

LAND MANAGEMENT PLAN

FLATFORD SWAMP PRESERVE



SEPT. 20, 2023

Southwest Florida
Water Management District



Land Management Plan

Flatford Swamp Preserve

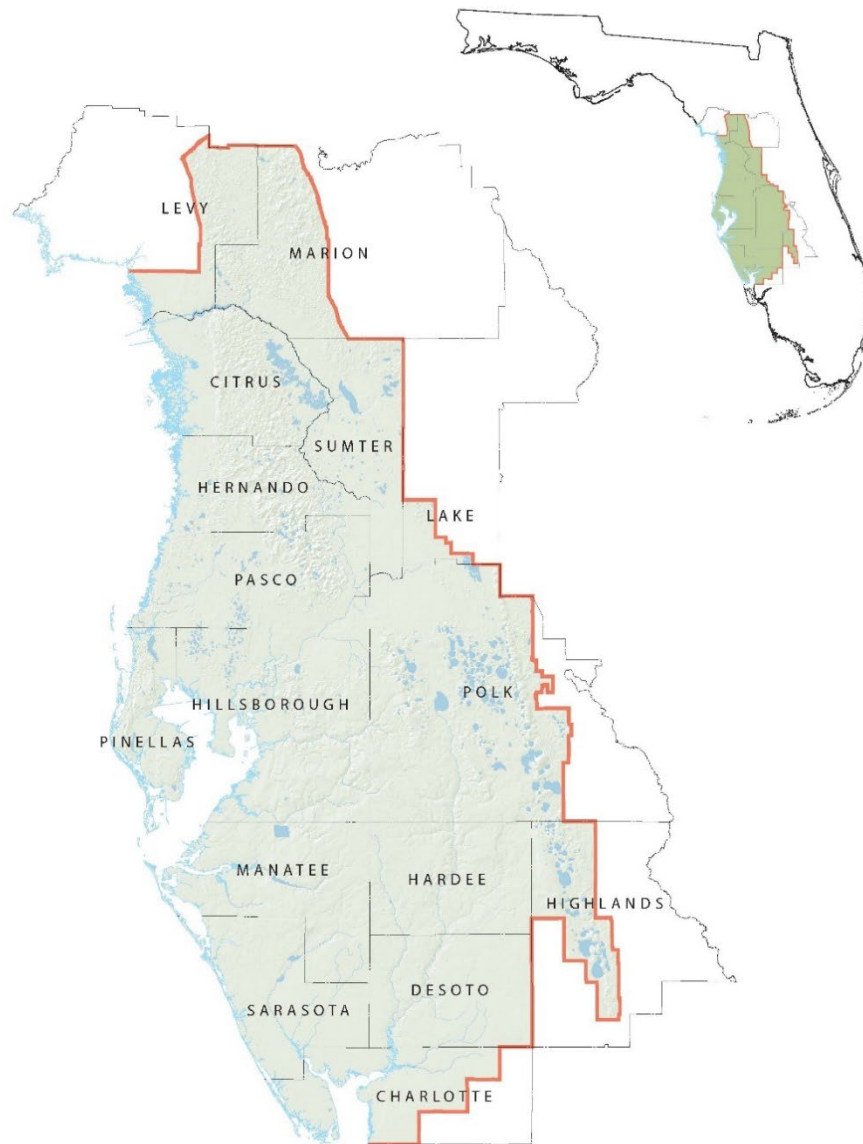
Land Resources Bureau

Southwest Florida Water Management District

September 20, 2023

The Southwest Florida Water Management District (District) is a science-based organization responsible for managing and protecting water resources in west-central Florida. The District's job is to ensure there are adequate water supplies to meet the needs of current and future users while protecting and restoring water and related natural resources.

The District encompasses all or part of 16 counties, from Levy County in the north to Charlotte County in the south. It extends from the Gulf of Mexico east to the highlands of central Florida. The District contains 97 local governments spread over approximately 10,000 square miles, with a total population estimated to be 5.4 million in 2020.



Southwest Florida Water Management District



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Executive Summary

Acres: 2,357

Acquisition Date: 1991

Plan Term: 10 Years (2024-2033)

Primary Basin: Myakka River

Secondary Basins: Ogleby Creek, Long Creek, and Maple Creek

Location: Manatee County

Funding Source: Preservation 2000

Natural Systems: The District uses the natural community classification system defined by the Florida Natural Areas Inventory (FNAI) to describe and categorize the habitat types found at the Flatford Swamp Preserve (Preserve). Nine different natural communities or land cover types were identified by FNAI. Wetlands account for 80 percent of the Preserve, with the vast majority consisting of a large floodplain marsh (1,834 acres) that comprises Flatford Swamp. Several clusters of upland habitat adjoin the perimeter of the floodplain marsh along the Preserve's eastern and western boundaries.

Water Resources: Water Resource benefits provided by the Preserve include flood protection, water quality enhancement, and water supply. Approximately 2,045 acres of the Preserve, or 87 percent of the total land area, is located within the 100-year floodplain. The floodplain corresponds closely with the 80 percent (1,881 acres) of the Preserve that is comprised of wetland. The extensive area of wetland enhances water quality by sequestering nutrients and other contaminants that drain into the property from surrounding agricultural lands. An aquifer recharge project designed to intercept excess water draining into the Preserve, treat it to primary drinking water standards and then inject it into the Floridan aquifer is currently being tested. In addition to enhancing recharge in the vicinity of the Preserve, the project may offset saltwater intrusion occurring along the coast.

Land Management: Management activities on the Preserve include applications of prescribed fire, habitat management, and control of invasive, nonnative plant species, and feral hogs. The District seeks to apply fire to all fire-dependent natural communities based on natural fire return intervals as defined by FNAI. There is a network of firelines maintained throughout the property and along the properties perimeter to facilitate the safe use of prescribed fire and to limit the potential for wildfires to enter or escape from the property.

Cultural and Historical Resources: There are no known archaeological or cultural sites documented in the Florida Master Site File maintained by the Florida Department of State. Any such sites that are discovered on the Preserve will be protected and managed consistent with established guidelines.

Recreation: Recreational activities permitted at the Preserve include hiking and fishing. The predominance of forested wetlands greatly limits the land area available for recreational use. The

trail network available for hiking is approximately two miles in total length. A parking area and walk-thru entrance are located at the intersection of Wauchula Road and Taylor Road. An additional walk-thru entrance is located approximately two miles south of the Taylor Road entrance however, no parking area is provided.

Special Use Authorization (SUA): A variety of special uses may potentially be permitted on the Preserve through issuance of a SUA which must be approved by the District as set forth in Florida Administrative Code §40D-9. Uses typically covered by SUAs include various recreational activities, scientific research, and law enforcement training. There are no SUAs currently issued for this property.

Access: Primary access to the Preserve is on Taylor Road. A parking area and walk-thru entrance are located at 39450 Taylor Road, adjacent to the intersection of Wauchula and Taylor Road. An additional walk through is located south of the primary access on Wauchula Road.

Real Estate: There are no additional acquisitions currently planned for lands adjacent to the Preserve. The Preserve encompasses nearly the entirety of the Flatford Swamp system. There may be an opportunity in the future for additional land acquisition within the Upper Myakka River Watershed project area.

Cooperative Agreements, Leases, and Easements: There are no cooperative agreements, leases or easements that apply to any of the Preserve land area. However, the District purchased a conservation easement over the 1,159-acre Rocking Seven Ranch, which adjoins the western boundary of the Preserve and is located wholly within the Ogleby Creek basin.

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Introduction and General Information

Management Plan Purpose

The purpose of this Management Plan is to set forth the District's management strategy for the Preserve for the next 10 years. The creation, updating, and implementation of this Management Plan is governed by the District's Governing Board Policy titled Land Use and Management (District Policy) and the District's Executive Director Procedure titled Land Use and Management Planning (Procedure) which govern the use and management of District-owned conservation lands. District-owned conservation lands are managed for the protection of water resources and natural systems through the application of effective and efficient land management practices. This Management Plan provides an overview of the property, a summary of past achievements, and an outline of goals and objectives for the next 10-year planning period.

District Planning Philosophy

The District's planning philosophy is to develop comprehensive management plans that are created with input from both internal and external stakeholders that will account for next 10 year planning cycle. Stakeholder input is essential and is outlined further below. Land Management Plans are designed to guide the appropriate uses on and the management of District conservation lands that are consistent with statutes, District Governing Board Policy, and Executive Director Procedures.

Management Plans are therefore developed following an extensive process of planning, coordination, data review, field review, and creation of strategic goals and objectives. Through this process, a draft Management Plan is created and reviewed by key stakeholders, including District staff, subject matter experts, state agencies, local governments, partners, non-governmental organizations, and other interest groups.

Following review of the draft Management Plan by the key stakeholders identified above, a public workshop is held to solicit public input on the draft Management Plan. The workshop is advertised through a press release, on the District's website, and via social media outlets, and it is open to everyone. Additionally, the public has an opportunity to provide written input via the District's website for a period both preceding and following the workshop. Once the public comment period has expired, a final draft of the Land Management Plan that includes consideration of public input is presented to the District's Governing Board for approval at a regular Governing Board meeting.

Stakeholder Involvement

In addition to the input solicited through a public workshop during the development of the Management Plan, the District also provides the opportunity for stakeholders to provide input during the Land Management Review process. This process occurs periodically throughout the life of the Management Plan to allow stakeholders an opportunity to review management activities and hold the District accountable for the management of the property. This process assures the District is managing the land in accordance with the Land Management Plan and is consistent with the purpose for which the property was acquired. The Land Management Review team is comprised of team members from various state agencies, cooperative partners, private land managers, and

other entities involved in land management. The focus is on land management activities and recreational uses on the property and includes a thorough review of the property by the Management Review Team. At the conclusion of the field review an evaluation is completed by each participant. These evaluations are reviewed by staff and then consolidated into a summary that is presented to the District's Governing Board.

District Strategic Plan

The District has authored a Strategic Plan that covers a five-year planning cycle covering each of its four planning regions, the Northern Region, the Tampa Bay Region, the Heartland Region, and the Southern Region. The 2023-2027 Strategic Plan outlines the District's focus in each of these four planning regions as it relates to the District's core mission of water supply, water quality, natural systems, and flood protection and establishes a goal for each of those areas of responsibility. The Strategic Plan further identifies 11 strategic initiatives to meet these four goals: Regional Water Supply Planning, Alternative Water Supply, Reclaimed Water, Water Conservation, Water Quality Assessment and Planning, Water Quality Maintenance and Improvement, Minimum Flows and Levels Establishment and Monitoring, Conservation and Restoration, Floodplain Management, Flood Protection Maintenance and Improvement, and Emergency Flood Response.

As part of the District's goal relating to the natural systems element of its core mission, the Conservation and Restoration strategic initiative incorporates the restoration and management of natural ecosystems for the benefit of water and water-related resources. The major components of the goal include land acquisition and management, ecosystem monitoring and restoration, education, and regulation. Land acquisition and management are critical to the District's conservation and restoration objectives. If land acquired has been altered, that land may be restored if beneficial and then managed to maintain ecological and hydrological functions. In addition, land management is identified in the Strategic Plan as one of seven Core Business Processes critical to achieving the District's strategic initiatives and regional priorities as defined in the Strategic Plan.

Management Authority

The District considers the Preserve to be conservation land which dictates the management intent for the property. Pursuant to Subsection 373.089(6)(c) of the Florida Statutes, all lands titled to the District prior to July 1, 1999, were designated as having been acquired for conservation purposes. This brings parcels that were purchased originally as water control projects within the purview of conservation land management. Other parcels that were later acquired under conservation land acquisition programs are also managed for these same purposes.

Furthermore, pursuant to Section 373.1391 of the Florida Statutes, lands titled to the District should be managed and maintained, to the extent practicable, in such a way as to ensure a balance between public access, recreation, and the restoration and protection of their natural state and condition. District Policy and District Procedure govern the use and management of these lands in accordance with Chapters 259 and 373 of the Florida Statutes.

Location

The Preserve is located in southeastern Manatee County approximately three miles north of Myakka City (**Figure 1**). The property is 19 miles east of Interstate 75 and is situated between State Road 64 and State Road 70, along Wauchula Road. It is bounded on the east by Wauchula Road and on the north by Taylor Road (**Figure 2**). The primary access point is located at 39450 Taylor Road Myakka City, Florida 34251. Flatford Swamp is the dominant natural feature and is the discharge point for a series of creeks (Maple, Ogleby, Long, Coker and Sand Slough) that collectively comprise the heart of the headwaters network for the Myakka River.

