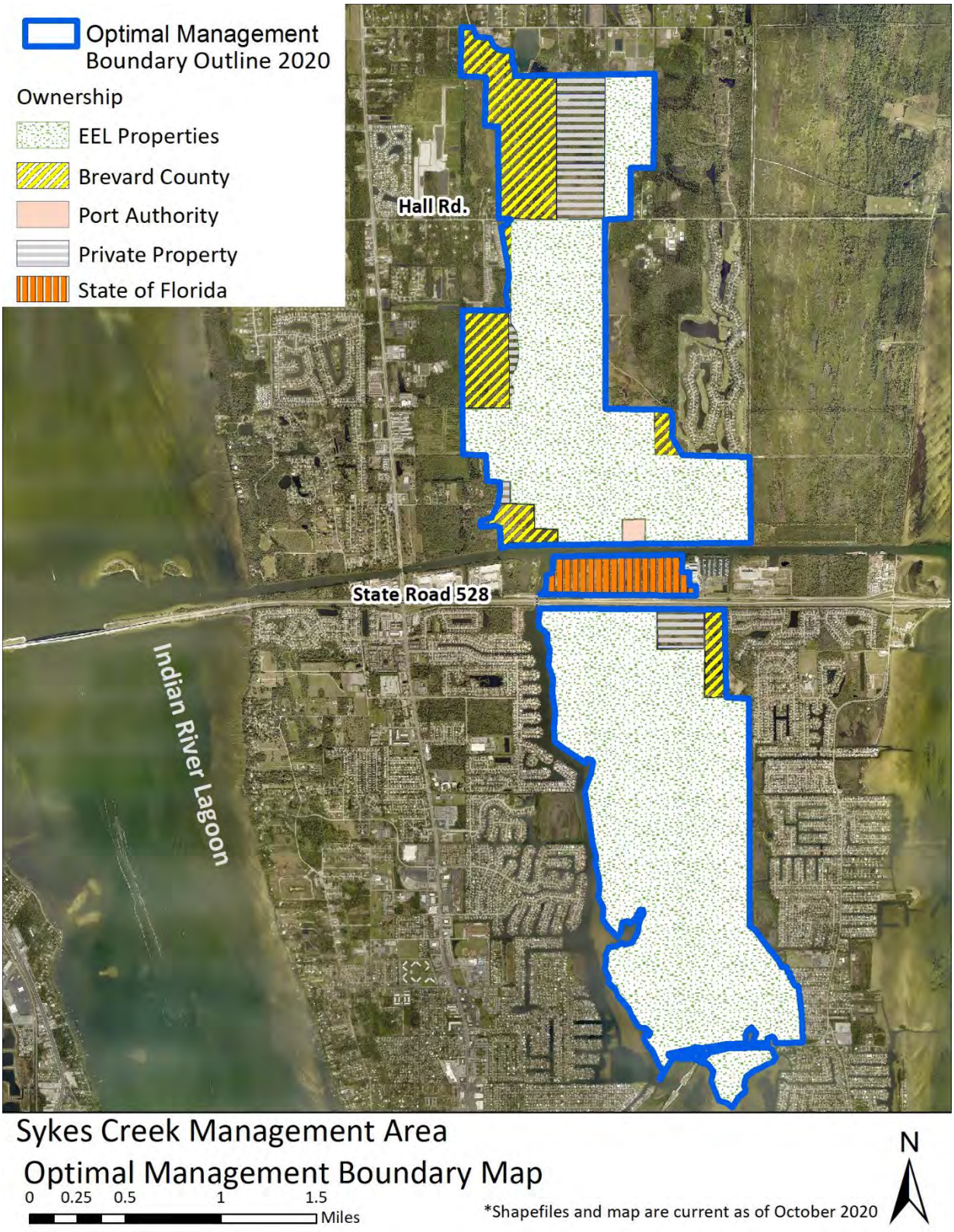


Figure 6 (Long Description 6)

Other management goals include the provision of passive recreation and environmental education.

There are water resources within the Ulumay Wildlife Sanctuary and Kabboord Wildlife Sanctuary tracts that are designated as Outstanding Florida Waters. The Outstanding Florida Waters Letter can be found within **Appendix B**. There are no water resources within the Johnson Property that are designated as Outstanding Florida Waters.

The Banana River Aquatic Preserve is located in north central Brevard County, separating Merritt Island on the west and the beach barrier island on the east. According to the Florida Department of Environmental Protection, the surface water area of the aquatic preserve is approximately 30,000 acres. The aquatic preserve begins at State Road 528 (Bennett Causeway), extends almost to the southern tip of Merritt Island, and includes Newfound Harbor and Sykes Creek as far north as Hall Road. The aquatic preserve is accessible from the east by U.S. Highway A1A and from the west by State Road 3. Numerous parks and boat ramps provide direct public access to the aquatic preserve.

The Kabboord and Ulumay Wildlife Sanctuary properties fall within the Banana River Aquatic Preserve and are a Designated Area of Critical State Concern by the Florida Department of Environmental Protection. No portions of Sykes Creek Management Plan properties should be declared surplus.

Detailed passive recreation maps of the Kabboord and Ulumay Wildlife Sanctuaries can be seen in **Figure 7 and Figure 8** respectively. These maps detail the trails (existing and proposed), trail types, gates, and overlooks. There are no motorized vessels allowed in these two Sanctuaries. The Johnson Property does not have a trailhead, any gates, trails, or structures. For this management plan revision, there are no present plans presented for these features at this site. Due to legal access issues and the consistently high-water levels onsite at the Johnson Property, theoptions for hiking, structures, and parking arenot be available for public use. The marked gates at the other two sites are for management access only.

At this time, the Kabboord Wildlife Sanctuary does not have a designated hiking or kayaking trails. If public access agreements can be established with the private landowners along the perimeter impoundment road, the Sanctuary could provide excellent opportunities for hiking, biking and wildlife viewing. There is a proposed kayak trail detailed on the trail map. There are no plans for hiking trails at Kabboord Wildlife Sanctuary due to private ownership restrictions and the lack of disturbed upland areas that could be converted into parking. Hiking and kayaking opportunities exist at Kings Park, also located on Hall Road. Parking and bathroom facilities are available at the south Kings Park trailhead approximately 800 feet east of the Kabboord pump facilities. These pumps are located at the existing gate in the northwest corner of the site. Changes to the pump area at Kabboord Wildlife Sanctuary will not increase an area

for parking. Limited parking is available at the Pioneer Trailhead on the north side of Hall Road. A kayak launch is proposed on the south side of the road from the existing parking area and bathrooms. Ulumay Wildlife Sanctuary does have roadside parking near the trailhead, but there are no restroom facilities.

Figure 7 (Long Description 7)

Figure 8 (Long Description 8)

INTRODUCTION

In the 1990, 2004, and 2022 referendums, Brevard County voters approved funding for the Environmentally Endangered Lands Program. The Program's Mission is to Protect and preserve biological diversity through responsible stewardship of Brevard County's natural resources. The Program Vision Statement is as follows:

"The Environmentally Endangered Lands Program acquires, protects and maintains environmentally endangered lands guided by scientific principles for conservation and the best available practices for resource stewardship and ecosystem management. The Environmentally Endangered Lands Program protects the rich biological diversity of Brevard County for future generations through acquisition and management. The Environmentally Endangered Lands Program provides passive recreation and environmental education opportunities to Brevard's citizens and visitors without detracting from the primary conservation goals of the program. The Environmentally Endangered Lands Program encourages active citizen participation and community involvement."

The Program established a conceptual framework and funding mechanism to implement an Environmentally Endangered Lands Sanctuary Network in Brevard County. The Environmentally Endangered Lands Program Sanctuary Network represents a collection of protected natural areas that form a regional conservation effort focused upon the protection of biological diversity. Within the Countywide Environmentally Endangered Lands Sanctuary Network, management areas are geographically defined within Brevard County.

A full-time sanctuary manager (Regional Land Management Superintendent) coordinates all management efforts on Environmentally Endangered Lands Sanctuaries within the regional management area. Environmentally Endangered Lands Sanctuaries in the Central Regional Management Area include Pine Island Conservation Area, The Johnson Property, Kabboord Wildlife Sanctuary, Ulumay Wildlife Sanctuary, Thousand Islands Conservation Area, Cruickshank Scrub Sanctuary, and Capron Ridge Sanctuary. As outlined in the Environmentally Endangered Lands Sanctuary Management Manual, the Environmentally Endangered Lands Program has adopted and implemented an ecosystem approach to environmental management. Ecosystem management is defined as an integrative, flexible approach to the management of natural resources. Key themes of ecosystem management include the following:

Adaptive Management
Natural areas must be managed in the context of the landscape in which they exist and based on scientific knowledge. Resource managers must adapt to continuing advances in the

scientific understanding of ecosystems and changing environmental and human influences on the resources.

Partnerships
Interagency and private sector partnerships are essential to manage and protect ecosystems. Natural resource management is complex and requires multi-disciplinary skills and experiences.

Holistic Approach
Ecosystem management includes the maintenance, protection and improvement of both natural and human communities. This systems approach to management considers the "big picture" of natural resource protection, community economic stability and quality of life.

Land management issues, such as fire management, protection and restoration of natural hydrologic cycles, threatened and endangered species, and removal of invasive exotics must be integrated with issues, such as provisions for public access and levels of human use. The integration of ecosystem protection and human needs should combine to form the foundation of an effective ecosystem management strategy. In situations where conflicts arise between site conservation goals and public use interests, the conservation goals and objectives for which the site was acquired will remain the priority for decision-making and conflict resolution.

Principals of Conservation

The Sanctuary Management Manual also establishes a general framework for management of specific sites and establishes ten Principles of Conservation. These principles are designed to achieve the following:

- Maintain all sites in a natural state and/or restore sites to enhance natural resource values.
- Protect natural resource values by maintaining biological diversity and using conservation as a primary goal for decision-making.
- Balance human use with the protection of natural resources.
- Apply the most accurate scientific principles to strategies for conservation.
- Collect and use the most accurate data available for developing site management plans.
- Consider the interests and values of all citizens by using scientific information to guide management policy making.
- Promote effective communication that is interactive, reciprocal, and continuous with the public.
- Promote the value of natural areas to Brevard County residents and visitors through the maintenance of the quality of resource values, public services, and visitor experiences.
- Promote the integration of natural resource conservation into discussions of economic development and quality of life in Brevard County.

- Provide a responsible financial strategy to implement actions to achieve long-term conservation and stewardship goals.

Principle 1

Maintain all sites in a natural state and/or restore sites to enhance natural resource values pursuant to management plans as approved by the Board of County Commissioners. All sites in the EEL Sanctuary Network shall be maintained in a desirable natural state or restored to enhance natural resource values for species, natural communities and ecosystems.

The EEL Program shall:

a. Make management decisions recommendations to ensure that natural resource values are maintained, restored or enhanced as natural assets for future generations.

Principle 2

Protect natural resource values by maintaining biological diversity and using conservation as a primary goal for decision-making. The EEL Program will strive to maintain biological diversity at genetic, species, natural community, and ecosystem levels to secure present and future natural resource values and options.

The EEL Program shall:

a. Make resource management decisions with the understanding that resource conservation was the primary goal of the voter-approved referenda (1990, 2004, and 2022).
b. Manage and monitor total impacts on ecosystems and sites within the natural areas network.
c. Work to preserve essential natural features of the ecosystem.
d. Identify natural communities, species and processes that are particularly important to the maintenance of an ecosystem, and make special efforts to protect them.
e. Manage and monitor in ways that do not further fragment natural areas.
f. Maintain, mimic or enhance patterns of natural processes; including disturbances at scales appropriate to the natural system.
g. Avoid disruption of food webs, especially removal of top or basal species.
h. Avoid significant genetic alteration within populations.
i. Recognize that biological processes are often nonlinear, are subject to critical thresholds and synergism's, and that these issues must be identified, understood and incorporated into management strategies.
j. Recognize that events, like hurricanes, damaging wildfires, or epidemics are unpredictable and potentially devastating to species viability. The EEL sanctuary network should be developed with consideration for the probability of uncontrolled natural events.

Principle 3

Balance human access to EEL Sanctuary sites and public use with the protection of natural resources.

The EEL Program shall:

a. Recognize that an acceptable balance can be attained between resource protection and public use. Land management practices and sanctuary development plans will use spatial, temporal, visual or auditory controls (like elevated boardwalks, scenic overlooks, specific trail location and educational signage) to provide appropriate public access and use, rather than to exclude the public from EEL sanctuaries.
b. Recognize that the total impact of humans on natural resources is the product of human population size, per capita consumption, extent of public access, incidental taking of habitats, and habitat degradation caused by human activities.
c. Recognize that public interest in recreation on protected natural areas is high and that public interest is projected to increase over time.
d. Take appropriate actions to successfully meet the conservation needs of a natural area site with provisions for responsible public access and use.
e. Recognize that natural resource conservation by private land owners on private lands is an important part of the statewide conservation effort in Florida and Brevard County.

Principle 4

Apply the best most accurate current scientific principles to strategies for conservation. Strategies to conserve and manage living resources should be formulated and implemented using the best available scientific and natural resource management principles. The full range of knowledge and skills from both the natural and social sciences is required to achieve a balance between resource conservation and human use.

The EEL Program shall:

a. Identify the local and regional pool of scientific and resource management experts and provide opportunities for their active participation with the EEL Selection and Management Committee and EEL Staff.
b. Establish formal financial partnerships through contracts with interested scientific and land management agencies and institutions, as approved by the Board of County Commissioners, to apply local, regional and national expertise to EEL Program initiatives.
c. Recognize that science is a vital part of natural resource conservation. Science can be used to describe resource inventories, understand natural processes, and provide predictive capabilities.
d. Identify a local and regional pool of individuals recognized for their expertise and knowledge in social sciences (i.e., education, recreation, individuals with special needs, art, literature, tourism, etc.). Encourage their active participation in the EEL Program projects through active participation in the EEL Volunteer Programs.

e. Encourage EEL Staff to consult with a wide range of knowledgeable individuals and institutions recognizing that all conservation issues have biological, economic, and social implications. Ignoring any of these may lead to conflicts that will impair effective conservation.
f. Encourage public participation in land management and stewardship through active community involvement in EEL sanctuary programs and projects.

Principle 5

Collect and use the best data available for developing site management plans. Resource inventories, ecological surveys, and land management assessments should precede and guide the provision of public access and use. The information should be made available for critical scientific and public review.

The EEL Program shall:

a. Develop Interim Management Plans within 90 days and Management Plans within one year after the acquisition of a management unit or sanctuary site. In cases where a management unit may be composed of multiple properties, a management plan would not be required until one year after all the essential properties are assembled. Interim Management Plans can be developed for individual management units within large multi-parcel projects.
In cases where property ownership is to be transferred to the State of Florida Board of Trustees of the Internal Improvement Trust Fund as part of Multi-Party Acquisition Agreements in the Conservation and Recreational Lands (CARL) Program, Management Plans or Interim Management Assignment Letters will be completed within one year of the property transfer to the State as directed in §259.032 F.S. and §253.034 F.S. The EEL Program will comply with future amendments to the Florida Statutes and state land management policies as applicable to joint CARL Projects.
b. Prepare Interim Management Plans, Management Plans or Interim Management Assignment Letters to the Board of County Commissioners for review and ratification to allow for public comment and discussion.
c. Identify uncertainties and assumptions regarding natural history, size and productivity of site resources.
d. Identify major ecological and sociological uncertainties and assumptions regarding resource uses and visitor impacts.
e. The EEL Program shall ensure that the level of resource use does not risk degradation of the resource nor allow expansion of public use at rates that exceed the known vulnerability of the resource and its relationship with other ecosystem components.
f. Evaluate human use impacts through on-going visitor impact analyses. The results of these observations shall guide all resource management decisions.
g. Encourage private sector - public sector partnerships to implement site management or specific programs so that: 1. the partnership shall not result in the exclusion of the public from acceptable resource uses defined in the Management Plan, and 2. the partnership shall result in a net economic and/or resource management benefit to the EEL Program,

the sanctuary site and the citizens of Brevard County.

Principle 6

Consider the interests and values of all citizens by using scientific information to guide management policy making.

The EEL Program shall:

a. Whenever possible, provide positive incentives to the users of living resources that correspond to the values those resources have to society. Ensure that these incentives promote conservation, and constrain uses that do not promote, or are inconsistent with, the conservation objectives of the EEL Program.
b. Implement conflict resolution mechanisms to minimize conflicts over resource uses among competing stakeholders.
c. Encourage the integration of science and best management practices with policy making, independent of resource users and special interests.
d. Require that policy makers and resource managers be held accountable for the use of the best possible data and analysis in establishing policy and management decisions.
e. Use the criteria and procedures in the EEL Land Acquisition Manual and EEL Sanctuary Management Manual to guide policy and conservation decisions.
f. Ensure that formal institutions responsible for resource management decisions have temporal and spatial perspectives consistent with the ecological character of the resources and organizational structures.

Principle 7

Promote communication that is interactive, reciprocal and continuous.

The EEL Program shall:

a. Ensure that communication is provided to the general public and is based on mutual respect and sound information.
b. Require external and internal review of all reports and analyses to verify objectivity and results.
c. Inform and motivate the public regarding conservation, land stewardship and responsible use of the EEL Program natural areas network.
d. Encourage inter-disciplinary communication to inform decision makers, land managers and the general public.
e. Promote enhanced public understanding and awareness of Brevard's rich biological diversity through programs that support public use of the EEL Program Sanctuary Network, environmental education and responsible nature-based tourism.

Principle 8

Promote the value of natural areas to Brevard County residents and visitors through the maintenance of the quality of resource values, public services and visitor experiences. The environmental and economic values of the EEL Program sanctuary network depends upon high quality natural resources and the provision of exceptional visitor experiences.

The EEL Program shall:

a. Develop public-use facilities and programs that create a positive visitor experience.
b. Hire sufficient EEL Program staff or contract outside land management services as approved by the Board of County Commissioners to ensure that conservation objectives are achieved and quality passive recreation and environmental education are provided.
c. Implement a long-term economic plan that provides sufficient funding for resource protection, public access and environmental education.
d. Encourage the development of programs that provide natural or human transportation corridors or connections to the surrounding landscape and community. The EEL Program shall ensure that all public access points or trails are compatible with the conservation goals of EEL Sanctuary sites. Examples of connectors include greenways, pedestrian trails, bicycle paths, horse trails and wildlife corridors.
e. Ensure that Sanctuary site design and development contribute to environmental and cultural protection and interpretation.
f. Integrate cultural, archaeological, historical and architectural considerations into site protection, site design and interpretive programs.
g. Develop environmental education programs with support from local and regional educators, education programs, nature-based tourism interests, non-profit groups, private corporations and other interested organizations.

Principle 9

Promote the integration of natural resources conservation into community discussions of economic development and quality of life.

The EEL Program shall:

a. Initiate and enhance communication and cooperation with local governments, chambers of commerce, economic development councils, tourist development councils, school boards and other community programs within Brevard County and Florida.
b. Actively participate in local, state and national discussions and planning efforts to expand and promote responsible nature-based tourism in Florida.
c. Recognize that the EEL Sanctuary Network is an integral part of the local community and Brevard County. Public use of a sanctuary site and development within a site shall be compatible with the interests of the local community.
d. Encourage public recognition and understanding of the value of history, natural resource protection and human community development to promote a common vision, pride and respect for Brevard County and Florida.

e. Encourage public sector/private sector partnerships for conservation, education and nature-based tourism.

Principle 10

Provide a responsible financial strategy to support implementation of management actions to achieve long-term conservation and stewardship goals.

The EEL Program shall:

a. Recognize that conservation, passive recreation and environmental education are long-term EEL Program responsibilities that require a financial commitment extending beyond the sunset date of the EEL Program ad valorem revenue collection.
b. Identify and implement a financial strategy that provides sufficient funds for conservation, passive recreation and environmental education programs.
c. Provide a long-term financial plan to the Board of County Commissioners that allows the EEL Program to be economically self-sufficient. The plan shall decrease the future need for increased taxes above and beyond the 1990 EEL Referendum.
d. Acknowledge that all lands acquired by the EEL Program will require varying levels of management and experience varying levels of public use.

In addition to the conservation principles, this management plan provides specific goals, strategies, and actions to guide management of the Sanctuaries in terms of the objectives of the Environmentally Endangered Lands Program. The plan is divided into the following 9 sections:

Executive Summary identifies the location, size, general natural resource features and primary management goals for the site.

Introduction provides a brief introduction to the Environmentally Endangered Lands Program as well as a description of the structure of the management plan.

Site Description and Location provides a detailed site location and description.

Natural Resource Descriptions includes physical resources (climate, geology, topography, soils, and hydrology), biological resources (ecosystem function, flora, fauna, special concern species, and biological diversity), and cultural resources (archeological, historical, land-use history, and public interest).

