

PALM BEACH COUNTY
BOARD OF COUNTY COMMISSIONERS
AGENDA ITEM SUMMARY

Meeting Date:	August 16, 2016	<input checked="" type="checkbox"/>	Consent	<input type="checkbox"/>	Regular
		<input type="checkbox"/>	Ordinance	<input type="checkbox"/>	Public Hearing

Department _____

Submitted By: Environmental Resources Management

Submitted For: Environmental Resources Management

I. EXECUTIVE BRIEF

Motion and Title: Staff recommends motion to approve: a management plan for the Pawpaw Preserve Natural Area.

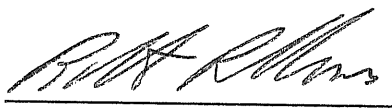
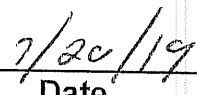
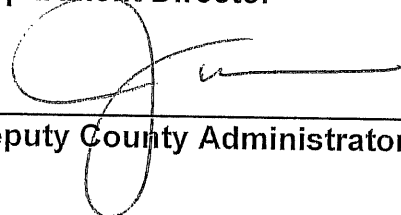
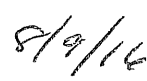
Summary: The management plan (Plan) identifies natural resources present on the site and provides for the preservation, restoration, management and passive recreational uses of those resources. The first update to the Plan will be due in 2026. District 1 (AH)

Background and Justification: After review of the Plan by the Natural Areas Management Advisory Committee (NAMAC) and a public hearing held on May 26, 2016, NAMAC unanimously recommended the Plan for approval at its June 17, 2016 meeting.

Initial invasive/nonnative vegetation removal, fence and regulatory sign installation, and trash pickup activities have been completed. Annual management and maintenance costs, including biological monitoring, prescribed burns/mechanical vegetation reduction, ongoing nonnative/invasive animal and plant control, and repair and replacement of facilities, as needed, are estimated to be \$35,714. Funds for the management and maintenance of the site are expected to come from the Natural Areas Fund, Natural Areas Stewardship Endowment Fund, Pollution Recovery Trust Fund, and/or Ag Reserve Land Management Fund. Staff also will pursue grants to offset a portion of land management costs.

- Attachments:**
- 1. Pawpaw Preserve Natural Area Management Plan

=====

Recommended by:			
	Department Director	Date	
Approved by:			
	Deputy County Administrator	Date	

II. FISCAL IMPACT ANALYSIS

A. Five Year Summary of Fiscal Impact:

Fiscal Years	2016	2017	2018	2019	2020
Capital Expenditures	<u>\$35,714</u>	<u>\$36,785</u>	<u>\$37,889</u>	<u>\$39,026</u>	<u>\$40,197</u>
Operating Costs	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
External Revenues	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
Program Income (County)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
In-Kind Match (County)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>
NET FISCAL IMPACT	<u>\$35,714</u>	<u>\$36,785</u>	<u>\$37,889</u>	<u>\$39,026</u>	<u>\$40,197</u>
# ADDITIONAL FTE POSITIONS (Cumulative)	<u> </u>	<u> </u>	<u> </u>	<u> </u>	<u> </u>

Is Item Included in Current Budget?

Yes x

No

Budget Account No.: Fund 1226 Department 380 Unit 3162 Object various
Program

B. Recommended Sources of Funds/Summary of Fiscal Impact:

Fiscal year 2016 costs include \$35,714 in annual management and maintenance costs. Over the past five years, management and maintenance costs for County owned/managed natural areas have increased an average of 3% per year. Actual costs for FY 2017 and beyond may be higher or lower than projected. Funds for the management and maintenance of the site are expected to come from the Natural Areas Fund (1226), Natural Areas Stewardship Endowment Fund (1220), and/or Ag Reserve Land Management Fund (1222).

C. Department Fiscal Review:

E. Neary

III. REVIEW COMMENTS

A. OFMB Fiscal and /or Contract Administrator Comments:

[Signature]
OFMB ED ET 7/21 AK
7/24

[Signature] 7/29/16
Contract Administrator
7/29/16 [Initials]

B. Legal Sufficiency:

Anne Odeh 8/9/16
Assistant County Attorney

C. Other Department Review:

Department Director



**MANAGEMENT PLAN FOR
PAWPAW PRESERVE
NATURAL AREA**

March 2016

Prepared by:

**Palm Beach County
Department of Environmental Resources Management
2300 North Jog Road, 4th Floor
West Palm Beach, Florida 33411- 2743**

THE PALM BEACH COUNTY NATURAL AREAS SYSTEM MANAGEMENT STATEMENT

The Palm Beach County Natural Areas System is comprised of those environmentally sensitive lands that are owned or leased by the County and managed as natural areas by the County's Department of Environmental Resources Management. These natural areas were selected on the basis of their biological characteristics and were acquired to preserve the rare and diverse native ecosystems present on these sites and the endangered, threatened, and rare species of plants and animals that live there.

Purpose and Goals of the Natural Areas System

- *The purpose of the Natural Areas System is to protect historic native ecosystems and their biological diversity throughout Palm Beach County. Examples of each ecosystem shall be acquired and managed to preserve in perpetuity the full complement of plants and animals characteristic of that ecosystem. The management of each natural area shall be coordinated with that of the other natural areas in the system to support existing populations and to reflect in perpetuity the subtropical biological diversity characteristic of Palm Beach County in pre-development times.*
- *The wilderness values of each natural area shall be preserved.*
- *Where a natural area currently is physically or biologically connected to another publicly- or privately-owned natural area, attempts shall be made to maintain that connection through additional land acquisitions, regulatory preserve set-asides, conservation easements, interlocal agreements, and other appropriate actions.*

Management Considerations

- *The natural areas in the system shall be available to the public for passive, resource-based recreation, environmental education, and scientific research. Public use shall not take precedence over ecosystem protection. Proposed public uses shall take into account the specific environmental conditions of each natural area, and may be modified in response to changing environmental conditions.*
- *Facilities for passive public use shall be provided on each site. These facilities shall be designed to have a minimal impact on native ecosystems and shall be located in previously disturbed areas as much as possible.*
- *Facilities, structures, or roads other than management or access roads that would cause fragmentation of a natural area shall not be permitted within a natural area.*

- *The establishment of compatible land uses and activities on lands adjacent to a natural area shall be encouraged.*
- *To the extent possible, fire-maintained native ecosystems shall be burned at the appropriate interval and season, as determined by historical data, to maintain those ecosystems. Burns shall be conducted by trained personnel, using a prescribed burn plan that addresses safety and smoke concerns. The seasonality of prescribed burns may be adjusted for initial fuel reduction burns and site safety constraints.*
- *Where ecosystems within a natural area have been impacted by invasive, nonnative plant infestations, land-clearing activities, drainage, or flooding, attempts shall be made to restore those ecosystems to their previous condition or to a natural ecosystem best suited to the existing conditions on the natural area.*
- *The special requirements of listed species shall be considered in developing management strategies for each natural area, but management for an individual species shall not take precedence over management of an entire ecosystem or be allowed to have a detrimental impact on that ecosystem's complement of species.*

Management Plan Development and Revision

- *A specific management plan, based on biological, hydrological, and historical information and interpretation of this information, shall be written for each natural area that takes into account the environmental conditions found on that natural area.*
- *Each management plan shall address the strategies and techniques that will be used to manage and restore native ecosystems, to protect listed species, control the occurrence of invasive, non-native plants and animals, to allow for appropriate public access, and to prevent unauthorized access and activities.*
- *Each plan shall be reviewed by the Palm Beach County Natural Areas Management Advisory Committee (NAMAC), a citizens' advisory board, and the public shall be invited to comment on the plan at a public hearing held by NAMAC in the community in which the site is located.*
- *Following NAMAC review of the comments received, the plan shall be sent to the Board of County Commissioners for approval.*
- *Each approved plan shall be subsequently reviewed at least every ten years by NAMAC.*

EXECUTIVE SUMMARY

The Pawpaw Preserve Natural Area (natural area) is located in the northeastern portion of Palm Beach County (County). The entire 3.2-acre natural area is located within an unincorporated portion of the County. The County owns the entire natural area. The site was donated to the County on November 17, 1998 pursuant to the Conditions of Approval for development of the adjacent Southern Self Storage facility. Preservation, management and development of the site as a natural area with non-consumptive resource-based public uses will assist the County in complying with portions of its comprehensive plan.

Disturbed scrub is the only natural community present on the site. The scrub community has been ranked by the Florida Natural Areas Inventory as imperiled in Florida.

The natural area contains important habitats for several rare plant and animal species. Thus far, 56 species of plants and 48 species of animals have been recorded on the site, including three plant and three animal species that have been listed as having some degree of endangerment by at least one governmental agency or have been ranked by the Florida Natural Areas Inventory.

The primary objective for the acquisition of the Pawpaw Preserve Natural Area is to preserve the site's existing ecological resources. The site's acquisition and management preserves an example of the historic scrub vegetative community and its associated wildlife populations. The secondary objectives are to provide for public resource-based recreation, environmental education and scientific research consistent with protecting the natural resources of the natural area.

Fire suppression, nonnative plant invasions, clearing of native vegetation, construction of adjacent roads and buildings, and dumping have all impacted the site. These factors must be dealt with in the management of the natural area. In addition, the site managers face special challenges unique to fragmented natural communities located within a suburban/urban environment.

To protect the natural plant communities and wildlife of the site, public use must remain limited to non-consumptive/non-destructive recreational uses, environmental education and scientific study. Because of the site's small size; the presence of federally-listed fourpetal pawpaw (*Asimina tetramera*); and the lack of a secured, long-term management funding source, public use facilities will not be constructed on the natural area at this time. If/when public use facilities are constructed on this site they will most likely include a short, natural-surfaced hiking trail, a pedestrian gate/entrance along the east side of Ellison Wilson Road and a small kiosk. A bicycle rack/post may be installed near the pedestrian gate/entrance to encourage visitors to ride bicycles to the natural area. Due to the site's small size and presence of listed species, no on-site parking facilities will be provided.

Local schools are invited to use the natural area for nature study, environmental education and community service projects. The Palm Beach County Department of Environmental Resources Management's volunteer program provides opportunities for people from local citizen's organizations, schools and businesses, and members of the general public to learn about the natural area through firsthand experience removing nonnative plants and trash, and through participating in site restoration activities such as planting projects. Scientific research permitted on the site may include monitoring of populations of rare and/or endemic species, and evaluation of restoration and management techniques.

The Pawpaw Preserve Natural Area is one of 25 natural areas, preserves and parks that are part of the Northeast Everglades Natural Area, a special place in northern Palm Beach County and southern Martin County that contains more than 165,000 acres of publicly-owned conservation lands and activity/education centers that will be connected through a system of greenways and trails. These sites provide a wide range of nature-based outdoor recreation activities.

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1. INTRODUCTION

1.1 LOCATION AND DESCRIPTION

The Pawpaw Preserve Natural Area (natural area) is located in the northeastern portion of Palm Beach County (County) (Figure 1). The 3.2-acre natural area is located within an unincorporated portion of the County. The natural area is bordered to the west by Ellison Wilson Road, to the east by the Southern Self Storage facility and U. S. Highway 1, and to the north and south by high-density, multi-family residential properties. The County owns the entire natural area. The site was donated to the County on November 17, 1998 pursuant to the Conditions of Approval for development of the adjacent Southern Self Storage facility. Preservation, management and development of the site as a natural area with non-consumptive resource-based public uses will assist the County in complying with portions of its comprehensive plan.

Scrub is the only natural community present on the site. The scrub natural community present on the natural area has been ranked by Florida Natural Areas Inventory (FNAI) as imperiled in Florida (FNAI 2016). The natural area contains important habitat for several rare plant and animal species. Thus far, 56 species of plants and 48 species of animals have been recorded on the site, including 3 plant and 2 animal species that have been listed as having some degree of endangerment by at least one governmental agency or have been ranked by FNAI. A list of plant species recorded at the site is provided in Appendix A and a list of animal species recorded at the site is provided in Appendix B. The listed plant and animal species recorded at the site are indicated in Tables 1 and 2, respectively. Definitions for the listing categories used by the agencies are provided in Appendix C.

1.2 PAST USES

Based on historic aerials, it appears that nearly all of the Pawpaw Preserve Natural Area has been disturbed by man. Perimeter disturbances associated with the construction and maintenance of Ellison Wilson Road and the adjacent high-density, multi-family residential and commercial properties began in 1928 and continue today. Over the years, perimeter disturbances have included vegetation clearing, illegal dumping and parking of cars and trucks. Most of these disturbances occurred along the northern, western and southern property boundaries. In addition to the previously listed perimeter disturbances, the eastern and western boundaries of the site are subject to sewer line and utility easements, respectively (see Section 1.7).

Known disturbances to the remainder of the site began sometime in the 1940s or early 1950s. Between 1940 and 1953 almost all of the trees were lost from the eastern $\frac{3}{4}$ of the site, either as the result of fire or tree harvesting (United States Department of Agriculture [USDA] 1940 and 1953). Additional clearing of native vegetation occurred in the western portion of the site between 1964 and 1973, and in the eastern portion of the site between 1973 and 1986 (Florida

Department of Transportation [FDOT] 1964, 1973 and 1986). A few footpaths were created within the site between 1973 and 1986, but had become overgrown by vegetation by 1991 (FDOT 1973, 1986 and 1991).

1.3 ADJACENT LAND USES

The natural area and surrounding lands are located within an unincorporated portion of the County. The natural area has a Future Land Use designation of “Conservation” and a Zoning designation of “Residential High Density” on the County’s most recent Future Land Use Atlas and Zoning District Map (Palm Beach County Planning, Zoning and Building Department 2014 and 2015, respectively). Since the County’s Unified Land Development Code allows natural areas with Future Land Use designations of “Conservation” to exist in all zoning categories, the County will not seek to change the zoning designation for this site.

Lands immediately north and south of the natural area have a Future Land Use designation of “High Residential – 8 units per acre” and a Zoning designation of “Residential High Density”. Lands west of the natural area have a Future Land Use designation of “Medium Residential – 5 units per acre” and Zoning designation of “Multifamily Residential.” And finally, lands east of the natural area have a Future Land Use designation of “Commercial High, with an underlying High Residential – 8 units per acre” and a Zoning designation of “General Commercial.”

