



FLORIDA DEPARTMENT OF Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

October 18, 2022

Mr. Keith Rowell
Florida Forest Service
Department of Agriculture and Consumer Services
3125 Conner Boulevard, Room 236
Tallahassee, Florida 32399-1650

RE: Tiger Bay State Forest – Lease No. 3902/4086/4326

Dear Mr. Rowell:

On **October 14, 2022**, the Acquisition and Restoration Council (ARC) recommended approval of the **Tiger Bay State Forest** management plan. Therefore, Division of State Lands, Office of Environmental Services (OES), acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **Tiger Bay State Forest** management plan. The next management plan update is due October 14, 2032.

Pursuant to s. 253.034(5)(a), F.S., each management plan is required to describe both short-term and long-term management goals and include measurable objectives to achieve those goals. Short-term goals shall be achievable within a 2-year planning period, and long-term goals shall be achievable within a 10-year planning period. Upon completion of short-term goals, please submit a signed letter identifying categories, goals, and results with attached methodology to the Division of State Lands, Office of Environmental Services.

Pursuant to s. 259.032(8)(g), F.S., by July 1 of each year, each governmental agency and each private entity designated to manage lands shall report to the Secretary of Environmental Protection, via the Division of State Lands, on the progress of funding, staffing, and resource management of every project for which the agency or entity is responsible.

Pursuant to s. 259.036(2), F.S., management areas that exceed 1,000 acres in size, shall be scheduled for a land management review at least every 5 years.

Pursuant to s. 259.032, F.S., and Chapter 18-2.021, F.A.C., management plans for areas less than 160 acres may be handled in accordance with the negative response process. This process requires small management plans and management plan amendments be submitted to the Division of State Lands for review, and the Acquisition and Restoration

Mr. Keith Rowell
Page 2
October 18, 2022

Council (ARC) for public notification. The Division of State Lands will approve these plans or plan amendments submitted for review through delegated authority unless three or more ARC members request the division place the item on a future council meeting agenda for review. To create better efficiency, improve customer service, and assist members of the ARC, the Division of State Lands will notice negative response items on Thursdays except for weeks that have State or Federal holidays that fall on Thursday or Friday. The Division of State Lands will contact you on the appropriate Friday to inform you if the item is approved via delegated authority or if it will be placed on a future ARC agenda by request of the ARC members.

Conditional approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

Deborah Burr

Digitally signed by
Deborah Burr
Date: 2022.10.18
14:00:47 -04'00'

Deborah Burr
Office of Environmental Services
Division of State Lands

TEN-YEAR LAND MANAGEMENT PLAN
FOR THE
TIGER BAY STATE FOREST
VOLUSIA COUNTY



PREPARED BY THE
FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
FLORIDA FOREST SERVICE

APPROVED ON
October 14, 2022

TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

TIGER BAY STATE FOREST



Approved by:

A handwritten signature in black ink, appearing to read "Erin Albury", written over a horizontal line.

Erin Albury, Director
Florida Forest Service

A handwritten date "10/18/22" in black ink, written over a horizontal line.

Date

A handwritten signature in blue ink, appearing to read "James Roberts", written over a horizontal line.

James Roberts, Chief
Forest Management Bureau

A handwritten date "10-18-22" in blue ink, written over a horizontal line.

Date

**TEN-YEAR LAND MANAGEMENT PLAN
TIGER BAY STATE FOREST
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**TEN-YEAR LAND MANAGEMENT PLAN
TIGER BAY STATE FOREST
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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service
 COMMON NAME: Tiger Bay State Forest (TBSF)
 LOCATION: Volusia County
 ACREAGE TOTAL: 27,389 acres

Historic Natural Communities	Approximate Acreage
Basin swamp	11,270
Mesic flatwoods	9,540
Wet flatwoods	2,206
Dome swamp	1,130
Baygall	972
Wet prairie	879

Historic Natural Communities	Approximate Acreage
Scrubby flatwoods	661
Scrub	342
Swamp lake	123
Basin marsh	96
Sandhill	58
Depression marsh	33

TIITF LEASE AGREEMENT NUMBERS: 3902, 4086 and 4326

USE: Single ☐ Multiple ☒

MANAGEMENT AGENCY

Florida DACS, Florida Forest Service
 Florida Fish and Wildlife Conservation Commission
 St. Johns River Water Management District
 Volusia County
 Department of State, Division of Historical Resources

RESPONSIBILITY

General Forest Resource Management
 Wildlife Resources and Laws
 Water Resource Protection and Restoration
 Overall Management Review
 Historical and Archaeological Resource Management

DESIGNATED LAND USE: Multiple-Use State Forest
 SUBLEASES: None
 ENCUMBRANCES: Existing water wells and related easements, Gopher Tortoise Mitigation Site (121.45 acres), and Clark Bay Road (4.5 acres)
 TYPE OF ACQUISITION: Environmentally Endangered Lands (EEL), Save Our Rivers (SOR), Conservation and Recreation Lands Acquisition Program (CARL), Preservation 2000, and Florida Forever
 UNIQUE FEATURES: Tiger Bay, the largest physiographic feature within the forest, was formed from an ancient marine terrace located between two historic dunes, the DeLand Ridge and the Daytona Ridge.
 ARCHAEOLOGICAL / HISTORICAL: Thirteen (13) known sites
 MANAGEMENT NEEDS: Reforestation and thinning, fuel/fire management, hydrological restoration, road repair and maintenance, maintenance and expansion of recreational trails and facilities, game and non-game wildlife management, gopher tortoise management, and update and maintain forest inventory
 ACQUISITION NEEDS: 15,305.26 Acres of Optimal Management Boundary
 SURPLUS ACREAGE: None
 PUBLIC INVOLVEMENT: TBSF Liaison Committee, Volusia County Council, Management Plan Advisory Group and Public Hearing, Acquisition and Restoration Council -----

