

*Land Stewardship Section*

*3301 Gun Club Road*

*West Palm Beach, Florida 33406*



DuPuis  
Management Area  
Ten-Year  
General Management Plan  
2014 through 2024



# DuPuis Management Area Ten-Year General Management Plan (2014 through 2024)

January, 2014

Land Stewardship Section  
South Florida Water Management District  
3301 Gun Club Road  
West Palm Beach, Florida 33406

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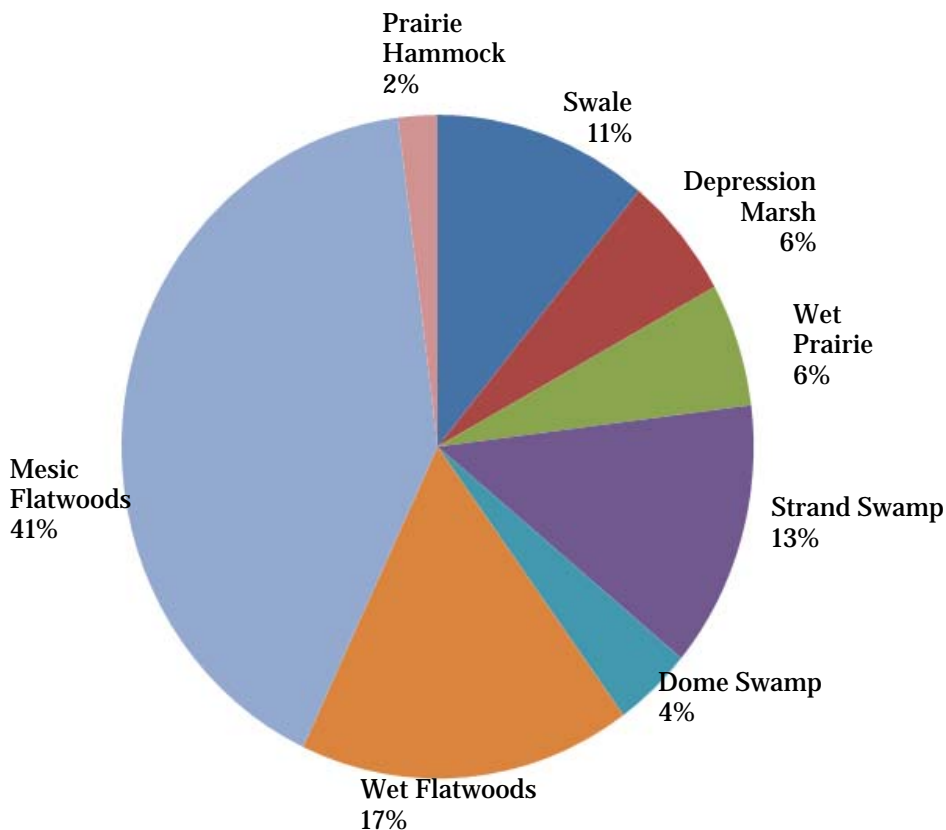
## 1. Executive Summary

The South Florida Water Management District (District) is directed by statute to acquire and manage lands which are vital to the restoration of the Everglades. In the 1980s the District targeted the DuPuis Management Area (Management Area) which contains the northernmost edge of the Everglades marsh as a Save Our Rivers project. This plan addresses management for the 21,858 acres that have been acquired by the District within the project area.

This General Management Plan describes the historical, ecological, and managerial aspects of the area as a means to coordinate effective management programs. The plan serves as a guidance document for the implementation of resource-based land management practices. It also provides information on operational procedures and organizational structures within the District and of management activities and objectives for the management areas.

### NATURAL SETTING

The natural character of the management area are defined by 4 distinct soil categories classified by the Natural Soil Landscape Positions soil classification system: flatwood soils, flats soils, sand depression soils, and muck depression soils. These soils support 8 distinct plant communities that are defined by criteria established by the Florida Natural Areas Inventory; and have the following coverage:



### RESOURCE MANAGEMENT

Resource management programs for the management area consist of:

- Prescribed fire to mimic the natural fire frequency in fire-dependent plant communities.
- Forestry and vegetation management such as shredding or mowing overgrown understories, or thinning pine flatwoods for silvicultural purposes.
- Wildlife management, including surveys, habitat management, and hunting programs.
- Exotic vegetation treatment.
- Monitoring the health of the natural communities and the impact of management practices on them.
- Restoring sites that have previously been altered by drainage and/or agriculture.

### RESTORATION PROJECTS

The District has used water management trust funds and mitigation funds to fund the restoration of wetland systems and upland pine forests. This has involved hydrologic restoration, groundcover restoration, exotic species control, vegetation management, and prescribed burning.

### MONITORING

The Florida Fish and Wildlife Conservation Commission monitors wildlife on the site including red-cockaded woodpeckers, turkeys, bald eagles, wading birds, deer, and bobwhite quail.

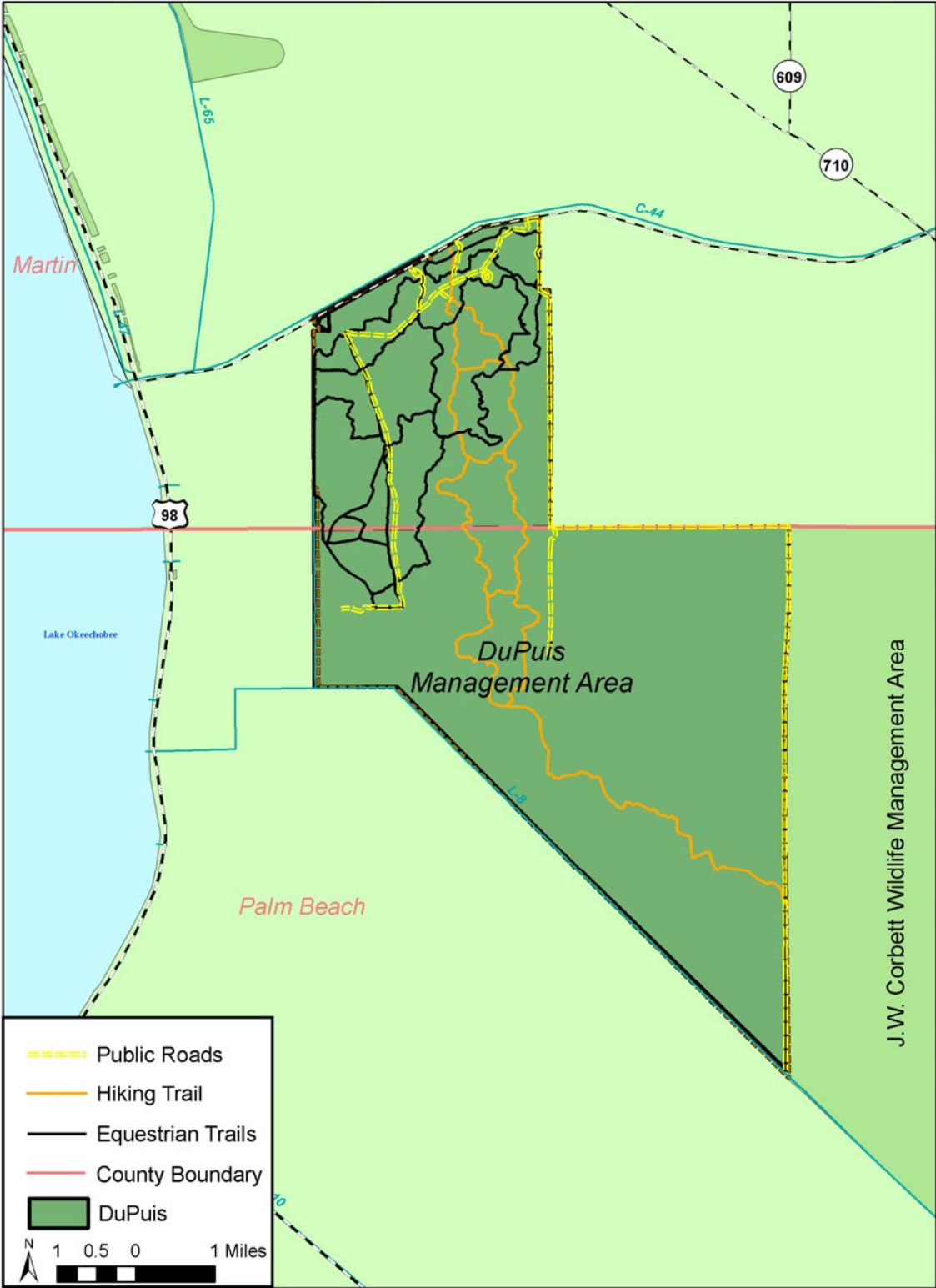
### WILDLIFE MANAGEMENT

Wildlife management, including hunting programs, is conducted by the Florida Fish and Wildlife Conservation Commission through a multi-site cooperative agreement. The hunting program includes a general gun, muzzle loading, and archery season for deer and feral hogs; small game; special hog hunts; dove hunting on an established dove field; and spring turkey hunting.

### PUBLIC USE

A variety recreational activities are provided for and encouraged in the management area including canoeing, bicycling, mountain biking, camping, birding, equestrian use, fishing, hiking, geocaching, and hunting. The Ocean to Lake Trail, which connects to the Florida National Scenic Trail at Lake Okeechobee, winds its way through portions of the management area. The management area also includes equestrian facilities (stables, barn, and campground), a visitor center, a boardwalk, a fishing pier, and several established campsites and picnic areas.

**Map 1. DuPuis Management Area**





## **2. Introduction and Management Plan Purpose**

The District purchased the DuPuis Management Area in 1986 through the Save Our Rivers program. The management area comprises 21,858 acres in northwest Palm Beach and southwest Martin counties. The southwestern boundary contains the L8 Marsh, this area was the historic northeastern edge of the Everglades, and is bounded by a sand ridge with a long narrow oak hammock. The southeastern half of the site is dominated by cypress swamps; the area is part of a historic flow-way that extended north along the east side of the Osceola Plain to St. Lucie County where the waters of the everglades would seasonally connect to waters of the St. Johns River system. The northern portion of the site has many public use facilities. The property hosts a large equestrian campground with several barn-stables and paddocks, a family campground for tent camping, a large group campground, a boardwalk, a mountain biking trail, a fishing pier, picnic shelters, a visitor center and butterfly garden, and many miles of equestrian and hiking trails. The Ocean-to-Lake trail runs through the site; this is a regional trail that extends from Lake Okeechobee to the Atlantic Ocean.

This General Management Plan consolidates relevant information about the DuPuis Management Area (**Maps 1-2**) including land management goals and objectives, past and present land uses, resource data, restoration and management needs, public use programs, and administrative duties to guide management actions for the period 2014 through 2024. Management activities described in this plan are based on requirements and directives of Florida Statutes and established District policies. Section 373.591(4), Florida Statutes, requires that management plans be developed for District conservation, preservation, and recreation lands.

State statutes further directs the District to provide natural resource protection and management while allowing compatible multiple uses on designated public lands. This mission statement and requirements set forth in Florida Statutes provide three primary goals for the Land Stewardship Section:

- Conserve and protect water resources
- Protect and/or restore land to its natural state and condition
- Provide appropriate public use

To accomplish these goals, the Land Stewardship Section performs six major functions:

- Strategic, project, and management planning
- Operation and maintenance of land resources
- Development of public use programs
- Development of restoration projects
- Evaluation of management activities

- Administration of land management service contracts

The plan consolidates current site information and general guidelines for management of the area. It also updates and replaces the 2008-2013 General Management Plan for the area. As such, it serves as a collective information source for management staff, partners, and the general public.

## **2.1 DuPuis Management Area Goals and Objectives**

The Land Stewardship Section's primary functions and management priorities for 2014-2024 are contained in the following Goals and Objectives:

**Goal 1:** Manage natural communities and modified habitats to protect and enhance water, floral, and faunal resources.

### Objectives:

- Maintain an appropriate hydroperiod through the installation, operation, and maintenance of water control structures, culverts, and ditch plugs as needed.
- Continue to regularly apply prescribed fire to manage fire dependent plant communities through the use of a well-planned and documented prescribed burning program. Maintain a fire return interval of 2-5 years in pine flatwoods, with the majority of burns to be conducted during the months of April through September if possible.
- Continue to treat exotic vegetation through the use of herbicides and biological control measures and reduce exotic plant infestations to maintenance control levels by 2020.
- Continue appropriate forest management activities to enhance natural communities. Evaluate the need for additional cabbage palm removal using low ground pressure harvest equipment.
- Continue to reforest deteriorated areas within the northern portion of the management area with slash pine.
- Continue to monitor and evaluate vegetation and wildlife responses to ongoing restoration and land management activities.
- Coordinate with the Florida Fish and Wildlife Conservation Commission to manage and enhance area wildlife. Continue to improve habitat conditions and fund the reintroduction of the federally endangered red-cockaded woodpecker with the assistance of the Florida Fish and Wildlife Conservation Commission and U.S. Fish and Wildlife Service in order to establish stable and interconnected woodpecker populations on the DuPuis and Corbett Management Areas.
- Provide resource protection through partnerships with the Florida Fish and Wildlife Conservation Commission's Division of Law Enforcement and with local law enforcement agencies for the enforcement of pertinent resource based laws and regulations.

**Goal 2:** Provide resource-based public use opportunities.

Objectives:

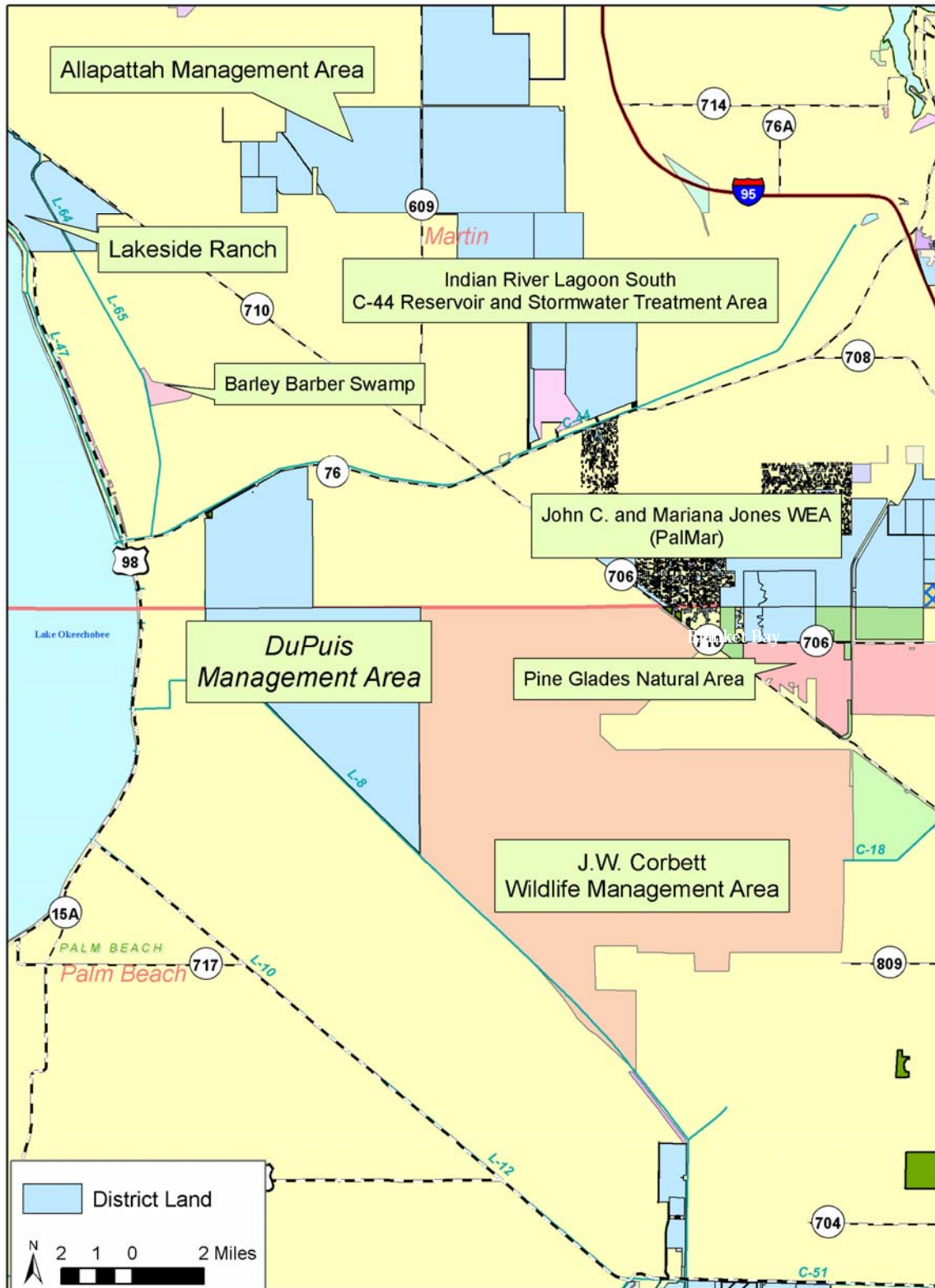
- Maintain environmental education and outreach programs through continued partnership with the Florida Atlantic University's Center for Environmental Studies.
- Maintain recreational improvements such as roads, trails, signs, trail heads, parking areas, campgrounds and public use facilities in an operational condition using District staff, the Department of Corrections inmate crew, contracted services, and volunteers.
- Install a Clivus Mulstum self-composting toilet at the fishing pier parking lot during the plan period.
- Update the Self-Guided Auto Tour along Jim Lake and DuPuis Grades.
- Maintain, and expand if appropriate, existing nature based recreational opportunities including hiking, biking, equestrian use, camping, hunting, birding, and wildlife viewing.
- Coordinate with local cooperating land managers on expanding future recreational opportunities on the Ocean to Lake Trail.
- Utilize quarterly Water Resource Advisory Committee – Recreation Issues Workshop meetings to receive public input on the management and coordination of recreational activities provided on the management area.

**Goal 3:** Maintain public use facilities and area infrastructure.

Objectives:

- Replace the existing equestrian campground bathroom which receives a high level of use by the public and is currently in poor condition and in need of replacement.
- Replace three water control structures necessary to control the retention and release of water from the restored L-8 marsh.
- Remove two dilapidated and hurricane damaged pole barns located within the equipment and shop compound area.
- Add two equipment bays to the existing shop and maintenance building.
- Construct a chemical storage building for storing herbicides and other chemicals in a secured manner.
- Construct a new pole barn for storing tractors, implements, and other pieces of large equipment out of direct sunlight and extreme weather in order to minimize maintenance costs and maximize equipment life.

**Map 2. DuPuis and other public lands**



### **3. Site History**

The DuPuis Management Area has been inhabited by humans for at least 2000 years. A detailed report of the early history of the site through the mid-1900s is included as **Appendix A** (See also **Maps 3-10**, and **Table 1**, which further illustrate the historic character of the property).

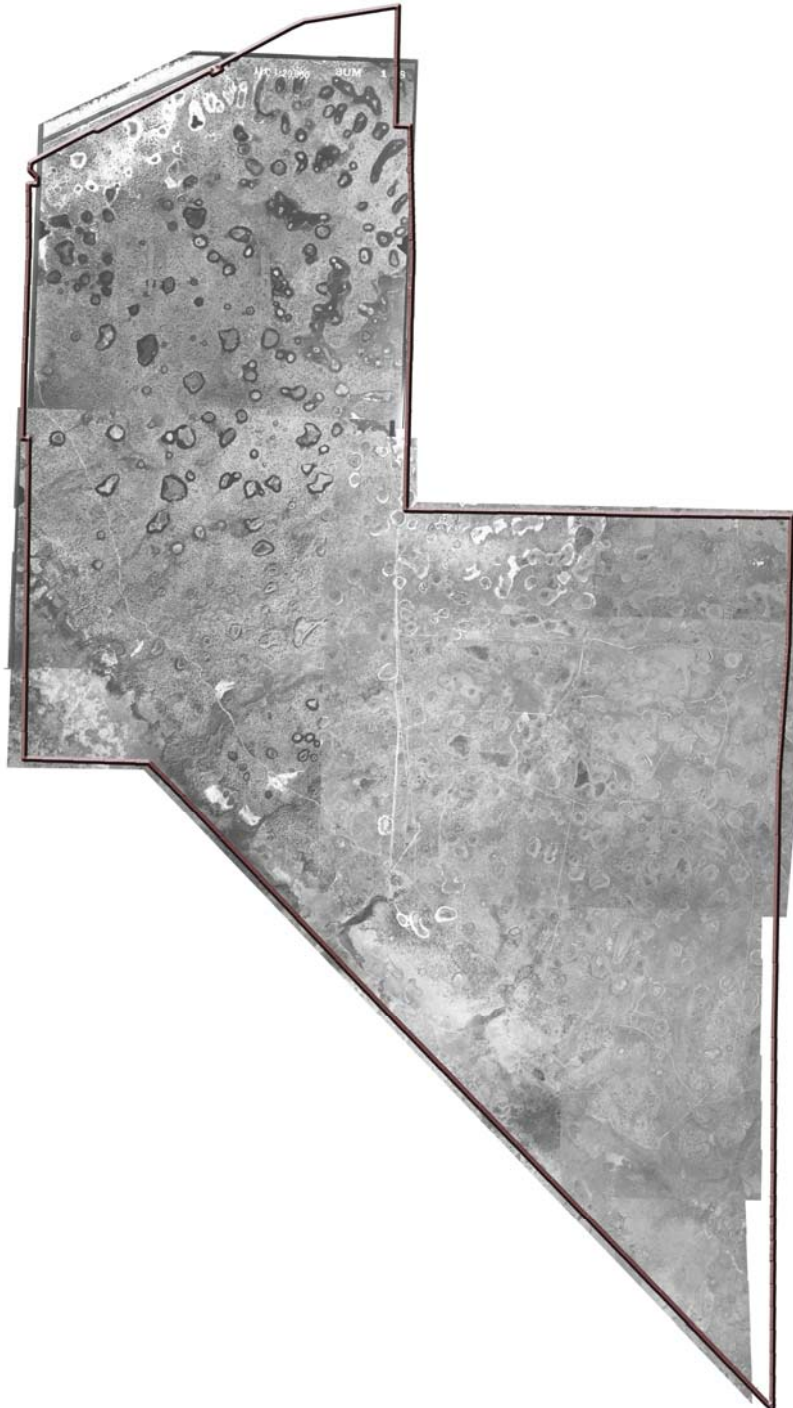
In 1981, the Florida Legislature established the Save Our Rivers program for the five water management districts to acquire environmentally sensitive land. The legislation (Chapter 373.59 F.S.) produced the Water Management Lands Trust Fund and empowered the water management districts to acquire lands needed to manage, protect, and conserve the state's water resources. Once acquired, the lands are to be managed in an environmentally acceptable manner and restored to their natural state. Districts may make certain capital improvements, i.e. fencing, access roads/trails, public use facilities, and are directed to provide appropriate public use compatible with the resource. The legislation also requires the districts develop appropriate public use. In addition, management practices such as control of exotic species and controlled burning are to be conducted to properly manage public lands acquired by the District.

The District purchased the DuPuis Management Area in 1986 through the Save Our Rivers program. The management area comprises 21,858 acres in northwest Palm Beach and southwest Martin counties. Prior to acquisition, the property was managed as the White Belt Ranch for the production of beef cattle, sheep, and goats. Ranch improvements included the construction of an extensive interior network of drainage ditches and the planting of exotic pasture grasses. As part of the initial environmental assessment, the District completed a wetland and hydroperiod restoration plan. Subsequently, a hydrologic restoration program was initiated to seasonally re-flood historic wetland areas. The Land Stewardship Program also developed a burn program to reintroduce regular fire to the property including those portions where fire had been suppressed. The District initiated exotic plant control, forest management, upland restoration, and development of an environmental education center.

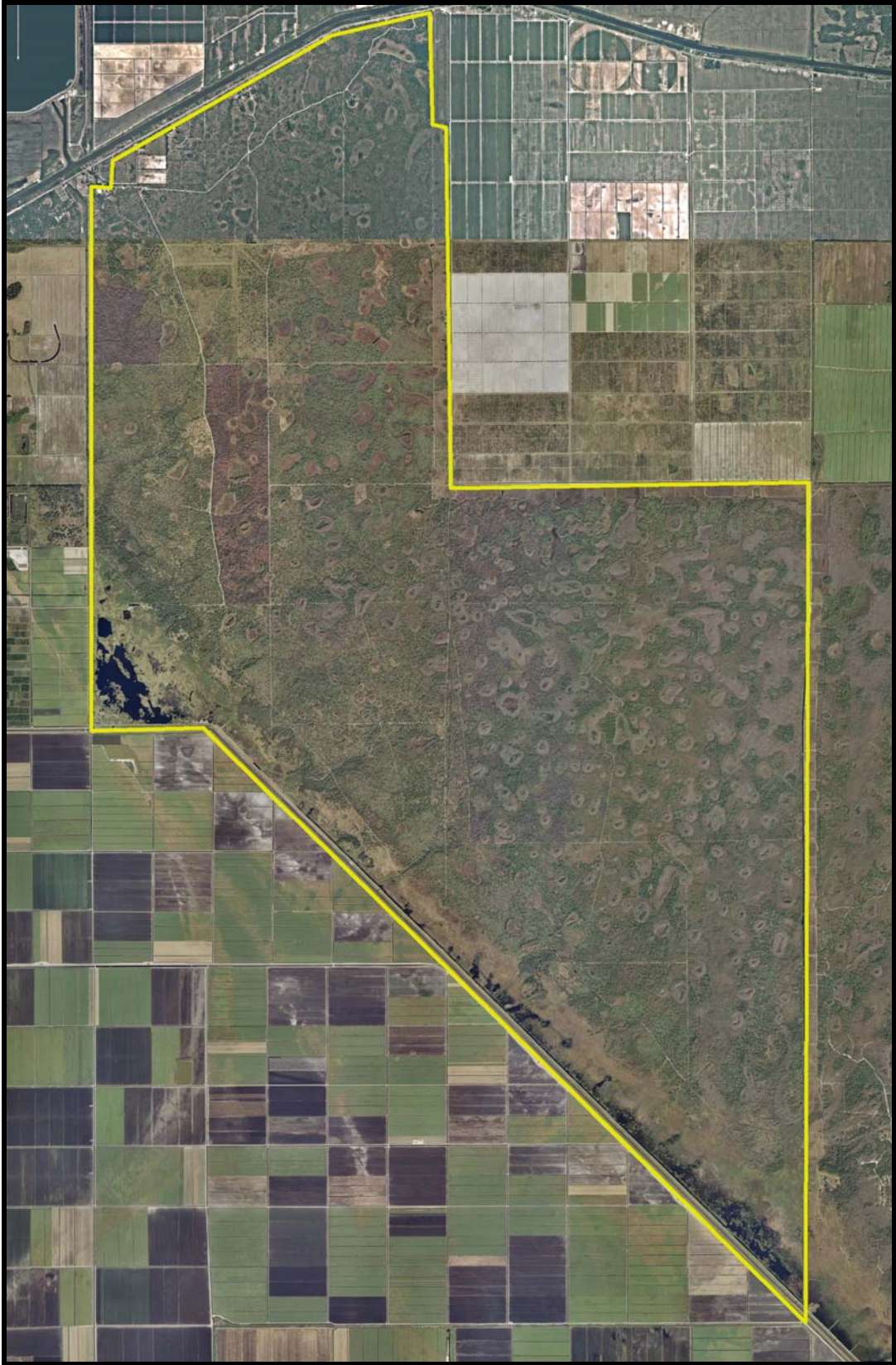
Lead management responsibility for the management area has changed over time. From acquisition until 1990, the District managed the DuPuis area jointly with the Florida Fish and Wildlife Conservation Commission. During this time, initial resource management, restoration activities, and public use programs were started. In 1990, the Florida Division of Forestry began a 5-year contract as lead manager of the area with the Commission and the District as cooperative managers. During this time, the area was operated as the DuPuis State Forest. Continuation of this arrangement was contingent upon the Florida Legislature authorizing the necessary funds for the Division of Forestry (now the Florida Forest Service) to conduct management beyond the contract expiration. As a result of the legislature not appropriating the required funding, the contract with the Division of Forestry was allowed to expire and the District solicited proposals

to manage the property from the public/private sector in 1995. A cooperative management proposal submitted by the District and the Fish and Wildlife Conservation Commission was selected by the review committee; this cooperative agreement was rolled into a Districtwide multi-site cooperative agreement with the Commission in 2007.

**Map 3. DuPuis Management Area with 1938 (west half) and 1949 (east half) aerials**



**Map 4: DuPuis Management Area Aerial Imagery, 2011-2012**



**Map 5. 1895 - J. Bien Military General Topographic Map**

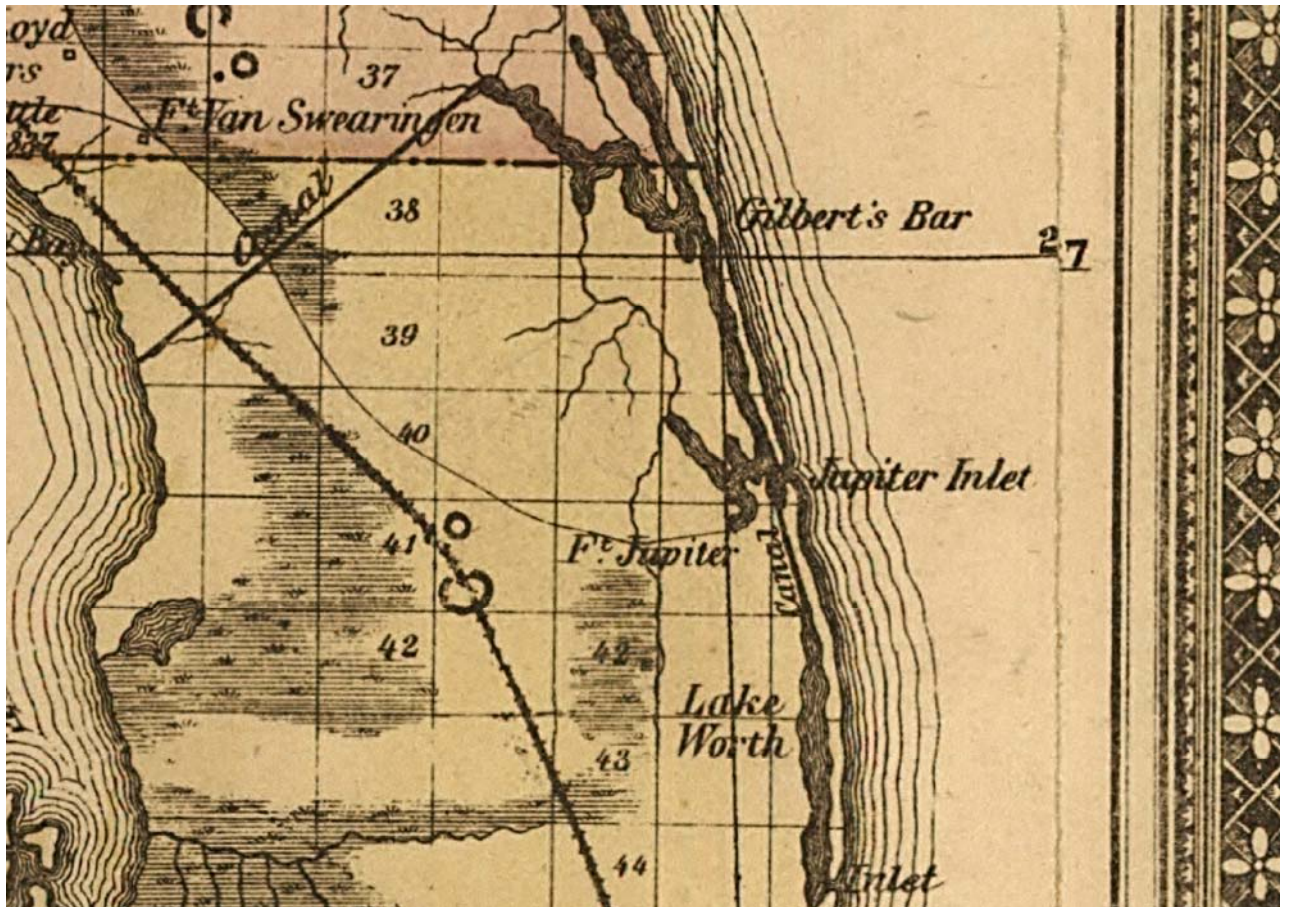


The above map is from an 1895 reproduction of Leut. J.C. Ives 1856 "A Military Map of the Peninsula of Florida South of Tampa Bay". The boundary of the DuPuis Management area has been added in green. In Leut. Ives memoir, the route from Ft. McRae to Ft. Jupiter is described as

*"The only continuous route between the eastern shore of Lake Okeechobee and Fort Jupiter, that has been traversed and reported upon, leads nearly east from Fort McRae to General Eustis' Road, and along that road to the Fort. The trail passes over the hammock that borders the beach; here a hundred yards wide. This hammock can be passed on foot, by wading from one cypress root to another, and making use of the dead branches of trees. The marsh beyond is about a mile and a-half wide, having the same character as the Everglades; the sawgrass being six feet in height; the water of variable depth, and the mud so soft that a pole can be thrust down with the hand 'to a depth of from six to ten feet. This marsh can be crossed only at dry seasons, and then with great difficulty, by men on foot, though unincumbered by arms or burdens of any description. East of the marsh, the route, for five miles, passes over a low pine country with occasional ponds and marshes that can be easily turned. It then crosses another difficult marsh, a quarter of a mile wide. From surveys that have been made in the vicinity it appears that this marsh might be avoided by keeping a mile or two to the north. A high pine and palmetto region then commences; continuing as far as the point where the trail from the lake intersects General Eustis' Route. This route traverses a low and somewhat marshy country, but a road practicable for wagons, during a greater portion if not all of the year, could be easily constructed upon it."*



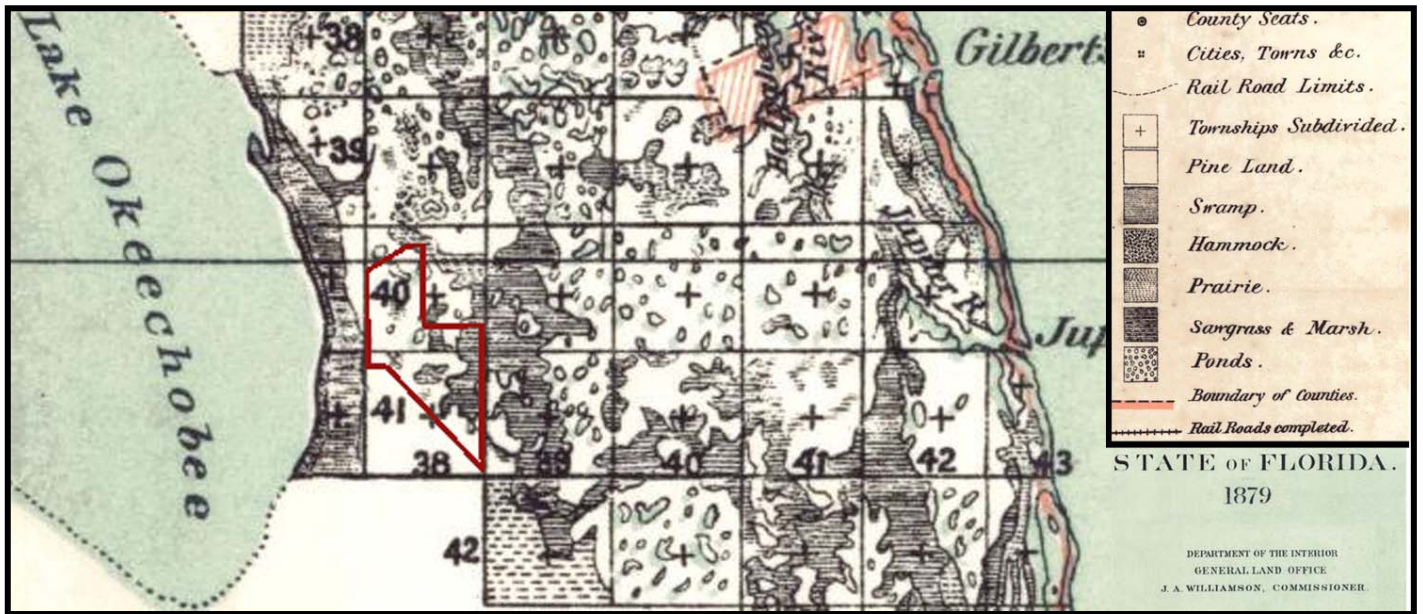
**Map 6: 1874 Map of Florida**



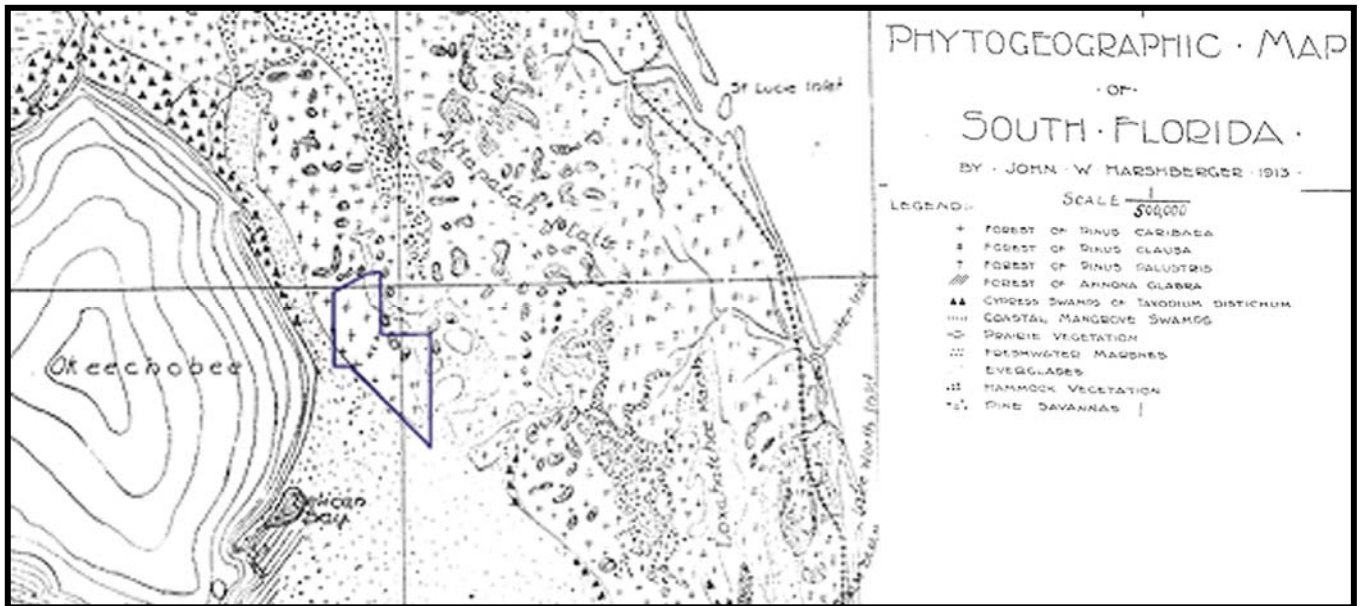
The above map is from the 1874 “Drew’s New Map of the State of Florida.” It shows the proposed St. Lucie canal and the railway that would become the Seaboard East Coast Rail line. The March, 1884 issue of Harper New Monthly had an article titled “The Drainage of the Everglades” that described the planned canal being:

*“... a proposed canal from Cahoney Bay, in Okeechobee, to the St. Lucea, is to be cut one hundred and twenty feet wide and ten feet deep, having a fall of one foot per mile, with a mean velocity of 3.86 lineal feet per second, capable of lowering the estimated 1000 square miles of surface four feet in a season.”*

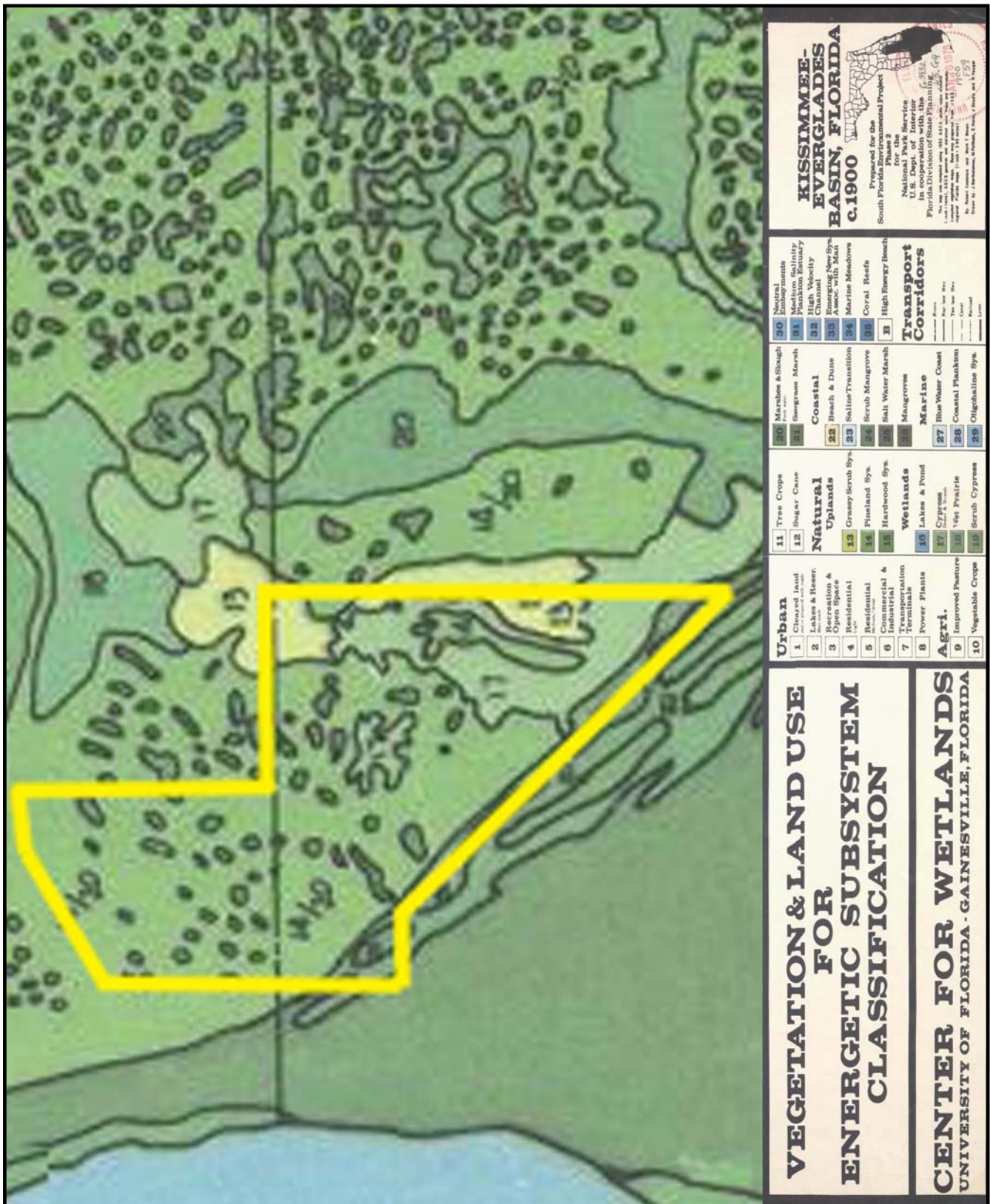
**Map 7. 1879 - General Land Office Map with land cover classification**



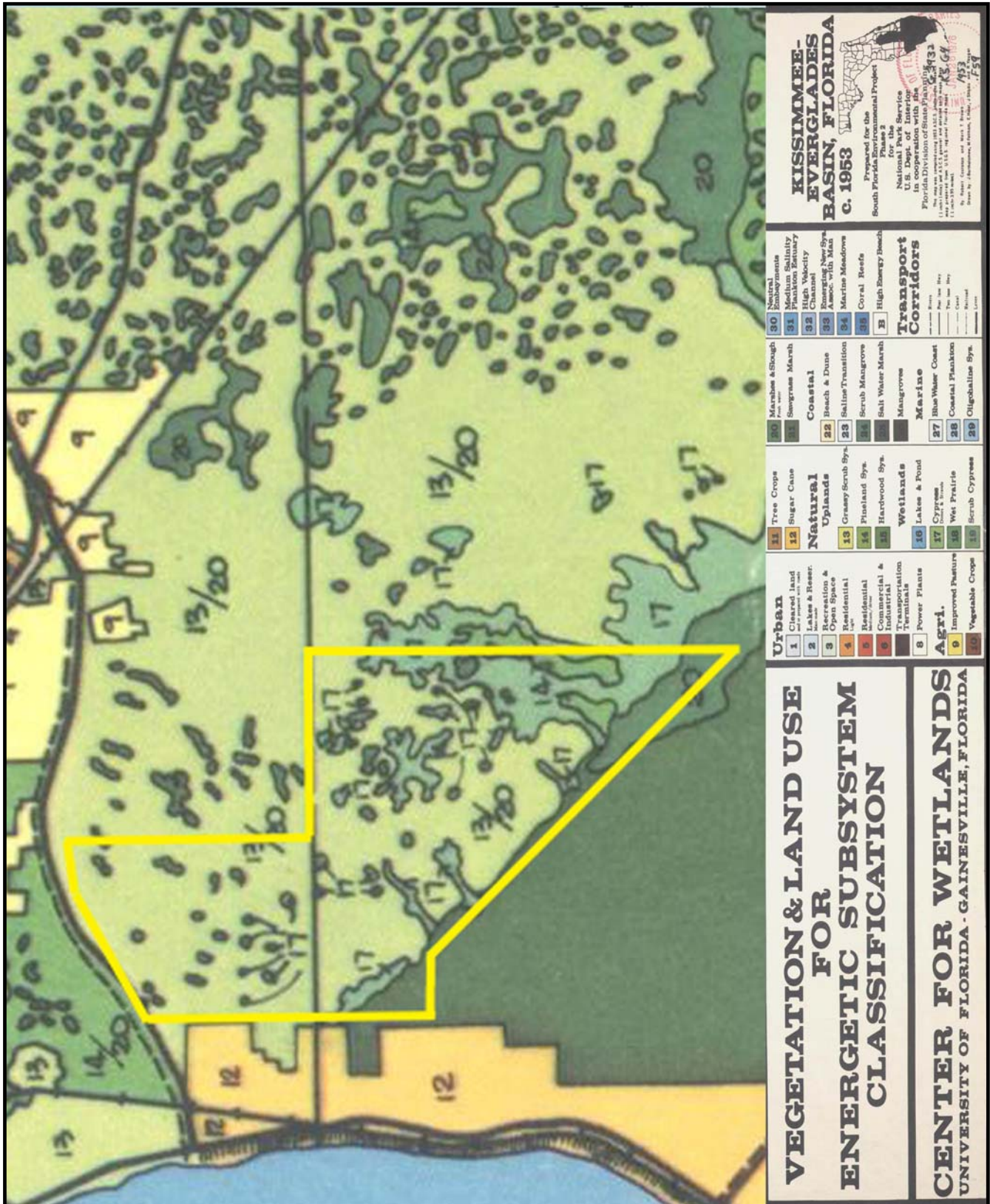
**Map 8. 1913 - Harshberger Phytographic Map**



**Map 9. 1900 UF Land Cover Map, Local Vicinity**



**Map 10. 1953 UF Land Cover Map, Local Vicinity**



**Table 1 – DuPuis Management Area History**

	<b>ACTIVITY</b>	<b>EFFECT ON MANAGEMENT AREA</b>
1838	Fort McRae constructed	Trails constructed between forts spaced approximately 20 miles apart, laid the foundation for settlement of the area when the Armed Occupation Act was passed in 1842.
1850	U. S. Congress passed the Swamp and Overflowed Land Act	Allowed the state legislatures to transfer the ownership of swamp and overflowed lands to private entities to reclaim the land through drainage and levee projects.
1881-1884	Hamilton Disston’s Atlantic and Gulf Coast Canal and Okeechobee Land Company completes canals and dredging projects throughout the region creating a navigable water way from Fort Myers to St. Cloud.	The St. Lucie canal was proposed at this time. The original proposal would have placed it a few miles north of its current location. Its final location at the north boundary of the management area significantly drained the northern portion of the site.
1902	Southern States Land and Timber Company acquired the management area and surrounding lands.	The acquisition started the opportunistic logging of the easiest old-growth trees in the management area.
1915-1923	The St. Lucie Canal was constructed, as well as the Stuart-Annie Highway (later called SR 76 and Kanner Hwy), and the Seaboard Rail line.	The canal significantly drained the northern portion of the site. Both the canal, road, and railroad improved access to the management area that made it more accessible to logging.
1944	Robert Chastain acquired the management area from Southern States Land and Timber for use as a cattle ranch	By 1948 most of the infrastructure was constructed such as the cooter creek canal, interior wetland ditches, main buildings, and road grades.
1954	The L-8 Canal was constructed along the southerly border of the management area	The L-8 canal allowed most of the wetlands within the management area to be significantly drained.
1955	The management area was sold to John G. DuPuis Sr.’s White Belt Dairy Farms	The DuPuis family and the White Belt Dairy Farm continued the agricultural operations until acquisition by the District
1986	The management area was acquired by the South Florida Water Management District	A restoration program was implemented that included hydrologic restoration, vegetation management, and exotic species control

#### **4. Resource Inventory**

*Policy 140-25(3)(e) Inventories of natural and historic resources shall be performed to provide information for effective land management planning, natural community maintenance and ecological restoration. (District policies are reprinted in **Appendix B**)*

Floral and faunal species are inventoried and natural communities are mapped by Land Stewardship personnel, other governmental entities, volunteers, or private contractors. The data helps District land managers with resource management planning.

Inventory data is on file with the Land Stewardship Section. Land Stewardship shares natural areas and species data with the Florida Natural Areas Inventory through a Memorandum of Understanding.

Floral and faunal inventories in the DuPuis Management Area were included in the environmental assessment initiated shortly after acquisition. Additional surveys have been completed with species' lists being updated regularly by volunteers, contractors, and District and Florida Fish and Wildlife Conservation Commission staff. Archaeological and cultural resource inventories were conducted in coordination with the Department of State, Division of Historical Resources and are described in the State's Master Site File.

##### **4.1 Hydrology**

*Policy 140-25(1) The basis for the Land Stewardship Program is the protection and management of natural hydrologic resources.*

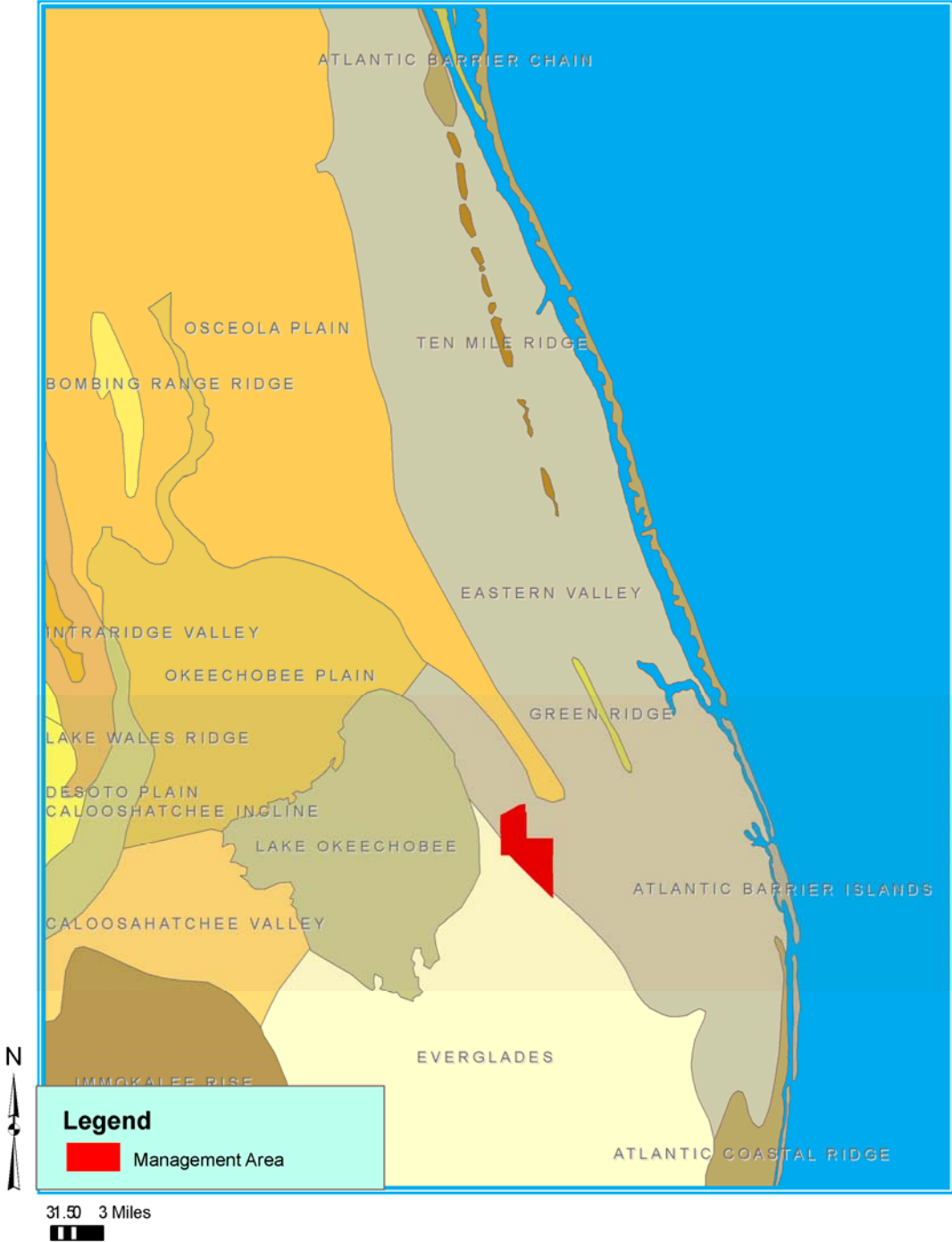
In general, relief on the management area is slight with ground elevations ranging between 23 and 25 feet over most of the property. Elevation gradually declines from northeast to southwest (**Maps 11-13**). Overland sheet flow on the property occurs in a south-southwest direction through a connected series of wet prairie, marsh and cypress wetlands (**Map 14**). Wetlands may be inundated for long periods, beginning with the wet season. The greatest change in elevation occurs in the L-8 marsh along the southerly boundary where elevation declines from 20 ft at the treeline to less than 15 ft at several locations near the canal levee. From the treeline, elevation increases gradually reaching 24 to 25 ft in the north and northeast sections of the property.

Elevations of pine flatwood communities in the Martin County portion of the area exist at elevations of approximately 25 ft with slight declines to 23-24 ft at the west property boundary. Broad leaf marsh and wet prairie depressions occur between the elevations of 20-23 ft, with the cypress dome centers representing the lowest elevations (20-21 ft). In the Palm Beach County portion, pine flatwoods and wet prairie communities fluctuate between 24 and 25 ft with

cypress domes and strands occurring at elevations between 20 and 23 ft. Elevations decline to the southwest towards the L-8 marsh where elevations range from 15 ft to 19 ft.

Over the years, three off-site developments had major impacts on area hydrology. In the 1920s, the St. Lucie Canal (C-44) was dredged parallel to the property's northern boundary completely severing historic inflows from the north while providing a means of increased offsite drainage (see **Map 15**, the northern and southern portions of the property are in two separate basins). Along the southern boundary, the L-8 canal was completed in the early 1950s facilitating additional drainage. In the 1970s a canal and elevated road along the east boundary stopped historic inflows from the Corbett Management Area. During ranch development, an extensive network of interior canals and ditches were constructed that significantly decreased surface water retention and increased drainage offsite. One of the District's primary goals was to complete a hydroperiod restoration plan to reverse overdrainage and re-establish wetland structure and function. (see **Restoration Projects**, section **5.1**).

**Map 11. Regional Major Geomorphic Features**





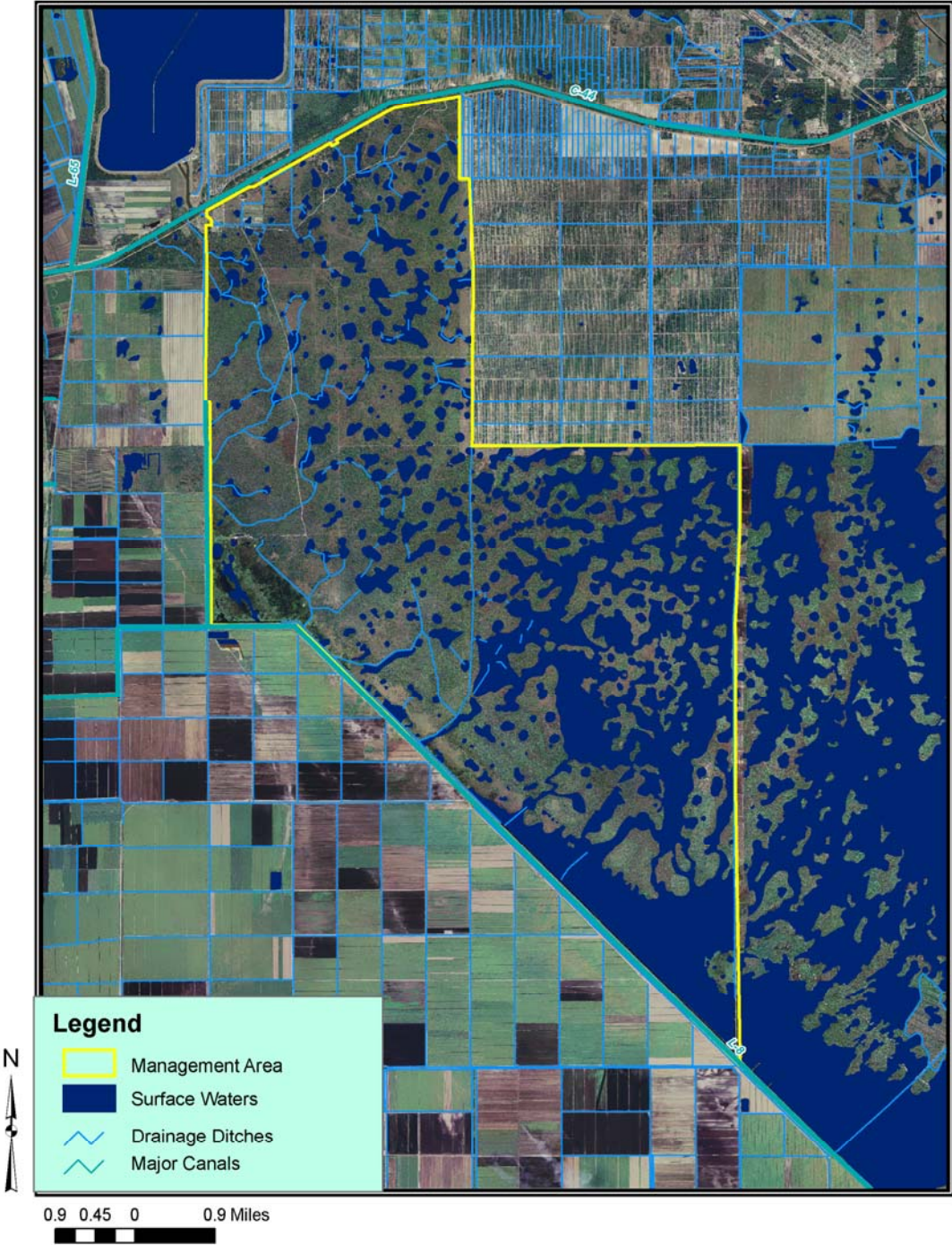
**Map 12. Regional Topographic Setting**



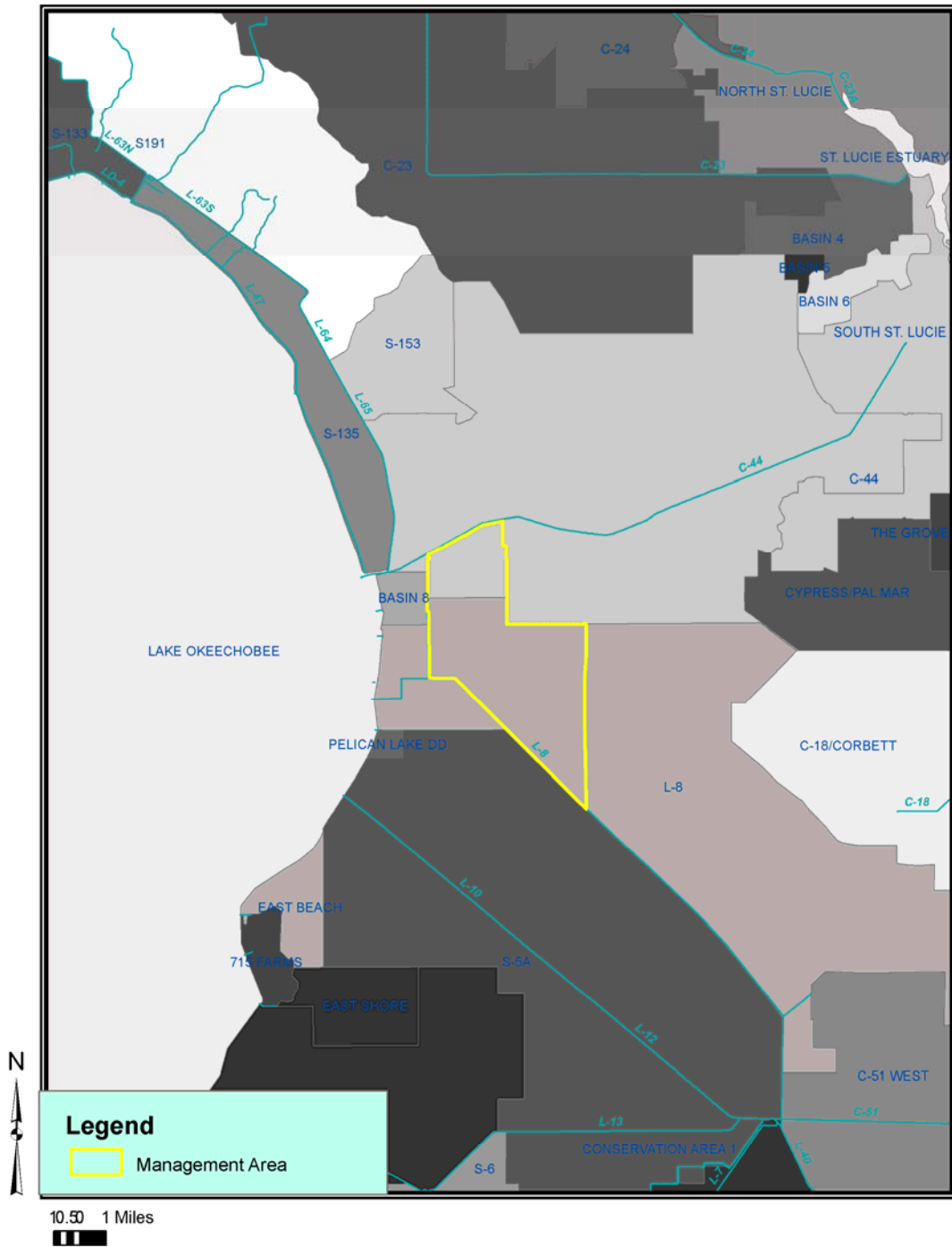
**Map 13. DuPuis Topography**



**Map 14. Surface Waters**



**Map 15. Hydrologic Basins**



## 4.2 Soils

There are four distinct soil categories within the DuPuis Management Area as defined by the Natural Soil Landscape Positions soil classification system: flatwoods soils, flat soils, sand depression soils, and muck depression soils (**Map 16**). This classification system groups South Florida soils into 12 categories based on hydrology and soil morphology that reflect the local relative topography, hydrology, and vegetation of the area. Soil classification descriptions are included as **Appendix C**.

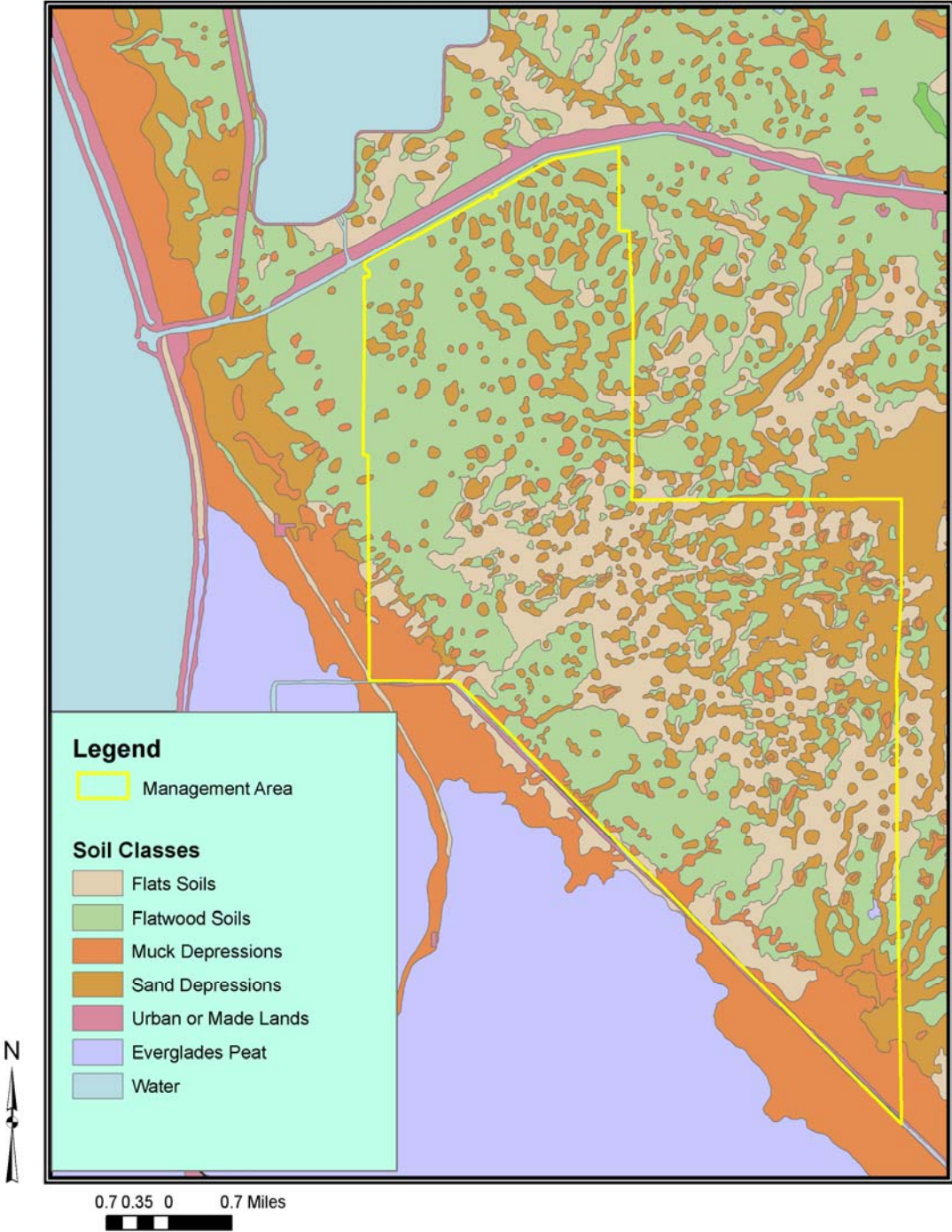
### Soil Contamination and Excavation Sites

A cattle dipping area that was located at the present Gate 3 equestrian area was removed by the District in the late 1980's. This chemical treatment area was one of the 3,200 cattle dipping vats constructed statewide between 1906 and 1961 for a tick fever eradication program that was mandated by state law. At these locations, soils became polluted with insecticides as cattle were either lead through in-ground dipping vats or sprayed in holding pens. Shortly after acquisition, the District began appropriate corrective actions to remediate soil contamination associated with the cattle dipping vat.

Five other soil contamination sites were identified on the property at the time of acquisition. These sites were used for petroleum or chemical storage or equipment maintenance areas. The District had these contaminated sites chemically and physically analyzed as the first phase of a two-part remedial strategy that developed site-specific, risk-based action levels. The second phase of this process determined the appropriate degree of corrective actions. The Florida Department of Environmental Protection Waste Cleanup Section staff assisted in decision-making with regard to the appropriate land use classification and required corrective actions. In the early 1990s, a remediation plan was designed and implemented at the five contaminated sites. In June 2001, a final site rehabilitation order was issued by the Department of Environmental Protection which completed the District's remediation activities.

Four small inactive borrow pits exist that were used to supply fill for road building and repair. The largest pit is about 3 acres in size and located at the south end of the DuPuis Grade. This pit was re-contoured and re-planted with native vegetation in 2001 (See **Restoration Projects**, section 5.1).

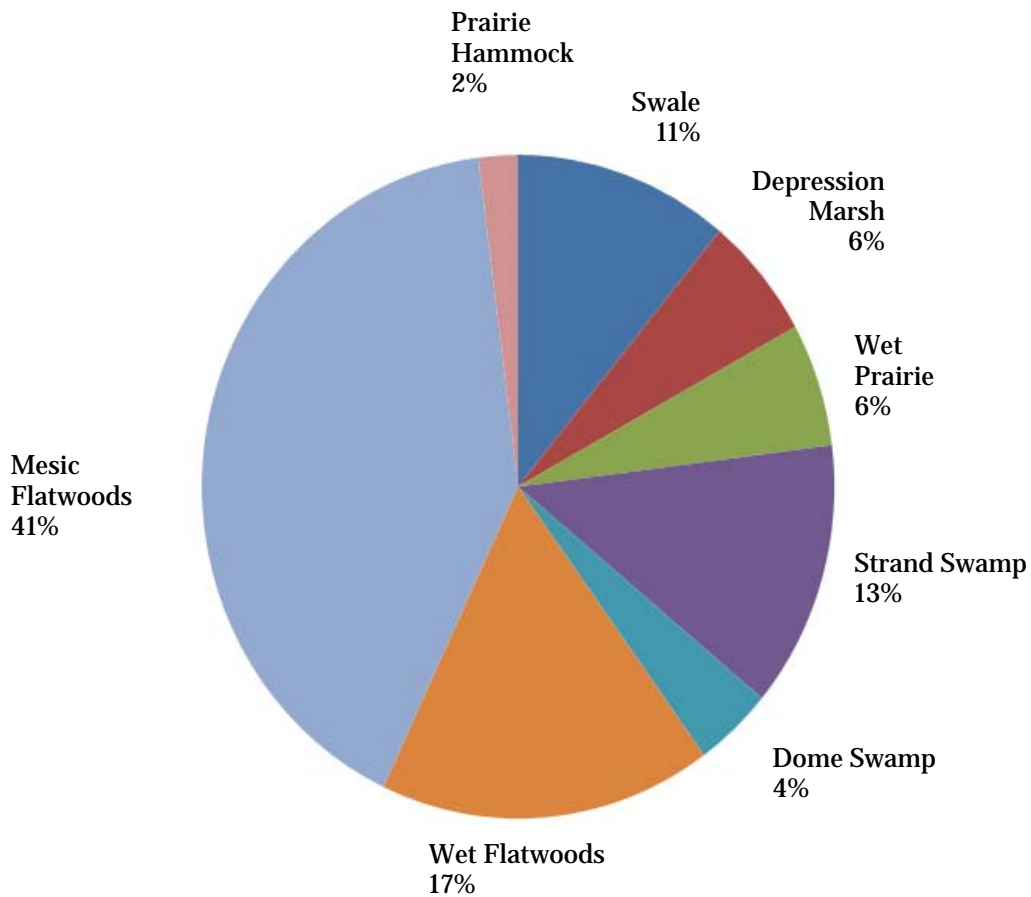
**Map 16. Soils**



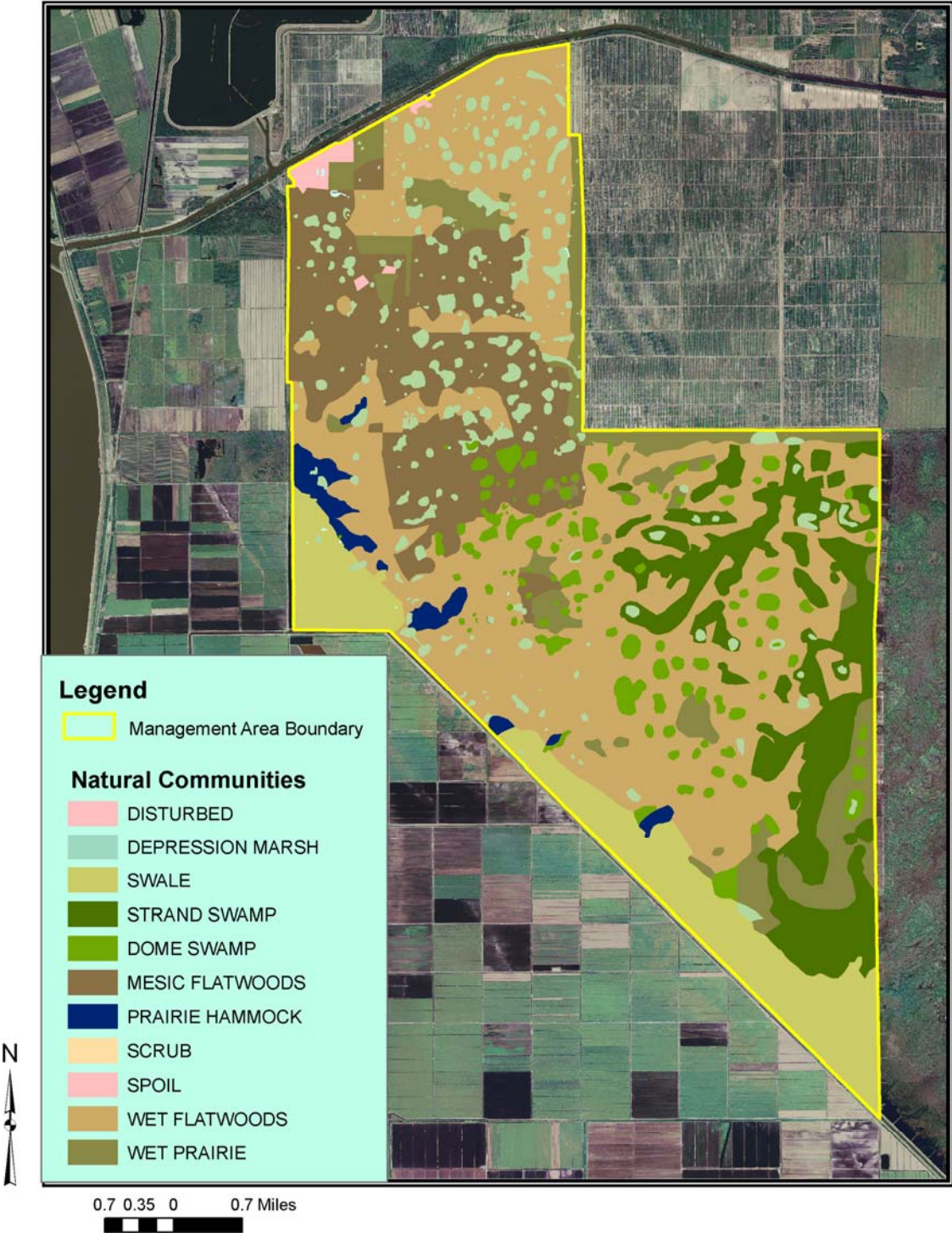
### 4.3 Natural Communities

The District classifies natural community types by the Florida Natural Areas Inventory Classification system. Eight natural community types occur on the DuPuis Management Area (**Figure 1**, and **Map 17**). Community condition varies widely, depending on previous and current land use, hydrologic alteration, exotic infestation, and current management activities. Natural community descriptions and acreage figures are included in **Appendix D**.