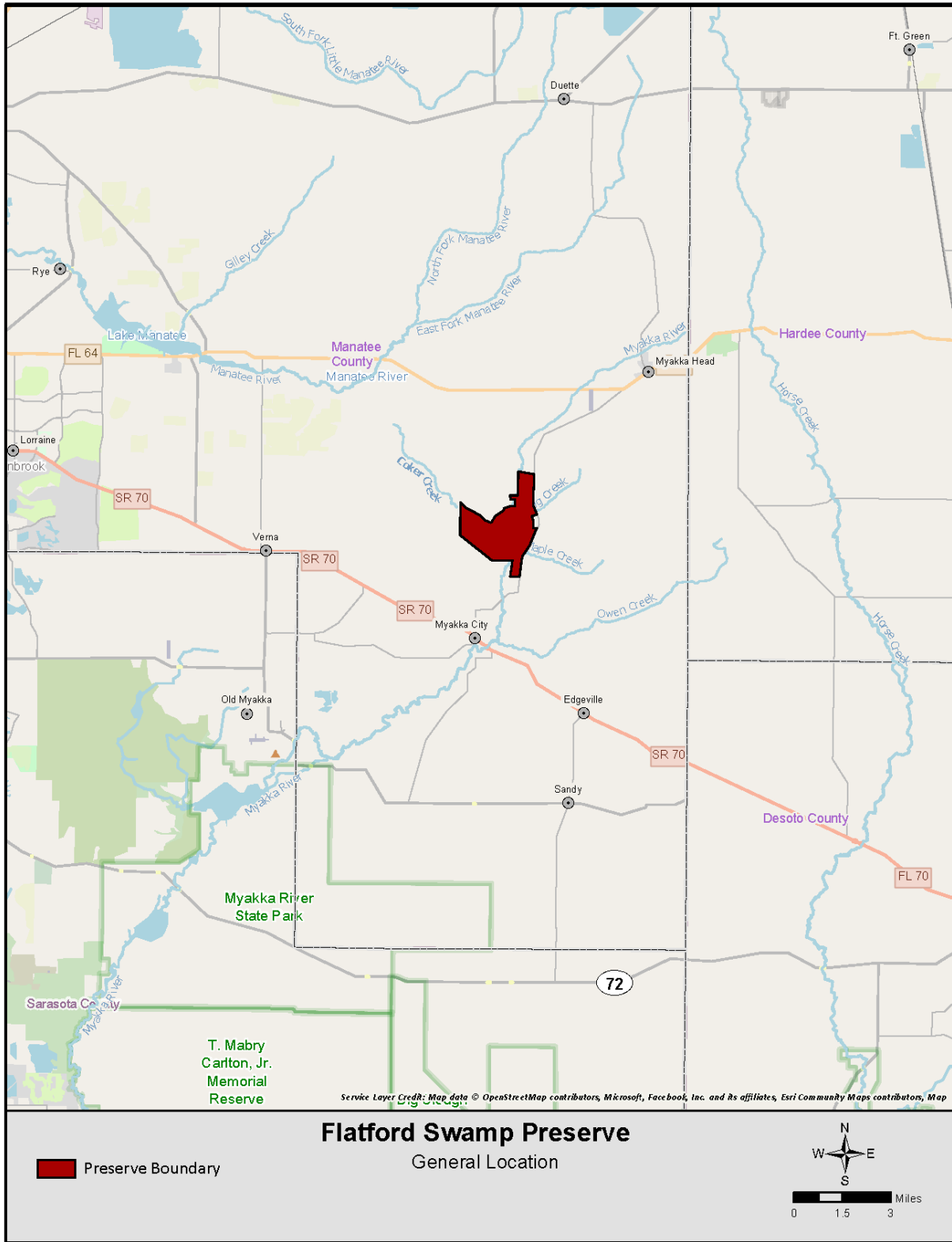


FIGURE 1. GENERAL LOCATION

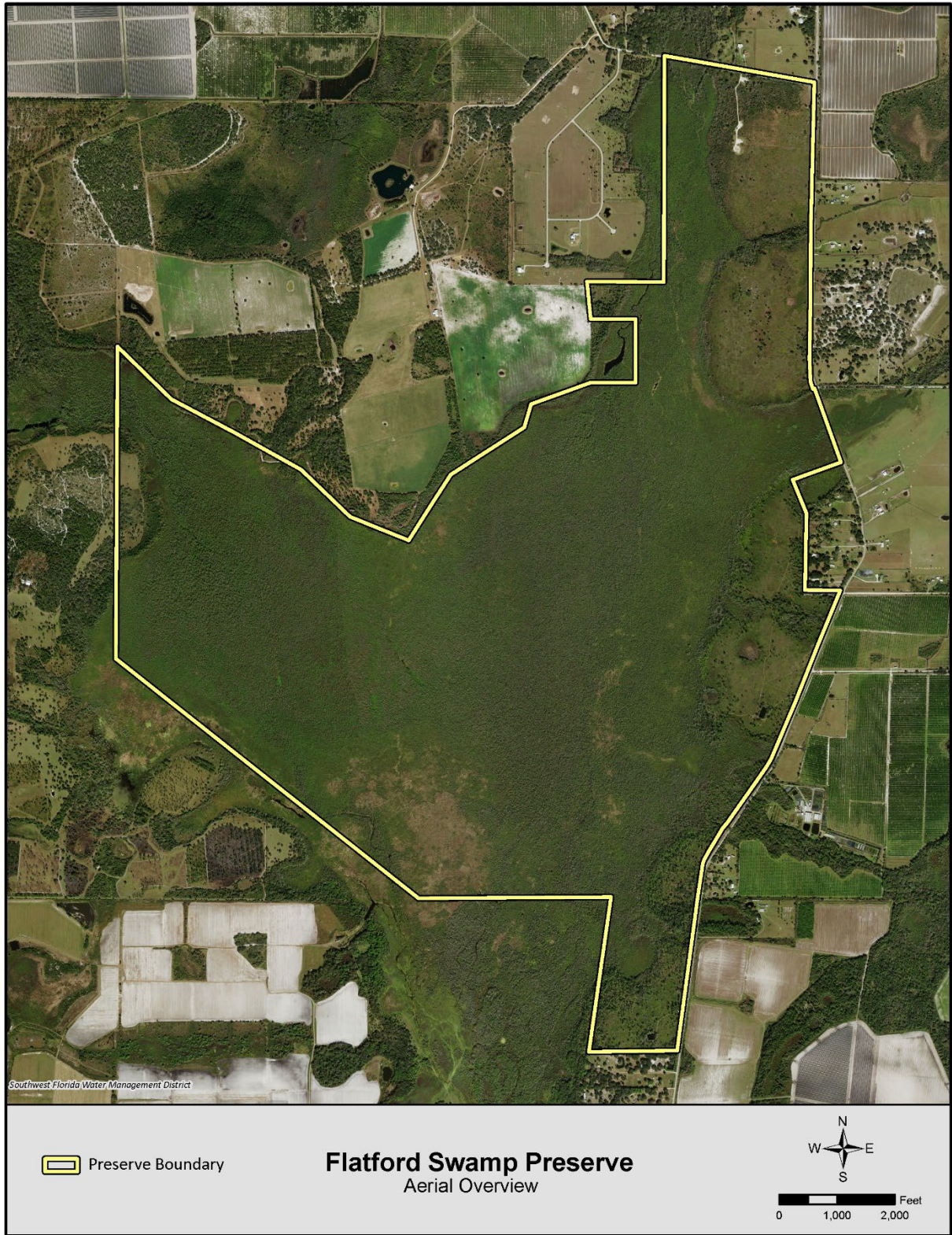


FIGURE 2. AERIAL OVERVIEW

Acquisition

Pursuant to Section 373.139(2), Florida Statutes, the District's Governing Board is empowered and authorized to acquire title to real property for purposes of flood protection, water management, conservation and protection of water resources, aquifer recharge, water supply development, and preservation of wetlands, streams, and lakes. The District evaluates lands for potential purchase based on the District's four primary Areas of Responsibility (AORs): water supply, water quality, flood protection, and natural systems protection. The Governing Board is interested primarily in acquiring and conserving lands that meet at least two of the four AORs.

History

The Preserve was acquired through a fee simple purchase in August 1991. Funding came from the state's Preservation 2000 program. The Preserve was part of the Upper Myakka River Watershed acquisition project area, which included additional parcels around the Preserve for potential acquisition. Much of the additional land area has also been protected through the subsequent purchase of conservation easements. The District purchased an easement over the 1,159-acre Rocking Seven Ranch, which adjoins the Preserve on the west, in 2020. The Howze Ranch (936 acres) west of Rocking Seven was protected under an easement purchased by the Florida Department of Agriculture and Consumers Services (FDACS), and the Pallardy Ranch (564 acres) was protected via an easement purchased by the Florida Department of Environmental Protection (**Figure 3**).

Regional Significance

FNAI maintains an interactive mapping tool, referred to as the Florida Forever Conservation Data Viewer ([Florida Forever Conservation Needs Assessment Interactive Map](#)), that depicts the extensive set of spatial data that collectively comprise the Florida Forever Conservation Needs Assessment (FNAI, 2022), which in turn provides the source data used by the Critical Lands and Waters Identification Project. These data provide a general characterization of the regional conservation significance of the Preserve. Nearly the entire Preserve land area is ranked as Priority 1 and 2 for its water resource values. It is also distinguished as highly important to the conservation of biodiversity with a Priority 2 ranking. Finally, it is also recognized as a link in the Florida Wildlife Corridor by way of attaining a Priority 3 ranking in the Florida Ecological Greenways Network.

Regional Conservation Network

The Preserve is part of a large network of conservation lands extending across a 20-mile radius (**Figure 3**). Many different tracts have been acquired for natural resource protection through the efforts of state and local governments, and private entities (**Table 1**). These include lands protected through both fee-title ownership and conservation easements. The majority of the network is comprised of a contiguous block of lands centered around Myakka River State Park and the T. Mabry Carlton Reserve that exceeds 110,000 acres. Lands conserved by the District are an essential component of protecting water resources and maintaining connectivity across this regionally significant expanse of conservation land and the Peace River corridor to the east. The

Preserve may serve as a future link in maintaining connectivity between the Myakka River State Park complex and the 22,000-acre Duette Preserve located north of the Preserve.

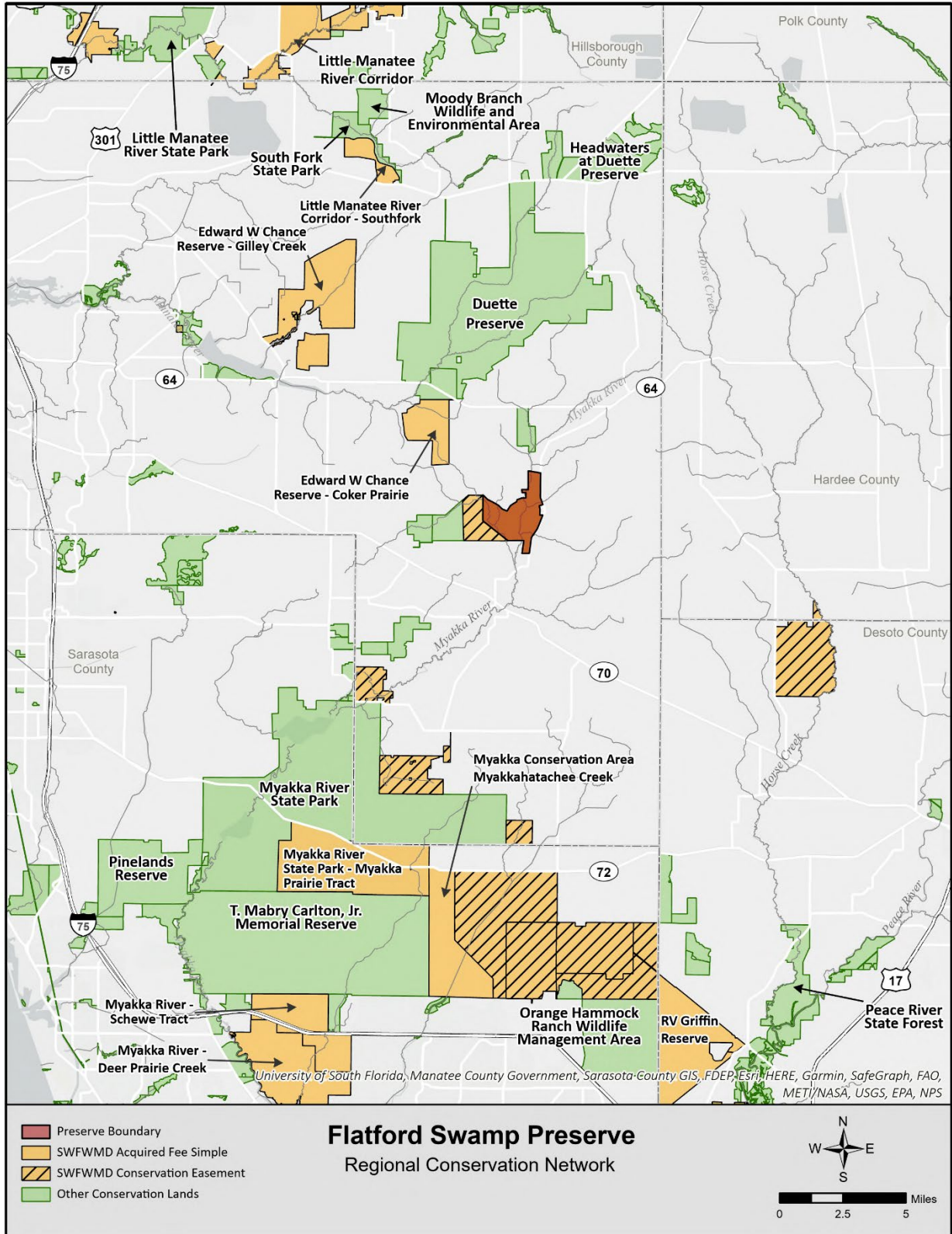


FIGURE 3. REGIONAL CONSERVATION NETWORK

TABLE 1. CONSERVATION LANDS WITHIN THE VICINITY OF THE PRESERVE.

Property	Manager	Owner	Acres	County
Edward Chance Reserve	SWFWMD	SWFWMD	7,931	Manatee
Little Manatee River	SWFWMD	SWFWMD	1,071	Manatee
Deer Prairie Creek Preserve	SWFWMD	SWFWMD	6,344	Sarasota
Myakka River- Schewe Tract	SWFWMD	SWFWMD	3,994	Sarasota; Manatee
Little Manatee River- Southfork	SWFWMD	SWFWMD	940	Manatee
RV Griffin Reserve	PRMRWSA	SWFWMD	5,920	DeSoto
Lewis Longino Preserve	SWFWMD	Private	3,422	Sarasota
Longino Ranch Cons Easement	SWFWMD	Private	3,981	Sarasota
Myakka Prairie Cons Easement	SWFWMD	Private	2,906	Sarasota
Myakkahatchee Creek CE	SWFWMD	Private	7,630	Sarasota
Rocking Seven Ranch CE	SWFWMD	Private	1,135	Manatee
Triangle Ranch Cons Easement	SWFWMD	Private	1,142	Manatee
Howze Ranch Cons Easement	FFS	Private	936	Manatee
Peace River State Forest	FFS	TIITF	5,048	DeSoto
Moody Branch WEA	FWC	TIITF	960	Manatee
Orange Hammock Ranch WMA	FWC	TIITF	5,777	Sarasota
Beker-Wingate Creek State Park	FDEP	TIITF	614	Manatee
Cockroach Bay Preserve SP	FDEP	TIITF	615	Manatee
Lake Manatee State Park	FDEP	TIITF	549	Manatee
Little Manatee River State Park	FDEP	TIITF	2,494	Manatee
Myakka River State Park	FDEP	TIITF	37,198	Sarasota
Oscar Scherer State Park	FDEP	TIITF	1,396	Sarasota
South Fork State Park	FDEP	TIITF	1,129	Manatee
Pallardy Ranch Cons Easement	FDEP	Private	559	Manatee
Peace River Preserve CE	FDEP	Private	771	DeSoto
Rawls Ranch Cons Easement	FDEP	Private	380	DeSoto
Duette Preserve	Manatee County	Manatee County	21,907	Manatee
Headwaters at Duette Preserve	Manatee County	Manatee County	2,223	Manatee
Hidden Harbor Park	Manatee County	Manatee County	298	Manatee
Rye Preserve	Manatee County	Manatee County	531	Manatee
Balm Scrub Nature Preserve	Hillsborough	Hillsborough	2,710	Hillsborough
Cockroach Creek Greenway	Hillsborough	Hillsborough	549	Hillsborough
Little Manatee River	Hillsborough	SWFWMD	1,507	Hillsborough
Little Manatee River Corridor	Hillsborough	SWFWMD	9,700	Hillsborough
Little Manatee River Corridor Add	Hillsborough	Hillsborough	493	Hillsborough
Upper Little Manatee River	Hillsborough	SWFWMD	1,393	Hillsborough
Alligator Creek Conservation Area	Sarasota County	Sarasota County	339	Sarasota
Big Slough Preserve	Sarasota County	Sarasota County	4,746	Sarasota
Deer Prairie Creek/Churchill/Jordyn	Sarasota County	Sarasota County	894	Sarasota
Fox Creek	Sarasota County	Sarasota County	163	Sarasota
Jelks Preserve	Sarasota County	Sarasota County	615	Sarasota
Knight Trail Park	Sarasota County	Sarasota County	377	Sarasota
Pinelands Reserve	Sarasota County	Sarasota County	6,151	Sarasota
Rocky Ford	Sarasota County	Sarasota County	901	Sarasota
Alligator Creek Conservation Area	Sarasota County	Sarasota County	339	Sarasota
Big Slough Preserve	Sarasota County	Sarasota County	4,746	Sarasota
T. Mabry Carlton Reserve	Sarasota County	Sarasota County	24,565	Sarasota
Walton Ranch	Sarasota County	Sarasota County	3,759	Sarasota

SWFWMD – Southwest Florida Water Management District
 FWC- Florida Fish and Wildlife Conservation Commission
 TIITF-Trustees of the Internal Improvement Trust Fund

FFS – Florida Forest Service
 FDEP–Florida Dept of Environmental Protection

Current Land Use

The Preserve is managed to conserve and protect its water resources and natural resources. The Preserve also serves as a recreational resource and will continue to be managed consistent with a multiple-use concept that encompasses water resource protection, natural systems protection, and accommodation of compatible recreational access. It is the policy of the District that appropriate public recreational use of District lands be permitted, provided the use is compatible with natural resource management and protection needs. This approach is consistent with Chapter 373 of the Florida Statutes, which states that “Lands titled to the governing boards of the districts shall be managed and maintained, to the extent practicable, in such a way as to ensure a balance between public access, general public recreational purposes, and restoration and protection of their natural state and condition.” The Preserve protects natural wetland and upland systems that provide habitat for many noteworthy natural communities and species of wildlife, including federal and/or state-listed species, while also offering visitors with opportunities for passive nature-based recreation. The recreational opportunities accommodated on the Preserve are discussed later in this plan.