Both direct and indirect impacts from adjacent and nearby land uses are to be expected. Impacts that have affected and continue to affect the natural area include invasion of the site by nonnative plant species via seeds produced by nonnative plants growing within the Ellison Wilson Road right of way and within adjacent and nearby commercial, residential and vacant properties; dumping; and animal mortality from vehicular traffic.

Additionally, wildlife may be killed or injured by cats (*Felis catus*) and/or dogs (*Canis lupus familiaris*) which originate from adjacent and nearby residential and commercial properties. Efforts to mitigate for these impacts include an aggressive nonnative/nuisance animal control program, public outreach, volunteer and interpretive programs, and enforcement of the provision of the Palm Beach County Natural Areas Ordinance, as amended, (Chapter 11, Article XI of the Palm Beach County Code; <http://www.co.palm-beach.fl.us/erm/natural/naturalareaordinances.htm/>) regarding the prohibition of domestic animals and pets on the natural area.

1.4 USES THAT ARE NOT APPROPRIATE

Public uses on county natural areas such as the Pawpaw Preserve Natural Area are regulated by the Palm Beach County Natural Areas Ordinance (Natural Areas Ordinance) which has been adopted by the County’s Board of County Commissioners (BCC). The Natural Areas Ordinance restricts public uses within a county-managed natural area to those that are compatible with the

perpetual preservation and protection of the natural area. This ordinance permits passive recreational activities such as hiking, nature study and photography. Other uses (for example, fishing, canoeing/kayaking, horseback riding and/or bicycling in areas that have been designated for such uses; environmental education; and scientific research) are permitted as long as they do not jeopardize the protection of the existing natural resources. The Natural Areas Ordinance prohibits destructive uses such as off-highway vehicle (OHV) use and dumping, and requires special permits for camping, horseback riding, scientific research involving collection of plant and animal specimens or the use of watercraft in wetlands, and nighttime use of the natural area. Except for service animals, no dogs, cats, or other domestic animals are permitted on the natural area. The ordinance also prohibits damaging, taking, molesting, trapping, hunting and/or poaching of plants and animals. Although not prohibited by the Natural Areas Ordinance, logging is not appropriate for this natural area since it does not contain commercially-viable quantities of timber.

There are no plans for any concessions or support services to be located on the site, nor are there plans to provide a camping area or allow horseback riding, fishing or boating on the natural area. There are sufficient retail businesses in the vicinity of the natural area to supply services normally provided by concessionaires. Due to the extremely small size of the site and its location within a residential/commercial area, camping and horses are not permitted on the site. There are no permanent wetlands or navigable waters on the site, so there is no way to accommodate fishing or boating uses.

No vehicles (for example, OHVs, bicycles, skateboards, etc.) are permitted in the natural area, except to perform the monitoring, maintenance and prescribed burning activities described in this management plan, and except as authorized by the County's Access Policy for Use of Natural Area Trails and Other Public Use Facilities by Persons with Mobility Disabilities. No drones are permitted within the natural area, except to assist with the management and monitoring activities described in this management plan or as may be permitted for scientific research.

1.5 OUTPARCELS

There are no outparcels adjacent to the natural area that would be suitable for acquisition. All of the land(s) immediately east, south and west of the natural area have already been developed for commercial and residential purposes. The parcel immediately north of the natural area is slated to be developed as a town home community.

1.6 MANAGEMENT CONSTRAINTS

The natural area has been and will continue to be managed under the "single-use" concept by Palm Beach County. This means that the natural area will be managed in a manner that preserves the site's natural resources. The entire site is managed under the constraints imposed by the County's Natural Areas Ordinance (see Section 1.4).

The most significant management constraint on the natural area is the requirement to protect rare and endangered plants, animals and ecosystems. The size, shape and location of the natural area do not restrict certain management activities such as invasive/nonnative vegetation removal or upland restoration activities. These factors do, however, limit what can be done on the site relative to the reintroduction of fire; the site's small size and its proximity to US 1, Ellison Wilson Road, PGA Boulevard and residential and commercial areas severely limit the options for prescribed burning. The surrounding commercial and residential uses also are a source of invasive/nonnative plant and domestic pet incursions.

1.7 EASEMENTS, CONCESSIONS, LEASES AND OTHER ENCUMBRANCES

There are two easements and one set of lien rights that currently restrict use of the natural area. A third easement - a 5-foot-wide limited access easement along the western boundary of the site - merged with the title when the County acquired the natural area. There are no concessions or leases that affect the natural area.

The two easements that currently affect the natural area include a utility easement and sewer line easement. The utility easement is 10-feet-wide and runs parallel to Ellison Wilson Road along the entire western edge of the natural area. The utility easement is dedicated for the construction and maintenance of utility facilities, including cable television systems. The sewer line easement is 20-feet-wide and is dedicated for use by the Seacoast Utility Authority. It runs from the southern property boundary, northeast along the eastern edge of the natural area, before turning east-northeast onto the adjacent Southern Self Storage property.

A conservation easement will be placed over the entire site through South Florida Water Management District following acceptance of this management plan by the BCC. On September 13, 2005 the BCC expressed a desire to place conservation easements on all county natural areas and approved a resolution establishing standard form conservation easements (R2005-1770). The conveyance of conservation easements over county natural areas provides the natural areas with a level of protection that is not affected by the retirement of county or state conservation bonds.

The Seacoast Utility Authority (utility company) has the ability to place a lien over any property within its service area, including the natural area, for the nonpayment of any fees or charges owed to the utility company. The utility company, which provides potable water and sewer services to a large portion of northeastern Palm Beach County, was established on August 17, 1988 pursuant to an interlocal agreement signed by Palm Beach County and the City of Palm Beach Gardens, Village of North Palm Beach, Town of Lake Park and Town of Juno Beach. Pursuant to Florida Statute 159.17 and a "Notice of Lien Rights" that was recorded by the utility company in 2008, any unpaid fees and charges owed to the utility company automatically constitutes a lien over the benefitting property. Although the natural area is located within the

utility company's service area, the site does not currently utilize any of the services provided by the utility company; the utility company's right of lien will only affect the natural area if the site begins to use the services provided by the utility company.

No additional easements, concessions, leases or other encumbrances are anticipated.

1.8 PLAN DEVELOPMENT AND REVIEW

The primary purpose of the County's Natural Areas System is to protect native ecosystems and their biological diversity throughout Palm Beach County. Therefore, each natural area's management plan must ensure that the proposed management and restoration activities will preserve and enhance/restore the existing and historic natural vegetation communities, and their associated plant and animal species. Scientific research, environmental education, and passive, resource-based recreation are permitted on natural areas as long as they do not jeopardize the protection of natural resources.

Before a comprehensive initial management plan could be developed for the Pawpaw Preserve Natural Area, a thorough inventory and assessment of the site's natural resources was required. Once the necessary background information was obtained, an initial management plan was drafted for the site. The primary goals of the initial management plan were to: 1) identify the existing natural resources; 2) address the site-specific strategies and techniques that would be used to manage and restore those resources and 3) identify recreational uses which could be accommodated without adversely affecting the site's natural resources.

As development of the draft management plan neared completion, the seven members of the County's Natural Areas Management Advisory Committee (NAMAC) were invited to tour the natural area with staff and to hear an overview of the management/restoration activities and recreational uses proposed for the site. All comments and suggestions received from NAMAC at the site visit were taken into consideration during completion of the draft management plan. The draft management plan was then sent to NAMAC and interested members of the public for review and discussion. The draft management plan was also posted on the County's Department of Environmental Resources Management (ERM) website for public review and comment.

The purpose of NAMAC is to review and comment on management plans developed by staff for natural areas acquired and/or managed by the County, and to hold public hearings on the initial management plans prior to their review and adoption by the BCC. NAMAC was originally established on August 16, 1994 when the BCC adopted Resolution 94-1051. NAMAC was most recently reestablished by the BCC on October 1, 2013 (Resolution 2013-1328). The current membership categories are: a member with experience in the management of natural areas, a biological scientist, a professional educator with knowledge of South Florida ecosystems, a representative of a local municipal government parks and recreation program, a member of the

Palm Beach County Parks and Recreation Department staff, and two citizens having an interest in the preservation and conservation of natural areas.

Members of the public were invited to provide comments on the initial management plan at the April 22, 2016 regularly-scheduled meeting of NAMAC as the plan was being reviewed by the committee prior to approval for public hearing. The members of NAMAC held a publicly-noticed evening public hearing on the draft management plan on May 26, 2016 at the Gardens Branch of the Palm Beach County Library in Palm Beach Gardens. A notice of the public hearing was posted on the natural area, in a paper of general circulation (Appendix D) and on the ERM website. An open house held prior to the public hearing allowed the public to review and discuss the management plan with county staff and to view a display of the proposed public use facilities. A copy of the draft management plan was available through ERM's website for a minimum of 30 days prior to the public hearing.

Members of the public who could not attend the public hearing or who attended but wished to provide comments after the hearing were allowed to submit written comments to the County during the one-week period following the hearing. Members of the public also were invited to provide comments at a subsequent, regularly-scheduled meeting of NAMAC held on June 17, 2016. A summary of the comments made by members of the public are included as Appendix D. NAMAC members took those comments into consideration prior to forwarding the draft management plan to the BCC with a recommendation that it be approved.

1.9 SITE HISTORY

Roads, Celestial Railroad, Florida East Coast Canal and Land Boom/Bust – 1885 to 1940

The first major human impact in proximity to the natural area was the establishment of a diagonal north-south county road in 1885 (Lynfield 1984 and Shappee 1962). In the 1880s and early 1890s, passengers and freight were transported from Titusville south to Jupiter, and from the northern shores of Lake Worth Lagoon south to Palm Beach via small boats. At that time there was no viable inland water route between the Jupiter Inlet and Lake Worth. The purpose of the county road was to allow people and goods to avoid having to make an often-rough ocean passage between the Jupiter and Lake Worth Inlets. Not much more than a wagon trail, the county road extended 7.5 miles, from a dock on the south side of the Loxahatchee River near its mouth to another dock in unincorporated Juno at the northern end of the Lake Worth Lagoon (Corbett 1992). The county road, which was located approximately 900 feet east of the natural area, was only used for a few years before it was replaced by a narrow-gauge railroad.

In 1888 construction began on the 7.5 mile-long Jupiter and Lake Worth Railway which was built on top of the county roadbed. This 3-foot-wide, steam railroad was dubbed the “Celestial Railroad” because it ran from Jupiter to Juno, with stops at wayside areas known as Mars and Venus (Corbett 1992, Lynfield 1984). The railroad, which was owned by the Jacksonville,

Tampa & Key West Railway, was completed and began operation in July 1889 (Shappee 1962). Although a good income producer in the late 1880s and early 1890s, the 7.5-mile Celestial Railroad could not compete with Henry Flagler's Jacksonville, St. Augustine and Indian River Railroad (the present-day Florida East Coast Railway) and ceased operations in 1895. The County converted the Celestial Railroad back to a public road in 1896 (Palm Beach County History Online undated[a]).

In 1882 the Florida Coast Line Canal and Transportation Company (the canal company) began constructing an inland transportation canal known as the Florida East Coast Canal (the predecessor to the Atlantic Intracoastal Waterway [AIWW]) southward from St. Augustine to Miami (Crawford 2002). Dredging began at the mouth of the Lake Worth Creek in Jupiter in 1892 then moved southward towards the Lake Worth Lagoon (Corbett 1992). The canal company's dredge contractor cut through the final sand ridge approximately 1.0 mile south of the natural area and entered the northern portion of the present-day Lake Worth Lagoon in May 1898 (Corbett 1992, Crawford 2006).

The dredging of the Florida East Coast Canal west of the natural area in the 1890s eliminated several of the barriers that held water in sawgrass marshes west and north of the natural area. As a result, water levels in many of these sawgrass marshes fell to the level of the Lake Worth and the Jupiter Inlets (currently about 1.3 feet above sea level). The construction and subsequent expansion/maintenance of the AIWW also lowered the water table within and adjacent to the natural area, thereby making lands in the vicinity of the AIWW more xeric.

The next significant human impact in the vicinity of the natural area was the construction of a narrow, north-south road just west of the natural area in 1928. The road initially connected present-day RCA Boulevard to Juno Road, but was later extended northward to its present terminus at Donald Ross Road. This road eventually became known as Ellison Wilson Road after a local resident who lost his life in World War II (Corbett 1992, Palm Beach County History Online undated[b]). Although the 1928 road provided direct access to the natural area, the site was not developed or visibly altered through 1940 (USDA 1940).

In 1891 the U.S. Government conveyed ownership of the northwest quarter of Section 4, Township 42 South, Range 43 East, to Albert M. Field, acting attorney for Richard S. Field. In 1896 the Fields sold a 10-acre tract within the southwest quarter of the northwest quarter of Section 4 to Charles A. Woodruff for \$5.00. This 10-acre tract included the present-day natural area. Mr. Woodruff retained ownership of the tract for the next 30 years but never developed it.

Most of Palm Beach County's east coast experienced a land boom during the early to mid 1920s. Land was sold for escalating prices with little or no money down (University of South Florida 2002). This was the case with the natural area. In February 1926 Mr. Woodruff sold his 10-acre tract in Section 4 to Kelsey Associates, Inc. This sale was subject to a mortgage that was

initially held by Mr. Woodruff, but which was reassigned to the Southland Finance Company in 1930.

The Florida real estate boom was short-lived. In September 1926 a devastating hurricane struck Miami and many people who were considering moving to Florida were scared away. Investors stopped putting money in Florida ventures and the land boom collapsed when there were no new buyers willing to pay higher prices. Then in September 1928, a Category 4 hurricane hit Palm Beach County killing thousands around Lake Okeechobee, and damaging or destroying many buildings in the County's coastal areas (Barnes 1998). Thirteen months later, the Stock Market crashed and the whole nation was plunged into the Great Depression.

In 1930 Kelsey Associates, Inc. sold the 10-acre tract and other lands to the Palmwood Investment Company; the sale was subject to the mortgage held by the Southland Finance Company. After it acquired the property, the Palmwood Investment Company was unable to sell it or keep up with the required mortgage payments. In 1934 the mortgage holder, Southland Finance Company, filed a lawsuit against Kelsey Associates, Inc. and Palmwood Investment Company for nonpayment of the mortgage. The mortgage holder won the lawsuit and the property was sold at public auction in 1937 in an effort to recoup some of the finance company's money. The Tennessee Company was the winning bidder for the property; the company paid \$3,500 to acquire the natural area and others lands previously owned by the Palmwood Investment Company.