Factors Influencing Management includes natural trends, human-induced trends, external influences, legal obligations and constraints, management constraints, and public access and passive recreation.

Management Action Plans include specific goals, strategies and actions.

Financial Considerations discusses funding mechanisms and projected management costs.

Bibliography cites original research and publications used to develop the Management Plan.

Appendices include supplemental information.

SITE DESCRIPTION AND LOCATION

The Sykes Creek Management Plan complies with Brevard County's comprehensive plan. All letters relating to compliance can be found in **Appendix C**. The Environmentally Endangered Lands Selection and Management Committee considered site location, natural communities, biological diversity, habitat quality, and contributions to functional ecological integrity to determine if the acquisition of the Sykes Creek Management Plan tracts met the Environmentally Endangered Lands Program's conservation goals. The three Properties within this plan are all under County ownership and managed by the Environmentally Endangered Lands Program.

Johnson Sanctuary

The Johnson Sanctuary consists of 99.2 acres, and is located on the north side of Hall Road. The Parcel Identification numbers of the tracts for the Johnson Sanctuary are 23-26-36-00-255 and 23-36-36-00.504. These individual parcels within the Johnson Sanctuary boundary can be viewed on the Brevard County Property Appraisers website using the Tax Identification numbers or Account Numbers. The following Account Numbers will also provide a link to the parcel's legal descriptions: 2319696 and 2318767.

The Sanctuary was purchased in February of 2008 with Environmentally Endangered Lands Program (EEL) bond proceeds received through the voter approved referendum. The interim management plan was presented and approved at the May 13, 2008 Selection and Management Committee.

Management access for the Johnson Sanctuary is available from Hall Road and along the privately owned White Ibis Lane. .Due to the wetland habitats on the southern side of the property, there is no physical access to the property that would allow for the creation of a trailhead or parking for public access.

Kabboord Wildlife Sanctuary

The Kabboord Wildlife Sanctuary consists of 803 acres. It is located south of Hall Road and east of North Courtney Causeway. The Parcel ID numbers are 24-36-01-NJ-A, 24-36-11-00-1, 24-36-

12-00-250, 24-36-12-00-2, 24-36-12-00-3, 24-36-12-00-500, 24-36-11-75-*-1, 24-36-11-00-9, 24-36-11-00-4, 24-36-11-00-7, 24-36-11-00-10, and 24-36-11-00-8. These individual parcels within the Kabboord Wildlife Sanctuary Property boundary can be viewed on the Brevard County Property Appraisers website using the Tax Identification numbers or Account Numbers. The following Account Numbers will also provide a link to the parcel's legal descriptions: 2410118, 2443798, 2443800, 2411610, 2443797, 2443799, 2411820, 2411607, 2411901, 2411902, 2411898, and 2411899.

The original 449-acre footprint of the Sanctuary was purchased in February of 1992 with Environmentally Endangered Lands Program bond proceeds received through the voter approved referendum. An additional 53 acres was donated in July of 1999. The most recently acquired parcel within the Sanctuary came through an interagency transfer of 301 acres from Brevard County Parks and Recreation. It was approved by the Board of County Commissioners on August 23, 2016. The initial management plan done for Kabboord Wildlife Sanctuary was approved in 2004.

Management access for Kabboord Wildlife Sanctuary is available from Hall Road along the perimeter impoundment berm. There is currently no designated public access to the perimeter berm due to restrictions from several privately owned parcels.

Ulumay Wildlife Sanctuary

The Ulumay Wildlife Sanctuary consists of 1227 acres. It is located mostly between Highway 528 and North Sykes Creek Parkway with a small portion located just south of North Sykes Creek Parkway. The Parcel ID numbers are 24-37-30-00-252, 24-37-19-00-502.2, 24-37-19-00-506, 24-36-24-00-501, 24-36-24-00-750, 24-36-24-00-2, 24-36-24-00-1, 24-36-13-00-503, 24-36-13-00-752, 24-36-13-00-501, 24-36-13-00-500, 24-36-13-00-5, 24-36-13-00-753, 24-36-13-00-750, and 24-36-13-00-250. The portion just south of North Sykes Creek Parkway has the Parcel ID number of 24-36-25-00-1. The island to the south of the Sanctuary boundary and north of Kiwanis Park is County owned but is not under the Environmentally Endangered Lands Program's management. These individual parcels within the Ulumay Wildlife Sanctuary boundary can be viewed on the Brevard County Property Appraisers website using the Tax Identification numbers or Account Numbers. The following Account Numbers will also provide a link to the parcel's legal descriptions: 2412098, 2411941, 2411939, 2411943, 2411946, 2459379, 2411945, 2411947, 2418534, 2418535, 2418537, 2418541, 2431742, 2431739, 2418617, and 2437351.

The original footprint of the Ulumay Wildlife Sanctuary was obtained by the State of Florida in 1933. It was then transferred to the then State of Florida's Road Department on February 2, 1956. On February 21, 1963, the parcel was re-dedicated for public park purposes to the Brevard County Board of County Commissioners.

In July 2008, The Brevard County Environmentally Endangered Lands (EEL) Program acquired additional lands that were added to the Ulumay Wildlife Sanctuary. These lands were acquired using EEL referendum bond proceeds and involved two separate fee simple acquisitions and one donation. The first purchase was 148.10 acres from the Boyd party and the second purchase was 147.32 acres from the DiChristopher party. At that same time, a donation of 15 acres was also made by the DiChristopher party. The remaining acreage, which is just over 916 acres, was acquired through an inter-County department land transfer on January232018. An interim management plan was created for the original footprint of the site and accepted by the Selection and Management Committee on August 14, 2008. This management plan incorporates that interim plan as well as the Johnson and Kabboord property interim plans.

Management access for Ulumay Wildlife Sanctuary is available from Old Audubon Road off Sykes Creek Parkway and at the end of North Furman Road to the north. There is also a locked gate behind Audubon Elementary School property to the east. The site's kiosk and public access entrance is from Old Audubon Road off of Sykes Creek Parkway. There are no other recreational access locations.

NATURAL RESOURCE DESCRIPTIONS

This section provides descriptions of natural resources, including physical resources such as climate, geology, topography, soils, hydrology, and biological resources which include ecosystem function, flora, fauna, special concern species, and biological diversity, as well as cultural resource information such as archeological, historical, land-use history, and public interest.

Physical Resources

Climate

The Sykes Creek Management Plan areas are located in east central Florida on Merritt Island, a relic barrier island. It falls within the subtropical climatic zone and is just southeast of the isothermal junction with the temperate climatic zone. Temperature data from the **National Oceanic and Atmospheric Administration's (NOAA) 1991-2020** Temperature normals based on the Melbourne Weather Prediction Office indicate an average annual temperature of 72.9° F. The warmest month is July with an average maximum of 90.2° F. The coolest month is January with an average minimum of 52.4° F (**National Oceanic and Atmospheric Administration, 2021**). Summer temperatures are moderated by frequent afternoon thunderstorms. Periods of extreme cold weather are infrequent due to the site's latitude and proximity to the Atlantic Ocean and Indian River Lagoon.

There are reliable rainfall records from Titusville that span approximately 100 years, and average 53.8 inches of rain per year. These data are consistent with the data collected by staff around the area for the past decade. Wet and dry seasons are typically well defined, with the wet season occurring between May and October and the dry season between November and April. Annual and seasonal rainfall is subject to large variations in both amount and distribution. During spring and summer, Brevard County experiences numerous thunderstorms often coupled with frequent lightning strikes. Prevailing winds are generally from the north to northeast during the dry season (November-April) and from the east-southeast during the wet season (May-October). Weather patterns such as cold fronts and thunderstorms will affect local wind direction depending upon the time of year (Eastern Space and Missile Center, 1989).

Geology

Merritt Island represents a prominent land feature of the Indian River Lagoon located west of Cape Canaveral beach-ridge plain. Holocene sea level rise has been the most significant natural influence on the evolution of both the physical and biological aspects of east central Florida's continental margin. Fluctuating sea levels and glacial-interglacial cycles have shaped the formation of the barrier island (**Parkinson 1995**). Merritt Island is an old geological feature whose formation may have begun as much as 240,000 years ago, although most of the surface sediments are younger. Surface deposits of Merritt Island and Cape Canaveral are probably of Pleistocene and recent Holocene age (**Schmalzer and Hinkle 1990**). The Cape Canaveral-Merritt Island barrier island complex is unique along the Florida coast. This barrier island complex has been greatly influenced by sea level changes, erosion, and natural barrier island migration.

Topography

Elevations for the Sykes Creek Management Plan area (**Figure 9 and Figure 10**) range from approximately 0 feet in the lower wetlands up to 10 feet National Geodetic Vertical Datum along the higher scrub/sand ridges west of Ulumay Wildlife Sanctuary and to the eastern side of Kabboord Wildlife Sanctuary. These slight differences in elevations are enough to support varied ecosystems present within the Sanctuaries. Drainage ditches present within some of the Sanctuaries may be filled in at a future time to restore more natural hydrological conditions.

Soils

The soil types (**Figure 11**) within the Sykes Creek Management Plan area, are defined by the Natural Resource Conservation Service (formally the Soil Conservation Service).

Immediate soil disturbing activities will be limited to maintaining fire lines. Future restoration projects may involve removing spoil within wetland areas as well as filling historical mosquito

ditches in the management plan areas. On areas that have been disturbed prior to acquisition, assessments will be made to determine if soil erosion is occurring. If erosion is taking place, the appropriate measures will be taken to stop or control the effects of the erosion.

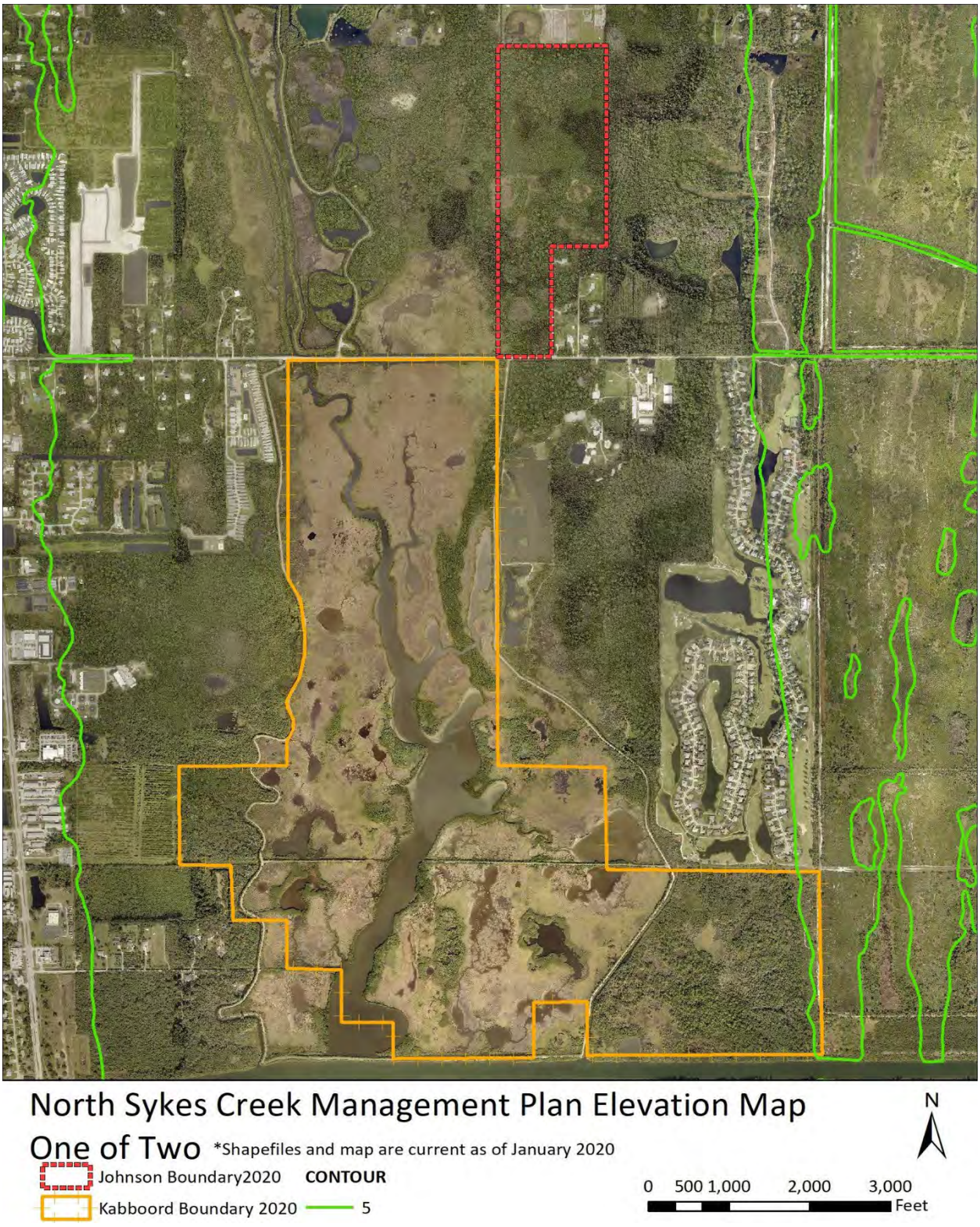
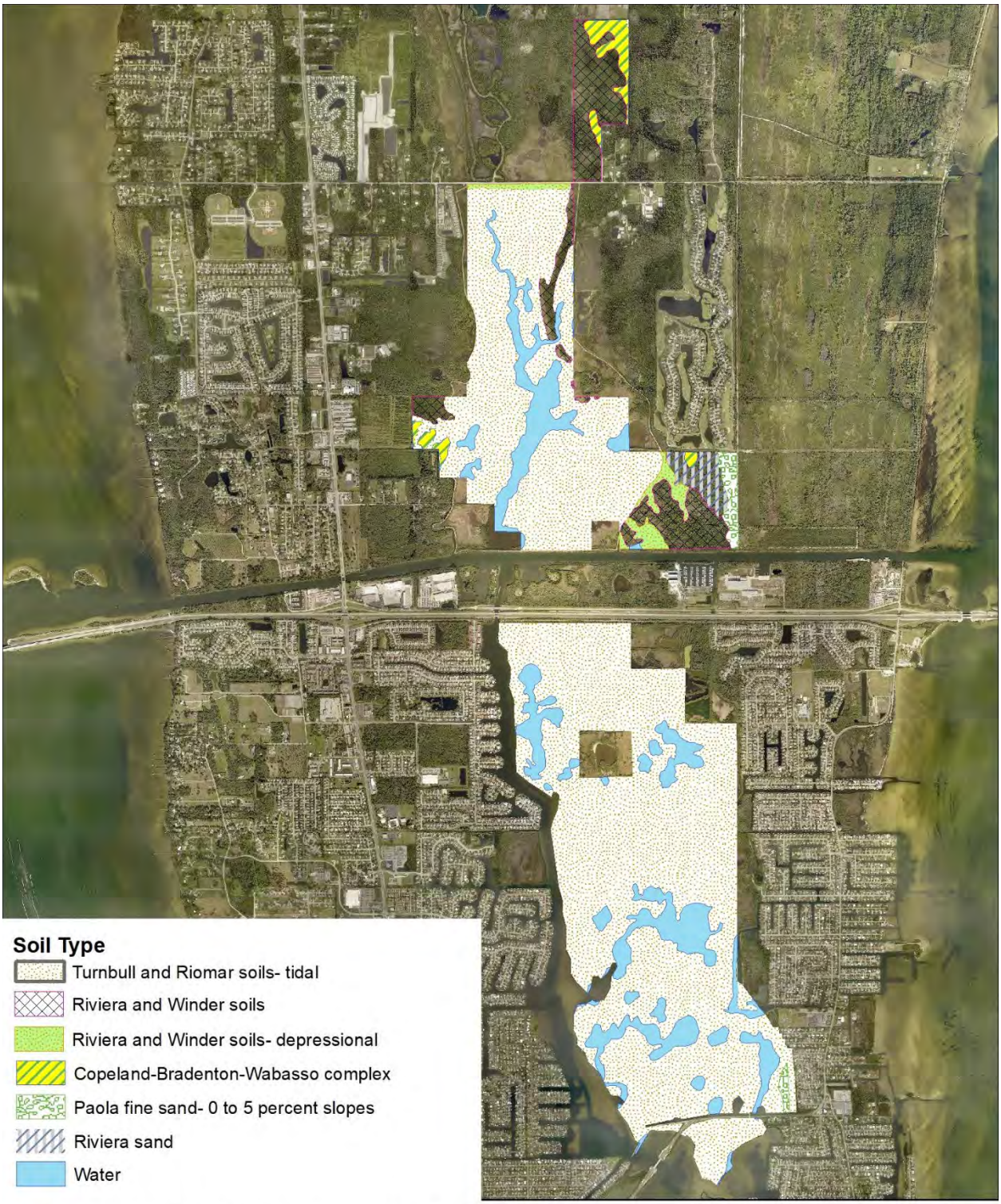


Figure 9 (Long Description 9)

*The LIDAR elevation shapefile (NGVD) was received from the Brevard County Natural Resources office in 2011

Figure 10 (Long Description 10)

*The LIDAR elevation shapefile (NGVD) was received from the Brevard County Natural Resources office in 2011



Sykes Creek Management Plan Soil Map

*Shapefiles and map are current as of January 2020

*Soil shapefile received from the USGS

Figure 11 (Long Description 11)

Copeland- Bradenton- Wabasso Complex
These series of soil mainly formed over limestone or loamy materials. They are poorly drained soils. The natural communities are mainly made up of hammocks and are found in the central part of Merritt Island in general. The natural vegetation is a thick growth of cabbage palms and hardwoods, such as live oaks, magnolia, and sweetgum with a few pines.

Paola Fine Sand, 0-5 percent slopes (PfB)
This is an excessively drained soil on ridges. The water table is below a depth of 10 feet. Vegetation on this soil type includes pines with a scattered understory of palmetto. According to the soil and natural communities maps, this sand is observed mainly within the scrub and flatwoods areas in the Southeast corner of Kabboord Wildlife Sanctuary.

Riviera Sand (Ri), Riviera and Winder soils, Riviera and Winder soils – (depressional)
The Riviera series of soil consists of very deep, poorly drained, very slowly permeable soils on abroad, flats and in depressions in the Lower Coastal Plain. They formed in stratified sandy and loamy marine sediments. These soils are found where the mean annual temperature is about 75 degrees Fahrenheit and the mean annual precipitation is about 62 inches a year. Slopes range from zero to two percent. Riviera soils are used for citrus, winter truck crops, and improved pasture. Native vegetation consists of slash pine, saw palmetto, and maiden cane.

Turnbull and Riomar
Turnbull and Riomar soils are mapped on approximately 80 percent of the site. This series of soil consists of very deep, very poorly drained, very slowly permeable soils near sea level and are flooded periodically by tidal over wash. They formed in clayey and sandy estuarine deposits. These soils are found where the mean annual temperature is about 72 degrees Fahrenheit and the mean annual precipitation is about 55 inches. Slopes are less than one percent. The Riomar soils are moderately deep to limestone bedrock.

Hydrology

Johnson Property
The Johnson Property lies within parcel numbers 12009C0333G and 12009C0345G, of the FEMA Flood Insurance Rate Maps dated 1/29/2021. One hundred percent of the Johnson Property falls within flood zone AE which is within the 100-year flood plain elevation. Flood zone AE is flood prone and subject to erosion.

There are no major hydrological features within the Johnson Property, however a significant portion of the site contains forested wetlands. There is a ditch on the eastern and northern boundary lines, and an artesian well onsite that staff have tried to cap with the help of St. Johns River Water Management District and other departments. Due to the soil saturation and current status of the well, these attempts were not successful. Efforts to cap the well will continue as drier conditions become available. It is the hope that with the addition of fire control lines, heavy equipment will be able to access the area and the well will be capped.

The primary hydrologic features of the Johnson Property are the mesic hammocks and wetland systems throughout the site. Onsite exotic control is needed. Further research will be needed to determine if any onsite ditches can be filled to restore natural hydrology without affecting surrounding property and infrastructure.

Kabboord Wildlife Sanctuary and Ulumay Wildlife Sanctuary

These tracts lie within Parcel Numbers 12009C0345G and 12009C0340G, of the FEMA Flood Insurance Rate Maps dated 1/29/2021. Over 95 percent of the property lies in flood zone AE. These areas are within the 100-year flood elevation.