Local Government Land Use Designation

Per Section 163, Florida Statutes, local governments are required to create, adopt, and maintain a Comprehensive Plan that directs where development is to be concentrated, and generally guides where agricultural, residential, commercial, and industrial land uses can be developed. Manatee County’s Future Land Use Map has designated the Preserve as Conservation Land in recognition of its dedication to conservation under District ownership and stewardship.

Adjacent Land Uses

The Preserve is bounded on all sides by lands designated as Agriculture/Rural (AG/R) on the Manatee County Future Land Use Map. Lands designated as AG/R can be developed to a maximum residential density of one unit per five acres. Although there are several small pockets of low-density residential development around the Preserve, the surrounding area remains in various agricultural uses, including primarily cattle ranches and row crop farming. The unincorporated community of Myakka City, located several miles south, has an estimated population of 6,000 residents; however, the population estimate applies to a larger region that includes the Preserve and encompasses a land area of about 250 square miles.

Management Challenges

The primary challenges associated with the management of the Preserve are centered on the proliferation of nonnative Old World climbing fern in inaccessible reaches of the Flatford Swamp system, and inundation of Flatford Swamp due to excessive inflow of water entering the Preserve from multiple upstream tributaries and surrounding properties. These issues are discussed in greater detail elsewhere in the plan. Otherwise, development pressure in the region remains low and the Preserve is not expected to experience significant development within the next ten years.

Historical Land Use and Cultural Resources

Historical Land Use

Early 19th Century survey notes identified the lands comprising the Preserve as “pine and saw palmetto land”. Property records show the majority of the property was purchased by the Myakka Company of South Carolina in 1903, just prior to the logging boom that encompassed much of Southwest Florida. The pockmarked appearance evident in 1940’s aerial imagery indicates the uplands had been logged and the stumps harvested to produce turpentine. This combination of factors suggests the property was heavily logged. It is believed the low coverage of pines in the Preserve’s flatwoods communities are a continuing legacy of this history of intensive logging, rather than being indicative of dry prairie habitat. Other historical uses included cattle grazing.

Cultural and Archaeological Resources

The Florida Department of State’s Division of Historical Resources (DHR) has confirmed that no sites of cultural or archaeological significance have been documented on the Preserve. The absence of documented sites does not mean that none are present. Staff will remain alert for evidence of undiscovered cultural sites and will implement appropriate protective measures, in consultation with DHR, in the event any are found.

Water Resources and Natural Systems

The acquisition of conservation lands is important for the management of water resources and is a strategic element in the District's effort to meet its four primary Areas of Responsibility, or AORs. These AORs are flood protection, water supply, water quality, and natural systems protection. The District is one of five regional agencies directed by state law to protect and preserve water resources within its boundaries. Established in 1961 to operate and maintain several large flood protection projects, the District's responsibilities have since expanded to include managing water supply, protecting water quality, and protecting natural systems including rivers, lakes, wetlands, and associated uplands. **Figure 4** depicts the hydrography of the area within and surrounding the Preserve.

Water Quality Enhancement

The District is actively involved in maintaining and improving water quality through both regulatory and non-regulatory programs. Protecting and improving surface and groundwater quality are the two primary objectives of the Water Quality AOR (SWFWMD, 2021). The ability of natural systems, particularly wetlands, to improve water quality has become an important consideration in water quality issues. Wetland vegetation sequesters nitrogen, phosphorus and other pollutants through denitrification, plant uptake, accumulation of soil organic matter and through geochemical and biological processes (Widney, 2018).

Water quality on the Preserve is influenced by water that drains into the property from surrounding development and agricultural operations. The topography and hydrologic setting of the Preserve is such that it serves largely as the headwaters of the Myakka River. Ogleby Creek, Boggy Creek, Coker Creek, Sand Slough, Long Creek and Maple Creek drain into the Preserve, discharging ultimately into the main stem of the Myakka River, which forms just north of Flatford Swamp (**Figure 4**). The Preserve's primary contribution to maintaining or enhancing water quality is through its ability to detain and sequester nutrients and other pollutants originating from agricultural operations conducted in the contributing creek basins and the small segment of the Myakka River basin located upstream of the Preserve.

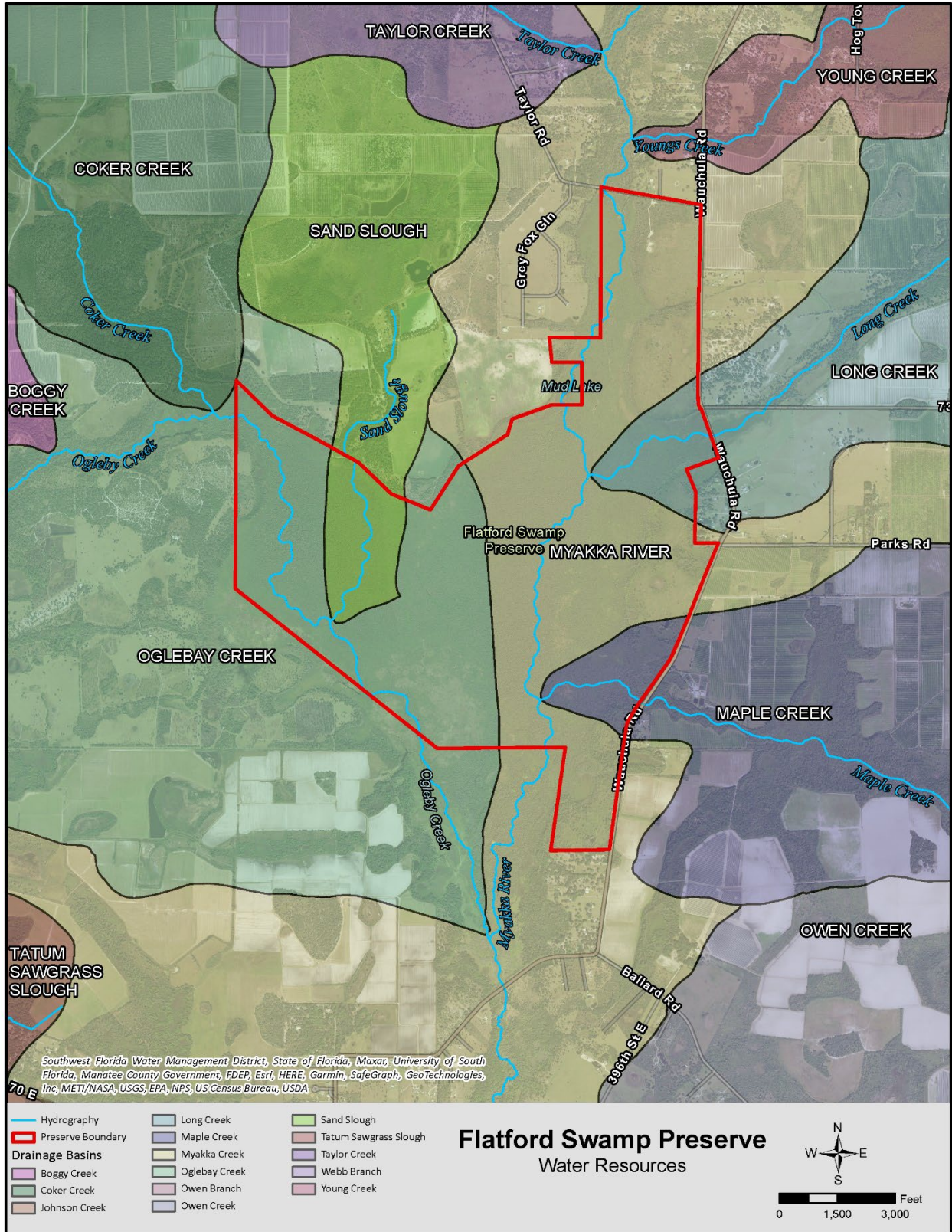


FIGURE 4. WATER RESOURCES

Flood Protection

Flood protection is another important responsibility in the District's mission. Historically, flood protection depended upon the use of structural systems and controls to provide for the storage and managed conveyance of floodwater. The current approach to flood protection relies on mimicking natural processes as a more environmentally sound and cost-effective method. The District's primary flood protection strategy depends upon identifying and preserving natural floodplains and other low-lying lands that can serve as storage areas for storm-generated floodwater.

Flatford Swamp serves as the confluence for several flowing systems, including the Myakka River and several of its tributaries. The 100-year floodplain as delineated by the Federal Emergency Management Agency accounts for about 2,045 acres (87 percent) of the Preserve's total land area (**Figure 5**). The extensive floodplain of the Flatford Swamp system makes the most significant contribution to the Preserve's important role in providing flood protection. During the rainy season, a significant proportion of the Preserve's flatwoods are also subject to occasional flooding following major rainfall events and thereby contribute to storing and attenuating the eventual downstream discharge of storm-generated water. The Preserve receives drainage from an estimated 80 square mile portion of the Myakka River drainage basin located up-gradient of the Preserve (SWFWMD, 1991).

Nearby agricultural land alterations have affected the historical hydrologic conditions of Flatford Swamp. During the dry season, when aquifer levels typically decline, the swamp receives groundwater contributions from irrigation and other farming practices. This contributes to keeping aquifer levels in the swamp higher for longer periods of time. As a result, less storage is available during the wet season and high-water conditions are extended after flood events. Flatford Swamp does serve a critical role in the region, storing large volumes of water during flood events and helping to prevent flooding downstream. In the wet season, it's not uncommon for water levels to rise five or six feet in the swamp, then completely dry up during the following spring.

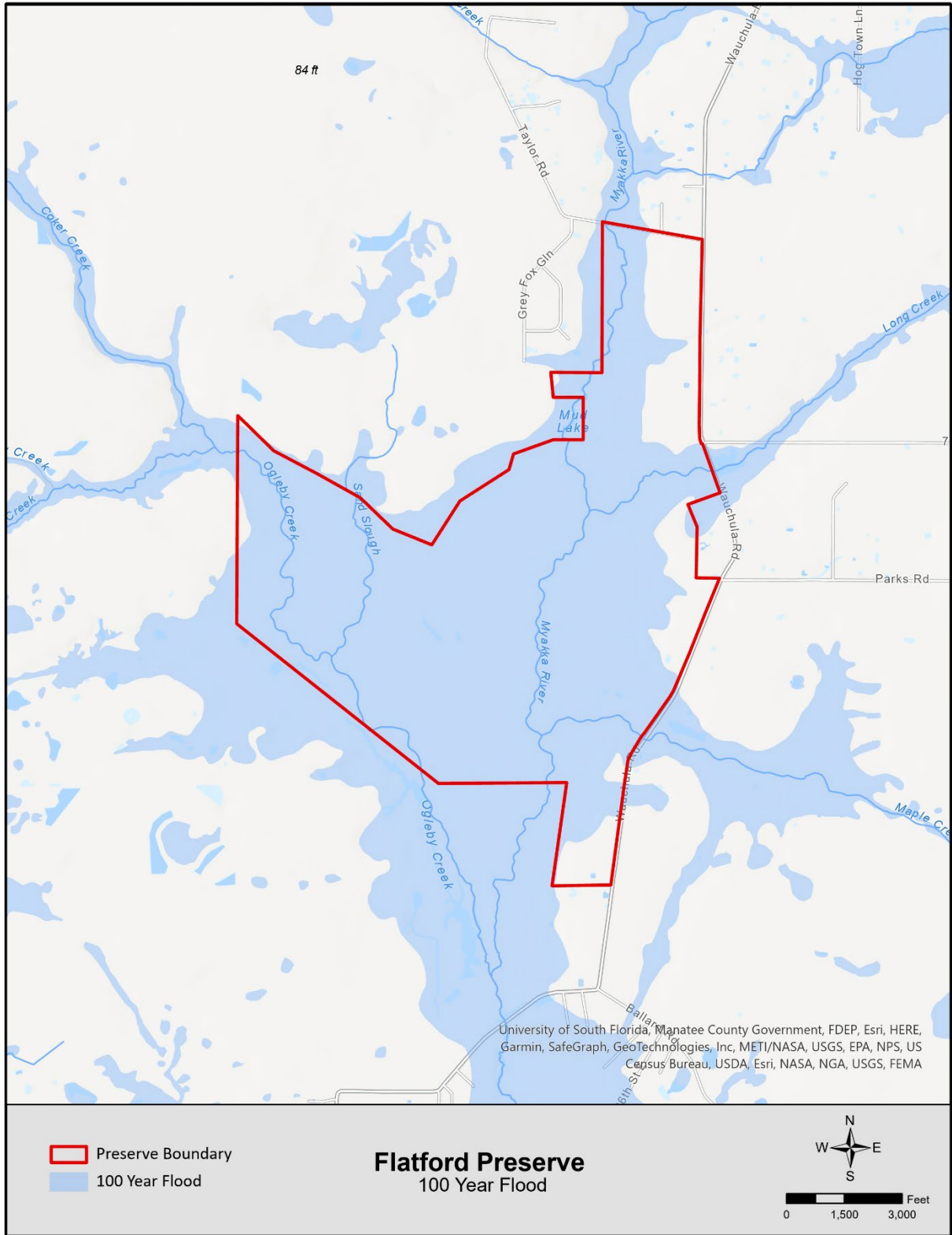


FIGURE 5. FLOODPLAIN MAP

Water Supply

Ensuring adequate water supplies for humans and the environment is central to the District's Mission. A variety of effective water supply programs, including water use permitting, address the use and management of surface and groundwater sources. The District's regulatory efforts are balanced with other strategies, including District Initiatives and incentives provided through the Cooperative Funding Initiative and Facilitating Agricultural Resource Management Systems (FARMS) programs. These programs support water conservation and development of alternative water supplies such as reclaimed water, surface water, brackish groundwater, seawater desalination, or other non-traditional sources.