Delodder Family, North Palm Storage Partners, Ltd. – 1941 to 1997

In 1947 the Tennessee Company sold 5.3 acres of land, including the natural area, to Harry Delodder and his wife Evelyn. The property was owned by the Delodder family until March 4, 1997 when the land was purchased by North Palm Storage Partners, Ltd. The purchased land was subdivided into two lots and platted under the name "Southern Self Storage" in August 1997. Disturbances which occurred within the site between 1941 and 1997 are identified in Section 1.2 above.

County Acquisition – 1998 to Present

As part of the land use amendment process North Palm Storage Partners, Ltd. agreed to dedicate the western 3.1± acres of the platted Southern Self Storage property to the County for the purposes of a park, neighborhood play area or preserve. In exchange for dedication of the western portion of the property, the storage company was allowed to significantly expand its storage facility in the eastern portion of the property.

Prior to the County's acquisition of the natural area, the site was inspected on at least two occasions by ERM staff. At the time of these inspections the natural area was described as typical scrub habitat which contained some sand pine (*Pinus clausa*), myrtle oak (*Quercus*

myrtifolia) and sand live oak (*Quercus geminata*), numerous healthy fourpetal pawpaw plants (*Asimina tetramera*) and several dense pockets of Brazilian pepper (*Schinus terebinthifolius*). Due to the presence of many endangered fourpetal pawpaw plants, it was determined that the property would become a natural area instead of a park. The site was donated to the County on November 17, 1998 pursuant to the Conditions of Approval for the expansion of the adjacent Southern Self Storage facility. North Palm Storage Partners, Ltd. fenced the property after its acquisition by the County; the company also donated \$20,000 to the County's Natural Areas Stewardship Endowment Fund to help pay for the perpetual management of the site.

Information regarding notable events taking place at the natural area subsequent to its acquisition is depicted in the following chapters: "Management and Restoration Activities" (Chapter 4), and "Site Development and Improvement" (Chapter 5).

2. PURPOSE AND OBJECTIVES

2.1 PURPOSE OF ACQUISITION

The primary purpose for the acquisition of the natural area was to preserve the site's ecological resources. The acquisition, preservation and perpetual management of this site has and will continue to help protect the scrub natural community, its component plant and animal species, and the quality and quantity of local groundwater resources. Acquisition and management of the site as a natural area will provide the general public with opportunities for passive recreational activities, environmental education and scientific research which are consistent with the primary purpose of the acquisition. It also will help the County comply with portions of its comprehensive plan. All portions of the natural area are important to preserving ecological resource values of the site. Because every portion of the site provides habitat for at least one rare or endangered plant species, animal species or natural community, there are no portions of the property that can be declared as surplus.

2.2 MANAGEMENT GOALS AND OBJECTIVES

The natural area contains a disturbed scrub native vegetation community (Figure 3). This community was in a highly-degraded condition at the time of site acquisition as a result of fire exclusion and suppression, nonnative plant invasions, construction of an adjacent road, development of adjacent residential and commercial properties, dumping and other human-caused disturbances. The primary goal of site management is to preserve and, where appropriate, restore or enhance the scrub community, together with its component species, as described in Section 3.3. Maintaining and improving the ecological quality of the disturbed scrub community is the primary management objective for this site. The disturbed scrub community will be restored, enhanced and/or managed in a manner that will enhance the overall biological diversity of the site and/or meet specific needs of listed species. Habitats for listed species will be managed for the needs of individual species when such management is compatible with the overall management of the ecosystems within the natural area. Management efforts to date have included securing the site with fencing, gates and signage; implementation of invasive/nonnative plant control and nonnative/nuisance animal control programs; and mechanical fuel reduction activities.

The site is managed under the "single-use" concept, which means that it is managed to preserve and restore/enhance the existing natural resource values. Scientific research, environmental education and public outdoor recreational uses are encouraged as secondary management objectives as long as they do not jeopardize the protection of natural resources. Passive, resource-based outdoor recreational uses, such as nature appreciation and study, hiking and photography are allowed throughout the site.

3. NATURAL AND CULTURAL RESOURCES

The Pawpaw Preserve Natural Area represents a small remnant of an extensive mosaic of upland communities formerly present along the coast of southeastern Florida. Urbanization, road construction, fire suppression and a host of other human disturbances have eliminated or severely modified the majority of the upland natural communities in this region. Acquisition of sites like the natural area is important because it helps preserve examples of rare natural communities and rare and/or endemic plant and animal species in southeastern Florida. The following sections provide this information regarding the site's natural resources.

Both the scientific name and the common name of a plant or animal species are provided the first time the species is mentioned in this management plan. After the initial reference, only the common name is used. The scientific and common names of the plants and animals recorded at the natural area are provided in Appendixes A and B, respectively.

3.1 SOILS

Brown et al. (1990) urged caution when using soil maps, even at the scale of county maps, because soil properties are highly variable over the landscape. Despite these limitations, the Palm Beach County soil maps (United States Department of Agriculture, Soil Conservation Service [USDA, SCS] 1978; United States Department of Agriculture, Natural Resource Conservation Service [USDA, NRCS] 2015) are useful tools in determining the historic distributions of natural communities and plants as well as in predicting responses of natural communities to alterations of historic hydrology and fire frequency.

The following descriptions of soil series, soil phases and vegetation are based on a combination of updated series descriptions available on the USDA, NRCS website (USDA, NRCS undated) and more detailed soil descriptions contained in USDA, SCS (1978). In this plan, scientific names have been added to the descriptions for clarification where possible. USDA, SCS (1989) correlates soil types with ecological communities in Florida, and these correlations are listed for each soil series. USDA, SCS (1989) uses a different ecological community classification system than the FNAI system that is used in other parts of this plan.

Although the present tense has been used to describe these soils, most soils in Palm Beach County have been modified by hydrologic manipulations and other disturbances. All of the soils on the natural area have been altered by an increase in the depth from the soil surface to the water table due to regional drainage.

Three soil series are present at the natural area: Paola, Pomello and St. Lucie (Figure 2). In addition, one soil mapping unit representing artificial soil is present on the site: Urban Land. Of the three soil series and one artificial soil found on the site, only the Pomello series is present in

its natural form. The other soils are present as part of the St. Lucie – Paola – Urban land complex.

3.1.1 Paola

The Paola series consists of very deep, nearly level to sloping, excessively-drained, deep sandy soils in uplands (USDA, SCS 1978; USDA, NRCS undated). Under natural conditions the water table is below a depth of 72 inches (USDA, NRCS undated). USDA, SCS (1989) identifies sand pine scrub as the typical ecological community found on this soil. Scrubby flatwoods also may be found on this soil, especially following disturbance of the natural fire regime. The natural vegetation is described as including sand pine, slash pine (*Pinus elliottii*), longleaf pine (*Pinus palustris*), sand live oak, scattered turkey oak (*Quercus laevis*) and bluejack oak (*Quercus incana*) in the canopy, and an understory of cacti, mosses, lichens, fiveangled dodder (*Cuscuta pentagona*), Florida rosemary (*Ceratiola ericoides*) and scattered saw palmetto (*Serenoa repens*). The series is represented at the natural area as part of the St. Lucie – Paola – Urban land complex (Figure 2).

3.1.2 Pomello

The Pomello series consists of nearly level to gently sloping, moderately-well to somewhat-poorly-drained, very deep, sandy soils (USDA, SCS 1978; USDA, NRCS undated). Pomello soils are present on low knolls and ridges within flatwoods in peninsular Florida. Under natural conditions the water table is at a depth of 24 to 42 inches for 1 to 4 months during the normal wet season and below 42 inches during the remainder of the year (USDA, NRCS undated). USDA, SCS (1989) states that sand pine scrub is the typical ecological community found on this soil. The natural vegetation is described as including slash pine, sand pine, dwarfed oaks, saw palmetto, gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), wiregrass (*Aristida stricta* var. *beyrichiana*) and other native grasses (USDA, SCS 1978). The series is represented at the natural area by Pomello fine sand (Figure 2).

3.1.3 St. Lucie

The St. Lucie series consists of nearly level to sloping, excessively-drained, very deep, sandy soils on long, narrow, dune-like ridges and isolated knolls near the Atlantic coast (USDA, SCS 1978; USDA, NRCS undated). Under natural conditions the water table is below a depth of 72 inches (USDA, NRCS undated). USDA, SCS (1989) states that sand pine scrub is the typical ecological community present on this soil. The natural vegetation is described as including sand pine, sand live oak, saw palmetto, dwarf willow (*Salix humilis*), Florida rosemary, pricklypear (*Opuntia* sp.), Dixie reindeer lichen (*Cladina subtenuis*), and sparse clumps of wiregrass and rose natalgrass (*Melinis repens*) (USDA, SCS 1978; USDA, NRCS undated). The series is represented at the natural area as part of the St. Lucie-Paola-Urban Land complex (Figure 2).

3.1.4 Urban Land

This mapping unit consists of soils that have been so altered by dredging, filling or regrading that the parent soil can no longer be easily recognized (USDA, SCS 1978). It occurs adjacent to and within developed areas. This mapping unit is represented at the natural area by one soil complex, the St. Lucie-Paola-Urban Land complex (Figure 2).

3.2 HYDROLOGY

The natural area contains no drainage improvements. Most rain that falls on the natural area quickly percolates into the underlying soil. However, in a 100-year or greater storm, a small amount of excess surface water may flow in an eastward direction into the Southern Self Storage preserve area and/or drainage system. There are no wetlands on the site.

3.3 NATURAL COMMUNITIES

The following discussion provides a general description of the only plant community present on the natural area – disturbed scrub. The community description is based upon the FNAI classification system (FNAI 2010) and contains information on the rarity of the community worldwide and in Florida (FNAI 2016). The natural scrub community at this site has been altered to the point that it no longer can be considered an “intact” community and is classified as “disturbed” in the community description listed below. The phrase “natural community” is used in this plan, even when the historic community has been heavily modified. Any classification system is artificial, and not all communities in a natural area will fall neatly into discrete classification units.

The goal of natural communities management is to reverse or lessen the impact of as many of the human-caused disturbances to the natural area as possible, and to restore and maintain as many of the functions and values of the natural communities that historically occupied the site as possible. The disturbed scrub natural community present at the natural area has been enhanced or restored to the greatest extent practicable in such a highly-urbanized area (see Section 4.3.4). It will be maintained through the implementation of invasive/nonnative plant and nonnative/nuisance animal control programs (see Sections 4.3.2 and 4.3.3), and through security measures designed to prevent OHV use and dumping (see Section 4.4). The only fire-maintained community on the site – disturbed scrub – also will be maintained through mechanical vegetation reduction and possible micro-burns (see Section 4.3.1).

3.3.1 Disturbed Scrub

Scrub communities occur on sand ridges along former shorelines and are characterized by very-well-drained soils, a relatively open canopy, a dense-to-open understory layer, and a sparse groundcover layer. Scrub communities are composed of evergreen shrubs, with or without a

canopy of pines (FNAI 2010). The signature species – three species of shrubby oaks (myrtle oak, sand live oak and Chapman’s oak [*Quercus chapmanii*]), sand pine and Florida rosemary – are found in scrub statewide. Other typical scrub plant species which occur in Palm Beach County include saw palmetto, threeawns (*Aristida* spp.), hairsedges (*Bulbostylis* spp.), pinweeds (*Lechea* spp.), jointweeds (*Polygonella* spp.), sandyfield beaksedge (*Rhynchospora megalocarpa*) and ground lichens (*Cladina* spp. and *Cladonia* spp.) (FNAI 2010, Wunderlin and Hansen 2011). Animal species found in Palm Beach County that typically are associated with scrub include red widow spider (*Latrodectus bishopi*), oak toad (*Anaxyrus quercicus*), gopher tortoise (*Gopherus polyphemus*), six-lined racerunner (*Aspidoscelis sexlineata*), coachwhip (*Coluber flagellum*), Florida scrub lizard (*Sceloporus woodi*), Florida scrub-jay (*Aphelocoma coerulescens*), common ground-dove (*Columbina passerina*), yellow-rumped warbler (*Setophaga coronata*), loggerhead shrike (*Lanius ludovicianus*), eastern towhee (*Pipilo erythrophthalmus*), Florida mouse (*Peromyscus floridanus*) and eastern spotted skunk (*Spilogale putorius*) (Bartlett and Bartlett 2003, 2011a and 2011b, Cox et al. 1987; FNAI and FDNR 1990; NatureServe 2015, Pranty et al. 2006).

Scrub is a fire-maintained community (FNAI 2010). Natural fire frequency can range from 5 to 70 years, and is dependent on the dominant plant species – oak scrub has a natural fire interval of 5 to 20 years, sand pine scrub has a fire interval ranging from 20 to 80 years, and rosemary scrub likely burns at intervals of 10 to 40 years (FNAI 2010). Periodic fire is one of the physical disturbances that help maintain the areas of open sand that characterize typical scrub. Fire is necessary for the growth and proliferation of many of the rare and/or endemic species that are found in scrub communities in Florida.

The density of key species within a scrub canopy often is a reflection of fire frequency. Individual sand pines usually are killed by fire, but replaced through reseeding. It takes nearly 10 years for the replacement stand of sand pines to mature and begin producing new seeds, and sand pines start to die off once they reach 50 years of age (FNAI 2010). Therefore, fires which occur at relatively short intervals (before replacement trees become mature enough to produce seeds) or at relatively long intervals (approaching, or beyond, the normal reproductive life of sand pine) may eliminate sand pines from a scrub community. Similarly, Florida rosemary succumbs to fire and is reestablished from seed. This species requires 10-15 years to reach reproductive maturity and becomes senescent around 40 years of age. As a result, Florida rosemary also may be eliminated from scrub due to too frequent or too infrequent fire. Most of the other scrub species resprout readily from root-shoots following fire.

Disturbed scrub typically has many of the same plant species as intact scrub, but the plants are smaller and sparser, and there are larger expanses of bare sand. There also is a higher-than-normal percentage of ruderal and nonnative plants such as rose natalgrass. Pioneer, high-light environment scrub plant species such as skyblue lupine (*Lupinus diffusus*), narrowleaf silkgrass (*Pityopsis graminifolia*), Feay’s prairieclover (*Dalea feayi*) and Deckert’s pinweed (*Lechea deckertii*) are more common. The higher levels of herbaceous plants provide an important food

source for gopher tortoises. This community generally does not burn because the vegetation is too sparse to carry a fire.