The major hydrology-altering features of these sites include historic mosquito control ditch systems, a mosquito control impoundment, water control structures, and pumps. These alterations began subsequent to 1951. Dragline ditches first attempted to drain marshland. These were superseded by impoundments that allowed for control of water levels. The berms and their adjacent ditches were constructed in what is now Kabboord and Ulumay Wildlife Sanctuaries for mosquito control and local drainage. They still function for those purposes. Additional uses also include stormwater storage and water level management in times of flooding events. Culverts, flap gates, and risers allow for the release of water into and out of the site with pumps installed at the north-western Hall Road gate entrance for Kabboord Wildlife Sanctuary and at the public access gate area for Ulumay Wildlife Sanctuary. Recently, some culverts were replaced and new ones installed. Future culverts may need to be put in place. The culverts currently are and in the future will be the responsibility of the Brevard County Mosquito Control District for maintenance and all other financial obligations regarding the equipment and structures. All culvert projects have been, and in the future will be, permitted through Saint Johns River Water Management District and the Army Corps of Engineers.

Biological Resources

Protection of the resources depends upon five key items: Restoration of any historical hydrological processes that have drastically altered plant communities, removal of invasive

exotic species, limiting recreational impacts, reintroduction of a fire regime where appropriate, and monitoring all of the above items.

Ecosystem Function

Johnson Property
The Johnson Property is made up of mesic flatwoods, cabbage palm hammocks, and wetland systems. Protection and management of this property lies in the management of vegetative succession. Returning fire to the upland portions of the site is vital for the wildfire dependent species. Areas with lower land elevations make up the variety of wetland habitats. Fire will also return the ecotone areas to their natural state. Other habitats found between those elevations, consist of various stages of cabbage palm hammock. The Johnson Property preserves a fine example of the upland and wetland communities that once covered larger areas of Merritt Island.

Kabboord Wildlife Sanctuary and Ulumay Wildlife Sanctuary
All of the Ulumay Wildlife Sanctuary and most of the Kabboord Wildlife Sanctuary are situated within mosquito impoundments. Their habitats are comprised of salt tolerant systems with upland habitat in the minority, such as the hammock and scrub habitats on the southeastern side of Kabboord Wildlife Sanctuary. The biodiversity of these tracts will be maintained and improved through the careful application of hydrologic restoration, invasive species control, and prescribed fire. Mosquito projects have scarred the landscape, but much of the habitat persists in its natural form despite the destruction. The conservation of these areas is vital for the animals that have come to depend upon their existence for their breeding and foraging needs.

Vegetation

This section describes the plant communities identified within the Sykes Creek Management Plan. The identified vegetative communities in **Figure 12 and Figure 13** can be seen and are described on the following pages using the **Florida Natural Areas Inventory's Guide to the Natural Communities of Florida (2010)**. These figures were put together by staff using Geographic Information Systems (GIS) based on historical aerials, data from the Florida Natural Areas Inventory, the cooperative land cover map, soil data from the Natural Resources Conservation Service, and field observations by staff.

The Florida Natural Areas Inventory Letter for the Sykes Creek Management Plan was received on January 9, 2019. A copy of that letter can be found in **Appendix D**. Most of the Sykes Creek Management Plan properties are wetland habitats, from brackish water systems to freshwater depression marshes. Upland habitats consist of all major landscapes including a small area of

scrub habitat in the southeastern portion of Kabboord Wildlife Sanctuary, to flatwoods systems found in the northwest portion of the Johnson Property. These uplands are pristine in some locations, but other portions are disturbed or recovering from disturbances.

The following Flora and Fauna descriptions are from the Florida Natural Areas Inventory classification and are generic and not specific to the Sykes Creek Management Plan. Staff has surveyed these managed areas and confirmed that these habitats are present in the general locations noted.

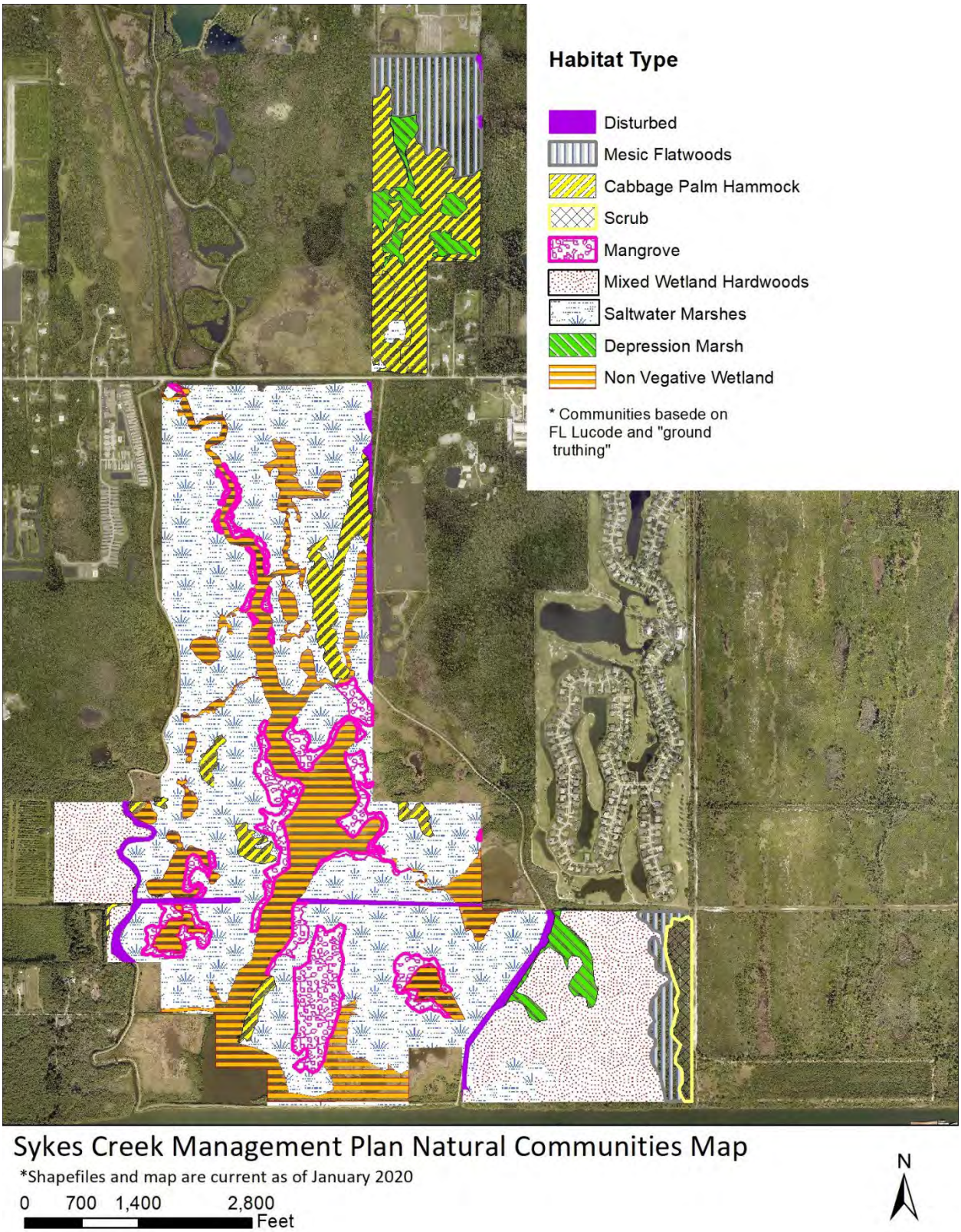


Figure 12 (Long Description 12)

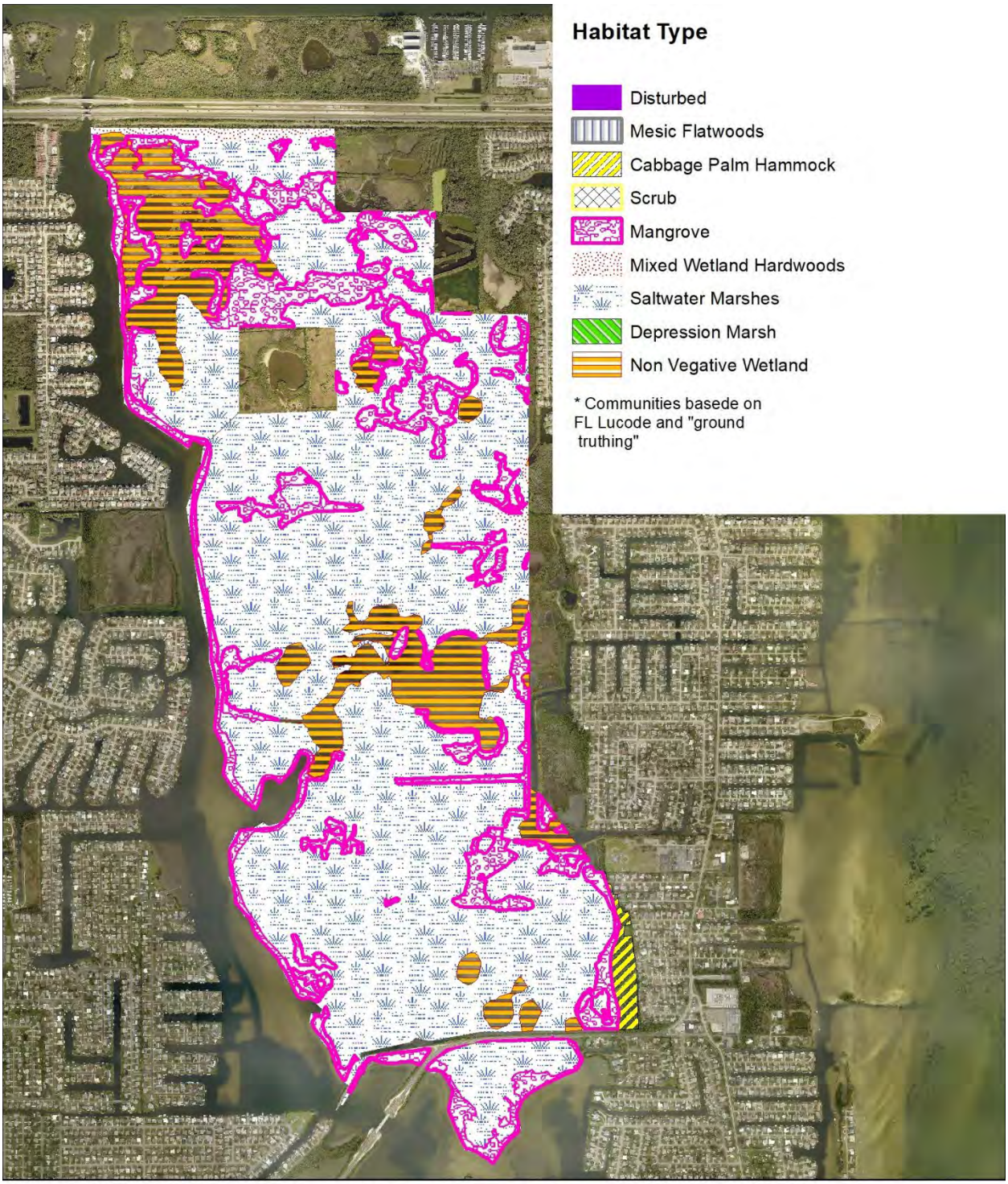


Figure 13 (Long Description 13)

Mesic Flatwoods (44 Acres)

This plant community is found on the Johnson Property (31 acres) and Kabboord Wildlife Sanctuary (13 acres). Pine density varies, with some areas containing only longleaf pine (Pinus palustris), others only slash (Pinus elliotti) and still others a combination. Mesic flatwoods are characterized as an open canopy forest of widely spaced pine trees with little or no understory and a dense ground cover of herbs and shrubs. Typical understory vegetation consists of saw palmetto (Serenoa repens), gallberry (Ilex glabra), fetterbush (Lyonia lucida), and a variety of grasses with occasional pawpaw (Asimina reticulata), tar flower (Bejaria racemosa) and redbay (Persea borbonia) also present. Portions of this habitat have been altered due to historic hydrological alterations and the interruption of historic fire frequencies.

A return to a more natural fire regime is necessary for all of the mesic flatwoods within the properties. The height of the shrub layer can accurately reflect the period since the last fire event. Flatwoods in ideal situations should burn every 1 to 3 years to remain in maintenance condition. Maintenance condition (**Florida Natural Areas Inventory,2010**) for these tracts would consist of less than 40% saw palmetto coverage with pine density ranging from 3 to 4 pine (of varying ages) per acre in scrubby flatwoods to 40 -70 square foot. basal area (BA) in the flatwoods.

Mesic flatwoods occur on relatively flat, moderately to poorly drained terrain. The soils typically consist of 1-3 feet of acidic sands generally overlying an organic hardpan or clay subsoil. The hardpan substantially reduces the percolation of water below and above its surface. During the rainy seasons, water frequently stands on the hardpan's surface and inundates much of the flatwoods; while during the drier seasons, ground water is unobtainable for many plants whose roots fail to penetrate the hardpan. Thus, many plants are under the stress of water saturation during the wet seasons, and under the stress of dehydration during the dry seasons. Flatwoods on the Johnson Property are frequently under water during the wet season and some of the periods before and after.

Depression Marsh (23 Acres)

Depression marshes are the seasonally wet ponds scattered throughout the mesic flatwoods. These wetlands are essential for the conservation of many of the site's amphibians and provide breeding grounds for species such as the sandhill crane (Grus canadensis). The marshes are ringed by dense saw palmetto with sandweed (Hypericum fasciculatum) as the dominant species. Sphagnum moss (Sphagnum sp.) occurs in some. Bloodroot (Lachnanthes caroliniana) and pipeworts (Eriocaulon sp.) are present. This represents a natural community fast disappearing to development in Brevard County.

Fire is important in maintaining this community type by restricting invasion by shrubs and trees and in the formation of peat. Fire will need to be reintroduced in the depression marshes within the Sykes Creek Management areas.

Fire intervals should be consistent enough that hardwoods and fire shadows are eliminated. Burning during varying conditions, wind direction, and seasons are an important factor in reaching these goals. **The Florida Natural Areas Inventory (2010)** considers maintenance condition when herbaceous vegetation reaches 75% to 100%.

Cabbage Palm Hammock (92 Acres)

Cabbage palm hammock is characterized as a well-developed hardwood and cabbage palm forest with a variable understory often dominated by palms and ferns. Typical plants include cabbage palm (Sabal palmetto), red maple (Acer rubrum), swamp bay (Persea palustris), wax myrtle (Myrica cerifera) and saw palmetto. Animals include the raccoon (Procyon lotor), squirrel treefrog (Hyla squirrela) and grey squirrel (Sciurus carolinensis).

The cabbage palm hammocks within the Sykes Creek Management Areas consist of mainly cabbage palms and are found at the south end of the Johnson Property and bordering the saltmarsh areas of the other two sites. The habitat also has a dense oak overstory and a shrubby understory.

Maintenance condition for this habitat would include fire intervals between 50 to 100 years. The landscape would consist of a closed canopy of oaks and palms with an open understory of palms and fern (**Florida Natural Areas Inventory, 2010)**.

Scrub (11 Acres)

Scrub habitat only occurs within the Kabboord Wildlife Sanctuary. Some plants common to the habitat are the Florida rosemary (Ceratiola ericoides), Chapman Oak (Quercus chapmanii), sand live oak (Quercus geminata), myrtle oak (Quercus myrtifolia), and rusty lyonia (Lyonia ferruginea). The scrub's loose sands drain rapidly, creating very xeric conditions for which the plants have evolved water conservation strategies. This community is essentially maintained by hot, fast burning fires, which allow for the regeneration of the scrub community. Periodic fires should be reintroduced to maintain the scrub for species survival. Fire intervals for scrub should range from 3 to 10 years. Maintenance conditions would include open sandy areas ranging from 10 to 50%. 70% of Scrub oaks should measure 1.7 meters or less in height **(Kent and Kindell, 2009)**. The Florida Fish and Wildlife Conservation Commission put together scrub management guidelines in 2009 and have recently updated those guidelines in February of 2019. The Environmentally Endangered Lands Program uses these guidelines in management activities for scrub related decisions **(Florida Fish and Wildlife Conservation Commission, 2019).**

Mangrove (303 Acres)

This habitat, within the Sykes Creek Management boundaries, is located mostly along the berms of all sites. Generally, this habitat exists where there is low wave energy, marine and estuarine shorelines. The dominant plants of mangrove/ mangrove swamp are red mangrove (Rhizophora mangle), black mangrove (Avicennia germinans), white mangrove (Laguncularia racemosa), and buttonwood (Conocarpus erectus). Generally, these four species can occur either in mixed stands or often in differentiated, monospecific zones that reflect varying degrees of tidal influence, levels of salinity, and types of substrate. Mangrove swamp provides important habitat for many rare animal species, including mangrove gambusia (Gambusia rhizophorae), opossum pipefish (Microphis brachyurus), and mangrove rivulus (Rivulus marmoratus). Mangrove species are expanding northward and increasing in abundance in response to global warming and reduction in the occurrences of hard freezes.

Mixed Wetland Hardwood (125 Acres)

The mixed wetland hardwoods habitat has a canopy of laurel oak (Quercus laurifolia) and red maple (Acer rubrum); subdominant tree species will include water oak (Quercus nigra). Sparse wax myrtle and buttonbush dominate the shrub layer. The groundcover includes sparse sawgrass (Cladium jamaicense) and soft rush (Juncus effusus). This habitat exhibits a natural species composition and structure, strong hydrologic indicators of restored hydrology, with hydric soils present.

Non-Vegetative Wetland (201 Acres)

These areas are generally characterized as expansive, relatively open areas of subtidal, intertidal, and supratidal zones which lack dense populations of sessile plant and animal species. They can temporarily exhibit freshwater conditions during periods of heavy rainfall or upland runoff or marine conditions when rainfall and upland runoff are low. This occurs during large storms at Kabboord Wildlife Sanctuary due to the pumps located at the northern boundary and the southern boundary of Ulumay Wildlife Sanctuary.

Saltwater Marsh (1189 Acres)

These areas are adjacent to or connected to Sykes Creek. They are largely herbaceous habitats in the coastal zone affected by tides and seawater along a bay or estuary. The vegetative composition of the saltwater marsh communities located within Kabboord Wildlife Sanctuary have not been significantly disturbed by the historic mosquito impoundment activities such as drag lining. These features do show up within the Ulumay Wildlife Sanctuary and both have berms around this habitat type.

Prevalent species are saltwort (Batis maritima), glasswort (Salicornia virginica), sea oxeye (Borrichia frutescens), salt grass (Distichlis spicata), and knotgrass (Paspalum distichum). Marshelder (Iva frutescens), and christmasberry (Lycium carolinianum), often marks the transition to upland vegetation or low berms along the seaward marsh edge.

The list of flora for this management plan is not a complete floristic inventory. A plant species table generated through the compilation of data collected by members of the Environmentally Endangered Lands staff and volunteers is included in **Appendix E**.

The following table details the amount of acres of each habitat in each of the three Sanctuaries within the Sykes Creek Management Plan area. Acreage was pulled from the Geographic Information System (GIS)

	The Johnson Property	**Kabboord Wildlife Sanctuary**	**Ulumay Wildlife Sanctuary**
Habitat Type			
Cabbage Palm Hammock	53	29	10
Depression Marsh	14	9	
Mangrove		51	252
Mesic Flatwoods	31	13	
Mixed Wetland Hardwoods		102	23
Non Vegetative Wetland		132	169
Saltwater Marsh		438	751
Scrub		11	
Disturbed	1	18	22
Total	99	803	1227

The natural communities component of these properties are diverse with natural community transitions. Historic aerials dated as far back as 1943 were examined to determine changes within these plant communities. The most obvious habitat changes occurred in the wetland ecosystems. Human activities have interrupted the natural wetland cycles by both altering the hydrology as well as eliminating any naturally occurring fire across the landscape. Photographs from 1943, 1951, 1975, 2000, and present day were inspected and observations of significant changes are noted below. Historical aerials for the three tracts can be seen in **Figure 14 (1943), Figure 15 (1951), Figure 16 (1975), and Figure 17 (2000)**.