The Preserve, and the area surrounding it, are not generally considered to be a high recharge zone, with an estimated rate of approximately one inch per year. An aquifer recharge project designed to intercept excess water draining into Flatford Swamp is currently undergoing testing at the Preserve. The intercepted water is treated to primary drinking water standards and injected into the Floridan Aquifer at a depth of more than 1,000 feet. As currently conceived, the project may have the potential to help reduce the rate of saltwater intrusion from the Gulf of Mexico in the Southern Water Use Caution Area's (SWUCA) Most Impacted Area (MIA). The facilities associated with the project have been constructed in the northeast corner of the Preserve and include an intake and water treatment system, monitoring wells, and a recharge well.

Natural Systems

The following discussion of the Preserve’s natural communities follows the classification system used by FNAI. For a detailed discussion of the classification system, refer to FNAI’s *Guide to the Natural Communities of Florida*. **Figure 6** depicts the FNAI community types on the Preserve and a breakdown of the composition of the natural communities is outlined in **Table 2**.

The Preserve is characterized by a landscape in which wetland communities predominate. FNAI identified eight different natural community types during their assessment of land cover, with three of the eight accounting cumulatively for less than one percent of the total Preserve land area. The overwhelming predominance of floodplain marsh is the outcome of an extended period of flooding that reduced a preexisting bottomland forest wetland system.

TABLE 2. NATURAL COMMUNITY TYPE SUMMARY

FNAI Natural Community	Acreage	Percentage of Community Type
Blackwater stream	1	0.1%
Bottomland forest	31	1.2%
Depression marsh	5	0.2%
Floodplain marsh	1,834	78%
Mesic flatwoods	321	14%
Ruderal	47	2%
Scrubby flatwoods	23	1%
Wet flatwoods	83	3%
Wet prairie	12	0.5%
Total Acreage	2,357	100 %

Wetland Communities

Bottomland Forest (31 acres)

Bottomland forests are deciduous or mixed forests usually associated with blackwater or alluvial floodplains. Hydrologically, they are influenced by high water tables and seasonal flooding and are considered intermediate between swamps and uplands. Bottomland forest was once the dominant natural community at Flatford Swamp, covering an estimated 1,050 acres historically and now reduced to 31 acres of remnant forest restricted to narrow margins along the edge where elevations are slightly higher. Irrigation in support of large-scale agricultural operations conducted on lands surrounding and up-gradient of the Preserve induced a rise in groundwater levels that caused long-term inundation of the forest. The extended periods of flooding caused widespread mortality in the bottomland forest (Coastal Environmental, 1998) and a shift to floodplain marsh. The tree mortality allowed significant invasion by nonnative plant species.

In the remnant patches of bottomland forest, the canopy is dense and dominated by a mixture of species with a wide range of flood tolerances, including red maple, sweetgum, swamp tupelo, red bay and swamp laurel oak. The moderately dense subcanopy includes Carolina ash, sweetbay and swamp bay. The sparse-to-moderate shrub layer consists of groundsel tree, common buttonbush, wax myrtle, coastalplain willow, and St. Andrew's cross. Groundcover by herbaceous plants is typically very sparse in bottomland forest but includes joyweed, toothed midsorus fern, cinnamon fern, royal fern, giant sedge, spotted water hemlock, and blue mistflower. Common epiphytes include resurrection fern, Bartram's air-plant, common wild-pine, and Spanish moss. No rare plant species were found in the Preserve's bottomland forest community.

Depression Marsh (5 acres)

Depression marsh occurs in shallow, usually rounded depressions dominated by herbaceous vegetation often growing in concentric bands. They typically occur in landscapes occupied by fire-maintained matrix communities such as mesic flatwoods and often burn with the adjoining natural community. The characteristic concentric bands of vegetation are correlated with increasing hydroperiod and depth of inundation in the central reaches. Most of the depression marsh historically present at Flatford Swamp was subjected to deeper and more frequent flooding as water levels rose in the drainage basin and are now included in the floodplain marsh community.

The three remaining areas of depression marsh at the Preserve are located at higher elevations enmeshed within stands of mesic flatwoods and account for a total land area of only five acres. The outer bands of vegetation are comprised of blue maidencane, slender flattop goldenrod, Carolina redroot, rosy camphorweed, combleaf mermaidweed, and peelbark St. John's wort. The deeper interior zones also feature common buttonbush.

No rare species have been documented in the depression marshes; however, the invasive plant species torpedo grass and Peruvian primrose-willow are present. Little is known about the natural fire frequency in depression marshes. Generally, management will consist of allowing fires

conducted in adjoining communities to burn into the marshes until they extinguish naturally or burn through them. Actions that would alter natural hydrology will also be avoided.

Floodplain Marsh (1,834 acres)

Floodplain marsh is a wetland community occurring in river floodplains that is dominated by herbaceous vegetation and/or shrubs. Floodplain marshes are naturally found along rivers and streams, and in lakes. They are directly influenced by river flooding on an annual or semi-annual basis with inundation ranging from 120 to 350 days per year. Floodplain marsh may burn periodically and the characteristic herbaceous species re-sprout vigorously following burns. There is evidence that frequent fire helps to limit shrub invasion.

As noted previously, most of the bottomland forest that once dominated the Preserve was lost when groundwater levels were elevated to such a degree, and for such a duration, that the natural vegetation was killed by the extended periods of inundation. These areas succeeded to the floodplain marsh that we see today (Coastal Environmental, 1998). The marshes include dense patches of small red maple, groundsel tree, common buttonbush, swamp dogwood, large gallberry, wax myrtle, and coastal plain willow.

In shallower areas the herbaceous layer consists of toothed midsorus fern, false nettle, spotted water hemlock, watersprite, spikerush, fireweed, dogfennel, marsh pennywort, soft rush, climbing hempvine, cinnamon fern, royal fern, maidencane, dotted smartweed, broadleaf cattail, and Virginia chain fern. In the deepest areas the floodplain marsh supports dense patches of grasses and emergent and floating aquatics such as water spangles, American waterfern, pickerelweed, bulltongue arrowhead, water hyacinth, broadleaf cattail, soft stem bulrush, maidencane, spike rushes, and flatsedges. Epiphytes include ballmoss and Spanish moss. No rare species were found in the Preserve's floodplain marsh.

The alterations in hydrology in the marsh have facilitated the establishment of invasive exotic plant species such as West Indian marsh grass, Old World climbing fern, and Peruvian primrose-willow. Peruvian primrose-willow has become the dominant cover in some areas and Old World climbing fern has also become a significant problem along the edges of the floodplain marsh community, as well as in inaccessible parts of the interior.

Wet Prairies (12 acres)

Wet prairie is an herbaceous community found in broad, flat areas that are subject to frequent fires. These areas are underlain by continuously saturated and periodically inundated soils. They are often dominated by dense growths of wiregrass, which may be replaced in wetter areas by sedges. Slight spatial differences in moisture conditions and variations in flowering time across a wet prairie contribute to the high species diversity commonly associated with this community.

The Preserve's wet prairie occurs in low areas intermediate between mesic flatwoods and bottomland forest or floodplain marsh. It usually occurs on gentle slopes between bottomland forest or marshes and slightly higher wet or mesic flatwoods. Wet prairie differs from marsh by being inundated only to very shallow depths, if at all. Herbaceous species aside from the dominant wiregrass may include bluestem, flatsedge, slender flattop goldenrod, narrowleaf sunflower,

clustered bushmint, maidencane, rosy camphorweed, rustweed, fascicled beaksedge, Tracy's beaksedge, and American cupscale. A canopy and subcanopy are sparse to absent, but in areas where fire has been excluded may include red maple, live oak, and swamp bay. Tall shrubs may also be common in fire excluded areas and include groundsel tree and wax myrtle. Short shrubs may be sparse to moderate in coverage and consist of myrtleleaf St. John's wort and patchy saw palmetto. No rare plant or animal species were found in the Preserve's wet prairies.

Fires burning through surrounding communities frequently burn across wet prairie. Natural fires likely entered wet prairie from surrounding pinelands and burned through them when they were dry enough to carry fire. A clear indication of wet prairie's dependence on fire is the stimulated flowering response that is observed in many wet prairie plant species. In the absence of fire, trees and woody shrubs may encroach from both the bordering communities and eventually shade out the sun-loving herbaceous species. Wet prairies are sensitive to relatively slight physical alterations to the soil surface, which can permanently alter the hydrology. Such disturbances include soil rutting caused by trampling, rooting by feral hogs, plowed fire lanes, or placing roads and ditches near the prairies. Wet prairie historically accounted for a larger proportion of the Preserve; however, increased water levels in the adjacent basin have caused much of the former wet prairie community to become permanently flooded, killing characteristic herbs and replacing wet prairie with a degraded form of floodplain marsh.

Upland Communities

Mesic Flatwoods (321 acres)

Mesic flatwoods is the most widespread natural community in Florida and is characterized by an open canopy of tall pines and a dense, low ground layer of shrubs, grasses, and forbs. At the Preserve, they are often closely associated with, and grade into, wet flatwoods, wet prairie, and scrubby flatwoods. Some of the Preserve's mesic flatwoods resemble dry prairie due to the lack of a pine canopy. The natural canopy ranges from sparse to dense and consists of South Florida slash pine and longleaf pine. In areas where fire has been excluded, live oak may be common. In areas that are adjacent to scrubby flatwoods, sand live oak may be a component of this community. The subcanopy is sparse to absent and may consist of any mixture of the canopy species.

Tall shrubs are common in areas where fire has been excluded and common species include wax myrtle and winged sumac. The short shrub layer is moderate to dense and one to six feet tall depending on time since the last fire. Characteristic species are saw palmetto, netted pawpaw, groundsel tree, American beautyberry, dwarf huckleberry, fourpetal St. John's wort, gallberry, gopher apple, coastal plain staggerbush, prickly pear, wild pennyroyal, runner oak, dwarf live oak, and shiny blueberry.

The herbaceous layer can also be moderate-to-dense and is generally dominated by wiregrass. Other common herbs include false foxglove, yellow colicroot, blue maidencane, bluestem, broomsedge bluestem, bottlebrush threeawn, coastalplain honeycombhead, coastal plain chaffhead, rabbitbells, witchgrass, tall elephantsfoot, white thoroughwort, Mohr's thoroughwort, slender flat top goldenrod, Elliott's milkpea, Carolina redroot, sensitive briar, yellow milkwort, bracken fern, blackroot, Indiangrass, pineywoods dropseed, queen's delight, and hoary-pea.

One small population of the rare plant species longbristle beaksedge (State-listed Endangered) was found in the Preserve's mesic flatwoods. As discussed in the imperiled species section of this plan, caution should be exercised to avoid soil disturbance where this population is growing. Invasive plants present in the flatwoods include cogon grass, Natal grass, Caesar's weed, old world climbing fern, lantana, and torpedo grass.

Mesic flatwoods require frequent fire to remain viable. Virtually all its constituent plant species recover rapidly from fire and several species require fire to reproduce. South Florida slash pine and longleaf pine are extremely tolerant of fire. The need for fire on recurring intervals of two to four years to control invasion by hardwoods and stimulate flowering in many of the herbaceous species has long been recognized and is part of the District's management regime for flatwoods.

Scrubby Flatwoods (23 acres)

Scrubby flatwoods are distinguished from mesic flatwoods by the presence of scrub oak species, which reflect drier conditions. Scrubby flatwoods typically have an open canopy of widely spaced South Florida slash pine and longleaf pine trees, and a low, shrubby understory dominated by scrub oaks and saw palmetto, often interspersed with sandy openings. A relatively large patch of scrubby flatwoods is present on the western edge of the property. The remaining stands of scrubby flatwoods are located on the east side of Flatford Swamp and are conspicuously lacking in a pine overstory.

Shrub cover in the scrubby flatwoods includes saw palmetto, sand live oak, myrtle oak, and Chapman's oak. Short shrub species are a mixture of netted pawpaw, tarflower, myrtleleaf St. John's wort, gopher apple, coastalplain staggerbush, pricklypear, wild pennyroyal, runner oak, sparkleberry, shiny blueberry, and hog plum. The herb layer is a mixture of mesic and xeric plant species, including bluestem, wiregrass, bottlebrush threeawn, coastalplain honeycomb-head, grassleaf roseling, coastalplain chaffhead, Mohr's thoroughwort, slender flattop goldenrod, indigo, sensitive briar, narrowleaf silkgrass, brackenfern, blackroot, and pineland scalypink. No rare or invasive exotic plant species were found in the Preserve's scrubby flatwoods.

Fire intervals in scrubby flatwoods are longer than those for mesic flatwoods, tending to range from five to fifteen years. This is largely a function of the drier conditions in scrubby flatwoods, resulting in slower plant growth and the related accumulation of fuels to carry fire. Fires expanding into scrubby flatwoods from adjoining mesic flatwoods typically will be patchy and naturally extinguish if the time since the last fire has been insufficient.

Wet Flatwoods (83 acres)

Wet flatwoods are open pine forests with a sparse-to-absent midstory and a dense groundcover of hydrophytic grasses, herbs, and low shrubs. Shrubs and vines tend to dominate where fire has been absent for an extended period or where dormant season fires predominate. Some of the Preserve's wet flatwoods are dominated by an oak canopy as a result of fire exclusion, creating small inclusions of hammock. Wet flatwoods can be distinguished from mesic flatwoods by a preponderance of hydrophytic herbs, the absence or near-absence of saw palmetto, and the absence of low-growing oaks.

The canopy is moderate to dense and includes slash pine, longleaf pine, and swamp laurel oak. The subcanopy is sparse-to-dense and can include red maple, loblolly bay, and swamp bay. Shrubs include silverling, dahoon, gallberry, coastalplain staggerbush, wax myrtle, American beautyberry, common buttonbush, fetterbush, and shiny blueberry.

The herbaceous layer supports broomsedge bluestem, chalky bluestem, Florida threeawn grass, wiregrass, toothed midsorus fern, false nettle, flatsedge, spikerush, slender flattop goldenrod, clustered bushmint, whitehead bogbutton, primrosewillow, cinnamon fern, royal fern, yellow milkwort, yellow hatpins, Virginia chainfern, Carolina yellow-eyed grass, and Elliott's yelloweyed grass. Common epiphytes include ballmoss, southern needleleaf, and Spanish moss. Vines are also common in areas where fire has been excluded and include peppervine, yellow jessamine, Virginia creeper, earleaf greenbrier, eastern poison ivy, and muscadine. The rare epiphytic species giant air-plant (State Endangered) was found in the wet flatwoods community and exhibited evidence of bromeliad weevil damage.