The entire 3.2-acre natural area is classified as disturbed scrub (Figure 3). At this site, the disturbed scrub community is the result of long-term fire exclusion, localized clearing and nonnative plant invasions. Due to the small size of the natural area and the proximity of residential and commercial areas, the use of prescribed fire will be very limited at this site. Staff will investigate the use of micro-burns to help restore habitat and increase species diversity. Any portions of the disturbed scrub community that cannot be treated with prescribed fire will be mechanically reduced on an as-needed basis.

FNAI (2016) ranked scrub as G2/S2 - imperiled both globally and in Florida because of rarity or vulnerability to extinction.

3.4 PLANTS

A total of 56 species of plants have been recorded at the natural area (Appendix A). Of these, three have been listed for protection or special management by a government agency or have been ranked by FNAI (Table 1). To date, 15 species of plants recorded at the site are not native to the South Florida mainland. These species are discussed in more detail in Section 4.3.2.

3.5 ANIMALS

A total of 48 species of animals have been recorded at the natural area - 3 arachnids, 13 insects, 6 reptiles, 25 birds and 1 mammal (Appendix B). Of these, three have been listed for protection or special management by a government agency or have been ranked by FNAI (Table 2). To date, two species of invertebrates and four species of vertebrates recorded at the site are not native to the South Florida mainland. These species are discussed in more detail in Section 4.3.3.

3.6 LISTED SPECIES

3.6.1 Plants

Three plant species recorded at the natural area have been listed for protection or special management by at least one governmental agency or have been ranked by FNAI (Table 1). These species will be protected as components of the natural communities of which they are a part. All listed/ranked plant species recorded at the natural area will be protected through the implementation of management activities designed to restore, enhance and maintain the natural communities in which they occur; by control/removal of invasive nonnative vegetation at the natural area; by routing trails and other public use facilities away from known populations whenever possible; by relocating plants that cannot be avoided during construction and restoration activities; and by protecting the site from plant collectors.

This section includes a brief description of each listed/ranked species and any species-specific management/protection strategy that will be used to protect that species. The ranks and designations assigned to the species are provided in Table 1. Listed/ranked plant species recorded at the natural area are discussed in alphabetical order by common name.

Fourpetal pawpaw (*Asimina tetramera*)

This endemic, long-lived shrub has been recorded at the natural area by ERM staff in 1988, 1998, 1999, 2002 and on a regular basis since 2005. Fourpetal pawpaw typically is found in openings in sand pine scrub on the south-central Atlantic Coastal ridge (Chafin 2000).

Shell-mound pricklypear (*Opuntia stricta*)

This perennial forb was recorded at the natural area by ERM staff in 2013. It typically is found on dunes and shell middens, and in coastal hammocks (Wunderlin and Hansen 2011).

West Indian mahogany (*Swietenia mahagoni*)

Three of these semi-deciduous trees were first recorded along the site's southern property boundary by ERM staff in 2013. The trees most likely grew from seeds produced by landscape trees located on the adjacent residential property. This species typically is found in tropical hammocks and disturbed areas (Wunderlin and Hansen 2011); it is susceptible to fire. Because this species is not a component of the scrub community, no special effort will be made to protect the trees during prescribed burns or other land management activities.

3.6.2 Animals

Three animal species recorded at the natural area have been listed for protection or special management by at least one governmental agency or have been ranked by FNAI (Table 2). They include one arachnid, one reptile and one bird.

This section includes a brief description of each listed/ranked species, including the habitats in which it is typically found and the species' primary diet. The ranks and designations assigned to the species are provided in Table 2. Listed/ranked animal species recorded at the natural area are discussed in alphabetical order by common name.

Florida scrub-jay (*Aphelocoma coerulescens*)

Two individuals of this medium-sized bird were recorded at the natural area by ERM staff in 1988. However, this species has not been recorded on the natural area since that time and is believed to have been extirpated from the site. Fitzpatrick et al. (1991) estimated that 750 acres

of periodically-burned scrub would be required to support an adequately-protected population. Based upon that estimate, it would be difficult to maintain a viable population of Florida scrub-jays in northern Palm Beach County. In 2015 the closest site on which a scrub-jay was recorded was the Jupiter Ridge Natural Area in Jupiter approximately 4.2 miles north of the Pawpaw Preserve Natural Area.

Gopher tortoise (*Gopherus polyphemus*)

Although live gopher tortoises were recorded at this site by ERM in 1988 and 1998, and by Kilday and Associates in 1998 (Kilday & Associates 1998), this medium-sized terrestrial turtle has not been recorded on the site since 1999. Gopher tortoises are plant eaters; the bulk of their diet consists of grasses and herbaceous plants and they are known to feed on up to 400 species of plants (Ashton and Ashton 2008). They can travel up to two miles from their burrows to feed on seasonal vegetation such as flowers, fruits and leaves from trees, shrubs and vines, deer feeding plots, or ripe orchard fruits on neighboring properties. They also may eat a variety of other items, such as carrion, small animals, insects and other invertebrates. The gopher tortoise typically inhabits sandhill, scrub, scrubby flatwoods, xeric hammock, pine flatwoods, dry prairie, coastal strand, mixed pine-hardwood communities and a variety of disturbed well-drained habitats (Florida Fish and Wildlife Conservation Commission [FWC] 2012). The gopher tortoise is considered to be a keystone species in upland communities because of the important role that this species plays in relation to other plants and animals. At least 411 species of vertebrate and invertebrate animals are known to use gopher tortoise burrows (Mushinsky et al. 2006).

Red widow spider (*Latrodectus bishopi*)

Red widow spiders were recorded at the natural area by ERM in 2012. This venomous, nocturnal spider is endemic to Florida; it makes its web in saw palmettos, primarily in sand pine scrub and scrubby flatwoods habitats in central and southeast Florida (Carrel 2001, Short and Castner 2003).

3.7 ARCHAEOLOGICAL AND HISTORICAL RESOURCES

No archaeological or historic resources are known to be present on the natural area. Any ground disturbance of previously undisturbed areas will be coordinated with Florida Department of State, Division of Historical Resources (FDHR) and the Palm Beach County archaeologist. If any archaeological or historical sites are discovered in the future, FDHR management procedures will be followed to protect those sites. If human remains are found, the provisions of Section 872.05, Florida Statutes, will be followed to protect those remains. The County will comply with Chapter 267, Florida Statutes, in its management of any archaeological or historic sites discovered on the natural area. If historic resources are found on the natural area, a historic resources protection plan will be developed in consultation with the Palm Beach County Historic Preservation Officer.

4. MANAGEMENT AND RESTORATION ACTIVITIES

Long-term resource management and restoration of the site began with baseline inventories and assessments of the natural community and listed species described in Chapter 3 of this plan. Numerous plant community, and plant and animal species surveys were conducted by ERM staff between 1988 and 2016. The information collected during these surveys was used as the basis for determining the management activities necessary to protect, restore, enhance and maintain the natural resources of the site, and for determining the locations and types of public use facilities for passive recreation that have been proposed for the site.

4.1 MANAGEMENT UNITS

The entire site will be treated as a single management unit due to its small size.

4.2 MAINTENANCE

4.2.1 Removal of Debris and Litter

Most of the debris located within the natural area was removed prior to acquisition. Any visible debris that remained within the site following its acquisition was removed by county staff. If additional debris becomes visible after a management/restoration activity, it will be removed in a timely manner, unless such removal would cause undesirable damage to the existing natural community or listed species. The installation and maintenance of perimeter fencing, and a single management access gate has and will continue to help prevent the dumping of trash and hazardous materials on the site. Periodic site cleanups to remove litter and maintain the site will be conducted, as necessary, by county staff with the assistance of volunteers.

4.2.2 Trail Maintenance

Periodic maintenance of any trails constructed on the site will be performed by county staff and community volunteers.

4.2.3 Facilities Maintenance

County staff will be responsible for the maintenance of any fences, gates, signs and kiosks installed on the site.

4.3 RESTORATION AND ENHANCEMENT ACTIVITIES

The site has been and will continue to be managed in a manner that preserves, restores and enhances the natural resource values. The restoration and enhancement of the disturbed scrub community within the natural area has begun. Activities conducted to date include the

implementation of a mechanical vegetation reduction program on an as-needed basis (see Section 4.3.1), the implementation of an invasive/nonnative plant control program throughout the natural area (see Section 4.3.2), the implementation of a nonnative/nuisance animal control program (see Section 4.3.3) and the exclusion of unauthorized uses (see Section 4.4).

4.3.1 Fire Management/Mechanical Vegetation Reduction Program

The site's only natural community – disturbed scrub – is dependent upon fire for its long-term restoration and maintenance. However, due to the small size of the natural area and the proximity of residential and commercial developments, and heavily-travelled roads, the use of prescribed fire will be very limited at this site. Staff will investigate the use of micro-burns to help restore habitat and increase species diversity. A specific burn plan will be prepared prior to any prescribed burns on the site. Any portions of the disturbed scrub community that cannot be treated with prescribed fire will be mechanically reduced on an as-needed basis.

4.3.2 Invasive/Nonnative Plant Control

Like many fragmented conservation lands in southeastern Florida, the natural area has been invaded by a number of nonnative plant species. To date, 15 species of nonnative plants have been recorded at the natural area – 26.8 percent of the 56 plant species recorded (Appendix A). Many of these species were brought to the site by animals (especially birds), or spread from adjacent residential areas. Some were recorded on the site prior to the implementation of the invasive/nonnative plant control program and may no longer be present. Nonnative plant species are expected to continue to colonize the site from the surrounding residential and commercial areas; periodic invasive/nonnative plant control treatments will be required to prevent these species from adversely affecting the natural area.

A number of the nonnative, and some native, plant species recorded at the natural area exhibit invasive tendencies. In this management plan, the phrase “invasive plant species” includes the plants designated as Category I (invasive) and Category II (potentially invasive) by Florida Exotic Pest Plant Council (FLEPPC 2015), those designated as noxious weeds, or Class I or Class II prohibited aquatic plants by Florida Department of Agriculture and Consumer Services (FDACS 2014 and 2008, respectively), as well as native plant species that are harmful to other native vegetation (such as love vine [*Cassytha filiformis*]) or that are too dense or inappropriate for the targeted vegetation community. Invasive plant species have caused disturbances at the natural area in the past, especially around the perimeter and previously cleared portions of the site. Invasive nonnative plant species pose a serious threat to the natural community and listed species found at the site, and are a major management concern.

Nine (60.0 percent) of the 15 nonnative plant species recorded at the natural area are designated as either Category I or Category II species by FLEPPC (2015). A current copy of FLEPPC's list of invasive exotic plant species, sorted by category, can be found at

<http://www.fleppc.org/list/list.htm>. Two (13.3 percent) of the nonnative plant species have been designated as noxious weeds by FDACS (FDACS 2014) and one (6.7 percent) has been designated as a Class I prohibited aquatic plant species (FDACS 2008). All of these species are identified in Appendix A.

Control of nonnative and invasive native plant species has been given a high priority in the management of the natural area. The County's initial multi-phase invasive/nonnative plant control program was started in August 2002 and was completed in October 2006. Follow-up treatments for invasive/nonnative vegetation have been conducted on an as-needed basis since 2006. The site is now in maintenance condition. A site is considered to be in a maintenance condition when the coverage of invasive plant species does not exceed 1 percent of the canopy or understory layers within any given management year. Annual sweeps of the site will be conducted to maintain control of invasive/nonnative plants. If a native plant species begins to have an adverse effect on other native species within the natural area, or if it is too dense or inappropriate for the targeted vegetation community, it may be targeted for eradication/control until such time as the area in which it is located is considered to be in a maintenance condition.

4.3.3 Nonnative/Nuisance Animal Control

Nonnative and nuisance (feral and certain native species) animals can be a problem within sites like the natural area. Populations of nonnative/nuisance animals will be monitored as part of the systematic and opportunistic wildlife surveys. Targeted surveys for nonnative/nuisance animals also may be undertaken if they are necessary to acquire additional information. Nonnative/nuisance animal control programs will be developed and implemented, as necessary, to control species that adversely affect the natural area. Thus far, two species of invertebrates - red imported fire ant (*Solenopsis invicta*) and scarlet skimmer (*Crocothemis servilia*) - and four species of vertebrates - brown anole (*Anolis sagrei*), domestic/feral cat, European starling (*Sturnus vulgaris*) and rock pigeon (*Columba livia*) - recorded at the natural area are not indigenous to the South Florida mainland. Of these species, only the domestic/feral cat is currently targeted for control at the site. The other nonnative animal species recorded at the natural area do not appear to be having a negative effect on the existing natural community.

FWC has estimated that there are approximately 5.3 million cats in Florida that spend some or all of their time outdoors, potentially preying on wildlife, and that approximately 2.8 million of those may be feral (FWC 2003). Cats are an increasing problem in natural areas in South Florida because of their predation on birds and small animals. There also is the potential for rabies to spread to feral and domestic cats from infected wildlife. A cat was recorded on the site by ERM in 2009, 2010 and 2013, and may have entered the natural area from an adjacent residence. Control of feral and domestic cats will focus on educating the surrounding community, combined with selective live-trapping, if necessary.

Domestic dogs have not yet been reported on the natural area, but may be observed in the future given the site's close proximity to residential areas. Any members of the public observed walking dogs on the site will be informed that pets are not allowed on the site and the owners may be subject to citation under the provisions of the Natural Areas Ordinance. If/when the public use facilities are constructed the natural area rules sign that will be posted at the pedestrian gate/entrance will contain a "no pets" statement.

4.3.4 Restoration and Enhancement Projects

The restoration and enhancement of the natural community within the natural area has begun. Activities conducted to date include the mechanical reduction of vegetation to reduce fuel levels and begin to create a mosaic of successional stages within the site (see Section 4.3.1), the implementation of an invasive/nonnative plant control program throughout the natural area (see Section 4.3.2), and the removal of trash dumped on the site prior to the County's acquisition of the site. Although no large scale planting is anticipated at the site, scattered planting of native species may occur within the natural area. Restoration and enhancement activities conducted on the site have begun to restore the disturbed scrub community on the site in terms of biological composition and ecological function. However, it will take several years for existing plants to mature and for additional native plants to recruit into the restored and enhanced areas. As a result, it will take several years for the natural area to reach full restoration status.