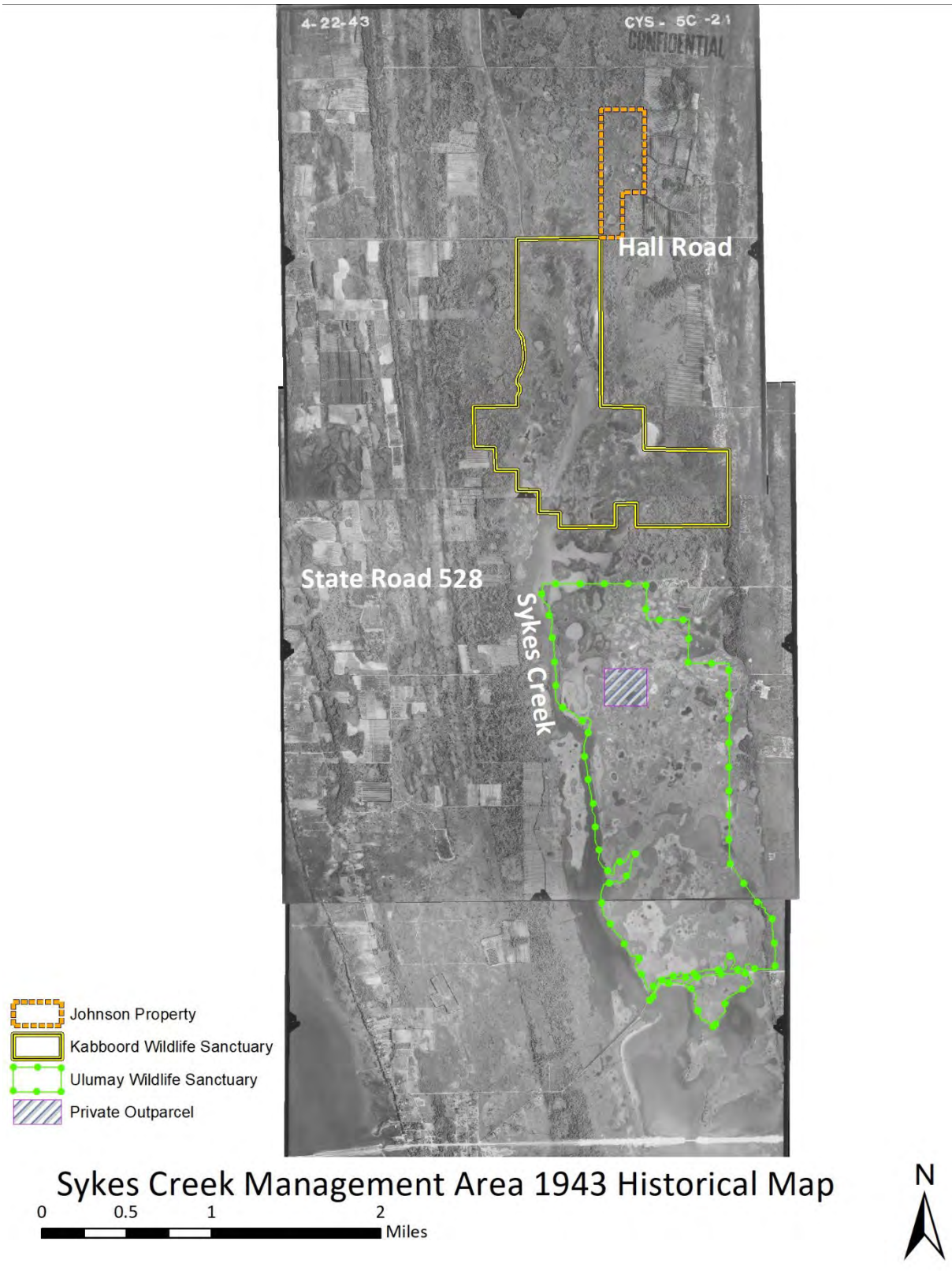


Figure 14 ([Long Description 14]**)**

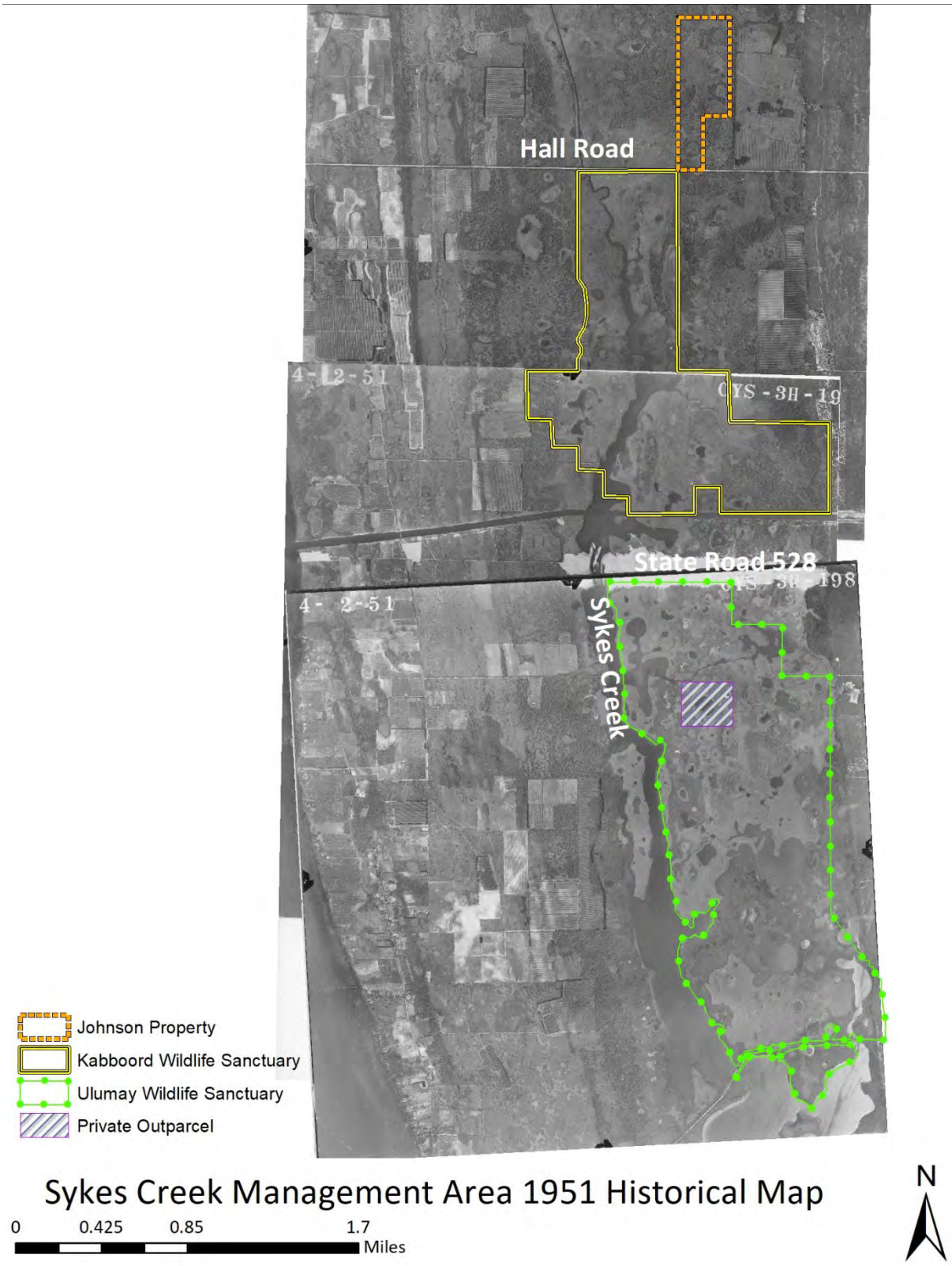


Figure 15 (Long Description 15)

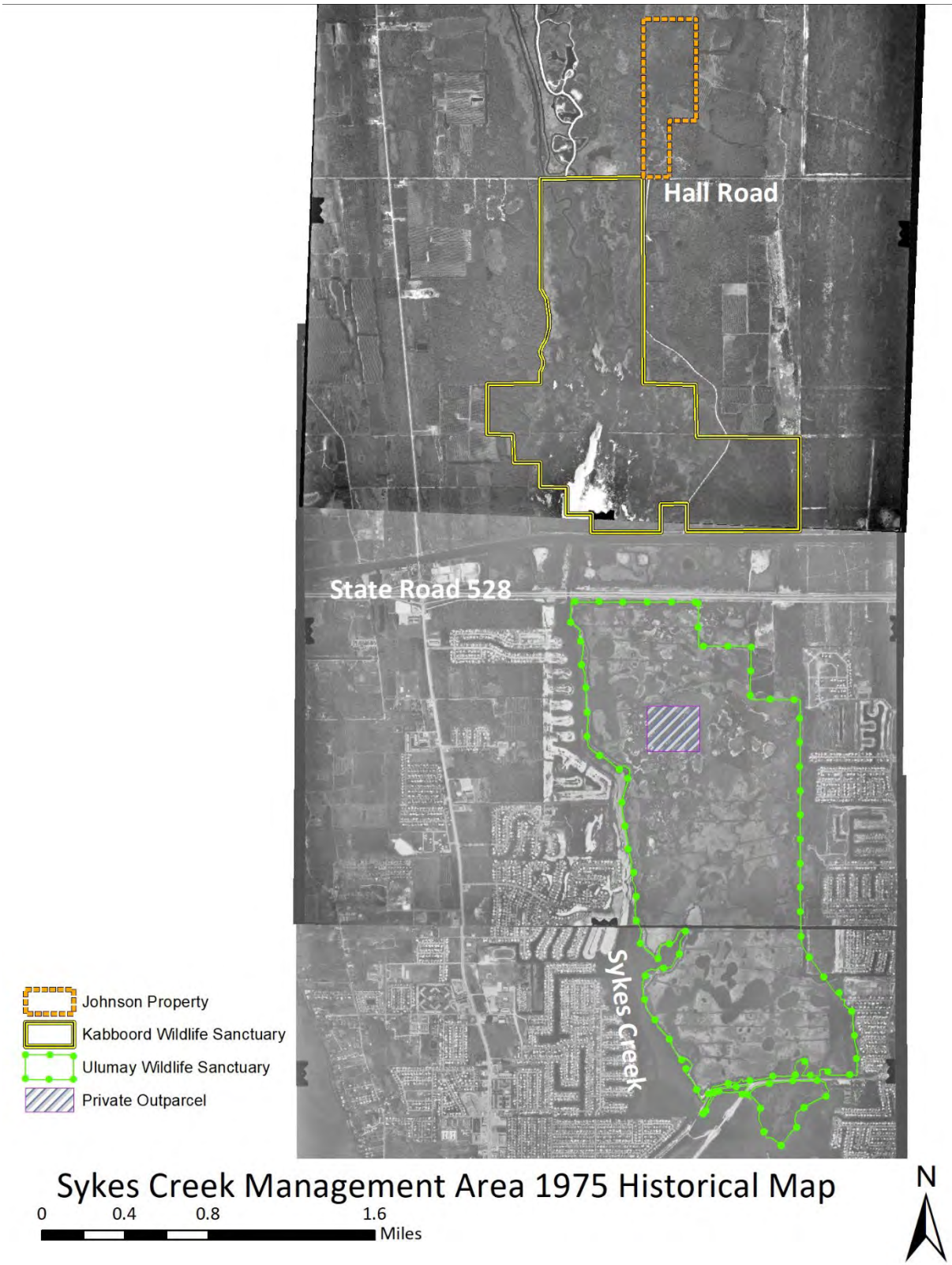


Figure 16 (Long Description 16)

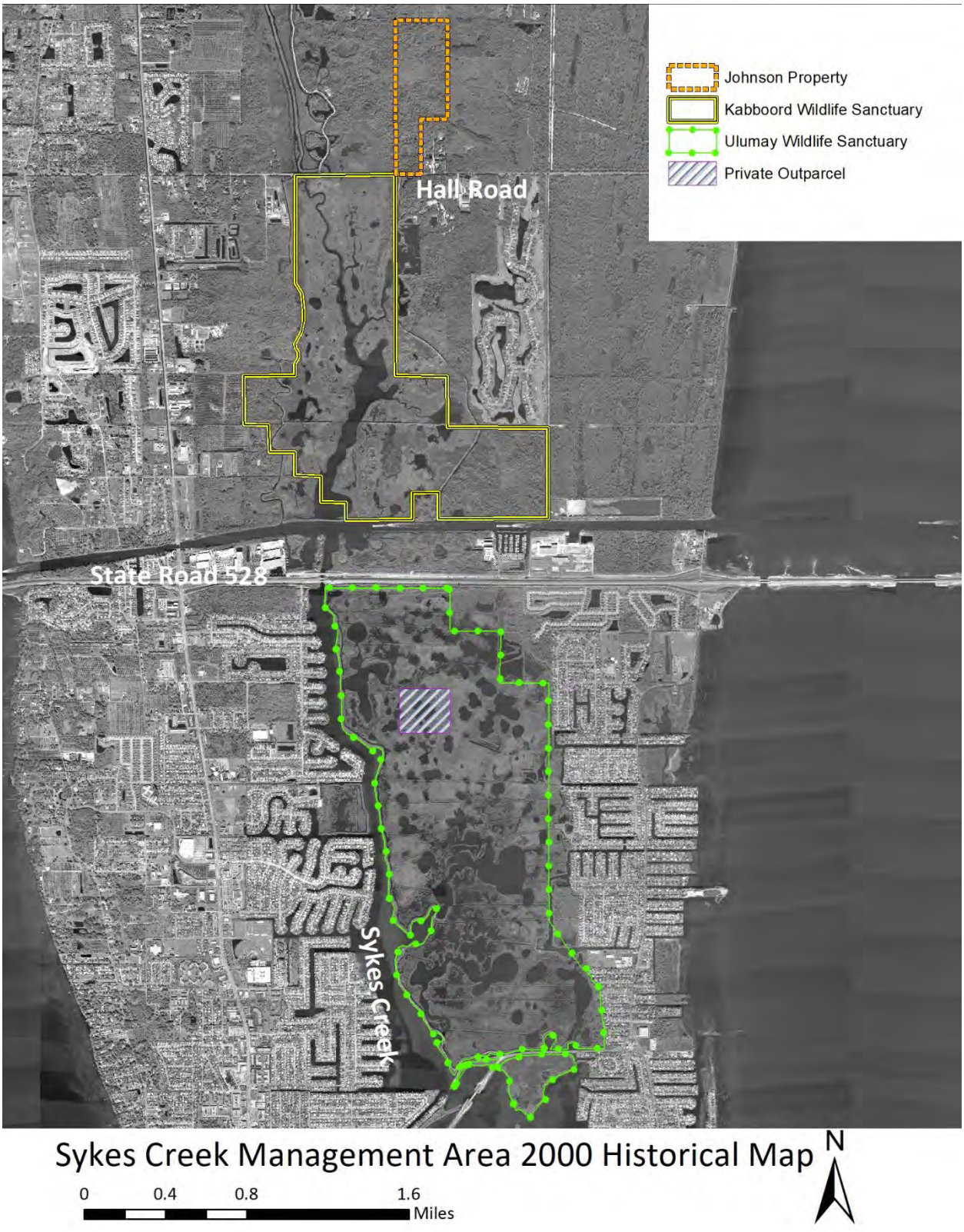


Figure 17 (Long Description 17)

Sykes Creek Management Plan Properties
1943: The management area is relatively pristine. State Road 528 is not present.
1951: State Road 528 can be seen in the construction phase.
1975: New developments and roads are present as well as drag lines in Ulumay Wildlife Sanctuary.
2000: The more recent developments can be seen.

Fauna

The size and diversity of natural communities found within the Sykes Creek Management Plan area support a high number of animal species. There is a need for extensive faunal surveys to be performed within the Sykes Creek Management Plan boundaries.

Insects
General insect surveys include the use of yearlong methods, such as Malaise and pitfall traps. These quantifiable methods of surveying document any listed insect species and provide a survey of insects through the season. In accordance with Florida Statues Section 388.4111, all environmentally sensitive and highly biologically productive lands are required to submit an arthropod control plan. The Sykes Creek Management Plan arthropod control plan and the known history of spraying within the Sykes Creek Management Plan managed area can be found in **Appendix F**. Brevard County Mosquito Control will adulticide only when populations exceed the landing rate thresholds, or when a potential for a mosquito-borne disease outbreak become sufficient for disease transmission or a quantifiable increase in numbers of pestiferous mosquitoes or other arthropods. Treatments will be in upland areas only.

Birds
With the help of volunteers, universities, and staff, extensive specie surveys have been done in recent years. Birds observed within the Sykes Creek Management Plan area are listed in **Appendix G**. Birds such as the bald eagle (Haliaeetus leucocephalus) have been observed on these sites though no nests have been located. The Florida Scrub-jay (Aphelocoma coerulescens) is present within the Kabboord Wildlife Sanctuary.

Reptiles and Amphibians
The reptiles and amphibians noted within the Sykes Creek Management Plan are listed in **Appendix H**. Staff have initiated ongoing species surveys with the help of a local volunteer. The Kabboord Wildlife Sanctuary had a survey done which focused specifically on snake species that were present on the property.

Mammals

The mammals recorded on-site are listed in **Appendix I** for all Sanctuaries within the Sykes Creek Management Plan. There is a need for more extensive surveys, especially for small rodents. Environmentally Endangered Lands staff have used game cameras within the Sanctuaries to help identify additional species. A more extensive survey would need to be conducted in order to estimate numbers of an individual species such as white tail deer (Odocoileus virginianus), bobcat (Felidae rufus floridanus), raccoons (Procyon lotor), and others found in the surveys.

Designated Species

Plants

The United States Fish and Wildlife Service (USFWS) and the Florida Department of Agriculture and Consumer Services (FDACS), compile lists of protected plant species. The USFWS classifies protected plants as either endangered or threatened. The FDACS lists plants that are considered State Endangered, Threatened, or Commercially Exploited.

Although there have been plant surveys conducted within the Sykes Creek Management Plan Area, they were conducted primarily to determine the presence or absence of species. The next step will require the generation of maps and photographic series detailing the extent of coverage of these designated species. Once a baseline has been established, monitoring of land management practices can occur. The location of designated plant and animal species will be considered during the creation of public access trails and during other management efforts including exotic species removal.

Animals

The United States Fish and Wildlife Service and the Florida Fish and Wildlife Conservation Commission also compile lists of wildlife species considered to be under the possible threat of extinction. These species are categorized as either Endangered or Threatened. The Florida Fish and Wildlife Conservation Commission utilizes an additional category, called “Species of Special Concern” (SSC), for several animal species that may ultimately be listed as endangered or threatened. This classification provides the SSC listed animal with a particular level of protection that varies from species to species.

There are several protected avian species on site; these include the Florida scrub-jay, bald eagle, wood stork (Mycteria americana), and sandhill crane. These species inhabit rare communities on-site. In particular, the Florida scrub-jay which have been noted on site reviews numerous times in Kabboord Wildlife Sanctuary.

Any translocation of plant or animal species into the sanctuaries covered in this plan must follow the Environmentally Endangered Lands Program's Species Translocation Policy.

Reptiles and Amphibians

The gopher tortoise (Gopherus polyphemus) is currently listed as a threatened by the Florida Fish and Wildlife Conservation Commission (FFWCC). The gopher tortoise is locally (FFWCC) protected as a threatened (T) species. Gopher tortoises can be found in a variety of upland habitats including scrub, scrubby flatwoods, and flatwoods. There are populations of Gopher tortoises on all three sites within the management plan area. Protections of these threatened species in endangered habitats are critical for species survival. It is essential that suitable habitat is kept in fire rotation to adequately sustain the existing population.

Though the Eastern Indigo Snake (Drymarchon couperi) has been observed in the adjacent wildlife refuge, the survey conducted in Kabboord Wildlife Sanctuary did not observe this species.

Biological Diversity

The collection of data relating to biodiversity studies is needed within the Sykes Creek Management Plan area starting with basic, complete inventories. Levels of richness and evenness (the two measures of overall diversity) should vary naturally among community types. Richness refers to the number of species found within a particular community, while evenness refers to the distribution of individuals among species.

A comprehensive sampling protocol (i.e. sampling each stratum of the community) is typical, but practicality and specific use dictate that the sampling should be limited to the subcanopy/scrub layer, and to the herbaceous/ground cover layer, wherein the stronger indications of change in species diversity will be noted. Sampling these layers provides useful management data regarding the effects of use on the plant communities. Sampling for small mammals, avian species, and herptile is also useful to staff when making decisions regarding trail selection and carrying capacity of the site.

Examples of sampling methodology may be found in:

Brower, J.E. ad J.H. Zar. 1984. Field and Laboratory Methods for General Ecology, 2nd Ed. Wm. C. Brown Publishers, Dubuque, Iowa.

Campbell, H.W. and S. P. Christman. 1982. Field techniques for herpetological community analysis. In N.J. Scott, ed.: Herpetelogical Communities, pp. 193-200. Fish and Wildlife Service Wildlife Research Report 13.

Corn, P.S. 1994. Straight-line drift fences and pitfalls. Pp. 109-117. in Heyer, M., A. Donnelly, R.W. McDiarmid, L.C. Hayek, and M.S. Foster. Measuring and Monitoring Biological Biological Diversity. Standard Methods for Amphibians. Smithsonian Institution Press. Washington, D.C.

Fitch, H.S. 1992. Methods of sampling snake populations and their relative success. Herpetol. Rev. 23: 17-19.

Grant, B.W., et al. 1992. The use of coverboards in estimating patterns of reptile and amphibian biodiversity. In D. McCollough and R.H. Barrett (eds): Wildlife 2001: Populations, pp. 379-403. Elsevier Science Pub. London, England.