Variations in the structure and species composition of the Preserve's wet flatwoods reflects variations in soils, hydrology, and fire. The natural fire return interval of wet flatwoods is estimated to be every one to three years. This interval is sufficient to maintain grasses while inhibiting invasion by shrubs and is consistent with management of longleaf pine systems. Wet flatwoods that are shrubby and dominated by slash pine may have experienced longer fire return intervals.

Evidence from 1940's aerial photographs and early nineteenth century survey notes indicate that the wet flatwoods in the Preserve once had a more open understory, suggesting a period when fire intervals were every five to ten years, leading to the observed increase in woody species cover and decline in grass and herb cover. It is unknown whether simply reverting back to a one to three year fire return interval will be sufficient to restore areas that have been heavily invaded by shrubs as a result of fire suppression. Prescribed fires conducted in the growing season may reduce the stature of woody vegetation more effectively while promoting flowering of herbaceous groundcover species.

Ruderal (47 acres)

Portions of the Preserve do not fit into FNAI's natural community classification system because they have been so greatly altered from a natural condition. Ruderal sites are areas where the native vegetation has been disturbed by humans to the extent that it is no longer recognizable as a natural community. Ruderal areas at Flatford Swamp include an abandoned field and roadside clearings. These areas were converted from wet prairie, wet flatwoods, and mesic flatwoods. The abandoned field is an early successional area that formerly supported agricultural use. The clearings include former dove fields, wildlife food plots, and some of unknown origin. In all ruderal communities, species composition is dependent upon the historic community, soil type, and nature of alteration and subsequent use. Areas of remnant or recolonized vegetation can help to elucidate the historic natural community.

The abandoned field is evident as a disturbed area in the northeastern portion of the property. This area is very weedy and has a conspicuous absence of saw palmetto. Shrub cover is moderate in extent and consists primarily of wax myrtle. In areas that were former wet flatwoods or wet prairie, sweetgum, bluestem, sedge, witchgrass, dogfennel, slender flattop goldenrod, whitehead

bogbutton, Virginia chain fern, and yellow-eyed grass are common. In more mesic areas that were historically dominated by mesic flatwoods, netted pawpaw, myrtleleaf St. John's wort, gallberry, tall elephantsfoot, yellow jessamine, sensitive briar, blackroot, and queen's delight are common.

Aquatic Communities

Blackwater Stream (1 acre)

Blackwater streams or rivers originate in the acidic, nutrient poor, sandy soils of the Southeastern Coastal Plain. Tannins, particulates, and dissolved organic matter, derived from drainage through associated swamps and marshes, give blackwater streams their characteristic tea-colored water. Several small blackwater streams, as well as the main stem of the upper Myakka River, meander through the Preserve. Most of these streams are too small or too obscured by vegetation to be visible in aerial imagery, but they are generally surrounded by bottomland forest or floodplain marsh. Most (e.g., Ogleby Creek and Maple Creek) are mapped on the Water Resources map (Figure 4). Typical plants in blackwater streams include golden club, smartweed, sedges and grasses. The relatively low buffering capacity of blackwater streams leaves this ecosystem especially susceptible to pollutants and sediments that enter the system as pollutants from surrounding agricultural fields and pastures.

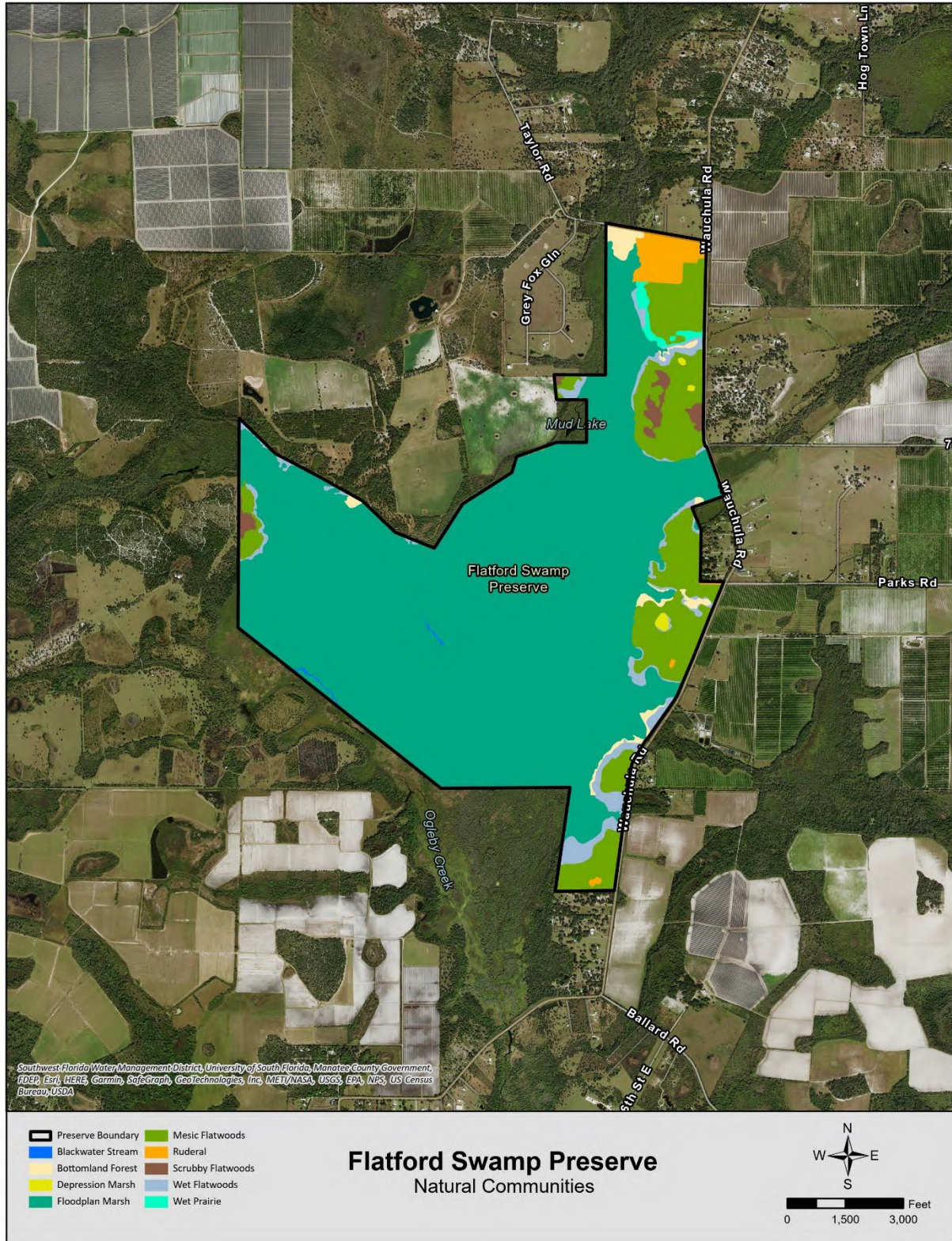


FIGURE 6. NATURAL COMMUNITIES – FNAI

Soils and Topography

Soils

Soils as mapped by the Natural Resources Conservation Service (NRCS) are depicted in **Figure 7**. Additional information on the Preserve's soils was derived from the online Web Soil Survey maintained by NRCS ([NRCS Websoil Survey Tool](#)). The soils were consolidated into three categories based on prevailing soil moisture levels: xeric, mesic, and hydric.

Xeric soils are well-drained, and typically confined to the highest elevations within a natural landscape. The only inclusion of xeric soil on the property is a 10-acre occurrence of Cassia fine sand near the southernmost end of the Preserve in an area that supports mesic pine flatwoods.

Mesic soils are intermediate in soil moisture (depth to the seasonal saturation depth) and include Waveland fine sands, which dominates the major portion of the Preserve's mesic and scrubby pine flatwoods, with inclusions of Cassia fine sand and an some Pomello fine sand that occurs within the scrubby flatwoods located on the Preserve's eastern boundary.

Hydric soils are wetter, very poorly drained to poorly drained soils, typically occurring at the lowest elevations or in depression areas. Consistent with the predominance of wetland natural communities, hydric soils are characteristic of most of the Preserve. The Flatford Swamp system is underlain by soils of the Felda-Wobasso association, which are described as frequently flooded floodplain soils, with a seasonal saturation depth of 0-12 inches. These soils correspond with the property's floodplain marsh, and the bottomland forest. Wet phase flatwoods areas contain a mixture of Felda-Wobasso fine sands, Felda, Delray, and Pomona fine sands. Inclusions of Canova, Anclote, and Okeelanta fine sands are found within the depression marshes.

Topography

The Preserve is located within the DeSoto Plain physiographic region, which is sandwiched between the Southern Gulf Coastal Plain to the west, and the Lake Wales Ridge to the east. Elevations range from a high of about 58 feet above sea level in the northeast corner of the Preserve (**Figure 8**) to a low of 35 feet. The edge of the floodplain marsh roughly follows the 40-foot contour.

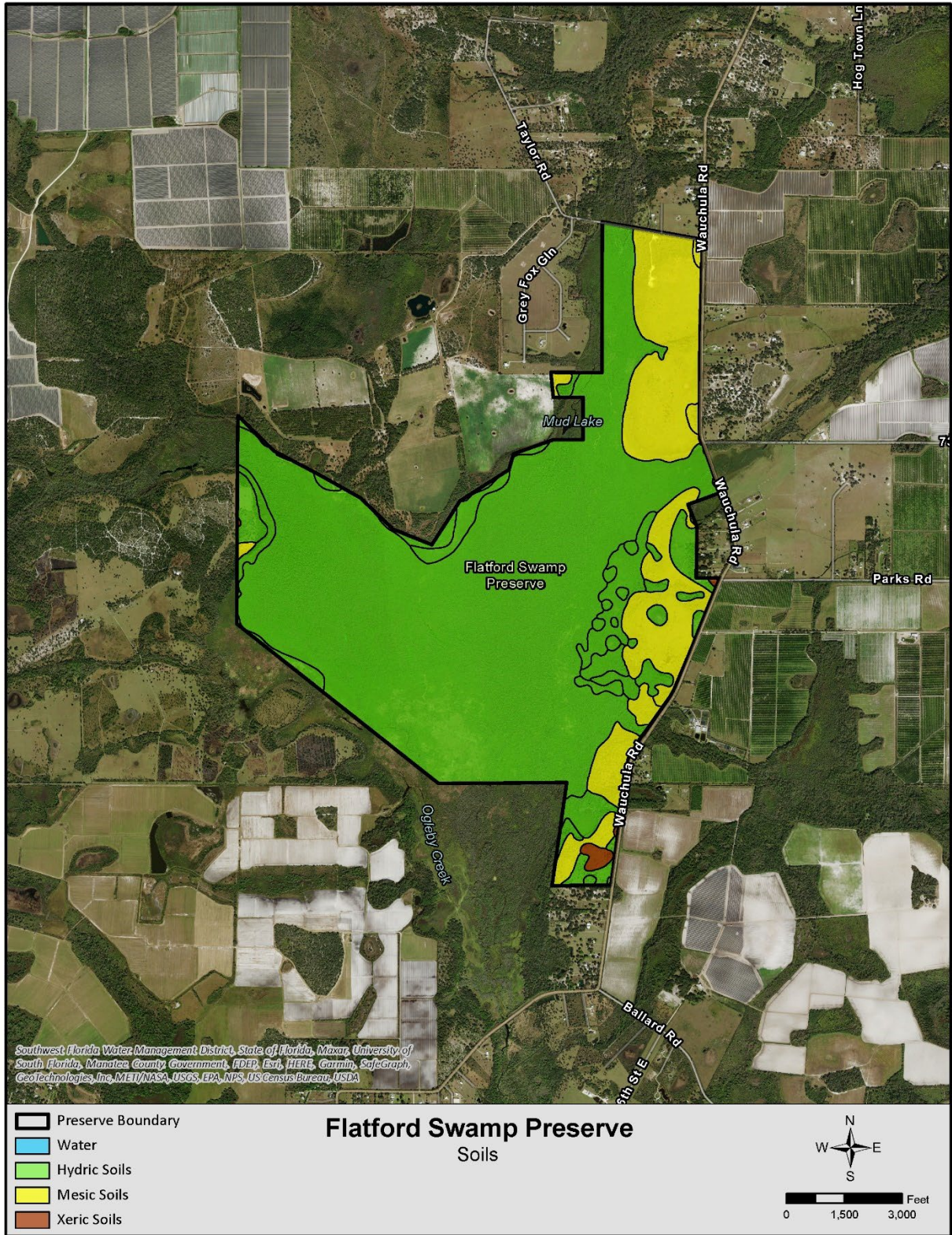


FIGURE 7. SOIL TYPES

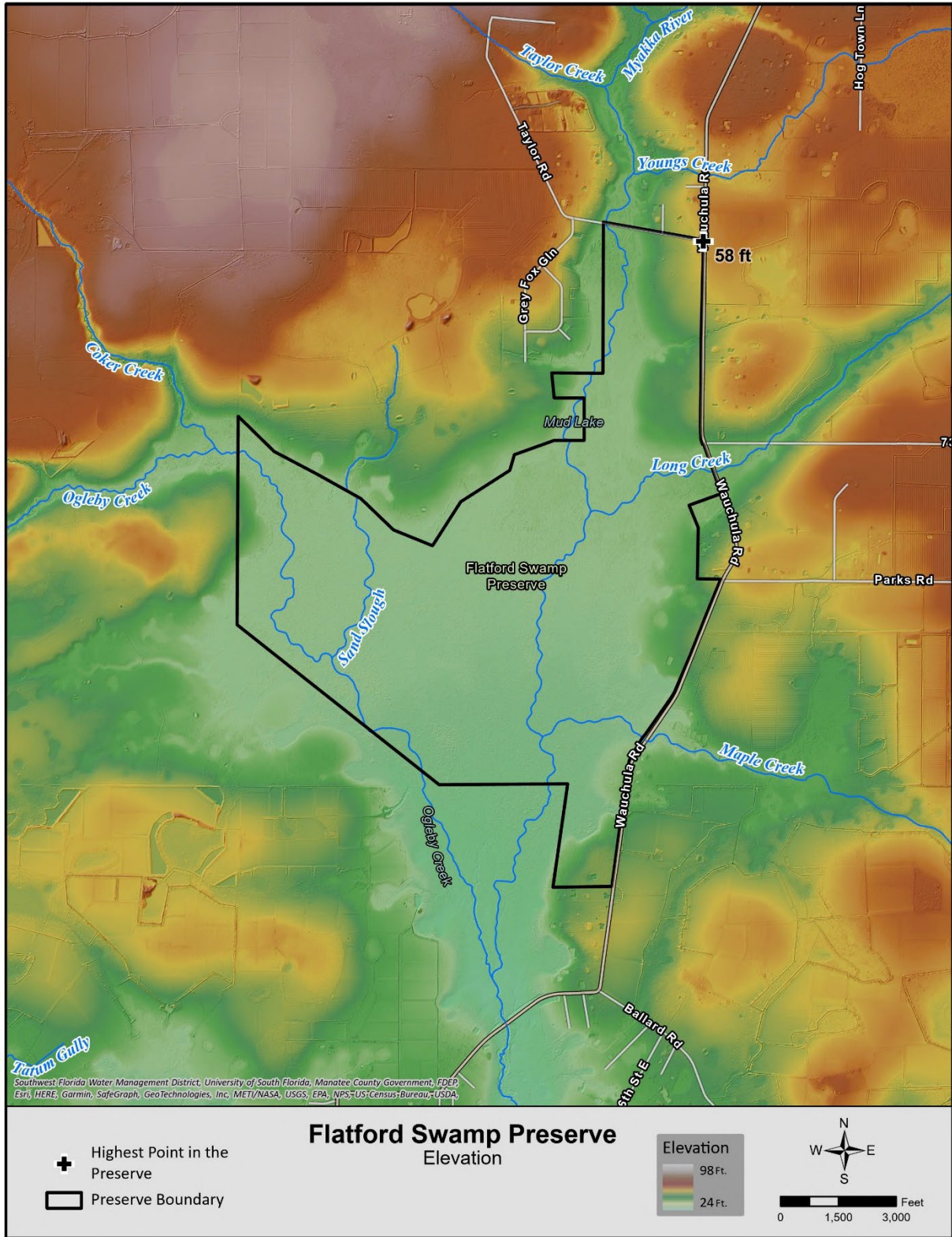


FIGURE 8. DIGITAL ELEVATION MODEL

Land Management and Land Use

Land Management

The District is responsible for the protection of water resources and natural systems on the lands under its ownership. It successfully meets this responsibility through the application of proven, effective land management practices. The primary management practices employed by the District include the use of prescribed fire, forest management, habitat restoration, control of nonnative and invasive species, and imperiled species management. The application of prescribed fire is the primary land management tool used by the District. It is the most cost-effective and environmentally beneficial method to maintain or restore fire-dependent natural communities that have been degraded by decades of persistent fire suppression. The goal of the District's land management program is to maintain and restore natural systems to their historic condition, as described in FNAI's Guide to the Natural Communities of Florida.