**Figure 1 Natural Community Types**



**Map 17. Natural Communities**





#### **4.4 Wildlife**

The natural communities within the project provide habitat for numerous bird, fish, amphibian, reptile, and mammal species, several of which are listed federally or by the state. Initial wildlife inventories on the management area were conducted from 1987-1989. Regular surveys are ongoing by the Florida Fish and Wildlife Conservation Commission and species lists are updated accordingly. Wildlife species observed utilizing the property include 139 bird, 25 mammal, 19 reptile, and 10 amphibian species (**Appendix E**). At least 15 species considered rare, endangered, threatened, or of special concern have been noted.

#### **4.5 Cultural Resources**

*Policy 140-25(3)(j) Archaeological and historic resources are protected by site identification and inter-agency coordination with the Florida Division of Historical Resources. Land Stewardship planning shall include an analysis of archaeological data accompanied by appropriate public education opportunities.*

The District's management goal for cultural resources is historic preservation by identification, evaluation, documentation, protection, and stabilization of known historic or prehistoric sites. The District maintains a database of all known archeological and historical sites on District properties that is periodically updated through the Department of State's Master Site File. Due to its sensitive nature, site-specific data is not made available to the general public.

Four archaeological sites of Native American earthworks are present on the management area and are registered in the Florida Master Site File as sites of archaeological significance. The department of State, Division of Historic resources has visited the sites to conduct mapping and sampling. Research assistance has been provided by the Southeast Florida Archaeological Society and Florida Museum of Natural History. Information was summarized in "Cultural Resource Assessment of Four Archaeological Sites at Dupuis Reserve, Palm Beach County," (Wheeler, 2000) and subsequent reports (Wheeler, 2001; Rich, 2001). Studies concluded that the four DuPuis sites represented important examples of Lake Okeechobee mounded earthwork complex that is well preserved. Management recommendations included keeping the area in public ownership, prohibiting grazing or agricultural activities, prohibiting vehicle traffic at mound sites, and monitoring sites for feral hog rooting and vandalism (Wheeler, 2000). Management activities will continue to promote research on these sites and continue to safeguard site integrity. Management activities planned for these areas are the treatment of invasive exotic vegetation and the periodic application of prescribed burns. Ground disturbing activities will be avoided in these areas. Staff from the Division of Historic Resources may revisit these sites at times to conduct additional investigations.



A representation of the mound and earthwork complex at DuPuis

It appears from maps from the Seminole wars that two of the Army patrol routes between the frontier forts passed through DuPuis, including one that was traveled by a column under the command of President Zachory Taylor when he was a colonel in the Army. (**Map 18**).

There are several structures on site that exhibit vernacular architecture typical of older Florida ranches including three horse barns in the equestrian area, the sheep shearer's cabin and the mound house (a hunting cabin). Management of these structures mainly involves security patrols and signage; repairs are made as necessary to the horse barns.

In 2002, District staff contracted local historian, Steve Farnsworth, to research the history of the DuPuis property. A detailed description of the history of the area from pre-European settlement to acquisition by the District is contained in **Appendix A**.

**Map 18. Seminole War Era Military Maps**



Military maps from the Seminole Wars: 1839 (above) and 1856 (below) The boundary of the DuPuis Management area has been added in green.

## 5. Natural Resource Management

*Policy 140-23 The Land Stewardship Program mission is to provide natural resource protection and management while allowing compatible multiple uses on designated public lands.*

Resource management includes all applied programs wherein activities manipulate, modify, and control natural features within the management area. All lands acquired through the Save Our Rivers program are managed and maintained in an environmentally acceptable manner and, to the extent practicable, restored and protected in their natural state and condition. Management responsibilities are defined by statute, and directed by best management practices. Goals and objectives for the management area clarify resource management guidelines necessary to fulfill the District's land stewardship responsibilities. Land Stewardship resource management activities include the implementation of projects to restore a more natural hydrologic regime, the application of vegetation control activities to restore natural forest structure and composition, the continuation of an aggressive exotic plant control program, the application of a prescribed burn program for the maintenance of fire dependent plant communities, and coordination with the Florida Fish and Wildlife Conservation Commission to implement wildlife management programs.

### 5.1 Restoration Projects

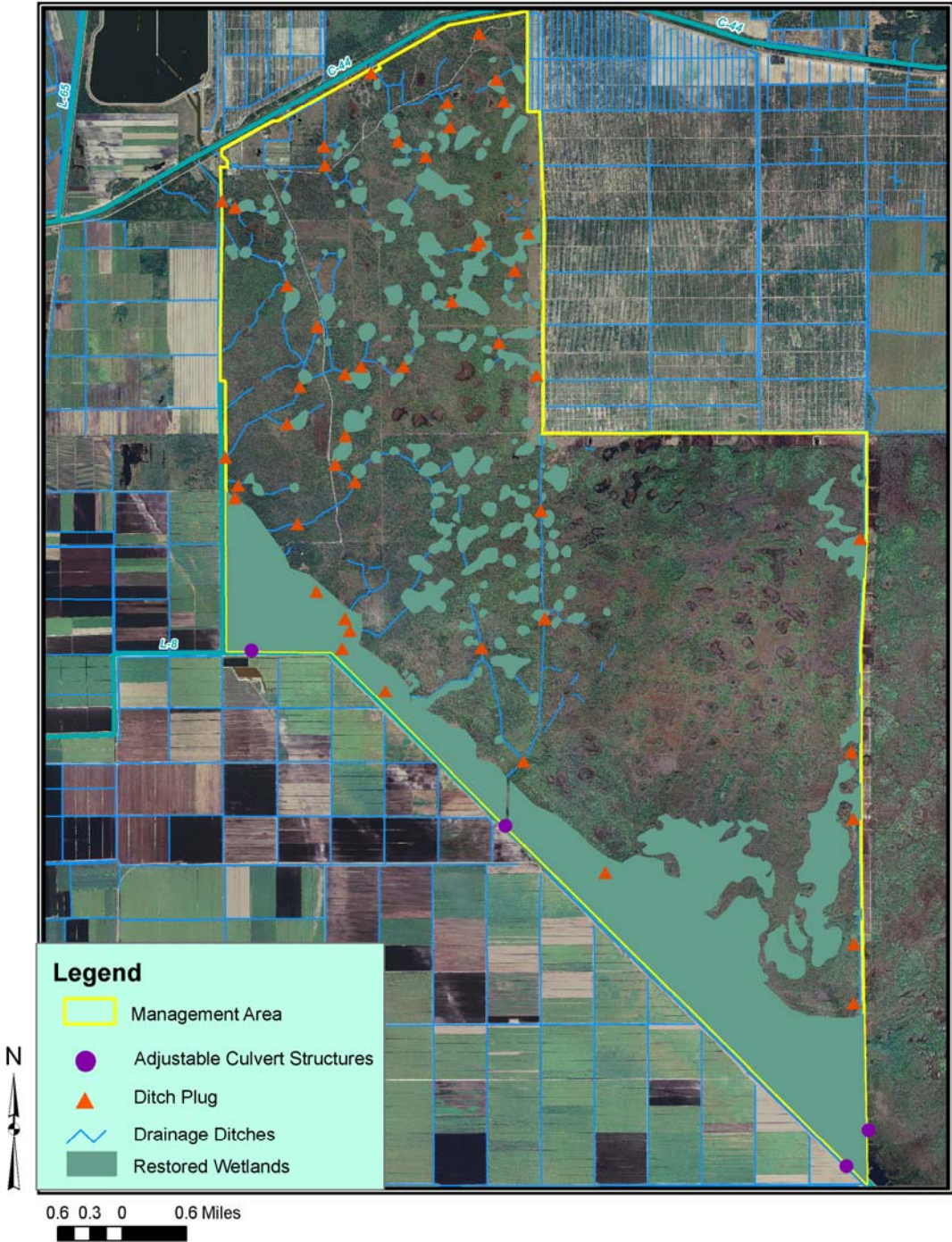
*Policy 140-25(1) The basis for the Land Stewardship Program is the protection and management of natural hydrologic resources.*

*Policy 140-25(1)(c) Where feasible, an attempt shall be made to restore a more natural hydroperiod on tracts where the drainage patterns have been altered.*

#### Wetland Restoration

An environmental assessment completed for the property shortly after acquisition included a wetland and hydroperiod restoration plan as a primary management goal. The plan recognized that severe overdrainage of the property had occurred through the construction of a major network of swales and canals built to facilitate the drainage of water north to the St. Lucie Canal and south to the L-8 canal. The plan outlined a three-phase restoration project targeting restoration of both the interior wetlands and 2,341 acres of historic Everglades referred to as the L-8 marsh. In 1990 and 1991, 41 earthen ditchplugs were installed at strategic interior ditches to re-hydrate isolated wetlands and reestablish sheetflow across the property interior (**Map 19**). Approximately 4,000 acres of wetlands were restored through the use of ditch plugs. Monitoring has demonstrated that re-hydrating the wetlands resulted in native wetland plant species replacing upland species. However, exotic wetland plants such as torpedo grass have also invaded some re-hydrated wetlands requiring additional exotic plant control efforts.

**Map 19. Wetland Restoration**



The second phase of the restoration project entailed the construction of an eight-mile levee separating the management area from the L-8 canal and the Everglades Agricultural Area. This project included installation of three water control structures that became operational in December 1996. The District utilizes mitigation funds to pay for this portion of the restoration project.

The final restoration phase consisted of re-establishing the hydrologic connection between the L-8 marsh and similar habitat on the adjacent Corbett Area. In 1992, two sections in the roadway separating the DuPuis Management Area and Corbett Wildlife Management Area were degraded and stabilized with geo-web swales to reconnect historic water pathways. In 2001, installation of six culverts with adjustable control gates was completed to increase flow to DuPuis and help provide drainage from the adjacent Corbett Area.

### Upland Restoration

In the mid 1990's, managers began additional work to restore DuPuis' upland areas. Prescribed burning was initiated shortly after property acquisition to reintroduce the beneficial effects of fire to the area, however, fire alone could not effectively reduce the overgrown structure of some upland areas. This overgrown condition negatively affected the diversity of native vegetation and wildlife, and was a probable contributor to the extirpation of the indigenous red-cockaded woodpecker from the area. Due to the heavy shrub layer and lack of herbaceous fuel, managers began using mechanical means to remove overgrown shrubby understory followed by prescribed burning. Vegetation throughout most of the site is now able to be maintained in a cost-effective manner using primarily prescribed fire.

Beginning in 2005, approximately 17 acres of Bahia grass was targeted with multiple herbicide treatments to encourage the recruitment of native species in a pilot project for groundcover restoration. This pilot project used chemical treatment and prescribed fire over successive years to break-up the solid Bahia cover and encourage the recruitment of native groundcover species. Many areas of DuPuis have seen a reduction in Bahia grass cover due to frequent inundation following hydrologic restoration. The pilot project has demonstrated that the chemical and prescribed fire treatment approach may be successfully employed in areas where hydrologic restoration alone is insufficient in restoring pasture areas.

The District has also utilized timber thinning revenue contracts to relieve the overcrowding of pines and cabbage palms. This thinning helps prevent the spread of pine bark beetles and revitalizes the understory by exposing more surface area to sunlight and increasing primary productivity. The dense pine stands were likely a combined result of a lower water table due to past drainage efforts, and the suppression of fire. To date, most upland restoration has been conducted on the more overgrown west portion of DuPuis, however, future work will include additional areas. The combined restoration effort has restored conditions suitable for red-cockaded woodpeckers and has led to a reintroduction program for this species (see **Rare, Threatened, and Endangered Animal Species** section 5.4.3).

### Visitor Center Restoration

The District initiated an effort to restore native plant communities representative of the management area on a three-acre site immediately east of the main administration office that will become part of the visitor's center. The previous landowner had planted the area with imported exotic trees and the area subsequently became infested with invasive shrubs. A small concrete pond on the site had also become choked with invasive aquatic plants. In 1999, the District cleared the exotic trees and shrubs from the site, cleaned out the concrete pond, and re-shaped the contours around the pond to simulate a cypress dome. The District planted 35 nursery grown mature cypress trees, and over 100 slash pines and live oaks that were relocated from other sites on the property. In 2001, a new pump system was installed in the pond to control water levels. The pond was filled with a gravel base and topped with soil. The District planted over 20 native aquatic plant species to re-create various wetland plant communities that occur on the property. The site is used for environmental education purposes documenting the various plant communities found on DuPuis.

### Borrow Pit Restoration

Work has continued on restoration of a 3 acre borrow pit located at the end of DuPuis Grade that was enlarged in the early 1990's to provide shell material for construction of a portion of the area's public roads. After the pit was closed in 1995, the shoreline and adjacent disturbed areas became heavily infested with cattails and exotics. Work began in 2001 to remove undesirable plants, re-contour a portion of the pond, and plant a variety of native vegetation to create a more natural landscape. A large berm of overburden material along one side of the pond was lowered and contoured to create areas where cypress, native shoreline plants, and marsh vegetation were planted. The top of the re-contoured berm was planted with cabbage palms, oaks, and native ground vegetation to create a small hammock. Cabbage palms were also planted in spots around the pond perimeter. A hydrological connection to the surrounding marsh was established by lowering another berm to permit seasonal inundation and water exchange. A similar project occurred in 2013 at the borrow pit pond within the family campground, where fill was brought in to create a littoral shelf that was planted with native wetland species.

#### **5.1.1 Monitoring**

*Policy 140-25(3)(f)(2) Monitoring shall be conducted to identify landscape changes resulting from management activities.*

Tracking environmental response to management and restoration activities provides valuable information on progress toward restoration objectives. Information obtained by monitoring specific sites assists land managers in making sound ecological choices for each unique parcel.

Monitoring has focused on documenting vegetative changes from restoration of the area's hydroperiod. In May 1988, the District established a monitoring program to determine the progress of hydrologic restoration in the L-8 marsh and in re-flooded interior marshes. Digital recorders were installed at four locations to record changes in water levels. Vegetation monitoring consisted of repeated counts along transects at varying elevations both before and after completion of the restoration project. In addition, photomonitoring was conducted at marked plots in the marsh. Results of the restoration/monitoring program were included in unpublished annual monitoring reports completed in 1997-2001. Reports indicated a positive vegetative shift occurred in the direction of more obligate wetland species as a result of increased inundation. Periodic monitoring will continue in the L-8 marsh to evaluate the influence of increased hydroperiod and also evaluate the effects of the additional water flows through the connection with the Corbett area marsh constructed in 2001.

Additionally, twenty-six 360 degree photomonitoring points have been installed throughout the management area with additional points being added as needed. Twenty of the photopoints have been installed within the 17-acre Bahia grass groundcover restoration area and were accompanied by groundcover vegetation survey plots. These photo points were utilized between 2007 and 2010 to observe and document the vegetative character of the property at that time. The photopoints have been established with permanent monuments that can be located with GPS coordinates and a metal detector, and are available for use in the future to compare site conditions with the 2007-2010 baseline condition.

## **5.2 Vegetation Management**

*Policy 140-25(2)(d) Where practicable, an attempt shall be made to restore and maintain desirable vegetation to promote habitat diversity in areas where invasive exotic vegetation, grazing practices, or improved land uses have substantially altered the historic landscape.*

*Policy 140-25(3)(1) Mechanical equipment may be used in conjunction with prescribed burning and other management tools to control vegetation and restore habitat structure.*

Vegetation management is a program component where the composition and/or structure of a vegetative community is physically altered to meet a management objective. The techniques used in vegetation management include mowing, disking, shredding, roller-chopping, timber thinning, and planting. These techniques are applied to one or more management objectives that may include:

- Restoring a degraded vegetative community
- Improving an area's suitability as wildlife habitat
- Exotic species control or weed management

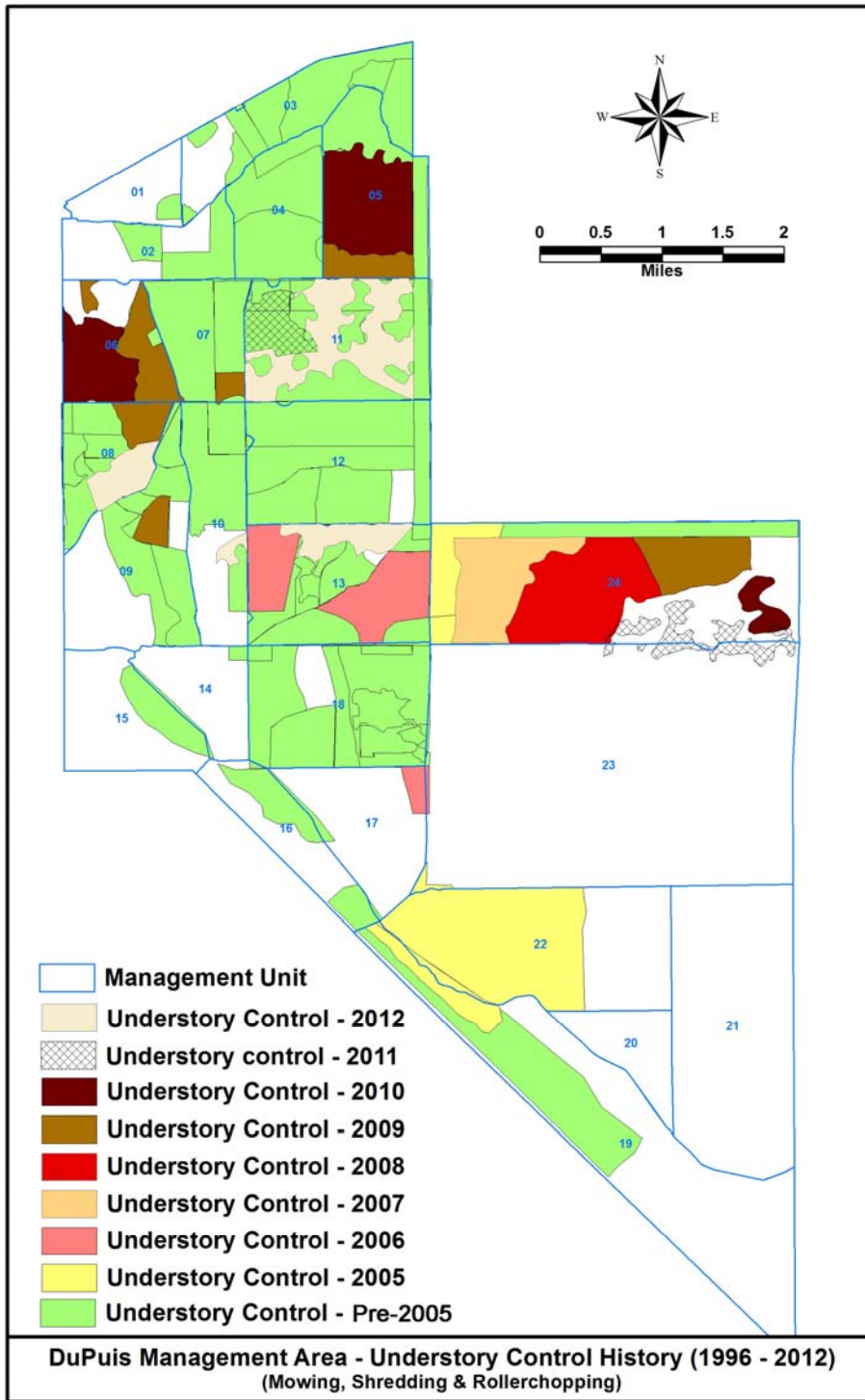


- Fuel management in relation to prescribed burning or minimizing wildfires
- Clearing for maintenance or project management purposes

Vegetation maintenance needs are identified annually by the regional land manager. Vegetation control and maintenance is executed by District or Florida Fish and Wildlife Conservation Commission field personnel or through contracts (**Map 20**). To date, several thousand acres of the DuPuis Management Area's understory have been mechanically treated using roller choppers or by shredding. Mechanical vegetation control will continue to be used in select areas where necessary to control understory brush species with the goal of maintaining these areas in a more cost-effective manner through the use of prescribed fire.

Past fire suppression and hydrologic alterations has resulted in the growth of dense stands of slash pine. This unnatural density reduces stand health and increases the stand's susceptibility to attacks from bark beetles and disease. Dense areas of slash pine have been thinned through selective harvests to attain more natural stand density. These projects were planned and conducted with sensitivity to surrounding environmental conditions and in coordination with public use schedules. These stands may also have locally heavy concentrations of cabbage palms in the midstory. Cabbage palms are thinned or eliminated through cutting or harvesting in select areas such as those being managed for red-cockaded woodpeckers. Through upland management, the extensive pine flatwoods are being restored to a more open natural condition that can be maintained through restored seasonal flooding and recurring prescribed fire.

**Map 20. Mechanical Vegetation Treatments, 1996 – 2013 \***



\*no treatments conducted in FY 2013, budgeted funds were directed to other areas of higher priority within the management region.

### 5.2.1 Exotic/Invasive Plants

*Policy 140-25(2)(c) Management practices will strive to identify existing infestations and implement appropriate control or eradication measures.*

*Policy 140-25(3)(b) Exotic plant control in all management areas shall strive to attain a level of success where periodic maintenance eliminates the infestation or reduces the coverage of exotic plants.*

South Florida's subtropical climate provides an excellent growth environment for the rapid spread of exotic plants that can cause extensive alterations to natural ecosystems. Environmental changes caused by extensive hydroperiod alterations have been an important factor in the spread of exotic vegetation. Exotic plant infestations can result in partial or total displacement of native plants, loss of wildlife habitat, and the degradation of public use areas.

Land Stewardship targets Category I and II non-native plant species as identified on the Exotic Pest Plant Council's biennially updated list of *Florida's Most Invasive Species* (<http://www.fleppc.org/>). Category I species include non-native plants that invade and disrupt Florida native plant communities. Category II plants have the potential to invade and disrupt natural successional processes. Both Category I and II exotics are considered invasive and a threat to the function and ecological stability of Florida's natural communities.

Invasive and exotic plant control measures can include a combination of herbicide application, biological control, prescribed fire, roller chopping, mowing, and physical removal. Selection of control measures is dependent upon species type, environmental factors, and natural communities impacted. Private contractors conduct exotic plant control activities in cooperation with the District's Vegetation Management Section. In addition the U.S. Department of agriculture has released the lygodium moth and melaueca weevils within the management area; these are biological control agents that have assisted in the control of melaueca and to a lesser extent, lygodium.

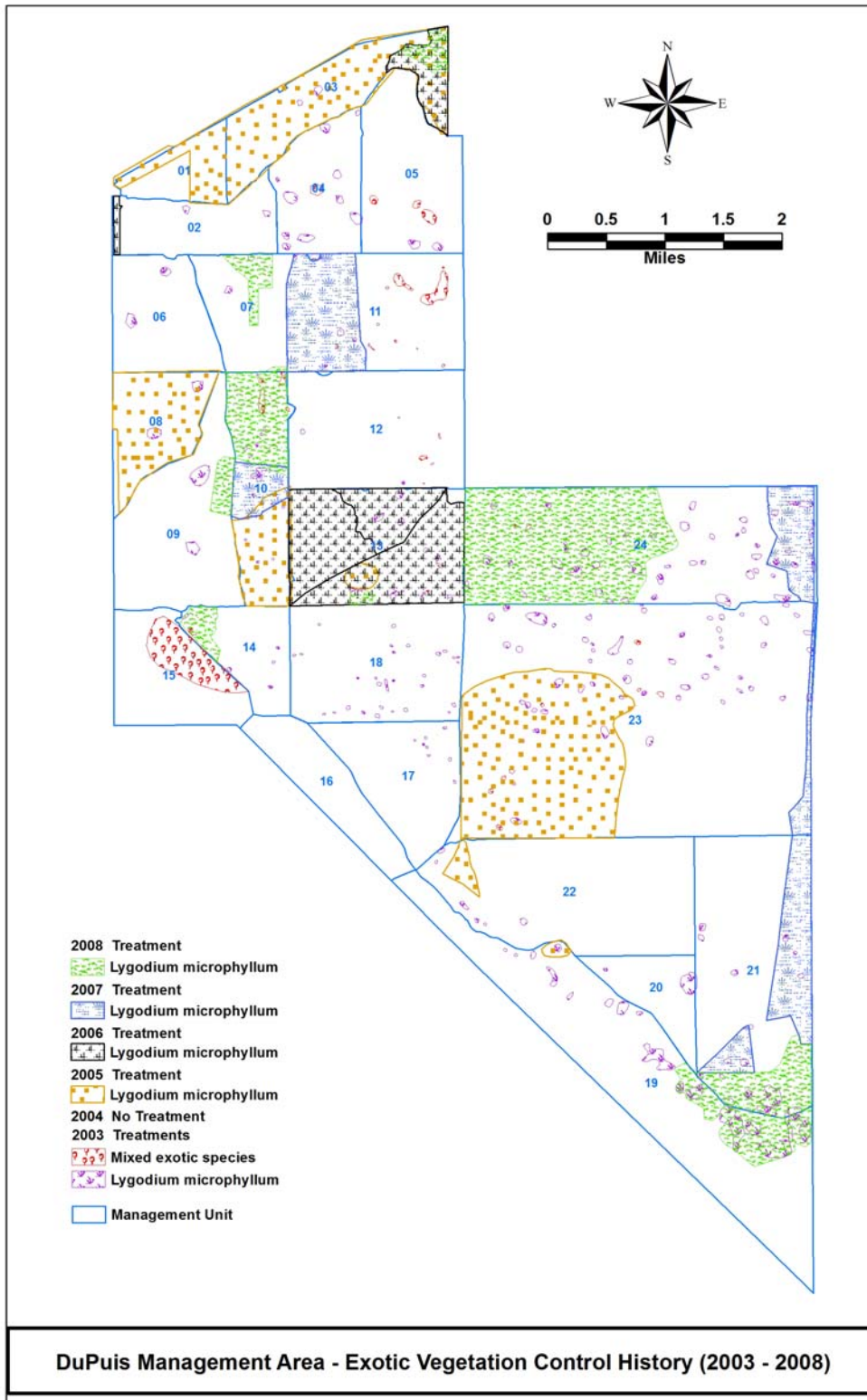
Melaleuca (*Melaleuca quinquenervia*) and Brazilian pepper (*Schinus terebinthifolius*) have received most control efforts since the acquisition of the management area. At present, all large infestations of Melaleuca have been eliminated and scattered young infestations are searched for and treated. Brazilian pepper remains prevalent and continues to require vigilance and control. Over the last decade, Old World climbing fern (*Lygodium microphyllum*) began spreading throughout the area and is now found in all habitat types, though heavy infestations are infrequent due to previous control efforts. This species poses the most significant threat to native plant communities on the property and recent additional funding has allowed aggressive and concentrated control efforts. Presently, Lygodium is sporadically scattered throughout the area and control efforts have significantly decreased

infestations. Because of this, per acre treatment costs are continuing to decrease. However, continued treatment is needed and will be applied to lower the prevalence of this aggressive exotic species into maintenance level.

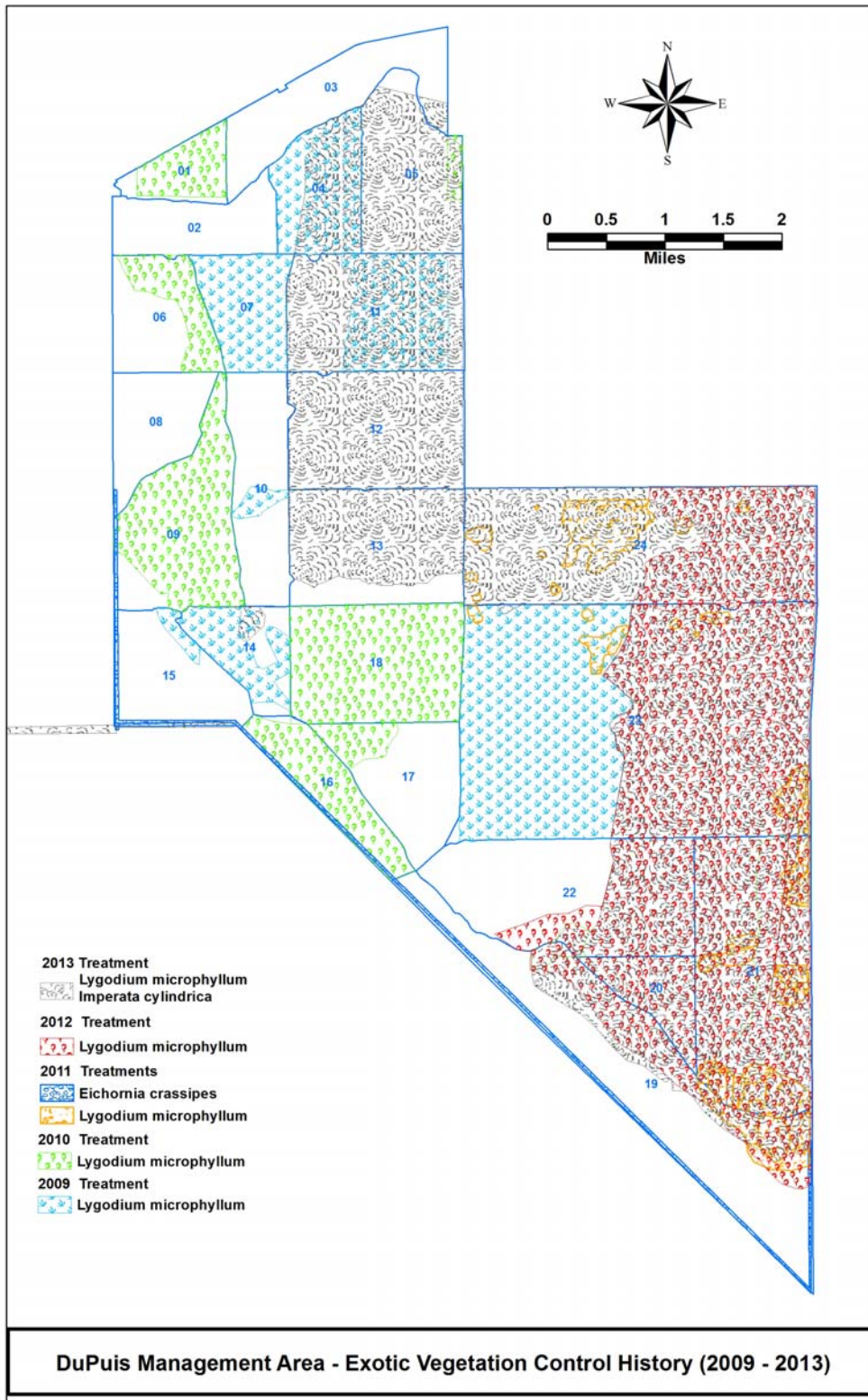
Other terrestrial species such as cogon grass (*Imperata cylindrica*) and napier grass (*Pennisetum purpureum*) are controlled by regular herbicide applications. Water-hyacinth (*Eichhornia crassipes*) and waterlettuce (*Pistia stratiotes*) are present in canals located near the DuPuis marsh and require regular treatment. Smaller localized infestations of West Indian marsh grass (*Hymenachne amplexicaulis*), shoebutton ardisia (*Ardisia elliptica*), Indian laurel fig (*Ficus microcarpa*), bladder pod (*Sesbania sp.*), Primrose willow (*Ludwigia peruviana*) and Ceasar weed (*Urena lobata*) are increasing but are not currently being targeted due to budgetary constraints, but will continue to be monitored.

Exotic plant control is conducted primarily by a contracted crew of applicators, supervised by Land Stewardship staff. District field technicians also provide supplemental support especially on small or sporadically distributed infestations. Generally, treatments are scheduled so that each unit is covered bi-annually, however schedules are adjusted based on current conditions. The District treats and surveys the climbing fern-infested areas several times a year to control established infestations and locate new ones. Areas of treatment are scheduled based on groundwater conditions, time since last treatment, virulence of infestation, public use, and in accordance with other management operations. All treatments follow herbicide Best Management Practices and use the best available science. Treatment dates, locations, and herbicide are noted and recorded in a GIS database. **(Maps 21a-21b)**

**Map 21a. Exotic Plant Control, 2003 – 2008**



**Map 21b. Exotic Plant Control, 2009 – 2013**



### 5.2.2 Rare, Threatened and Endangered Plant Species

*Policy 140-25(2)(b) Particular emphasis shall be placed on the identification, protection and management of rare, threatened and endangered species.*

Listed species are those plants and animals considered rare within a specific geographic area by the U.S. Fish and Wildlife Service, the Florida Fish and Wildlife Conservation Commission, Florida Natural Areas Inventory, or the Florida Department of Agriculture and Consumer Services. The plant list of the management area (**Appendix E**) contain several listed species (**Table 2**).

**Table 2. Plants Occuring in the DuPuis Management Area that are listed by the Florida Department of Agriculture and Consumer Services as Threatened (T), Endangered (E), or Commercially Exploited (C).**

Common Name	Scientific Name	Status
Giant Leather Fern	<i>Acrostichum danaeifolium</i>	C
Pinepink	<i>Bletia purpurea</i>	T
Manyflowered Grasspink	<i>Calopogon multiflorus</i>	E
Satinleaf	<i>Chrysophyllum oliviforme</i>	E
Florida Butterfly Orchid	<i>Encyclia tampensis</i>	C
Threadroot Orchid	<i>Harrisella filiformis</i>	T
Drysand Pinweed	<i>Lechea divaricata</i>	E
Catesby's Lily	<i>Lilium catesbaei</i>	T
Nodding Club-Moss	<i>Lycopodiella cernua</i>	C
Celestial-lily	<i>Nemastylus floridana</i>	E
Giant Sword Fern	<i>Nephrolepis biserrata</i>	T
Cinnamon Fern	<i>Osmunda cinnamomea</i>	C
Royal Fern	<i>Osmunda regalis</i>	C
Blue Butterwort	<i>Pinguicula caerulea</i>	T
Yellow Butterwort	<i>Pinguicula lutea</i>	T
Snowy Orchid	<i>Platanthera nivea</i>	T
Rose Pogonia	<i>Pogonia ophioglossoides</i>	T
Longlip Lady's-tresses	<i>Spiranthes longilabris</i>	T
Southern Lady's-tresses	<i>Spiranthes torta</i>	E
Reflexed Wild-pine	<i>Tillandsia balbisiana</i>	T
Cardinal Wild-pine	<i>Tillandsia fasciculata</i>	E
Twisted Wild-pine	<i>Tillandsia flexuosa</i>	T
Giant Wild-pine	<i>Tillandsia utriculata</i>	E
Simpson's Rainlily	<i>Zephyranthes simpsonii</i>	T

Land Stewardship establishes appropriate fire and hydrologic regimes, and controls invasive exotics in natural communities to benefit plant species. District Public Use Rules aid in the protection of native habitat and specifically prohibit destroying, defacing, or removing any natural feature or native plant on District

lands. In this manner, listed plants are given lawful protection and environmental conditions suitable for their growth and continued existence.

In 1999, a population of state-designated endangered celestial lily, *Nemastylis floridana*, was found in numbers not previously reported in Florida. This population was observed following a prescribed burn in this unit the previous summer. Management efforts to protect this species include prescribed burning every 2-4 years, control of exotic vegetation, and limited public access (foot travel only). Periodic surveys will be conducted to evaluate the species status and determine the effects of management efforts.