Gysel, L.W. and L.J. Lyon. 1980. Habitat analysis and evaluation. Wildlife Techniques Manual. Pp. 305-327. S.D. Schemnitz (ed.). The Wildlife Society. Washington, D.C.

U.S. Fish and Wildlife Service. 1980. Habitat Evaluation Procedures (HEP). Ecological Services Manual 102. U.S. Department of Interior, Fish and Wildlife Service, Division of Ecology Services, Government Printing Office. Washington, D.C.

Cultural

Archaeological

In response to the request for a review of Florida Master Site Files, the Department replied that within the Sykes Creek Management Plan area, multiple field surveys have been conducted with no historical structures found, and two archeological sites located. The Environmentally Endangered Lands staff consults with the Division of Historical Resources (DHR) before taking actions that may adversely affect archaeological resources.

Due to the sensitive nature of these archeological sites, this plan does not include maps of the surveyed areas. For general reference, 3 separate letters were received on January 4, 2019. The Johnson property did not contain either historical structures or archaeological sites. Two field surveys have been conducted. Kabboord Wildlife Sanctuary did not contain any historical structures but did have a recorded archaeological site. Seven field surveys have been conducted within the boundaries of that site. Ulumay Wildlife Sanctuary did not contain any historical structures but did have a recorded archaeological site. Six field surveys have been conducted within the Sanctuary's boundary.

Historical

People have inhabited Florida for 10,000 years, perhaps even longer. Paleo-Indians, the earliest Floridians, were nomadic hunters of mammoths, bison, camel and giant tortoise **(Myers and Ewel, 1990)**. Brevard is one of east-central Florida's oldest counties, established in 1855. "A boundless land of oaks, palm and pines flanked by a clean, pristine lagoon, the county was

largely without claim or improvement at the time of its creation. Marine life within the lagoon was the early resident's main form of food. By the turn of the industrial revolution, development and opportunities arose for many. Forests were cleared for agriculture. Citrus, cattle raising, timber, and lumber production were mainly chosen" **(Eriksen J., 1994).**

A timber assessment report has not been completed for the Sanctuaries within the Sykes Creek Management Area. Ulumay Wildlife Sanctuary and Kabboord Wildlife Sanctuary are comprised mostly of wetland mosquito impoundments. The Johnson property has some timber in the flatwood area, but due to the size of the Johnson Property as a whole and the minor acreage associated with the flatwoods community, staff will not use timbering as a process of restoration at that site. If future onsite thinning is needed to further promote the understory vegetation, the thinning of trees will occur by cutting and laying them in place followed by prescribed fire.

Land-Use History

Beginning in the 1950's, mosquito control drag lines were added to Ulumay Wildlife Sanctuary. Later, both at the Kabboord and Ulumay Wildlife Sanctuaries, berms were constructed to further control water levels of the area in order to manipulate the availability of breeding grounds for the mosquito.

The Johnson Property has some history with inhabitants as there is at least one artesian well onsite. Attempts to cap the well have been made, but were not successful. Staff continues to look at cost effective options.

Public Interest

Prior to Brevard County's management, several areas within the Sykes Creek Management Area boundary were popular duck hunting sites. Recreational hunting is not allowed on Environmentally Endangered Lands Properties. Feral hog (Sus scofa) control is a management action allowed under a special use permit to approved trappers. Because of impacts on the environment, the use of off-road vehicles is not authorized within the Environmentally Endangered Lands Sanctuary boundaries. These firebreaks, along with the berm systems, allows the regular presence of staff members to access the sites and maintain adequate control and protection of the properties.

All fishing must follow current Florida Fish and Wildlife Conservation Commission regulations. It is the responsibility of the user to know and understand the updated regulations when fishing onsite. Failure to follow these regulations will be enforceable by the proper authority onsite at the time of any infractions. The Environmentally Endangered Lands (EEL) Program encourages

passive recreation use in the form of hiking, birding, fishing, kayaking, and bicycling within the Sykes Creek Management Plan properties.

FACTORS INFLUENCING MANAGEMENT

Natural Trends

The main natural trends influencing the diversity of these sites are fire frequency (from lightning or arson), hydroperiod, and water quality. In the absence of fire, invasion by native and non-native woody species occurs rapidly. Within the Sykes Creek Management Plan areas, the natural fire regime must be re-established and maintained to insure the maintenance of the flora and fauna unique to these pyrogenic natural communities.

Fire is critical in Florida ecosystems, as it creates openings for fire dependent species and removes others that cannot resist fire. Fire breaks down complex organic molecules, which when added to the soil, enhance seed germination and regrowth of vegetation. Thus, fire changes both the composition and the density of the flatwoods forest. In the scrub, flora such as the sand pine provide fuel for fire in the form of dead branches and residual needles. The result is a hot fast burning fire that allows regeneration of the scrub habitat by adding minerals from the burning vegetation in the soil and helps the release of pine seeds (**FNAI, 2010**).

The primary change in the hydrologic character of land within the Sykes Creek Management Plan areas has been caused by mosquito control operations and the impacts of off-road vehicles in some areas. There is a drainage ditch on the east side of the Johnson Property as well as the artesian well.

Though the mosquito impoundments of Ulumay Wildlife Sanctuary and Kabboord Wildlife Sanctuary are challenging burns, ecologically it is necessary and historically it did take place. Habitat range of the Florida scrub-jay is also a natural trend that is affected by human-induced trends. Continued communication with local experts insures that the Florida scrub-jay population as a whole (throughout the County) are managed to insure long-term viability of the populations. The management staff of the Environmentally Endangered Lands Program work closely with the Merritt Island National Wildlife Refuge staff when coordinating burns and management on the southeastern boundary areas of Kabboord Wildlife Sanctuary. The scrub habitat within Kabboord Wildlife Sanctuary is part of the foraging area for the Florida scrub jay and must be managed to provide these opportunities to the Florida scrub jay families in the area.

An important factor influencing the natural communities within the Sykes Creek Management Plan sites is hydrology and more specifically the hydroperiod, particularly in the hydric hammocks. Changes in hydroperiod have the potential to significantly alter community structure. A decrease in hydroperiod could allow the invasion of nuisance or non-native species, while an increase in hydroperiod could surpass the inundation tolerances of the desired species present.

Evaluation of the natural, as well as the existing, hydroperiod should be completed to better understand and enhance the natural ecological processes. Corrections should be made to the site's flow patterns in an attempt to re-establish the historic flow patterns within the impounded areas where the cross canals currently exist.

Human-Induced Trends

Human influences on-site include:

Fire suppression/alteration of natural cycles
Naturally occurring fires have been modified during recent times through suppression actions and the fire shadowing effects of marshes and other wet ecosystems. Management activities such as those pertaining to mosquito control tend to result in plant and animal compositions that are different than what might have existed under more natural regimes. A more natural cycle under the prescribed burn plan has helped to address this problem.

Invasion of Exotic species
Invasive species such as Brazilian pepper (Schinus terebinthifolia), cogon grass (Imperata cylindrica), Japanese climbing fern (Lygodium japonicum), old world climbing fern (Lygodium microphyllum), melaleuca (Melaleuca quinquenervia), and Guinea grass (Urochloa maxima) are mostly located along roads and ditches. An initial chemical treatment of exotic plants over Sykes Creek Management Plan properties has taken place and maintenance treatments are ongoing. Staff continues to look for additional grants and funding through State and Federal Departments and continues to designate decontamination areas/ wash sites for vehicles and other equipment to ensure exotic species are not brought into the Sanctuary.

Environmentally Endangered Lands staff has treated Guinea grass along the bermed areas within Sykes Creek Management Plan properties. Spot treatment of cogon grass is ongoing. These grasses within Sykes Creek Management Plan are located mainly along the mosquito impoundment berms in Ulumay and Kabboord Wildlife Sanctuaries. It can spread via mowing equipment, rhizomes, and wind. It will be, and has been, treated immediately upon discovery. Other noted exotics within the boundaries include a strand of Australian pines (the three species found in Brevard County are Casuarina equisetifolia, Casuarina glauca, and Casuarina

cunninghamiana) within the Johnson Property and Brazilian pepper within the Kabboord Wildlife Sanctuary mesic flatwoods and hammock communities.

Known faunal invasive species include the red imported fire ants (Solenopsis invicta) and feral hogs. Feral hogs have been spotted within two of the three (not Ulumay Wildlife Sanctuary) Sanctuaries and are causing localized disturbances. Hog trapping methods are being pursued in order to control this exotic species. There are no known feral cat populations within these Properties.

Small roads/trails that run through property

There is an old pathway within the Johnson Property that meanders through some of the drier areas in the central portion of the property as well as an old trail through the east side of Kabboord Wildlife Sanctuary. These areas are designated trails but can be used for maintenance of exotic plant species by staff as well as access pathways during prescribed fire or wildfire events.

Drainage canals

Ulumay Wildlife Sanctuary contains cross-canals/ mosquito ditches which affect the hydrology of the sites and the importance of correcting their impact is critical. The history and future plans for these canals are discussed in the habitat restoration section of this management plan. All three sites within this management plan have had boundary ditching occurring at some point on the property.

Hydroperiod alterations

The alterations by filling and draining wetlands or leveling and grading uplands have drastically altered the natural water cycle within the Sykes Creek Management Plan boundaries. Natural ecosystem response has stabilized the vegetative community and the existing configuration. Some of the ditches in Ulumay Wildlife Sanctuary need to be filled to restore the natural hydroperiod of the area. More investigation is required to provide information on whether the natural hydroperiod of the marsh areas have been altered by the surrounding residential areas and any alterations that would be taken to fill in these ditch systems will need to be evaluated first. Staff consults with other stake holding County entities as well as presenting proposals to the Selection and Management Committee for their scientific opinions. The construction of ditches throughout the properties have altered water flow between wetlands. Most of the ditches on-site within the Ulumay Wildlife Sanctuary are due to past mosquito control measures which are no longer effective. Filling these disturbances will enhance the wetland and its biodiversity.

Hunting

Historically, hunting occurred throughout the Sykes Creek Management Plan properties.. Per County Ordinance Chapter 78, hunting is prohibited. Staff has installed boundary signs with

rules and regulations prohibiting hunting. The Environmentally Endangered Lands Program works with local law enforcement to monitor these sites for illegal hunting.

Dumping

The site reviews for Sykes Creek Management Plan show evidence of the dumping of various types of debris. This activity has been minimized with the posting of the boundaries. Boundaries have also been fenced where needed and gates have been installed to further control illegal or unwanted activities. Future fencing will need to be done along the Johnson Property. The issue of fencing and boundary notification for Kabboord and Ulumay Wildlife Sanctuaries have been addressed. Any dump sites within the Sykes Creek Management Plan boundaries that have been located by staff, have been cleaned up.

Florida Power and Light (FPL) powerline

There is a power line that runs east-west through Kabboord Wildlife Sanctuary which is burned periodically. The area under the lines is periodically mowed to eliminate fire dangers. Exotics are continually a problem in these areas due to contractor's equipment spreading seeds. Exotic grasses are the biggest problem and the hardest to contain. FPL does spray their easements. They do not do this for the purpose of keeping exotics to a minimum or eliminating them. Spraying and mowing are only done when vegetation height impacts their ability to service the lines. Staff does spray these easements occasionally, but it is not a high priority due to the continued seeding of the area from FPL's equipment. Staff's time is concentrated on minimizing the spreading of these exotics farther into the sanctuary from the easement area. Staff does keep in contact with FPL and works with them to keep the exotics to a minimum.

Major Roads and the Barge Canal

Hall Road, Highway 528, and Sykes Creek Parkway present obvious negative influences upon the survival of many species that often cross back and forth over these roadways.
The Barge Canal influences the water level of some of the Sanctuaries as well as creating disturbances to wildlife as it is a major corridor for boat traffic.

External Influences

There is a constant invasion of exotic plants and animals from outside of these conservation area boundaries. Boundary lines are surveyed as often as scheduling allows and staff will continue to secure these control points and treat exotics.

It is very important that boundary signs be posted along the fence lines and at entrances. Signs have been posted every 500 feet and staff continually checks these boundary signs due to vandalism and theft. When damaged or taken, staff replaces the signs. This allows law

enforcement to ticket individuals for illegal activities. There are no known encroachments from adjoining property owners at the time of this management plan.

The Environmentally Endangered Lands Program is still accepting donation and mitigation parcels where appropriate. Obtaining outparcels and adding parcels that better define the site boundary are always a priority.

Legal Obligations and Constraints

Permitting

The following is a summary of permits that might be required, based on the minimal capital improvements planned for Sykes Creek Management Plan (boardwalks or bridges over wetlands).

United States (U.S.) Army Corps of Engineers
The U.S. Army Corps of Engineers regulates wetlands connected to "Waters of the United States" and isolated wetlands pursuant to Section 404 of the Clean Water Act. Wetlands are defined as "those areas inundated or saturated by surface water or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas" (33 CFR Part 328.3).

Dredge and fill activities within "Waters of the United States" will require either an Individual Permit or verification under the General or Nationwide permit program. Wetland impacts less than one-third acre will typically qualify for a General Notice permit or can be authorized with no "Pre-Discharge Notification." The permittee will be required to provide the U.S. Army Corps of Engineers with a copy of the State 401 water quality certification documents or waiver prior to commencement of the fill activity. Wetland impacts between one-third and three acres involving isolated wetlands or wetlands "above the headwaters" will generally qualify for verification under Nationwide Permit Number 26 (NWP 26). Impacts to wetlands connected to flowing and/or navigable waters, or wetland impacts greater than three acres will generally require a Section 404 – Individual Permit. U.S. Army Corps of Engineers guidelines further require that all impacts "reasonably related" to a particular project be submitted for consideration under one permit application.

In reviewing the proposed activity for permit approval, U.S. Army Corps of Engineers biologists consider the impacts to wetland function, such as water quality benefits, wildlife utilization, groundwater recharge, etc. In instances where loss of wetland function is proposed, the U.S. Army Corps of Engineers may, and often does, require measures to compensate for such losses.

Mitigation may be required by the U.S. Army Corps of Engineers for proposed wetland impacts. Should mitigation be required, the U.S. Army Corps of Engineers most likely will accept the mitigation that ultimately will be proposed to the St. Johns River Water Management District.

In addition, United States (U.S.) Army Corps of Engineers regulations require that an investigation must be conducted, prior to permit issuance, to evaluate whether or not the proposed activity is likely to jeopardize the continued existence of any Federally threatened or endangered species as listed or proposed for listing under the Endangered Species Act.

Finally, U.S. Army Corps of Engineers regulations require that the State Historic Preservation Office (SHPO) of the Division of Historical Resources must be contacted regarding the presence of any archaeological or historic properties in the area that may be impacted by the proposed development. The Compliance Review Section in the SHPO Office should also see all permits so that they can check for not only recorded archaeological and historical sites, but also so that they may check for any potential sites that may occur on the property.

Saint John's River Water Management District

The Saint John's River Water Management District regulates impacts to wetlands and other surface waters pursuant to Part IV, Chapter 373 of the Florida Statutes and in accordance with Chapters 62-330 of the Florida Administrative Code (F.A.C.). The 1995 Florida Wetlands Delineation Manual defines jurisdictional wetlands. The Saint John's River Water Management District (SJRWMD) requires an Environmental Resource Permit (ERP) for work in a wetland unless the activity meets an exemption. Mitigation is required if the project is determined to have an adverse impact to wetland and other surface water functions. In considering wetland impacts, SJRWMD considers not only direct impacts to wetlands, but also secondary impacts that may affect wetland dependent wildlife. To minimize secondary wetland impacts, SJRWMD generally requires that applicants preserve a buffer of undisturbed upland habitat with a 15-foot minimum width and 25-foot average width around preserved wetlands [Sec. 12.2.7(a)].

Prior to submitting an application for dredging or filling within waters of the State, it is recommended that the areas proposed for impact be delineated in accordance with the Unified Wetland Delineation Methodology for the State of Florida dated 1 July, 1994 and then reviewed by St. John's River Water Management District staff.

Florida Forest Service, formally known as the Florida Division of Forestry

The Florida Forest Service issues permits for prescribed fires to Environmentally Endangered Lands Staff that possess certified burn numbers.

Other Legal Obligations

Brevard County
The Hall Road right-of-way is an outstanding feature within the Sykes Creek Management Plan area. The road is a barrier boundary between the Kabboord Wildlife Sanctuary and the Johnson Property. The similar right-of-way exists along the Ulumay Wildlife Sanctuary with Sykes Creek Parkway. These right-of-ways are overseen by Brevard County Public Works Department. Brevard County Public Works also maintains the ditches along these roads. These roads are elevated above common grade and prevent direct movement of water except at culverted areas. Brevard County Mosquito Control, Natural Resources, and Public Works also hold interests within the Sykes Creek Sanctuary boundaries and surrounding lands.

Private Ownership
There is one privately owned parcel within the Ulumay Wildlife Sanctuary. This 34-acre parcel is located in the northern section of the Sanctuary and is mainly open water with some berm features.

Florida Fish and Wildlife Conservation Commission (FFWCC)
Cooperation with FFWCC is ongoing though no formal agreement with the Environmentally Endangered Lands Program has been enacted in the Central Region.

St John's River Water Management District
The District has one conservation easement within the Sykes Creek Management Area. This 16.15-acre District conservation easement is on the south side of the Johnson Property. is the result of a mitigation project done that restored wetland habitat on the property. Any easements or mitigations through the District would be approved by the Board of County Commissioners for these County-owned Sanctuaries.

Florida Power and Light (FPL)
FPL maintains an east/west easement through Kabboord Wildlife Sanctuary. This easement is approximately one mile long and 100 feet wide. FPL has access to the gates onsite. All poles and wires were upgraded in mid-2020.

Management and Constraints

Fire

Utilizing prescribed fire within the Sykes Creek Management Plan area will benefit ecosystems and species that have evolved under the influences of this natural process in Florida. The Environmentally Endangered Lands Program's prescribed fire goals include:

- Restore or preserve fire-adapted communities with the reintroduction of fire
- Maximize biological diversity by the creation and maintenance of a vegetational mosaic
- Manage Threatened and Endangered species
- Provide educational opportunities
- Reduce fire hazards by managing fuels and fire
- Conduct safe prescribed fires
- Encourage cooperation between all parties with a vested interest in prescribed fire

The Environmentally Endangered Lands Program Fire Management Manual is a separate document which addresses in great detail the overall fire objectives of the Environmentally Endangered Lands Program. The manual lists equipment needed to perform prescribed fires, outlines fire's effects on natural communities, lists Threatened and Endangered species found within the Sanctuary network and contains copies of all necessary paperwork needed to perform prescribed fires. In addition to the Fire Management Manual is the site-specific Fire Management Plan for each of the tracts. This bridges the Environmentally Endangered Lands Program Fire Management Manual and the Unit-specific Burn Prescription. This site-specific plan will include:

- Sanctuary Fire Management Goals
- Burn Unit Descriptions, Fire Regime
- Fire History and Map
- Archaeological, Cultural and Historic Resources
- Fire Sensitive Areas
- Smoke Management Issues
- Public Notification
- Wildfire Policy
- Cooperation with Other Agencies
- Fire line Maintenance
- Fire Effects Monitoring and Photo point Locations

The prescribed burns within the boundaries of the Sykes Creek Management Plan are conducted in partnership with local, State and Federal cooperation, including the Florida Forest Service, the Nature Conservancy, United States Fish and Wildlife Service, the County's Public Safety Department, City and County Fire Departments, and volunteer fire departments. It is important, as well as in the Environmentally Endangered Lands Program's best interest, to assist the Florida Forest Service in any burns within any Brevard County managed sites or

Sanctuaries. The Florida Forest Service is essential to the Environmentally Endangered Lands Program conducting safe prescribed burns.

Johnson Property

The Johnson Parcel has not been divided up into its burn units. There is no fire history available for this site. Due to the wet nature of the site, wetland crossings will need to be installed in order to have the perimeter fire line follow the actual property boundary. Every effort will be made to keep the perimeter fire lines on the property line. It is anticipated that the property will be broken up into two or three fire units. Until the artesian well is capped, the exact lines cannot be determined. Lines installed in wetland habitats of the site will need to be permitted by The St. Johns River Water Management District.

Kabboord Wildlife Sanctuary

Kabboord Wildlife Sanctuary has one Burn Unit that allows the Environmentally Endangered Lands Program to safely conduct a prescribed fire outside of the impoundment area. This unit and the fire history can be viewed in **Figure 18**. Burn unit 2 is the area within the mosquito control berm with the berm designating the firebreak. Any prescribed burns that take place within the impounded areas of the Kabboord Wildlife Sanctuary entail the use of a helicopter or air boat. There is no fire history for this burn unit of Kabboord Wildlife Sanctuary.