Fire Management

The District's use of prescribed fire is designed to apply fire to all fire-dependent natural communities based on natural fire return intervals as defined through years of intensive research. A thorough review and explanation of fire dependence and fire return intervals is provided in the FNAI Guide to the Natural Communities of Florida (FNAI 2010).

Natural fires in Florida, historically occurred during the "growing" season, which corresponds with the spring and summer months during which lightning strikes are most common. Research has demonstrated that burning during the growing season has the most beneficial impact on native plant communities because it most closely mimics the natural incidence of fire. Many native plant species respond more vigorously to growing season fires than to fires conducted during the "dormant" season, as evidenced by heavier flowering and fruit development following growing season fires. Additionally, the fire-sensitive hardwood species that typically invade fire-dependent natural communities after an extended period of fire suppression are more effectively eliminated by growing season fires than dormant season fires.

Approximately 470 acres of the property, or 20 percent of the total Preserve land area, supports fire-maintained plant communities. To the greatest extent possible, the District will emphasize the use of growing season fires, conducted within the proper fire return interval established for the respective natural community. However, the importance of fire frequency, or return interval, is so critical to maintaining natural habitat structure and plant composition that it will take precedence over seasonality when planning and conducting prescribed burns. The large land area the District must manage with prescribed fire, the unpredictability of seasonal variations in weather patterns, and the commitment of staff and other resources that must be deployed to safely conduct prescribed burns require that the District also employ dormant season burns, as necessary, in order to maintain proper fire return intervals across the entirety of the lands it manages.

The Preserve's floodplain marsh and altered ruderal lands are not included in the fire-maintained category; however, they may also benefit from occasional incursions of fire when burns are conducted on adjacent fire-maintained habitats. Occasional fire can promote the regeneration of native vegetation within the altered ruderal habitat and prevent accumulations of hazardous fuel loads. Fires burning into the periphery of basin marshes can also be beneficial, provided conditions are sufficiently wet to prevent the ignition of organic soils, or "muck fires." FNAI's assessment of the Preserve's natural communities determined that most of the Preserve's floodplain marsh developed in areas that previously supported bottomland forest in response to a lengthened hydroperiod caused by excessive water draining into the Preserve from surrounding agricultural lands.

The District's fire management program seeks to achieve the following:

- Maintain and restore natural systems
- Maintain water resource benefits
- Reduce hazardous fuel loads and minimize wildfire risk
- Promote native plant diversity and habitat function
- Enhance habitat quality for wildlife
- Support forest management activities
- Maintain aesthetics and access for recreation

The Preserve is divided into seven distinct management units (**Figure 9**). One unit encompasses the large contiguous mass of the Flatford Swamp wetland system. The remaining units are comprised of the Preserve's fire-dependent or fire-tolerant natural communities or land cover types. The District's fire managers take precautions to limit potentially negative impacts from prescribed burns and target specific weather conditions as part of each fire's prescription parameters. A network of firelines and natural firebreaks are used to delineate the management units, allow for successful fire management, and limit the potential for wildfires to enter or exit the property.

Condition Class

The term "condition class" is a reference to the status of District-owned and managed lands relative to a historic fire return interval established for each community type. The fire return interval estimates the ideal amount of time between successive fires within a natural community. Condition Class 1 distinguishes areas within one fire return interval of the ideal, and Condition Class 2 those areas within two fire return intervals. Condition Class 3 represents any unit that is at three or more intervals since the last disturbance. Condition Class 4 represents any system that has had fire excluded for so long that it is considered beyond recovery through reintroduction of fire without implementing potentially cost-prohibitive measures. Condition Class 5 was developed to represent systems that are not regularly fire-maintained, such as hydric hammock. Condition Classes 1-5 represent the full range of variation within the prescribed burn program, aside from special exceptions based on unusual circumstances.

The primary objective of the Land Management Condition Class Evaluation Program is to assign a Condition Class value to all fire management units based on the natural fire return interval of the

targeted community type. In turn, this allows the District to provide an accurate representation of the condition of all lands managed with fire.



FIGURE 9. MANAGEMENT UNITS

Forest Management

The Preserve does not have any Timber Management Zones. However, if there was a need for specific forest management activities outlined in the management objectives, these activities could be performed in accordance with the Silvicultural Best Management Practices. The long-term management goal for the Preserve's forests is to maintain or restore the health and natural species composition of each native plant community occurring on the property.

Invasive Species Management

Invasive Plant Management

Invasive, non-native plants are a threat to ecosystems worldwide and are an especially serious issue in Florida due to the state's warm, subtropical climate and the many ports of entry through which plants are imported. A high rate of introduction, combined with the subtropical climate, increases the likelihood that introduced non-native plant species will escape into the wild and establish self-perpetuating populations. As a result, Florida is home to a large number of non-native plant species that have become aggressive invaders that are severely impacting natural systems.

The Florida Invasive Species Council (FISC) identifies non-native plant species that have become invasive in the state, compiles species lists, and categorizes the species based on their observed impact to natural systems. Category I species are the most aggressive and have been determined to disrupt natural communities by displacing native species, changing community structure or ecological functions, or by hybridizing with native species. Category II species are those that are increasing in abundance but have not yet altered natural plant communities to the extent shown by Category I species. At present, the FISC list includes 81 species designated as Category I and 85 species designated as Category II. Many species on the FISC list also appear on the FDACS Noxious Weed List.

The District is committed to the management of invasive plant species and uses an adaptive management strategy to control their establishment and spread on the Preserve. The District has a Vegetation Management Section with staff dedicated to surveying, prioritizing, and treating occurrences of invasive plants on District conservation lands. The District focuses its management efforts on species that FISC has designated Category I or II plants as set forth above. The Vegetation Management Section also uses The Nature Conservancy's Site Weed Management Plan Template as a framework for analyzing and prioritizing invasive plant species for treatment based on several factors, including:

1. their infestation levels;
2. the current and potential impacts of the species;
3. the value of habitat that the species does or could infest; and
4. the difficulty of controlling the species.

Under this system the species that are the highest priority for control efforts receive a score of 4, while the lowest priority species receive a score of 16. This prioritization scheme ensures that the District's resources are focused where they will have the greatest benefit to the ecosystem.

Five species have been identified to be the highest priority for invasive plant control operations on the Preserve (**Table 3**). Additionally, the District has implemented an Early Detection, Rapid Response (EDRR) strategy which identifies and rapidly treats occurrences of invasive species that are not currently present or are not widespread on the property but have the potential to become widespread if they become firmly established. District staff utilizes this list of EDRR species compiled by the Suncoast Cooperative Invasive Species Management Area (CISMA) when identifying new invasive plant concerns within the Preserve.

The District employs a variety of measures to control invasive plant species including thorough surveys, chemical treatments (basal-bark treatment, cut-stump applications, hack-and-squirt methods, and foliar applications), mechanical treatment, and the use of biological control agents or some combination thereof, which are done with both in-house and through contracted labor. Upland treatments are often scheduled to occur in the year following a prescribed burn because access to a site is easier and visibility is increased at this time. Personnel using herbicides comply with instructions found on the herbicide label and employ Best Management Practices (BMPs) for their application.

TABLE 3. INVASIVE PLANTS KNOWN TO OCCUR AT THE PRESERVE

Common Name	Scientific Name	FISC Status	Priority Level for Control
Cogongrass	<i>Imperata cylindrica</i>	Category I	6
Old World climbing fern	<i>Lygodium microphyllum</i>	Category I	9
Brazilian pepper	<i>Schinus terebinthifolius</i>	Category I	7
Caesarweed	<i>Urena lobata</i>	Category I	12
Lantana	<i>Lantana strigocamara</i>	Category I	8

Old world climbing fern represents the greatest invasive species management challenge on the Preserve. Its propensity for widespread dispersal via wind-carried spores, and ability for aggressive growth in isolated areas, distinguish it as the greatest invasive plant threat to the surrounding region. Old world climbing fern is currently targeted with herbicide treatments only in the upland areas of property. The most severe infestations occur in the extensive forested wetlands of the Flatford Swamp system. A strategy is currently being developed to address this invasive species in the inaccessible swamp system.

Invasive Wildlife Management

The monitoring and control of non-native animal species statewide is overseen by the Florida Fish and Wildlife Conservation Commission (FWC). The District obtains annual control permits through FWC to track and conduct invasive wildlife removal practices on District-owned properties.

The District's primary focus for invasive wildlife management is on control of feral hogs (*Sus scrofa*). Feral hogs have the ability to adapt to a wide variety of habitats, exhibit a high reproductive rate (Dzieciolowski et al. 1992), and lack significant natural predators. The result has

been rapidly increasing population densities throughout North America over the last several decades (West, Cooper and Armstrong, 2009).

Feral hogs are the most destructive nonnative animal species in the United States and some areas of the Preserve exhibit evidence of damage caused by their rooting activities. The soil disturbance associated with rooting also invites invasion by nonnative plants. Hogs are known to carry and transmit such diseases as brucellosis, leptospirosis, and pseudorabies, and they have the potential to be aggressive if startled or angered. Feral hogs also compete with native species for forage and have been documented preying on ground-nesting birds and reptiles (Coblentz and Baber 1987).

In recognition of the serious threats posed by feral hogs, the District has developed and implemented an integrated feral hog control plan. Due to the adaptive nature of wild hogs and their reproductive fecundity, a multi-faceted approach is required. Current control methods include trapping, FWC-administered Wildlife Management Area hog hunts, special District administered hog hunts, and on select properties, aerial operations conducted by the United States Department of Agriculture (USDA) - Wildlife Services Program.

Given the array of practical, environmental, and social constraints on hog management, it is generally recognized that the complete eradication of feral hogs from District lands is an unattainable goal. Therefore, the overarching goal of feral hog management at the Preserve will be to keep hog numbers at a maintenance level, thus minimizing the ecological damage resulting from feral hog rooting. This will be accomplished using a comprehensive, science-based strategy as explained above, and that is designed to be humane, cost-effective, and compatible with Preserve management.

Imperiled Species Management

For purposes of this Plan, “imperiled species” refers to plant and animal species that have been formally listed as Endangered or Threatened by the FWC, the USFWS, or the FDACS. The District’s comprehensive approach to land management places a priority on restoring or maintaining the natural structure, function, and species composition of the Preserve’s natural communities. This approach generally ensures the habitat needs of the Preserve’s entire slate of resident species will be met. In some instances, special measures may need to be implemented to account for the imperiled status of a particular species.

Imperiled Wildlife

A number of imperiled wildlife species have been documented at the Preserve in association with various surveys, and through the day-to-day observations collected by staff over the course of managing the Preserve. Other rare species are likely or potentially present, but not yet documented. FNAI developed the Biodiversity Matrix tool to identify rare species that are known or likely to occur within a specified land area based on a statewide geographic database. Table 4 lists all the imperiled wildlife species known or expected to be present on the Preserve based on surveys, direct observations, and application of a Biodiversity Matrix analysis.

TABLE 4. IMPERILED WILDLIFE SPECIES KNOWN OR LIKELY TO OCCUR

Common Name	Scientific Name	Listing Status*
American Alligator	<i>Alligator mississippiensis</i>	FT/SA
Florida Sandhill Crane	<i>Antigone canadensis pratensis</i>	ST
Florida Burrowing Owl	<i>Athene cunicularia floridana</i>	ST
Eastern Indigo Snake	<i>Drymarchon couperi</i>	FT; ST
Gopher Tortoise	<i>Gopherus polyphemus</i>	ST
Southeastern American kestrel	<i>Falco sparverius paulus</i>	ST
Wood Stork	<i>Mycteria americana</i>	FT

* FE = Federally Endangered FT = Federally Threatened ST = State Threatened
FT/SA = Federally Threatened Due to Similarity in Appearance

Eastern indigo snake (*Drymarchon couperi*)

Eastern indigo snakes may be present in the Preserve’s mesic pine flatwoods, scrubby flatwoods, and wet flatwoods natural communities. Habitat destruction and degradation due to inadequate fire management are key factors in the threatened status of the eastern indigo snake. The species is often closely affiliated with the presence of gopher tortoises. Managing the Preserve’s upland habitats with prescribed fire and maintaining any resident gopher tortoise population will be essential to maintaining viable habitat conditions for the eastern indigo snake.

Gopher tortoise (*Gopherus polyphemus*)

The gopher tortoise is recognized as a keystone species based on the dependence of many other “commensal” species on the shelter provided by tortoise burrows. This includes the previously

discussed eastern indigo snake and is an important factor in the gopher’s listing status. The life history and management guidelines for the gopher tortoise are discussed in the *Gopher Tortoise Management Plan* published by the FWC (FWC, 2012). Prescribed fire applied at the recommended habitat-specific return intervals is critical to maintaining viable habitat for gophers and the commensal species that use their burrows. Vulnerability to disease, and “overstocking” that can result from translocating too many individuals from lands slated to be developed to protected areas like the Preserve, are also threats to population viability. The District will ensure that any translocations permitted onto the Preserve are conducted in accordance with FWC guidelines and the biology of the species.