### **5.2.3 Forest Resources**

*Policy 140-25(3)(h) Sustainable use of forest resources shall be conducted where these activities adhere to a series of environmental criteria (see 1999 Forest Management Plan) that meet Land Stewardship Program goals. Timber contractors will be required to meet silvicultural Best Management Practices (BMP) developed for Florida forests.*

*Policy 140-25(5)(b)(3) Timber sales will be conducted to improve forest health or to support specific forest management goals.*

District policy designates its properties as multiple-use resources, which include timber harvesting. However, such activity must be compatible with Land Stewardship goals and objectives and meet strict environmental criteria:

- Sites considered for high-density pine plantings are currently in an “improved” or disturbed state (i.e. bahia pasture, existing pine plantation)
- Sites to be harvested are scheduled for hydrologic restoration and existing timber will likely be lost as a result of flooding
- The area does not contain any significant resources (e.g. endangered species) that may be harmed by changes in land use
- Forest operations would not require major road construction or improvement for accessing and processing timber, particularly within or across wetlands or other sensitive plant communities
- The area contains timber that requires salvage following fire and/or insect or disease damage, and could be subject to a sanitation harvest with minimal environmental impact
- The area has special needs for endangered species (e.g., red-cockaded woodpecker) management that requires timber stand improvement
- Harvest or planting would not negatively impact public use
- Timber harvests would return forests to a more natural structure and improved forest health



Several sites on the management area met the criteria for selective thinning, which last occurred in 2007. The thinning of dense stands adjacent to past beetle infestations improves stand health and lessened the chances of additional beetle expansion. All forest management activities were conducted in a manner consistent with good forest management practices and red-cockaded woodpecker recovery plans. There are currently no plans for additional thinning operations during this plan period.

Cabbage palms are also included in forest management planning. Occasionally palms become an unnaturally dense mid-story layer that shades out native vegetation and allows fires to reach pine canopies, often with catastrophic results. Revenue contracts have been utilized to selectively remove cabbage palms from areas where cabbage palms are growing too densely. Palms were individually spaded and the resulting holes were back-filled to required specifications. There are currently no plans for further thinning during this plan period, but land managers will continue to monitor areas where palms are likely to become too dense in the future.

To date timber and palm thinning has occurred in the following areas:

- In 1999, approximately 1200 acres of timber were harvested to salvage bark beetle-killed trees and thin overly-dense stands. This timber harvest also helped to promote and protect potential red-cockaded woodpecker nesting areas.
- In 2002, 180 acres of beetle-impacted former forest and areas of open pasture were planted with slash pine seedlings germinated from DuPuis seed stock. Future plans may include planting portions of the 60-acre citrus grove that had been previously cleared.
- In 2005, approximately 250 acres of over-dense stands of cabbage palms and 500 acres of pine trees were thinned to improve habitat quality.
- In 2006, 745 acres of pine timber were thinned to minimize the impact of a pine-beetle infestation. Additionally, 250 acres of palms were thinned to improve wildlife habitat at DuPuis through revenue generating contracts.
- In 2007, 350 acres of pine timber and 590 acres of cabbage palms were thinned through the use of two revenue generating contracts (continued from 2006).

#### **5.2.4 Agricultural and Range Resources**

*Policy 140-25(3)i Range management and grazing will be considered on improved or native ranges when the introduction of cattle will not conflict with other natural resource management and public use goals.*

Prior to District acquisition, the management area was managed as the White Belt Ranch where livestock grazing was the primary land use. The ranch supported 2500 head of cattle and 2000 sheep and goats at the time of acquisition. There are no plans to reintroduce livestock at this time.

When the District purchased the management area it contained a 60-acre citrus grove maintained by the previous owner for personal use. The District contracted the maintenance and operation of the grove from 1990 to 1998. In 2005 most of the remaining citrus trees were removed when canker was discovered on the north side of the St. Lucie Canal. Several mango, avocado, and lychee trees remain in the grove area.

#### **5.3 Fire**

*Policy 140-25(5)(c)(3) Prescribed fire will be a primary management tool on District lands and will be applied within fire-maintained communities at appropriate intervals.*

The majority of natural communities on District lands rely on frequent fire to maintain their vegetative characteristics and biodiversity. Wildfires no longer occur with historical frequency or extent, and this has altered natural community structure and function. Prescribed fire attempts to mimic the benefits of natural wildfires that historically reduced fuel loads, recycled soil nutrients, and maintained natural communities by inhibiting hardwood encroachment and stimulating fire-adapted plant growth and reproduction. The District recognizes the benefits of fire and has integrated prescribed fire planning and application into its land management strategy.

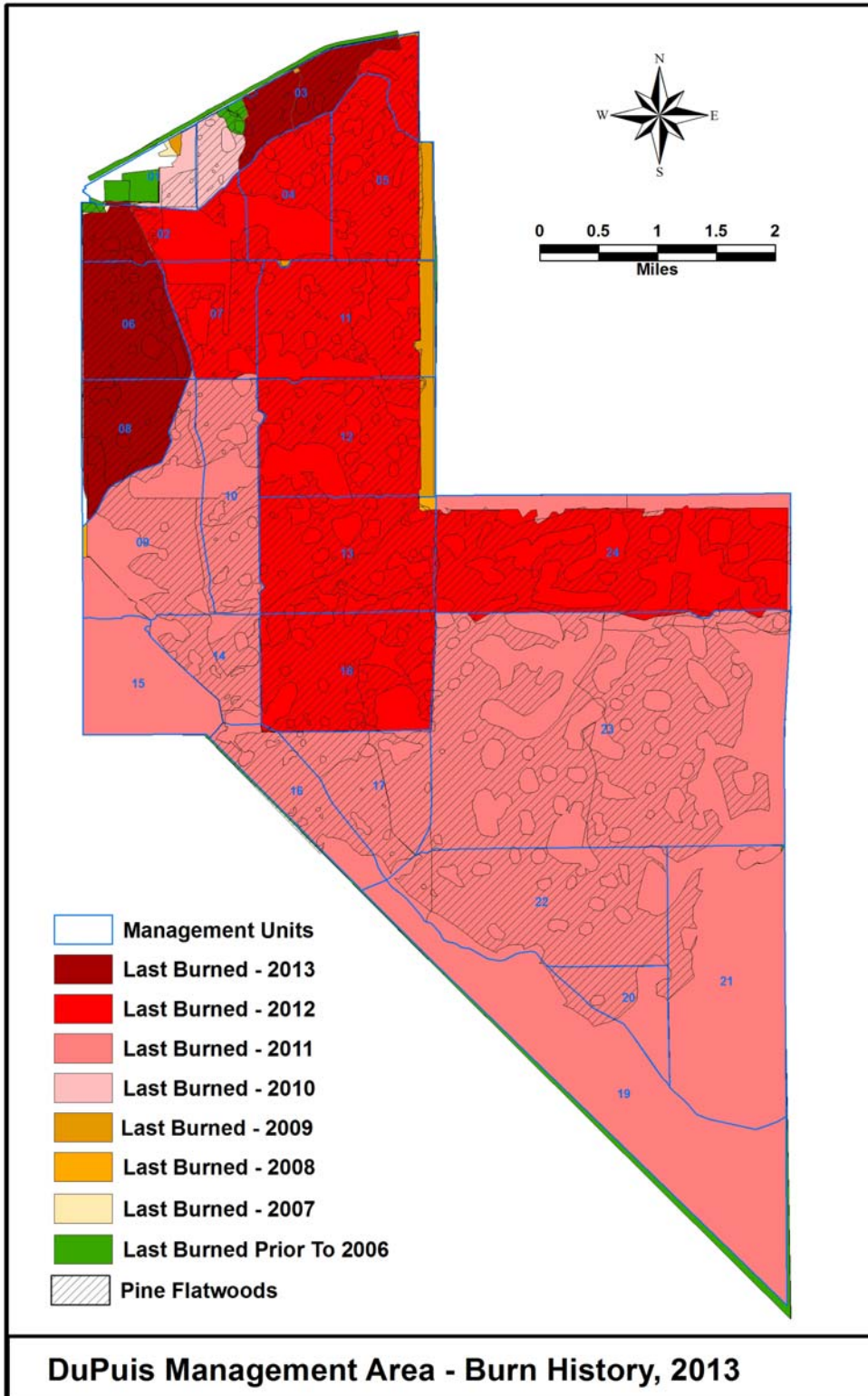
##### **5.3.1 Fire History**

Only limited fire history is available for the management area prior to District acquisition in 1986. Burn history before the mid 1950s is unknown. However, grazing practices for this region indicate native range areas were probably burned regularly to improve forage. From 1955 (date of acquisition by previous owner) until 1980, winter burning was conducted annually throughout the pinelands until pasture improvement began on the western portion in the late 1950s and was completed by about 1970. Burning was not allowed on the improved western portion of DuPuis or on the improved pasture in what is now the L-8 marsh area. From 1980 until 1986, most of the east portion of the management area (east of Cooter Creek Grade) was burned annually each winter after hunting season.

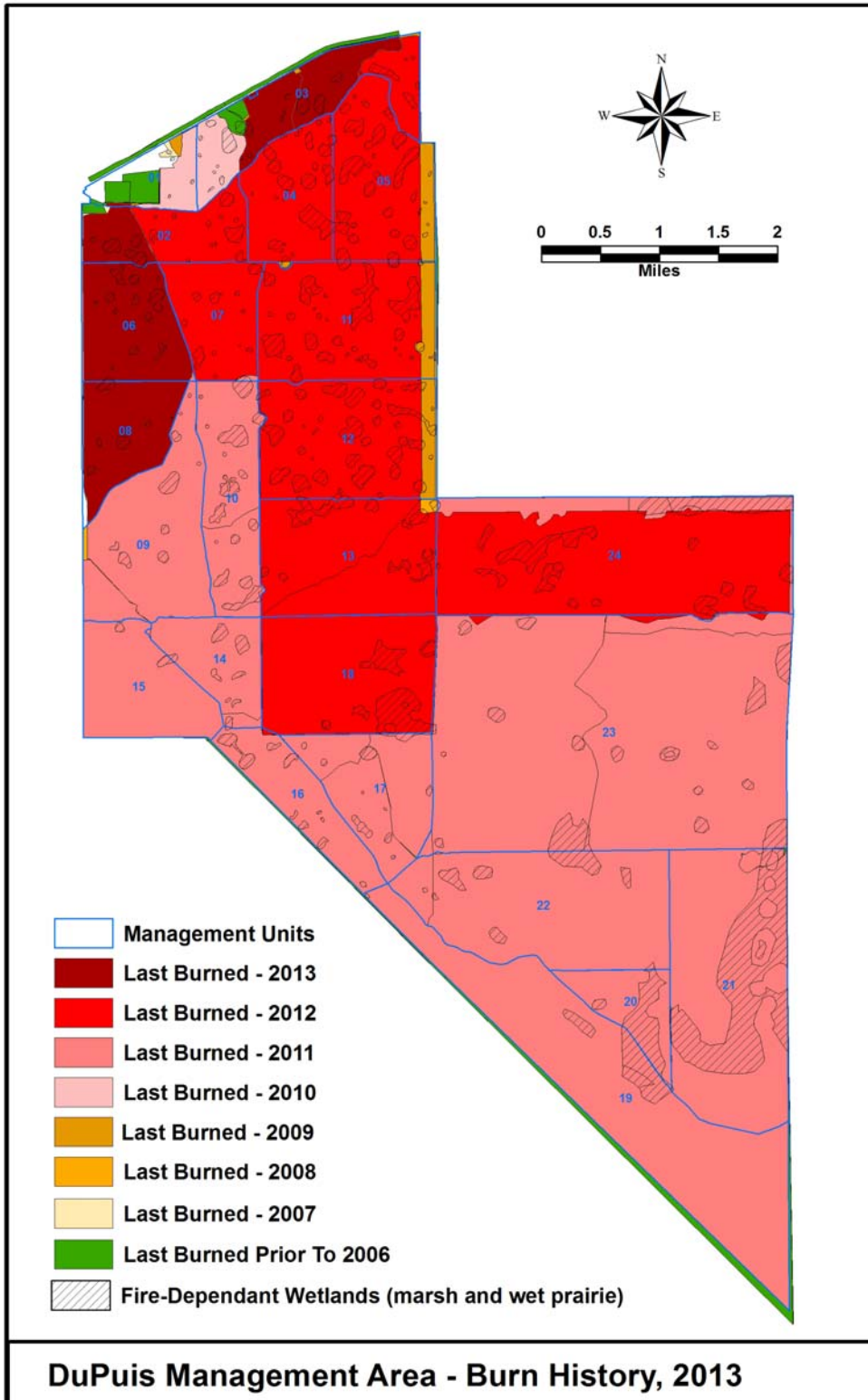
After securing the appropriate side of a grazing unit with a blackline, ranch hands would ride the interior jeep trails setting spot fires or dragging a burning torch. Fires were low intensity, slow moving, and mainly grass fires (personal communication with former ranch manager).

The District's prescribed fire program was initiated in the management area in 1989. Fire data (prescribed and wild) is maintained in GIS to produce historic burn maps of the property and is used for prescribed burn planning purposes (**Maps 22-23**).

**Map 22. Fire History Map for DuPuis Upland Fire-Dependent Communities**



**Map 23. Fire History Map for DuPuis Wetland Fire-Dependent Communities**



### **5.3.2 Prescribed Fire Planning**

Burn units have been established in DuPuis, and seasonal planning considers potential burn areas based on their location, natural community types, fire history, and fire management objectives and constraints. The Land Stewardship Section bases fire management plans on ecological research and professional experience. Fire frequency schedules for each natural community consider recommendations provided in *The Natural Communities of Florida* (Florida Natural Areas Inventory, 1990). To mimic historic fire conditions, Land Stewardship emphasizes growing season burns (April-September) where practical. Natural firebreaks are utilized where possible to promote historic fire patterns, avoid soil disturbance, and reduce hydrologic flow disruption created by fire lines. Listed species life requirements are elements of prescribed fire planning. Application of fire, with appropriately timed herbicide treatments, is used as a tool for the control of exotic and invasive plants.

Burns are executed using methods as defined by the Prescribed Burning Act of 1990, Chapter 590.026, Florida Statutes. This legislation and associated administrative rules outline accepted forestry burn practices and are administered through the Florida Forest Service. Prescribed burns on DuPuis are conducted with a five person prescribed fire crew (Land Stewardship field crew) with assistance provided by other cooperating agency staff— especially the Florida Forest Service and the Florida Fish and Wildlife Conservation Commission. All Land Stewardship staff have completed the state certified burn course to ensure safety and proper technique.

Prescribed fire is applied within the management area at appropriate fire intervals for each natural community. The District concentrates on applying fire to each area of the property in order to reduce accumulated fuel loads, improve habitat, and provide a safer basis for future burns of increased frequency and lower intensity. Planning emphasizes prescriptions targeting control of woody vegetation using low intensity fires to achieve burn objectives. Adjustments to prescriptions are made based on effects of previous burns, with the goal to attain a 2-5 year rotation for flatwoods and 5-10 year rotation for marsh communities.

Large aerial burns have been used since 2004 to reduce the amount of burn preparation (and number of disked firelines), needed manpower, and the overall cost as compared to conducting a larger number of small burns. At DuPuis, aerial ignition can burn, in a single day, an area that would take several days of burning using ground crews alone.

### **Prescribed Fire and Carbon Sequestration**

The District currently stores carbon on the lands it manages in vegetation and organic soils. Each year, the amount of carbon increases as young forests grow and marshes steadily fix carbon into peat. This is also known as carbon

sequestration. It is important to manage the District's land resources in a manner to maximize the amount of carbon that is sequestered, while minimizing carbon dioxide and other greenhouse gas emissions. Prescribed fire is a tool that when used under the right conditions and with the right frequency can increase the rate at which a fire-dependent natural community can grow and store carbon. Following a burn, there is a subsequent spike in primary productivity caused by a release of nutrients and exposure of more surface area to sunlight, as well as post-burn increases of both above and below ground carbon stores.

Prescribed fire guidelines for maximizing carbon storage that the District considers when conducting prescribed burns include:

- Burning at 3 to 5 year intervals
- Conducting late winter burns
- Implementing a proper mop-up phase of the prescribed fire to extinguish smoldering stumps is important to reduce unnecessary carbon and nitrous oxide releases, flaming combustion releases much less carbon than smoldering combustion
- Avoiding muck fires and conditions that lead to muck fires as they release large quantities of carbon and nitrous oxide
- Keeping fuel density low to avoid the possibility of massive carbon releases in wildfire

### **5.3.3 WILDFIRE SUPPRESSION**

*Policy 140-25(3)(d) The Florida Forest Service will be notified of all wildfires on District lands. Land Stewardship will provide initial suppression when commensurate personnel and equipment are available.*

Lightning-caused wildfires are a common occurrence throughout Florida, including the DuPuis Management Area. It is District policy, and state law, that the Florida Forest Service is notified when a wildfire occurs on Land Stewardship-managed properties. Land Stewardship staff assigned to the area respond to and, if appropriate, begin suppression of area wildfires when detected. The Florida Forest Service is called immediately and a fire assessment is made.

If District manpower is available and other conditions are favorable, a permit will be requested from the Florida Forest Service to incorporate the wildfire into a prescribed burn. Although infrequent, allowing these wildfires to burn helps achieve burn objectives and prevents counterproductive and unnecessary suppression efforts. It is recognized that the best wildfire mitigation for the management area is to maintain the area with frequent prescribed fires which promote a healthy open forest with light fuel loads.

## 5.4 WILDLIFE MANAGEMENT

A primary land management priority on DuPuis is to maintain healthy fish and wildlife populations. Land Stewardship accomplishes this in several ways:

- Performing land management activities that maintain and/or improve native wildlife habitat
- Conducting specific management practices to benefit protected species
- Conducting wildlife inventories through a partnership with the Florida Fish and Wildlife Conservation Commission and prohibiting activities that have the potential to negatively impact listed species
- Following management guidelines for listed species protection as determined by the *Multi-species Recovery Plan for the Threatened and Endangered Species of South Florida, Volume 1*, (U.S. Fish and Wildlife Service. 1998)
- Reducing non-native pest species populations where appropriate
- Maintaining a master file of confirmed and potential wildlife species
- Cooperating with the Florida Fish and Wildlife Conservation Commission on wildlife management issues, including wildlife inventories and evaluating management actions.

Wildlife management in the management area is directed toward maintaining native species diversity consistent with the biological community types present. The Florida Fish and Wildlife Conservation Commission plays a lead role in wildlife management in the management areas by:

- Managing public hunts in a manner that provides sustainable game populations
- Releasing and monitoring wading bird, bobwhite quail, deer, and eagle populations
- Relocating and monitoring the red cockaded woodpeckers that have been translocated into DuPuis from donor sites
- Assisting the District with prescribed burns (recommendations, manpower, equipment, etc.)
- Posting of informational and regulatory signage
- Enforcing environmental and public use regulations

### 5.4.1 Game Management

*Policy 140-25(4)(b)(4) Florida Fish and Wildlife Conservation Commission regulations shall govern hunting in areas opened for such use.*

The DuPuis Management Area has been established as a Wildlife and Environmental Area by the Florida Fish and Wildlife Conservation Commission. The Commission administers several hunting seasons for deer, turkey, feral hogs, small game, doves, and migrating game birds. Management activities directed towards game management include establishing bag limits for game species, regulating hunting pressure, mowing openings for wildlife, assisting in vegetation



management activities, and providing hunting related law enforcement support. The Commission also maintains a small planted dove field on a previously disturbed portion of the area.

#### **5.4.2 Exotic/Invasive Animal Species**

Wildlife pest species are those non-native species that are harmful to native wildlife, that negatively impact native vegetation and wildlife or interfere with management objectives. The Land Stewardship's goal for wildlife pest management is to reduce populations to attain an acceptable level of impact to natural plant and animal communities. The District's Land Manager uses monitoring, visual observation, and and consultation with the Commission to define an acceptable level of impact. When population control measures are warranted, land managers consult with the Commission to determine effective and appropriate control techniques. The effects of pest population control efforts are monitored by periodic site evaluations.

The feral hog is a pest species that occurs within the management area. Disturbance caused by this species negatively impacts natural communities and interferes with land management operations. Although valued by some members of the public as a game animal, the feral hogs' high fecundity, adaptability, rooting behavior, omnivorous diet, and ability to quickly colonize areas raises environmental concerns. Their disruption of soil and vegetation alter natural communities and can be especially damaging in sensitive habitats that are slow to recover. Hog disturbance has occurred within most of the management area including wetland communities. Land management objectives are affected when rooting disturbance disrupts prescribed burns by preventing the spread of fire. Areas of disturbed soil are also more susceptible to exotic plant invasion. Rooting can also damage hiking trails, have a detrimental impact on small animal populations, and ground-nesting birds, and can damage infrastructure.

Feral hogs are harvested through recreational hunting on the management area in accordance with rules and regulations established by the Florida Fish and Wildlife Conservation Commission. Public quota hunts conducted in the fall and non-quota hunts during the small game and hog hunt seasons are the primary method of hog population control at this time. The number of permitted hog hunters has been increased over the years by adding additional hog hunts and removing quotas that limited the number of hunt participants. The increase in hunting pressure has helped to further control hog numbers and provide additional hunting opportunities. Public hog hunting will continue to be an important use of the area and will be looked upon as the preferred hog population control method. Presently, rooting disturbance occurs in the area but is considered to be at an acceptable level. Any additional control methods will be determined in cooperation with the Commission.

Other exotic fish and wildlife have been identified on the management area including the armadillo, brown anole, two-spotted cichlid, Cuban tree frog, coyote, iguana, Eurasian collared doves, Norway rats, and house mice. No control programs have been implemented for these species, as such actions have been determined to not be necessary.

#### **5.4.3 Rare, Threatened and Endangered Animal Species**

*Policy 140-25(2)(b) Particular emphasis shall be placed on the identification, protection and management of rare, threatened and endangered species.*

Several listed wildlife species are present or have been observed historically on the management area. Potential impacts to these species from planned land management and recreational activities are of special concern. Activities that might jeopardize the well being of these species are evaluated carefully and may be altered or cancelled if necessary. District land management activities including prescribed burning, hydrologic restoration, exotic vegetation eradication, understory control, and selective forest thinning improve natural environmental characteristics that benefit listed species as well as a variety of other indigenous wildlife. Special management attention is given to the area's bald eagle population and the reintroduction of the red-cockaded woodpecker.

The recommended buffer zones have recently been reduced from a 1500' radius to a 660' radius around the nest site (USFWS, 1987; USFWS, 2007; FWC, 2010), however because of the size of the DuPuis property, the District is able to keep disruptive land management activities the original 1500' distance away from active eagle's nests. This includes keeping nearby prescribed burns and smoke away from nest trees. Recreation activities are also modified to minimize disturbances in nesting season. When non-breeding season burns are conducted, nest trees are protected by cutting vegetation around the tree base to limit fire intensity. The Bald Eagle was de-listed from both the Federal and State imperiled species lists in 2007 and 2008 respectively, but this iconic species continues to be protected under other laws such as the Bald and Golden Eagle Protection Act and the state of Florida's Eagle Rules.

Several old red-cockaded woodpecker tree cavities scattered throughout the management area indicate there was probably a sizeable resident population at one time. The last active cavity was destroyed by wildfire in 1989 at which time birds were no longer observed on the area. A program is currently underway to reintroduce this species. In preparation, several land management activities were conducted to restore suitable habitat and protect remaining old growth slash pine trees. Heavy-duty mowing of overgrown understory, and selective thinning of pines and cabbage palms restored the open forest structure preferred by these birds. Frequent prescribed burning and the control of invasive exotic vegetation have maintained the open forest. Reintroduction sites were identified and artificial cavities were inserted into specific trees capable of supporting artificial

nest cavities. The translocated birds are being monitored by a Florida Fish and Wildlife Conservation Commission biologist to document movements, survival, and nesting success. At the time of publication, 71 birds have been introduced since the fall of 2006. These birds have fledged a total of 31 chicks. The management activities for red cockaded woodpeckers include:

- Annual inspection, maintenance, and installation of artificial cavities
- Monitor nesting activity and band young each spring
- Surveys at various times throughout the year to locate and identify individuals
- Surveys to find locations for new cavities
- Translocation of birds onto DuPuis from donor sites

**Table 3. Listed Animal Species: (T) Threatened, (E) Endangered, (SSC) Species of Special Concern**

Scientific Name	Common Name	Status	
		Fed	State
<i>Aramus guarauna</i>	Limpkin		SSC
<i>Caracara cheriway</i>	Crested caracara	T	
<i>Drymarchon corais couperi</i>	Eastern indigo snake	T	
<i>Egretta caerulea</i>	Little blue heron		SSC
<i>Egretta thula</i>	Snowy egret		SSC
<i>Egretta tricolor</i>	Tri-colored heron		SSC
<i>Eudocimus albus</i>	White ibis		SSC
<i>Falco sparverius paulus</i>	Southeastern American kestrel		T
<i>Gopherus polyphemus</i>	Gopher tortoise		T
<i>Grus canadensis pratensis</i>	Florida sandhill crane		T
<i>Picoides borealis</i>	Red-Cockaded Woodpecker	E	
<i>Mycteria americana</i>	Wood stork	E	
<i>Pituophis melanoleucus mugitus</i>	Florida pine snake		SSC
<i>Sciurus niger shermani</i>	Sherman's fox squirrel		SSC

## 6. Public Use

*Policy 140-23 The Land Stewardship Program mission is to provide natural resource protection and management while allowing compatible multiple uses on designated public lands.*

Section 373.1391 (1)(a) Florida statute states that wherever practical, lands acquired by the District shall be open to the general public for recreational uses. The District encourages public use of management areas for appropriate natural resource-based activities. All District lands are available for public use, except in

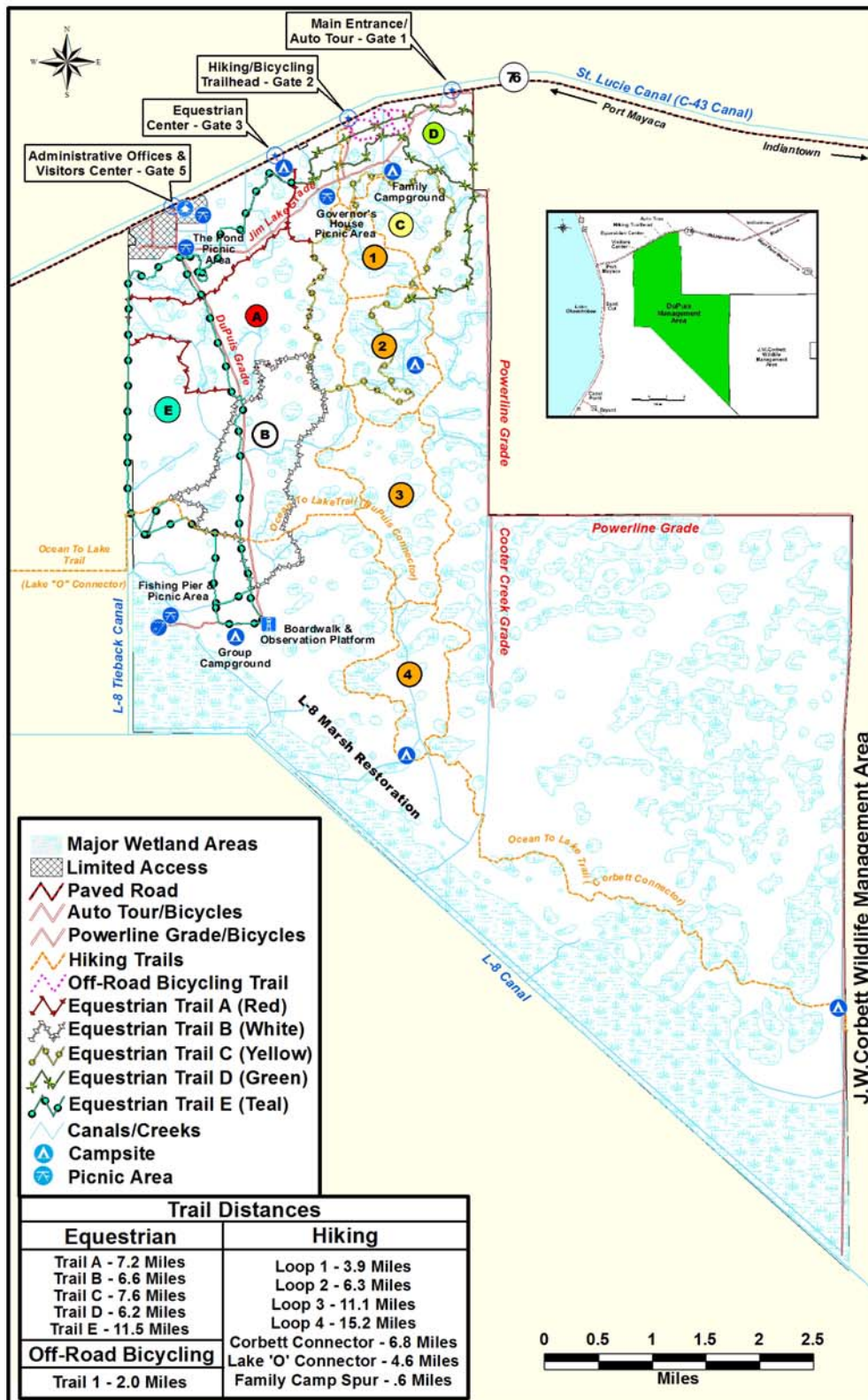
rare instances where there is no legal public access or where lease restrictions or construction activities prohibit public entry. Public input into the management of the area is solicited at quarterly Water Resource Advisory Committee Recreational Issues Workshops. Adjustments to public use opportunities are made on an ongoing-basis through the Recreational Issues Workshops and through amendments to the 40E-7, F.A.C., public use rule. This plan addresses public use matters only to describe the scope of public use opportunities available or planned as of the date of the plan, it is not intended to set public use policies through the plan period.

The determination of compatible public uses is based on the following criteria:

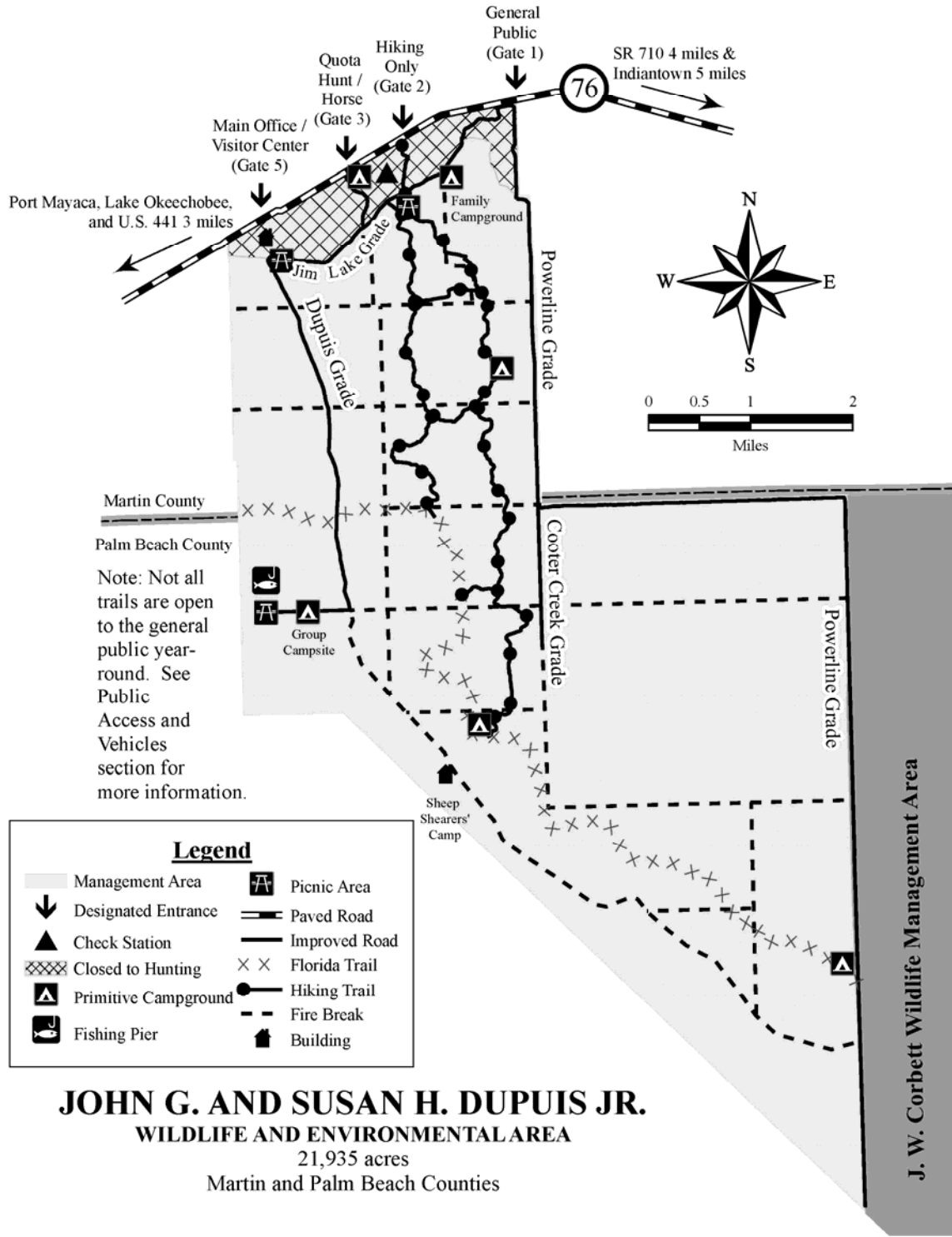
- Consistency with the reason the lands were acquired
- Restrictions and/or prohibitions imposed by easements, leases, reservations, purchase agreements, and other legal mandates
- Infrastructure and support facility requirements, such as fences, gates, signage, entry design, stabilized off-road parking, trails, campsites, maintenance, and other operational and budgetary impacts
- Opportunities for persons with disabilities
- Limitations on use resulting from endangered species, other sensitive natural resources, archeological resources, or land management practices
- Public health, safety and welfare
- Protection of resources

A wide variety of recreation activities are appropriate and encouraged in the management area including bicycling, mountain biking, canoeing, camping, equestrian use, fishing, hiking, amateur astronomy, geocaching, and hunting. Approximately 20 miles of interior roadway, 22 miles of hiking trails, and over 40 miles of equestrian trails provide access for public use. A self-guided auto tour along Jim Lake and DuPuis Grades highlight points of interest and management activities. A short trail with a boardwalk has been constructed off the DuPuis Grade, providing access through a nearby cypress dome community which enhances public use of this area. Campsites available include a family campground, an equestrian campground, a group campsite, and three backcountry sites. A public visitor's center at the DuPuis office and a fishing pier site off DuPuis Grade are handicapped accessible. Most of these sites have been significantly upgraded with new picnic shelters, landscaping, self-composting toilets, and other amenities. There are four access points to the management area for public use (**Maps 24 – 25**). User information concerning recreational activities is located at the DuPuis Management Area and West Palm Beach offices, and at each entrance to the management area. Information is also available on the District's recreation website and printed Recreation Guide.

### Map 24. DuPuis Recreation Opportunities



**Map 25. DuPuis Wildlife and Environmental Area**



## **6.1 Resource Protection**

*Policy 140-25(1)(d) Public use shall not result in detrimental impacts to water resources. When a public use activity produces detrimental effects on water resources, it shall be discontinued until an evaluation determines that such use is compatible.*

*Policy 140-25(3)(g) Resource protection shall be provided by professional law enforcement services through funded and unfunded contractual agreements to safeguard the public and protect natural and cultural resources on District-managed natural areas.*

*Policy 140-25(4)(b)(1) Public use regulations are set forth in 40E-7.511, Florida Administrative Code, to implement Section 373.1391(1)(b), Florida Statutes. Accordingly, the District shall publish and make available to the public a "Recreational Guide" for designated land management areas.*

Regulations that govern activities within the management area are in the District's 40E-7 rule and the Commission's DuPuis Wildlife and Environmental Area regulations. The 40E-7 rules are available at agency headquarters in West Palm Beach and on the District's website. Allowed activities include hiking, fishing, boating, canoeing, camping, hunting, geocaching, equestrian use, biking, and nature study. The Florida Fish and Wildlife Conservation Commission is responsible for enforcing laws, rules, and regulations applicable to the management area, along with the local county sheriffs' offices.

Management of public activities on District lands requires a commitment to resource protection while simultaneously promoting all appropriate public uses. The District emphasizes the enforcement of pertinent rules and regulations to protect natural resources and enhance recreation opportunities. The resource protection program integrates law enforcement to protect the natural resources and District assets. As part of the establishment of the area as a Wildlife and Environmental Area by the Commission, law enforcement officers conduct regular patrols throughout the year, increasing their presence during hunting seasons and at other times when public use is high. Law enforcement surveillance protects natural and cultural resources, deters illegal activity, and safeguards the public. Patrols are conducted with 4-wheel drive vehicles, all terrain vehicles, aircraft, and on foot. The Land Stewardship Section's law enforcement coordinator reviews biweekly reports and meets with officers to structure patrols based on resource needs.