4.4 SECURITY

The Palm Beach County Sheriff's Office (Sheriff's Office) has the primary responsibility for public safety and law enforcement at the Pawpaw Preserve Natural Area. These responsibilities include routine patrols of the boundaries and the prevention of vandalism, trespass, dumping and damage to the property and natural resources. The County also has contracted with the Sheriff's Office to have Wildlands Task Force deputies conduct extra patrols of the natural area when needed. The Wildlands Task Force is a specially-trained and specially-equipped unit that was formed to prevent illegal activities, such as dumping, on natural areas managed by the County and to enforce the provisions of the Natural Areas Ordinance. There is no on-site manager or security guard and no on-site staff residence. The County will attempt to recruit and train one or more local stewards and/or organize a neighborhood watch group for the site. These volunteers will visit the natural area on a regular basis and report any signs of illegal and prohibited activities to the Wildlands Task Force.

The County's Natural Areas Ordinance regulates public use of the natural area. The ordinance provides for passive recreational activities (for example, hiking, nature study and photography), environmental education and scientific research. It prohibits destructive uses such as OHV use, dumping, and poaching of plants and animals. The ordinance gives law enforcement personnel the authority to fine and/or arrest persons damaging a natural area. Dumping on public lands also is prohibited by state law (state statute 403.413).

The natural area is open to the public daily from sunrise to sunset. Access hours will be posted at the pedestrian gate/entrance if/when it is constructed. Regulatory signs have been posted at each corner of the natural area and every 500 feet along the perimeter of the natural area. The regulatory signs state that the Pawpaw Preserve Natural Area is a protected natural area and cite the appropriate county ordinance.

The entire perimeter of the site is fenced to help prevent unauthorized access to the natural area (see Section 5.2). There is a single management access gate in the northwest corner of the site. Only county staff and authorized contractors, and Wildlands Task Force deputies will have keys for this gate.

4.5 STAFFING

Because of the following factors, on-site staffing is not proposed for this natural area:

- the low-impact, non-consumptive activities allowed on the site require limited oversight by staff;
- the site is closed from sunset to sunrise;
- sufficient security measures (fencing, regulatory signage, Wildlands Task Force) are in place to protect the site when it is closed to the public;
- ERM staffing levels are insufficient to provide on-site staffing at any of the County's natural areas; and
- the construction and use of a permanent office or residence for on-site staff would adversely affect the imperiled natural community, and the rare and endangered plant and animal species that exist on the site.

Instead, ERM has created a roving management team that is responsible for management at this site and other county-managed natural areas. The members of the management team have been trained to conduct all levels of management activities, including invasive/nonnative vegetation control, prescribed burning, mechanical vegetation reduction activities and monitoring. Volunteers from local citizens' organizations, businesses and schools will provide additional support where feasible and necessary. Currently, there are no local volunteer(s) that have been trained as site stewards. Once one or more site stewards have been recruited, they will periodically visit the site and provide reports on its condition, and any problems noted, to ERM's volunteer coordinator and site manager.

4.6 COORDINATION WITH ADJACENT LAND MANAGERS

Other than a 0.08-acre preserve on the Southern Self Storage property just east of the site, there are no conservation lands located adjacent to or in the immediate vicinity of the natural area. The County will review any proposed land use changes or development plans for properties

adjacent to the natural area to ensure the protection of biological communities and to avoid or minimize adverse impacts on listed species.

4.7 GREENWAY CONNECTIONS/MANAGEMENT

The Pawpaw Preserve Natural Area is 1 of 35 conservation lands and parks that lie within the Northeast Everglades Natural Area (NENA). NENA includes approximately 165,000 acres of conservation lands in northern Palm Beach County and southern Martin County; it is a cooperative effort among partnering land managers and educational centers to link conservation lands, parks and activity/education centers through a system of designated and thematic elements. More information about NENA may be found on ERM's website at <http://www.co.palm-beach.fl.us/erm/nena/>.

Management of the natural area helps implement the NENA master plan by potentially providing a hiking trail and by preserving habitat for wildlife. The County will coordinate the development and management of the natural area with agencies managing other conservation lands within NENA to ensure that the natural area is managed as part of a linked conservation lands system that provides opportunities for nonconsumptive recreational uses that do not harm the natural resources of these lands.

The site also is in the vicinity of the East Coast Greenway (ECG). The ECG is an off-road route for bicyclists and pedestrians that is planned to run 3,000 miles between the Canadian border at Calais, Maine and Key West, Florida. Although a portion of the ECG runs along U.S. Highway 1, less than 500 feet east of the Pawpaw Preserve Natural Area, there is no direct route from the ECG to the natural area. The nearest east-west roads that connect U.S. Highway 1 to Ellison Wilson Road are approximately 500 and 660 feet south and north of the natural area, respectively.

4.8 PUBLIC OUTREACH, ENVIRONMENTAL EDUCATION AND SCIENTIFIC RESEARCH

ERM has a very active public outreach and environmental education program. To help members of the public become invested in the natural area, volunteer work days/environmental educational events will be held onsite periodically. Volunteer activities range from trash pickups, to removal of nonnative and invasive plant species, to trail maintenance, to assisting with environmental restoration projects. A short, site-specific educational presentation is conducted at the beginning of each volunteer work day to give the volunteers a deeper appreciation for the site they are working on. In addition, ERM staff is available to assist the faculty of local schools in developing educational programs for school use of the natural area. If a volunteer site steward is identified in the future, they will receive training from ERM staff prior to assuming their duties.

If/when public use facilities are constructed on the site interpretative exhibits will be prepared and installed in a kiosk located within the western portion of the site near Ellison Wilson Road. The kiosk exhibits will provide general information about the natural area, the natural community and wildlife found on the site, the protection of listed species and their habitats, ongoing management activities such as mechanical vegetation reduction activities, as well as other interesting information about the site. ERM staff will design a trail map for the site; the trail map will be posted at the kiosk. An electronic copy of the trail map will be available via a link at the bottom of the Pawpaw Preserve Natural Area webpage: <http://www.co.palm-beach.fl.us/erm/natural/natural-areas/pawpaw/>. The kiosk exhibits and trail map will be updated as appropriate and the exhibits will be periodically changed to provide returning visitors with a more comprehensive view of the natural area.

The natural areas portion of ERM's website includes links to trail guides, photo albums for most natural areas, current management plans, Naturescope programs (if available for that specific natural area), information on how to obtain a free map application for mobile devices, and maps of the County's natural areas. Each natural area map shows the trail system and main public use facilities that are available at that site. The link to the Pawpaw Preserve Natural Area management plan will be updated after the plan has been approved by the BCC. Information on the Pawpaw Preserve Natural Area can be accessed at: www.pbcgov.com/erm/natural/natural-areas/pawpaw/. The natural areas mobile map can be accessed at: www.pbcgov.com/erm/mobile-maps.

No specific research needs have been identified for this site. ERM does not anticipate performing any scientific research other than compiling and interpreting the data from monitoring activities, but will allow researchers affiliated with local institutes of higher learning, botanical gardens and government agencies to conduct scientific research on a permit basis.

4.9 RESPONSE TO SIGNIFICANT EVENTS

In the unlikely event that any unforeseen occurrence, either natural or human-caused, severely alters the natural values of the Pawpaw Preserve Natural Area, ERM staff will assess the nature of the alteration and will take remedial action to secure and/or stabilize the site if necessary. Natural events such as fires, floods and hurricanes may shift the ecology of the site from its present condition and cause damage to human-made structures (such as the proposed kiosk, trail, signs and fencing), but in no way would severely limit or eliminate the natural values of the site. The first priority following a natural or human-caused event will be to secure the site with fencing to prevent dumping, vandalism and unauthorized vehicular use. The natural area may be closed to public use until the site is stabilized and repairs are made to the structures. The native community at this site will be managed to naturally regenerate following such an event. If the natural values of the site are severely limited or eliminated, the County will discuss future plans for the site. Management practices will be modified to reflect any new conditions at the site, and the management plan will be updated to reflect these changes. All major events affecting the

natural community at the natural area will be discussed in the next annual report and in the next update of the management plan.

4.10 CLIMATE CHANGE

The preservation, restoration and enhancement of the Pawpaw Preserve Natural Area will help address climate change in two ways. First, the preservation and enhancement/restoration of the native vegetative community on the site will help reduce greenhouse gases by converting carbon dioxide to oxygen. Second, the enhanced/restored native vegetation community will serve as a refuge for wildlife that may be affected by climate change-induced habitat losses.

5. SITE DEVELOPMENT AND IMPROVEMENT

5.1 PUBLIC USE FACILITIES AND ACCESS

The natural area is a publicly-owned preserve. It is open to the public during daylight hours, unless a special, after-hours use permit has been issued. Resource-based, outdoor recreational opportunities such as nature appreciation and study, hiking, nature photography and bird watching are permitted on the site.

Because of the site's small size; the presence of federally-listed fourpetal pawpaw; and the lack of a secured, long-term management funding source, public use facilities will not be constructed on the natural area at this time. If/when public use facilities are constructed on this site they will most likely include a short, natural-surfaced hiking trail, a pedestrian gate/entrance along the east side of Ellison Wilson Road and a small kiosk. A bicycle rack/post may be installed near the pedestrian gate/entrance to encourage visitors to ride bicycles to the natural area. Due to the site's small size and presence of listed species, no on-site parking facilities will be provided. A tentative public use facilities map is provided as Figure 4. The County will be responsible for maintaining all fencing, gates and signage installed on the natural area, as well as any public use facilities that may eventually be constructed on the site.

If/when public use facilities are constructed on the site, they will be located in disturbed portions of the site to the greatest extent feasible. The location of each public use facility will be surveyed for listed species prior to the construction of that facility. If any listed species are found within the construction area, the location of the facility will be adjusted to avoid impacts to the listed species, or the listed species will be relocated to a safe location on the natural area.

5.2 FENCING AND GATES

The entire perimeter of the site has been fenced to help control/eliminate unauthorized OHV traffic, the poaching of native plants and wildlife from the site, and the dumping of trash and yard waste into the site. Two types of fencing have been installed at the natural area – chain-link and split-rail. Two-rail, split-rail fencing was installed along the western edge of the site where it borders Ellison Wilson Road. A 6-foot-tall, black-vinyl-coated chain-link fence was installed around the remaining perimeter of the site.

The only gate present on the natural area at this time is a single 12-foot-wide management access gate. This gate was installed in the northwest corner of the property along Ellison Wilson Road to provide vehicular access to the site for management and monitoring purposes. A single pedestrian gate/entrance will be installed in the fence line adjacent to Ellison Wilson Road if/when the proposed public use facilities are constructed.

5.3 SIGNS

A sign identifying the site as a natural area will be installed east of the Ellison Wilson Road right of way to inform the public of the existence of the natural area. Regulatory signs have been posted at each corner of the natural area and every 500 feet along the southern and northern edges of the natural area. These signs state that the Pawpaw Preserve Natural Area is a protected natural area and cite the appropriate county ordinance. Additional signs may be added as appropriate in the future.

5.4 OTHER STRUCTURES AND IMPROVEMENTS

No structures or improvements are planned for the site other than those described in Sections 5.1 through 5.3.

6. COST ESTIMATES AND FUNDING SOURCES

The County has sole responsibility for security, development, restoration, management and maintenance of the natural area. All of these activities will be accomplished by existing county personnel, with assistance from county contractors, site stewards and community volunteers.

6.1 ESTIMATED INITIAL CAPITAL COSTS

Initial capital projects, including initial security, site development, restoration and wildfire mitigation activities, are expected to total \$131,172 (Table 3). Work has already begun on some of the aforementioned projects/activities - installation of fencing and gates, installation of regulatory signs, initial invasive/nonnative vegetation removal/control activities, trash removal, and an initial mechanical fuel reduction treatment. Additional capital projects proposed for the site include the construction of a short, natural-surface hiking trail, kiosk, bicycle rack/post and installation of additional signage (see Sections 5.1 and 5.3). All of the proposed capital projects/activities are subject to, and contingent upon, annual budgetary funding and appropriations by the BCC.

6.2 ESTIMATED ANNUAL MANAGEMENT AND MAINTENANCE COSTS

If/when the public use facilities are constructed on the site, management and maintenance costs are expected to average \$35,714 per year (Table 4). Prior to that time, management and maintenance costs are expected to average \$25,707 per year. Management and maintenance costs have been and will continue to be minimized through the cooperation of local citizens' and nonprofit organizations, businesses, schools and individual volunteers, and by coordinating the management of natural areas on a countywide basis. However, the management and maintenance of this natural area will require more than volunteer assistance. Some activities, such as mechanical fuel reduction, herbicide application, operation of chain saws and other hazardous or technical operations, are not suited to volunteers. Most of the staffing for ongoing habitat management and facility maintenance, including all hazardous and technical work, will be accomplished by existing county personnel with assistance from county contractors. Maintenance of the public use facilities, ongoing invasive/nonnative vegetation control/removal activities and other planned management activities on the natural area are subject to, and contingent upon, annual budgetary funding and appropriations by the BCC.

6.3 FUNDING SOURCES

Most of the funds used to secure, develop, restore, manage and maintain the natural area have and will continue to come from County funding sources. A portion of the long-term management costs have and will be funded by a \$20,000 donation that was received in 1999 from North Palm Storage Partners Ltd, the company that donated the natural area to the County for that purpose. The balance of the funding has and will come from the Palm Beach County

Natural Areas Fund, Palm Beach County Natural Areas Stewardship Endowment Fund, Ag Reserve Land Management Fund and/or Palm Beach County General Fund, as may be amended.

The County has established a Natural Areas Stewardship Endowment Fund which includes funds received from restricted gifts and other sources. These funds are invested and the interest earned is used to provide operating funds for management of county-owned and county-leased natural areas. The County also has established a Natural Areas Fund to help pay for the development, restoration/enhancement and management of county natural areas. Funding sources for the Natural Areas Fund includes cash payments made in lieu of upland preserve or tree preservation requirements pursuant to Article 14, Chapter C (Vegetation Preservation and Protection Ordinance) of the Palm Beach County Unified Land Development Code (ULDC), as well as monies received from the sale of development rights on lands purchased by the County as natural areas, leases of county-owned land in the Agricultural Reserve, and the use of county natural areas as offsite mitigation areas. And finally, the Pollution Control Recovery Trust Fund, which receives fees related to civil violations under Article 14 of the ULDC, may be used to help pay for environmental enhancement projects on county natural areas. Even with these possible funding sources, the County recognizes the need for additional management funds. ERM will investigate all possible local, state, or federal sources of land management funds. Any fee received by ERM from any public or private entity for projects to offset adverse impacts to imperiled species or their habitats will be deposited into the Natural Areas Fund and used to restore, manage, enhance, repopulate or acquire imperiled species habitat and to implement land management plans for sites with such habitats.

