

Land Management Plan

Conner Preserve

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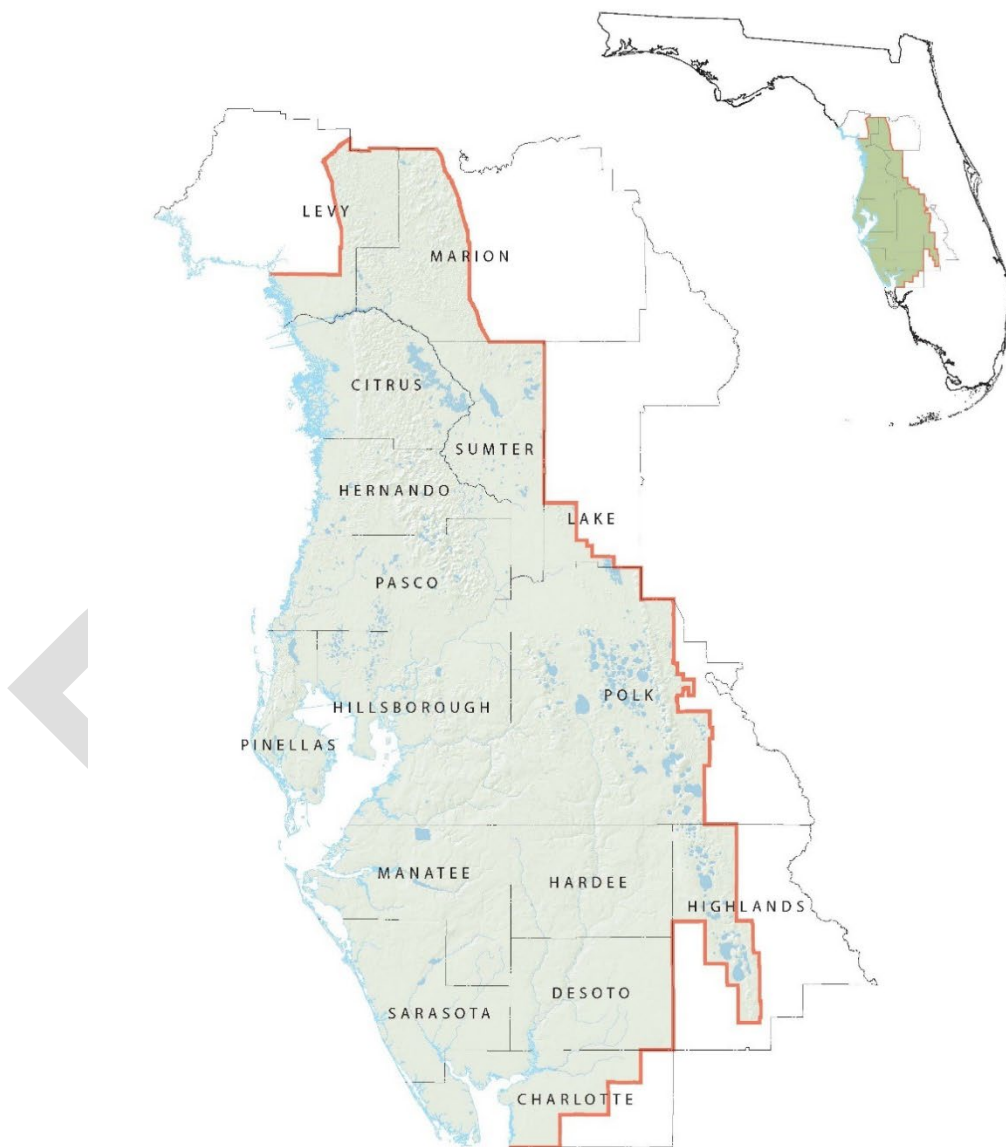
Land Resources Bureau

Southwest Florida Water Management District

May 3, 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: 3,486

Acquisition Date: 2003

Plan Term: 10 Years (2023-2032)

Primary Basin: Upper Coastal Areas and Hillsborough River

Secondary Basins: Cypress Creek and Pithlachascotee River

Location: Pasco County

Funding Source: Florida Forever

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 Conner Preserve (Preserve). Sixteen different natural communities or land cover types were identified by FNAI. Wetlands account for 56 percent of the Preserve, with the vast majority of the wetlands consisting of basin swamp (908 acres) and basin marsh (749 acres). Upland habitats are scattered within a matrix of upland land areas that were converted to improved pasture prior to purchase by the District and remain in various stages of restoration.

Water Resources: Water Resource benefits provided by the Preserve include flood control, water quality enhancement, and groundwater recharge. Approximately 2,274 acres of the Preserve, or 65 percent of the total land area, is located within the 100-year floodplain. The extensive wetland areas within the Preserve also enhance water quality by sequestering nutrients and other contaminants that may drain into the property from adjacent properties.

Land Management: Management activities on the Preserve include applications of prescribed fire, habitat management, habitat restoration, feral hog control, and control of invasive, nonnative plant species. The District aims 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 its perimeter to facilitate the safe use of prescribed fire and to limit the potential impacts from wildfires.

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, biking, and equestrian use of a 17-mile trail network. Approximately two miles are reserved for hiking access only due to sensitive plant communities. Nine miles of the trail network are designated for hiking and biking use, while the remaining six miles allow for biking, hiking, and equestrian use.

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 a variety of recreational activities, scientific research, and law enforcement training. No SUAs are in effect for the Preserve.

Access: Primary access to the Preserve is from State Road 52 approximately 3.5 miles east of US Highway 41, where a parking area and walk-thru entrance are available to accommodate recreational users.

Real Estate: The District will continue to consider opportunities to purchase lands adjacent to the Preserve with the goal of promoting the District's effort to protect the natural features of conservation lands for the benefit of flood protection, water quality, and water supply.

Cooperative Agreements, Leases, and Easements: Two perpetual easements grant rights of ingress and egress to the property. One encompassing a land area of approximately three acres was granted to Tampa Bay Water by the prior owner, Conner Land, LTC., in 2001 in order to accommodate the installation and maintenance of a water transmission line. The second easement was granted to the Florida Department of Transportation by the District in 2007 to accommodate creation and maintenance of a 1.8-acre stormwater pond on the eastern edge of US Highway 41 and including a 5,055 square-foot ingress-egress corridor.

Table of Contents

Executive Summary	iv
Introduction and General Information.....	1
Management Plan Purpose	1
District Strategic Plan.....	2
Management Authority	2
Location.....	3
Acquisition	6
Current Land Use	9
Local Government Land Use Designation	9
Adjacent Land Uses	9
Management Challenges	9
Historical Land Use and Cultural Resources	11
Historical Land Use.....	11
Cultural and Archaeological Resources	11
Water Resources and Natural Systems.....	12
Water Quality	12
Water Supply.....	12
Flood Protection	15
Natural Systems.....	17
Soils and Topography.....	26
Land Management and Land Use	29
Land Management.....	29
Recreation.....	38
Land Use Administration	41
Land Maintenance and Operations.....	43
Goals and Objectives	44
Resource Protection and Management.....	44
Administration.....	47
Significant Management Accomplishments	49
References	50
Appendix A.....	52

List of Figures

Figure 1. General Location	4
Figure 2. Aerial Overview	5
Figure 3. Regional Conservation Network	7
Figure 4. Water Resources	14
Figure 5. Floodplain Map	16
Figure 6. Natural Communities – FNAI	25
Figure 7. Soil Types	27
Figure 8. Digital Elevation Model	28
Figure 9. Management Units	31
Figure 10. Recreation and Access	40

List of Tables

Table 1. Conservation Lands within the Vicinity of the Preserve.	8
Table 2. Summary of Natural Community Types present on the Preserve	17
Table 3. Invasive Plants Known to Occur at Conner Preserve	34
Table 4. Imperiled Wildlife Species Known or Likely to Occur	35
Table 5: Imperiled Plant Species Known or Likely to Occur	37

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 central Pasco County north of the unincorporated community of Land O' Lakes and is 10 miles west of the City of San Antonio. It is bounded on the west by US Highway 41, on the north by State Road 52 and on the east by Ehren Cutoff Road (**Figure 1**). Along portions of the western boundary are other conservation lands and some small commercial development. The southern boundary borders the Connerton mixed-use development project (**Figure 2**).

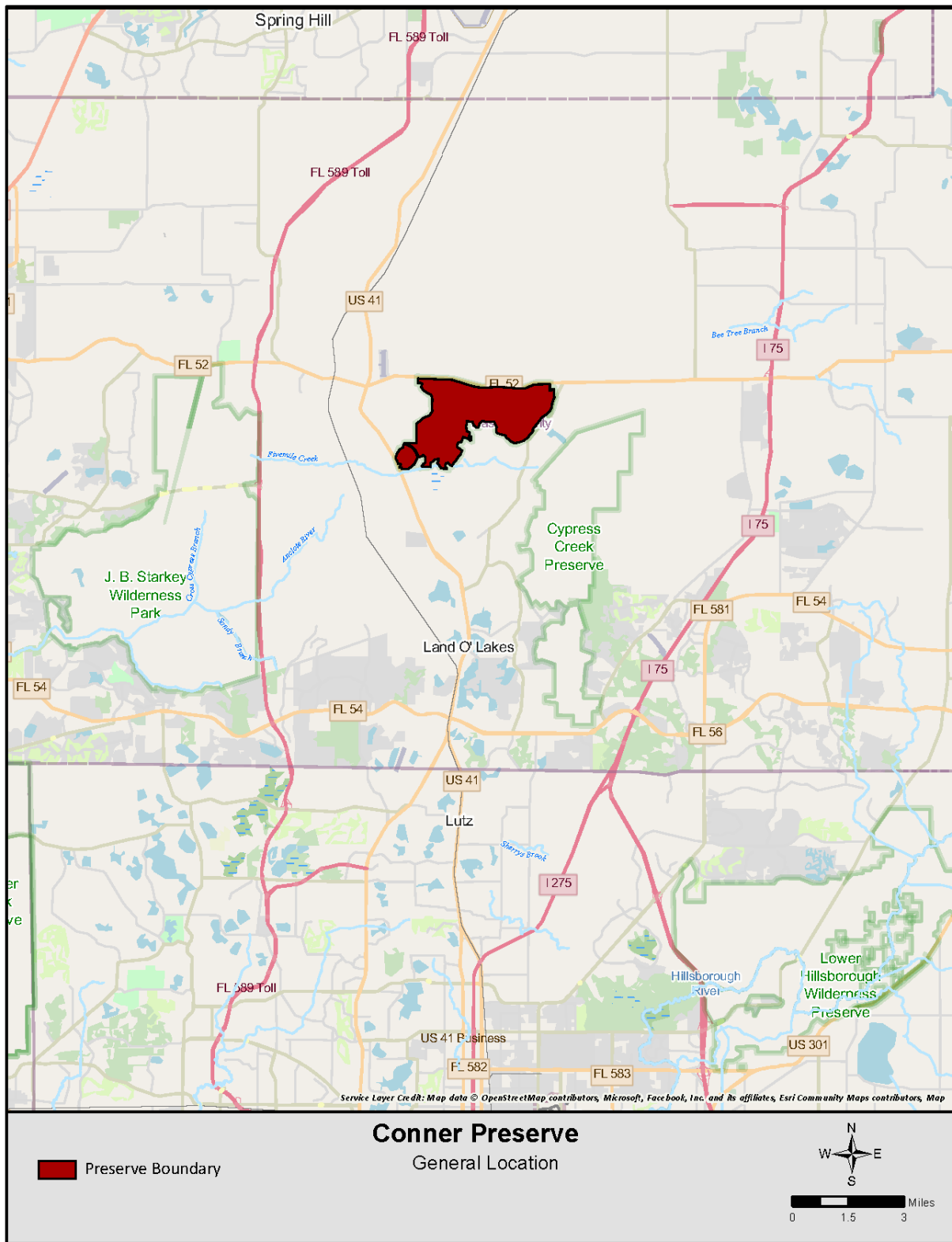


FIGURE 1. GENERAL LOCATION



FIGURE 2. AERIAL OVERVIEW

Acquisition

Policy

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 control, water storage, water management, conservation and protection of water resources, aquifer recharge, water supply development, and preservation of wetlands, streams, and lakes. Lands evaluated for purchase by the District are evaluated based on the District's four Areas of Responsibility (AORs): water supply, water quality, flood control, 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 February 2003. Funding came from the state's Florida Forever Trust Fund. The Preserve was part of the much larger 29,383-acre Pasco One Land Acquisition Project which sought to acquire several other tracts near the Preserve to provide connections between other existing conservation lands. Prior to the District's purchase of the property, it was part of the Conner Ranch. Most of the uplands on the property had been converted to improved pasture or pine plantation by the previous owners with some portions remaining in their natural condition. Lands that were previously altered have subsequently been undergoing restoration that is at various stages of completion. As part of the acquisition of the Preserve, there were considerations for the planned widening of adjacent highways which is evident in the boundary.