Resource protection is also greatly enhanced by the establishment and maintenance of posted fence lines that delineate property boundaries. The management area perimeter is fenced and posted in its entirety, and is maintained and repaired as necessary.

## **6.2 Environmental Education**

Educational programs are developed and implemented on select management areas by cooperators interested in promoting increased visitor awareness and appreciation of area natural and cultural resources. A central theme to these programs is the vital role of water management in maintaining our natural resources.

A section of the main office building and part of the surrounding grounds have been developed into a visitor's center and environmental education area. Additional parking areas were constructed to accommodate school buses for larger visitor groups. The District is working through a contractual agreement with Florida Atlantic University's Center for Environmental Studies to provide educational programs. An indoor exhibit room and lobby contain interpretive information as well as diorama-like displays of native communities and animals. Outdoor areas contain interpretive signage along a short trail through planted natural communities representative of those found on the management area. The visitor's center is open on weekdays to area users and also accommodates specialized programs for larger school groups.

## **7. Administration**

Administration of District land management is directed through the Land Stewardship Section. Policy decisions, planning and budgeting, procurement of personnel and equipment, contract administration, and issues of program development are administrative tasks coordinated through the Section. Input is provided from the public and regional land managers located at District Service Centers, Field Offices, or Field Stations over the 16-county area. Regional land managers handle regular administrative duties from their field locations to assure quick response to local concerns and management issues. Administrative activities for the management area are handled through the DuPuis field office.

### **7.1 Planning and Budgeting**

Planning is a major function of the Land Stewardship mission and is critical to maintain proper program focus, direction, and coordination with other agencies. Planning is accomplished by section planning staff in coordination with land management staff. Section-level planning produces the Land Stewardship Activity Report for the Florida Forever Workplan, and coordinates land acquisition planning with other District and outside agency personnel.

*Policy 140-25(6)(b) General Management Plan: Provides a description of recommended management and is required for each Land Stewardship Management Area. The GMP follows a designated format and is updated every ten years.*



General Management Plans are developed that detail strategies to guide management activities on individual project areas. These plans define goals and objectives, identify major management issues, and describe management activities. Each plan is subject to a draft revision period where public comment and professional review is requested prior to plan approval. Each plan is revised on a ten-year cycle by planning team and land management staff.

*Policy 140-25(5) The District will secure dedicated funding sources, personnel and other resources to support program goals and objectives. Project funding needs and sources for cooperative management agreements with government and non-government entities will be identified during acquisition. A cooperative management agreement will designate a lead manager and identify whether District funding is required.*

The principal sources of funding for land management operations include revenue from commercial and agricultural leases, revenue generated from mitigation banks and interest earned on offsite mitigation funds, and ad valorem tax revenue. Historically, the Water Management Lands Trust Fund, administered by the Florida Department of Environmental Protection, had been the primary source of land management funding. Additional funding and support has been obtained from grants, the harvest of renewable resources, in-kind services from cooperating management partners, and no-cost services from user groups and volunteers.

Budget planning begins in November during the work planning process for the following fiscal year (October-September). Overall funding availability generally determines management activities. Site-specific priorities are generated and submitted by the regional land managers. Budget distribution among the District's five land management regions is based on a programmatic prioritization of management needs.

The continued operation and maintenance of the DuPuis Management Area includes costs to cover staffing, ongoing operational and land management expenses, and capital refurbishment/replacement of aging infrastructure and equipment. Capital infrastructure needs are determined by infrastructure condition and anticipated continued serviceability over the next fiscal year. Priorities for capital refurbishment/replacement are made on a District-wide basis. It is anticipated that several infrastructure features will require refurbishment/replacement during this plan period, these features include: the bathroom building and barn roofs at the equestrian campground, replacement of equipment sheds and pole barns in the shop compound, and other minor features such as septic systems and air-conditioning units.

The operational and land management expenses for FY 2014 are included in **Table 4**, below. Contracted Land Management Services include contracts with the Florida Fish and Wildlife Conservation Commission, the Department of

Corrections (inmate labor for needs such as trailhead maintenance and fence repairs), and the Florida Center for Environmental Studies. Operational Expenses include supplies, janitorial services, septic service, business travel, and safety equipment. Public use costs are generally the maintenance costs associated with public use facilities. Site Security represents costs associated with contracted law enforcement services which currently are not budgeted for on DuPuis. It is anticipated that budget needs for the management area will increase during this planning period due to increased contracting costs and the need for infrastructure replacement as identified in Section 2.1 of this plan.

**Table 4. Operational and Land Management Expenses for Fiscal Year 2014.**

DuPuis	FY2014 Budget
Contracted Land Mgt. Svcs	\$209,000
Utilities and Operational Expenses	\$83,071
Equipment and Infrastructure Maintenance	\$31,000
Exotic Species Control	\$160,000
Vegetation Management	\$81,350
Public Use	\$29,000
Site Security	\$0
<b>Total</b>	<b>\$593,420</b>

## 7.2 Infrastructure

*Policy 140-25(3)(k) Infrastructure support shall be developed and maintained to provide safe access for responsible management and public use on District lands. Such infrastructure may include access points, roads, trails, signs, utilities, and minimal public facilities.*

Current infrastructure which requires regular maintenance includes recreation access points and trailheads, perimeter posting and fencing, firelines, hiking trails and roads, parking areas, kiosks, camp sites and rest rooms, the field office and visitor center, the equestrian center, and other structures.

## 7.3 Personnel and Equipment

The District is separated into five geographic regions, each staffed with professional land managers and technicians who are supervised by a Section Leader. The Land Stewardship Section administrator, recreation staff, and planning staff are headquartered at the main West Palm Beach office.

Stewardship of the management area is the primary responsibility of the District's East Coast senior land manager, who supervises an administrative assistant, a crew chief, and three land management technicians. The DuPuis staff manages an additional 34,389 acres of land throughout the East Coast land management region including Allapatta, Mecca, the Loxahatchee River, Cypress Creek, and portions of PalMar and the Atlantic Ridge. Additional management input and support comes from District planning and Field Station personnel, as well as the Vegetation Management Section. Staff has access to tools, supplies, four-wheel drive vehicles, fire suppression trucks, all terrain vehicles, swamp buggies, bull dozers, tractors, and other heavy equipment.

#### **7.4 Volunteers and Alternative Work Force**

*Policy 140-25(5)(d)(1) Volunteers, interns and alternative work forces will be used when possible to supplement existing staff and services.*

Section 373.1391(3) F.S. encourages the District to use volunteers for land stewardship and other services. The District recognizes the merits of volunteerism and welcomes participation in activities appropriate for public involvement. In Fiscal Year 2013, District lands benefited from 10,000 volunteer hours, or \$217,900 worth of volunteer services (using a \$21.79/hour national average for the value of volunteer service). Volunteer activities help accomplish management objectives, promote citizen involvement, and allow area staff to focus on other tasks. At DuPuis, the Loxahatchee chapter of the Florida Trail Association regularly provides volunteer services to maintain the Ocean to Lake Trail and the four other hiking trail loops onsite. The Florida Center for Environmental Studies coordinates a substantial amount of volunteer services including student service learning opportunities, and activities through the Friends of DuPuis. The DuPuis Horsemen's Association provides volunteer assistance in the maintenance of the equestrian facilities and trails. Land Stewardship also utilizes a volunteer campground host at both the equestrian and family campgrounds. Other volunteer services have been provided by the Eagle Scouts, and several other individual volunteers.

#### **7.5 Contractual Management**

*Policy 140-25(5)(a). The private sector may be solicited to furnish certain management-related facilities and services through the execution of leases and agreements. These leases/agreements will assure mutual benefits to both the District and private parties and be consistent with the program management objectives.*

Effective operation and management of District properties requires the services and cooperation of private organizations, other governmental agencies, and volunteers. Contractual relationships are formalized through management

agreements signed by both the District and contracting entity with the document defining the responsibilities of each party.

The District has established and maintains several contractual management agreements to assist with the cost and management of DuPuis which, at the time of this publication include:

Agreement #1  
4600000961

This is a contractual multi-site agreement that authorizes the Florida Fish and Wildlife Conservation Commission to perform land management and public recreation services on District-owned properties, including the DuPuis Wildlife and Environmental Area.

Agreement #2  
C89-0065

A Memorandum of Understanding with the Florida Trail Association to maintain the segment of the Ocean to Lake Trail that passes through the management area.

Agreement #3  
3600000804

The District entered into a cooperative agreement (originally contract number C-12559) in April, 2000 with Florida Atlantic University's Center for Environmental Studies to develop a public use and education program at the management area visitor center. The agreement includes interpretive trail and sign development, supervision of volunteers, conducting service learning projects, and site maintenance.

Agreement #4  
OT051110

A Memorandum of Understanding with the DuPuis Horsemen's Association to help maintain the equestrian trail system and equestrian campground at gate 3.

Agreement #5  
4600002826

An agreement with the Florida Department of Corrections to provide inmate labor for land management and infrastructure maintenance. The agreement covers DuPuis and other lands within the East coast Land Management Region.

## **7.6 Management Review**

Policy 140-22(j) Section 373.591, Florida Statutes, mandates the District to solicit input on current management programs through professional peer reviews.

A land management review team is identified for each project area with a General Management Plan. These ad hoc teams are comprised of state, county, and private entities that periodically review management activities to assure they are consistent with acquisition intent and program objectives. Management assessments are conducted in light of the goals and objectives defined in the area's general management plan and are scored on a scale of 1 to 5 with a '1' meaning the management is insufficient and a '5' meaning the management is extremely effective. If the review team determines that management is insufficient in any area, attaining an average score of less than 3.0, then the District is to provide a written explanation to the review team along with proposed corrective actions.

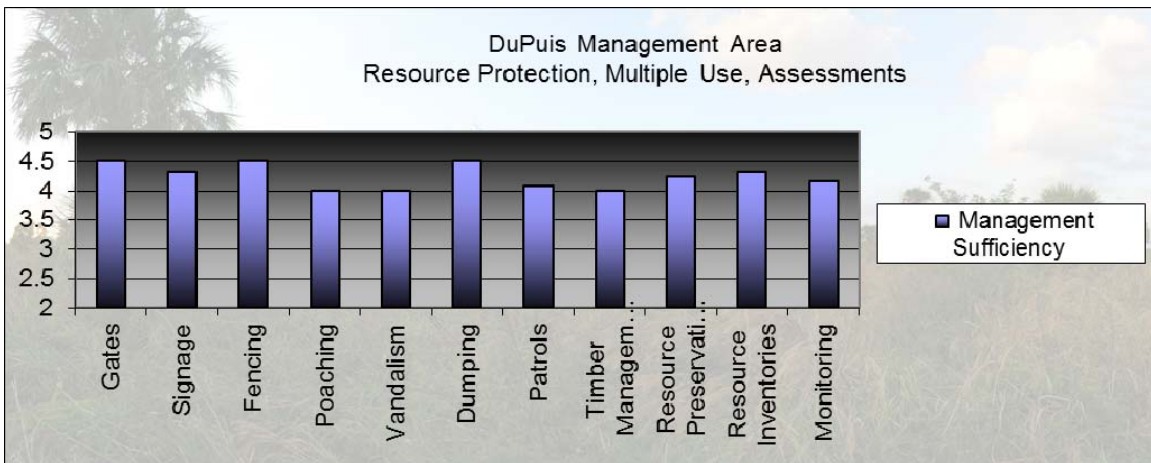
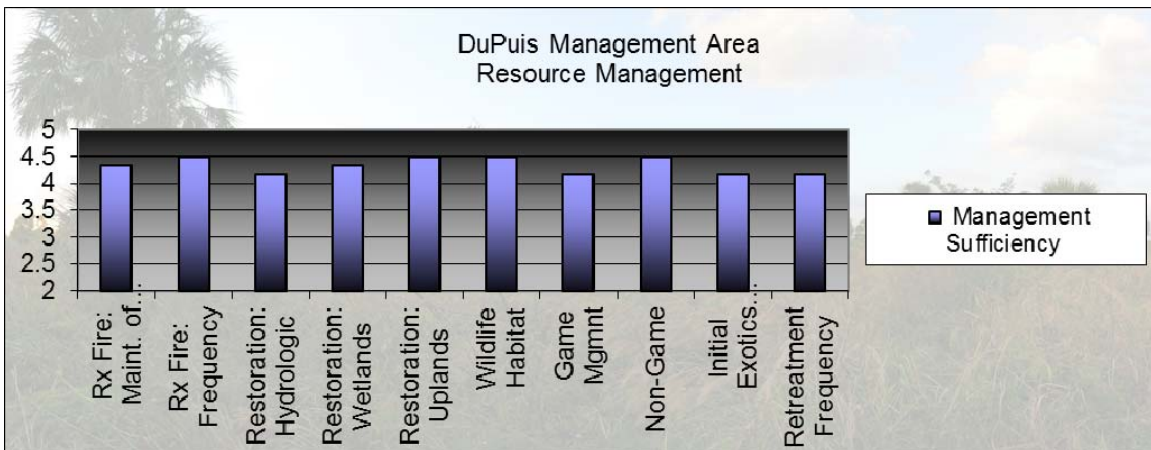
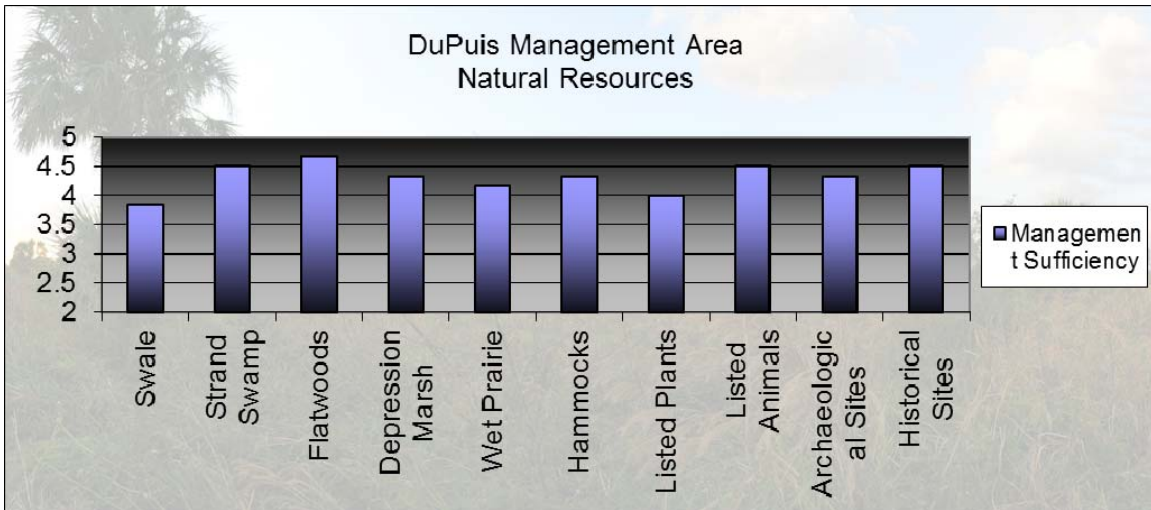
A management review of DuPuis was conducted in November, 2013. The review team provided comments on the condition of the land and scored the District's management of the site.

Positive comments were received on the prescribed fire program including that most of the sites have been burned on schedule for many years with good seasonal variability. Positive comments were also provided on the availability of diverse public use opportunities provided free-of-charge.

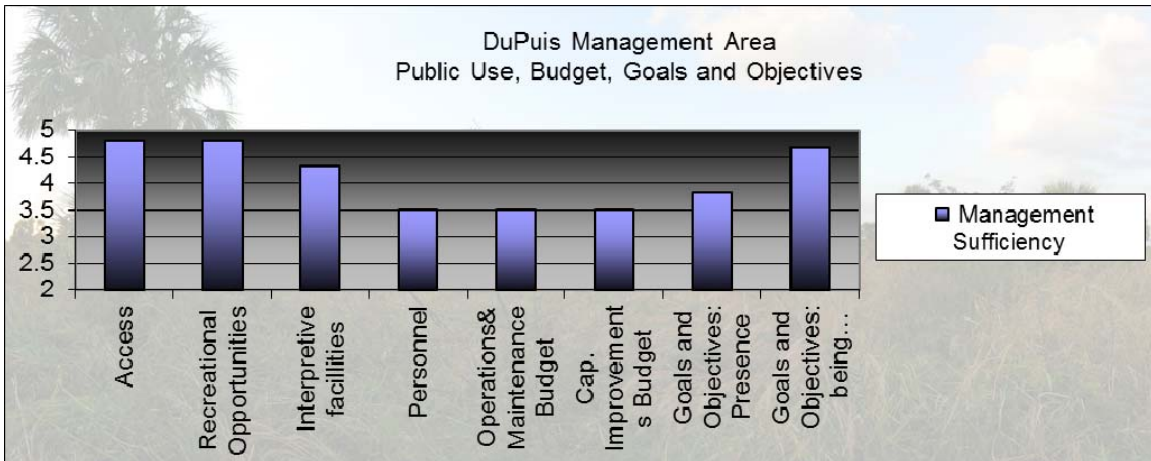
Several team members expressed a desire to see further work on hydrologic and understory restoration. One member of the management review team commented that the plan could better address poaching and vandalism issues. One member stated that the environmental education goals should be explicitly stated in the plan.

The team rated the overall management of the land on criteria such as: the natural resources, resource management activities, public use, budget, goals and objectives, resource protection, multiple use, and biological assessments and monitoring. The average scores by category are indicated on the graphs below:  
Adherence

DuPuis Management Area General Management Plan 2014 through 2024  
 South Florida Water Management District, Land Stewardship Section



DuPuis Management Area General Management Plan 2014 through 2024  
South Florida Water Management District, Land Stewardship Section



The average score for the 2013 for the condition of the Natural Resources was 4.3; Resource Management was 4.3; Resource Protection, Multiple Use, and Assessments was 4.2; and Public Use, Budget and Goals and Objectives was 4.1. The relatively low scores received in the categories of Personnel, Operations & Maintenance Budget, and Capital Improvements Budget reflect the review team's recognition of the District's current budgetary challenges.

## **Appendix A**

**History of the DuPuis property.** Steve Farnsworth. Unpublished report to the SFWMD. 2003.

The DuPuis Reserve has a long history of human usage. The southern border of the reserve is part of a physiographical feature known as the Loxahatchee Scarp. Within a half mile distance, the sandy soils of the pine flatwoods at 20 to 25 feet in elevation drop down to the mucky soils of the Everglades sawgrass marshes at elevations below 15 feet (USGS 1971). Shallow wet prairies occupy the transitional areas. Upland areas in close proximity to large water bodies were attractive sites for early Americans, who would establish seasonal camps and permanent settlements in hammocks accessible by water. There are four known archeological sites, all located along the southern edge of the site (Wheeler 2000). Most of the sites are located in close proximity to sloughs that flow into the Everglades. These sites are associated with the Belle Glade culture and have the pottery, circular and linear earthworks, and the reliance on freshwater resources that characterize this culture. The presence of shark teeth, shell tools, sea turtle remains, and chert artifacts indicate that the inhabitants of these sites had trade networks with coastal areas and central Florida.

Site 1 contains a circular ditch feature nearly 900 feet in diameter. It is believed to have been constructed between 1000 B.C. and A.D. 200. Human habitation in the hammocks associated with the ditch appears to have continued until A.D.1100. Site 2 was a small crescent-shaped earthwork with a pair of linear earthworks extending southwards from the crescent. The earthworks have been obliterated by grazing sheep and cattle. Human habitation in the nearby hammock at this site was believed to be short-lived. Site 3 is in a large hammock and is believed to be a village or hamlet midden with a long period of occupation. There are no earthworks associated with this site and human habitation is believed to have ceased around A.D. 1100. Site 4 is a conical sand mound with outlying crescent-shaped earthworks. It is believed to be a burial mound and was in use into the Spanish contact period (Wheeler 2000).

The only historical account of the native Americans that lived near the reserve comes from Hernando d'Escalante Fonteneda, a Spanish shipwreck survivor taken captive as a young boy by the Calusa tribe in 1545 and rescued by Jean Ribault seventeen years later. He later wrote a account of his captivity, which was translated by True (1944). Fonteneda mentions a tribe called the Mayaimi which occupied the area north and east of the Lake of Mayaimi (present-day Lake Okeechobee). The Mayaimi had a major town called Guacata, which was located somewhere near present-day Pahokee, and numerous small settlements around the lake. The Mayaimi were probably the last users of the DuPuis Reserve burial mound.



The population of the Mayaimi declined rapidly in the early 1700s, as they were decimated by European diseases, slave raids, and warfare with other tribes. In the 1740s, a Spanish mission was established near present-day Miami. Documents related to this mission indicate that the “Maymies, Santaluzos (St. Lucie), and Mayacas “ had united and were living four days journey from the mission in the interior (Hann 1991). The Mayacas were originally from the upper St. John’s River area in Volusia County, but may have been forced to move south because of raids from tribes to the north in the English colonies. The Mayaca tribe is believed to be the origin of the name of Port Mayaca.

The native American inhabitants of southern Florida are believed to have mostly disappeared by 1760s. The few survivors are believed to have traveled to Cuba with their Spanish allies in 1763 when Florida became a British colony, or have been absorbed into the Seminoles. In the early 1700s, native Americans from the Creek and Cherokee tribes in Georgia and Alabama began to move south into north Florida. This movement accelerated in the early 1800s. These native Americans were being pushed out by white settlers or were on the losing side of a civil war among the Creek tribes. They welcomed runaway black slaves, who joined them as freed allies, or became subject to the native Americans in a less onerous form of slavery. This agglomeration of tribes became known as the Seminoles which was derived from a word meaning “wild“ in their language. Conflicts between white settlers in and the Seminoles and their black allies would lead to three periods of open warfare known as the Seminole Indian Wars after Florida became a U.S. Territory.

In the First Seminole Indian War in 1817-18, the Seminoles were forced out of North Florida. A disputed treaty confined them to a reservation in the interior of central and south Florida. After a drought and famine in 1825, the Seminoles and their black allies began to return to their old lands in central Florida and came into conflict with white settlers. In 1830, the U.S. Congress passed the Indian Removal Act, which gave the government the authority to forcibly remove native Americans in Florida and other states to the Indian Territory, which is present-day Oklahoma. Some of the Seminoles reluctantly moved, but were unhappy with the poor quality of the land and having to share a reservation with their old enemies in the Creek tribes. Others refused to leave and tensions mounted between the U.S. Army, white settlers and the Seminoles (Robison and Andrews 1995).

In late 1835, the Second Seminole Indian War began. The Seminoles ambushed and wiped out a column of U.S. Army soldiers under Major Dade, and attacked and burned sugar plantations along the east coast of Florida. The army retaliated by attacking and burning Seminole villages in central Florida, and building a series of forts. The Seminoles rarely attacked forts and large groups of soldiers, but engaged in guerrilla warfare with hit and run tactics, picking off a few soldiers here and there. The Army, with an enemy that would rarely stand and fight, concentrated on destroying Seminole villages and crops, and capturing

women and children to send to Oklahoma and runaway slaves to return to their owners (Robison and Andrews 1995).

At first, the Seminoles and their allies outnumbered the troops sent to fight them, and the war went badly for the U.S. Nearly half of the small U.S. Army was sent to Florida, along with often unreliable state militia units, and the tide of the war began to turn. By late 1837, virtually all of the remaining Seminoles had retreated to south Florida. The U.S. Army's commanding officer, General Thomas Jesup, divided his forces into four columns that moved southward from central Florida. A column under the command of future president Zachary Taylor encountered a large group of Seminoles at the north end of Lake Okeechobee and fought them in the Battle of Okeechobee on December 25, 1837. Colonel Taylor's men forced the Seminoles to retreat, but took far greater casualties (Hutchinson and Paige 1998).

General Joseph Hernandez's column came down the east coast of Florida, with a small naval force operating on the Indian River lagoon. The army column established Fort Pierce as a base of operations, while the naval forces explored the rivers and waterways. General Jesup's troops went to Fort Pierce for resupply, then moved west to join General Eustis' forces at Fort Lloyd. The combined columns moved southeast into northwestern Martin County, where they joined Col. Taylor's troops and constructed Fort Van Swearingen. General Eustis and Jesup continued southeast, and would fight the Battle of the Loxahatchee on January 24, 1838 (Hutchinson and Paige 1998). Col. Taylor's men moved south along the east shore of Lake Okeechobee and built Fort McRae on the north side of the mouth of the present-day St. Lucie Canal. It is believed that a small river entered the lake at that location, as such a river is present in an 1838 map (USDW 1838). Rifles dating to the Seminole Wars period were reportedly dredged up during the construction of the St. Lucie Canal, further supporting the location of Fort McRae. Fort McRae was little more than a rough cabbage palm trunk stockade designed to store supplies and house a small garrison to defend the supplies. It was used for only a short time, and was then abandoned.

After the Battles of Okeechobee and the Loxahatchee River, many of Seminoles displaced by these battles retreated to the area of the DuPuis Reserve, where they tried to live off the land. They quickly depleted the local game animal population, and there was no time to plant crops and little in the way of natural plant foods to gather. The area encompassing DuPuis and the adjacent J. W. Corbett Wildlife Management Area became known as the "Hungryland". The starving Seminoles were induced to camp near Ft. Jupiter under a flag of truce when General Jesup told them that he would try to obtain permission for them to stay in Florida on a reservation. They established a camp to about a mile from the fort under the flag of truce. In April, a letter arrived from Washington denying the request for a reservation. General Jesup ordered his men to quietly surround the Seminoles and take them captive. His reputation was already

damaged from capturing the Seminole leader Osceola under a flag of truce, so he may not be concerned about additional damage. He feared that there would be many more deaths of soldiers and Seminoles if he honored the flag of truce and allowed the Seminoles to leave. Over five hundred Seminoles were shipped out from Jupiter to Oklahoma (DuBois 1981).

In 1842, the Army declared the Second Seminole Indian War to be over and an uneasy truce was maintained between the white settlers, the Army and the Seminoles. In 1855, the Army began harassing the Seminoles again, and two more years of fighting ensued. A new Fort McRae was built as a base for patrols (Hutchinson and Paige 1998). In 1858, Billy Bowlegs, the Seminoles' main chief at that time, was induced to move to Oklahoma with his followers. Just before the Civil War started, the Army gave up on trying to capture the remaining 300 or so Seminoles (Robison and Andrews 1995). The network of wooden forts, including Fort McRae, was abandoned, and quickly disappeared under the twin attacks of termites and wildfire. The Seminole Indian Wars would be one of the longest and most costly native American conflicts in U.S. history.

After the Third Seminole Indian War ended, the Seminoles slowly emerged from their hideouts deep in the Everglades. A settlement was established near present-day Indiantown, and in 1898, Joe Bowers established a trading post where he would trade store goods for animal skins. He would later plant citrus and establish the Bowers Groves. That same year, Francis and Annie Platt established a cattle ranch near present-day Indiantown. Mr. Platt named the settlement "Annie" after his wife and it was granted a post office with him as postmaster in 1902. In 1902-3, Mr. Platt and his sons cut a wagon road from Annie to Stuart, which they called the Stuart-Annie Road. This road would eventually become today's State Road 76 or Kanner Highway. Annie became Indiantown in 1917 when the post office was renamed (Hutchinson and Paige 1998).

In 1902, a group of New Orleans investors, the Southern States Land and Timber Company, purchased approximately two million acres of land around Lake Okeechobee from the State of Florida for fifty cents an acre. The purchase included large areas of western present-day Palm Beach and Martin Counties, and virtually all of the DuPuis Reserve except for the low-lying areas along the present-day L-8 Canal. Southern States was primarily a real estate investment company. It did start cutting the old growth pine trees on its purchase, although in the absence of railroads, the sawmills had to be initially located on Lake Okeechobee, where water could be used to transport the logs (Hutchinson and Paige 1998).

The railroads, however, were apparently interested in serving the area. By 1911, the Indiantown area had enough white children (they were the only ones receiving public education at that time) to warrant a public school. Of the three families sending children to the school, two were listed as railroad engineers

(Hutchinson and Paige 1998). It is not clear what the engineers were doing, but the railroads would not come to the area until the 1920s.

In 1914, the U.S. Army Corps of Engineers proposed a canal to link the St. Lucie River on the east coast of Florida with the Caloosahatchee River on the west coast, and connecting to Lake Okeechobee in the middle. There was heavy local lobbying in favor of the canal. This canal has been called various official names, such as the Cross-State Waterway, and the Okeechobee Waterway, but for purposes of this history it will be referred to by its local name, the St. Lucie Canal. The dredging contract for the canal was signed on February 19, 1915, and the work began on May 28th (Hutchinson and Paige 1998), starting at the lake. It is believed that the western end of the canal at Lake Okeechobee was located in a natural small river that flowed into the lake. Some Seminole War-era military maps show a small river entering the lake in the vicinity of the canal (USDW 1838). Small tributaries that emptied into the lake were common and Will (1984) noted eight “dead rivers” between Clewiston and Belle Glade. 1940 aerial photographs of the reserve and vicinity (USDA 1940) show what clearly appears to be a creek leaving the canal and circling south of the Port Mayaca cemetery before petering out in the extreme northwest corner of the preserve. Another small creek is visible just east of the western reserve property line.

Spoil deposition patterns also support the river hypothesis. The spoil was deposited on the northern bank of the canal and the 1940 photographs shows very little spoil present until the western border of the reserve is reached. It is possible, however, that the spoil near the lake was removed for road or railroad building purposes. The path of the canal also supports a river route. The western end of the canal north of the reserve has a very convoluted route, as does the eastern end where it joins the South Fork of the St. Lucie River. The middle of the canal, where there were no streams to follow is very straight and linear. In any case, if the canal followed the route of some former “Mayaca” River, that river is now gone.

A small “dipper” dredge made the initial cut for the canal, creating a channel wide enough for a larger suction dredge to follow. The suction dredge “Northwood” was still digging the canal in 1916 (Hutchinson and Paige 1998), and a dam burst on the canal in November 1916, indicating that work was still ongoing. An event summary by the Stuart News (Hutchinson and Paige 1998) indicate that the first water flowed from Lake Okeechobee through the canal on June 13, 1923, and the authors state the canal was widened in 1923, although no other sources support this claim. The St. Lucie Canal was definitely widened in the mid-1930s, and was completed on March 22, 1937, with new lock construction in 1940 eliminating the island in the canal near the lake. The 1940 aerial photographs show fresh spoil has been deposited on the north side of the canal, but the island is still present. The great hurricane of 1928 drowned several thousand persons around Lake Okeechobee when the lake overtopped a low levee. The federal government’s response to this was to build a huge dike

around the lake, and widen the St. Lucie Canal and the Caloosahatchee River to dump water from the lake. The Stuart News reported that a contract to widen the canal again for \$1,276,000 was let on June 11, 1948 (Hutchinson and Paige 1998). The final design specifications for the canal are believed to be 200 feet wide at the top, 160 feet wide at the bottom, and a minimum depth of twelve feet, although some maps show the depth as eight feet (USGS 1953).

World War II would prove to be the heyday of the St. Lucie Canal. Barges and small ships used the canal to avoid being exposed to German U-boat attacks if they rounded the southern tip of Florida in the open ocean. After the war, commercial use declined, with recreational and fishing boats becoming the main users of the canal. The construction of the canal had major impacts to the hydrology of the northern portions of the reserve. The canal would have been controlled at or below the water level in the lake, which averages around 15 feet. According to the topographic maps (USGS 1971, 1953), the historic wetland (and groundwater) elevation in the northern part of the reserve was 25 feet. Since the canal lowered the ground water elevation by at least 10 feet at the canal, and by decreasing amounts with distance from the canal, it is not surprising that the 1940 photographs show the wetlands within 3/4 of a mile of the canal as being partially dried up and suffering from a decreased hydroperiod. The groundwater drawdown continues today.

The construction of one form of transportation often stimulates the construction of another form, and that certainly happened near the DuPuis Reserve. According to Hutchinson and Paige (1998), a \$120,000 bond issue was approved on August 12, 1919 for county roads between Stuart and Lake Okeechobee. A 1921 Palm Beach County road map (Carr and McFadden 1921) shows a dashed line paralleling the south side of the St. Lucie Canal from Jupiter-Indiantown Road to the lake, but the map legend is not clear whether this is just a proposed road, instead of a real road. A 1923 road map (H.C. Fugate 1923) shows the road present as a graded dirt road. A 1926 Martin County road map (Associated Map Co. 1926) shows the road present as an improved road, which means it had been surfaced with shellrock. The 1926 map still shows the road as Stuart-Annie Highway, although it would be later renamed as Gaines Highway in honor of the Palm Beach County Commissioner Henry Gaines, who worked for its improvement.

The original 1920s road was built just south of the St. Lucie Canal, and may have been rendered unsafe by the 1930s canal widening. The State of Florida took over responsibility from maintaining the road in 1931, designating it State Road 76. The State built a new road farther south of the canal in the late 1930s (the present-day road) as a result of lobbying by A.O. Kanner, a Martin County legislator and judge. The road was renamed Kanner Highway after his death in 1976 (Hutchinson and Paige 1998). The 1940 aerial photograph shows both the old and new roads present. The older side roads connect to both roads, while the newer side roads only extend to the new road.

During this time, the Southern States Land and Timber Company had not been idle with its lands. It would sell land to anyone who met their price, and sold a large tract to the St. Lucie Land Company as early as 1904. (Hutchinson and Paige 1998). The secretary of the company, George Bensel, established an office in West Palm Beach and ran its south Florida operations for 48 years. The company is credited with laying the groundwork to drain the Everglades and pioneering the planting of sugar cane, cutting roads and trails on its lands, opening the area to ranchers, and introducing the first pure-bred cattle in Martin County. The Southern States Ranch was established by 1920 on the north side of the St. Lucie Canal in Section 13 west of the reserve. The ranch was located in the transitional area between the Everglades and the pine flatwoods, and shows up on the 1921 road map (Carr and McFadden 1921). A road ran northeastward from the ranch for approximately five miles until it joined the old Indiantown to Okeechobee graded road. The 1940 aerial photograph shows several buildings where the ranch should be located, and a cleared pasture area to the west. The road leading to Indiantown appears to be falling into disuse, as there is another road leading south to the north bank of the St. Lucie Canal, and then westwards to Conners Highway.

A number of trails appeared on the Southern States lands in the early 1920s, but it is not clear who constructed them. One trail, known as the Hungryland Trail, traversed the DuPuis Reserve from its northwest corner, at first running south and then turning southeasterly and running through the pine flatwoods just north of the edge of the Everglades. It exited the reserve at the southeast corner near Big Mound. At Big Mound, the trail was renamed the Big Mound Trail and continued southeasterly until it terminated at the intersection of present-day Okeechobee Road and "A" Road in Loxahatchee Groves. These trails appear to be little more than wagon roads. There is no evidence of actual road construction, such as the digging of shoulder ditches and the piling of fill in the middle to create an elevated roadway. It appears that the trails sought to traverse the highest open ground, and trees and palmettos were cut and removed only as necessary. The Hungryland Trail is first present on the 1921 road map (Carr and McFadden 1921), and is also present on the 1923 H. C. Fugate map and the 1926 Associated Map Company Map.

This trail appears on aerial photographs and topographic maps from 1940 to the present, and is still present on the reserve. The portions west of the DuPuis Grade are little-used and have become overgrown, but the portions east of the grade are still passable by four-wheel drive vehicles. The old trail is variously used as a management road, equestrian trail, or as part of the Florida Trail hiking trail in different portions of the reserve, although few persons are aware of its name or origin. The 1920s-era maps also show another trail crossing through the reserve. This unnamed trail departed from the Hungryland Trail about two miles west of Big Mound, and then arced northwestward through Sections 14, 10, 3, 4, and 33. It curved back northeastward towards Indiantown

in Section 33 and then through the present-day citrus groves north of the reserve. Traces of this trail are visible in the 1940, 1957 (USDA 1957) and 1965 (PBCPA 1965) aerial photographs and the 1971 topographical map (USGS 1971), with the most consistent trace in the eastern portion of Section 33, where the trail may be used today as a management road. Since construction of the Cooter Creek ditch in the 1940s would have severed the trail, the other portions of the trail may have fallen into disuse early and become overgrown.

It is not clear who made these trails or when they were cleared. The Hungryland Trail continued north of the reserve to connect to the old Indiantown to Okeechobee graded road. This seems to indicate that it predates the St. Lucie Canal which was dug in 1915, as there is no indication of a ferry or ford to cross the canal. This northern section appears to have fallen into disuse after the canal was constructed, although the construction of present-day Kanner and Connors Highways may be responsible for this. However, the Big Mound Trail connects to the roads in Loxahatchee Groves, which were not built until 1917. It does seem likely that the trails were created sometime in the 1910s. They do not show up on maps until the 1920s, but none of the 1910s maps showed any trails, including those known to be present prior to 1910.