7. MONITORING AND REPORTING

If/when public use facilities are constructed on this site they will be carefully chosen and designed so as to not have a significant impact on any of the rare and endangered plants, animals and natural communities found on the natural area. No specific carrying capacity has been determined for this natural area. This site is managed specifically to promote natural resource values. The lack of an onsite parking lot and current lack of a public access point are the limiting factors in controlling public usage; if/when public use facilities are constructed on the site, all public access will be through a single pedestrian entrance. No OHVs, bicycles, domestic animals or pets will be allowed past the pedestrian entrance if/when it is constructed so impacts from these sources will be minimal. With the exception of the use of vehicles for management purposes, all human traffic within the natural area will be by foot. ERM staff assigned as site managers will continually monitor and assess anthropogenic impacts to the natural area that result from “other” uses (for example, trail jogging, picnicking, geocaching, etc.) to ensure those activities are not negatively impacting the natural area. The effects of human impacts on the site will be determined through implementation of the monitoring program described in the following sections.

Photomonitoring, vegetation, wildlife and climate change monitoring activities were initiated for the natural area in 2005; opportunistic wildlife and plant surveys have been conducted since 2004 and 2005, respectively. Hydrological monitoring activities will not be performed at this site due to its small size and lack of wetlands in a dry scrub environment. The purpose of these monitoring activities and the data generated from these activities is to determine whether the stated management and restoration objectives for natural vegetation communities and listed species are being achieved, and/or to identify any new species not previously identified on the site. Results of the monitoring program described in the following sections have been and will continue to be used to evaluate the success of mechanical vegetation reduction activities, invasive/nonnative plant treatments, and other restoration and management efforts at the natural area. The management practices will be adjusted (a process known as “adaptive management”) if an analysis of the monitoring data indicates that management objectives are not being met. If an analysis of monitoring data indicates that public uses are having a negative impact on vegetation and/or wildlife populations, a carrying capacity or additional use restrictions may need to be established for the site. Monitoring data also will be used to prepare Annual Site Evaluation reports (ASEs) (see Section 7.5).

A series of monitoring protocols has been developed to ensure consistency on all natural areas managed by ERM. Copies of these protocols are available upon request. The types of monitoring activities conducted on the natural area are summarized in the following sections. The monitoring requirements and procedures contained in this chapter are based on the monitoring protocols in existence as of March 2016. If any of the monitoring protocols are amended or revised prior to the initial update of this management plan, the monitoring requirements contained in this chapter will automatically be revised so that they are in

compliance with the newly approved monitoring protocols. All data collected as a result of required monitoring activities is entered in the Natural Resources Stewardship (NRS) portion of ERM's Environmental Enterprise Database (EEDB).

The location of each monitoring station was recorded with a global positioning system (GPS) receiver. The location of each station also has been clearly described on a monitoring form, along with any additional reference points (such as trees, structures or other unique features) used to help staff locate the station in the field.

7.1 PHOTOMONITORING

The primary objective of photomonitoring is to obtain a qualitative, long-term visual record of changes in vegetative composition and/or condition over time, including the effects of planned management and restoration activities. Photomonitoring also may be used on a short-term basis to document relatively rapid changes in vegetation coverage which are related to specific restoration or management activities, such as the mechanical removal of invasive/nonnative vegetation, ditch filling/plugging, recontouring of areas which have been mined or filled, and prescribed fire; or to document changes related to natural events, such as wildfires and tropical storms/hurricanes.

Photomonitoring began at the natural area in 2005. Two permanent photomonitoring stations have been established in areas where planned management or restoration activities have occurred, or are anticipated to occur, and in areas in which natural vegetation succession of management interest is expected to occur.

7.2 VEGETATION MONITORING

Any plant species that has been listed for protection or special management by at least one governmental agency and/or is ranked as a S1-S3 species by FNAI, and that has been observed on the site during a given calendar year, will be recorded in ERM's EEDB. In addition, population information is collected for certain listed plant species in accordance with established monitoring protocols. Additional surveys may be conducted if it is determined that they are necessary to document the effect(s) of changing site conditions, or a significant natural event or land management activity on one or more listed plant species. If the population of a species is too large to practically count all individuals, a representative portion of the population is surveyed. A species-specific monitoring plan may be developed for endangered listed plant species when more intense monitoring is needed due to regulatory requirements, management information needs, or because the species is highly endangered or suspected to be declining. Species-specific monitoring of one plant species, four-petal pawpaw, has been conducted at the natural area since 2005.

County staff also records any plant species encountered opportunistically (during a normal site visit) on a natural area that has not previously been recorded for the site. The sighting and any specific information obtained during the opportunistic sighting (for example, the number of individual plants observed, location, whether or not the plant is blooming or fruiting, etc.) are recorded in the EEDB.

7.3 WILDLIFE MONITORING

Migratory bird surveys and nonmigratory wildlife surveys have been performed within the natural area since 2006 and 2008, respectively, using a point count station. Migratory bird surveys are conducted when migratory bird species are expected to be present - September through October and February through May. Nonmigratory wildlife surveys are conducted from June through August. All surveys have been conducted in a manner that is largely repeatable in order to obtain information that can be compared from year to year. Data collected during these surveys will be used to determine what effect, if any, public recreational uses, and management and restoration activities have on resident and migratory wildlife populations at the natural area.

Any animal species observed at the site that has been listed for protection or special management by at least one governmental agency or that has been ranked as a S1-S3 species by FNAI, and that has been observed on the site during a given calendar year, will be recorded in ERM's EEDB. A species-specific monitoring plan may be developed for any listed animal species that is recorded as breeding on the site, if deemed necessary/feasible by the site manager and his/her supervisor.

County staff also records any animal species that is encountered opportunistically (during a regular site visit) and that has not previously been recorded for the site. The sighting and any specific information obtained during the opportunistic sighting (for example, the number of individuals observed, whether they were adult/juvenile, male/female, breeding, feeding, etc.) are recorded in the EEDB.

7.4 CLIMATE CHANGE MONITORING

All of the monitoring information gathered on the site will be evaluated for changes that may be the result of climate change. If significant changes in rainfall patterns and/or vegetation communities are noted over time, staff will attempt to mitigate for these changes if possible. If the changes cannot be mitigated for, county staff will modify its management practices to provide the highest quality vegetation communities practicable under the new climate conditions.

7.5 ANNUAL REPORT

ERM staff will prepare an ASE report each year. Each ASE will include information related to any structural improvements, natural events, management activities and restoration activities that

occurred during the prior year, as well as the degree of success of any management and restoration activities relative to the stated management goals for the site. The ASE will include a description of any changes to the monitoring plan that occurred during the prior year, as well as recommendations for future management actions for the natural area. A general review of management efforts related to natural vegetation communities and the status of listed species also will be completed at the end of each management year and included in the ASE.

The ASE will be the vehicle through which detailed information on the management of the natural area will be shared with other ERM staff, including any new or current employee who may be assigned as the site manager in the future. ASEs will provide information that will be used in conjunction with data stored in the NRS portion of ERM's EEDB to allow staff biologists, ecologists and engineers to analyze and evaluate the success of staff management activities on the natural area over a period of years. ASEs will provide the basis for trend analysis of site data that will be performed at least every five years by staff.

8. ACRONYMS

ADA - Americans with Disabilities Act
AIWW – Atlantic Intracoastal Waterway
ARC - Acquisition and Restoration Council
ASE – Annual Site Evaluation
ATV – all-terrain vehicle
BCC – Palm Beach County Board of County Commissioners
BIPM – Bureau of Invasive Plant Management
BLM – U.S. Department of the Interior, Bureau of Land Management
CARL - Conservation and Recreation Lands
CFC - Communities Finance Company
CLASC - Palm Beach County Conservation Land Acquisition Selection Committee
DSL - Division of State Lands
ERM - Palm Beach County Department of Environmental Resources Management
ERP – environmental resource permit
ESLAAC – Palm Beach County Environmentally Sensitive Lands Acquisition Advisory Committee
ESLASC – Palm Beach County Environmentally Sensitive Lands Acquisition Selection Committee
FAU – Florida Atlantic University
FCT – Florida Communities Trust
FDACS - Florida Department of Agriculture and Consumer Services
FDCA – Florida Department of Community Affairs
FDEP - Florida Department of Environmental Protection
FDHR - Florida Department of State, Division of Historical Resources
FDOT – Florida Department of Transportation
FEC – Florida East Coast Railway
FFS - Florida Forest Service
FGFWFC – Florida Game and Fresh Water Fish Commission
FIND - Florida Inland Navigation District
FLEPPC - Florida Exotic Pest Plant Council
FNAI - Florida Natural Areas Inventory
FPL- Florida Power & Light Company
FTA – Florida Trail Association
FWC - Florida Fish and Wildlife Conservation Commission
GFBWT – Great Florida Birding and Wildlife Trail
GPS - global positioning system
IC – incident commander
IRC – Institute for Regional Conservation
ITID - Indian Trail Improvement District
ITWCD – Indian Trail Water Control District
JID - Jupiter Inlet District

LAAC – Land Acquisition Advisory Council
LAMAC – Land Acquisition and Management Advisory Council
LOST – Lake Okeechobee Scenic Trail
LRD – Loxahatchee River District
LRPI – Loxahatchee River Preservation Initiative
LWDD – Lake Worth Drainage District
MPO – Palm Beach Metropolitan Planning Organization
NAMAC - Palm Beach County Natural Areas Management Advisory Committee
NAVD – North American Vertical Datum
NCGAA – North County General Aviation Airport
NENA – Northeast Everglades Natural Area
NGVD - National Geodetic Vertical Datum
NPBCID – Northern Palm Beach County Improvement District
NPBCWCD – Northern Palm Beach County Water Control District
NRCS –Natural Resources Conservation Service
OGT –Office of Greenways and Trails
OHV – off-highway vehicle
OTL – Ocean to Lake Trail
PBSO - Palm Beach County Sheriff’s Office
PBSWCD – Palm Beach Soil & Water Conservation District
SCS – Soil Conservation Service
SFWMD - South Florida Water Management District
SIRWCD – South Indian River Water Control District
SWA – Solid Waste Authority of Palm Beach County
TIITF – Trustees of the Internal Improvement Trust Fund
ULDC – Unified Land Development Code
USACE – United States Army Corps of Engineers
USCGS – United States Coast and Geodetic Survey
USDA – United States Department of Agriculture
USFWS - United States Department of Commerce, Fish and Wildlife Service
USGS – United States Geological Survey
WCA – Water Catchment Area
WCI – Watermark Communities, Inc.
WEA – wildlife and environmental area
WHIP – Wildlife Habitat Incentives Program
WMA – wildlife management area