Regional Significance

FNAI maintains an interactive mapping tool, referred to as the Florida Forever Conservation Data Viewer ([FNAI 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 2 for both its surface water and biodiversity conservation values. It is also distinguished as an important regional link in the Florida Ecological Greenways Network; however, the overall level of fragmentation in this region precludes the Preserve from being ranked as a segment of the Florida Wildlife Corridor. The presence of mesic flatwoods habitat plays an important role in elevating the Preserve's biodiversity conservation value because mesic flatwoods are recognized as an under-represented natural community within the state's network of conservation lands.

Regional Conservation Network

The Preserve is part of a large network of conservation lands within an approximately 20-mile radius (**Figure 3**). Dozens of tracts, totaling more than 348,000 acres in total land area, have been acquired and dedicated to natural resource protection through the efforts of state and local governments, and private entities (**Table 1**). The Preserve is situated as an important conservation link for maintaining connectivity between the Starkey Wilderness Preserve, Cross Bar Ranch Wellfield, Al Bar Ranch, Cypress Creek Preserve, and Old Town Mitigation Bank properties.

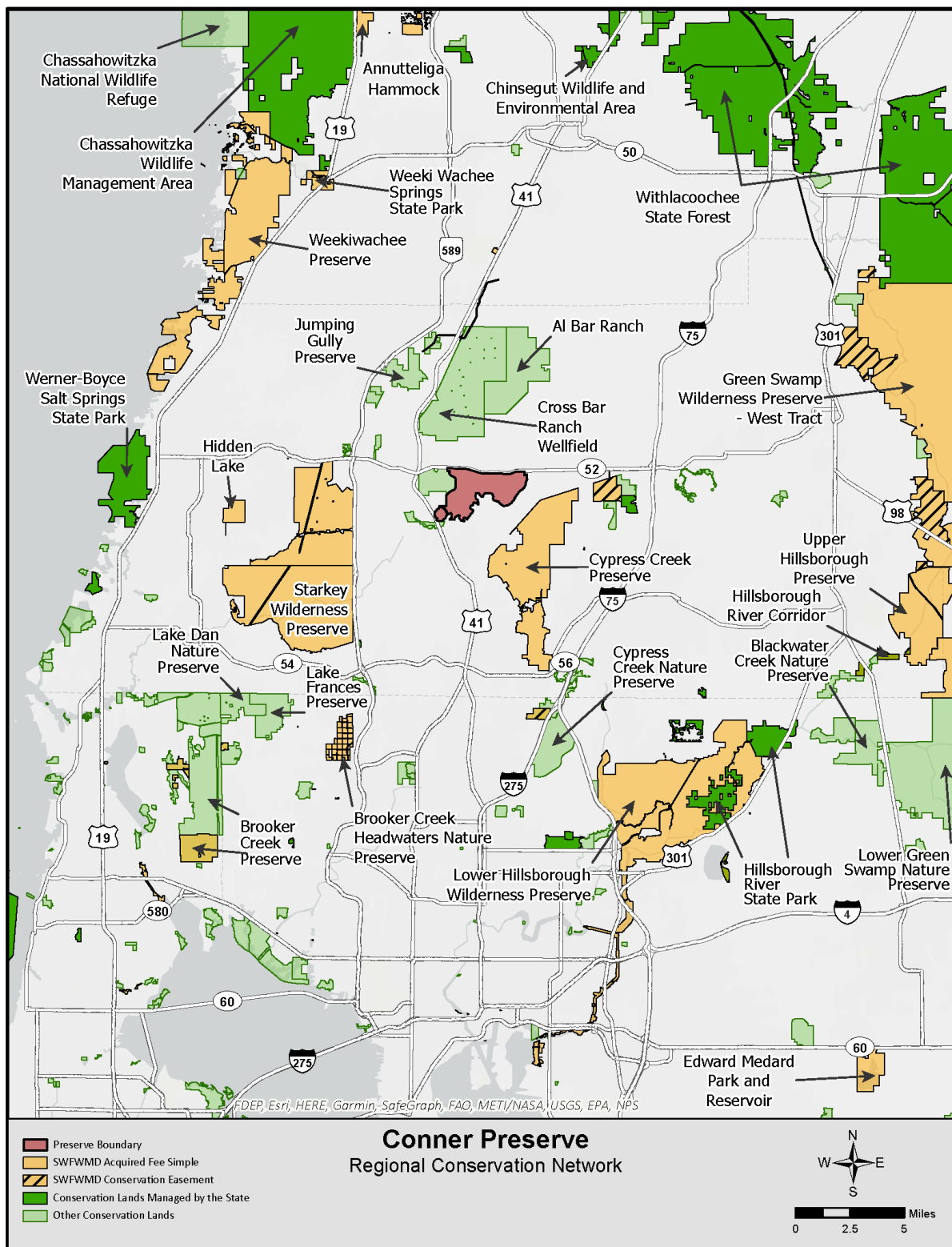


FIGURE 3. REGIONAL CONSERVATION NETWORK

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

Property	Manager	Owner	Acres	County
Starkey Wilderness Preserve	SWFWMD	SWFWMD	19,853	Pasco
Cypress Creek Preserve	SWFWMD	SWFWMD	7,475	Pasco
Lower Hillsborough Wilderness Preserve	SWFWMD	SWFWMD	16,062	Hillsborough
Weekiwachee Preserve	SWFWMD	SWFWMD	11,236	Hernando, Pasco
Beville Ranch Conservation Easement	SWFWMD	Private	5,471	Sumter
Green Swamp Wilderness Preserve	SWFWMD	SWFWMD	104,275	Lake, Pasco, Polk, Sumter
Hidden Lake	SWFWMD	SWFWMD	588	Pasco
Lower Hillsborough	SWFWMD	SWFWMD	9,440	Hillsborough, Pasco
Withlacoochee River Park	SWFWMD	Pasco	258	Pasco
Withlacoochee State Forest (Croom, Richloam and Headquarters Tracts)	FFS	TIITF	78,000	Hernando, Citrus, Pasco
Phillips Mathis Conservation Easement	FFS	TIITF	289	Pasco
Chassahowitzka WMA	FWC	TIITF	27,263	Hernando, Citrus
Janet Butterfield Brooks Preserve WEA	FWC	TNC	318	Hernando
Chinsegut WEA	FWC	TIITF	853	Hernando
Perry Oldenburg WEA	FWC	FWC	369	Hernando
Hillsborough River State Park	FDEP	TIITF	3,319	Hillsborough
Werner-Boyce Salt Springs State Park	FDEP	TIITF	3,999	Pasco
Anclote Key Preserve State Park	FDEP	TIITF	12,117	Pasco, Pinellas
Caladesi Island State Park	FDEP	TIITF	2,420	Pinellas
Honeymoon Island State Park	FDEP	TIITF	2,824	Pinellas
Cypress Lakes Preserve	Hernando	Hernando	331	Hernando
Lake Townsen Preserve	Hernando	Hernando	375	Hernando
Fickett Hammock Preserve	Hernando	Hernando	148	Hernando
Peck Sink Preserve	Hernando	Hernando	112	Hernando
Jenkins Creek/Linda Pedersen Preserve	Hernando	Hernando	140	Hernando
Jumping Gully Conservation Area	Pasco	Pasco	1,701	Pasco
Key Vista Nature Park	Pasco	TIITF	102	Pasco
Brooker Creek Preserve	Pinellas	Pinellas	8,746	Pinellas
Al Bar Ranch	Pinellas	Pinellas	4,252	Pasco
Cross Bar Ranch Wellfield	Pinellas	Pinellas	8,180	Pasco
Lake Francis Preserve	Hillsborough	Hillsborough	1,664	Hillsborough
Blackwater Creek Nature Preserve	Hillsborough	Hillsborough	2,026	Hillsborough
Lower Green Swamp Nature Preserve	Hillsborough	Hillsborough	12,800	Hillsborough
Ahhochee Hill Sanctuary	Audubon	Audubon	270	Hernando
Old Florida Mitigation Bank	Private	Private	1,093	Pasco

SWFWMD – Southwest Florida Water Management District

FWC- Florida Fish and Wildlife Conservation Commission

FDEP – Florida Department of Environmental Protection

FFS – Florida Forest Service

USFWS – United States Fish and Wildlife Service

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 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. Pasco 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 the north by lands placed in the Agricultural and Agricultural/Rural land use categories. Although these lands all remain in agricultural production as cattle ranches, the region surrounding the Preserve is experiencing additional development. Except for the private conservation tract along the Preserve’s western boundary, the remainder of adjoining lands are currently undergoing residential development or have agricultural use.

Most of the southern boundary has already been developed as part of the Connerton mixed use development that includes residential, as well as commercial uses and community centers. Most of the land along the east boundary fronting Ehren Cutoff is planned for road projects with additional planned development further to the east.

Management Challenges

The challenges associated with the management of the Preserve are centered primarily around the increasing development which could impact the management activities to an extent. Uses along the southwest boundary include a large complex owned and operated by the Pasco County Sheriff’s Office, including a jail, and a community hospital. Such land uses are considered to be especially “smoke sensitive” when conducting prescribed burns. In addition to constraining the District’s ability to conduct prescribed burns, the wildland-urban interface often serves as a vector for the introduction of invasive or nuisance plant and animal species. The Preserve is also experiencing increasing levels of recreational use and land use requests that have to be evaluated

These factors all have the potential to put increasing pressure on the water resources and natural systems the Preserve seeks to protect.

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Historical Land Use and Cultural Resources

Historical Land Use

The historical uses of the lands comprising the Preserve primarily included cattle grazing and timber harvesting. Some minor hydrologic alteration was implemented prior to District acquisition to improve drainage and facilitate the creation of improved pasture across much of the upland land area in order to increase the grazing capacity for cattle grazing. A comprehensive habitat restoration project was implemented and is discussed later in the plan.

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. Many District Land Management staff have completed DHR's Archaeological Resource Management Training to ensure protection of these resources.

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. The District's Mission is to protect water resources, minimize flood risks, and ensure the public's water needs are met. 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

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 a discharge point, and the origin or headwaters of Five-Mile Creek, Gowers Corner Slough, and Jumping Gully, which ultimately drain to the Pithlachascotee River, and an unnamed drainage basin at the eastern end of the Preserve that drains to Cypress Creek.

Water quality on the Preserve is excellent because most of the water arrives on the property as rainfall. The Preserve's primary contribution to maintaining or enhancing water quality is through its preservation and protection, which precludes the potential water quality degradation that would result from development or continuation of the agricultural uses that preceded the District's acquisition of the property.

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 incentives provided through the Cooperative Funding Initiative that support water conservation and development of alternative water supplies such as reclaimed water, surface water, brackish groundwater, seawater desalination, or other non-traditional sources.

Ensuring an adequate supply of water is available to support both human and natural systems needs is central to the District's Mission. Although the Preserve does not serve directly as a water supply

source, it contributes indirectly to advancing the District's water supply mission through groundwater recharge. The Preserve is in an area of moderate-to-high recharge values (one to ten inches annually). Its proximity to both the Cypress Creek and Cross Bar Ranch wellfields lends additional importance to the Preserve's role in groundwater recharge.