Although the trails were largely on Southern States' land, it is not believed that the company cleared them. The Hungryland Trail passes almost one mile east of the Southern States Ranch. If the company had built the trails, they would have presumably connected to the Southern States' facilities. The 1920s maps all show an agricultural settlement at Big Mound, where the land was divided into 40-acre tracts. It seems more likely that the trails were built by the residents of Big Mound for access to other population centers, possibly with the blessings of Southern States. They gradually fell into disuse when better roads were constructed nearby.

In 1923, William "Fingy" Connors bought large amounts of land around Lake Okeechobee, and began building a toll road to provide access to the land. Beginning at Twenty Mile Bend, the road followed the West Palm Beach Canal northwestward to Canal Point, and then northwards around the Lake to Okeechobee City. The road was hailed as an engineering marvel and was completed in 1925 at a cost of \$1.8 million dollars. This road is located two miles west of the reserve along the lake shore, and is the present-day U.S. Highway 441/98. It is still known as Connors' Highway. Although the toll was 3 cents a mile, the road averaged \$2,000 per day in tolls. The 1926 road map shows a toll station just south of the St. Lucie Canal (Associated Map Co. 1926). After Connors' death in 1929, Palm Beach County acquired the road, abolished the toll, and turned it over to the State Road Department.

Also in 1925, the Florida East Coast Railroad was constructed 1.5 miles west of the reserve. This railroad had reached Okeechobee City in 1915 and was extended to Canal Point in 1925 and Belle Glade in 1928. The primary purpose of

this railroad extension appears to be to haul produce from the Everglades Farming regions to northern markets. An examination of the 1940 aerial photographs shows no sidings or structures that appear to be sawmills, and it is not believed that this railroad played any role in the logging of the reserve.

A competing railroad was nearing Indiantown about the same time. Although sources vary on whether the Seaboard Airline Railroad reached Indiantown in 1924 or 1925, the railroad and associated companies were active in the area in 1924 (Hutchinson and Paige 1998). The Seaboard railroad was run by S. Davies Warfield, a Baltimore banker. In 1924, the Land Company of Florida, which was controlled by Warfield, bought 100,000 acres in the Indiantown area from Southern States, as well as the Platt cattle ranch. Warfield had grand plans for Indiantown. He planned to make it the southern headquarter for his railroad, with an elaborate passenger station and a roundhouse for turning around the engines. The railroad laid out the first streets, built houses and a school, built the Seminole Inn as a social center for the new town, and converted a proposed sawmill building into railroad offices and apartments.

The Seaboard railroad abandoned Warfield's plans after his death in 1927. The Land Company of Florida ran into financial difficulties when the Florida land boom collapsed and announced that it was abandoning its \$4 million dollar investment in Martin County in 1930 (Hutchinson and Paige 1998). It sold its remaining land to the Indiantown Development Company in 1937. Sometime in the late 1920s, Warfield Highway was constructed along the north side of the Seaboard tracks from just east of Okeechobee City to Indiantown. The State took over responsibility for the road in 1931 and designated it State Road 710 (Hutchinson and Paige 1998). The old Indiantown to Okeechobee graded road that ran south of the railroad tracks fell into disuse, and portions were eliminated by orange groves and the Martin Power Plant reservoir. Only a three mile segment west of Indiantown is present today and it used for access to the orange groves on the north side of the St. Lucie Canal.

Although Indiantown did not become the grand city envisioned by Warfield, it did become the focus of the logging activities in the area. Cut pine trees were brought to the sawmills at Indiantown where they were cut up and loaded on the train. Since the reserve was at least six miles from Indiantown, it was a lower priority for logging. Indications are that the reserve was not logged in a systematic or organized pattern, but on a kind of hit or miss fashion, with the easiest trees harvested. It is believed that the reserve was logged in the 1930s, although logging may have continued into the 1940s. The cut trees would have been hauled out by trucks via present-day Kanner Highway. Slash pines can be identified on the 1940 aerial photographs (USDA 1940), and the photographs do not show the virtual absence of trees seen in other areas of Palm Beach County that were logged in the 1930s.



In 1925, the Phipps family purchased 6,500 acres of with five miles of lake frontage from “Fingy” Conners. This land included the four-mile western border of the reserve, which is currently occupied by sugarcane fields, citrus groves and vacant land. The Phipps had big plans for a grandiose city at Port Mayaca, but the bank financing disappeared and the plans were dropped. Prior to 1925, Port Mayaca was just a wide place in the road where the St. Lucie Canal entered Lake Okeechobee. In 1927, the Phipps formed Bessemer Properties to develop their holdings, primarily as an agricultural enterprise. The land was divided into 20-acre blocks and windbreaks of Australian pines planted. Citrus was the main crop, and Bessemer was among the first to use pumps to control water levels with the groves (Hutchinson and Paige 1998). The operation was a financial success.

The headquarters for the agricultural operation was on present-day Kanner Highway, just west of the Florida East Coast railroad tracks. The 1940 aerial photograph shows several large buildings near the railroad track, a water tower, and numerous workers’ houses lined up in neat rows. The rusting water tower is still present with Port Mayaca still readable on its side. The workers’ housing is long gone. This agricultural complex formed the majority of Port Mayaca, with the rest being scattered houses, a lodge, and a general store on the lakeshore ridge south of the St. Lucie Canal. Bessemer platted the Osceola Groves subdivision on the land west of Section 31 in the reserve in the mid 1940s. Perimeter dirt roads were built and the land divided into acre-plus lots. The subdivision was not successful, with most of the lots remaining unsold and no houses built. The perimeter roads for the subdivision are visible in the 1948 aerial photograph (USDA 1948).

The Port Mayaca cemetery on the northwestern corner of the reserve was reportedly established in the early 1920s. Approximately 1,600 victims of the 1928 hurricane are buried there in a mass grave (Hutchinson and Paige 1998). The City of Pahokee handles the administration of the cemetery, and it is the major burial site for residents of the Glades area, being the closest stable (non-muck) soil area. Some initial tree plantings and access roads are visible in the 1940 aerial photograph (USDA 1940) and increase in subsequent photographs.

Martin County was formed in 1925 out of the northern 17 miles of Palm Beach County and a small piece of coastal St. Lucie County. Stuart area voters were incensed when Palm Beach County announced a \$6 million dollar road bond issue in early 1925, but planned to spend less than \$250,000 of it in the Stuart area. They felt that they were continually getting less than their fair share of County benefits, and were tired of it. At first the legislation authorizing the new county was going nowhere, primarily because of opposition from West Palm Beach interests. The Stuart interests tried a new plan - proposing to name the new county after Governor John Martin. The plan worked, as the governor threw his support behind the legislation. Both Martin County and Indian River counties were created on May 19, 1925 (Hutchinson and Paige 1998). The

northern four miles of the reserve were part of the new county. Stuart was named the interim county seat. The Seaboard railroad interests pushed to have Indiantown named the permanent county seat, but gave up on this after Mr. Warfield's death in 1927.

Very little happened in the vicinity of the DuPuis Reserve in the 1930s other than the widening of the St. Lucie Canal and the construction of a new State Road 76. A 1937 Dolph's land atlas shows the land ownership in the reserve in Palm Beach County. Chase National Bank owned almost all of the northern two miles of the reserve. The Glades Land Corporation owned the land all along the southern edge of the reserve, while Southern States only owned six sections in the east central portion. The State Board of Education owned Section 15. The section of land containing Big Mound is shown as being divided into 40-acre sections. Although Southern States had sold most of its ownership in the reserve at that time, it bought back many of its properties for delinquent taxes during the Depression (Hutchinson and Paige 1998), and regained ownership at a later date.

The 1940 aerial photographs give the first comprehensive look at the reserve and its vicinity. To the west, the Bessemer groves and buildings are well-developed, and what appears to be a landing strip is present just west of Section 30. The Hungryland Trail is clearly visible and heavily used, with a few side trails branching off from it. Several large agricultural clearings are visible along the trail in the southern portions of the reserve, primarily west of Big Mound. Smaller clearings found in the central portion of the reserve appear to be associated with the unnamed trail to Indiantown, which is hard to distinguish on the photographs. The clearings appear to be associated with shallow wet prairie systems, and are probably a form of farming practiced at the time called "pothole" farming. Shallow wetlands would be planted with crops like tomatoes at the beginning of the dry season. These wetlands would be close enough to the water table to stay moist and keep the crops growing without irrigation, and were free from soil-borne diseases. By the time the wet season returned and water levels rose, the crops would have already been harvested. Pothole farming at the reserve seemed to stop shortly thereafter, possibly because World War II dried up the labor available.

Furrows, berms, and ditches are clearly visible in the 1940 aerial photographs, and remain visible on subsequent photographs and topographic maps into the 1970s. The farmed areas today appear to be densely vegetated with slash pine or pond cypress, who find the altered wet prairies favorable for colonization. This response is consistent with that seen on similarly-farmed areas in Palm Beach County. Along the northern edge of the reserve, the understory vegetation has been cleared in the area that would become the farmed fields around the reserve office building, and the wetlands appear partially dried up. Short trails radiate south and east from the cleared areas. A short entrance road extends southeast from SR 76, with a building present at the southern end. Another structure is

visible nearer SR 76, by it is not clear whether this is a corral or some other building. This entrance road would become the main entrance to the reserve and the building was expanded into the first ranchhouse.

In November 1944, Southern States Land and Timber sold 20,439 acres of land to Robert Chastain of Canal Point. This land includes most of the northern and central portions of the reserve, and included the land that would become citrus groves east of the reserve. It did not include the southern portions of the reserve, or the northern two miles. In 1946, Chastain purchased the 610 acres containing the current reserve office and farmed fields from Malcolm and Beatrice Chace. This gave him access to SR 76 from the western portion of his property. Also in 1946, Chastain purchased Section 15 from the State Board of Education for \$50 an acre. In 1942, U.S. Sugar Corporation purchased a large amount of land from Glades Land Corporation, including the southern portion of the reserve. In 1949, U.S. Sugar sold this land to Robert Chastain along with some other inholdings owned by U.S. Sugar in the land he had already purchased. As part of this purchase, Chastain acquired most of the four sections in the northeast corner of the reserve, almost all of the southern border, and five sections of muck land below the present-day L-8 Canal. After this last purchase, Chastain owned all of the reserve except the three sections in the southern tip.

By the end of 1948, Chastain had constructed most of the basic infrastructure on the reserve. The infrastructure is visible on aerial photographs from December 1948 (USDA 1948) and March 1949 (USDA 1949). The aerial photographs show that the ranchhouse building has been expanded, and a small building and tree plantings are present in the area of the present office building. Both the Jim Lake and DuPuis grades have been constructed, along with an extension of the DuPuis Grade that runs southeast along the edge of the Everglades south of the Hungryland Trail. At that time, the Jim Lake Grade ran past the eastern boundary of the reserve and then turned north and connected to SR 76 next to two houses (USGS 1953). Another road forks off the DuPuis Grade and runs south to the Mound House area. There is extensive understory clearing in the vicinity of Mound House, with windrows of debris visible in some areas. The Mound House road would fall into disuse in subsequent aerial photographs. The Hungryland Trail and its side trails are still visible and in active use at this time.

The current ditch and farm field system around the reserve office had been constructed by 1948, with spur ditches extending south and east into adjacent wetlands. This ditch system, which will be called the "Office" ditch system, empties into a small creek that flowed to the St. Lucie Canal in the northwest corner of the reserve. Another outfall for this system is visible under SR 76 approximately 1/4 mile east of the reserve office. Another ditch system is present in the northeastern portion of the reserve. This ditch system, which will be called the "Chastain" ditch system, linked wetlands for three miles south and 1.5 miles west of its main outfall just east of the reserve. Three additional smaller outfalls are present along SR 76 west of the main outfall. South of the

Chastain ditch system, the Cooter Creek ditch ran south for four miles to a slough emptying into the Everglades. Wetlands near this ditch were also connected to it. On the west side of the reserve, a canal had been constructed southwards from the Osceola Groves subdivision to the West Palm Beach Canal. This canal is known today as the L-8 stub canal, or North Tieback canal. A ditch system, which will be called the "Osceola" ditch system, ran through the western portion of the reserve, connecting the stub canal and cutting across the Hungryland Trail.

The Chastain Ranch was apparently not a big proponent of digging cattle watering holes in wetlands. Only eight are visible in the 1948/49 aerial photographs and are scattered along southern edge of the reserve. The ranch apparently thought that mowing shallow wetlands improved the cattle forage quality. The 1949 aerial photograph shows that the shallow areas of wetlands in the northeastern portion of the reserve appear to have been mowed. The deeper areas were not mowed, probably either because of high water levels or soft muck soils. Whatever the reason for this practice, it apparently was not repeated and little effects from it can be seen in the 1957 aerial photographs (USDA 1957). According to Hutchinson and Paige (1998), the Sam Chastain Ranch raised registered quarterhorses and Brahma bulls in the early 1950s. It is not known who Sam Chastain was and what his relationship to Robert Chastain was.

A small spur road led south from the DuPuis Grade extension along the edge of the Everglades to a small hammock, and is visible in the 1949 photograph (USDA 1949). At the edge of the hammock near the water is a small set of parallel brick foundations. Wheeler (2000) dated these as being pre-1955. The foundations were too small and too narrow to be any sort of dwelling place. Given that they are located near what may have been the easiest point on the ranch to get boat or airboat access to the Everglades, it is believed that they served some boating purpose, such as tie down or storage. Although the L-8 Canal was not present in 1949, a survey line for its construction is visible in the aerial photograph.

The western two miles of the L-8 Canal was constructed through the Bessemer lands in 1953, and the stretch bordering the reserve was dug in 1954. The L-8 Canal was generally controlled at 15 feet, which was lower than virtually all the land in the reserve, except for the extreme southwest corner. This canal created new opportunities for drainage systems along the southern border of the site, as drainage culverts were placed through the northern berm at intervals of a mile or so. Some new short drainage ditches along the L-8 are present in 1957 aerial photographs (USDA 1957). By 1953, the first citrus groves were being developed and planted on the north side of the St. Lucie Canal, just north of the northeast portion of the reserve (USGS 1953). In the 1950s, the Bessemer orange groves were sold to Ben Hill Griffin, Inc.

In August 1955, Robert Chastain sold almost all of the western three miles of the reserve to White Belt Dairy Farms, Inc., which was controlled by John G. DuPuis, Sr. The 1,586 acres in the northwestern portion of the reserve was sold directly to Mr. DuPuis. The White Belt purchase also included six sections of land below the L-8 Canal, including two that stretched to Lake Okeechobee. The 1957 aerial photographs of the reserve (USDA 1957) does not show that many changes, possibly because Mr. DuPuis, Sr. died in 1957. Most of the firebreaks that follow section lines were created at this time and are visible in the photographs, along with two new cattle watering holes.

The photographs show that additional understory clearing is visible extending eastward from Mound House and east of the farm field area in along SR 76. The western pond at Mound House has been dug, but it cannot be determined whether the house is present under the trees. A road with a causeway near the end has been extended to L-8 Canal in the southwestern portion of the reserve. A bridge crosses the canal at the end of the causeway - presumably to provide access to the White Belt lands south of the canal. Another bridge over the canal is present at the southwest corner of the reserve. A long linear clearing that may be a landing strip lies west of the causeway, although because of its connection to a L-8 Canal culvert, it could also be a clearing for a drainage ditch that was not constructed. In the southwest corner, there is evidence of some sort of agricultural activity, such as the mowing of rectangular blocks. Along the western border of the reserve, a new perimeter canal has been extended northward from the Bessemer lands through the Port Mayaca cemetery to the St. Lucie Canal. This new canal eliminated the old connection of the Hungryland Trail to SR 76, but by this time, the trail was only being used as an internal ranch road.

Control of the White Belt Dairy and the separate DuPuis tract passed to John G. DuPuis, Jr. in late 1957. Mr. DuPuis, Jr. was apparently a owner who wanted to experiment with a great many things. A series of aerial photographs was taken in early 1958 (USDA 1958). These photographs show that the first fruit trees have been planted in the trapezoidal field west of the ranchhouse and around the office building. Southern States sold the land bordering the southeastern edge of the reserve to the State in 1957 for the J.W. Corbett Wildlife Management Area. The Big Mound area was not part of this purchase and was not acquired by the State until the 1980s.

Another series of aerial photographs of the Palm Beach County and adjacent Martin County sections of the Reserve was made in 1965 (PBCPA 1965). These photographs indicate that not much was happening on the DuPuis-controlled lands except for the southwest corner. A new drainage system is present, which will be called the "Bamboo" ditch system after the bamboo plantings along the east side of the L-8 stub canal, which are visible for the first time in 1965. The Bamboo ditch system ran through the transitional area between the pine flatwoods and the Everglades muck soils in the southwest corner. This ditch

system was not present in 1957 (USDA 1957), although its route appears to have been cleared. The ditches seemed to be designed to intercept surface and groundwater flows that were keeping the muck soils too wet for their intended use as pasture.

The southern leg of the Bamboo ditch appears to have been constructed first. It started near Mound House and ran southeastward, linking up with several short ditches created prior to 1957, and then emptied into the L-8 Canal. The northern leg appears to be newly constructed in 1965. It started at a pre-1957 short ditch, and then ran northwestward to empty into the L-8 Stub canal. Spur ditches from both legs were extended northwards for a mile or two to drain additional wetlands. The Hungryland Trail was severed without a crossing by a north Bamboo spur ditch, which led to a further decline in the usage of the western portions of this trail. The Cooter Creek canal was extended southward to link to a L-8 Canal culvert. Elsewhere along the L-8 Canal in the reserve, culverts that are not connected to ditches show erosional channels radiating outwards from them. These channels may have been present in 1957, but could not be seen because of the small scale of the photographs. They do indicate that large amounts of water are flowing from the reserve into the L-8 Canal through the culverts. Only one new cattle watering hole is visible on the 1965 photograph on the White Belt lands.

In January 1964, Robert Chastain sold nine sections of land running north to south on the eastern edge of his land holdings to George Caulkins. The southernmost four sections of this sale form part of the present southeastern border of the reserve. Chastain passed away later in 1964, and his estate sold to Caulkins the remaining nine-plus sections of land between the White Belt dairy and the previous Caulkins purchase in March 1965. The 1965 aerial photographs show that Chastain had done little with the Palm Beach County portions of the reserve that he owned. Only one new cattle watering hole is visible, and the trails within his ownership appear to be falling into disuse.

Caulkins, on the other hand, was converting his land into citrus groves. By early 1965, he had already begun ditching and draining the land on the first five sections extending south from SR 76, preparing it for tree planting. He never developed groves more than five miles south of the St. Lucie Canal, even though he owned the land further south. It is possible that he could not get adequate drainage at that distance from the canal, or could pump irrigation water that far. The 1965 photograph does show a small agricultural clearing in a shallow wet prairie in the middle of Section 36 on the northern border of the reserve. It is believed to be caused by some freelance pothole farming, possibly by one of Caulkins' employees. The southern three sections of the reserve were still owned at this time by U.S. Sugar. The 1965 aerial photographs show numerous vehicle tracks through the marshlands along the L-8 Canal in these sections. It is

believed that these tracks were caused by hunting vehicles. Just east of the U.S. Sugar lands, agricultural clearing in the Big Mound Area is still visible.

White Belt Dairy Farms signed a stumpage agreement with Heyden Newport Chemical Corp. to remove lighter pine stumps in 1961. Since it takes at least 20 years for slash pine stumps to rot enough that the resin-soaked cores can be easily removed, this dates the logging on the western portion of the reserve as prior to 1940. When White Belt and Mr. Caulkins exchanged quit claim deeds in 1967 to resolve a property line dispute, the stumpage agreement had to be released from the lands going to Caulkins. Since there was no stumpage agreement on the Caulkins lands, it raises the possibility that the eastern portions of the reserve were never logged.

The period 1965 to 1970 appears to be a period of very active development on the White Belt lands. The soil survey for Palm Beach County (USDA 1978) has 1970 aerial photographs, while the survey for Martin County (USDA 1981) has 1972 aerial photographs. These photographs allow the dating of the new development on the White Belt lands. In the Palm Beach County portion of the White Belt lands, numerous new cattle watering holes are present. The bridge crossing the L-8 canal from the causeway is not longer present. The eastern pond at Mound House has been recently dug, and it is believed that the house itself was constructed at this time. Although the aerial photographs are inconclusive, it is believed that the sheep shearers buildings were built at the same time because of similarities in construction. A new ditch system, which will be called the "South Fork" ditch system is present. It starts in Section 4, heading south, and then forks. The eastern fork continues southeast and joins the Cooter Creek canal, while the western fork heads southwest and then west and empties in the L-8 Canal. A peculiar kind of scarification is visible in 1972 on the shallow edges of wetlands in the northern half of Section 34 south of the citrus grove. This scarification appears to shallow ridges and furrows. The scarification is not present in 1970, but can still be seen in 1990 aerial photographs.

On the Martin County White Belt lands, numerous cattle watering holes and ditches have been constructed in wetlands. Spur ditches have been extended westward from the Cooter Creek canal to drain additional wetlands. The T-shaped landing strip has been constructed and there is extensive clearing in the east half of Section 20 east of the landing strip. Most of the buildings in the reserve maintenance compound appear to have been recently built, and a road extends from the compound to SR 76. The residences on the eastern and western borders of the office farm field area appear to be present. The reserve office building has been expanded, and new buildings are visible south of the ranchhouse. The entrance drive to the office and ranchhouse buildings, which previously had been to the east of the buildings, was now shifted to its present location west of the buildings.

The orange grove area south of the reserve office has been recently cleared, and the wetland there has been partially filed in. The wetland just south of the farm field area east of DuPuis Grade has been excavated to form parallel berms. The barn may be present at the equestrian area, but the aerial photograph is inconclusive. The planted hammock north of Governor's House is present, and the house itself appears to be visible. A comparison with the 1971 topographic map (USGS 1971) shows that the landing strip and the ditched wetland east of DuPuis Grade were present prior to 1971. East of the reserve, George Caulkins had almost finished development of this citrus groves, with only a few sections left unplanted. South of the groves, he was doing little with the land forming the eastern portion of the reserve. Five new cattle watering holes are visible in 1970, but otherwise there are no changes.

In January 1972, a complex series of land transactions resulted in White Belt Dairy Farms acquiring the eastern three miles of the reserve. In two separate transactions, George Caulkins sold most of the land that he owned south of the developed citrus groves to U.S. Sugar. U.S. Sugar then sold this land to White Belt Dairy Farms. U. S. Sugar also sold the southernmost three sections of land in the reserve to John G. DuPuis, Jr. It is believed that White Belt transferred its muck lands south of the L-8 Canal to U.S. Sugar at the same time, but it is not known whether this was a sale or a land swap. Finally, George Caulkins sold the last 2 1/2 sections of land south of the citrus groves to White Belt. This series of transactions brought the reserve into its final configuration with 100% ownership by the DuPuis family. This eastern section was much wetter than the rest of the reserve, and portions have been labeled on some old maps as a continuation of the Allapattah Flats (H.C. Fugate 1923).

White Belt moved quickly to develop the new lands in the eastern portion of the reserve. A parallel ditch was dug for three miles just north of the L-8 Canal and was extended northward seven miles along the eastern reserve boundary to the citrus groves. A new raised road with shoulder ditches was constructed through Section 25 to connect the canal berm road along the eastern border. As on the western portion of the site, the muck and transitional lands along the L-8 Canal appear to be the most valuable agricultural area. Spur ditches were extended from the ditch along the L-8 Canal to drain this area. In the northwest corner of Section 14, a square nursery area was created in a shallow wetland area to grow Limpopo grass. This grass was then planted in other wet areas to provide what was hoped to be improved cattle forage. Many of the management roads that follow section lines were also created at this time.

Three new cattle watering holes were created at this time in the eastern section near the L-8 Canal grazing areas. Elsewhere on the reserve, only two new watering holes were created and many of the older holes appear to be not maintained and falling into disuse. The South Fork ditch system was extended a half-mile farther north. Because of the gap between the aerial photographs of the early 1970s and those in the mid-1980s, it is difficult to date when the



changes in the eastern section of the reserve occurred. Since the appearance of the changes in the 1980s photographs is that of something that happened many years earlier, it appears that the mid-1970s was the last period of major changes at the reserve. The buildings in the equestrian complex appear to have been built about this time, while a number of tree plantings along the DuPuis Grade that were probably made in the 1970s became visible in the 1980s.

A high-voltage power line that forms the main north-south backbone of the Florida electrical grid was constructed along the eastern border of the reserve in the late 1970s or early 1980s. It consists of three groups of electrical lines on towers lined up three abreast. The line runs just over the eastern reserve border in the Corbett WMA for the first seven miles, then turns west and runs on the northern edge of the reserve just below the citrus groves. It then turns northward and runs just inside the reserve for the next three miles, before crossing into the citrus grove for the last mile before it reaches the St. Lucie Canal. All woody vegetation was removed underneath the power lines, and is being prevented from reestablishing itself by cutting and herbicides. The towers were placed on raised beds placed approximately every 0.25 miles. There are a few pits underneath the power line that apparently were dug to provide fill for the raised beds. Another high-voltage power line was constructed just over the western edge of the reserve in the early 1990s. It consisted of only a single set of towers and connected to the new Martin Power Plant that had been built to the north of the reserve.

Very little appeared to happen at the reserve in the early 1980s, possibly because Mr. DuPuis was in declining health. John G. DuPuis, Jr. died in 1984 and control of the reserve passed to his widow Susan DuPuis. Mrs. DuPuis sold the reserve to the South Florida Water Management District (SFWMD) in December 1986. Very little change in the reserve can be noted between 1984 and 1986 except that the office building was expanded to its present configuration. After acquiring the reserve, SFWMD sought partners in managing the reserve. Florida Game and Fresh Water Fish Commission, which is now the Florida Fish and Wildlife Conservation Commission, has managed the hunting on the reserve since the beginning.

In 1990, the State Division of Forestry (DOF) took over management of the reserve and it was known as DuPuis State Forest until 1996. During their time managing DuPuis, DOF rebuilt the DuPuis and Jim Lake Grades with shellrock excavated from a borrow pit in the southwest corner of the reserve. A new entrance road that connected to the Jim Lake Grade was established in the northeast corner of the reserve. A boardwalk has been recently constructed at the borrow pit. DOF may have also been responsible for the small borrow pits in the family camping area in the northeastern portion of the reserve. DOF also started prescribed burning at the reserve in 1990. Some of the initial burns were fairly hot because of excessive fuel buildups. The hot burns and sub-normal rainfall stressed the slash pines and left them vulnerable to pine bark beetle

infestation. Selective logging was done in 1992 to try to control the infestation, but it continued to spread and led to the logging of almost 900 acres in 1995 and 1996. DOF was unable to secure permanent funding for the state forest and turned the management back over to SFWMD in 1996.

SFWMD went through a bidding process for the management of the reserve and decided that SFWMD staff had the best proposal. The District has been managing the non-hunting functions at the reserve since 1986. The ranchhouse south of the reserve office was demolished in the 1990s. This was the oldest building on the reserve, dating back to 1940. The foundation of this building was recently removed for construction of a new shellrock parking area. The fruit orchards around the reserve office are not being maintained and are slowly dying out. The citrus grove was recently removed to help contain the spread of citrus canker.

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## **Appendix B.**

### Goals and Policies

#### ARTICLE II. LAND STEWARDSHIP

##### **Sec. 140-21. Scope.**

This policy shall apply to all lands managed by the Land Stewardship Program, including property acquired with Save Our Rivers, Preservation 2000 or mitigation funding. Nothing in this policy shall negate any statute, administrative rule, or other policy requirement. This policy may be reviewed and approved by the District Governing Board at five-year intervals or earlier and updated as required. Public comment may be solicited as part of the review process.

(R.M. No. 139)

##### **Sec. 140-22. Purpose.**

(a) This policy establishes a commitment to the responsible management of District lands in a manner consistent with legislative directives and the District's mission.

(b) In 1981, the Florida Legislature established the "Save Our Rivers" program (SOR) for the five water management Districts to acquire water resource lands. This legislation (Section 373.59, Florida Statutes) produced the Water Management Lands Trust Fund, empowering the water management Districts to acquire lands needed to protect, manage, and conserve the state's water resources. Preservation 2000 (P2000), enacted by the Legislature in 1990, also added land acquisition funds to the Save Our Rivers program. The 1999 Florida Forever Act consolidated the legislative directives of SOR/P2000 and expanded the funding to take over when P2000 terminates. The 1999 legislation authorized funds to be appropriated for acquisition, management, maintenance and capital improvements, including perimeter fencing, signs, control of invasive exotic species, controlled burning, habitat inventory and restoration, law enforcement, access roads and trails, and minimum public accommodations.

(c) Land acquired by the District's Save Our Rivers program and managed by the Land Stewardship program must satisfy several requirements set forth in Sections 373.139 and 373.1391, Florida Statutes. Section 373.139, Florida Statutes, declares it necessary for the public health and welfare that water and water-related resources be conserved and protected. The acquisition of real property for this objective shall constitute a public purpose for which public funds may be budgeted.

(d) Section 373.1391(1)(a), Florida Statutes, states that lands titled to the water management districts shall be managed and maintained to the extent practicable to ensure a balance between public access, general public recreational purposes, and restoration and protection of their natural state and condition.

(e) Section 373.1391(1)(b), Florida Statutes, states, in part, that "Whenever practicable, such lands shall be open to the general public for recreational uses. General public recreational uses shall include, but not be limited to, fishing,

hunting, horseback riding, swimming, camping, hiking, canoeing, boating, diving, birding, sailing, jogging, and other related outdoor activities to the maximum extent possible considering the environmental sensitivity and suitability of those lands."

(f) Section 373.1391(1)(d), Florida Statutes, states that the District shall first consider using soil and water conservation Districts to administer agricultural leases.

(g) Section 373.1391(3), Florida Statutes, encourages each District to use volunteers to provide land management and other services.

(h) Section 373.1391(4), Florida Statutes, encourages each District to enter into cooperative land management agreements with state agencies or local governments to provide the coordinated and cost-effective management of lands.

(i) Section 373.1391(5), Florida Statutes, authorizes water resource and supply projects, stormwater management projects, linear facilities, and sustainable agriculture and forestry where it is compatible with the natural resource values and the public interest and is consistent with the project management plan, the proposed use is appropriately located on the property and other lands have been considered, and the titleholder of the property has been properly compensated.

(j) Section 373.591, Florida Statutes, mandates the District to solicit input on current management programs through professional peer reviews.

(R.M. No. 139)

### **Sec. 140-23. Statements of Policy.**

The Land Stewardship Program mission is to provide natural resource protection and management while allowing compatible multiple uses on designated public lands. The mission statement, together with requirements set forth in the Florida Statutes, provide three primary goals for the District Land Stewardship Program, each of which is linked to sections in this Land Stewardship Policy document:

- (1) Conservation and protection of water resources (section 140-25(1)).
- (2) Protection and/or restoration of land to its natural state and condition:
  - a. Restoration and Protection of Natural Communities (section 140-25(2)); and
  - b. Resource Operations and Maintenance (section 140-25(3)).
- (3) Provide public use (section 140-25(4)).

(R.M. No. 139)

### **Sec. 140-24. Definitions.**

For the purpose of this article, the following words and terms shall have the meanings respectively ascribed:

*Archaeological/Historic Resources* means any prehistoric or historic district site, building, object, or property of historic, architectural, or archaeological value relating to the history, government, and culture of a historic or pre-historic people.

*Best Management Practice (BMP)* means the best available technology or process that is practical and achieves the desired goal or objective.

*Capital Improvement* means activities relating to the restoration, public access, recreational uses and necessary services for land and water areas, including the

initial removal of invasive plants, and the construction, improvement, enlargement or extension of facilities' signs, fire lines, access roads, and trails. Such activities shall be identified prior to the acquisition of a parcel or the approval of a project.

*Cooperating Agencies* means two or more agencies working together to operate a specific management area.

*Cooperative Management Agreement* means an agreement between two or more agencies outlining the respective duties and responsibilities of each agency in the management of a specific tract of land.

*Critical Habitat* means areas designated for the survival and recovery of state/federally listed rare, threatened, endangered or other sensitive species.

*Desirable Vegetation* means native plant species that are appropriate for a specific community type and provide benefits to wildlife in the form of food, cover and nesting.

*Habitat Diversity* means richness and variety of native plant communities within a particular area of the landscape.

*Hydroperiod* means flooding duration, depth, and timing that influences species composition, ecosystem structure and function.

*Interim Land Management* means management of non-natural areas that provides revenue without impacting long-term water-development projects.

*Invasive/Exotic Vegetation* means certain plants that displace native species and adversely affect wildlife habitat, water quality, recreation, and biological diversity.

*Lead Manager* means the prime managing entity designated for a given tract of land; generally provides the on-site staff.

*Management Area* means a single tract or combination of tracts under one management program.

*Mitigation* means, for purposes of this policy, the actual acquisition, restoration, creation, or enhancement of wetlands to compensate for permitted wetland impacts.

*Mitigation Banking* means wetland acquisition, restoration, creation or enhancement undertaken expressly to provide compensation in advance of wetland losses from development activities.

*Multiple-Use* means the management of renewable resources for a variety of purposes such as recreation, range, timber, wildlife habitat, and water resource development.

*Prescribed Fire* means burning of vegetative fuels using controlled application of fire within specified environmental conditions.

*Primary Resource Lands* means lands having high water resource, fish, wildlife, and recreational values requiring acquisition or protection.

*Regional Mitigation Area* means, for purposes of this policy, permitted wetland impacts offset through payment for the acquisition, restoration and perpetual management of a Save Our Rivers identified and duly noticed project.

*Responsible Management* means level of management described in the General Management Plan.

*Sustainable Use* means to provide continued use of a natural resource without degradation or loss of that resource.

*Water Resource Buffer* means that portion of a Preservation 2000 or Save Our Rivers project necessary to protect the aquatic environment.

*Wildlife Corridor* means a connection between natural areas that allows the safe movement of wildlife.

(R.M. No. 139)

**Cross references:** Definitions and rules of construction, § 100-2.

### **Sec. 140-25. Responsibilities.**

The Land Stewardship Program is responsible for:

**(1) Water Resource Protection.** The basis for the Land Stewardship Program is the protection and management of natural hydrologic resources. The following policies guide implementation of this objective:

a. Acquired lands shall be managed to provide water resource-related benefits.

b. Land uses or activities that significantly or permanently alter or degrade the quality, quantity and/or natural movement of ground or surface water are not allowed unless they are a part of a regional water management system.

c. Where feasible, an attempt shall be made to restore a more natural hydroperiod on tracts where the drainage patterns have been altered.

d. Public use shall not result in detrimental impacts to water resources. When a public use activity produces detrimental effects on water resources, it shall be discontinued until an evaluation determines that such use is compatible.

e. Water resource lands designated as necessary to implement the Central and Southern Florida "Restudy" Project shall, upon acquisition, become the responsibility of the (Interim) Land Management Program, and follow the guidelines set forth under Section 373.1391(5), Florida Statutes.

**(2) Restoration and Protection of Natural Communities:**

a. The Land Stewardship Program will encourage the acquisition of large or regionally significant areas that protect important natural resources and provide wildlife corridors.

b. Particular emphasis shall be placed on the identification, protection and management of rare, threatened and endangered species.

c. The planting of invasive exotic plant species shall be prohibited in all management areas. Management practices will strive to identify existing infestations and implement appropriate control or eradication measures.

d. Where practicable, an attempt shall be made to restore and maintain desirable vegetation to promote habitat diversity in areas where invasive exotic vegetation, grazing practices, or improved land uses have substantially altered the historic landscape.

**(3) Resource Operations and Maintenance:**

a. Lands acquired for natural and/or hydrologic resource benefits shall be managed to conserve and protect those resources.

b. Exotic plant control in all management areas shall strive to attain a level of success where periodic maintenance eliminates the infestation or reduces the coverage of exotic plants.

c. Prescribed fire will be a primary management tool on District lands and will be applied within fire-maintained communities at appropriate intervals.

d. The Division of Forestry will be notified of all wildfires on District lands. Land Stewardship will provide initial suppression when commensurate personnel and equipment are available.

e. Inventories of natural and historic resources shall be performed to provide information for effective land management planning, natural community maintenance and ecological restoration.

f. Evaluation and monitoring of management activities shall be conducted to improve program effectiveness and efficiency.

1. Research shall evaluate the environmental response of certain management activities to assist staff in making appropriate management decisions.

2. Monitoring shall be conducted to identify landscape changes resulting from management activities.

3. Legislative-mandated management reviews will provide input from professional peers.

g. Resource protection shall be provided by professional law enforcement services through funded and unfunded contractual agreements to safeguard the public and protect natural and cultural resources on District-managed natural areas.

h. Sustainable use of forest resources shall be conducted where these activities adhere to a series of environmental criteria (see 1999 Forest Management Plan) that meet Land Stewardship Program goals. Timber contractors will be required to meet silvicultural Best Management Practices (BMP) developed for Florida forests.

i. Range management (grazing) will be considered on improved or native ranges when the introduction of cattle will not conflict with other natural resource management and public use goals.

j. Archaeological and historic resources are protected by site identification and inter-agency coordination with the Florida Division of Historical Resources. Land stewardship planning shall include an analysis of archeological data accompanied by appropriate public education opportunities.

k. Infrastructure support shall be developed and maintained to provide safe access for responsible management and public use on District lands. Such infrastructure may include access points, roads, trails, signs, utilities, and minimal public facilities.

l. Mechanical equipment may be used in conjunction with prescribed burning and other management tools to control vegetation and restore habitat structure.

m. Agricultural developments previously existing on acquired natural areas may be maintained if management of these developments is consistent with other land stewardship goals.