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10. FIGURES

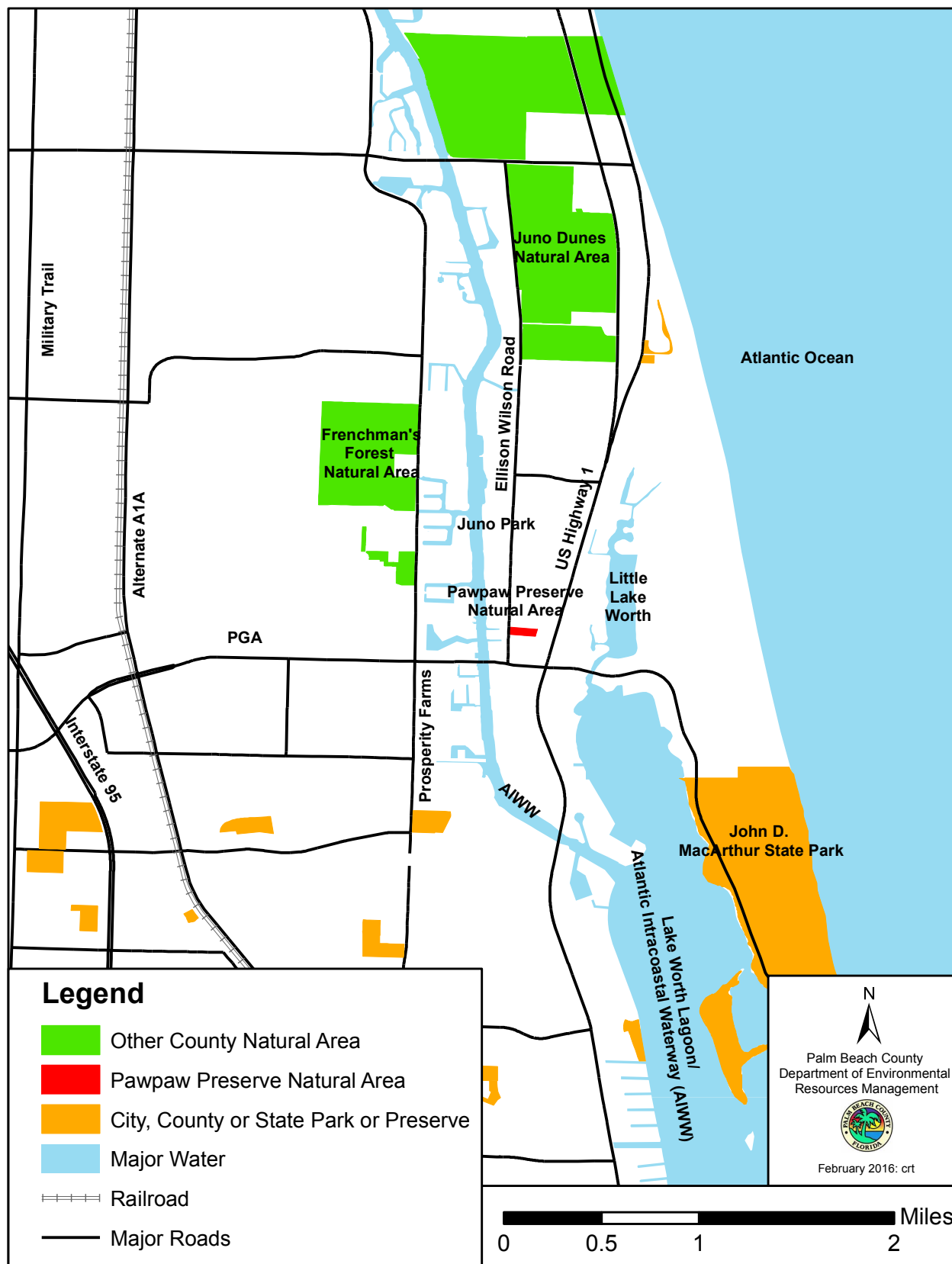


Figure 1. Pawpaw Preserve Natural Area Location Map

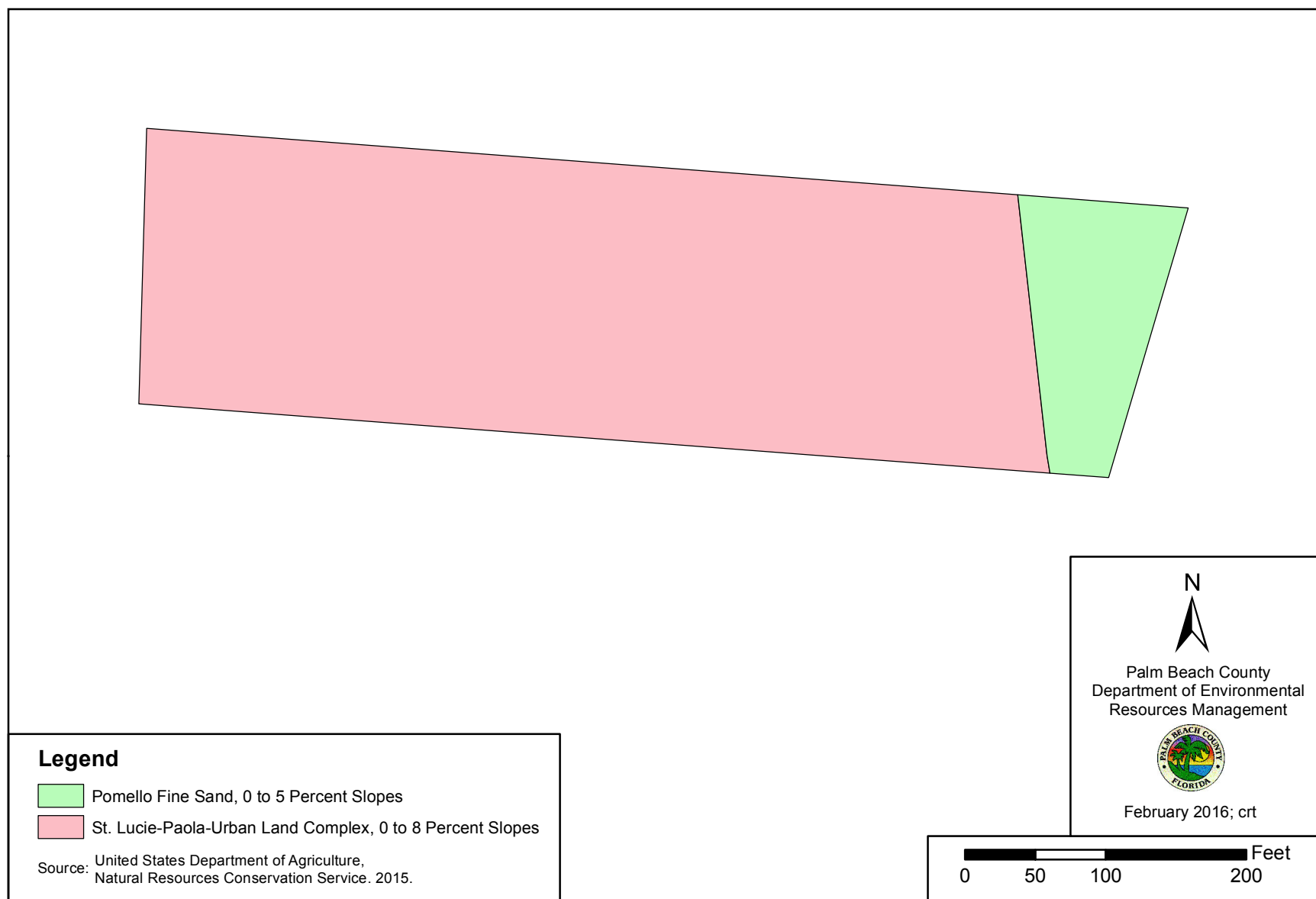


Figure 2. Pawpaw Preserve Natural Area Soils Map

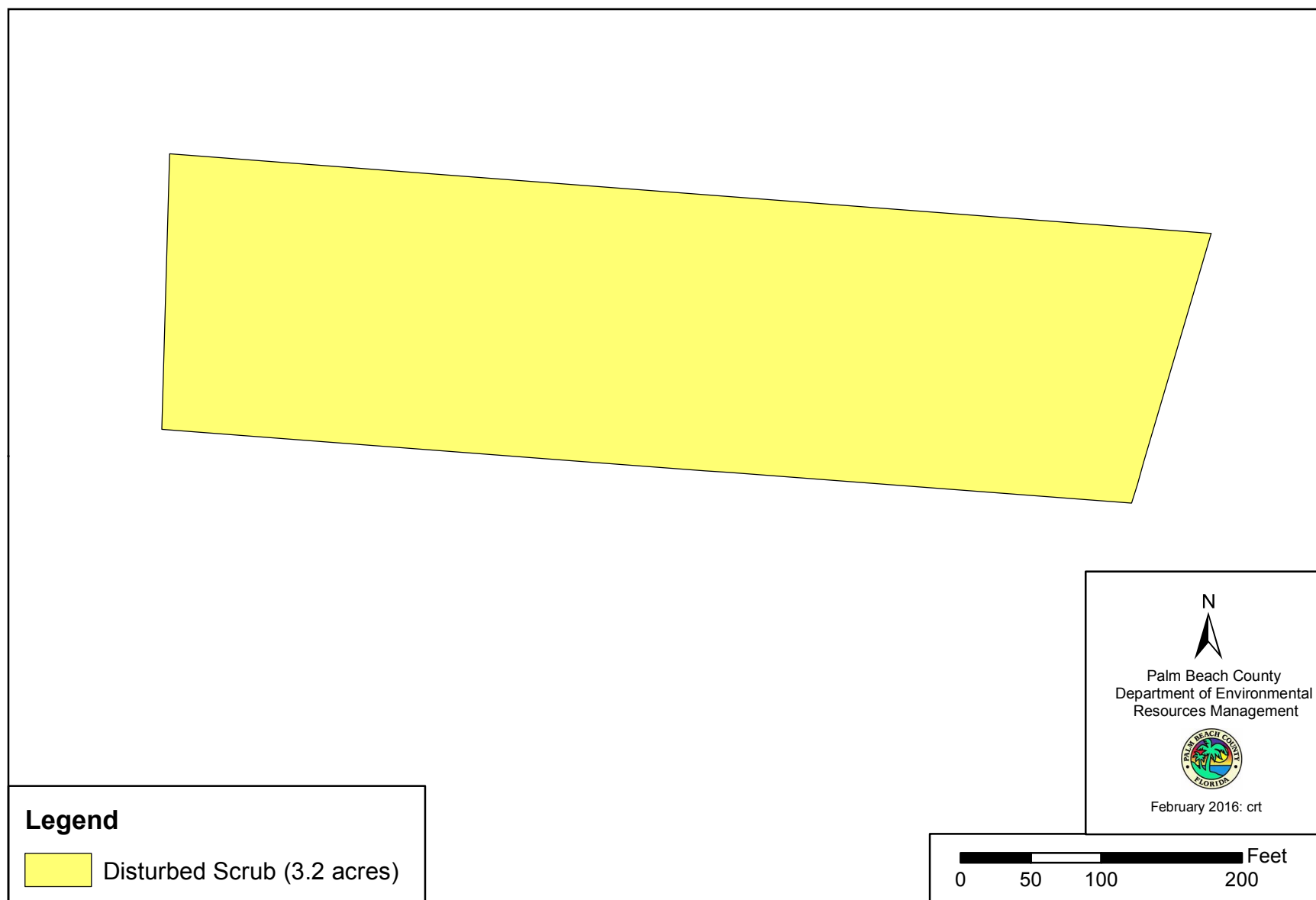


Figure 3. Pawpaw Preserve Natural Area Vegetation Communities Map



Figure 4. Pawpaw Preserve Natural Area Public Use Facilities Map

11. TABLES

Table 1. Listed Plant Species Recorded at the Pawpaw Preserve Natural Area

SCIENTIFIC NAME	COMMON NAME	STATUS/RANK DESIGNATIONS		
		USFWS	FDACS	FNAI
<i>Asimina tetramera</i>	Fourpetal pawpaw	E	E	G1/S1
<i>Opuntia stricta</i>	Shell mound prickly-pear	N	T	N
<i>Swietenia mahagoni</i>	West Indian mahogany	N	T	G3G4/S3

CE = Commercially exploited

E = Endangered

FDACS = Florida Department of Agriculture and Consumer Services

FNAI = Florida Natural Areas Inventory

N = Not listed

T = Threatened

USFWS = United States Fish and Wildlife Service

Occurrences determined from field surveys collected by ERM (1988-2016). Listings by FDACS are from Chapter 5B-40 of the Rules of the Department of Agriculture and Consumer Service, Division of Plant Industry (FDACS 2015); listings by FNAI are from FNAI (2016); listings by USFWS are from USFWS (undated). Listing categories are defined in Appendix C.

Table 2. Listed Animal Species Recorded at Pawpaw Preserve Natural Area

SCIENTIFIC NAME	COMMON NAME	STATUS/RANK DESIGNATIONS		
		USFWS	FWC	FNAI
<i>Aphelocoma coerulescens</i>	Florida scrub-jay	T	FT	G2/S2
<i>Gopherus polyphemus</i>	Gopher tortoise	C	ST	G3/S3
<i>Latrodectus bishop</i>	Red widow spider	N	N	G2G3/S2S3

C = Candidate
 E = Endangered
 FE = Federally-designated Endangered
 FT = Federally-designated Threatened
 FT(S/A) = Federally-designated Threatened due to Similarity of Appearance
 FWC = Florida Fish and Wildlife Conservation Commission
 FNAI = Florida Natural Areas Inventory
 N = Not listed
 SSC = State Species of Special Concern
 ST = State-designated Threatened
 T = Threatened
 T(S/A) = Threatened due to Similarity of Appearance
 USFWS = United States Fish and Wildlife Service

Occurrences determined from data collected by ERM (1988-2016). Ranks assigned by FNAI are from a January 2016 tracking list (FNAI 2016); designations assigned by FWC are from FWC (2016); and designations assigned by USFWS are from USFWS (undated). Definitions for the ranks and designations used by these entities are provided in Appendix C.

Table 3. Cost Estimates and Funding Sources for Public Use Facilities and Capital Restoration Activities (in 2016 dollars)

ITEM	ACTUAL ¹ AND ESTIMATED ² COSTS	FUNDING SOURCE(S)
Invasive/nonnative vegetation removal (2002-2015)	\$78,689 ¹	Natural Areas Fund and Ag Reserve Land Management Fund
Signage – 6 regulatory perimeter signs; 1 Natural Area sign; 3 misc. signs	\$387 ^{1, 2}	Natural Areas Fund
Fencing – 2-hole post-and-rail fencing (196 ft.); and 6-foot-tall black vinyl chain link fence (1,619 ft.)	\$46,812 ¹	Prior Property Owner and Natural Areas Fund
12-foot-wide management gate (1)	\$477 ¹	Natural Areas Fund
Construction of natural-surfaced hiking trail (approx. 750 ft) with 10 trail markers	\$2,950 ²	Natural Areas Fund
Mechanical vegetation reduction - 3.2 acres	\$1,200 ¹	Natural Areas Fund
Bike rack/post (1)	\$457 ²	Natural Areas Fund
Educational mini kiosk with display (1)	\$173 ²	Natural Areas Fund
Solid waste disposal fees	\$27 ¹	Natural Areas Fund
TOTAL PROJECTED COSTS (IN 2016 DOLLARS)	\$131,172	

Table 4. Estimated Annual Maintenance and Operation Costs (in 2016 dollars)

Site Management and Maintenance

Mechanical fuel reduction (personnel and equipment – \$1,300/reduction, 2 reductions in 10-year period) = \$260/year	\$260*
Fence line maintenance (\$739/treatment x 2 treatments/year)	\$1,478*
Maintenance of public use facilities, including trail markers and trimming of hiking trail vegetation (\$93/week x 52 weeks/year)	\$4,836*
Site management – monitoring program, annual reports, management plan updates, listed species protection, volunteer coordination and supervision, educational materials and intergovernmental coordination	\$12,910*
Nonnative/invasive plant control (\$3,000/ treatment x 4 treatments/year)	\$12,000**
Repair/replacement due to damage/vandalism (0.005 times the structural facilities cost of \$49,306)	\$247**
<i>Subtotal – present annual cost</i>	\$31,731

Capital Facilities Maintenance and Replacement

Removal and replacement of facilities with 10-year expected life (trail markers, signs, post-and-rail fencing)	\$2,867
<i>Estimated annual cost for facilities with 10-year life expectancy @ 4% interest rate (multiply by 0.1233)</i>	\$354 **
Removal and replacement of facilities with 10-year expected life (listed previously), plus those facilities with 20-year expected life (bicycle rack/post, metal gate, chain-link fencing, kiosk)	\$49,306
<i>Estimated annual cost for facilities with 20-year life expectancy @ 4% interest rate (multiply by 0.0736)</i>	\$3,629 **
<i>Subtotal – estimated annual capital replacement costs</i>	\$3,983 **

TOTAL ANNUAL COST (in 2016 dollars) \$35,714 **

* To be performed by existing Palm Beach County personnel.