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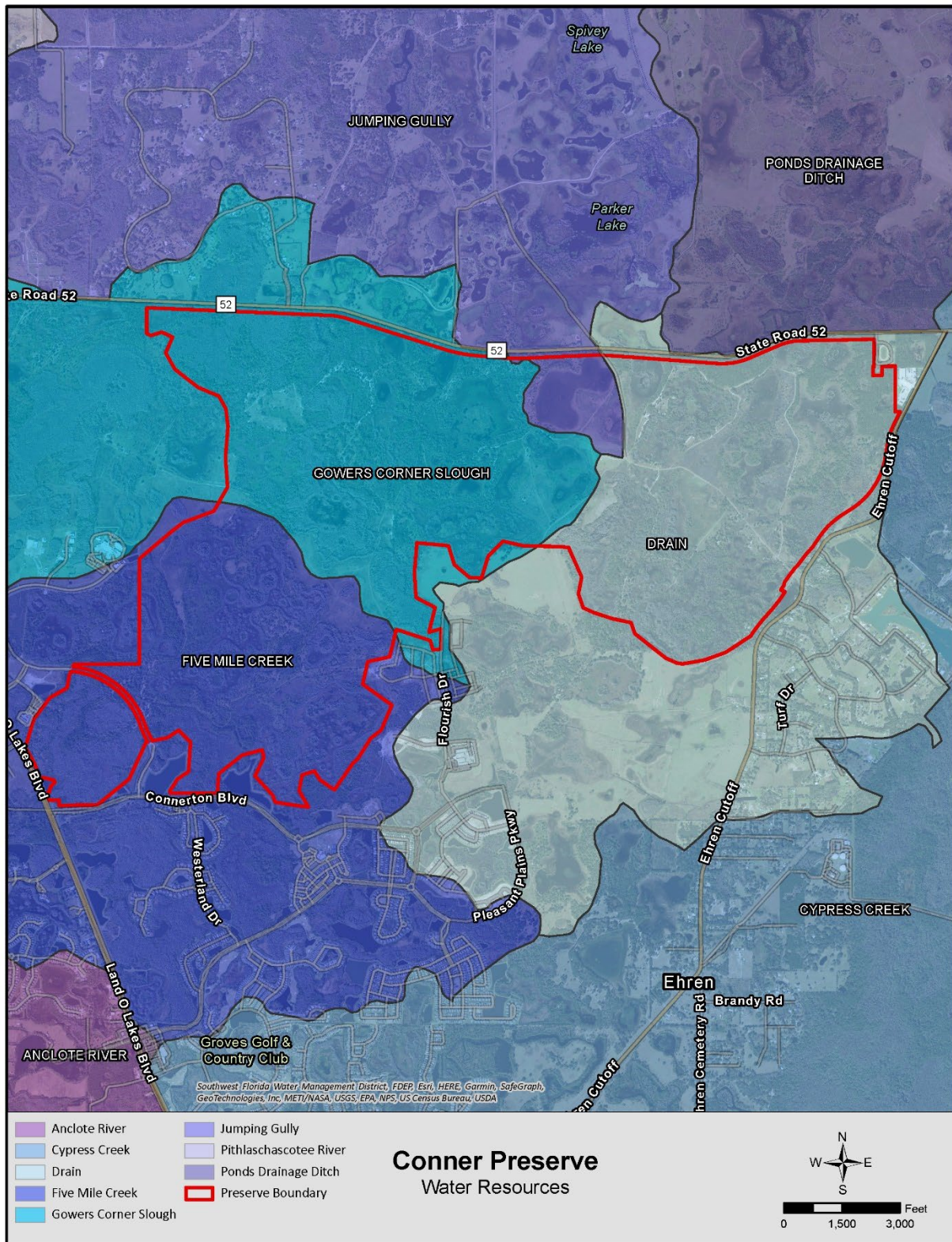


FIGURE 4. WATER RESOURCES

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.

The 100-year floodplain as delineated by the Federal Emergency Management Agency accounts for 65 percent of the Preserve's total land area (**Figure 5**). The vast majority of the floodplain corresponds with the property's wetlands, which account for 56 percent of the total land area. As such, some of the lower-lying upland communities (approximately 313 acres) are also within the 100-year floodplain and contribute 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.

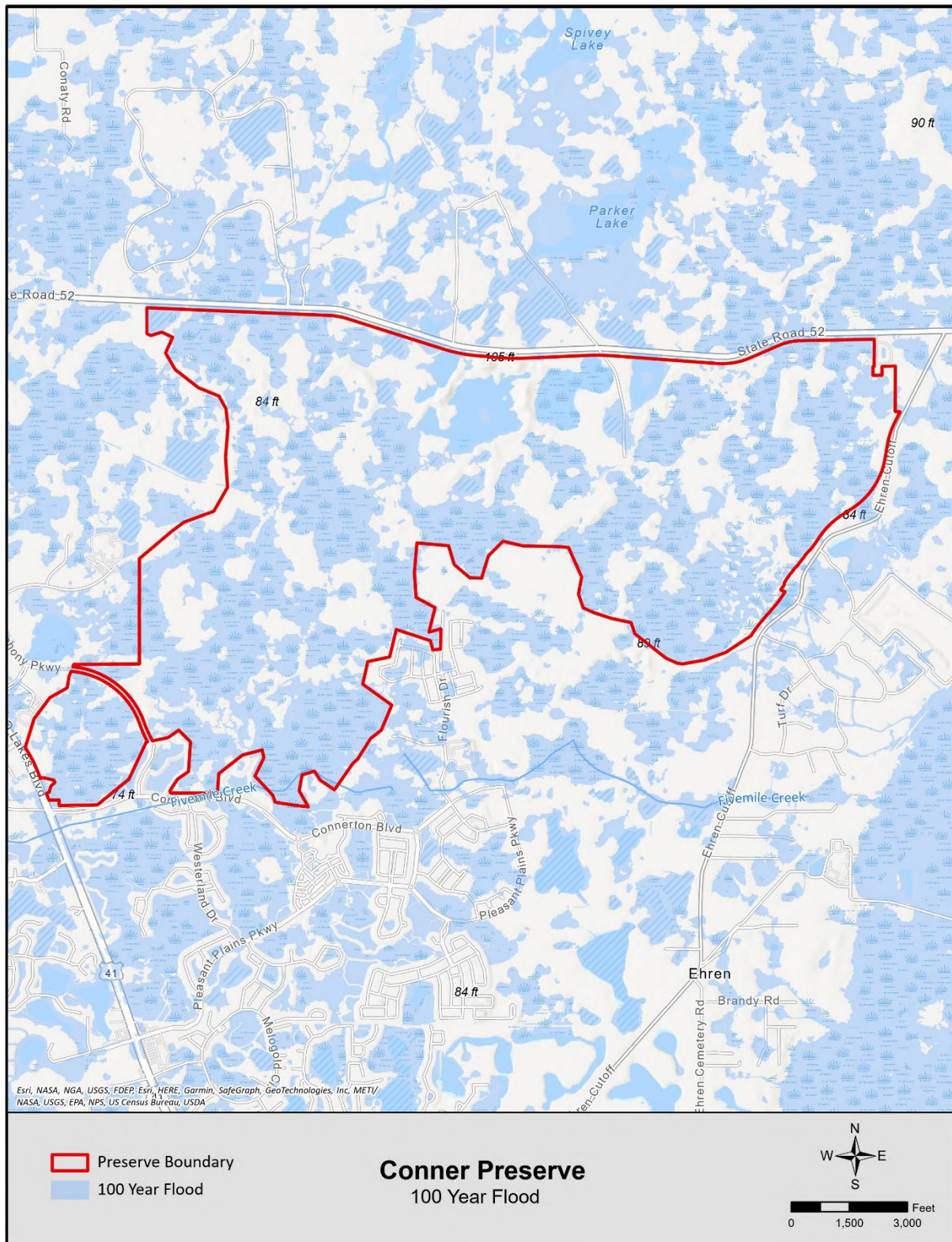


FIGURE 5. FLOODPLAIN MAP

Natural Systems

The following discussion of the Preserve's natural communities follows the classification system used by the Florida Natural Areas Inventory (FNAI). For a detailed discussion of the classification system, refer to FNAI's *Guide to the Natural Communities of Florida*.

The Preserve is characterized by a very diverse natural landscape. FNAI identified 12 different natural community types within the Preserve, which occur as a complex mosaic that includes basin marsh, basin swamp, baygall, depression marsh, dome swamp, mesic flatwoods, mesic hammock, sandhill, scrub, scrubby flatwoods, wet flatwoods, wet prairie, and xeric hammock. In addition, four altered land cover types that are a legacy of land use changes made prior to the District's acquisition of the property were listed. All are summarized in **Table 2** and identified in **Figure 6**.

A large percentage of the upland areas within the Preserve were converted historically to improved pasture dominated by bahiagrass. These areas are now categorized as either improved or semi-improved pasture depending on the amount of native vegetation that has regenerated, or as ruderal "old fields", depending on the extent of weedy invasion or recent soil disturbances.

Additional fieldwork was conducted in March 2023 in association with preparation of this Management Plan update to confirm current conditions and to evaluate the effects of land management on each natural community. Brief descriptions of each of the natural communities and altered land cover types present on the Preserve are provided below. Special management considerations are also briefly discussed where appropriate.

TABLE 2. SUMMARY OF NATURAL COMMUNITY TYPES PRESENT ON THE PRESERVE

FNAI Natural Community	Acreage	Percentage of Community Type
Basin marsh	749	21
Basin swamp	908	26
Baygall	46	1
Depression marsh	65	2
Dome swamp	119	3
Mesic flatwoods	597	17
Mesic hammock	58	2
Pasture- semi-improved	210	6
Pasture-improved	226	6
Pine plantation	114	3
Ruderal	126	4
Sandhill	88	3
Scrubby flatwoods	36	1
Wet flatwoods	79	2
Wet prairie	63	2
Xeric hammock	4	1
Total Acreage	3,486	100 %

Wetland Communities

Basin Marsh (599 acres)

Basin marshes are herbaceous wetlands that form in large, shallow, irregularly shaped depressions. Although portions may go dry during periods of drought, water typically persists in the deepest sections. Vegetation can occur in concentric bands along a hydroperiod gradient. Occasional fire is required to impede invasion of shrubs and trees along the perimeter.

The Preserve's basin marshes are dominated by maidencane and blue maidencane in the outer, drier areas. In the deeper areas bulltongue arrowhead, common arrowhead, and pickerelweed are common. The deepest areas feature yellow pondlily and American white waterlily. Other typical herbaceous species include soft rush, needleleaf witchgrass, pennywort, sand cordgrass, sawgrass, dotted smartweed, pale meadowbeauty, fascicled beaksedge, Tracy's beaksedge, Carolina redroot, and largeflower rosegentian. Woody species make up a minor component of the basin marshes in the Preserve, although lack of fire has allowed encroachment of shrubs and trees into portions of some basin marshes. Typical shrubs include buttonbush, peelbark St. John's wort, dwarf St. John's wort, and wax myrtle. Encroaching tree species include red maple, slash pine, dahoon holly, and pond cypress.

Natural fluctuations in water level are important for maintaining the natural floristic diversity of basin marshes. The Preserve's basin marshes appear to exhibit relatively natural hydroperiods; however, a long history of fire exclusion has allowed much of the land area historically occupied by basin marsh to succeed to basin swamp as hardwood shrubs and trees progressively invaded the marsh. FNAI has projected that basin marsh originally occupied a larger percentage of the Preserve land area than basin swamp, estimating that approximately a third (317 acres) of the existing basin swamp naturally support basin marsh. While few studies have extrapolated the natural fire return interval for basin marshes, it is likely that natural fires occasionally burned through them at the end of the dry season. The frequency of fire varies, depending on marsh hydrology and its exposure to fire from surrounding areas. In order to prevent additional basin marsh from being converted to basin swamp, prescribed fires conducted in adjoining uplands should be allowed to burn into the adjacent basin marsh whenever possible. Caution must be exercised to avoid igniting peat fires in the basin marsh by ensuring the marsh is sufficiently hydrated prior to burning.

Basin Swamp (908 acres)

Basin swamps are forested wetlands that occur in large, often irregularly shaped depressions, typically with no water outlets except at times of very high water. Fire is generally restricted to the edges of basin swamps. As explained previously, about 317 acres of the Preserve's basin swamps resulted from tree encroachment into what had historically been basin marsh. These areas are typically a mosaic of swamp and marsh vegetation, often with trees overtopping a dense growth of herbaceous marsh vegetation.