**(4) Public Use and Environmental Education:**

a. Public use of management areas that is consistent with other management goals shall be encouraged. Public use that may have detrimental impacts on sensitive environmental resources shall be restricted until an evaluation determines such use is compatible. A public use compatibility assessment will be included in the General Management Plan completed for each management area and will be based on the following criteria:

1. Consistency with the reason the lands were acquired.
2. Restrictions and/or prohibitions imposed by easements, leases, reservations, adjacent land ownership, conditions of the purchase agreement, and any other agreements concerning the property.
3. Infrastructure and support facility requirements, such as fences, gates, signage, entry design, stabilized off-road parking, trails, campsites, maintenance, and other operational and budgetary impacts.
4. Opportunities for persons with disabilities.
5. Limitations resulting from endangered species, other sensitive natural resources, archaeological resources, or land management practices.
6. Public health, safety and welfare.
7. Environmental education program opportunities.

b. Public Use Regulation:

1. Public use regulations are set forth in 40E-7.511, Florida Administrative Code, to implement Section 373.1391(1)(b), Florida Statutes. Accordingly, the District shall publish and make available to the public a "Public Use Guide" for designated land management areas. The Public Use Guide will be adopted by the Governing Board at a public meeting advertised in accordance with Chapter 120, Florida Statutes.

2. Rules and regulations governing the public use of each management area shall be enforced by agencies with appropriate law enforcement jurisdiction.

3. Pursuant to Section 373.609, Florida Statutes, the District shall seek the cooperation of every state and county attorney, sheriff, police officer, and appropriate city and county official in the enforcement of the provisions set forth according to 40E-7.511, Florida Administrative Code.

4. Florida Fish and Wildlife Conservation Commission regulations shall govern hunting in areas opened for such use.

**(5) Implementation Strategies.** The District will secure dedicated funding sources, personnel and other resources to support program goals and objectives. Project funding needs and sources for cooperative management agreements with government and non-government entities will be identified during acquisition. A cooperative management agreement will designate a lead Manager and identify whether District funding is required.

a. The private sector may be solicited to furnish certain management-related facilities and services through the execution of leases and agreements. These leases/agreements will assure mutual benefits to both the District and private parties and be consistent with the program management objectives.

b. Mitigation:

1. Mitigation Banking: Mitigation banking provides an opportunity to accomplish large-scale restoration that may otherwise go unfunded. Pursuant to Section 373.4135, Florida Statutes, the District is encouraged to develop mitigation banks. Land managers will evaluate opportunities in their regions to implement mitigation banks that are consistent with the guidelines established in the Joint State and Federal Mitigation Bank Review Team Process for Florida.

2. Regional Mitigation Areas: The acquisition, restoration and management of District lands as mitigation shall be consistent with Chapter 2000-133, amending Sections 373.414 and 373.4135, Florida Statutes. This includes the establishment of Memorandums of Agreement (MOA) that include restoration plans, success criteria, and monitoring requirements. The MOAs will be used to implement mitigation using full-cost accounting, public noticing, and approval by the Governing Board for use as a mitigation area. The mitigation shall meet restoration objectives as provided in the General Management Plan.

c. Revenue Generation:

1. Private concessions and/or agreements with non-profit organizations will be considered to implement needed services through concession contracts.

2. Entrance and user fees, permits, licenses and/or advance reservations may be required where considered necessary by the managing agency.

3. Timber sales will be conducted to improve forest health or to support specific forest management goals.

4. Grazing leases will be encouraged on selected rangeland to generate revenue or to provide services that offset program management costs.

d. Volunteers and Interns:

1. Volunteers, interns and alternative work forces will be used when possible to supplement existing staff and services.

2. Any volunteer services must meet the standards and procedures prescribed by the District (Risk Management Manual, Volume 1).

**(6) Program Components:**

a. Management Assessment: A brief summary of the management issues completed when the site is identified for acquisition.

b. General Management Plan (GMP): Provides a description of recommended management and is required for each Land Stewardship Management Area. The GMP follows a designated format and is updated every five years.

c. Activity Plan (AP): Provides a detailed implementation strategy for specific activities such as prescribed burning, exotic removal and restoration. The plan shall be developed by the lead Manager in consultation with the cooperating agencies for each major tract of land (or group of tracts) to be operated as a single

management unit. The AP may be included in the GMP and is updated when necessary.

d. **Annual Work Plan (AWP):** Summarizes activities corresponding with annual budget development and is prepared by the Operations Section of the Land Stewardship Program.

e. **Reporting:** Summaries of management activities for each management area will be reported quarterly within the District and annually as part of the Florida Forever Work Plan.

(R.M. No. 139)

Secs. 140-26--140-40. Reserved.

## **Appendix C. Soil Descriptions**

### Flatwood Soils

Flatwood soils are poorly drained non-hydric, upland soils with sandy marine sediments throughout the profile. The seasonal high water table can range from six to 18 inches below the soil surface for three to six months annually. This soil type is dominant in the uplands in the western portion of the site.

### Flats Soils

Flats (previously referred to as slough) soils are poorly drained hydric soils with sandy marine sediments throughout the profile. Flats are located between the flatwoods and topographic depressions and are generally regarded as transition areas, e.g. a wet prairie or a slough. Generally, the seasonal high water table begins in June and ends from September or thereafter with inundation periods dependent upon seasonal rainfall or large storm events. Within the Management Area the wet flatwoods and wet prairies in the eastern portion of the site are representative of this classification.

### Sand Depression Soils

Sand depression soils are very poorly drained hydric soils that typically have sandy marine sediments throughout the profile. Often, these areas are depressions adjacent to flatwoods. The seasonal high water table can range from one foot below to two feet above the soil surface for seven to 10 months annually. Wetland communities dominate this landscape position. Within the Management Area, most of the depression marshes represent this soil class.

### Muck Depression Soils

Muck depression soils are very poorly drained hydric soils that have an organic surface layer underlain by sandy marine sediments. These areas are often depressions adjacent to Flatwood soil-types. The seasonal high water table can range from six inches below to two feet above the soil surface for seven to eleven months annually. Wetland communities dominate this soil type. Examples within the Management Area include the soil under the L-8 marsh.

### Urban or Made Lands

Urban or made land areas have soils that have been altered, excavated, or disturbed and no longer possess their natural morphological features. These soils do not function as they did in their original state, and little information on this subject is available. The seasonal high water table varies by site and is usually controlled to inhibit flooding of developed areas. No ecological communities are representative of this landscape position. The L-8 levee falls into this classification.

## **Appendix D. FNAI Natural Communities**

### Mesic Flatwoods 9,138 acres

This is the dominant plant community on the DuPuis Management Area and is distinguished by the south Florida slash pine overstory and an open or dense understory, depending on degree of drainage and fire frequency. Where drainage and fire suppression has been most severe, the understory consists of dense saw palmetto and to a lesser extent live oak. Use of mechanical shrub control in conjunction with increased prescribed fire has been instrumental in enhancing native plant communities that include saw palmetto, gallberry (*Ilex glabra*), St. Johns-wort (*Hypericum myrtifolium*), shiny blueberry (*Vaccinium myrsinites*), beautyberry (*Callicarpa americana*), bog buttons (*Lachnocaulon anceps*), yellow-eyed grass (*Xyris* spp.), wire grass (*Aristida berychiana*), and numerous other native wildflowers.

This community occurs on similar soils as dry prairies and wet flatwoods, with minor changes in topography determining plant species composition. Acidic sandy soil overlays hardpan that reduces water exchange between the soil surface and subsurface. Native plants of this community have adapted to long intervals of inundation and desiccation combined with periodic fire.

An important physical factor in mesic flatwoods is fire, which probably occurred every one to eight years in pre-Columbian times. Nearly all plants and animals inhabiting this community are adapted to periodic fires; several species depend on fire for their continued existence. Without relatively frequent fires, mesic flatwoods succeed into hardwood-dominated forests whose closed canopy can essentially eliminate the herbaceous ground cover.

### Wet Flatwoods 3,644 acres

Wet flatwoods are characterized as relatively open-canopy forests of scattered pine trees or cabbage palms with either a thick shrubby under-story and very sparse ground cover, or a sparse under-story and a dense ground cover of hydrophytic herbs and shrubs, with variations between these extremes (Florida Natural Areas Inventory, 1990). Other plants associated with this habitat type in the MA include wax myrtle, saw palmetto, beakrush (*Rhynchospora* sp.), St. John's-wort (*Hypericum* sp.), and blue maidencane (*Amphicarpum muhlenburgianum*).

Wet flatwoods develop on poorly drained acidic, low nutrient sands underlain by hardpan. Surface water appears a minimum of one month per year. Natural fire frequency is considered to be three to 10 years. Frequent fire postpones hardwood succession and thins canopy trees, while promoting under-story growth and fire-adapted species.

State ranking is "S4", apparently secure in the state, although it may be rare in some parts of its state range. Global ranking requires further research. Most wet

flatwoods are extremely vulnerable to hydrologic manipulation and exotic invasion.

#### Strand Swamp 2,740 acres

Strand swamps are shallow, forested, usually elongated depressions or channels dominated by bald cypress. They are generally situated in troughs in a flat limestone plain. Other typical plants include red maple, laurel oak (*Quercus laurifolia*), cabbage palm (*Sabal palmetto*), pond apple (*Annona glabra*), sweet bay (*Magnolia virginiana*), coastal plain willow, wax myrtle, myrsine (*Myrsine guianensis*), buttonbush (*Cephalanthus occidentalis*), poison ivy (*Toxicodendron radicans*), leather fern (*Acrostichum danaeifolium*), swamp fern (*Blechnum serrulatum*), sawgrass, swamp primrose (*Ludwigia palustris*), smartweed (*Polygonum* sp.). Strand swamp soils are peat and sand over limestone with normal hydroperiods of 200 to 300 days per year. Periodic water flow is an integral component of strand swamps. Natural fire is infrequent in strand swamps, occurring on a cycle of 30 to 200 years. Fire, however, is essential for reduction of hardwood encroachment and reduction of peat accumulation that would convert this community to a bottomland forest. Strand swamps are extremely vulnerable to local and regional hydrologic modifications.

#### Swale 2,341 acres

Swales are marshes situated in broad shallow channels and characterized by emergent grasses, sedges and herbs up to 10 feet in height. The dominant species are sawgrass, pickerelweed, and maidencane.

Swale soils are peat or sands and are generally located over linear depressions in the underlying limestone. Swales typically have long hydroperiods and are valuable ecologically because they serve as water storage and recharge areas, water transportation corridors, nutrient filters, and saltwater intrusion barriers. Threats to this natural community are disruption of natural hydrologic flow and fire cycles, conversion to agriculture and invasion of exotics in disturbed areas.

Light ground fires occur every one to five years in swales, and may occur any time of the year, as sawgrass can carry fire over the water's surface. Fire during dry seasons may result in peat fire that lowers the ground surface, converting the swale into a slough. Lack of fire results in dominance of coastal plain willow and buttonbush thickets.

#### Wet Prairie 1,261 acres

Wet prairie is characterized as a treeless plain with a sparse to dense ground cover of grasses, sedges, rushes, and herbs; including wiregrass, toothache grass (*Ctenium aromaticum*), maidencane (*Panicum hemotomon*), spikerush (*Eleocharis* sp.), and beakrush (*Rhynchospora* sp.). Other typical plants include hatpins (*Lachnocaulon* sp.), marsh pinks (*Rhexia* sp.), crownbeard (*Verbesina chapmanii*), sundews (*Drosera* sp.), tickseed (*Bidens* sp.), wax myrtle, St. John's-wort (*Hypericum* sp.), and Panicums (Florida Natural Areas Inventory, 1990).

Wet prairies occur on low, flat, poorly drained terrain and are inundated from 50 to 100 days per year. Wet prairie species have adapted to long periods of drought conditions due to rainfall seasonality. Soils typically are sands with a major organic component. Fire plays an integral role in wet prairie ecology, and with sufficient fuel build-up, burns every two to four years. If deprived of fire, these grass-dominated flatlands succumb to shrub encroachment, and are especially vulnerable to wax myrtle infestations.

Wet prairie has a state ranking of “S4”, apparently secure in the state, although it may be rare in some parts of its state range. Global ranking requires further research.

Depression Marsh 1,234 acres

Depression marsh, also known as a flatwoods pond, is characterized as a shallow, usually rounded depression in sand substrate with herbaceous vegetation often occurring in concentric bands (Florida Natural Areas Inventory, 1990). Typical plants include St. John’s-wort, spikerush (*Eleocharis sp.*), yellow-eyed grass, chain fern, primrose willow (*Ludwigia peruviana*), maidencane (*Panicum hemitomon*), wax myrtle, buttonbush, pickerelweed, arrowhead, and bladderwort.

Where marshes occur, one of three geological conditions is present: surficial deposits are impermeable, the water table emerges through the permeable substrate, or the marsh is hydrologically connected to a river (Kushlan, 1991). Depression marshes are typically small in size and hydrologically isolated from other surface water bodies. Water is received by runoff, seepage or direct rainfall. Hydroperiods range widely from as few as 50 days or less to more than 200 days per year (Florida Natural Areas Inventory, 1990). Bottom soils are generally acidic peat, resulting from accumulation of decayed plant material. This community frequently grades into wet or mesic flatwoods.

Natural fire occurs in depression marshes every one to five years, depending on a combination of weather conditions and fuel build-up. Fire preserves the open canopy by limiting invasion of woody vegetation, promoting herbaceous growth, and slowing succession by deepening the marsh with an occasional peat fire. The Land Stewardship Program coordinates fire schedules to insure depression marshes burn at natural frequencies and during periods of adequate ground moisture.

Depression marshes provide critical breeding and foraging habitat for a wide assemblage of amphibians and reptiles not found in larger, more permanent systems. Cyclic surface water availability promotes foraging by numerous listed wading bird species such as the wood stork, white ibis, snowy egret, and sandhill crane.

Depression marsh is ranked statewide as “S”, either very rare throughout its range; or found locally, even abundantly at some of its locations in a restricted range; or because of other factors making it vulnerable to extinction throughout its range. Global ranking indicates it is apparently secure, though it may be quite rare in parts of its range, especially at the periphery. Further research is required for a definitive global classification.

#### Prairie Hammock 359 acres

Prairie hammock is characterized as a clump of tall cabbage palms and live oaks in the midst of prairie or marsh communities (Florida Natural Areas Inventory, 1990). Prairie hammocks establish on elevated soils surrounded by lower topography. These islands are generally flooded only for a short duration during the highest water levels. Naturally occurring fires are rare in these hammocks, due mainly to a lack of under-story fuel.

Canopy species are live oak and cabbage palm, with occasional laurel oak in lower elevations. An abundance of epiphytes, including listed species, are found in mature canopy trees. As in most prairie hammocks, those found here have a sparse under-story due to over-story shading, but cover is also reduced by cattle grazing and trampling of shrub and ground layer vegetation. Many species common to undisturbed hammocks are sparse or lacking, replaced by disturbance species such as broomweed (*Sida sp.*), tropical soda apple (*Solanum viarum*), and caesarweed (*Urena lobata*). Typical under-story plants of pristine prairie hammocks include wax myrtle, water oak, stoppers (*Eugenia sp.*), marlberry (*Ardisia escallonioides*), beautyberry (*Callicarpa americana*), and saw palmetto.

Florida Natural Areas Inventory ranks prairie hammocks as “G4” and “S4” both statewide and globally secure, although it may be quite rare in parts of its range, especially at the periphery. Land Stewardship management strives to minimize soil disturbance, restrict fire where appropriate and eradicate non-native invasive species within hammock areas.



## Appendix E. Species List

### Plant Species

(This list of DuPuis plants was compiled by D. Black (SFWMD) from lists by P. David, R. Woodbury, and The Institute for Regional Conservation.)

#### Trees, Shrubs, and Vines

Earleaf Acacia	<i>Acacia auriculiformis</i>
Red Maple	<i>Acer rubrum</i>
Woman's Tongue	<i>Albizia lebbek</i>
Golden Trumpet	<i>Allamanda cathartica</i>
Pepper Vine	<i>Ampelopsis arborea</i>
Bastard Indigobush	<i>Amorpha fruticosa</i>
Pond Apple	<i>Annona glabra</i>
Coralvine	<i>Antigonon leptopus</i>
Groundnut	<i>Apios americana</i>
Northfolk Island Pine	<i>Araucaria excelsa</i>
Shoebuttan Ardisia	<i>Ardisia elliptica</i>
Sprenger's Asparagus	<i>Asparagus aethiopicus</i>
Common Asparagus-fern	<i>Asparagus setaceus</i>
Pawpaw	<i>Asimina reticulata</i>
Saltbush	<i>Baccharis halmifolia</i>
Silverling	<i>Baccharis glomeruliflora</i>
Bamboo	<i>Bambusa vulgaris</i>
Orchid Tree	<i>Bauhinia variegata</i>
Tarflower	<i>Befaria racemosa</i>
Gumbo-limbo	<i>Bursera simaruba</i>
Beauty Berry	<i>Callicarpa americana</i>
Hedge False Bindweed	<i>Calystegia sepium limnophila</i>
Love Vine	<i>Cassytha filiformis</i>
Gray Sheoak	<i>Casuarina glauca</i>
Sugarberry	<i>Celtis laevigata</i>
Buttonbush	<i>Cephalanthus occidentalis</i>
Cocoplum	<i>Chrysobalanus icaco</i>
Satinleaf	<i>Chrysophyllum oliviforme</i>
Orange	<i>Citrus aurantium</i>
Lemon	<i>Citrus limon</i>
Citron	<i>Citrus medica</i>
Tangerine	<i>Citrus reticulata</i>
Sweet Orange	<i>Citrus sinensis</i>
Grapefruit	<i>Citrus Xparadisi</i>
Cockspur Hawthorn	<i>Crataegus crus-galli</i>
Colombian Waxweed	<i>Cuphea carthagenensis</i>
Indian Rosewood	<i>Dalbergia sissoo</i>
Common Persimmon	<i>Diospyros virginiana</i>
Air-potato	<i>Dioscorea bulbifera</i>
Eucalyptus	<i>Eucalyptus sp.</i>
Surinam Cherry	<i>Eugenia uniflora</i>
Florida Strangler Fig	<i>Ficus aurea</i>

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Indian Laurel	<i>Ficus microcarpa</i>
Pop Ash	<i>Fraxinus caroliniana</i>
Dwarf Huckleberry	<i>Gaylussacia dumosa</i>
Firebush	<i>Hamelia patens</i>
Lindenleaf Rosemallow	<i>Hibiscus furcellatus</i>
Swamp Rosemallow	<i>Hibiscus grandiflorus</i>
Sandweed	<i>Hypericum fasciculatum</i>
St. Johnswort	<i>Hypericum cistifolium</i>
St. Andrew's-cross	<i>Hypericum hypericoides</i>
Dwarf St. John's-wort	<i>Hypericum mutilum</i>
Four petal St. John's-wort	<i>Hypericum tetrapetalum</i>
Atlantic St. John'- wort	<i>Hypericum reductum</i>
Dahoon	<i>Ilex cassine</i>
Gallberry	<i>Ilex glabra</i>
Hairy Indigo	<i>Indigofera hirsuta</i>
Moonflower	<i>Ipomoea alba</i>
Morning-glory	<i>Ipomoea indica var. acuminata</i>
Arrowleaf morning-glory	<i>Ipomoea sagittata</i>
Virginia Willow	<i>Itea virginica</i>
Southern Red Cedar	<i>Juniperus silicicola</i>
Lantana	<i>Lantana camara</i>
White Leadtree	<i>Leucaena leucocephala</i>
Gopher Apple	<i>Licania michauxii</i>
Rusty Lyonia	<i>Lyonia fruticosa</i>
Fetterbush	<i>Lyonia lucida</i>
Winged Loosestrife	<i>Lythrum alatum</i>
Florida Loosestrife	<i>Lythrum flagellare</i>
Sweetbay	<i>Magnolia virginiana</i>
Mango	<i>Mangifera indica</i>
Cajeput Tree	<i>Melaleuca quinquenervia</i>
Chinaberry Tree	<i>Melia azedarach</i>
Creeping Cucumber	<i>Melothria pendula</i>
Florida Keys Hempvine	<i>Mikania cordifolia</i>
Climbing Hempweed	<i>Mikania scandens</i>
Balsam-pear	<i>Momordica charantia</i>
Red Mulberry	<i>Morus rubra</i>
Wax Myrtle	<i>Myrica cerifera</i>
Mexican Palo Verde	<i>Parkinsonia aculeata</i>
Corkystem Passionflower	<i>Passiflora suberosa</i>
Virginia Creeper	<i>Parthenocissus quinquefolia</i>
Avocado	<i>Persea americana</i>
Red Bay	<i>Persea borbonia</i>
Swamp Bay	<i>Persea palustris</i>
Date Palm	<i>Phoenix reclinata</i>
Slash Pine	<i>Pinus elliotti</i>
Strawberry Guava	<i>Psidium cattleianum</i>
Common Guava	<i>Psidium guajava</i>
Wild Coffee	<i>Psychotria sulzneri</i>
Flamevine	<i>Pyrostegia venusta</i>

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Laurel Oak	<i>Quercus laurifolia</i>
Dwarf Live Oak	<i>Quercus minima</i>
Myrtle Oak	<i>Quercus myrtifolia</i>
Live Oak	<i>Quercus virginiana</i>
Myrsine	<i>Rapanea punctata</i>
White Indigoberry	<i>Randia aculeata</i>
Rose Myrtle	<i>Rhodomyrtus tomentosa</i>
Winged Sumac	<i>Rhus copallinum</i>
Southern Dewberry	<i>Rubus trivialis</i>
Cabbage Palm	<i>Sabal palmetto</i>
Coastal Plain Willow	<i>Salix caroliniana</i>
Southern Elderberry	<i>Sambucus canadensis</i>
White-Vine	<i>Sarcostemma clausum</i>
Brazilian Pepper	<i>Schinus terebinthifolius</i>
Graytwig	<i>Schoepfia chrysophylloides</i>
Privet Wild Sensitive Plant	<i>Senna ligustrina</i>
Coffeeweed	<i>Senna obtusifolia</i>
Septicweed	<i>Senna occidentalis</i>
Saw Palmetto	<i>Serenoa repens</i>
Common Wireweed	<i>Sida acuta</i>
Lima	<i>Sida cordifolia</i>
Cuban Jute	<i>Sida rhombifolia</i>
Florida Bully	<i>Sideroxylon reclinatum</i>
Earleaf Greenbrier	<i>Smilax auriculata</i>
Saw Greenbrier	<i>Smilax bona-nox</i>
Catbrier	<i>Smilax laurifolia</i>
Shrubby False Buttonweed	<i>Spermacoce verticillata</i>
Blue Porterweed	<i>Stachytarpheta jamaicensis</i>
Corkwood	<i>Stillingia aquatica</i>
Queen's Delight	<i>Stillingia sylvatica</i>
Java-Plum	<i>Syzygium cumini</i>
Rose-Apple	<i>Syzygium jambos</i>
Pond Cypress	<i>Taxodium ascendens</i>
Bald Cypress	<i>Taxodium distichum</i>
Yellow Elder	<i>Tecoma stans</i>
West Indian Almond	<i>Terminalia catappa</i>
Blackeyed Susan Vine	<i>Thunbergia alata</i>
Poison Oak	<i>Toxicodendron radicans</i>
Nettletree	<i>Trema micranthum</i>
Virginia Marsh St. John's-wort	<i>Triadenum virginicum</i>
Forked Bluecurls	<i>Trichostema dichotomum</i>
Sacramento Burrbark	<i>Triumfetta semitriloba</i>
Shiny Blueberry	<i>Vaccinium myrsinites</i>
Black Haw	<i>Viburnum obovatum</i>
Fourleaf Vetch	<i>Vicia acutifolia</i>
Hairy-pod Cowpea	<i>Vigna luteola</i>
Simpleleaf Chaste Tree	<i>Vitex trifolia</i>
Summer Grape	<i>Vitis aestivalis</i>
Muscadine	<i>Vitis rotundifolia</i>

Calloose Grape  
Creeping Oxeye  
Arrowleaf Elephantear  
Tallow Wood  
Hercules' Club

*Vitis shuttleworthii*  
*Wedelia trilobata*  
*Xanthosoma sagittifolium*  
*Ximenia americana*  
*Zanthoxylum clava-herculis*

**Herbaceous**

Slender Threeseed Mercury  
Shyleaf  
Flaxleaf False Foxglove  
Saltmarsh False Foxglove  
Purple False Foxglove  
Sisal Hemp  
Hammock Snakeroot  
Tropical Whiteweed  
Colic root  
Alligatorweed  
Sessile Joyweed  
White Moneywort  
Ragweed  
Pink Redstem  
Nodding Nixie  
Mexican poppy  
Jack-in-the-pulpit  
Ovateleaf Indian Plantain  
Scarlet Milkweed  
Swamp Milkweed  
Lanceolate Milkweed  
Longleaf Milkweed  
Savannah Milkweed  
Whorled Milkweed  
Green Antelopehorn  
Butterfly-weed  
Scale-leaf Aster  
Climbing Aster  
Rice Button Aster  
Annual Marsh Aster  
Lemon Bacopa  
Tropical Waterhyssop  
Bacopa  
Honeycomb Head  
White Screwstem  
Beggarticks  
Smooth Beggarticks  
Smallfruit Beggarticks  
Pineland Rayless Goldenrod  
Browne's Blechum  
Pinepink  
False Nettle

*Acalypha gracilens*  
*Aeschynomene americana*  
*Agalinis linifolia*  
*Agalinis maritima*  
*Agalinis purpurea*  
*Agave sisalana*  
*Ageratina jucunda*  
*Ageratum conyzoides*  
*Aletris lutea*  
*Alternanthera philoxeroides*  
*Altenanthera sessilis*  
*Alysicarpus vaginalis*  
*Ambrosia artemisiifolia*  
*Ammannia latifolia*  
*Apteria aphylla*  
*Argemone mexicana*  
*Arisaema triphyllum*  
*Arnoglossum ovatum*  
*Asclepias curassavica*  
*Asclepias incarnata*  
*Asclepias lanceolata*  
*Asclepias longifolia*  
*Asclepias pedicellata*  
*Asclepias verticillata*  
*Asclepias viridis*  
*Asclepias tuberosa*  
*Aster adnatus*  
*Aster carolinianus*  
*Aster dumosus*  
*Aster subulatus*  
*Bacopa caroliniana*  
*Bacopa innominata*  
*Bacopa monnieri*  
*Balduina angustifolia*  
*Bartonia verna*  
*Bidens alba var. radiata*  
*Bidens laevis*  
*Bidens mitis*  
*Bigelowia nudata subsp. australis*  
*Blechum pyramidatum*  
*Bletia purpurea*  
*Boehmeria cylindrica*

Wineflower	<i>Boerhavia diffusa</i>
Leaf Mustard	<i>Brassica juncea</i>
American Bluehearts	<i>Buchnera americana</i>
Bluethread	<i>Burmannia biflora</i>
Southern Bluethread	<i>Burmannia capitata</i>
Bearded Grasspink	<i>Calopogon barbatus</i>
Manyflowered Grasspink	<i>Calopogon multiflorus</i>
Tuberous Grasspink	<i>Calopogon tuberosus</i>
Bandana-of-the-Everglades	<i>Canna flaccida</i>
Pineland Chaffhead	<i>Carphephorus carnosus</i>
Florida Paintbrush	<i>Carphephorus corymbosus</i>
Vanillaleaf	<i>Carphephorus odoratissimus</i>
Hairy Chaffhead	<i>Carphephorus paniculatus</i>
Periwinkle	<i>Catharanthus roseus</i>
Coinwort	<i>Centella asiatica</i>
Butterfly Pea	<i>Centrosema virginianum</i>
Coontail	<i>Ceratophyllum demersum</i>
Partridge Pea	<i>Chamaecrista fasciculata</i>
Sensitive Pea	<i>Chamaecrista nictitans var. aspera</i>
Pillpod Sandmat	<i>Chamaesyce hirta</i>
Graceful Sandmat	<i>Chamaesyce hypericifolia</i>
Spotted Sandmat	<i>Chamaesyce maculata</i>
Prostrate Sandmat	<i>Chamaesyce prostrata</i>
Pineland Daisy	<i>Chaptalia tomentosa</i>
Pigweed	<i>Chenopodium ambrosioides</i>
Jack-in-the-bush	<i>Chromolaena odorata</i>
Coastalplain Goldenaster	<i>Chrysopsis scabrella</i>
Spotted Water Hemlock	<i>Cicuta maculata</i>
Thistle	<i>Cirsium horridulum</i>
Nuttall's Thistle	<i>Cirsium nuttallii</i>
Seasonvine	<i>Cissus verticillata</i>
Pine Hyacinth	<i>Clematis baldwinii</i>
Finger-Rot	<i>Cnidioscolus stimulosus</i>
Wild Taro	<i>Colocasia esculenta</i>
Common Dayflower	<i>Commelina diffusa</i>
Whitemouth Dayflower	<i>Commelina erecta</i>
Blue Mistflower	<i>Conoclinium coelestinum</i>
Canadian Horseweed	<i>Conyza canadensis</i>
Florid Tickseed	<i>Coreopsis floridana</i>
Tickseed	<i>Coreopsis gladiata</i>
Leavenworth's Tickseed	<i>Coreopsis leavenworthii</i>
Swamp Lily	<i>Crinum americanum</i>
Shakeshake	<i>Crotalaria incana</i>
Lanceleaf Rattlebox	<i>Crotalaria lanceolata</i>
Low Rattlebox	<i>Crotalaria pumila</i>
Rattleweed	<i>Crotalaria retusa</i>
Rabbitbells	<i>Crotalaria rotundifolia</i>
Showy Rattlebox	<i>Crotalaria spectabilis</i>
Vente Connigo	<i>Croton glandulosus</i>

DuPuis Management Area General Management Plan 2014 through 2024  
South Florida Water Management District, Land Stewardship Section

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Pineland Croton	<i>Croton linearis</i>
Florida Scrub Roseling	<i>Cuthbertia ornata</i>
Ticktrefoil	<i>Desmodium incanum</i>
Threeflower Ticktrefoil	<i>Desmodium triflorum</i>
Carolina Ponysfoot	<i>Dichondra carolinensis</i>
Poor Joe	<i>Diodia teres</i>
Virginia Buttonweed	<i>Diodia virginiana</i>
Dwarf Sundew	<i>Drosera brevifolia</i>
Pink Sundew	<i>Drosera capillaris</i>
Drymary	<i>Drymaria cordata</i>
Pineland Twinflower	<i>Dyschoriste angusta</i>
Water Hyacinth	<i>Eichhornia crassipes</i>
Tall Elephants Foot	<i>Elephantopus elatus</i>
Florida Tasselflower	<i>Emilia fosbergii</i>
Lilac Tasselflower	<i>Emilia sonchifolia</i>
Florida Butterfly Orchid	<i>Encyclia tampensis</i>
Fireweed	<i>Erechtites hieracifolia</i>
Oakleaf Fleabane	<i>Erigeron quercifolius</i>
Early Whitetop Fleabane	<i>Erigeron vernus</i>
Flattened Pipewort	<i>Eriocaulon compressum</i>
Hatpins	<i>Eriocaulon decangulare</i>
Rarenel's Pipewort	<i>Eriocaulon ravenelii</i>
Michaux's Cupgrass	<i>Eriochloa michauxii</i>
Dogtongue Wild Buckwheat	<i>Eriogonum tomentosum</i>
Button Snakeroot	<i>Eryngium aquaticum</i>
Baldwin's Eryngo	<i>Eryngium baldwinii</i>
Button Rattlesnakemaster	<i>Eryngium yuccifolium</i>
Wild Coco	<i>Eulophia alta</i>
Dog-fennel	<i>Eupatorium capillifolium</i>
False Fennel	<i>Eupatorium leptophyllum</i>
Semaphore Thoroughwort	<i>Eupatorium mikanioides</i>
Mohr's Thoroughwort	<i>Eupatorium mohrii</i>
Lesser Florida Spurge	<i>Euphorbia polyphylla</i>
Flat-topped Goldenrod	<i>Euthamia grominifolia</i>
Narrowleaf Yellowtops	<i>Flaveria linearis</i>
Cottonweed	<i>Froelichia floridana</i>
Elliott's Milkpea	<i>Galactia elliottii</i>
Eastern Milkpea	<i>Galactia regularis</i>
Downy Milkpea	<i>Galactia volubilis</i>
Bluntleaf Bedstraw	<i>Galium hispidulum</i>
Bedstraw	<i>Galium obtusum</i>
Stiff Marsh Bedstraw	<i>Galium tinctorium</i>
Oneflower Bedstraw	<i>Galium uniflorum</i>
Southern Beeblossom	<i>Gaura angustifolia</i>
Narrowleaf Purple Everlasting	<i>Gnaphalium falcatum</i>
Rabbit Tobacco	<i>Gnaphalium obtusifolium</i>
Pennsylvania Everlasting	<i>Gnaphalium pensylvanicum</i>
Spoonleaf Purple Everlasting	<i>Gnaphalium purpureum</i>
Arrasa Con Todo	<i>Gomphrena serrata</i>

Rough Hedgehyssop	<i>Gratiola hispida</i>
Hedge Hyssop	<i>Gratiola pilosa</i>
Branched Hedgehyssop	<i>Gratiola ramosa</i>
Longhorn False Reinorchid	<i>Habenaria quinqueseta</i>
Waterspider False Reinorchid	<i>Habenaria repens</i>
Threadroot Orchid	<i>Harrisella filiformis</i>
Flatop Mille Graines	<i>Hedyotis corymbosa</i>
Clustered Mille Graines	<i>Hedyotis uniflora</i>
Southeastern Sneezeweed	<i>Helenium pinnatifidum</i>
Pinebarren Frostweed	<i>Helianthemum corymbosum</i>
Florida Scrub Frostweed	<i>Helianthemum nashii</i>
Scorpion's Tail	<i>Heliotropium angiospermum</i>
Pineland Heliotrope	<i>Heliotropium polyphyllum</i>
Camphorweed	<i>Heterotheca subaxillaris</i>
Queen-devil	<i>Hieracium gronovii</i>
Coastalplain Hawkweed	<i>Hieracium megacephalon</i>
Waterthyme	<i>Hydrilla verticillata</i>
Manyflower Marshpennywort	<i>Hydrocotyle umbellata</i>
Whorled Pennywort	<i>Hydrocotyle verticillata</i>
Skyflower	<i>Hydrolea corymbosa</i>
Alligator Lily	<i>Hymenocallis palmeri</i>
Fringed Yellow Stargrass	<i>Hypoxis juncea</i>
Bristleseed Yellow Stargrass	<i>Hypoxis wrightii</i>
Musky Mint	<i>Hyptis alata</i>
John Charles	<i>Hyptis verticillata</i>
Juba's Bush	<i>Iresine diffusa</i>
Southern Blue Flag	<i>Iris hexagona var. savannarum</i>
Piedmont Marshelder	<i>Iva microcephala</i>
Water Willow	<i>Justica crassifolia</i>
Cathedral Bells	<i>Kalanchoe pinnata</i>
Marsh Mallow	<i>Kosteletzkya virginica</i>
Red Root	<i>Lachnanthes caroliniana</i>
Engler's Bogbutton	<i>Lachnocaulon engleri</i>
Small's Bogbutton	<i>Lachnocaulon minus</i>
Grassleaf Lettuce	<i>Lactuca graminifolia</i>
Drysand Pinweed	<i>Lechea divaricata</i>
Piedmont Pinweed	<i>Lechea torreyi</i>
Valdivia Duckweed	<i>Lemna valdiviana</i>
Virginia Pepperweed	<i>Lepidium virginicum</i>
Chapman's Gayfeather	<i>Liatris chapmanii</i>
Garber's Gayfeather	<i>Liatris garberi</i>
Slender Gayfeather	<i>Liatris gracilis</i>
Dense Gayfeather	<i>Liatris spicata</i>
Shortleaf Gayfeather	<i>Liatris tenuifolia</i>
Catesby's Lily	<i>Lilium catesbaei</i>
Frog's Bit	<i>Limnobiium spongia</i>
Asian Marshweed	<i>Limnophila sessiliflora</i>
Canada Toad Flax	<i>Linaria canadensis</i>
Apalachicola Toad Flax	<i>Linaria floridana</i>