The only prescribed fire conducted within the Sanctuary was in the scrub habitat area on January10, 2006. This burn, in Unit 1, was approximately 20 acres in size. This unit is overdue for burning. The Florida scrub jays are still foraging within the unit, but nesting has not been noted within the Kabboord Wildlife Sanctuary boundary.

Ulumay Wildlife Sanctuary

The Ulumay Wildlife Sanctuary tract has been broken into 2 fire units; there is no fire history on site. The berms will act as the firebreaks and form the two units, one north of Sykes Creek Blvd and one unit south of the road. Any prescribed burns that would take place within the boundaries of the Ulumay Wildlife Sanctuary would entail the use of a helicopter or air boat. Special attention would need to be made in the northeast portion of the site, where the mosquito berm is not continuous as it is in the Kabboord Wildlife Sanctuary. Using the water as a natural fire break is the only option in that area.

Figure 18 (Long Description 18)

Exotic Species Control

Exotic or non-indigenous species are terms used to describe plants and animals that are foreign in origin. These species may persist, thrive, harm or displace native species. These plants and/or animals alternative species habitats and ecosystem functions.

Plants

Exotic plant species within these tracts are concentrated along disturbed areas created by canals, ditching, berms, and adjacent roads. The primary invasive exotics on-site are Brazilian pepper, cogon grass, Japanese climbing fern, old world climbing fern, melaleuca, and Guinea grass.

The Environmentally Endangered Lands Program typically uses State funds from the Florida Fish and Wildlife Conservation Commission's (FFWCC) Invasive Plant Management (IPM) program to hire contractors for larger treatment areas. The funding also provides chemicals to retreat these areas using existing program staff. Smaller areas not treated through the IPM program are handled in house using County employees and funding.

Environmentally Endangered Lands staff uses GIS to map out exotic areas as they are found. These areas are then sprayed and monitored for re-growth.

Animals

The control of the red imported fire ant is an on-going task with spot treatment using Amdro or another similar chemical. They prefer to nest in disturbed habitats such as berms, cross canals, and firebreaks. The flatwoods is monitored for new mounds.

Exotic and non-indigenous animal species also have the potential to adversely affect ecosystem function, and to significantly alter population levels of native animals through predation or displacement. The brown anole (Anolis sagrei) has become ubiquitous in central Florida, as has the nine-banded armadillo (Dasypus novemcinctus).

The feral hog problem is also widespread. Their rooting can cause harm to the vegetation and soils. They eat eggs of native species as well as native species themselves (i.e. frogs and lizards).

Due to the proximity of residential homes to Sanctuaries within the Sykes Creek Management Area, the impacts from feral hogs and cats as well as from domestic pets are monitored (see Feral Cats Ordinance: Section 14-64 of Brevard County Ordinance 99-39 and Parks and Recreation Ordinances 98-53 and 96-31). Entities currently implementing exotic animal control programs such as the Florida Fish and Wildlife Conservation Commission, the United States Fish

and Wildlife Service, and the Water Management Districts, are contacted for guidance on the development of control protocols.

Coyotes (Canis latrans) are also present in the area. They are considered an exotic species. At this time, there are no eradication plans for coyotes within the Sykes Creek Management Plan. Hog control is an option for areas within the Sykes Creek Management Plan. The Environmentally Endangered Lands Program has Feral Hog Control Guidelines. All policies and guidelines are followed if hog control is needed within the Sanctuary boundaries.

Habitat Restoration

Since the 1950's, hydrological alterations have taken place within the boundaries of the Sykes Creek Management Plan areas. Berms and mosquito drag ditches disrupt the natural sheet flow of water throughout the entire Ulumay Wildlife Sanctuary parcel. As ditches were constructed, large amounts of spoil were placed on either side of the canal. The natural communities suffered due to the reduction in hydroperiod and natural sheet flows that occurred before the ditches were installed. Ditches vary in depth averaging from a few feet to 10 feet deep.

The restoration of natural upland communities on-site is primarily focused upon the scrub habitat in Kabboord Wildlife Sanctuary and the mesic flatwoods of the Johnson Property. Mitigation options are being explored in addition to what has already been done on site. Restoration activities have and will likely occur in phases as schedules and funding allow. Restoration efforts have certain limitations such as economic feasibility, the potential for success, and the assurance of a sound scientific basis for the restoration. The areas proposed for restoration will be analyzed in the context of the vegetative community, so as to ensure that the restoration is consistent with the principles set forth by the Environmentally Endangered Lands Program and the primary goal of maintaining biological diversity. In the case where government entities are mitigating on Environmentally Endangered Lands managed properties, monitoring will be conducted by Consultants/ Project Leaders associated with any wetland mitigation project for a minimum of 5 years. Mitigation photo points will be taken by the mitigation company as the projects take place.

Public Access and Passive Recreation

Public access and opportunities for passive recreation are provided within Sykes Creek Management Plan boundaries pursuant to public use and recreational policies of the Environmentally Endangered Lands Program's Sanctuary Management Manual which was originally adopted by the Brevard County Board of County Commissioners in 1997. It has been determined that passive recreational activities best support the Environmentally Endangered

Lands Program's goals. The Environmentally Endangered Lands Program Sanctuary Management Manual defines passive recreation as follows:

"a recreational type of use, level of use, and combination of uses that do not individually or collectively, degrade the resource values, biological diversity, and aesthetic or environmental qualities of a site."

All references to public meetings can be seen in **Appendix J**. A recreational assessment for all sites has been completed in order to determine the best placement of passive recreation resources. An initial public meeting for this management plan took place on May 7, 2019. This was the first chance for citizen input. An advertised, public meeting of the Recreation and Education Advisory Committee regarding Sykes Creek Management Plan took place on May 9, 2019. The first advertised, public meeting before the Selection and Management Committee regarding this plan took place on February 24, 2020.

The Sykes Creek Management Plan went through a 30-day public review. A copy of the notice for public review and all comments related to the 30-day review are cataloged in the Appendix J.

1) Hiking/ Biking

This management plan includes one existing hiking/ biking trail located at Ulumay Wildlife Sanctuary. Informative signs are placed along the trail, and any research or restoration projects that may be ongoing (such as prescribed fire) is included in the signage. Human-powered bikes are allowed which includes human-powered bikes with electric assist. Electric bikes with a throttle which allows the operation of the electric motor without the need to pedal are considered motorized-vehicles are not permitted. Additionally, all other motorized vehicles including foot scooters, electric unicycles, one-wheels, segways and other similar devices are not permitted within the sanctuary boundaries.

The trails offer excellent opportunities for bird watching and general wildlife observation. Several observation platforms are available along the trail at the Ulumay Wildlife Sanctuary.

2) Parking and Public Access

No vehicle parking is available at the Johnson Sanctuary and the Kabboord Wildlife Sanctuaries due to the lack of upland areas. Vehicle parking at Ulumay Wildlife Sanctuary is available along the entrance road.

3) Environmental Education

Environmental education for the Central Region is based out of the Sams House Management and Education Center at Pine Island Conservation Area in Merritt Island, Florida. It provides a holistic approach to the habitats and history of the diverse ecosystems, their related histories and dynamic changes, while demonstrating the relationships of natural communities as support systems to a vast array of species within the Conservation Area, other Central Region Sanctuaries, and Indian River Lagoon system. Relative historic study highlights the changes to land and anthropomorphic contributions relating paleontology, archaeology, anthropology, and agriculture to the natural history of Florida and land use within the Region. Curriculum contains relevant Sunshine State Standard requirements supporting varying grades inclusive of VPK through Sixth Grade. Special education programs are adapted from the standard curriculum to accommodate students on diverse levels of the spectrum of learning. Advanced curriculum for Secondary programs expands Earth Sciences with a focus on life in and around the Indian River Lagoon system. Homeschool programs provide a diverse subject matter experience, with mastered marketing, enhancing attendance and ensuring exposure to many of the curriculum driven programs offered to the public, private, and charter schools.

The Environmentally Endangered Lands Staff work with area schools, school board, homeschooling groups, and any agencies or organizations in offering environmental education programs to assist in the environmental education of Brevard County citizens as staffing and operational funding allows. The long-term success of the Environmentally Endangered Lands Program and the Environmentally Endangered Lands Sanctuary network is directly linked to the level of citizen support, active participation and commitment to conservation. The Environmentally Endangered Lands Program actively recruits volunteers from diverse backgrounds and promotes the involvement of disabled citizens.

Prohibited Activities / General Site Rules:

Due to the small size of the sites and limited availability of upland areas, horseback riding and camping are not permitted.

No pets
Day use only
No smoking
No fires
No fireworks
No Hunting or target shooting
No dumping of trash or yard waste
No commercial activity without a permit
No removal of plants, animals or other natural resources
No relocation of wildlife to the sanctuary

No alcoholic beverages
No unlawful carry of firearms
No motorized vehicles (electric or gas)

MANAGEMENT ACTION PLANS

Although much of the proposed resource management and public access strategies have been discussed, the following is a comprehensive outline of the goals, strategies and actions necessary to manage the tracts within the Sykes Creek Management Plan area.

Goals

The Sanctuary Management Manual of the Environmentally Endangered Lands Program provides the following management goals for all Sanctuaries within the Environmentally Endangered Lands Program.

- Documentation of historic public use
- Conservation of ecosystem function
- Conservation of natural (native) communities
- Conservation of species (including endemic, rare, threatened and endangered species)
- Documentation of significant archeological and historic sites
- Provision for public access and responsible public use
- Assessment of carrying capacity of natural resources with public use
- Provision for environmental education programs
- Opportunities for multiple uses and compatibility
- General upkeep and security of the property

Strategies and Actions

The following is an outline of specific management strategies and actions that are needed to meet each management goal for the Sykes Creek Conservation Area. A timetable is included after each action to denote if the action is “Completed (Year),” “Ongoing” (work will continue indefinitely), or “ 5 years or 10 years” (to be accomplished within the next five or ten years).

GOAL: DOCUMENTATION OF HISTORIC PUBLIC USE

Strategy 1: Document historic public use

Actions:

- Collect historic information (such as aerials, historic photos, interviews with previous landowners) regarding the types of activities that have occurred on-site. **(Completed 2021)**
- Evaluate how historic public use impacted the site's natural resources. **(Completed 2021)**
- Consider historic public use patterns in planning future public uses. **(Completed 2021)**
- Map all existing trails using GIS/GPS. **(Completed 2021)**

GOAL: CONSERVATION OF ECOSYSTEM FUNCTION

Strategy 2: Protect, maintain, and restore native diversity, ecological patterns, and the processes that maintain diversity.

Actions:

- Research and monitor baseline conditions of natural systems. **(5 years)**
- Research the connection of on-site natural resources with adjacent resources. **(Completed 2018)**
- Research hydrologic patterns on and off-site. **(Completed 2018)**
- Restore natural hydrology of the area within the Johnson Property. **(5 years)**
- Restore natural communities to improve efforts on enhancing native diversity. **(5 years)**
- Investigate the historic hydroperiod and restore natural hydrologic patterns. **(5 years)**

Strategy 3: Ensure that natural upland-wetland interfaces are protected and enhanced.

- Collect data to analyze the existing community interfaces. **(5 years)**
- Restore/enhance natural communities where and when possible. **(5 years)**
- Protect communities from deleterious impacts deriving from external influences. **(On-going)**

GOAL: CONSERVATION OF NATURAL (NATIVE) COMMUNITIES

Strategy 4: Restore degraded, disturbed, or altered wetlands within the Sykes Creek Management Area.

Actions:

- Establish baseline conditions within wetlands. **(10 years)**
- Use native plants for restoration efforts. **(On-going)**
- Consult local experts and current literature regarding best scientific methods for wetland restoration. **(Completed 2020)**
- Prioritize the wetland communities in need of restoration based upon ease of accomplishment, expected habitat value yield, or financial considerations. **(Completed 2020)**
- Use off-site mitigation projects to fund on-site wetland restoration. **(On-going)**

- Assess possible impacts of proposed restoration on adjacent communities and offsite properties. **(5 years)**
- Implement the selected restoration activities (i.e. remove exotic species, restore natural hydrologic flood, etc.). **(Ongoing)**
- Monitor the effects of the restoration activities, evaluate the success of the restoration projects, and revise the restoration plan, as necessary. **(10 years)**
- Manage invasive exotic plant species at a maintenance level (0-5%), continue to treat FLEPPC cat 1 & 2 invasive exotic plant species. **(10 years)**

Strategy 5: Design and implement a "natural" fire management program.

- Identify natural communities that require prescribed fire management. **(Completed 2020)**
- Document listed species within Sanctuary that require fire for their propagation. **(Completed 2021)**
- Install perimeter firebreaks. **(10 years)**
- Identify and evaluate individual proposed burn management units. **(Ongoing)**
- Identify the goal of the application of fire to each proposed burn unit. **(Completed 2020)**
- Develop and implement public education campaign including programs and literature regarding the need for prescribed fires. **(Completed 2015)**
- Meet with local citizens to help educate neighbors to the prescribed fire program. **(Ongoing)**
- Secure the necessary permits from the State Division of Forestry. **(Ongoing)**
- Monitor the effects of the fire management activities, evaluate the success of the program, and revise the program strategies as needed. **(On-going)**
- Re-introduce and continue prescribed fire to fire adapted communities within this management plan. The Environmentally Endangered Lands (EEL) staff will burn as needed. Where applicable, they will work in coordination with the Florida Forest Service using the Hawken's Bill permitting to burn private property, EEL managed properties and other agency managed County property as one unit. Ulumay and Kabboord Wildlife Sanctuaries have private outparcels as well as other agency managed parcels within their boundaries/ berm system. **(On-going)**
- Incorporate all of the above into a Sanctuary-specific fire management plan to be attached to this plan as an Appendix. **(Completed 2021)**

GOAL: CONSERVATION OF SPECIES (INCLUDING ENDEMIC, RARE, THREATENED AND ENDANGERED SPECIES)

Strategy 6: Protect on-site populations of endemic, rare, threatened and endangered species through the utilization of existing habitat management and species recovery plans.
Actions:

- Develop a methodology and work plan to accomplish the identification of designated plant and animal species. **(5 years)**
- Survey for, and identify, designated plant and animal species. **(Completed 2017 and Ongoing)**

- Plot the location of identified designated species within and/or adjacent to the sanctuary for use in the implementation, or re-distribution, of amenities or site improvements. **(Completed 2018 and Ongoing)**
- Periodically update these baseline survey data to determine possible changes in designated species distribution or density. **(Ongoing)**
- Map gopher tortoise burrows post burns or once every five years. **(Ongoing)**
- Implement habitat restoration activities for listed species (i.e. removal of exotic/nuisance species, restoration of ecosystem function). **(10 years)**
- Establish periodic monitoring of habitat suitability (where indices are available for a given species), species population levels, diversity levels, and exotic/nuisance species, as a means of evaluating the success of management strategies. **(10 years)**

GOAL: DOCUMENTATION OF SIGNIFICANT ARCHAEOLOGICAL AND HISTORIC SITES

Strategy 7: Survey for archaeological and historic sites within the Sykes Creek Management Area.

Actions:
- Contact the State Division of Historic Resources to conduct a Phase I survey of the site. **(Completed 2022)**
- Review available maps and historic records for indications of past usage of the site. **(Completed 2022)**
- Map all archaeological and historic sites for future reference. **(Completed 2022)**

GOAL: PROVISION FOR PUBLIC ACCESS AND RESPONSIBLE PUBLIC USE

Strategy 8: Establish and enforce specific policies and management techniques for public access and responsible public use.

Actions:
- Perform Public Access Site Assessment. **(Completed 2022)**
- Coordinate recreational use with the ecological burning strategies of the Environmentally Endangered Lands Program. **(Completed 2019)**
- Minimize unauthorized trail expansion by establishing sufficient trails, along with the development of written guidelines. **(Completed 2018)**
- Install educational signs along approved trails. **(Completed 2018)**
- Install an informational kiosk at the sanctuary entrance of Ulumay to inform visitors. **(Completed 2018)**

GOAL: ASSESSMENT OF CARRYING CAPACITY OF NATURAL RESOURCES WITH PUBLIC USE

Strategy 9: Establish a monitoring program to assess effects of public usage on natural resources.

Actions:

- Establish a methodology and record keeping system to document public use. **(5 years)**
- Conduct regular monitoring to assess impacts of public use on natural habitats. **(10 years)**
- Conduct regular "walk-throughs" over frequently used sites to assess the need for changes in routing/user types, or user intensity. **(Ongoing)**
- Re-route users from sensitive areas or popular sites on a regular or as-needed basis. **(Ongoing)**
- Re-align public use to avoid areas which observations or data indicate are too sensitive for the level of use originally planned. **(Completed 2018)**

GOAL: PROVISION FOR ENVIRONMENTAL EDUCATION PROGRAMS

Strategy 10: Develop a plan to provide on-going environmental education programs to Brevard County residents and visitors.

Actions:

- Determine target audiences and types of programming best suited to those groups. **(Completed 2017)**
- Design and develop signs and printed materials. **(Completed 2016)**
- Provide a trail brochure to visitors of the sanctuary. **(Completed 2017)**
- Include educators, friends groups, and other organizations in the design, development, and delivery of programs. **(On-going)**
- Develop criteria and process of evaluation for program review and refinement. **(Completed 2018)**
- Provide 2 guided hikes per year to school groups when requested. **(Ongoing)**
- Provide a "special collection" of books and other materials specifically related to the environmental and cultural character of the Sykes Creek Management Area. **(Completed 2020)**
- Coordinate outreach and on-site programs for school-aged children with school board and area schools. **(Ongoing)**

GOAL: OPPORTUNITIES FOR MULTIPLE USES AND COMPATIBILTY

Strategy 11: Provide opportunities for multiple use and compatibility when practical.

Actions:

- Reroute trails, where possible off firebreaks, to provide improved access. **(Completed 2018)**
- Include multiple benefits of natural community restoration efforts in education program. **(Completed 2017)**

GOAL: GENERAL UPKEEP AND SECURITY OF THE PROPERTY

Strategy 12: Secure and maintain the Sanctuary to the highest degree possible using Environmentally Endangered Lands staff. Parks and Recreation staff, contract employees, and volunteers.

Actions:

- Install perimeter fencing or signs clearly marking the site's boundary. **(Completed 2018)**
- Employ full-time Land Management Staff. **(Completed 2017)**
- Develop a specific maintenance plan identifying specific task, frequency and responsible entities or individuals. **(Completed 2015)**
- Coordinate daily maintenance tasks using staff and volunteers. **(On-going)**
- Based on the maintenance, security, and resource management plan -develop an annual budget for the Sykes Creek Management Area. **(Ongoing)**

FINANCIAL CONSIDERATIONS

The Brevard County Environmentally Endangered Lands Program receives land acquisition and management revenues from ad valorem revenues collected pursuant to the 1990, 2004, and 2022 voter-approved Environmentally Endangered Lands Referendums. The Environmentally Endangered Lands Program allocates bond funds to capital land acquisition and one-time capital expenditures. Ad valorem revenues collected during each fiscal year that are not required for bond debt services can be used for any legal purpose within the Environmentally Endangered Lands Program pursuant to 200.181 and 125.013 of the Florida Statutes. The Environmentally Endangered Lands Program collected ad valorem revenues from the 1990 referendum until 2011. Revenues from the 2004 referendum will be collected until 2024, the sunset date of that ad valorem collection. The 2022 referendum will run for 20 years. Based on financial projections, the Environmentally Endangered Lands Program shall annually appropriate a portion of the Environmentally Endangered Lands Program ad valorem millage not required for bond debt services to fund annually Environmentally Endangered Lands Program capital and non-capital expenditures. The Environmentally Endangered Lands Program budget will be reviewed and adopted annually as part of the Brevard County budget process and as authorized by the Board of County Commissioners.

The annual estimated expenses for the land management operations related to the Sykes Creek Conservation Area, as well as past and future expenditures related to capital improvements for management and passive recreation is listed below.

Annual land management for the Pine Island Conservation Area is estimated at $35,363.

Exotic Species Control:	$11,341
Boundary Fence Maintenance:	$881
Fire Line Maintenance:	$643
Prescribed Fire:	$3,107
General Security:	$7,124
Trail Management:	$9,419
Site Monitoring:	$2,848

Future Public Access Improvements:
ADA Boardwalk, Ulumay $300,000
Kayak Launches (4), Ulumay and Kabboord $200,000
Observation Platform, Ulumay $100,000

REFERENCES

-Brevard County Environmentally Endangered Lands Program. Sanctuary Management Manual. Adopted by the Board of County Commissioners on September 23, 1997.