The canopy and subcanopy trees within the Preserve's basin swamps are dominated by pond cypress with a variety of deciduous and evergreen trees including swamp tupelo, swamp bay,

loblolly bay, red maple, and bald cypress. Shrubs include buttonbush, dahoon holly, Virginia willow, and wax myrtle. Epiphytes growing on the trees and shrubs can be abundant and include Bartram's airplant, ballmoss, and Spanish moss. Vines include coral greenbrier and laurel greenbrier. Common species in the herbaceous sublayer include Carolina redroot, maidencane, bulltongue arrowhead, common arrowhead, blue maidencane, pickerelweed, sawgrass, and others typical of the basin marsh. Ferns can also be common and include Virginia chain fern, toothed midsorus fern, and cinnamon fern.

Baygall (46 acres)

Baygalls account for only a small proportion of the Preserve. They are forested or shrub-dominated wetlands that receive much of their water via seepage from adjoining uplands. The native vegetation in baygalls is evergreen, broad-leaved species that include loblolly bay, swamp bay, and dahoon holly. The Preserve's baygalls are distinguished by a dense canopy of these three species, with occasional bald cypress and slash pine. Shrubs include coastalplain staggerbush, fetterbush wax myrtle, and gallberry. The sparse herbaceous layer includes Virginia chain fern, creeping primrosewillow, Carolina redroot, muscadine, and climbing hempvine.

Depression Marshes (65 acres)

Depression marshes develop in shallow, rounded depressions that are seasonally inundated and typically dominated by a cover of herbaceous plants. Concentric zones or bands of vegetation are often characteristic of depression marshes due to the increasing length and depth of inundation that occurs from the outer edge of the marsh. The presence of woody plant cover is often indicative of fire exclusion in the surrounding communities, or of an altered hydroperiod. The Preserve's depression marshes appear to be in healthy condition.

Floristically, depression marshes are similar to basin marshes; however, depression marshes are typically smaller and shallower than basin marshes. Dominant species in the Preserve's marsh include maidencane, blue maidencane, spikerush, dotted smartweed, pennywort tapered witchgrass, Carolina redroot rosy camphorweed, and largeflower rosegentian. Trees are generally absent, although some encroachment by red maple, slash pine, and pond cypress can be observed in some areas of the Preserve. Shrubs include common buttonbush, peelbark St. John's wort, wax myrtle, gallberry, groundsel tree, fetterbush, and coastalplain willow; however, shrub growth is typically sparse.

Little is known about the natural fire frequency in depression marshes. Generally, fires conducted in adjoining communities should be allowed to burn into depression marshes until they extinguish naturally or burn through them. Sometimes, a sparsely vegetation zone around the outside perimeter of a marsh functions as a natural firebreak.

Dome Swamps (119 acres)

Like baygalls, dome swamps account for a very small proportion of the total Preserve land area. However, they add important habitat diversity for wildlife. Dome swamps are small, forested wetlands that occupy shallow depressions within flatwoods and sandhills. They require occasional fire to prevent hardwood invasion, much like basin marshes and depression marshes. Exposure to

fire happens much more frequently around the periphery, and very rarely in the deeper central reaches of the swamp, where natural fire intervals may approach or exceed 100 years.

The canopy and subcanopy layers in the few dome swamps present at the Preserve are dominated by pond cypress, with occasional swamp laurel oak, red maple, and loblolly bay also present. Shrub species include dahoon holly, swamp bay, common buttonbush, Virginia willow, and coastalplain willow. Herbaceous growth is sparse but may include Carolina redroot, millet beaksedge, narrowfruit horned beaksedge, cinnamon fern, and Virginia chain fern. Laurel greenbrier occurs as a common vine.

Wet Prairies (63 acres)

Wet Prairies are grass and sedge-dominated wetlands maintained by a high or perched ground water table and frequent fires. They comprise a very small proportion of the Preserve and are restricted to narrow zones of saturated soil at the base of gentle slopes near basin swamps and on the outer edges of depression marshes and basin marshes, and may even be enmeshed within areas of marsh. Typical species include maidencane and wiregrass. Other herbaceous species include fewflower milkweed, lemon bacopa, spadeleaf, tenangle pipewort, dogfennel, Carolina redroot, pale meadowbeauty, starrush, and yellow-eyed grasses. A few shrubs may be present, including queensdelight, peelbark St. John's wort, and gallberry. Similar to depression marsh, fires ignited on surrounding lands should be permitted to burn into the wet prairies until they extinguish naturally.

Wet Flatwoods (79 acres)

Wet flatwoods in the Preserve have a canopy of slash pine or south Florida slash pine and an understory of dense wetland shrubs and/or grasses. In many areas bordering the basin and depression marshes, slash pines grow in dense patches over a groundcover of marsh or wet prairie grasses and are classified here as “wet flatwoods.” These areas may be an artifact of fire exclusion or the lowering of the water table by ditching to accommodate the historic cattle ranching that occurred on the property. Wet flatwoods depend on frequent fires to prevent hardwood encroachment and encourage the perpetuation of herbaceous species. Fire likely occurred naturally in wet flatwoods every three to ten years in the late spring/early summer lightning season.

A dense subcanopy of loblolly bay, dahoon holly, swamp bay, slash pine, laurel oak or water oak may be present if fire has been suppressed for an extended period. Shrubs can include St. John's wort, fourpetal St. John's wort, large gallberry, dahoon holly, fetterbush, wax myrtle, swamp bay, saw palmetto, and highbush blueberry. Herbs include blue, bushy bluestem, broomsedge bluestem, fireweed, dogfennel, Mohr's thoroughwort, Carolina redroot, cinnamon fern, pale meadowbeauty, largeflower rosegiantian, sand cordgrass, and Virginia chain fern.

Soils, hydrology, fire frequency, and burn season all influence the relative density of shrubs and herbs in wet flatwoods. Shrubs tend to dominate where fire has been absent for a long period or where cool season fires predominate, while herbs are more common in locations that are frequently burned. Naturally shrubby wet flatwoods may have fire return intervals of five to seven years, while grassy wet flatwoods may burn as frequently as every one to three years.

Upland Communities

Mesic Flatwoods (597 acres)

Mesic flatwoods is the most extensive upland community occurring on the Preserve. These forests occur on low, sandy flatlands across the Southeastern coastal plain. They are characterized by an open canopy of pines, little or no midstory vegetation, and a lush, highly diverse groundcover composed of a mixture of shrubs and grasses. The open overstory allows abundant sunlight to reach the forest floor, and frequent fires (the fire return interval ranges from two to five years) maintain the open canopy. This combination of factors maintains the open, highly diverse plant composition typical of mesic flatwoods.

Most of the mesic flatwoods that were present historically at the Preserve were converted to improved pasture to support grazing by cattle. Several stands of good-to-marginal quality mesic flatwoods remain on the Preserve and are depicted in the Natural Communities map (**Figure 6**). These areas have all experienced shrub encroachment due to fire exclusion.

The canopy is primarily slash pine, although there are a few areas with some longleaf pine and South Florida slash pine. The subcanopy layer includes a diversity of hardwoods that have encroached due to the fire exclusion, including red maple, loblolly bay, swamp bay, Carolina laurelcherry, laurel oak, water oak and/or live oak. Characteristic shrubs include saw palmetto and gallberry, with occasional netted pawpaw, blue huckleberry, coastalplain staggerbush, fetterbush, wax myrtle, and shiny blueberry. The dominant herbaceous are wiregrass and Florida dropseed, with a diversity of other species present, including bushy bluestem, chalky bluestem, needleleaf witchgrass, tall elephantsfoot, button rattlesnakemaster, slender flattop goldenrod, blackroot, pale meadowbeauty, sand blackberry, lopsided Indiangrass, and little bluestem. Common vines include Elliott's milkpea, sensitive plant, earleaf greenbrier, and muscadine.

Sandhill (88 acres)

Sandhill vegetation at the Preserve is restricted to high, well-drained, sandy ridges at the north end of the property. The sandhill areas are in relatively good condition and feature a canopy of longleaf pine with occasional slash pine and turkey oak. The sub-canopy and shrub layers are dominated by sand live oak, bluejack oak, Chapman's oak, and sand holly. Groundcover species and small shrubs typical of sandhill are also present, including slimleaf pawpaw, saw palmetto, gopher apple, wiregrass, Darrow's blueberry, Indiangrass Florida dropseed, tall prickly pear, tall elephantsfoot, Michaux's snoutbean, goat's rue, bracken fern, and slender gayfeather.

Sandhill is one of the most pyrogenic natural communities in Florida, and natural fire return intervals are as frequent as every two to three years. The native plants found in sandhill thrive under frequent fire, and extended periods of fire exclusion often cause a decline in the overall plant diversity and wildlife values of sandhill.

Bahiagrass is present in some parts of the sandhill and is a legacy of historic cattle grazing on the property, and extensive conversion of upland areas to improved pasture. In some of the areas where Bahiagrass has encroached, narrowly targeted treatment with a herbicide effective in controlling pasture grasses may be warranted.

Scrubby Flatwoods (36 acres)

Like sandhill, scrubby flatwoods occur on elevated sites underlain by well-drained sands, and it often occurs in close association with sandhill, and on rises within mesic flatwoods or transitional areas between scrub and mesic flatwoods. It is similar to mesic flatwoods in terms of structure and species composition, with widely spaced pines and dense shrubs. The natural fire return interval for scrubby flatwoods is likely five to eight years; however, in stands where fire has been excluded, more frequent burning may be required in order to restore reduce fuel loads and restore the natural structure, which should include scattered sandy openings in the vegetation. Over the long term, introducing variability in the season and the frequency of prescribed fires would generate a mosaic of burned and unburned patches which is preferable for maintaining the high species diversity and wildlife habitat values characteristic of scrubby flatwoods.

The scrubby flatwoods canopy in the Preserve consists primarily of slash, although longleaf pine was probably dominant historically. Due to long term fire exclusion, live oak, or water oak may also be present in the canopy and subcanopy. Shrubs are typically dense and multi-layered and include sand live oak, myrtle oak, bluejack oak, blue huckleberry, shiny blueberry, tarflower, gallberry., wax myrtle, fetterbush, netted pawpaw, red bay, and saw palmetto.

The natural abundance of grasses and forbs in scrubby flatwoods can be reduced where shrubs are dense, but dense patches of herbaceous vegetation can grow where large gaps in the shrub layer occur, including broomsedge bluestem, wiregrass, fringed yellow stargrass, bracken fern, Michaux's snoutbean, blackroot, Florida dropseed, Adam's needle, Elliott's milkpea, and muscadine.

Mesic Hammock (58 acres)

Mesic hammocks are forests of broadleaved evergreen trees that become established in areas that are naturally protected from fire. Fires occur rarely in mesic hammocks due to the combination of incombustible fuels, relatively high humidity, and the presence of natural firebreaks. Mesic hammocks are not common in the Preserve and typically occur as small patches of oaks on slopes adjacent to basin swamps and streams. Mesic hammocks can also develop within flatwoods as a result of long-term fire exclusion.

The canopy in these hammocks consists primarily of live oak and laurel oak. Other tree species can include southern magnolia, sand live oak, and water oak. Occasional slash pine, longleaf pine, and cabbage palm may also be present. Shrubs are usually sparse and include American beautyberry, fetterbush, wax myrtle, saw palmetto, and persimmon. Epiphytes can be common, including Bartram's airplant, ballmoss, and Spanish moss. The density and diversity of herbaceous species varies depending on the degree of shading by trees and shrubs, but it typically includes toothed midsorus fern, low panic grasses, dogfennel, bracken fern, netted chain fern, and Carolina yelloweyed grass. Common vines include Elliott's milkpea, yellow jessamine, saw greenbrier, and muscadine.

Xeric Hammock (4 acres)

Xeric hammocks are usually small and occur on xeric soils dominated by oaks and often considered to be an advanced successional stage of scrub, scrubby flatwoods, or sandhill resulting

from the long-term exclusion of fire. Typical canopy and subcanopy trees in xeric hammocks in the Preserve include sand live oak, live oak and laurel oak. Epiphytes including ballmoss and Spanish moss are often present. Scattered clumps of saw palmetto may be common in the shrub layer, especially at those sites that are a product of extended fire exclusion. Other shrubs include blackberry, persimmon, netted pawpaw, tarflower and coastalplain staggerbush. Herbaceous species are usually sparse, but may include silkgrass, wiregrass, dogfennel, bracken fern, sweet goldenrod and Adam's needle. Vines are also sparse but may include catbrier and muscadine.