Imperiled Plants

Table 5 lists a total of six imperiled plant species that have either been documented on the Preserve or are likely to be present based on habitat availability and the Preserve’s location within the species’ documented range. It is important to note that no thorough plant surveys have been conducted on the property, and several of these species are relatively inconspicuous and easily overlooked. Management guidelines for all six species call for either burning within recommended fire return intervals, maintaining natural hydrology, maintaining a natural canopy, and/or avoiding soil disturbance. These practices are all consistent with the District’s fundamental approach to land management and will promote persistence of those species that are present, or immigration by those that may currently be absent.

Two of the species listed in Table 5 have been documented on the property. A small population of longbristle beaksedge (*Rhynchospora megaplumosa*) was found in the Preserve’s mesic flatwoods. It is an endemic plant species known only from Sarasota, Manatee, Hillsborough, and Polk Counties and has been designated a threatened species by the State. Giant airplant (*Tillandsia utriculata*) is present in the Preserve’s wet flatwoods and has been designated as endangered by the State. It is highly susceptible to attack by an invasive bromeliad weevil and the plants observed on the Preserve exhibited evidence of weevil damage.

TABLE 5. IMPERILED PLANT SPECIES KNOWN OR LIKELY TO OCCUR

Common Name	Scientific Name	Listing Status*	Management Comments
Manyflowered grasspink	<i>Calopogon multiflorus</i>	ST	Scrubby flatwoods; burn in rotation
Piedmont jointgrass	<i>Coelorachis tuberculosa</i>	ST	Basin marsh and depression marsh; maintain hydrology.
Pine Lily	<i>Lilium catesbaei</i>	ST	Mesic pine flatwoods; burn in rotation.
Long-bristle beaksedge	<i>Rhynchospora megaplumosa</i>	SE	Burn pine flatwoods in rotation; avoid soil disturbance.
Giant airplant	<i>Tillandsia utriculata</i>	SE	Maintain canopy & micro- climate in wetland ecotones.
Giant Orchid	<i>Orthochilus ecristata</i>	ST	Scrubby and mesic pine flatwoods; burn in rotation.

* SE = State Endangered ST = State Threatened

Arthropod Management

In compliance with Chapter 388.4111 of the Florida Statutes and Section 5E-13.042 of the Florida Administrative Code, all lands comprising the Preserve have been designated as “*environmentally sensitive and biologically highly productive*”. Such designation is appropriate and consistent with the natural resources and ecosystem values of the Preserve and requires the FDACS to develop an Arthropod Control Plan for the property that ensures any future or ongoing mosquito control practices implemented on the Preserve will not pose a hazard to fish, wildlife, and other natural resources protected on the property. The control methods employed by the local mosquito control agency must be limited to the minimum necessary to abate a public health or nuisance problem.

Recreation

District Policy directs the establishment of passive, resource-based recreational uses on conservation lands under its ownership. Only uses that are compatible with the natural values and environmental sensitivity of the particular property are allowed. Compatible uses generally consist of outdoor recreational and educational pursuits that are dependent on the natural resources and surroundings the property provides. Public access points are restricted to locations that can accommodate the parking and other infrastructure necessary to accommodate the permitted uses, and to areas where there is security or control sufficient to discourage unauthorized use and access. Site-specific determinations about the compatibility of uses are based on ensuring the property will be able to satisfy the purposes for which it was acquired.

A trail network totaling two miles in length has been designated and is accessed via a parking area and walk-thru entrance located at the intersection of Wauchula Road and Taylor Road (**Figure 10**). A second walk-thru entrance located on Wauchula Road allows access to the southern segment of the trail and parking is limited at this location. In addition to hiking, fishing is allowed on the Preserve in various locations.

Environmental Education

The Preserve does not have any developed facilities to accommodate usage for environmental education purposes. However, Special Use Authorizations can be submitted for review and approval by the District, on a case-by-case basis, to allow for compatible environmental education uses.

Americans with Disabilities Act

The Southwest Florida Water Management District (District) does not discriminate on the basis of disability. This nondiscrimination policy involves every aspect of the District's functions, including access to and participation in the District's programs, services and activities. Anyone requiring reasonable accommodation, or who would like information as to the existence and location of accessible services, activities, and facilities, as provided for in the Americans with Disabilities Act, should contact the Human Resources Office Chief, at 2379 Broad St., Brooksville, FL 34604-6899; telephone (352) 796-7211 or 1-800-423-1476 (FL only); or email ADACoordinator@WaterMatters.org. If you are hearing or speech impaired, please contact the agency using the Florida Relay Service, 1-800-955-8771 (TDD) or 1-800-955-8770 (Voice). If requested, appropriate auxiliary aids and services will be provided at any public meeting, forum, or event of the District. In the event of a complaint, please follow the grievance procedure located at WaterMatters.org/ADA.

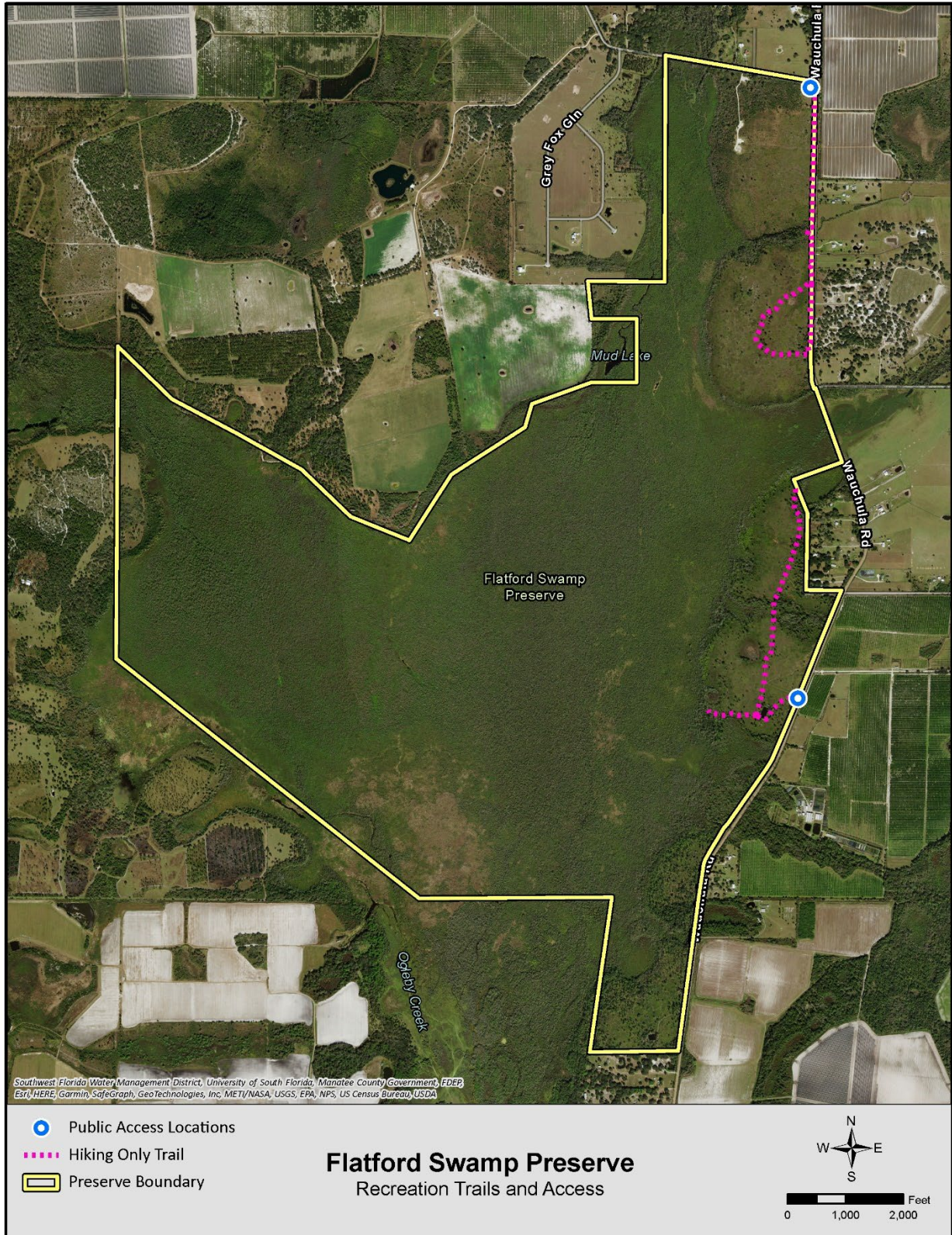


FIGURE 10. RECREATION AND ACCESS

Land Use Administration

The land uses administered on District conservation lands are governed by established District policy. The policy recognizes two separate categories of public use: recreational uses and non-recreational uses. Allowable recreational uses vary by property, based on site-specific considerations related to environmental sensitivity and compatibility. A discussion of recreational use at the Preserve was provided in the preceding section of the Plan. Non-recreational public uses that could be potentially considered include, but are not limited to, linear facilities, scientific research opportunities, water resource development projects, sustainable forestry, and environmental education.

Research Opportunities

District properties provide a variety of research opportunities to benefit natural resource conservation and preservation efforts. Such projects can include wildlife surveys, wetland studies, natural resource monitoring projects, and archaeological surveys or investigations. The natural resources conserved at the Preserve can serve as outstanding living laboratories or outdoor classrooms for environmental studies due to the array of ecosystems present on the property.

Special Use Authorizations

Special Use Authorizations (SUAs) can be issued by the District to accommodate uses or access that are not otherwise permitted. Applications for SUAs must be submitted for review by the District's Land Resources Bureau, which is responsible for determining whether the requested use or access can be conducted in a manner that is compatible with the District's resource protection mission and management objectives.

Examples of activities that may be permitted by SUAs include vehicular access for recreational use by groups or individuals that are mobility-impaired, or who require other special accommodation to engage in activities that would otherwise be considered compatible; environmental, biological or cultural research projects; and training exercises by law enforcement or military personnel.

License Agreements

License agreements can be issued to allow for access or uses that are more expansive, or cover a more protracted time span, than those addressed by SUAs. There are no license agreements currently in effect for the Preserve.

Land Maintenance and Operations

Roads and Boundaries

The District is responsible for managing the roads and trails on the Preserve to provide access for conducting routine management activities and to accommodate the public's recreational use. The existing network of roads and trails must also be sufficient to ensure ready access for wildfire response and to function as effective firebreaks when conducting prescribed burns. District staff engage in continuing maintenance efforts of the road network to ensure it remains clear of obstructions and to repair or enhance impaired sections of the road and trail network.

The Preserve's boundary is posted and fenced as necessary to prevent unauthorized access and use, and to minimize the potential for encroachment by neighboring landowners. Firebreaks are maintained along the Preserve's perimeter in upland natural communities to help ensure prescribed burns and wildfires can be contained within the Preserve, and to prevent fires on adjoining lands from entering the Preserve.

District staff will remain alert for evidence of illegal activities, including unauthorized vehicular access and boundary incursions, and will respond accordingly to ensure the Preserve remains secure.

Facilities and Infrastructure

Consistent with legislation adopted by the state in 1999, lands acquired through state-funded acquisition programs can be used for a variety of public facilities. These include utility lines and other linear facilities, stormwater management projects, and water resource or water supply development projects. Approval of such uses is contingent upon a number of criteria, including compatibility with the natural resource values of the property, commensurate compensation provided for the use, location of the proposed use within the Preserve, and consistency with this Plan.

Goals and Objectives

Overview

The following represents a general overview of the goals and objectives over the next 10-year planning period for the Preserve. This set of goals will serve as an outline of management expectations and provide direction over the management activities for the life of this plan. These goals are not an annual work plan, which is beyond the scope of this plan.

Resource Protection and Management

Hydrologic Management

Goal: Protect water resources within the Preserve and associated tributaries.

- Objective 1: Continue to observe and assess water resources within the Preserve to ensure desired hydrologic function and develop restoration projects, as necessary.
- Objective 2: Continue monitoring water quality and wetland conditions through the data collection network and periodic wetland assessments.
- Objective 3: Protect water resources during management activities by continued implementation of Silvicultural and Agricultural Best Management Practices.
- Objective 4: Continue to implement aquifer recharge project to aid in mitigating saltwater intrusion within the groundwater system.

Fire Management

Goal: Maintain and restore function of natural systems through application of prescribed fire as the primary management tool.

- Objective 1: Develop and implement an annual burn plan and apply prescribed fire according to the District's Fire Management Guidelines.
- Objective 2: Conduct majority of prescribed burns during the growing and dormant seasons to support development of native fire-dependent species and habitat function.
- Objective 3: Update and maintain a condition class database to track management activities on specific management units.
- Objective 4: Maintain perimeter firelines on an annual basis and disk strategic internal management lines supporting the seasonal needs of prescribed fire program.

Restoration and Natural System Maintenance

Goal: Evaluate individual management units and develop restoration projects to recover historic natural communities.

- Objective 1: Assess habitat conditions and develop restoration strategy to recover historic natural communities on previously altered sites targeting imperiled natural communities.
- Objective 2: Utilize information obtained from historic imagery, FNAI Natural Communities Mapping, and on-site investigations to implement site specific restoration projects that support the District's restoration goals.

Goal: Maintain and enhance natural system structure and function.

- Objective 1: Continue to maintain existing habitat enhancement projects over the long-term to achieve desired future conditions outlined in the FNAI Natural Community Guide.
- Objective 2: Evaluate and develop habitat enhancement projects to improve habitat function.
- Objective 3: Implement habitat management projects that support the improvement and development of native plant and animal communities, including imperiled species.

Forest Management

Goal: Manage the forest resources on the Preserve by applying sound silvicultural techniques, with consideration for maintenance of sustainable forest resources to achieve the District's land stewardship goals.

- Objective 1: Manage the forest resources in accordance with the District's 10-Year Timber Management Plan and conduct timber harvests as scheduled.
- Objective 2: Evaluate and develop forest management projects to support specific restoration and enhancement objectives developed for the Preserve.
- Objective 3: Conduct annual inspections of forest resources for indication of disease, insect infestations, or damage from fire to promote forest health and sustainability.

Imperiled Species Management

Goal: Manage and maintain natural systems to support development of imperiled, threatened, or endangered plant and animal species.

- Objective 1: Implement land management strategies and techniques that support development of habitat required for known imperiled species.
- Objective 2: In cooperation with other agencies and partners, implement survey and monitoring protocol where feasible for imperiled species and identify strategies for their recovery.
- Objective 3: Work with other state agencies, conservation organizations, and landowners to maintain habitat connectivity.

Invasive and Exotic Species Management

Goal: Manage the populations of exotic and invasive plants and animals found on the Preserve at a maintenance level.