-Eastern Space and Missile Center (ESMC). 1989. Weather Meteorological Handbook ESMC pamphlet 105-1. Department of the Air Force. Eastern Space and Missile Center - Patrick Air Force Base, Florida. in Mailander, J.L. 1990. Climate of Kennedy Space Center. NASA Technical Memorandum 103498. Biometrics Corporation. Kennedy Space Center, Florida

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-Kent, A. and C. Kindell. 2009. Scrub Management guidelines for peninsular Florida: using the scrub jay as an umbrella species. Florida Fish and Wildlife Conservation Commission, Division of Habitat and Species Conservation, Tallahassee, FL

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-Schmalzer, P.A. and R. Hinkle. 1990. Geology, Geohydrology and Soils of Kennedy Space Center. NASA Technical Memorandum 103813. NASA/John F Kennedy Space Center. 40 p

Sykes Creek
Management Plan
October 2022 Draft
Appendices Section

Appendices

A. Section 508 Compliance Documentation
B. Outstanding Florida Waters Letters
C. Compliance Letters
D. Florida Natural Areas Inventory Letter
E. Flora related to Sykes Creek Management Plan
F. Arthropod Plan
G. Avian species related to Sykes Creek Management Plan
H. Reptile and Amphibian species related to Sykes Creek Management Plan
I. Mammal species related to Sykes Creek Management Plan
J. Public Meeting Minutes and comments related to Sykes Creek Management Plan
K. Land Management Plan Compliance Checklist and Review (needs to be at the beginning)

Appendix A
Section 508 Compliance Documentation
Required by the Americans with Disabilities Act
for Figures and Tables found within the
Sykes Creek Management Plan

Long Description Figure 1
Figure One is the Area Site Map for the 3 properties contained within the Sykes Creek Management Plan. The Johnson Property is the most northernly located of the 3 sites. A portion of its southern boundary runs along Hall Road. To the west, Kabboord Wildlife Sanctuary's northern most boundary runs along the south side of Hall Road. Continuing west on Hall Road, North Courtney Parkway (NCP) intersects with Hall Road and runs north and south on the map. To the south on NCP, State Road 528 intersects with it and runs east and west on the map. Ulumay Wildlife Sanctuary's northern most boundary line runs along the south side of State Road 528. Sykes Creek waterway runs along the west side of Ulumay Wildlife Sanctuary and The Indian River Lagoon is the larger, next body of water to the west. Sykes Creek Parkway runs along the southern boundary of the Ulumay Wildlife Sanctuary.

Back to Figure 1

Long Description Figure 2
Figure Two is the Johnson Property Site Map. The boundary is a solid green line. There is a small neighborhood to the southeast of the property. Kabboord Wildlife Sanctuary is to the southwest and represented by an orange striped overlay of the property.

Back to Figure 2

Long Description Figure 3
Figure Three is the Kabboord Wildlife Sanctuary Site Map. The boundary is a solid yellow line. There is a neighborhood to the east of the property. The Johnson Property is to the northeast and represented by an orange striped overlay of the property.

Back to Figure 3

Long Description Figure 4
Figure Four is the Ulumay Wildlife Sanctuary Site Map. The boundary is a solid blue line. Ulumay Wildlife Sanctuary's northern most boundary line runs along the south side of State Road 528. Sykes Creek waterway runs along the west side of Ulumay Wildlife Sanctuary. Sykes Creek Parkway runs along the southern boundary of the Ulumay Wildlife Sanctuary. The site has large neighborhoods on both the entirety of its eastern and western boundaries.

Back to Figure 4

Long Description Figure 5

Figure Five shows the Means of Acquisition for all the properties and segments of these Sanctuaries. Solid blue areas signify that the property was acquired through a County entity to County entity change of management. Purchased properties/ segments are represented by the red hashing overlays with the Johnson Property outlined in a dotted orange line, Kabboord Wildlife Sanctuary outlined by a solid double yellow line and the Ulumay Wildlife Sanctuary boundary outlined by a solid green line with larger green dots on that same green line.

Back to Figure 5

Long Description Figure 6

Figure Six shows the Optimal Management Boundaries and managing entities as of this management plan copy for all the properties and segments of these Sanctuaries. Management entities include the Environmentally Endangered Lands Program (EEL), Brevard County, the Port Authority, Private Property holders, and the State of Florida. EEL Properties make up most of this map and is represented by a white background overlay with green dots throughout.

Back to Figure 6

Long Description Figure 7

Figure Seven show the proposed trail map for Kabboord Wildlife Sanctuary. The trail consists of a dotted red line that runs through the middle of the Sanctuary in a north- south waterway and is a proposed kayak trail. The Sanctuary boundary is represented by an orange line with perpendicular orange hashes running throughout.

Back to Figure 7

Long Description Figure 8

Figure Eight show the existing trail map for Ulumay Wildlife Sanctuary. The kayak trail consists of a solid red line that runs through the southwest portion of the Sanctuary in a loop. The Sanctuary boundary is represented by a blue line with blue dots running along the same line. The four overlooks along the hiking trail in the southwest area of the Sanctuary are represented by a small picture of binoculars. The hiking trail is a double orange line. The kiosk and entrance are marked with a green square along the southern boundary and the kayak launch is located closely to the west by a yellow triangle.

Back to Figure 8

Long Description Figure 9

Figure Nine is the Elevation Map for the Johnson Property and the Kabboord Wildlife Sanctuary.

The Johnson Property is outlined by a red dotted line and the Kabboord Wildlife Sanctuary boundary is represented by a solid orange line with perpendicular hashed along the line. The contour lines in the map do not exceed 5 and that line is represented by a solid green line. All of the contour to this map are outside the Sanctuary boundaries to the east and west.

Back to Figure 9

Long Description Figure 10
Figure Ten is the Elevation Map for the Ulumay Wildlife Sanctuary. The Ulumay Wildlife Sanctuary boundary is represented by a solid red line. The contour lines in the map do not exceed 10 and that line is represented by a dotted yellow line. The contour for 5 is represented by a solid blue line with perpendicular hashes along that line. All of the contour to this map are outside the Sanctuary boundaries to the east and west.

Back to Figure 10

Long Description Figure 11
Figure Eleven is the Soil Map for the properties contained in this management plan. The majority of soil is made up of Turnbull and Riomar soils and are represented by an off-white color overlay with dots throughout. Other soils in the map are described in the text.

Back to Figure 11

Long Description Figure 12
Figure Twelve is the Natural Communities Map for the Johnson Property and the Kabboord Wildlife Sanctuary. The Johnson Property consists of mainly Mesic Flatwoods in the northern portion of the site, represented by the grey outline overlay with vertical gray hash lines throughout. The southern portion of the site is made up mainly of Cabbage Palm Hammocks which are represented by a diagonal yellow line hash overlay. The Kabboord Wildlife Sanctuary is mainly made up of Saltwater Marshes and is represented by a white overlay with blue plant symbols throughout.

Back to Figure 12

Long Description Figure 13
Figure Thirteen is the Natural Communities Map for the Ulumay Wildlife Sanctuary. The Sanctuary consists of mainly Saltwater Marshes and is represented by a white overlay with blue plant symbols throughout.
Back to Figure 13
Long Description Figure 14
Figure Fourteen is the management plan aerial for 1943. The Johnson Property is represented

by a dotted orange line, the Kabboord Wildlife Sanctuary is represented by a double yellow line and the Ulumay Wildlife Sanctuary is represented by a solid green line with dots along that line. The aerial description of the area is found in the text.

Back to Figure 14

Long Description Figure 15
Figure Fifteen is the management plan aerial for 1951. The Johnson Property is represented by a dotted orange line, the Kabboord Wildlife Sanctuary is represented by a double yellow line and the Ulumay Wildlife Sanctuary is represented by a solid green line with dots along that line. The aerial description of the area is found in the text.

Back to Figure 15

Long Description Figure 16
Figure Sixteen is the management plan aerial for 1975. The Johnson Property is represented by a dotted orange line, the Kabboord Wildlife Sanctuary is represented by a double yellow line and the Ulumay Wildlife Sanctuary is represented by a solid green line with dots along that line. The aerial description of the area is found in the text.

Back to Figure 16

Long Description Figure 17
Figure Seventeen is the management plan aerial for 2000. The Johnson Property is represented by a dotted orange line, the Kabboord Wildlife Sanctuary is represented by a double yellow line and the Ulumay Wildlife Sanctuary is represented by a solid green line with dots along that line. The aerial description of the area is found in the text.

Back to Figure 17

Long Description Figure 18
Figure Eighteen is the Fire Unit Map for Kabboord Wildlife Sanctuary. The boundary of the site is represented by a solid red line with perpendicular hash marks along that line. The burn unit area is represented by a orange hash overlay.

Back to Figure 18

(Return to Text - A)

Appendices Descriptions and Links

Long Description Appendix B
Appendix B contained the letter from the Florida Department of Environmental Protection. As stated in the text, there are some classified waterways in the Sanctuary's immediate locations. The letter was written on January 7, 2019 and was signed by Kenneth Weaver from the Water Quality Standards Program. An original document was presented in this Plan's appendix as it was received from the respective agency. To access this entire document in a Section 508 compliant format, please request it through Brevard County's Public Request Process.

(Return to Text – B)

Long Description Appendix C
Appendix C contained the letter from Brevard County. As stated in the text, all activities comply with Brevard County Zoning, Regulations, etc. The letter was written on October 13, 2020 and was signed by Jeffrey Ball from the Planning and Development Department. An original document was presented in this Plan's appendix as it was received from the respective agency. To access this entire document in a Section 508 compliant format, please request it through Brevard County's Public Request Process.

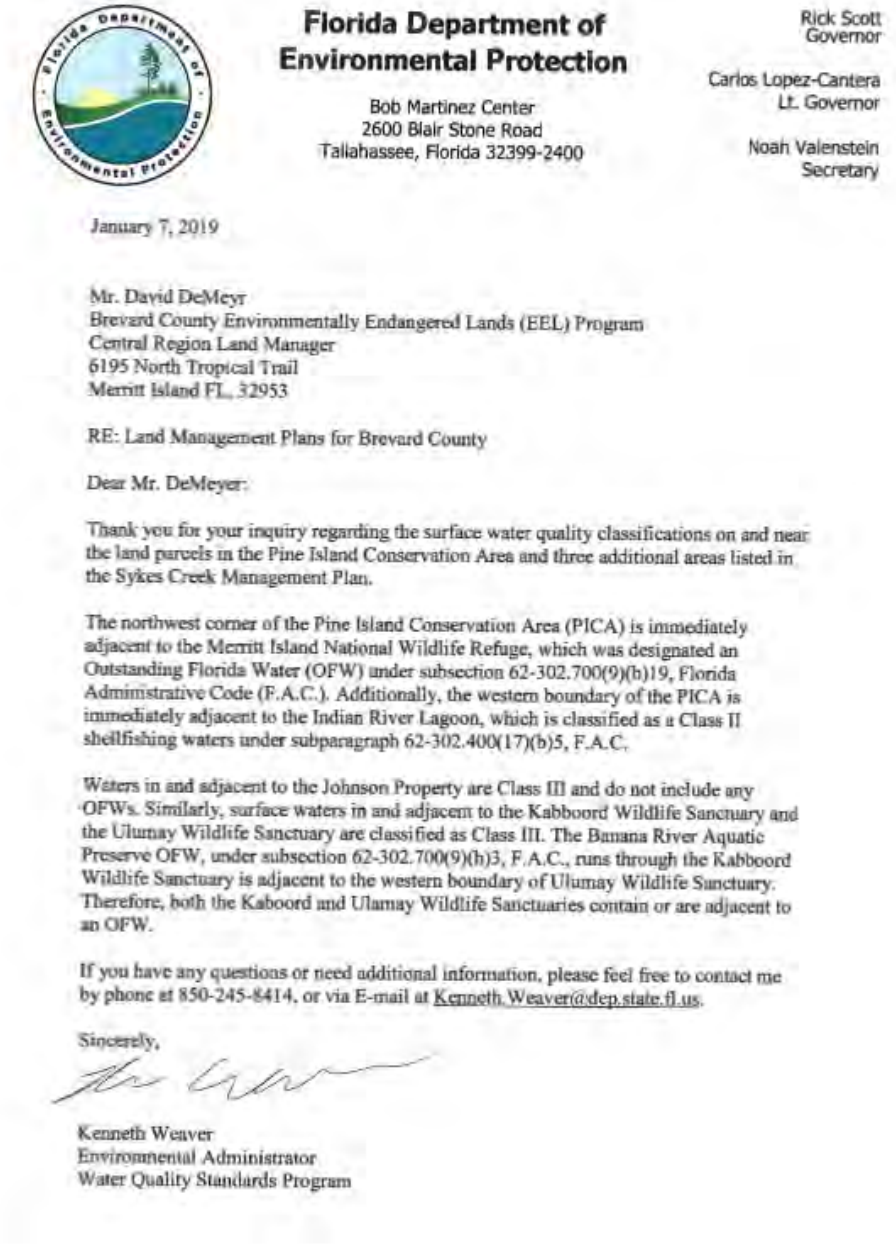
(Return to Text – C)

Long Description Appendix D
Appendix D contained the letter from the Florida Natural Areas Inventory. As stated in the text, this letter details occurrences, rarities, etc. of flora and fauna species found and recorded on sites within this plan. The letter was written on January 9, 2019 and was signed by Kerri Brinegar from GIS and Data Services. An original document was presented in this Plan's appendix as it was received from the respective agency. To access this entire document in a Section 508 compliant format, please request it through Brevard County's Public Request Process.

(Return to Text – D)

Long Description Appendix F
Appendix F contained the letter from Brevard County. As stated in the text, this letter details arthropod management that Brevard County does in and around the Sanctuaries of this management plan. The letter was signed on January 13, 2010 and January 22, 2010 by the then director of Mosquito Control and the current Program manager of the Environmentally Endangered Lands Program. An original document was presented in this Plan's appendix as it was received from the respective agency. To access this entire document in a Section 508 compliant format, please request it through Brevard County's Public Request Process.
(Return to Text – F)

Appendix B
Sykes Creek Management Plan Area
Outstanding Florida Waters Letter



Florida Department of Environmental Protection

Bob Martinez Center
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

Rick Scott
Governor

Carlos Lopez-Cantera
Lt. Governor

Noah Valenstein
Secretary

January 7, 2019

Mr. David DeMeyr
Brevard County Environmentally Endangered Lands (EEL) Program
Central Region Land Manager
6195 North Tropical Trail
Merritt Island FL, 32953

RE: Land Management Plans for Brevard County

Dear Mr. DeMeyer:

Thank you for your inquiry regarding the surface water quality classifications on and near the land parcels in the Pine Island Conservation Area and three additional areas listed in the Sykes Creek Management Plan.

The northwest corner of the Pine Island Conservation Area (PICA) is immediately adjacent to the Merritt Island National Wildlife Refuge, which was designated an Outstanding Florida Water (OFW) under subsection 62-302.700(9)(h)19, Florida Administrative Code (F.A.C.). Additionally, the western boundary of the PICA is immediately adjacent to the Indian River Lagoon, which is classified as a Class II shellfishing waters under subparagraph 62-302.400(17)(b)5, F.A.C.

Waters in and adjacent to the Johnson Property are Class III and do not include any OFWs. Similarly, surface waters in and adjacent to the Kabboord Wildlife Sanctuary and the Ulumay Wildlife Sanctuary are classified as Class III. The Banana River Aquatic Preserve OFW, under subsection 62-302.700(9)(h)3, F.A.C., runs through the Kabboord Wildlife Sanctuary is adjacent to the western boundary of Ulumay Wildlife Sanctuary. Therefore, both the Kaboord and Ulamay Wildlife Sanctuaries contain or are adjacent to an OFW.

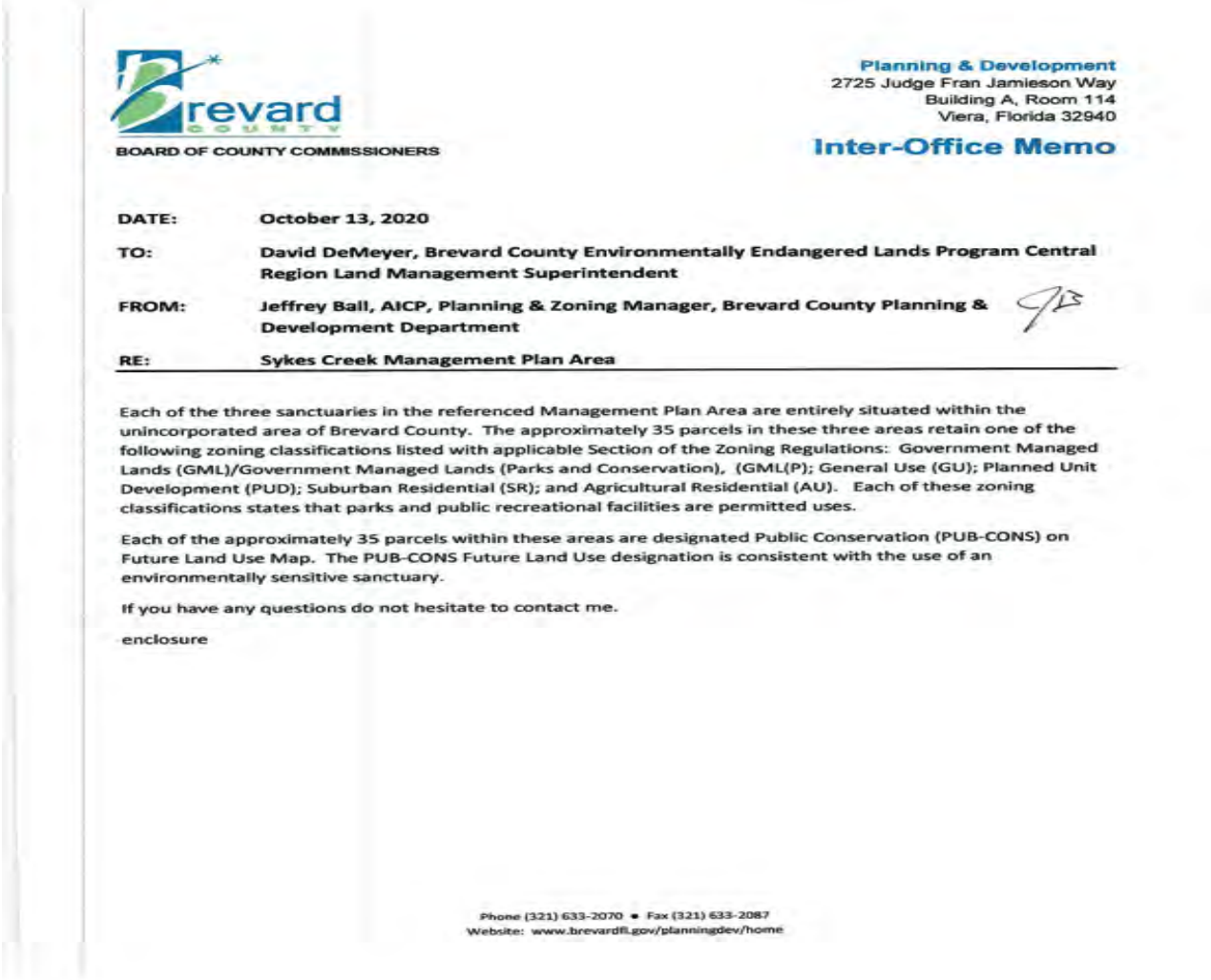
If you have any questions or need additional information, please feel free to contact me by phone at 850-245-8414, or via E-mail at Kenneth.Weaver@dep.state.fl.us.

Sincerely,

Kenneth Weaver
Environmental Administrator
Water Quality Standards Program

(Long Description Appendix B) (Return to Text - B)

Appendix C
Sykes Creek Management Plan Area
Brevard County Compliance Letter



BOARD OF COUNTY COMMISSIONERS

Planning & Development
2725 Judge Fran Jamieson Way
Building A, Room 114
Viera, Florida 32940

Inter-Office Memo

DATE: October 13, 2020

TO: David DeMeyer, Brevard County Environmentally Endangered Lands Program Central Region Land Management Superintendent

FROM: Jeffrey Ball, AICP, Planning & Zoning Manager, Brevard County Planning & Development Department

RE: Sykes Creek Management Plan Area

Each of the three sanctuaries in the referenced Management Plan Area are entirely situated within the unincorporated area of Brevard County. The approximately 35 parcels in these three areas retain one of the following zoning classifications listed with applicable Section of the Zoning Regulations: Government Managed Lands (GML)/Government Managed Lands (Parks and Conservation), (GML(P); General Use (GU); Planned Unit Development (PUD); Suburban Residential (SR); and Agricultural Residential (AU). Each of these zoning classifications states that parks and public recreational facilities are permitted uses.

Each of the approximately 35 parcels within these areas are designated Public Conservation (PUB-CONS) on Future Land Use Map. The PUB-CONS Future Land Use designation is consistent with the use of an environmentally sensitive sanctuary.