Improved Pasture (226 acres)

Improved pasture is not a naturally occurring plant community. Rather, they are a result of a land use conversion to create enhanced areas for grazing by livestock by removing most of the natural vegetation and replacing it with nonnative pasture grasses. The improved pasture areas in the Preserve are distinguished by the presence of a dense growth of bahiagrass. Weedy species such as dog fennel, broomsedge bluestem, Nuttall's thistle, Bermudagrass, fireweed, and blackberry may also be present, but bahiagrass is dominant. The few shrubs that might be present include persimmon and wax myrtle.

Semi-Improved Pasture (210 acres)

The species composition of semi-improved pasture is characterized by the presence of patchy bahiagrass mixed with scattered occurrences of the native vegetation that was characteristic of the original natural community. Live oaks, sand live, laurel oaks, water oaks, and occasional slash pine or longleaf pine may be present in the form of an open canopy layer. Shrubs saw palmetto, wax myrtle, netted pawpaw, persimmon, and gallberry may be present in patches. Grasses and herbs that may be present include blue maidencane, bushy bluestem, broomsedge bluestem, wiregrass, Nuttall's thistle, dogfennel, bracken fern, blackroot, and Adam's needle.

Ruderal (126 acres)

The ruderal classification refers to areas within the Preserve where the native vegetation has been disturbed to such an extent that it no longer resembles the pre-existing natural community. The Preserve's ruderal areas are comprised mostly of old improved bahiagrass pastures that were not maintained and allowed to become overgrown with weedy native forbs, shrubs, and tree species. These areas historically supported wet, mesic or scrubby flatwoods and are now covered primarily with a mixture of bahiagrass, big carpetgrass, slender amaranth, common ragweed, bushy bluestem, purple bluestem, broomsedge bluestem, chalky bluestem, silverling, Mexican tea, purple thistle, Nuttall's thistle, persimmon, dogfennel, wax myrtle, blue crowngrass, purple sesban, and smutgrass.

Pine Plantation (114 acres)

There are several stands of planted slash pine and longleaf pine in the Preserve that were planted at high densities in order to generate harvestable trees. Most of the plantation areas support at least some of the native groundcover and understory species that were originally present in the wet and mesic flatwoods that occurred on these sites historically. Species in the sub-canopy include

loblolly bay, swamp tupelo, swamp bay, and water oak. Shrubs include netted pawpaw, persimmon, dahoon holly, gallberry, fetterbush, wax myrtle, swamp bay, sand live oak, and laurel oak. Herbs include blue maidencane, bushy bluestem, broomsedge bluestem, dogfennel, bahiagrass, and blackberry. Typical vines include earleaf greenbrier, and muscadine.

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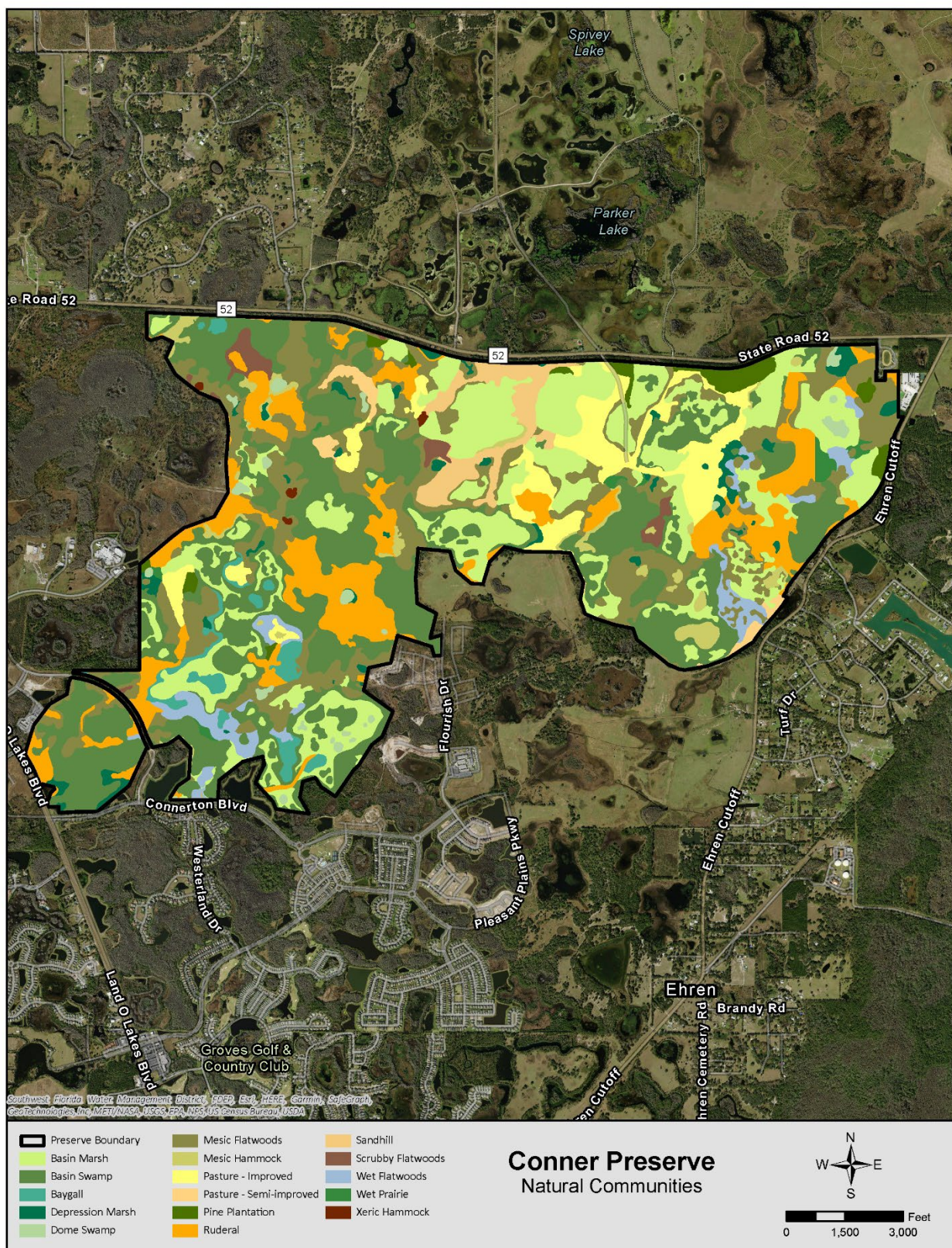


FIGURE 6. NATURAL COMMUNITIES – FNAI

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 Web Soil Survey](#)). The soils were consolidated into three categories based on prevailing soil moisture levels: xeric, mesic, and hydric.

Xeric soils are well-drained to excessively well-drained fine sands, confined to the highest elevations on the Preserve, and coincide with the presence of the Preserve's sandhill, scrubby flatwoods, and xeric hammock natural communities. These soils also coincide with much of the Preserve's improved pasture, semi-improved pasture, and ruderal areas since the historic conversions to those land cover types targeted well-drained sections of the property. The soils comprising the xeric category at the Preserve include Astatula, Tarvares and Narcoosee fine sands.

The hydric soils are wetter and very poorly drained to poorly drained fine sands and mucky textured soil units, occurring at the lowest elevations or in depressional areas. These soils correspond with the property's extensive system of basin marsh and basin swamp and are characterized by frequent inundation. Samsula muck and soils of the Okeelanta-Terra Ceia association account for much of the Preserve's hydric soils areas.

Mesic soils are intermediate in soil moisture (depth to seasonal saturation depth) and support the Preserve's mesic flatwoods, wet flatwoods, and mesic hammocks. Smyrna fine sand is representative of the mesic soils present at the Preserve.

Topography

The Preserve is located within the Northern Gulf Coastal Lowland physiographic region. Elevations range from a high point of 108 feet above sea level near the State Road 52 entrance to a low of about 72 feet above sea level (**Figure 8**). The lowest elevations coincide with the Preserve's basin marsh and basin swamp wetlands.

The physiography and elevational contours of the Preserve create a fairly complex hydrologic setting. The southeastern section of the Preserve is within the Cypress Creek watershed, which eventually discharges into the Hillsborough River. The central section of the property is within the Gowers Corner Slough subbasin, which drains towards the northwest and eventually discharges into the Pithlachascotee River. The remaining third of the property, in the southwest corner, comprises the headwaters of Five-Mile Creek, which drains to the southwest and also eventually discharges into the Pithlachascotee River.