- Objective 1: Implement the District's Invasive Plant Management Plan for the Preserve.
- Objective 2: Employ an EDRR methodology on new infestations identified in the
- Objective 2: Employ an EDRR methodology on new infestations identified in the Invasive Plant Management Plan.
- Objective 3: Implement the feral hog control plan and manage the feral hog population on the Preserve.

Goal: Manage the significant populations of old-world climbing fern found within the Flatford Swamp.

- Objective 1: Implement aerial overflight or drone surveys to monitor infestation levels present in the wetlands.
- Objective 2: Routinely inspect and treat uplands for old-world climbing fern to mitigate spread from wetlands.
- Objective 3: Continue to evaluate best management practices that support suppression of large-scale old-world climbing fern infections.
- Objective 4: Provide research opportunities through the release of bio-control agents on old-world climbing fern infestations.

Infrastructure and Maintenance

Goal: Manage and maintain the infrastructure to protect the water resources and support the District's management objectives.

- Objective 1: Annually inspect and maintain roads and trails according to their designated maintenance schedule.
- Objective 2: Monitor and maintain culverts, bridges, and low water crossings to prevent adverse impacts on hydrology.
- Objective 3: Periodically inspect boundary fencing and gates to assure adequate protection and site security of resources and repair, as needed.

Administration

Land Acquisition

Goal: Pursue land acquisition projects that support the Florida Forever acquisition plan and seek to obtain conservation easements to maintain critical habitat linkages.

- Objective 1: Consider acquisition of inholding parcels to complete project boundary and improve management.
- Objective 2: Evaluate opportunities to acquire fee interest of parcels within the District's optimal boundary and Florida Forever work plan.
- Objective 3: Pursue acquisition of less-than-fee interest through strategic conservation easements that complement the District's existing network of fee interest and less-than-fee acquisitions.

Land Use and Recreation

Goal: Manage District lands for multiple-use purposes through the administration of leases, easements, and various types of agreements.

- Objective 1: Routinely review agreements, easements, and leases. Routinely review and update as necessary agreements, easements, and leases.
- Objective 2: Review special requests and issue special use authorizations for uses that are consistent with the District policies.
- Objective 3: Maintain cooperative relationships with state, local, and other governmental entities along with stakeholders.

Goal: Provide quality, resource-based passive recreational opportunities for the public's enjoyment.

- Objective 1: Maintain appropriate public access and quality compatible recreational opportunities.
- Objective 2: Evaluate requests for additional compatible public access and recreational opportunities.

Archaeological and Cultural Resources

Goal: Manage cultural and historical resources to protect and preserve natural and cultural history.

- Objective 1: Coordinate and follow the Division of Historical Resources' recommendations for protection on known sites. Continue to monitor, protect, and preserve as necessary any identified sites.
- Objective 2: Take precautions to protect these sites from potential impacts resulting from management or maintenance activities.
- Objective 3: Maintain qualified staff as an Archaeological Site Monitor.

Security

Goal: Provide site security and resource protection.

- Objective 1: Identify, document, and address security issues, including encroachments and unauthorized access.
- Objective 2: Maintain and inspect boundary fences, boundary lines, and gates to deter encroachment and unauthorized access. Post and maintain rule and boundary signage.
- Objective 3: Maintain and as needed, update law enforcement agreement with FWC or other agencies as appropriate.

Significant Management Accomplishments

Below is a summary of the significant management accomplishments over the last ten years for the Preserve. This is not an exhaustive list of all the management activities that have occurred, but a brief highlight of the significant accomplishments over the last ten years.

Land Management

- Developed annual burn plans.
- Completed prescribed burns on approximately 852 acres.
- Maintained perimeter firelines on an annual basis for prescribed fire and wildfire mitigation.
- Performed maintenance of internal roads and trail along with mowing twice per year on primary and secondary roads.
- Removed 11 feral hogs.
- Over 3,157 acres surveyed for invasive exotic plants and any invasives found within the surveyed area were treated.

Water Resources

- Performed regular measurements on data collection network to monitor hydrologic conditions.
- District staff from various Bureaus worked to implement the saltwater intrusion mitigation project for Flatford Swamp, which included the installation of an Aquifer Recharge System to treat and inject surface water into the aquifer and potentially help reduce saltwater intrusion within the groundwater systems.

Recreation

- Approximately 2.5 miles of hiking trails were maintained for public use.
- Created an access point on the eastern portion of the property along Wauchula Road to provide access to a fishing pond and an isolated portion of the Preserve.
- Maintained parking and day use areas for public access.
- Inspected recreational signage such as kiosk maps, trail markers, and interpretive signs for damage and replaced as needed.
- Performed regular maintenance of public trail system.

Acquisition

- Acquisition of an approximate 1,106 acre conservation easement adjoining the west side of the Preserve in 2016.

Administration

- Authorized three SUAs for recreational uses, research opportunities and training.

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Appendix A

PLANT SPECIES KNOWN TO OCCUR IN THE PRESERVE

Scientific Name	Common Name
<i>Acer rubrum</i>	red maple
<i>Agalinis sp.</i>	false foxglove
<i>Aletris lutea</i>	yellow colic-root
<i>Alternanthera sp.</i>	joyweed
<i>Ampelopsis arborea</i>	peppervine
<i>Amphicarpum muhlenbergianum</i>	blue maidencane
<i>Andropogon sp.</i>	bluestem
<i>Andropogon virginicus</i>	broomsedge bluestem
<i>Andropogon virginicus var. glaucus</i>	chalky bluestem
<i>Aristida rhizomophora</i>	Florida threeawn grass
<i>Aristida spiciformis</i>	bottlebrush threeawn
<i>Aristida stricta var. beyrichiana</i>	wiregrass
<i>Asimina reticulata</i>	netted pawpaw
<i>Baccharis glomeruliflora</i>	silverling
<i>Baccharis halimifolia</i>	groundsel tree
<i>Balduina angustifolia</i>	coastalplain honeycomb-head
<i>Bejaria racemosa</i>	tarflower
<i>Blechnum serrulatum</i>	toothed midsorus fern
<i>Boehmeria cylindrica</i>	false nettle
<i>Callicarpa americana</i>	American beautyberry
<i>Callisia graminea</i>	grassleaf roseling
<i>Carex gigantea</i>	giant sedge
<i>Carex sp.</i>	sedge
<i>Carphephorus corymbosus</i>	coastalplain chaffhead
<i>Carphephorus sp.</i>	chaffhead
<i>Centella asiatica</i>	spadeleaf
<i>Cephalanthus occidentalis</i>	common buttonbush
<i>Ceratopteris thalictrioides</i>	watersprite
<i>Chapmannia floridana</i>	Florida alicia
<i>Cicuta maculata</i>	spotted water hemlock
<i>Conoclinium coelestinum</i>	blue mistflower
<i>Cornus foemina</i>	swamp dogwood
<i>Crotalaria rotundifolia</i>	rabbitbells
<i>Cynanchum angustifolium</i>	Gulf Coast swallow-wort
<i>Cyperus haspan</i>	haspan flatsedge
<i>Cyperus sp.</i>	flatsedge
<i>Dichantherium sp.</i>	witchgrass

<i>Eclipta prostrata</i>	false daisy
<i>Eleocharis sp.</i>	spikerush
<i>Elephantopus elatus</i>	tall elephantsfoot
<i>Erechtites hieraciifolius</i>	fireweed
<i>Eupatorium album</i>	white thoroughwort
<i>Eupatorium capillifolium</i>	dogfennel
<i>Eupatorium mohrii</i>	Mohr's thoroughwort
<i>Euphorbia sp.</i>	spurge
<i>Euthamia caroliniana</i>	slender flattop goldenrod
<i>Fraxinus caroliniana</i>	Carolina ash
<i>Fuirena scirpoidea</i>	southern umbrellasedge
<i>Fuirena sp.</i>	umbrellasedge
<i>Galactia elliotii</i>	Elliott's milkpea
<i>Gaylussacia dumosa</i>	dwarf huckleberry
<i>Gelsemium sempervirens</i>	yellow jessamine
<i>Gordonia lasianthus</i>	loblolly bay
<i>Helianthus angustifolius</i>	narrowleaf sunflower
<i>Hydrocotyle sp.</i>	marshpennywort
<i>Hymenachne amplexicaulis</i>	West Indian marsh grass
<i>Hypericum fasciculatum</i>	peelbark St. John's wort
<i>Hypericum hypericoides</i>	St. Andrew's cross
<i>Hypericum myrtifolium</i>	myrtleleaf St. John's wort
<i>Hypericum tetrapetalum</i>	fourpetal St. John's wort
<i>Hyptis alata</i>	clustered bushmint
<i>Ilex cassine</i>	dahoon
<i>Ilex coriacea</i>	large gallberry
<i>Ilex glabra</i>	gallberry
<i>Indigofera sp.</i>	indigo
<i>Iris sp.</i>	iris
<i>Juncus effusus ssp. Solutus</i>	soft rush
<i>Juncus sp.</i>	rush
<i>Lachnanthes caroliniana</i>	Carolina redroot
<i>Lachnocaulon anceps</i>	whitehead bogbutton
<i>Licania michauxii</i>	gopher apple
<i>Liquidambar styraciflua</i>	sweetgum
<i>Ludwigia palustris</i>	marsh seedbox
<i>Ludwigia peruviana</i>	Peruvian primrosewillow
<i>Ludwigia sp.</i>	primrosewillow
<i>Lycopodiella alopecuroides</i>	foxtail club moss
<i>Lycopodiella sp.</i>	club-moss

<i>Lygodium microphyllum</i>	old world climbing fern
<i>Lyonia fruticosa</i>	coastalplain staggerbush
<i>Lyonia lucida</i>	fetterbush
<i>Magnolia virginiana</i>	sweetbay
<i>Mikania scandens</i>	climbing hempvine
<i>Mimosa quadrivalvis</i>	sensitive briar
<i>Myrica cerifera</i>	wax myrtle
<i>Nyssa sylvatica var. biflora</i>	swamp tupelo
<i>Oclemena reticulata</i>	whitetop aster
<i>Opuntia humifusa</i>	pricklypear
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Osmunda regalis var. spectabilis</i>	royal fern
<i>Panicum hemitomon</i>	maidencane
<i>Panicum sp.</i>	panic grass
<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Paspalum sp.</i>	crowngrass
<i>Persea borbonia</i>	red bay
<i>Persea palustris</i>	swamp bay
<i>Phoebanthus grandiflorus</i>	Florida false sunflower
<i>Phoenix reclinata</i>	Senegal date palm
<i>Piloblephis rigida</i>	wild pennyroyal
<i>Pinus elliottii var. densa</i>	South Florida slash pine
<i>Pinus palustris</i>	longleaf pine
<i>Pityopsis graminifolia</i>	narrowleaf silkgrass
<i>Pleopeltis polypodioides var. michauxiana</i>	resurrection fern
<i>Pluchea rosea</i>	rosy camphorweed
<i>Pluchea sp.</i>	camphorweed
<i>Polygala rugelii</i>	yellow milkwort
<i>Polygala setacea</i>	coastalplain milkwort
<i>Polygala violacea</i>	showy milkwort
<i>Polygonella robusta</i>	largeflower jointweed
<i>Polygonum punctatum</i>	dotted smartweed
<i>Polygonum sp.</i>	smartweed
<i>Polypremum procumbens</i>	rustweed
<i>Pontederia cordata</i>	pickerelweed
<i>Proserpinaca pectinata</i>	combleaf mermaidweed
<i>Pteridium aquilinum</i>	bracken fern
<i>Pterocaulon pycnostachyum</i>	blackroot
<i>Ptilimnium capillaceum</i>	mock bishopsweed
<i>Quercus chapmanii</i>	Chapman's oak

<i>Quercus elliotii</i>	runner oak
<i>Quercus geminata</i>	sand live oak
<i>Quercus laurifolia</i>	swamp laurel oak
<i>Quercus minima</i>	dwarf live oak
<i>Quercus myrtifolia</i>	myrtle oak
<i>Quercus nigra</i>	water oak
<i>Quercus sp.</i>	oak
<i>Quercus virginiana</i>	live oak
<i>Rhexia nashii</i>	maid marian
<i>Rhus copallinum</i>	winged sumac
<i>Rhynchospora cephalantha</i>	bunched beaksedge
<i>Rhynchospora colorata</i>	starrush white-top
<i>Rhynchospora fascicularis</i>	fascicled beaksedge
<i>Rhynchospora inundata</i>	narrowfruit horned beaksedge
<i>Rhynchospora megaplumosa</i>	longbristle beaksedge
<i>Rhynchospora sp.</i>	beaksedge
<i>Rhynchospora tracyi</i>	Tracy's beaksedge
<i>Sabal palmetto</i>	cabbage palm
<i>Sacciolepis striata</i>	American cupscale
<i>Sagittaria lancifolia</i>	bulltongue arrowhead
<i>Salix caroliniana</i>	coastalplain willow
<i>Salvinia minima</i>	water spangles
<i>Schoenoplectus tabernaemontani</i>	soft stem bullrush
<i>Scleria sp.</i>	nutrush
<i>Scleria triglomerata</i>	whip nutrush
<i>Serenoa repens</i>	saw palmetto
<i>Sesbania herbacea</i>	danglepod
<i>Smilax auriculata</i>	earleaf greenbrier
<i>Smilax bona-nox</i>	saw greenbrier
<i>Smilax rotundifolia</i>	roundleaf greenbrier
<i>Sorghastrum sp.</i>	indiangrass
<i>Sporobolus junceus</i>	pineywoods dropseed
<i>Stillingia sylvatica</i>	queen's delight
<i>Stipulicida setacea</i>	pineland scalypink
<i>Styrax americanus</i>	American snowbell
<i>Symphotrichum carolinianum</i>	carolinianum climbing aster
<i>Syngonanthus flavidulus</i>	yellow hatpins
<i>Tephrosia sp.</i>	hoary-pea
<i>Tillandsia bartramii</i>	Bartram's air-plant
<i>Tillandsia fasciculata</i>	common wild-pine

<i>Tillandsia recurvata</i>	ballmoss
<i>Tillandsia setacea</i>	southern needleleaf
<i>Tillandsia usneoides</i>	Spanish moss
<i>Tillandsia utriculata</i>	giant airplant
<i>Toxicodendron radicans</i>	eastern poison ivy
<i>Tradescantia sp.</i>	spiderwort
<i>Typha latifolia</i>	broadleaf cattail
<i>Ulmus americana</i>	American elm
<i>Urena lobata</i>	Caesar's weed
<i>Vaccinium arboreum</i>	sparkleberry
<i>Vaccinium myrsinites</i>	shiny blueberry
<i>Vaccinium stamineum</i>	deerberry
<i>Vitis rotundifolia</i>	muscadine
<i>Vitis sp.</i>	grape
<i>Woodwardia virginica</i>	Virginia chain fern
<i>Ximenia americana</i>	hog plum
<i>Xyris caroliniana</i>	Carolina yellow-eyed grass
<i>Xyris elliotii</i>	Elliott's yellow-eyed grass
<i>Xyris sp.</i>	yellow-eyed grass