** To be paid for with interest from the Natural Areas Stewardship Endowment Fund.

NOTE: All facilities and activities listed are subject to annual budgetary funding and appropriations by the Palm Beach County Board of County Commissioners

APPENDIX A

**PLANT SPECIES RECORDED AT
THE PAWPAW PRESERVE NATURAL AREA**

APPENDIX A

PLANT SPECIES RECORDED AT PAWPAW PRESERVE NATURAL AREA

Updated February 25, 2016

<u>Scientific Name</u>	<u>Common Name</u>
<i>Abrus precatorius</i> *NX (I)	Rosary pea
<i>Ambrosia artemisiifolia</i>	Common ragweed
<i>Asimina reticulata</i>	Netted pawpaw
<i>Asimina tetramera</i>	Fourpetal pawpaw
<i>Bidens alba</i>	Beggarticks
<i>Callicarpa americana</i>	American beautyberry
<i>Cassytha filiformis</i>	Love vine
<i>Catharanthus roseus</i> *	Madagascar periwinkle
<i>Cenchrus spinifex</i>	Coastal sandbur
<i>Chamaecrista fasciculata</i>	Partridge pea
<i>Cnidoscolus stimulosus</i>	Tread-softly
<i>Croton glandulosus</i>	Vente conmigo
<i>Dactyloctenium aegyptium</i> * (II)	Durban crowfootgrass
<i>Emilia fosbergii</i> *	Florida tassleflower
<i>Eupatorium capillifolium</i>	Dogfennel
<i>Ficus aurea</i>	Strangler fig
<i>Froelichia floridana</i>	Cottonweed
<i>Helianthus debilis</i>	East coast dune sunflower
<i>Heteropogon contortus</i> *	Tanglehead
<i>Heterotheca subaxillaris</i>	Camphorweed
<i>Kalanchoe delagoensis</i> *	Chandelier plant
<i>Kalanchoe pinnata</i> * (II)	Life plant
<i>Kalanchoe</i> sp. *	Widow's thrill
<i>Lepidium virginicum</i>	Virginia pepperweed
<i>Licania michauxii</i>	Gopher apple
<i>Melinis repens</i> * (I)	Rose natalgrass
<i>Momordica charantia</i> * (II)	Balsampear
<i>Opuntia humifusa</i>	Pricklypear
<i>Opuntia</i> sp.	Pricklypear
<i>Opuntia stricta</i>	Shell-mound pricklypear
<i>Palafoxia feayi</i>	Feay's palafox
<i>Passiflora incarnata</i>	Purple passionflower
<i>Pennisetum setaceum</i> * (II)	Fountaingrass
<i>Phytolacca americana</i>	American pokeweed
<i>Pinus clausa</i>	Sand pine
<i>Pityopsis graminifolia</i>	Narrowleaf silkgrass
<i>Poinsettia cyathophora</i>	Paintedleaf
<i>Polanisia tenuifolia</i>	Slenderleaf clammyweed
<i>Polygonella polygama</i>	October flower
<i>Quercus chapmanii</i>	Chapman's oak

<i>Quercus geminata</i>	Sand live oak
<i>Quercus myrtifolia</i>	Myrtle oak
<i>Sabal palmetto</i>	Cabbage palm
<i>Sansevieria hyacinthoides</i> * (II)	Bowstring hemp
<i>Schinus terebinthifolius</i> * NX (PAP I)(I)	Brazilian pepper
<i>Serenoa repens</i>	Saw palmetto
<i>Seymeria pectinata</i>	Piedmont blacksenna
<i>Smilax auriculata</i>	Earleaf greenbrier
<i>Solanum chenopodioides</i>	Black nightshade
<i>Stipulicida setacea</i>	Pineland scalypink
<i>Swietenia mahagoni</i>	West Indian mahogany
<i>Tecoma capensis</i> *	Cape honeysuckle
<i>Tradescantia spathacea</i> * (II)	Oyster-plant
<i>Vaccinium myrsinites</i>	Shiny blueberry
<i>Vitis rotundifolia</i>	Muscadine
<i>Ximenia americana</i>	Hog plum

NOTES:

* = Nonnative species

NX = Species is on the state noxious weed list (Rule 5B-57.007, Florida Administrative Code)

PAP I = Species designated as Class I Prohibited Aquatic Plant by FDACS (2008)

PAP II = Species designated as Class II Prohibited Aquatic Plant by FDACS (2008)

(I) = Exotic species designated as Category I by FLEPPC (FLEPPC 2015)

(II) = Exotic species designated as Category II by FLEPPC (FLEPPC 2015)

Scientific and common names of vascular plant species generally follow ITIS (2016); Nature Serve (2015); and Wunderlin and Hansen (2008). Lichens are from Brodo et al. (2001).

APPENDIX B

ANIMAL SPECIES RECORDED AT THE PAWPAW PRESERVE NATURAL AREA

APPENDIX B

ANIMAL SPECIES RECORDED AT PAWPAW PRESERVE NATURAL AREA

Updated 02/25/2016

SCIENTIFIC NAME

COMMON NAME

Arachnida (Arachnids)

Gasteracantha cancriformis

Spinybacked orbweaver

Latrodectus bishop

Red widow spider

Nephila clavipes

Golden silk orbweaver

Insecta (Insects)

Hemiptera

Tibicen latifasciatus

Coastal scissors grinder

Tibicen sp.

Cicada

Hymenoptera

Bombus pensylvanicus

American bumble bee

*Solenopsis invicta**

Red imported fire ant

Lepidoptera

Agraulis vanillae

Gulf fritillary

Ascia monuste

Great southern white

Heliconius charithonia

Zebra

Phoebis sennae

Cloudless sulphur

Odonata

Celithemis eponina

Halloween pennant

*Crocothemis servilia**

Scarlet skimmer

Erythemis simplicicollis

Eastern pondhawk

Erythrodiplax umbrata

Band-winged dragonlet

Orthoptera

Romalea microptera

Eastern lubber grasshopper

CHORDATA

Reptilia (Reptiles)

Squamata

Anolis carolinensis

Green anole

*Anolis sagrei**

Brown anole

Aspidoscelis sexlineata

Six-lined racerunner

Coluber constrictor
Hemidactylus sp.

North American racer
Gecko

Testudines
Gopherus polyphemus

Gopher tortoise

Aves (Birds)

Accipitriformes
Accipiter cooperii
Cathartes aura
Coragyps atratus

Cooper's hawk
Turkey vulture
Black vulture

Columbiformes
*Columba livia**
Columbina passerina
Zenaida macroura

Rock pigeon
Common ground-dove
Mourning dove

Falconiformes
Falco sparverius

American kestrel

Passeriformes
Aphelocoma coerulescens
Cardinalis cardinalis
Corvus ossifragus
Cyanocitta cristata
Dumetella carolinensis
Geothlypis trichas
Mimus polyglottos
Poliophtila caerulea
Quiscalus major
Quiscalus quiscula
Regulus calendula
Setophaga discolor
Setophaga palmarum
Setophaga striata
*Sturnus vulgaris**
Tyrannus dominicensis
Tyrannus tyrannus

Florida scrub-jay
Northern cardinal
Fish crow
Blue jay
Gray catbird
Common yellowthroat
Northern mockingbird
Blue-gray gnatcatcher
Boat-tailed grackle
Common grackle
Ruby-crowned kinglet
Prairie warbler
Palm warbler
Blackpoll warbler
European starling
Gray kingbird
Eastern kingbird

Piciformes
Melanerpes carolinus

Red-bellied woodpecker

Mammalia (Mammals)

*Felis catus**

Domestic cat

* = Nonnative species

NOTE: Scientific and common names of species generally follow FWC (2013), FNAI (2015), NatureServe (2015), ITIS (2016) or Arnett (2000).

APPENDIX C

DEFINITIONS OF DESIGNATIONS AND RANKS FOR LISTED SPECIES AND NATURAL COMMUNITIES

APPENDIX C

DEFINITIONS OF DESIGNATIONS AND RANKS FOR LISTED SPECIES AND NATURAL COMMUNITIES

United States Fish and Wildlife Service (USFWS) - Wildlife and Plants

Species listed in the Code of Federal Regulations (CFR) and protected under the provisions of the Endangered Species Act of 1973 (16 USC 1531-1543, as amended); animals are listed in 50 CFR 17-11 and plants are listed in 50 CFR 17-12; definitions are from 16 USC 1532, 36 CFR 219.36 and 50 CFR 17.50.

Endangered (E)	Any species which is in danger of extinction through all or a portion of its range other than a species of the Class Insecta determined by the Secretary [of the Interior] to constitute a pest whose protection under the provisions of this chapter would present an overwhelming and overriding risk to man
Threatened (T)	Any species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range
Candidate (C)	Species identified by the United States Fish and Wildlife Service (USFW) or the National Marine Fisheries Service (NFMS), which are considered to be candidates for listing under the Endangered Species Act as published in the <i>Federal Register</i> .

If a species is not endangered or threatened, but it closely resembles an endangered or threatened species, such species may be treated as endangered or threatened if the Director of USFWS makes a determination that the species shall appear in the list in 50 CFR 17.11 (wildlife) or the list in 50 CFR 17.12 (plants) and that the notation (S/A) shall appear in the status column following the letter “E” for endangered or the letter “T” for threatened, due to its similarity of appearance to an endangered or threatened species – for example, E (S/A) or T (S/A).

Florida Fish and Wildlife Conservation Commission (FWC) - Animals

Species listed in Chapter 68A-27 of the Florida Administrative Code (F.A.C.) as Florida Endangered and Threatened Species and protected under that chapter and the Endangered and Threatened Species Act, Section 372.072, Florida Statutes (F.S.); definitions are from Chapter 68A-27.

Federally-designated Endangered and Threatened Species (FE) and (FT)	Species of fish or wild animal life, subspecies or isolated populations of species or subspecies, whether vertebrate or invertebrate, that are native to Florida and are classified as Endangered or Threatened under Commission rule by virtue of designation by the United States Departments of Interior or Commerce as endangered or threatened under the Federal Endangered Species Act, 16 U.S.C. § 1531 et seq. and rules thereto.
State-designated Threatened Species (ST)	As designated by the Commission, species of fish or wild animal life, subspecies, or isolated population of a species or subspecies, whether vertebrate or invertebrate, that are native to Florida and are classified as Threatened as determined by paragraph (a), (b), (c), (d), or (e) [in subsequent part of definition] in accordance with Rule 68A-27.0012., F.A.C. The designation of a species as threatened shall include all subspecies unless stated otherwise in Commission rule.
Species of Special Concern (SSC)	Per Rule 68A-27.005: During the moratorium period created in subsection 68A-27.0012(4), F.A.C.: Management plans will be developed for the species listed in this rule and the species will be evaluated under the listing criteria in subsection 68A-27.001(3), F.A.C. for listing as a State-designated Threatened species. If the Commission determines that the species warrants listing as a State-designated Threatened species, final Commission action on the listing shall include removing reference to the species from this rule. If the species evaluation demonstrates the species does not qualify for listing as a State-designated Threatened species, the Commission will remove the species from this rule upon completion of a management plan. After a biological status review is conducted and a management plan is approved, the Commission will decide whether a species should remain listed when the species is determined to be data deficient pursuant to the Guidelines for Using the IUCN Red List Categories and Criteria.
Candidate Species	A species of fish or wild animal life, subspecies, or isolated populations of species or subspecies, whether invertebrate or vertebrate, that the Commission has determined warrants listing as a State-designated Threatened Species in accordance with Rule 68A-27.0012, F.A.C., and is awaiting final Commission action to be added to the list of Florida Endangered and Threatened Species in Rule 68A-27.003, F.A.C.

Florida Department of Agriculture and Consumer Affairs (FDACS) - Plants

Species listed in Chapter 5B-40 of the Rules of FDACS, Division of Plant Industry and protected under the Preservation of Native Flora of Florida Act (Section 581.185, F.S.); definitions are from that Act

Endangered (E)	Species of plants native to the state that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue, and includes all species determined to be endangered species or threatened species pursuant to the federal Endangered Species Act of 1973, as amended. Pub. L. No. 93-205 (87 Stat. 884).
Threatened (T)	Species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in such number as to cause them to be endangered.
Commercially Exploited (CE)	Species native to the state which are subject to being removed in significant numbers from native habitats in the state and sold or transported for sale.

Florida Natural Areas Inventory (FNAI) - Plants, Animals and Natural Communities

FNAI ranks indicate the global (G) or state (S) status of a species or a natural community. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Rank definitions are from FNAI (2016).

FNAI Global Rank Definitions

- G1 Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- G2 Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- G4 Apparently secure globally (may be rare in parts of range).
- G5 Demonstrably secure globally.

- GH Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
- GX Believed to be extinct throughout range.
- GXC Extirpated from the wild but still known from captivity or cultivation.
- G#? Tentative rank (e.g., G2?).
- G#G# Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
- G#T# Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have the same definition as above (e.g., G3T1).
- G#Q Rank of questionable species – ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
- G#T#Q Same as above, but validity as subspecies or variety is questioned.
- GU Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
- GNA Ranking is not applicable because the element is not a suitable target for conservation (e.g., a hybrid species).
- GNR Element not yet ranked (temporary).
- GNRTNR Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI State Rank Definitions

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

- S5 Demonstrably secure in Florida.
- SH Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
- SX Believed to be extirpated throughout Florida.
- SU Unrankable; due to a lack of information no rank or range can be assigned.
- SNA State ranking is not applicable because the element is not a suitable target for conservation (e.g., a hybrid species).
- SNR Element not yet ranked (temporary).

APPENDIX D

**PUBLIC HEARING NOTICE
AND PUBLIC COMMENT SUMMARY**

NAMAC

PUBLIC HEARING FOR PAWPAW PRESERVE NATURAL AREA

THURSDAY, MAY 26, 2016

MEETING SUMMARY

The meeting was held at the Palm Beach Gardens Branch of the Public Library in their large meeting room.

NAMAC member Russ Ruskay called the meeting to order at 6:30 PM. Mr. Ruskay explained the purpose of the meeting was for NAMAC to gather comments from the public regarding the staff prepared management plan for the Pawpaw Preserve Natural Area.

Mr. Christian Thibaut of ERM, gave his quick PowerPoint presentation on the Pawpaw site, its attributes, vegetation communities, and the management options for the site.

There was one member of the public in attendance, Mr. Kevin True. Mr. True proposed that developing the area into a miniature golf course would be the best use of the property as he feels the county lacks this as a recreational option. Mr. Gillings thanked him for his comments and assured him that his comments would be taken into consideration at the next Committee meeting. This will be an item for discussion at the June 17, 2016 NAMAC meeting.

As there were no further comments from the public, Mr. Ruskay adjourned the public hearing at 6:45 PM.

DKG