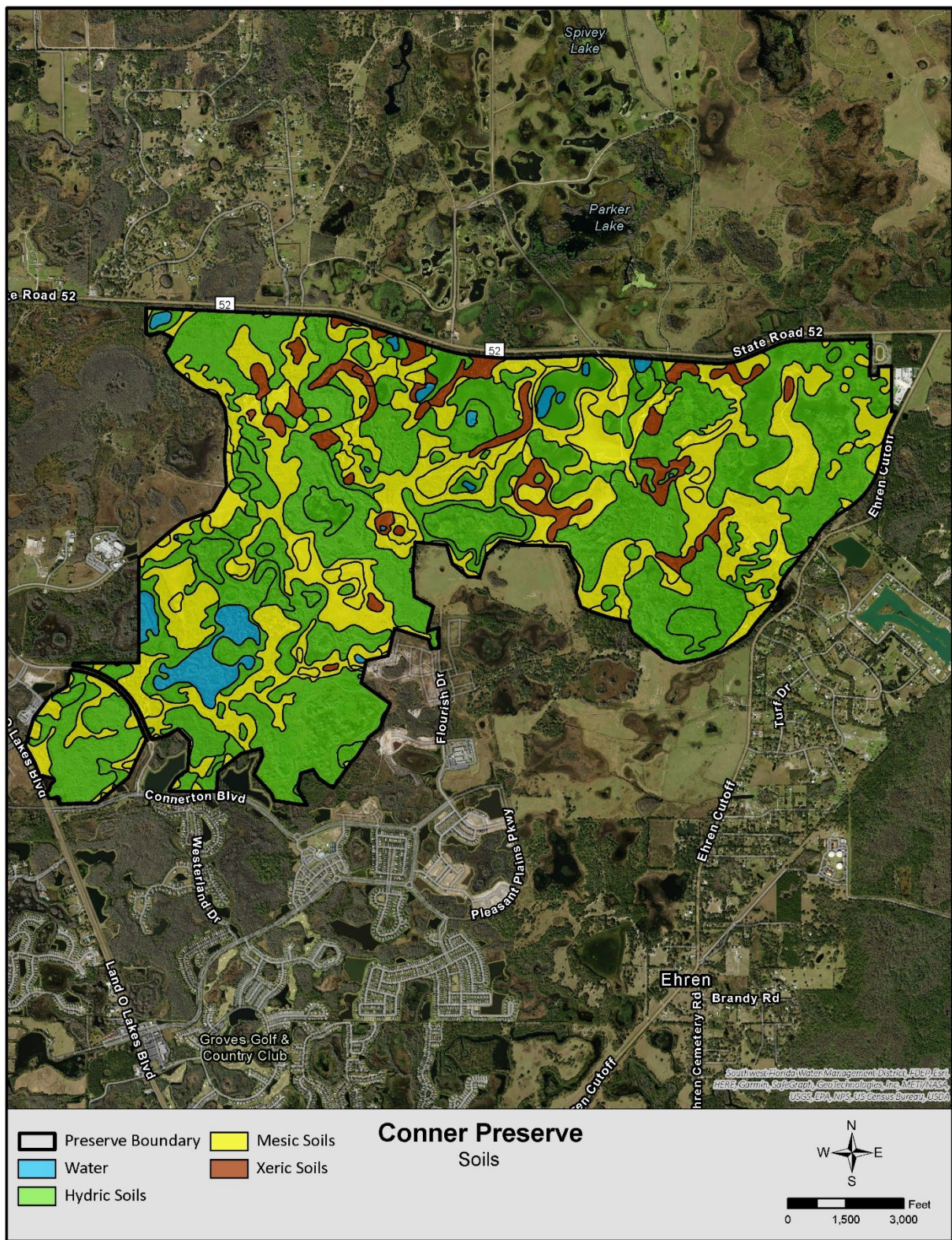


FIGURE 7. SOIL TYPES

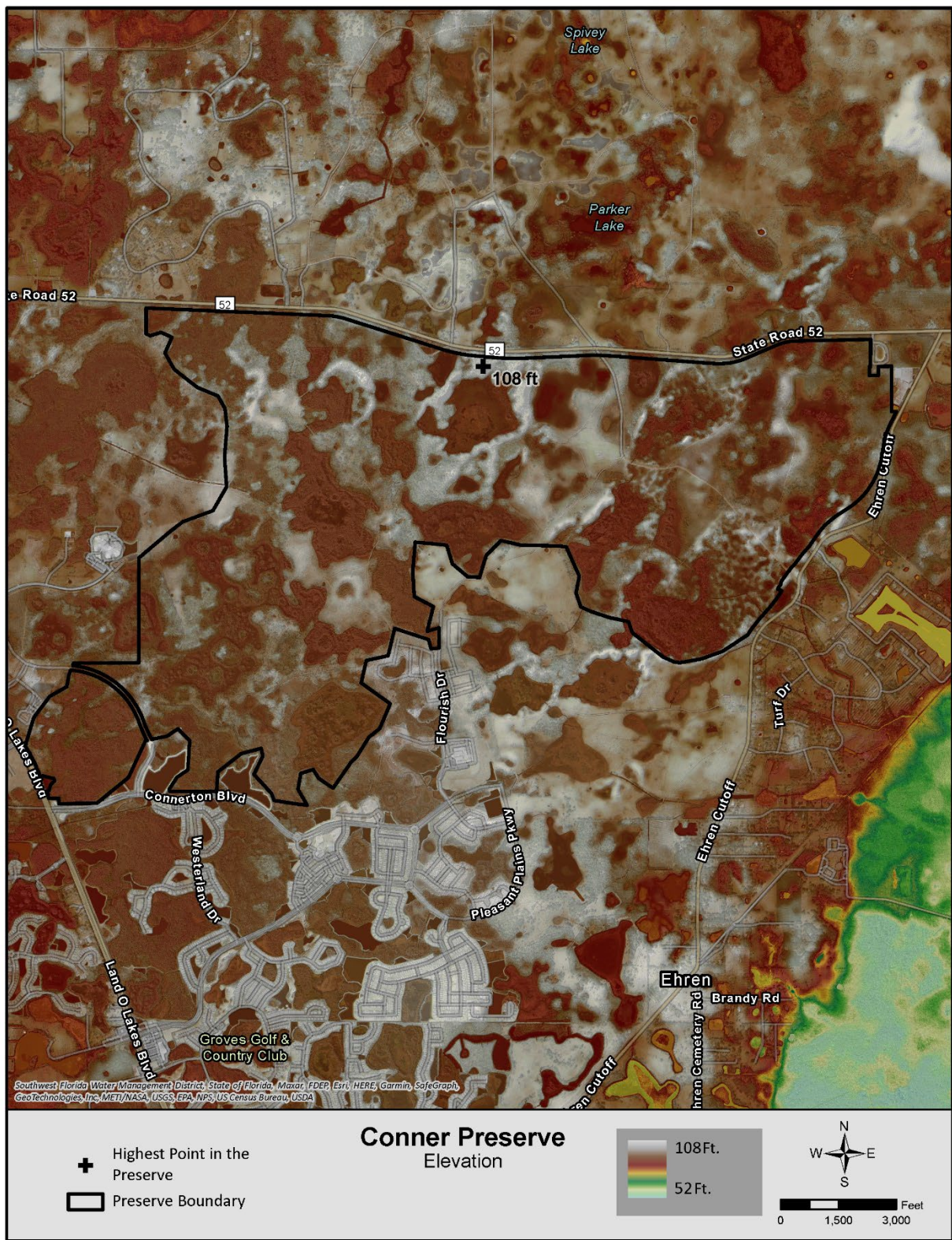


FIGURE 8. DIGITAL ELEVATION MODEL

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. 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.

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. Approximately 1,478 acres of the property, or 50 percent of the total Preserve land area, supports fire-maintained plant communities. The large extent of land area that must be managed with prescribed fire, the unpredictability of seasonal variations in weather patterns require that the District also employ dormant season burns. These dormant season burns are necessary in order to maintain proper fire return intervals across the entirety of District conservation land.

The Preserve's basin swamp, and the altered land types also benefit from occasional incursions of fire and can help meet management objectives. Occasional fire can promote the regeneration of native vegetation within the altered habitats and prevent accumulations of hazardous fuel loads.

Fires burning into the periphery of basin swamps can also be beneficial, provided conditions are sufficiently wet to prevent the ignition of organic soils.

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 28 distinct management units covering approximately 3,428 acres of fire-dependent or fire-tolerant natural communities or land cover types (only areas of mesic hammock are excluded from potential burn areas). These management units are delineated in **Figure 9**. The District's land managers take precautions to limit potentially negative impacts from prescribed burns and target specific weather conditions as part of each fire's prescription parameters. This is especially important given the Preserve's extensive length of boundary at the wildland-urban interface. 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.

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 represent 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.

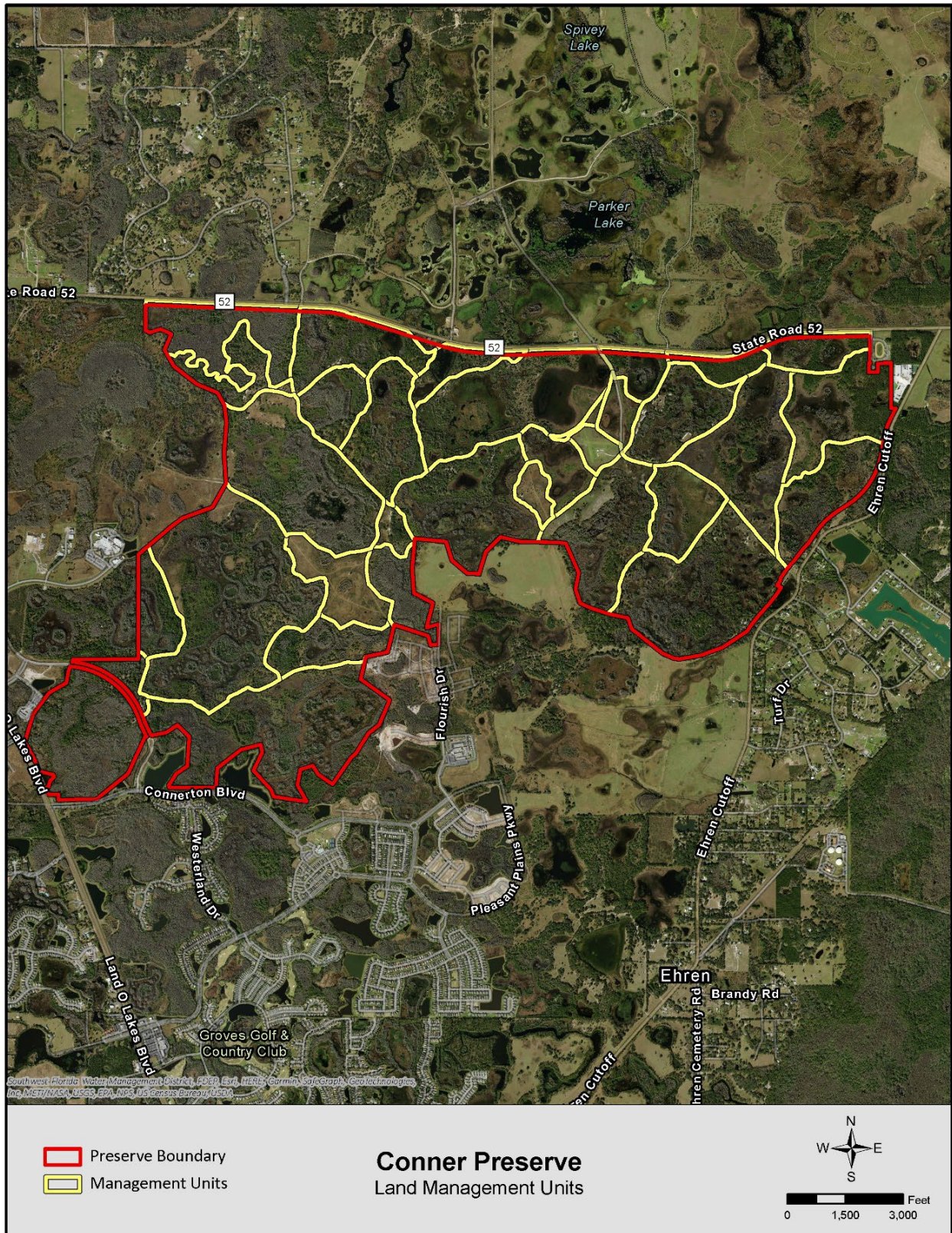


FIGURE 9. MANAGEMENT UNITS

Forest Management

The Preserve does not have any Timber Management Zones. However, there are several stands of slash pine plantation, totaling approximately 114 acres and concentrated in the northeast corner of the Preserve that were established by the previous landowner. Portions of these stands exist within County owned right-of-way and are not part of the Preserve. Aside from these plantations, there have been efforts to complement the native groundcover restoration sites with the establishment of forest-sourced longleaf pine. This phase of the restoration project occurs over an extended period of time will require monitoring to determine if any silvicultural actions are necessary. The long-term goal is to manage the forest resources within the Preserve using standard silvicultural practices to maintain forest health and enhance habitat values whenever it is applicable.

Habitat Restoration

A comprehensive strategy for habitat restoration was developed and implemented following the District's acquisition of the Preserve. Although a substantial proportion of the Preserve's upland land area had been converted to improved pasture, the wetlands had been subject to only minimal alteration and most of the adjoining uplands had been left intact. The primary elements of restoration consisted of enhancing the Preserve's wetlands through the eradication of invasive plant species, enhancing degraded upland areas through the reintroduction of fire and control of invasives, and restoring native groundcover and canopy species to much of the area that had been converted to improved pasture.

The most intensive component of the habitat restoration consisted of eradicating bahiagrass through a combination of mechanical and herbicide treatments. The treated areas were then seeded with site-appropriate mixtures of native plant seed selected to restore pine flatwoods and sandhill species. Approximately 300 acres were subjected to such treatment. The pine canopy that has regenerated across much of the restored land area is now sufficiently mature that prescribed fire can be re-introduced to promote continued regeneration of the pre-existing native plant communities. It is anticipated the District's fire management program will be sufficient to support the progressive enhancement of the formerly degraded and altered upland portions of the Preserve.

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 and 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 82 species designated as Category I and 85 species designated as Category II. Many species on the FISC list also appear on the Florida Department of Agriculture and Consumer Service's 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 four (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.

Three species have been identified to be the highest priority for invasive plant control operations on the Preserve: cogongrass, Tropical soda apple, and Chinese tallow-tree. 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. EDRR species at the Preserve include coral ardisia, Old World climbing fern, and

Guineagrass. **Table 3** lists the invasive plant species known to be present on the Preserve, their priority level for control if applicable and their FISC status.

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 CONNER PRESERVE

Common Name	Scientific Name	FISC Status	Priority Level for Control
Cogongrass	<i>Imperata cylindrica</i>	Category I	4
Japanese climbing fern	<i>Lygodium japonicum</i>	Category I	6
Old World climbing fern	<i>Lygodium microphyllum</i>	Category I	EDRR
Skunk-vine	<i>Paederia foetida</i>	Category I	7
Camphor-tree	<i>Cinnamomum camphora</i>	Category I	7
Brazilian pepper	<i>Schinus terebinthifolius</i>	Category I	N/A
Tropical soda apple	<i>Solanum viarum</i>	Category I	4
Chinese tallow-tree	<i>Triadica sebifera</i>	Category I	4
Coral ardisia	<i>Ardisia crenata</i>	Category I	EDRR
Caesarweed	<i>Urena lobata</i>	Category I	N/A
Guineagrass	<i>Urochloa maxima</i>	Category I	EDRR

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 Florida Fish and Wildlife Conservation Commission (FWC), the United States Fish and Wildlife Service (USFWS), or the Florida Department of Agriculture and Consumer Services (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 accumulated 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*	Management Comments
American Alligator	<i>Alligator mississippiensis</i>	FT/SA	Protect from illegal take; manage wetlands
Florida Sandhill Crane	<i>Antigone canadensis pratensis</i>	FT	Maintain marshes by burning in rotation.