If you have any questions do not hesitate to contact me.

enclosure

Phone (321) 633-2070 • Fax (321) 633-2087
Website: www.brevardfl.gov/planningdev/home

(Long Description C) (Return to Text – C)

Appendix D
Sykes Creek Management Plan Area
Florida Natural Areas Inventory Letter

FLORIDA Natural Areas INVENTORY

1018 Thomasville Road
Suite 200-C
Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

January 9, 2019

David DeMeyer
Environmentally Endangered Lands Program
Brevard County
6195 North Tropical Trail
Merritt Island, FL 32953

Dear Mr. DeMeyer,

Thank you for requesting information from the Florida Natural Areas Inventory (FNAI). We have compiled the following information for your project area.

Project: Sykes Creek Management Plan
Date Received: 01/04/19
Location: Brevard County

Based on the information available, this site appears to be located on or very near a significant region of scrub habitat, a natural community in decline that provides important habitat for several rare species within a small area. Additional consideration should be given to avoid and/or mitigate impacts to these natural resources, and to design land uses that are compatible with these resources.

Element Occurrences

A search of our maps and database indicates that we currently have several element occurrences mapped in the vicinity of the study area (see enclosed map and element occurrence table). Please be advised that a lack of element occurrences in the FNAI database is not a sufficient indication of the absence of rare or endangered species on a site.

Federally Listed Species

Our data indicate federally listed species are present on or very near this site, specifically *Aphelocoma coerulescens* (see enclosed map and tables for details). This statement should not be interpreted as a legal determination of presence or absence of federally listed species on a property.

The element occurrences data layer includes occurrences of rare species and natural communities. The map legend indicates that some element occurrences occur in the general vicinity of the label point. This may be due to lack of precision of the source data, or an element that occurs over an extended area (such as a wide ranging species or large natural community). For animals and plants, element occurrences generally refer to more than a casual sighting; they usually indicate a viable population of the species. Note that some element occurrences represent historically documented observations which may no longer be extant. Extirpated element occurrences will be marked with an 'X' following the occurrence label on the enclosed map.

*Several of the species and natural communities tracked by the Inventory are considered **data sensitive**. Occurrence records for these elements contain information that we consider sensitive due to collection pressures, extreme rarity, or at the request of the source of the information. The Element Occurrence*

Florida Resources and Environmental Analysis Center
Institute of Science and Public Affairs
The Florida State University

Tracking Florida's Biodiversity

Record has been labeled "Data Sensitive." We request that you not publish or release specific locational data about these species or communities without consent from the Inventory. If you have any questions concerning this please do not hesitate to call.

Likely and Potential Rare Species
In addition to documented occurrences, other rare species and natural communities may be identified on or near the site based on habitat models and species range models (see enclosed Biodiversity Matrix Report). These species should be taken into consideration in field surveys, land management, and impact avoidance and mitigation.

FNAI habitat models indicate areas, which based on land cover type, offer suitable habitat for one or more rare species that is known to occur in the vicinity. Habitat models have been developed for approximately 300 of the rarest species tracked by the Inventory, including all federally listed species.

FNAI species range models indicate areas that are within the known or predicted range of a species, based on climate variables, soils, vegetation, and/or slope. Species range models have been developed for approximately 340 species, including all federally listed species.

The FNAI Biodiversity Matrix Geodatabase compiles Documented, Likely, and Potential species and natural communities for each square mile Matrix Unit statewide.

Florida Scrub-jay Survey – U.S. Fish and Wildlife Service
This survey was conducted by staff and associates of the Archbold Biological Station from 1992 to 1996. An attempt was made to record all scrub-jay (*Aphelocoma coerulescens*) groups, although most federal lands were not officially surveyed. Each map point represents one or more groups.

This data layer indicates that there are potential scrub-jay populations on or very near your site. For additional information:

Fitzpatrick, J.W., B. Pranty, and B. Stith, 1994, Florida scrub jay statewide map, 1992-1993. U. S. Fish and Wildlife Service Report, Cooperative Agreement no. 14-16-004-91-950.

Managed Areas
Portions of the site appear to be located within the Ulumay Wildlife Sanctuary, managed by Brevard County, within the Kabboord Sanctuary, managed by Brevard County, within the Sykes Creek Headwaters - Tract A, managed by Brevard County, adjacent to the Kings Park, managed by Brevard County, and adjacent to the Merritt Island National Wildlife Refuge, managed by the US Dept. of the Interior, Fish and Wildlife Service.

The Managed Areas data layer shows public and privately managed conservation lands throughout the state. Federal, state, local, and privately managed conservation lands are included.

Land Acquisition Projects
This site appears to be located within the Indian River Lagoon Blueway Florida Forever BOT Project, which is part of the State of Florida's Conservation and Recreation Lands land acquisition program. For more information on this Florida Forever Project, contact the Florida Department of Environmental Protection, Division of State Lands.

Florida Forever Board of Trustees (BOT) projects are proposed and acquired through the Florida Department of Environmental Protection, Division of State Lands. The state has no specific land management authority over these lands until they are purchased.

The Inventory always recommends that professionals familiar with Florida's flora and fauna conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species.

Please visit www.fnai.org/trackinglist.cfm for county or statewide element occurrence distributions and links to more element information.

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore this information should not be regarded as a final statement on the biological resources of the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. FNAI data may not be resold for profit.

This report is made available at no charge due to funding from the Florida Department of Environmental Protection, Division of State Lands.

Thank you for your use of FNAI services. If I can be of further assistance, please contact me at (850) 224-8207 or at kbrinegar@fnai.fsu.edu.

Sincerely,

Kerri Brinegar

Kerri Brinegar
GIS / Data Services

Encl

(Long Description D) (Return to Text – D)

Appendix E
Sykes Creek Management Plan Area Plant Species List

The following is a list of species that staff and volunteers have come across while in the 3 Sanctuaries included within the Sykes Creek Management Plan. An official survey was done on the Boyd and DiChristopher parcel in 2006. That survey is listed below the combined list.

Common Name	Scientific Name
White Mangrove	Laguncularia racemosa
Black Mangrove	Avicennia germinans
Red Mangrove	Rhizophora mangle
White Stopper	Eugenia axillaris
Southern Red Cedar	Juniperus virginiana
Spanish Stopper	Eugenia foetida
American Beautyberry	Callicarpa americana
Buttonwood	Conocarpus erectus
Bluestem	Andropogon sp.
Wild Coffee	Psychotria nervosa
Cabbage Palm	Sabal palmetto
Saw Palmetto	Serenoa repens
Seagrape	Coccoloba uvifera
Peppervine	Ampelopsis arborea
Strangler Fig	Ficus aurea
Smilax	Smilax sp.
Ballmoss	Tillandsia recurvata
Poke Weed	Phytolacca americana
Dog Fennel	Eupatorium capillifolium
Winged Sumac	Rhus copallinum
Gumbo-Limbo	Bursera simaruba
Leather Fern	Acrostichum danaeifolium
Saltwort	Batis maritima
Saltgrass	Distichlis spicata
Spanish Moss	Tillandsia usneoides
Poison Ivy	Toxicodendron radicans
Rag Weed	Ambrosia artemisiifolia
Sprenger's asparagus	Asparagus aethiopicus
Groundsel tree	Baccharis halimifolia
Spanish needles	Bidens alba
Sea ox-eye daisy	Borrichia frutescens
Florida privot	Forestiera segregata
Lantana	Lantana camara
Christmas berry	Lycium carolinianum
White sweet clover	Melilotus alba
Prickly pear	Opuntia stricta
Guinea grass	Panicum maximum
Virginia creeper	Parthenocissus quinquefolia
Corky stem passion flower	Passiflora suberosa
Glasswort	Sarcocornia perennis
Brazilian pepeer	Schinus terebinthifolius
Smut grass	Sporobolus indicus
Yellow alder	Turnera ulmifolia

Site Visit to Boyd and DiChristopher Properties (Sykes Creek Impounded Wetlands)
February 9, 2006

Paul A. Schmalzer, Ph.D.

These two properties are part of a large wetland impoundment along Sykes Creek in Merritt Island. Together they comprise about 200 acres. They are located north of the Ulumay Wildlife Sanctuary, which is about 457 acres in size (Brevard County Parks and Recreation). North of these two properties, the impoundment extends to SR 528 and nearly all of that section is now also in public ownership. The entire impoundment (public and private) includes about 1200 ac.

Information supplied by Dr. Scott Taylor indicated that these wetlands had been impounded in the 1950s or early 1960s. In the late 1980s they were reconnected to the lagoon by culverts as part of a mitigation project. In addition to impoundment there are some ditches through the marshes. Vegetation of the marshes appears to be primarily low salt marsh (probably mostly Distichlis spicata and Paspalum vaginatum) and mangroves (primarily Avicennia germinans and Laguncularia racemosa). There are also areas of open water in the marsh/mangrove matrix. Exotic shrubs do not appear extensive in the marsh although they would be expected along the any spoil piled along ditches through the marsh. The entire impoundment is mapped as Submerged Marsh in the Brevard County Soil Survey (Huckle et al. 1974).

The outer dike supports a mix of native and introduced plants (Table 1). Brazilian pepper (Shinus terebinthifolius) is common on the dike through the Boyd and DiChristopher properties. Brevard County Parks and Recreation has removed much of the Brazilian pepper from the dikes within the Ulumay Sanctuary.

Acquisition of these two properties would link existing public lands and prevent any potential development along the shoreline of Sykes Creek in this region.

References

Huckle, H.F., H.D. Dollar, and R.F. Pendleton. 1974. Soil survey of Brevard County, Florida. USDA Soil Conservation Service, Washington, DC. 123pp. and maps.

Table 1. Plants observed on the Boyd and DiChristopher Properties (Sykes Creek). List compiled by Paul Schmalzer and Kim Zarillo, February 9, 2006.

Taxa Native (N) or Exotic (E)
Ambrosia artemisiifolia (N)
Andropogon sp. (N)
Asparagus aethiopicus (E)
Avicennia germinans (N)
Baccharis halimifolia (N)
Bidens alba (N)
Borrichia frutescens (N)
Conocarpus erectus (N)
Ficus aurea (N)
Forestiera segregate (N)
Juniperus virginiana (N)
Laguncularia racemose (N)
Lantana camara (E)
Lycium carolinianum (N)
Melilotus alba (E)
Opuntia stricta (N)
Panicum maximum (E)
Parthenocissus quinquefolia (N)
Passiflora suberosa (N)
Rhizophora mangle (N)
Sabal palmetto (N)
Sarcocornia perennis (N)
Schinus terebinthifolius (E)
Smilax sp. (N)
Sporobolus indicus (E)
Tillandsia recurvata (N)
Turnera ulmifolia (E)

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Appendix F
Sykes Creek Management Plan Area
Arthropod Control Plan

CHARLES H. BRONSON
COMMISSIONER

Florida Department of Agriculture and Consumer Services
Division of Agricultural Environmental Services

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

Chapters 388.4111, F.S. and 5E-13.042(4)(b), F.A.C.
Telephone: (850) 922-7011

For use in documenting an Arthropod control plan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein.

Name of Designated Land: Brevard County EELS Program – Sites include the following impoundments: From C-2 North, C-2 South, C-2A, Jefferson Marsh area, Crystal Lakes area, to Honest Johns Area.

Specific sites include:

1. Ocean Ridge Sanctuary
2. Coconut Point
3. Hog Point Cove
4. Washburn Cove
5. Maritime Hammock area
6. Barrier Island Sanctuary
7. Hardwood Hammock
8. 1000 Islands
9. Capron Ridge area
10. Crane Creek
11. Cruickshank
12. Dicerandra Scrub
13. Enchanted Forest
14. Fox Lake
15. Grant Flatwoods
16. Indian Mound
17. Indian River Sanctuary
18. Johnson (Hall Road)
19. Jordan Scrub Sanctuary
20. Kabboord
21. Kings Park
22. Malabar Scrub Sanctuary
23. Micco Scrub Sanctuary
24. North Buck Lake Scrub Sanctuary
25. Pine Island Conservation Area
26. Scottsmoor Flatwoods Sanctuary
27. Southlake Conservation Area
28. Sykes Creek

Is Control Work Necessary: ☒ Yes ☐ No

Location: Brevard County Florida

Land Management Agency: Environmentally Endangered Lands Program
Mike Knight, Program Manager
91 East Drive
Melbourne, FL 32904

Are Arthropod Surveillance Activities Necessary? ☒ Yes ☐ No
If "Yes", please explain:

According to the Florida Administrative Code 5E-13 surveillance shall be conducted to determine the species and numbers of both pestiferous and disease bearing arthropods. Our surveillance program provides information as to species and amounts of mosquitoes which may require larviciding and adulticiding.

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Which Surveillance Techniques Are Proposed?
Please Check All That Apply:

☒ Landing Rate Counts	☒ Light Traps	☒ Sentinel Chickens
☒ Citizen Complaints	☒ Larval Dips	☐ Other

If "Other", please explain:

Arthropod Species for Which Control is Proposed: *Aedes taeniorhynchus*
Aedes sollicitans
Culex nigripalpus (ground treatment only)
Culex salinarius

Proposed Larval Control:

Number of dips per site: 3+ per location at specific site.

Proposed larval monitoring procedure: When 10% or more of the dips are positive for mosquito larvae, control action will typically be taken

Are post treatment counts being obtained: ☒ Yes ☐ No

Biological Control of Larvae:

Might predacious fish be stocked: ☒ Yes ☐ No

Other biological controls that might be used:

Material to be Used for Larviciding Applications:

(Please Check All That Apply:)

☒ Bti (*Bacillus thuringiensis israeliensis)*
☒ Bs (*Bacillus sphaericus*)
☒ Methoprene (Altosid)
☒ Non-Petroleum Surface Film
☐ Other, please specify:

Please specify the following for each larvacide:

Chemical or Common name: BTI =VectoBac, Bs = Vectolex, (S) methoprene = Altosid

☒ Ground ☒ Aerial

Appplication rate/s must be according to applicable, site specific label rates and conditions for each product; for example:

Rate/s of application: 12 lb-18lb/acre = VectoBac (BTI) Granules

5lb-20lb/acre = Vectolex (BS) Granules

2.5lbs-10lb/acre = Altosid pellets [(s) methoprene]

7-21.5lb/acre = Agnique MMF G (non-petroleum surface film)

Method of application: liquid by hand, or granular by air.

Proposed Adult Mosquito Control:

Aerial adulticiding ☒ Yes ☐ No

Ground adulticiding ☒ Yes ☐ No

Please specify the following for each adulticide: N/A

Chemical or common name: Dibrom/ Permethrin

Rate of application: 0.6 oz/acre (Dibrom), 0.5 oz/acre (Permethrin)

Method of application: Ultra low volume

Adult mosquito population controls are determined by Brevard Mosquito Control District (BMCD) thresholds that are legally based, including: Florida Administrative Code 5E-13.036 requirements, with adult landing rate surveillance counts in surrounding urban areas, triggering at 3 mosquitoes per minute and for surrounding rural areas, triggering at 5-7 per minute . Also, aerial application of adulticides within the areas defined as "Beaches and Bay shores" (areas within 1,500 feet landward of high tide mark), require a three-fold confirmed increase to adult mosquito population backgrounds in order to commence adulticide applications.

Proposed Modifications for Public Health Emergency Control:
BMCD may request special exception to this plan during a threat to public or animal health declared by State Health Officer or Commissioner of Agriculture.

Proposed Notification Procedure for Control Activities: Approval of this plan is intended as notification.

Records:

Are records being kept in accordance with Chapter 388, F.S.:
☒ Yes ☐ No

Records Location: In District office Titusville.

How long are records maintained: 5+ Years

Vegetation Modification: ☒ Yes ☐ No

What trimming or altering of vegetation to conduct surveillance or treatment is proposed?
Minor trail trimming for surveillance and for ground larviciding will be done as needed.
Some herbiciding with AquaStar, Reward or Rodeo for control of *exotic* vegetation will be carried out only as needed.

Proposed Land Modifications: ☐ Yes ☒ No

Is any land modification, *i.e.*, rotary ditching, proposed: ☐ Yes ☒ No

The Brevard Mosquito Control District policy is to operate all managed impoundments, when possible, on a Rotational Impoundment Management (RIM) program. RIM, essentially, is elevating the water levels inside the impoundment to an elevation adequate to inundate the high marsh areas during mosquito breeding seasons. This action eliminates the egg laying sites for the salt marsh mosquito and controls mosquito breeding in an environmentally friendly manner. This elevated water level number is ~1.50 feet above mean sea level. This water level elevation action takes place from approximately May 15th through October 15th. This activity requires yearly pumping and constant monitoring of water levels within the impoundment network. The impoundments are left open, to decrease water elevations, during other yearly times.

Chronologically, the Brevard Mosquito Control District activities are as follows:

- January- Mowing the deck and bush hogging the side growth.
- January through May- Repairing storm damage if any. Larviciding as necessary.
- May 15th- All boards in, culverts and flaps closed. Begin pumping if Lagoon level is adequate. (>.5 ft mean sea level).
- May 15th through October 15th- Pump in order to maintain 1.3-1.5 ft mean sea level inside impoundment. Larvicide as necessary (helicopter monitoring). Monitor culverts for tampering three days per week.
- June- Mow deck and bush hog side growth.
- October 15th- Pumping stops. Boards removed and flap gates opened."

List any periodic restrictions, as applicable, for example peak fish spawning times: NA

Proposed Modification of Aquatic Vegetation: ☐ Yes ☒ No

Land Manager Comments:

Arthropod Control Agency Comments:

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(Long Description F) (Return to Text – F)

Appendix G

Sykes Creek Management Plan Area

Avian Species Survey – Union University 1/21/19

Common Name	Scientific Name
Wood stork	Mycteria americana
Belted kingfisher	Megaceryle alcyon
Fish Crow	Corvus ossifragus
Great Egret	Ardea alba
Roseate spoonbill	Platalea ajaja
Snowy egret	Egretta thula
Red-shouldered hawk	Buteo lineatus
Great blue heron	Ardea herodias
Tricolored heron	Egretta tricolor
Osprey	Pandion haliaetus
Black vulture	Coragyps atratus
Turkey Vulture	C. a. septentrionalis
Palm Warbler	Setophaga palmarum
Blue Grey gnatcatcher	Polioptilidae caerulea
Ring-billed gull	Larus delawarensis
Northern cardinal	Cardinalis cardinalis
Blue jay	Cyanocitta cristata
White ibis	Eudocimus albus
Mourning dove	Zenaida macroura

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Appendix H
Sykes Creek Management Plan Area
Reptile and Amphibian Species Survey-Survey Credit: Frank Robb

Kabboord Survey	Jan 2017-Oct 2017			Scientific Name
Snakes	Size Average	Largest	Total #	
Coach Whip	61"	93"	43	Masticophis flagellum flagellum
Black Racer	37"	59"	61	Coluber constrictor priapus
Dusky Pygmy Rattle Snake			74	Sistrurus miliarius barbouri
Banded Water Snake	22"	34"	8	Nerodia fasciata pictiventris
Red Rat Snake	31"	38"	4	Pantherophis guttatus
Blue Garter Snake	23"	27"	6	Thamnophis sirtalis
Ring Neck Snake	7"	7"	1	Diadophis punctatus
			197	
Others				
Whip Scorpions			3	Mastigoproctus giganteus giganteus
Diamond Back Terrapin			2	Malaclemys terrapin tequesta
Cotton Rats			5	Sigmodon Hispidus

Additional sightings:
- Florida King Snake (Lampropeltis getula floridana) – Monday May 15, 2023 (James Rowland) on the western berm of Ulamay Wildlife Sancturay.

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Appendix I
Sykes Creek Management Plan Area
Mammal Species Survey

The following is a list of species staff and volunteers have come across. An official survey needs to be done.

Common Name	Scientific Name
Nine-banded Armadillo	Dasypus novemcinctus
Virginia Opossum	Didelphis virginiana
Bobcat	Lynx rufus
Marsh Rabbit	Sylvilagus palustris
Raccoon	Procyon lotor
Eastern Cottontail Rabbit	Sylvilagus floridanus
Eastern Gray Squirrel	Sciurus carolinensis
White-Tailed Deer	Odocoileus virginianus

Footprint documented: Florida Black Bear (Ursus americanus floridanus) – footprint documented on Tuesday, May 23, 2023 in the Unit 1 fire zone (Frank and Judy Robb, Frank Robb JR).

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Appendix J
Sykes Creek Management Plan Area
Public Meetings

Stakeholder Meeting

May 7, 2019 – 6:00 PM

Recreation and Education Advisory Committee (REAC)

May 9, 2019

Selection and Management Committee Meeting Minutes

February 24, 2020

Selection and Management Committee Meeting

February 24, 2020