Yellowseed False Pimpernel	<i>Lindernia anagallidea</i>
Malaysian False Pimpernel	<i>Lindernia crustacea</i>
Savannah False Pimpernel	<i>Lindernia grandiflora</i>
Stiff Yellow Flax	<i>Linum medium var. texanum</i>
Bay Lobelia	<i>Lobelia feayana</i>
Glade Lobelia	<i>Lobelia glandulosa</i>
White Lobelia	<i>Lobelia paludosa</i>
Seedbox	<i>Ludwigia alternifolia</i>
Piedmont Primrosewillow	<i>Ludwigia arcuata</i>
Curtiss' Primrosewillow	<i>Ludwigia curtissii</i>
Yerba De Jicotea	<i>Ludwigia erecta</i>
Lanceleaf Primrosewillow	<i>Ludwigia lanceolata</i>
Anglestem Primrosewillow	<i>Ludwigia leptocarpa</i>
Southeastern Primrosewillow	<i>Ludwigia linifolia</i>
Seaside Primrosewillow	<i>Ludwigia maritima</i>
Mexican Primrosewillow	<i>Ludwigia octovalvis</i>
Marsh Seedbox	<i>Ludwigia palustris</i>
Peruvian Primrosewillow	<i>Ludwigia peruviana</i>
Hairy Primrosewillow	<i>Ludwigia pilosa</i>
Creeping Primrosewillow	<i>Ludwigia repens</i>
Shrubby Primrosewillow	<i>Ludwigia suffruticosa</i>
Savannah Primrosewillow	<i>Ludwigia virgata</i>
Sky Blue Lupine	<i>Lupinus diffusus</i>
Garden Tomato	<i>Lycopersicon esculentum</i>
Taperleaf Waterhorehound	<i>Lycopus rubellus</i>
Rose-Rush	<i>Lygodesmia aphylla</i>
Wild Bushbean	<i>Macroptilium lathyroides</i>
Grassleaf Barbara's Buttons	<i>Marshallia tenuifolia</i>
Axilflower	<i>Mecardonia acuminata</i>
Snow Squarestem	<i>Melanthera nivea</i>
White Sweetclover	<i>Melilotus albus</i>
Indian Sweetclover	<i>Melilotus indicus</i>
Manatee Mudflower	<i>Micranthemum glomeratum</i>
Lax Hornpod	<i>Mitreola petiolata</i>
Swamp Hornpod	<i>Mitreola sessilifolia</i>
Indian Chickweed	<i>Mollugo verticillata</i>
Nakedstem Dewflower	<i>Murdannia nudiflora</i>
Celestial-lily	<i>Nemastylus floridana</i>
American White Waterlily	<i>Nymphaea odorata</i>
Big Floatingheart	<i>Nymphoides aquatica</i>
Cut-leaf Evening-primrose	<i>Oenothera laciniata</i>
Exotic Prickly-pear	<i>Opuntia ficus-indica</i>
Prickley-pear	<i>Opuntia humifusa</i>
Lady's sorrel	<i>Oxalis corniculata</i>
Violet Wood-sorrel	<i>Oxalis debilis var. corymbosa</i>
Water Dropwort	<i>Oxypolis filiformis</i>
Florida Pellitory	<i>Parietaria floridana</i>
Santa Maria	<i>Parthenium hysterophorus</i>
Spreading Cinchweed	<i>Pectis prostrata</i>



Greed Arum	<i>Peltandra virginica</i>
Frog-fruit	<i>Phyla nodiflora</i>
Drummond's Leaf-flower	<i>Phyllanthus abnormis</i>
Carry-me-seed	<i>Phyllanthus amarus</i>
Mascarene Island Leaf-flower	<i>Phyllanthus tenellus</i>
Cutleaf Groundcherry	<i>Physalis angulata</i>
Cypresshead Groundcherry	<i>Physalis arenicola</i>
Husk Tomato	<i>Physalis pubescens</i>
Pokeberry	<i>Phytolacca americana</i>
Pennyroyal	<i>Piloblephis rigida</i>
Artillery Plant	<i>Pilea microphylla</i>
Blue Butterwort	<i>Pinguicula caerulea</i>
Yellow Butterwort	<i>Pinguicula lutea</i>
Small Butterwort	<i>Pinguicula pumila</i>
Pitted Stripeseed	<i>Piriqueta caroliniana</i>
Water-lettuce	<i>Pistia stratiotes</i>
Narrowleaf Silkgrass	<i>Pityopsis graminifolia</i>
Lance-leaf Plantain	<i>Plantago lanceolata</i>
Large Plantain	<i>Plantago major</i>
Virginia Plantain	<i>Plantago virginica</i>
Snowy Orchid	<i>Platanthera nivea</i>
Stinking Camphorweed	<i>Pluchea foetida</i>
Sweetscent	<i>Pluchea odorata</i>
Rosy Camphorweed	<i>Pluchea rosea</i>
Paintedleaf	<i>Poinsettia cyathophora</i>
Fiddler's Spurge	<i>Poinsettia heterophylla</i>
Rose Pogonia	<i>Pogonia ophioglossoides</i>
Slenderleaf Chlammyweed	<i>Polanisia tenuifolia</i>
White Bachelor Button	<i>Polygala baldwinii</i>
Drumheads	<i>Polygala cruciata</i>
Tall Pinebarren Milkwort	<i>Polygala cymosa</i>
Candyweed	<i>Polygala grandiflora</i>
Procession Flower	<i>Polygala incarnata</i>
Yellow Milkwort	<i>Polygala lutea</i>
Candyroot	<i>Polygala nana</i>
Milkwort	<i>Polygala ramosa</i>
Bachelor Button	<i>Polygala rugellii</i>
Coastalplain Milkwort	<i>Polygala setacea</i>
Denseflower Knotweed	<i>Polygonum densiflorum</i>
Mild Waterpepper	<i>Polygonum hydropiperoides</i>
Dotted Smartweed	<i>Polygonum punctatum</i>
Rustweed	<i>Polypremum procumbens</i>
Pickerelweed	<i>Pontederia cordata</i>
Purslane	<i>Portulaca oleracea</i>
Pink Purslane	<i>Portulaca pilosa</i>
Marsh Mermaidweed	<i>Proserpinaca palustris</i>
Combleaf Mermaidweed	<i>Proserpinaca pectinata</i>
Blackroot	<i>Pterocaulon pycnostachyum</i>
Giant Orchid	<i>Pteroglossaspis ecristata</i>

Mock Bishop Weed	<i>Ptilimnium capillaceum</i>
West Indian Meadowbeauty	<i>Rhexia cubensis</i>
Pale Meadowbeauty	<i>Rhexia mariana</i>
Meadowbeauty	<i>Rhexia nashii</i>
Nuttall's Meadowbeauty	<i>Rhexia nuttallii</i>
Least Snoutbean	<i>Rhynchosia minima</i>
Tropical Mexican-clover	<i>Richardia brasiliensis</i>
Large Flower Mexican-clover	<i>Richardia grandiflora</i>
Rough Mexican-clover	<i>Richardia scabra</i>
Castor Bean	<i>Ricinus communis</i>
Rougeplant	<i>Rivina humilis</i>
Toothcup	<i>Rotala ramosior</i>
Black-eyed Susan	<i>Rudbeckia hirta</i>
Ruellia	<i>Ruellia caroliniensis</i>
Swamp Dock	<i>Rumex verticillatus</i>
Marsh-pink	<i>Sabatia bartramii</i>
Slender Marsh-pink	<i>Sabatia calycina</i>
Large-flower Rose-gentian	<i>Sabatia grandiflora</i>
Rose-of-Plymouth	<i>Sabatia stellaris</i>
Lizard's tail	<i>Saururus cernuus</i>
Arrowhead	<i>Sagittaria lancifolia</i>
River Sage	<i>Salvia riparia</i>
Water Spangles	<i>Salvinia minima</i>
Limewater Brookweed	<i>Samolus ebracteatus</i>
	<i>Samolus valerandi subsp. parviflorus</i>
Pineland Pimpernel	<i>Schoenocaulon dubium</i>
Florida Feathershank	<i>Schoenolirion albiflorum</i>
Sunnybells	<i>Schoenus nigricans</i>
Black Bogrush	<i>Scoparia dulcis</i>
Sweetbroom	<i>Scutellaria integrifolia</i>
Rough Skullcap	<i>Senecio glabellus</i>
Golden Ragwort	<i>Sesbania herbacea</i>
Danglepod	<i>Sesbania vesicaria</i>
Bladderpod	<i>Sisyrinchium atlanticum</i>
Blue-eyed-grass	<i>Solanum americanum</i>
Common Nightshade	<i>Solanum diphyllum</i>
Twoleaf Nightshade	<i>Solanum erianthum</i>
Potato-tree	<i>Solanum seafortianum</i>
Climbing Nightshade	<i>Solanum torvum</i>
Turkeyberry	<i>Solanum viarum</i>
Tropical Soda Apple	<i>Solidago fistulosa</i>
Pinebarren Goldenrod	<i>Solidago odora var. chapmanii</i>
Chapman's Goldenrod	<i>Solidago stricta</i>
Narrow-leaved Goldenrod	<i>Sonchus asper</i>
Spiney Sowthistle	<i>Sonchus oleraceus</i>
Common Sowthistle	<i>Spermacoce assurgens</i>
Woodland False Buttonweed	<i>Spiranthes longilabris</i>
Longlip Lady's-tresses	<i>Spiranthes odorata</i>
Fragrant Lady's-tresses	

Greenvein Lady's-tresses	<i>Spiranthes praecox</i>
Southern Lady's-tresses	<i>Spiranthes torta</i>
Spring Lady's-tresses	<i>Spiranthes vernalis</i>
Florida Hedgenettle	<i>Stachys floridana</i>
Pineland Scaleypink	<i>Stipulicida setacea</i>
Yellow Hatpins	<i>Syngonanthus flavidulus</i>
Wood Sage	<i>Teucrium canadense</i>
Fire Flag	<i>Thalia geniculata</i>
Reflexed Wild-pine	<i>Tillandsia balbisiana</i>
Potbellied Wild-pine	<i>Tillandsia paucifolia</i>
Cardinal Wild-pine	<i>Tillandsia fasciculata</i>
Ball-moss	<i>Tillandsia recurvata</i>
Thin-leaved Wild-pine	<i>Tillandsia setacea</i>
Spanish Moss	<i>Tillandsia usneoides</i>
Giant Wild-pine	<i>Tillandsia utriculata</i>
Oysterplant	<i>Tradescantia spathacea</i>
Inchplant	<i>Tradescantia zebrina</i>
Brittleweed	<i>Tridax procumbens</i>
White Clover	<i>Trifolium repens</i>
Southern Cattail	<i>Typha domingensis</i>
Common Cattail	<i>Typha latifolia</i>
Caesar-weed	<i>Urena lobata</i>
Horned Bladderwort	<i>Utricularia cornuta</i>
Leafy Bladderwort	<i>Utricularia foliosa</i>
Humped Bladderwort	<i>Utricularia inflata</i>
Southern Bladderwort	<i>Utricularia juncea</i>
Eastern Purple Bladderwort	<i>Utricularia purpurea</i>
Small Purple Bladderwort	<i>Utricularia resupinata</i>
Fringed Bladderwort	<i>Utricularia simulans</i>
Zig-zag Bladderwort	<i>Utricularia subulata</i>
Harsh Verbena	<i>Verbena scabra</i>
Frostweed	<i>Verbesina virginica</i>
Florida Ironweed	
Little Ironweed	<i>Vernonia cinerea</i>
Long-leaf Violet	<i>Viola lanceolata</i>
Sleepy Morning	<i>Waltheria indica</i>
Rocketweed	<i>Youngia japonica</i>
Simpson's Rainlily	<i>Zephyranthes simpsonii</i>
<b><u>Ferns</u></b>	
Lawn Orchid	<i>Zeuxine strateumatica</i>
Carolina Mosquito Fern	<i>Azolla caroliniana</i>
Giant Leather Fern	<i>Acrostichum danaeifolium</i>
Swamp Fern	<i>Blechnum serrulatum</i>
Strap Fern	<i>Campyloneurum phyllitidis</i>
Watersprite	<i>Ceratopteris thalictroides</i>
Southern Club-Moss	<i>Lycopodiella appressa</i>
Nodding Club-Moss	<i>Lycopodiella cernua</i>
Japanese Climbing Fern	<i>Lygodium microphyllum</i>

Tuberous Sword Fern	<i>Nephrolepis cordifolia</i>
Boston Fern	<i>Nephrolepis exaltata</i>
Asian Sword Fern	<i>Nephrolepis multiflora</i>
Cinnamom Fern	<i>Osmunda cinnamomea</i>
Royal Fern	<i>Osmunda regalis</i>
Royal Fern	<i>Osmunda regalis var. spectabilis</i>
Golden Polybody	<i>Phlebodium aureum</i>
Resurrection Fern	<i>Polypodium polypodioides var. michauxiam</i>
Whisk-fern	<i>Psilotum nudum</i>
Bracken Fern	<i>Pteridium aquilinum var. caudatum</i>
Giant Brake	<i>Pteris tripartita</i>
Chinese Ladder Brake	<i>Pteris vittata</i>
Downy Maiden Fern	<i>Thelypteris dentata</i>
Hottentot Fern	<i>Thelypteris interrupta</i>
Widespread Maiden Fern	<i>Thelypteris kunthii</i>
Marsh Fern	<i>Thelypteris palustris var. pubescens</i>
Shoestring Fern	<i>Vittaria lineata</i>
Netted Chain Fern	<i>Woodwardia areolata</i>
Virginia Chain Fern	<i>Woodwardia virginica</i>

### **Graminoids**

Flatspike Sedge	<i>Abildgaardia ovata</i>
Blue Maidencane	<i>Amphicarpum muhlenbergianum</i>
Bushybeard Bluestem	<i>Andropogon glomeratus</i>
	<i>Andropogon glomeratus var. glaucopsis</i>
Purple Bluestem	<i>Andropogon gyrans</i>
Elliott's Bluestem	<i>Andropogon longiberbis</i>
Hairy Bluestem	<i>Andropogon ternarius</i>
Splitbeard Bluestem	<i>Andropogon virginicus</i>
Broomsedge Bluestem	<i>Andropogon virginicus var. glaucus</i>
Chalky Bluestem	<i>Aristida stricta var. beyrichiana</i>
Wiregrass	<i>Aristida palustris</i>
Longleaf Threeawn	<i>Aristida patula</i>
Tall Threeawn	<i>Aristida rhizomophora</i>
Florida Threeawn	<i>Aristida spiciformis</i>
Bottlebrush Threeawn	<i>Axonopus fissifolius</i>
Common Carpetgrass	<i>Axonopus furcatus</i>
Big Carpetgrass	<i>Axonopus compressus</i>
Tropical Carpetgrass	<i>Bulbostylis barbata</i>
Bearded Hairsedge	<i>Bulbostylis ciliatifolia</i>
Capillary Hairsedge	<i>Bulbostylis stenophylla</i>
Sandy Field Hairsedge	<i>Carex glaucescens</i>
Clustered Sedge	<i>Carex longii</i>
Long's Sedge	<i>Carex lupulina</i>
Hop Sedge	<i>Carex vexans</i>
Florida Hammock Sedge	<i>Carica papaya</i>
Papaya	<i>Cenchrus incertus</i>
Coastal Sandbur	

Souther Sandbur	<i>Cenchrus echinatus</i>
Sawgrass	<i>Cladium jamaicense</i>
Wrinkled Jointtailgrass	<i>Coelorachis rugosa</i>
Toothache Grass	<i>Ctenium aromaticum</i>
Bermuda Grass	<i>Cynodon dactylon</i>
Jointed Flatsedge	<i>Cyperus articulatus</i>
Poorland Flatsedge	<i>Cyperus compressus</i>
Baldwin's Flatsedge	<i>Cyperus croceus</i>
Variable Flatsedge	<i>Cyperus difformis</i>
Swamp Flatsedge	<i>Cyperus distinctus</i>
Chufa Flatsedge	<i>Cyperus esculentus</i>
Yellow Flatsedge	<i>Cyperus flavescens</i>
Haspan Flatsedge	<i>Cyperus haspan</i>
Epiphytic Flatsedge	<i>Cyperus lanceolatus</i>
Leconte's Flatsedge	<i>Cyperus lecontei</i>
Swamp Flatsedge	<i>Cyperus ligularis</i>
Fragrant Flatsedge	<i>Cyperus odoratus</i>
Many-spiked Flatsedge	<i>Cyperus polystachyos</i>
Low Flatsedge	<i>Cyperus pumilus</i>
Pinebarren Flatsedge	<i>Cyperus retrorsus</i>
Tropical Flatsedge	<i>Cyperus surinamensis</i>
Durban Crowfootgrass	<i>Dactyloctenium aegyptium</i>
Summer Farewell	<i>Dalea pinnata</i>
Needleleaf Witchgrass	<i>Dichanthelium aciculare</i>
Variable Witchgrass	<i>Dichanthelium commutatum</i>
Cypress Witchgrass	<i>Dichanthelium dichotomum</i>
Dwarf Cypress Witchgrass	<i>Dichanthelium ensifolium</i>
Erectleaf Witchgrass	<i>Dichanthelium erectifolium</i>
Openflower Witchgrass	<i>Dichanthelium laxiflorum</i>
Wooly Witchgrass	<i>Dichantheliumscabriusculum</i>
	<i>Dichanthelium</i>
Roughhair Witchgrass	<i>strigosumvar.glabrescens</i>
Southern Crabgrass	<i>Digitaria ciliaris</i>
Pangola Grass	<i>Digitaria pentzii</i>
Florida Crabgrass	<i>Digitaria floridana</i>
Jamaican Crabgrass	<i>Digitaria horizontalis</i>
Indian Crabgrass	<i>Digitaria longiflora</i>
Slender Crabgrass	<i>Digitaria villosa</i>
Jungle Rice	<i>Echinochloa colona</i>
Barnyard Grass	<i>Echinochloa crusgalli</i>
Coast Cockspur	<i>Echinochloa walteri</i>
Purple Spikerush	<i>Eleocharis atropurpurea</i>
Baldwin's Spikerush	<i>Eleocharis baldwinii</i>
Canada Spikerush	<i>Eleocharis geniculata</i>
Knotted Spikerush	<i>Eleocharis interstincta</i>
Black Spikerush	<i>Eleocharis nigrescens</i>
Spikerush	<i>Eleocharis vivipara</i>
Goose Grass	<i>Eleusine indica</i>
Thalia Lovegrass	<i>Eragrostis atrovirens</i>

Gophertail Lovegrass	<i>Eragrostis ciliaris</i>
Elliott's Lovegrass	<i>Eragrostis elliotti</i>
Teal Lovegrass	<i>Eragrostis hypnoides</i>
Tufted Lovegrass	<i>Eragrostis pectinacea</i>
Purple Lovegrass	<i>Eragrostis spectabilis</i>
Coastal Lovegrass	<i>Eragrostis virginica</i>
Centipede Grass	<i>Eremochloa ophiuroides</i>
Saltmarsh Fingergrass	<i>Eustachys glauca</i>
Pinewoods Fingergrass	<i>Eustachys petraea</i>
Slender Fimbry	<i>Fimbristylis autumnalis</i>
Forked Fimbry	<i>Fimbristylis dichotoma</i>
Hairy Fimbry	<i>Fimbristylis puberula</i>
Ditch Fimbry	<i>Fimbristylis schoenoides</i>
Saltmarsh Umbrellasedge	<i>Fuirena breviseta</i>
Dwarf Umbrellasedge	<i>Fuirena pumila</i>
Southern Umbrellasedge	<i>Fuirena scirpoidea</i>
Hairy Umbrellasedge	<i>Fuirena squarrosa</i>
Section 1.02 Cogan Grass	<i>Imperata brasiliensis</i>
Soft Rush	<i>Juncus effusus subsp. sodutus</i>
Shore Rush	<i>Juncus marginatus</i>
Bighead Rush	<i>Juncus megacephalus</i>
Many-headed Rush	<i>Juncus polycephalus</i>
Lesser Creeping Rush	<i>Juncus repens</i>
Needlepod Rush	<i>Juncus scirpoides</i>
Shortleaf Spikesedge	<i>Kyllinga brevifolia</i>
Southern Cutgrass	<i>Leersia hexandra</i>
Molasses Grass	<i>Melinis minutiflora</i>
Hair-awn Muhly	<i>Muhlenbergia capillaris</i>
Woods Grass	<i>Oplismenus hirtellus</i>
Beaked Panicum	<i>Panicum anceps</i>
Fall Panicgrass	<i>Panicum dichotomiflorum</i>
	<i>Panicum dichotomiflorum var.</i>
	<i>bartowense</i>
Hairy Fall Panicgrass	<i>Panicum hemitomom</i>
Maidencane	<i>Panicum hians</i>
Gaping Panicum	<i>Panicum longifolium</i>
Long-leaf Panicum	<i>Panicum maximum</i>
Section 1.03 Guinea Grass	<i>Panicum repens</i>
Torpedo grass	<i>Panicum rigidulum</i>
Red-top Panicum	<i>Panicum tenerum</i>
Bluejoint Panicum	<i>Panicum verrucosum</i>
Warty Panicum	<i>Panicum virgatum</i>
Switch Grass	<i>Paspalidium geminatum</i>
Egyptian Paspalidium	<i>Paspalum blodgettii</i>
Coral Paspalum	<i>Paspalum boscianum</i>
Bull Crowngrass	<i>Paspalum caespitosum</i>
Blue Crowngrass	<i>Paspalum conjugatum</i>
Sour Paspalum	<i>Paspalum dilatatum</i>
Dallis Grass	<i>Paspalum dissectum</i>
Mudbank Paspalum	

Florida Paspalum	<i>Paspalum floridanum</i>
Field Paspalum	<i>Paspalum laeve</i>
Gulfdume Paspalum	<i>Paspalum monostachyum</i>
Bahia Grass	<i>Paspalum notatum</i>
Brownseed Paspalum	<i>Paspalum plicatulum</i>
Early Paspalum	<i>Paspalum praecox</i>
Water Paspalum	<i>Paspalum repens</i>
Thin Paspalum	<i>Paspalum setaceum</i>
Vasey Grass	<i>Paspalum urvellei</i>
Seashore Paspalum	<i>Paspalum vaginatum</i>
Napier Grass	<i>Pennisetum purpureum</i>
Common Reed	<i>Phragmites australis</i>
Short-beaked Baldrush	<i>Psilocarya nitens</i>
Natal Grass	<i>Rhynchelytrum repens</i>
Shortbristle Beaksedge	<i>Rhynchospora breviseta</i>
Anglestem Beaksedge	<i>Rhynchospora caduca</i>
Bunched Beaksedge	<i>Rhynchospora cephalantha</i>
Chapman's Beaksedge	<i>Rhynchospora chapmanii</i>
Fringed Beaksedge	<i>Rhynchospora ciliaris</i>
White-tops	<i>Rhynchospora colorata</i>
Short-bristle Horned Beaksedge	<i>Rhynchospora corniculata</i>
Spreading Beaksedge	<i>Rhynchospora divergens</i>
Fascicled Beaksedge	<i>Rhynchospora fascicularis</i>
Threadleaf Beaksedge	<i>Rhynchospora filifolia</i>
Grass-like beaked-rush	<i>Rhynchospora globularis</i>
Pinebarren Beaksedge	<i>Rhynchospora intermedia</i>
Beaked-rush	<i>Rhynchospora inundata</i>
Giant White-tops	<i>Rhynchospora latifolia</i>
Millet Beaksedge	<i>Rhynchospora miliacea</i>
Littleseed Beaked-rush	<i>Rhynchospora microcarpa</i>
Fragrant Beaksedge	<i>Rhynchospora odorata</i>
Plumed Beaksedge	<i>Rhynchospora plumosa</i>
Fewflower Beaksedge	<i>Rhynchospora rariflora</i>
Narrow-leaf Beaksedge	<i>Rhynchospora stenophylla</i>
Tracy's Beaked-rush	<i>Rhynchospora tracyi</i>
Sugarcane Plumegrass	<i>Saccharum giganteum</i>
Indian Cupscale	<i>Sacciolepis indica</i>
American Cupscale	<i>Sacciolepis striata</i>
South Florida Bluestem	<i>Schizachyrium rhizomatum</i>
Creeping Bluestem (UR4)	<i>Schizachyrium stoloniferum</i>
Three-square Bulrush	<i>Scirpus pungens</i>
Balwin's Nutrush	<i>Scleria baldwinii</i>
Slenderfruit Nutrush	<i>Scleria georgiana</i>
Netted Nutrush	<i>Scleria reticularis</i>
Whip Nutrush	<i>Scleria triglomerata</i>
Low Nutrush	<i>Scleria verticillata</i>
Knot root Bristlegrass	<i>Setaria geniculata</i>
Lopsided Indiangrass	<i>Sorghastrum secundum</i>
Sand Cordgrass	<i>Spartina bakeri</i>

Coral Dropseed  
Smutgrass  
Pineywoods Dropseed  
St. Augustine's Grass  
Eastern Gamagrass  
Paragrass  
Signalgrass

*Sporobolus domingensis*  
*Sporobolus indicus*  
*Sporobolus junceus*  
*Stenotaphrum secundatum*  
*Tripsacum dactyloides*  
*Urochloa mutica*  
*Urochloa subquadriflora*

### **Birds**

American white pelican  
Brown pelican  
Pied-billed grebe  
Double-crested cormorant  
American anhinga  
Black-bellied whistling duck  
Fulvous whistling duck  
Mottled duck  
American widgeon  
Green-winged teal  
Wood duck  
Ring-necked duck  
American coot  
Purple gallinule  
Great blue heron  
Great white heron  
Little blue heron  
Tricolor heron  
Snowy egret  
Great egret  
Cattle egret  
Black-crowned night heron  
Yellow-crowned night heron  
Green heron  
American bittern  
Least bittern  
Woodstork  
Sandhill crane  
Limpkin  
Glossy ibis  
White ibis  
Roseate spoonbill  
Common moorhen  
Black-necked stilt  
American avocet  
Killdeer

*Pelecanus erythrorhynchos*  
*Pelecanus occidentalis*  
*Podilymbus podiceps*  
*Phalacrocorax auritus*  
*Anhinga anhinga*  
*Dendrocygna autumnalis*  
*Dendrocygna bicolor*  
*Anas fulvigula*  
*Anas americana*  
*Anas crecca*  
*Aix sponsa*  
*Aythya collaris*  
*Fulica americana*  
*Porphyrio martinica*  
*Ardea herodias*  
*Ardea herodias*  
*Egretta caerulea (SSCs)*  
*Egretta tricolor (SSCs)*  
*Egretta thula (SSCs)*  
*Casmerodius albus*  
*Bubulcus ibis*  
*Nycticorax nycticorax*  
*Nyctanassa violacea*  
*Butorides virescens*  
*Botaurus lentiginosus*  
*Ixobrychus exilis*  
*Mycteria americana (Ef)*  
*Grus canadensis pratensis(Ts)*  
*Aramus guarauna (SSCs)*  
*Plegadis falcinellus*  
*Eudocimus albus (SSCs)*  
*Platalea ajaja*  
*Gallinula chloropus*  
*Hemantopus mexicanus*  
*Recurvirostra americana*  
*Charadrius vociferus*



DuPuis Management Area General Management Plan 2014 through 2024  
South Florida Water Management District, Land Stewardship Section

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Common snipe	<i>Gallinago delicata</i>
Short-billed dowitcher	<i>Limnodromus griseus</i>
Greater yellowlegs	<i>Tringa melanoleuca</i>
Lesser yellowlegs	<i>Tringa flavipes</i>
Solitary sandpiper	<i>Tringa solitaria</i>
Pectoral sandpiper	<i>Calidris melanotos</i>
Western sandpiper	<i>Calidris mauri</i>
Least sandpiper	<i>Calidris minutilla</i>
Wild turkey	<i>Meleagris gallopavo</i>
Northern bobwhite	<i>Colinus virginianus</i>
Everglades snail kite	<i>Rostrhamus sociabilis(Ef)</i>
Swallow-tailed kite	<i>Elanoides forficatus</i>
Cooper's hawk	<i>Accipiter cooperii</i>
Northern harrier	<i>Circus cyaneus</i>
Red-shouldered hawk	<i>Buteo lineatus</i>
Red-tailed hawk	<i>Buteo jamaicensis</i>
Sharp-shinned hawk	<i>Accipiter striatus</i>
Osprey	<i>Pandion haliaetus</i>
Bald eagle	<i>Haliaeetus leucocephalus(Ts)</i>
Black vulture	<i>Coragyps atratus</i>
Turkey vulture	<i>Cathartes aura</i>
Crested caracara	<i>Caracara cheriway( Tf)</i>
American kestrel	<i>Falco sparverius</i>
Merlin	<i>Falco columbarius</i>
Screech owl	<i>Otus asio</i>
Barred owl	<i>Strix varia</i>
Barn owl	<i>Tyto alba</i>
Great horned owl	<i>Bubo virginianus</i>
White-winged dove	<i>Zenaida asiatica</i>
Mourning dove	<i>Zenaida macroura</i>
Ground dove	<i>Columbina passerina</i>
Eurasian-collared dove	<i>Streptopelia decaocto</i>
Yellow-billed cuckoo	<i>Coccyzus americanus</i>
Smooth-billed ani	<i>Crotophaga ani</i>
Common nighthawk	<i>Chordeiles minor</i>
Chuck-wills-widow	<i>Caprimulgus carolinensis</i>
Ruby-throated hummingbird	<i>Archilochus colubris</i>
Belted kingfisher	<i>Ceryle alcyon</i>
Red-headed woodpecker	<i>Melanerpes erythrocephalus</i>
Northern flicker	<i>Colaptes auratus</i>
Red-bellied woodpecker	<i>Melanerpes carolinus</i>
Red-cockaded woodpecker	<i>Picoides borealis (Ef)</i>
Downy woodpecker	<i>Picoides pubescens</i>
Hairy woodpecker	<i>Picoides villosus</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>
Yellow-bellied sapsucker	<i>Sphyrapicus varius</i>
Eastern kingbird	<i>Tyrannus tyrannus</i>
Great crested flycatcher	<i>Myiarchus crinitus</i>
Eastern Wood-Pee-wee	<i>Contopus virens</i>

Eastern phoebe	<i>Sayornis phoebe</i>
Chimney swift	<i>Chaetura pelagica</i>
Purple martin	<i>Progne subis</i>
Northern rough-winged swallow	<i>Stelgidopteryx serripennis</i>
Barn swallow	<i>Hirundo rustica</i>
Tree swallow	<i>Tachycineta bicolor</i>
American Crow	<i>Corvus brachyrhynchos</i>
Fish crow	<i>Corvus ossifragus</i>
Blue jay	<i>Cyanocitta cristata</i>
Ruby-crowned kinglet	<i>Regulus calendula</i>
Blue-gray gnatcatcher	<i>Poliophtila melanura</i>
House wren	<i>Troglodytes aedon</i>
Carolina wren	<i>Thryothorus ludovicianus</i>
Brown thrasher	<i>Toxostoma rufum</i>
Gray catbird	<i>Dumetella carolinensis</i>
Northern Mockingbird	<i>Mimus polyglottos</i>
Eastern bluebird	<i>Sialia sialis</i>
Robin	<i>Turdus migratorius</i>
Wood thrush	<i>Hylocichla mustelina</i>
Loggerhead shrike	<i>Lanius ludovicianus</i>
White-eyed vireo	<i>Vireo griseus</i>
Blue-headed vireo	<i>Vireo solitarius</i>
Prothonotary warbler	<i>Protonotaria citrea</i>
Cape may warbler	<i>Dendroica tigrina</i>
Pine warbler	<i>Dendroica pinus</i>
Palm warbler	<i>Dendroica palmarum</i>
Prairie warbler	<i>Dendroica discolor</i>
Yellow-rumped warbler	<i>Dendroica conoata</i>
Yellow-throated warbler	<i>Dendroica dominica</i>
Black-throated green warbler	<i>Dendroica virens</i>
Black-throated blue warbler	<i>Dendroica caerulescens</i>
American redstart	<i>Setophaga ruticilla</i>
Black and white warbler	<i>Mniotilta varia</i>
Connecticut warbler	<i>Oporornis ogilis</i>
Northern parula warbler	<i>Parula americana</i>
Common yellowthroat	<i>Geothlypis trichas</i>
Ovenbird	<i>Seiurus aurocapilla</i>
Louisiana waterthrush	<i>Seiurus motacilla</i>
Red-winged blackbird	<i>Agelaius phoeniceus</i>
Boat-tailed grackle	<i>Quiscalus major</i>
Common grackle	<i>Quiscalus quisqualis</i>
Eastern meadowlark	<i>Sturnella magna</i>
Brown-headed cowbird	<i>Molothrus ater</i>
Northern cardinal	<i>Cardinalis cardinalis</i>
Rufous-sided towhee	<i>Pipilo erythrophthalmus</i>
Chipping sparrow	<i>Spizella passerina</i>
Bachman's sparrow	<i>Aimophila aestivalis</i>
Song sparrow	<i>Melospiza melodia</i>
Blue grosbeak	<i>Passerina caerulea</i>

Painted bunting  
Indigo bunting  
European starling  
Cedar waxwing  
American goldfinch

*Passerina ciris*  
*Passerina cyanea*  
*Sturnus vulgaris*  
*Bombycilla cedrorum*  
*Carduelis tristis*

### **Mammals**

Florida panther\*  
Bobcat  
White-tailed deer  
Feral pig  
Gray fox  
Coyote  
Raccoon  
Opossum  
River otter  
Striped skunk  
Nine-banded armadillo  
Eastern cottontail  
Marsh rabbit  
Southern flying squirrel  
Eastern gray squirrel  
Sherman's fox squirrel  
Oldfield mouse  
Hispid cotton rat  
Rice rat  
Round-tailed muskrat  
Black rat  
Least shrew  
Short-tailed shrew  
Evening bat  
Yellow bat

*Felis concolor (Ef)*  
*Lynx rufus*  
*Odocoileus virginiana*  
*Sus scrofa*  
*Urocyon cinereoargenteus*  
*Canis latrans*  
*Procyon lotor*  
*Didelphis virginiana*  
*Lutra canadensis*  
*Mephitis mephitis*  
*Dasybus novemcinctus*  
*Sylvilagus floridanus*  
*Sylvilagus palustris*  
*Glaucomys volans*  
*Sciurus carolinensis*  
*Sciurus niger (SSCs)*  
*Peromyscus polionotus*  
*Sigmodon hispidus*  
*Oryzomys palustris*  
*Neofiber alleni*  
*Rattus rattus*  
*Cryptotis parva*  
*Blarina brevicauda*  
*Nycticeius humerdis*  
*Lasiurus intermedius*

Last documented sighting on Dupuis was in the 1980's.

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### **Reptiles and Amphibians**

#### **Reptiles**

American alligator  
Florida red-bellied turtle  
Peninsula cooter  
Florida softshell  
Green anole  
Brown anole  
Ground skink  
Southeastern five-lined skink  
Island glass lizard  
Southern black racer  
Southern ringneck snake

*Alligator mississippiensis*  
*Pseudemys nelsoni*  
*Pseudemys floridana*  
*Trionyx ferox*  
*Anolis carolinensis*  
*Anolis sagrei*  
*Scincella laterale*  
*Eumeces inexpectatus*  
*Ophisaurus compressus*  
*Coluber constrictor*  
*Diadophis punctatus*

Florida kingsnake  
Eastern garter snake  
Peninsula ribbon snake  
Florida brown snake  
Rough green snake  
Eastern indigo snake  
Eastern diamondback rattlesnake  
Gopher Tortoise

*Lampropeltis getulus*  
*Thamnophis sirtalis*  
*Thamnophis sauritus*  
*Storeria dekayi*  
*Opheodrys aestivus*  
*Drymarchon corais* (Tf)  
*Crotalus adamanteus*  
*Gopherus polyphemus* (Ts)

**Amphibians**

Greater siren  
Oak toad  
Southern toad  
Green treefrog  
Squirrel treefrog  
Greenhouse frog  
Pig frog  
Southern leopard frog  
Cuban treefrog  
Southern cricket frog

*Siren lacertina*  
*Bufo quercicus*  
*Bufo terrestris*  
*Hyla cinerea*  
*Hyla squirella*  
*Eleutherodactylus planirostris*  
*Rana grylio*  
*Rana utricularia*  
*Osteopilus septentrionalis*  
*Acris gryllus*

**Fish**

Everglades pygmy sunfish  
Bluespotted sunfish  
Redear sunfish  
Warmouth  
Bluegill  
Brown bullhead  
Channel catfish  
Brook silverside  
Bluefin killifish  
Mosquitofish  
Flagfish  
Golden topminnow  
Two-spotted cichlid  
Florida gar  
Sailfin molly  
Largemouth bass

*Elassoma evergladei*  
*Enneacanthus gloriosus*  
*Lepomis microlophus*  
*Lepomis gulosus*  
*Lepomis machrochirus*  
*Ictalurus nebulosus*  
*Ictalurus punctatus*  
*Labidesthes sicculus*  
*Lucania goodei*  
*Gambusia affinis*  
*Jordanella floridae*  
*Fundulus chrysotus*  
*Cichlasoma bimaculatum*  
*Lepisosteus platyrrhincus*  
*Poecilia latipinna*  
*Micropterus salmoides*

SSC = Species of Special Concern  
E = Endangered  
T = Threatened  
f = federally designated  
s = state designated