Florida Burrowing Owl	<i>Athene cunicularia floridana</i>	ST	Burn in rotation to maintain openings.
Eastern Indigo Snake	<i>Drymarchon couperi</i>	FT; ST	Burn xeric habitats in rotation.
Little Blue Heron	<i>Egretta caerulea</i>	ST	Maintain natural hydroperiods.
Gopher Tortoise	<i>Gopherus polyphemus</i>	ST	Maintain open canopy and burn in rotation.
Southeastern American kestrel	<i>Falco sparverius paulus</i>	ST	Burn in rotation and preserve snags.
Wood Stork	<i>Mycteria americana</i>	FT	Maintain hydrology.

* 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 a variety of the Preserve's habitat types including mesic pine flatwoods, scrubby flatwoods, and xeric hammock (USFWS, 2018). 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 tortoise. Managing the Preserve's xeric habitats with prescribed fire and maintaining the 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 for the available habitat to support 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 10 species that are known or likely to occur on the Preserve's variety of habitat types and presence within the documented range of the species. It is important to note that no thorough plant surveys have been conducted on the property, and most of these species are relatively inconspicuous and easily overlooked. Management guidelines for all 10 species call for either burning within recommended fire return intervals, maintaining natural hydrology, 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.

TABLE 5: IMPERILED PLANT SPECIES KNOWN OR LIKELY TO OCCUR

Common Name	Scientific Name	Listing Status*	Management Comments
Sand Butterfly Pea	<i>Centrosema arenicola</i>	SE	Scrubby flatwoods; burn in rotation
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.
Florida Spiny-pod	<i>Matelea floridana</i>	SE	Scrubby flatwoods & mesic hammock; burn in rotation.
Pygmy Pipes	<i>Monotropsis reynoldsiae</i>	SE	Mesic & xeric hammock; avoid soil disturbance.
Britton's beargrass	<i>Nolina brittoniana</i>	FE; SE	Scrubby flatwoods; burn in rotation.
Blue butterwort	<i>Pinguicula caerulea</i>	ST	Wet flatwoods, burn in rotation
Giant Orchid	<i>Pteroglossapsis ecristata</i>	ST	Scrubby and mesic pine flatwoods; burn in rotation.
Little ladies' tresses	<i>Spiranthes tuberosa</i>	ST	Sandhill, mesic flatwoods; burn in rotation

* FE = Federally Endangered 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 property 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 that an Arthropod Control Plan be developed for the property to ensure any ongoing or future mosquito control practices implemented on the Preserve will not pose a hazard to fish, wildlife, and other natural resources protected on the property.

Recreation

District Policy directs the provision 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.

The mix of recreational uses accommodated at the Preserve include hiking, horseback riding, bicycling, bird watching, and nature study conducted within a network of marked and designated trails (**Figure 10**). A license agreement executed with the Bay City Flyers also allows the flying of radio-controlled airplanes under narrowly defined parameters. A more detailed discussion of the conditions of the license agreement is provided in the Land Use Administration section of this plan.

Access for recreational users is located on State Road 52 approximately 3.5 miles east of US Highway 41, where a parking area and walk-thru entrance are available to the public. Equestrian users may be provided with access through the locked entrance gate, via a day use authorization, in order to accommodate the trailers required to safely transport horses to the Preserve.

Trails

A trail network totaling 17 miles in length is maintained on the Preserve. Approximately 15 miles of shared-use trail is available for use by hikers and bicyclists. A two mile trail segment is reserved for hiking only, and a series of loop trails totaling six miles in length in the eastern third of the Preserve is reserved for equestrian use (**Figure 10**). All trail users are required to restrict their use to the trails posted as open for their use. Horseback riders must be prepared to show proof of a current negative Coggins test, and riders under the age of 16 are required to wear helmets.

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 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 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.

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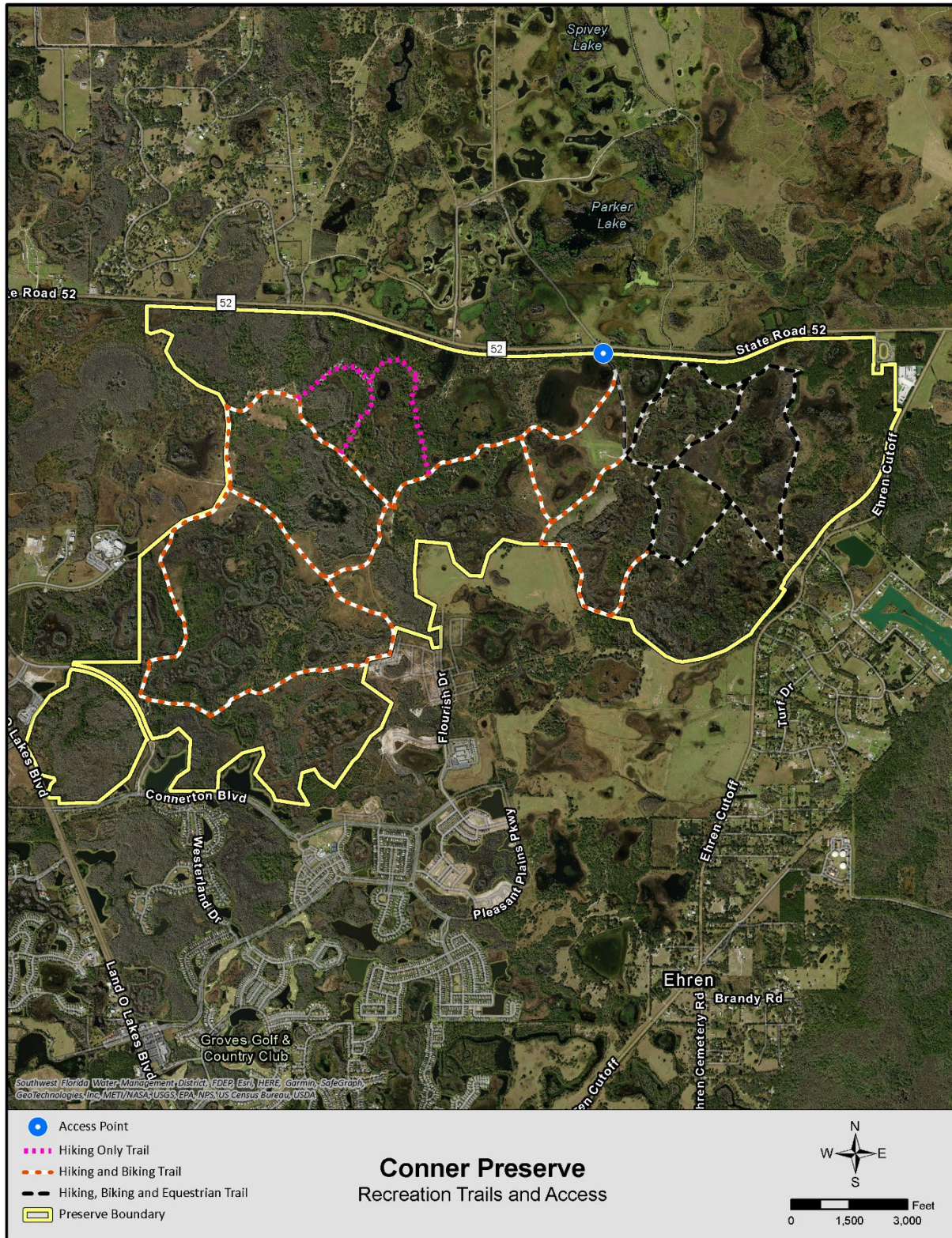


FIGURE 10. RECREATION AND ACCESS

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 considered potentially include, but are not limited to, linear facilities, scientific research opportunities, water resource development projects, sustainable forestry, and environmental education.

Partnerships and Cooperative Management

There are not currently any partnerships or cooperative management agreements in place for the Preserve.

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 diverse 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. The District entered into a license agreement with the Bay City Flyers, Inc., to allow their use of a designated 25-acre parcel of former improved pasture to develop and maintain a facility for operating radio-controlled model airplanes.

The license agreement was executed in 2006 and continues to be in force following a series of five-year extensions. The license agreement includes a list of conditions, including: a prohibition on the use of solid fuel rockets and propane or natural gas-fueled turbojet aircraft; a limitation on

the number of aircraft that can be flown simultaneously; a requirement that aircraft must use mufflers or other noise attenuating devices; and that users must be licensed members of the Academy of Model Aeronautics.

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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 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 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 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 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.

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 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 maintain, and where applicable, 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: Continue to conduct maintenance and monitoring on completed groundcover restorations while implementing long-term goals for each site.
- 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 Invasive Plant Management Plan.
- Objective 3: Implement the feral hog control plan and manage the feral hog population on the Preserve.

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.
- Objective 4: Work with Pasco County and Florida Department of Transportation to address fencing and fireline needs as a result of SR 52 widening.

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, if applicable.
- 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 and update as necessary, any agreements, easements, or leases.
- Objective 2: Review special requests and issue special use authorizations for uses that are consistent with the District Administrative Rules and 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.

Goal: Develop planned recreational access from SR 52 recreation trail and the Connerton Community.

- Objective 1: Coordinate with Pasco County and adjacent landowner to develop appropriate access points and integrate with existing multi-use trail system.

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 4,581 acres.
- Completed FDACS funded Prescribed Fire Enhancement Program project entailing vegetation management (mastication) and treatment with prescribed fire on 135 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 95 feral hogs through the application of District phase 3 feral hog management program.
- Over 1,370 acres surveyed for invasive exotic plants and any invasives found within the surveyed area were treated.
- Completed annual old world climbing fern overflights to help detect new infestations so EDRR could be applied.

Water Resources

- Performed regular measurements on data collection network to monitor hydrologic conditions.

Recreation

- 122 volunteer hours were logged to help with trail maintenance, trash cleanup, amenities maintenance, and invasive plant removal.
- 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 multi-use trail system.

Administration

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

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Appendix A

PLANT SPECIES KNOWN TO OCCUR

Scientific Name	Common Name
<i>Acer rubrum</i>	red maple
<i>Amaranthus viridis</i>	slender amaranth
<i>Ambrosia artemisiifolia</i>	common ragweed
<i>Amphicarpum muhlenbergianum</i>	blue maidencane
<i>Andropogon glomeratus</i>	bushy bluestem
<i>Andropogon glomeratus</i> var. <i>glaucopsis</i>	purple bluestem
<i>Andropogon</i> sp.	broomsedges
<i>Andropogon virginicus</i>	broomsedge bluestem
<i>Andropogon virginicus</i> var. <i>glaucus</i>	chalky bluestem
<i>Aristida stricta</i> var. <i>beyrichiana</i>	wiregrass
<i>Asclepias lanceolata</i>	fewflower milkweed
<i>Asimina angustifolia</i>	slimleaf pawpaw
<i>Asimina reticulata</i>	netted pawpaw
<i>Asimina</i> sp.	pawpaw
<i>Axonopus furcatus</i>	big carpetgrass
<i>Baccharis glomeruliflora</i>	silverling
<i>Baccharis halimifolia</i>	groundsel tree
<i>Bacopa caroliniana</i>	lemon bacopa
<i>Bejaria racemosa</i>	tarflower
<i>Bignonia capreolata</i>	crossvine
<i>Blechnum serrulatum</i>	toothed midsorus fern
<i>Buchnera americana</i>	American blueheart
<i>Callicarpa americana</i>	American beautyberry
<i>Carex longii</i>	Long's sedge
<i>Carex</i> sp.	sedges
<i>Carya glabra</i>	pignut hickory
<i>Centella asiatica</i>	spadeleaf
<i>Cephalanthus occidentalis</i>	common buttonbush
<i>Chenopodium ambrosioides</i>	Mexican tea
<i>Cinnamomum camphora</i>	camphor tree
<i>Cirsium horridulum</i>	purple thistle
<i>Cirsium nuttallii</i>	Nuttall's thistle
<i>Cladium jamaicense</i>	sawgrass
<i>Cladium mariscoides</i>	swamp sawgrass
<i>Clethra alnifolia</i>	coastal sweetpepperbush
<i>Cnidoscolus stimulosus</i>	tread softly
<i>Conradina</i> sp.	false rosemary

<i>Coreopsis leavenworthii</i>	Leavenworth's tickseed
<i>Croton michauxii</i>	Michaux's croton
<i>Croton sp.</i>	croton
<i>Cuphea carthagenensis</i>	Colombian waxweed
<i>Cynodon dactylon</i>	Bermudagrass
<i>Cyperus esculentus</i>	yellow nutgrass
<i>Cyperus sp.</i>	nutgrass
<i>Desmodium incanum</i>	zarzabacoa comun
<i>Dichanthelium aciculare</i>	needleleaf witchgrass
<i>Dichanthelium acuminatum</i>	tapered witchgrass
<i>Dichanthelium sp.</i>	panic grass
<i>Diospyros virginiana</i>	common persimmon
<i>Drosera capillaris</i>	pink sundew
<i>Eleocharis interstincta</i>	knotted spikerush
<i>Eleocharis sp.</i>	spikerush
<i>Elephantopus carolinianus</i>	Carolina elephantsfoot
<i>Elephantopus elatus</i>	tall elephantsfoot
<i>Erechtites hieraciifolius</i>	fireweed
<i>Eriocaulon compressum</i>	flattened pipewort
<i>Eriocaulon decangulare</i>	tenangle pipewort
<i>Eryngium yuccifolium</i>	button rattlesnakemaster
<i>Eupatorium capillifolium</i>	dogfennel
<i>Eupatorium compositifolium</i>	yankeeweed
<i>Eupatorium leucolepis</i>	justiceweed
<i>Eupatorium mohrii</i>	Mohr's thoroughwort
<i>Euthamia caroliniana</i>	slender flattop goldenrod
<i>Galactia elliotii</i>	Elliott's milkpea
<i>Galactia regularis</i>	eastern milkpea
<i>Gaylussacia dumosa</i>	dwarf huckleberry
<i>Gaylussacia frondosa var. tomentosa</i>	blue huckleberry
<i>Gelsemium sempervirens</i>	yellow jessamine
<i>Gordonia lasianthus</i>	loblolly bay
<i>Gratiola hispida</i>	rough hedgehyssop
<i>Helianthemum corymbosum</i>	pinebarren frostweed
<i>Houstonia procumbens</i>	roundleaf bluet
<i>Hydrocotyle sp.</i>	pennywort
<i>Hydrocotyle umbellata</i>	manyflower marshpennywort
<i>Hypericum cistifolium</i>	roundpod St.John's wort
<i>Hypericum fasciculatum</i>	peelbark St.John's wort
<i>Hypericum mutilum</i>	dwarf St.John's wort

<i>Hypericum myrtifolium</i>	myrtleleaf St.John's wort
<i>Hypericum sp.</i>	St.John's wort
<i>Hypericum tetrapetalum</i>	fourpetal St.John's wort
<i>Hypoxis juncea</i>	fringed yellow stargrass
<i>Hyptis sp.</i>	
<i>Ilex ambigua</i>	sand holly
<i>Ilex cassine</i>	dahoon holly
<i>Ilex coriacea</i>	large gallberry
<i>Ilex glabra</i>	gallberry
<i>Itea virginica</i>	Virginia willow
<i>Juncus effusus subsp. solutus</i>	soft rush
<i>Juncus marginatus</i>	grassleaf rush
<i>Juncus megacephalus</i>	bighead rush
<i>Juncus repens</i>	lesser creeping rush
<i>Juncus sp.</i>	rush
<i>Lachnanthes carolina</i>	Carolina redroot
<i>Lachnocaulon anceps</i>	whitehead bogbutton
<i>Lechea torreyi</i>	lechea
<i>Leersia hexandra</i>	southern cutgrass
<i>Lemna sp.</i>	duckweed
<i>Lepidium sp.</i>	pepperweed
<i>Lepidium virginicum</i>	Virginia pepperweed
<i>Liatris gracilis</i>	slender gayfeather
<i>Licania michauxii</i>	gopher apple
<i>Linaria canadensis</i>	toadflax
<i>Ludwigia maritima</i>	seaside primrosewillow
<i>Ludwigia repens</i>	creeping primrosewillow
<i>Lupinus sp.</i>	lupine
<i>Lycopodiella alopecuroides</i>	foxtail club-moss
<i>Lycopus rubellus</i>	taperleaf waterhorehound
<i>Lyonia ferruginea</i>	rusty staggerbush
<i>Lyonia fruticosa</i>	coastalplain staggerbush
<i>Lyonia lucida</i>	fetterbush
<i>Magnolia grandiflora</i>	southern magnolia
<i>Magnolia virginiana</i>	sweetbay
<i>Medicago lupulina</i>	black medick
<i>Melothria pendula</i>	creeping cucumber
<i>Mikania scandens</i>	climbing hempvine
<i>Mimosa pudica</i>	sensitive plant
<i>Mimosa quadrivalvis</i>	sensitive briar

<i>Muhlenbergia capillaris</i>	hairawn muhly
<i>Myrica cerifera</i>	wax myrtle
<i>Myrica cerifera</i> var. <i>pumila</i>	dwarf wax myrtle
<i>Myriophyllum heterophyllum</i>	twoleaf watermilfoil
<i>Nuphar advena</i>	yellow pondlily
<i>Nuphar</i> sp.	pondlily
<i>Nymphaea odorata</i>	American white waterlily
<i>Nymphaea</i> sp.	waterlily
<i>Nymphoides aquatica</i>	big floatingheart
<i>Nyssa sylvatica</i> var. <i>biflora</i>	swamp tupelo
<i>Opuntia humifusa</i>	pricklypear
<i>Opuntia</i> sp.	prickly pear
<i>Osmunda cinnamomea</i>	cinnamon fern
<i>Oxypolis filiformis</i>	water cowbane
<i>Panicum hemitomon</i>	maidencane
<i>Panicum repens</i>	torpedograss
<i>Panicum rigidulum</i>	redtop panicum
<i>Panicum</i> sp.	panic grass
<i>Parthenocissus quinquefolia</i>	Virginia creeper
<i>Paspalum caespitosum</i>	blue crowngrass
<i>Paspalum notatum</i>	bahiagrass
<i>Paspalum setaceum</i>	thin paspalum
<i>Persea borbonia</i>	red bay
<i>Photinia pyrifolia</i>	red chokeberry
<i>Phyla nodiflora</i>	turkey tangle frogfruit
<i>Phytolacca americana</i>	American pokeweed
<i>Pinguicula caerulea</i>	Blue butterwort
<i>Pinus elliotii</i>	slash pine
<i>Pinus elliotii</i> var. <i>densa</i>	South Florida slash pine
<i>Pinus palustris</i>	longleaf pine
<i>Pityopsis graminifolia</i>	narrowleaf silkgrass
<i>Pluchea rosea</i>	rosy camphorweed
<i>Polygala cymosa</i>	tall pinebarren milkwort
<i>Polygala setacea</i>	coastalplain milkwort
<i>Polygonum hydropiperoides</i>	swamp smartweed
<i>Polygonum punctatum</i>	dotted smartweed
<i>Polygonum</i> sp.	
<i>Polypremum procumbens</i>	rustweed
<i>Pontederia cordata</i>	pickerelweed
<i>Proserpinaca pectinata</i>	combleaf mermaidweed
<i>Prunus caroliniana</i>	Carolina laurelcherry

<i>Prunus serotina</i>	black cherry
<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>	running oak
<i>Quercus geminata</i>	sand live oak
<i>Quercus hemisphaerica</i>	laurel oak
<i>Quercus incana</i>	bluejack oak
<i>Quercus laevis</i>	turkey 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 virginiana</i>	live oak
<i>Rhexia mariana</i>	pale meadowbeauty
<i>Rumex hastatulus</i>	hastateleaf dock
<i>Rhus copallinum</i>	winged sumac
<i>Rhynchospora chapmanii</i>	Chapman's beaksedge
<i>Rhynchospora colorata</i>	starrush whitetop
<i>Rhynchospora decurrens</i>	swampforest beaksedge
<i>Rhynchospora fascicularis</i>	fascicled beaksedge
<i>Rhynchospora inundata</i>	Narrowfruit horned beaksedge
<i>Rhynchospora latifolia</i>	giant whitetop
<i>Rhynchospora microcarpa</i>	southern beaksedge
<i>Rhynchospora miliacea</i>	millet beaksedge
<i>Rhynchospora odorata</i>	fragrant beaksedge
<i>Rhynchospora sp.</i>	beaksedge
<i>Rhynchospora tracyi</i>	Tracy's beaksedge
<i>Rhynchospora wrightiana</i>	Wright's beaksedge
<i>Rubus cuneifolius</i>	sand blackberry
<i>Rubus sp.</i>	blackberry
<i>Sabal palmetto</i>	cabbage palm
<i>Sabatia grandiflora</i>	largeflower rosegentian
<i>Sabatia sp.</i>	rosegentian
<i>Saccharum giganteum</i>	sugarcane plumegrass
<i>Sagittaria lancifolia</i>	bulltongue arrowhead
<i>Sagittaria latifolia</i>	common arrowhead
<i>Sagittaria sp.</i>	arrowhead
<i>Salix caroliniana</i>	coastalplain willow

<i>Salvia sp.</i>	
<i>Sambucus nigra subsp. canadensis</i>	elderberry
<i>Saururus cernuus</i>	lizard's tail
<i>Schizachyrium scoparium</i>	little bluestem
<i>Scleria reticularis</i>	netted nutrush
<i>Scleria sp.</i>	nutrush
<i>Scleria triglomerata</i>	whip nutrush
<i>Scleria verticillata</i>	low nutrush
<i>Scutellaria integrifolia</i>	helmet skullcap
<i>Serenoa repens</i>	saw palmetto
<i>Sericocarpus tortifolius</i>	whiteweed aster
<i>Sesbania herbacea</i>	danglepod
<i>Sesbania punicea</i>	purple sesban
<i>Setaria magna</i>	giant bristlegrass
<i>Sideroxylon tenax</i>	tough bully
<i>Smilax auriculata</i>	earleaf greenbrier
<i>Smilax bona-nox</i>	saw greenbrier
<i>Smilax glauca</i>	cat greenbrier
<i>Smilax laurifolia</i>	laurel greenbrier
<i>Smilax walteri</i>	coral greenbrier
<i>Solidago fistulosa</i>	pinebarren goldenrod
<i>Solidago odora</i>	sweet goldenrod
<i>Sorghastrum secundum</i>	lopsided indiangrass
<i>Sorghastrum sp.</i>	
<i>Spartina bakeri</i>	sand cordgrass
<i>Spiranthes tuberosa</i>	little ladies' tresses
<i>Sporobolus floridanus</i>	Florida dropseed
<i>Sporobolus indicus</i>	smutgrass
<i>Sporobolus junceus</i>	pinewoods dropseed
<i>Stillingia aquatica</i>	water toothleaf
<i>Stillingia sylvatica</i>	queensdelight
<i>Stylisma patens</i>	coastalplain dawnflower
<i>Syngonanthus flavidulus</i>	yellow hatpins
<i>Taxodium ascendens</i>	pond cypress
<i>Taxodium distichum</i>	bald cypress
<i>Tephrosia hispidula</i>	sprawling hoarypea
<i>Tillandsia bartramii</i>	Bartram's airplant
<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>Typha latifolia</i>	broadleaf cattail
<i>Typha sp.</i>	cattail
<i>Vaccinium corymbosum</i>	highbush blueberry
<i>Vaccinium darrowii</i>	Darrow's blueberry
<i>Vaccinium elliotii</i>	Elliot's blueberry
<i>Vaccinium myrsinites</i>	shiny blueberry
<i>Vitis rotundifolia</i>	muscadine
<i>Woodwardia areolata</i>	netted chain fern
<i>Woodwardia virginica</i>	Virginia chain fern
<i>Xyris caroliniana</i>	Carolina yelloweyed grass
<i>Xyris elliotii</i>	Elliott's yelloweyed grass
<i>Xyris sp.</i>	yellow-eyed grass
<i>Yucca filamentosa</i>	Adam's needle