DO NOT WRITE BELOW THIS LINE (FOR DIVISION OF STATE LANDS USE ONLY)

ARC Approval Date: _____ TIITF Approval Date: _____

Comments: _____

I. Introduction

The Tiger Bay State Forest (TBSF) was named after its largest physiographic feature, Tiger Bay; an extensive wetland that provides critical aquifer recharge for the local area. Pine islands dot the extensive hydric swamp forest and comprise 40 percent of the property. Besides Tiger Bay, there are other wetlands including Bennett Swamp, Little Tiger Bay, and the Middle Haw Creek floodplain. These wetlands are critical to surface water storage and aquifer recharge in the area. Water originating from deep within the forest swamps eventually forms the headwaters of the Little Tomoka River which transitions into one of the most popular recreational fishing rivers in Central Florida, the Tomoka River.

The forest is located in central Volusia County, about seven (7) miles west of Daytona Beach on 27,389 acres. It is comprised of 15 natural communities including mesic flatwoods, wet flatwoods, and a variety of hydric forest types. TBSF is situated among several publicly owned lands that together create a wildlife corridor for species listed as endangered, threatened, or of special concern. The Volusia Conservation Corridor provides wildlife habitat for Florida black bear, white-tailed deer, fox, turkey, and many other species of wildlife. Bald eagles can also be seen within the forest.

The forest is important to aquifer recharge and surface water storage. Unique features include the globally imperiled scrub community of Rima Ridge and Outstanding Florida Waters (OFW) that encompass Tiger Bay, Scoggins Pond, Coon Pond, the west side of Indian Lake, and the portion of the Little Tomoka River floodplain on the northeast corner of TBSF.

The main recreational activities enjoyed at TBSF include fishing, picnicking, horseback riding, hiking, bicycling, camping, and hunting.

A. General Mission and Management Plan Direction

The primary mission of the Florida Forest Service (FFS) is to “protect Florida and its people from the dangers of wildland fire and manage the forest resources through a stewardship ethic to assure they are available for future generations.”

Management strategies for TBSF center on the multiple-use concept, as defined in sections 589.04(3) and 253.034(2)(a) F.S. Implementation of this concept will utilize and conserve state forest resources in a harmonious and coordinated combination that will best serve the people of the state of Florida, and that is consistent with the purpose for which the forest was acquired. Multiple-use management for TBSF will be accomplished with the following strategies:

- Practice sustainable forest management for the efficient generation of revenue and in support of state forest management objectives;
- Provide for resource-based outdoor recreation opportunities for multiple interests;
- Restore and manage healthy forests and native ecosystems ensuring the long-term viability of populations and species listed as endangered, threatened, or rare, and other components of biological diversity, including game and non-game wildlife, and plants;
- Protect known archaeological, historical, and cultural resources;
- Restore, maintain, and protect hydrological functions, related water resources, and the health of associated wetlands and aquatic communities; and

- Provide research and educational opportunities related to natural resource management.

This management plan is provided according to requirements of Sections 253.034, 259.032, and 373, Florida Statutes (F.S.), and was prepared utilizing guidelines outlined in Section 18-2.021 of the Florida Administrative Code (F.A.C.). It is not an annual work plan or detailed operational plan but provides general guidance for the management of TBSF for the next ten-year period and outlines the major concepts that will guide management activities on the forest.

B. Past Accomplishments

Data regarding past management activities and public use on TBSF have been compiled monthly and are available from the forest manager. A table has been prepared for this plan that summarizes the accomplishments made over the past ten years. See Exhibit A. The table does not attempt to account for all activities on the forest, but summarizes major activities. It does not list the multitude of daily activities and public interactions involved in managing the forest. Since the approval of the previous management plan in 2010, there have been numerous events, developments, and accomplishments. Among the most notable have been the following:

- Conducted prescribed fire on 13,268 acres
- Treated 116 acres of non-native invasive plants
- Roller-chopped 240 acres to reduce fuel loading in preparation for prescribed fire
- Harvested timber on 1,782 acres
- Welcomed more than 719,000 visitors to the forest
- Completed 29 programs and tours on the forest
- Planted 166 acres of slash pine

C. Goals / Objectives for the Next Ten-Year Period

The following goals and objectives provide direction and focus of management resources for the next ten-year planning period. Funding, agency program priorities, and the potential for wildfire during the planning period will determine the degree to which these objectives can be met. Management activities on TBSF during this management period must serve to conserve, protect, utilize, and enhance the natural and historical resources and manage resource-based public outdoor recreation, which is compatible with the conservation and protection of this forest. Most of the management operations will be conducted by the FFS, although appropriate activities will be contracted to private sector vendors or completed with the cooperation of other agencies. All activities will enhance the property's natural resource or public recreational value.

The management activities listed below will be addressed within the ten-year management period and are defined as short-term goals, long-term goals, or ongoing goals. Short-term goals are goals that are achievable within a two-year planning period, and long-term goals are achievable within a ten-year planning period. Objectives are listed in priority order for each goal. Other activities will be completed with minimal overhead expense and existing staff.

➤ GOAL 1: Sustainable Forest Management

Objective 1: Continue to update and implement the Five-Year Silviculture Action Plan

including reforestation, timber harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (Ongoing objective)

Performance Measures:

- Annual updates of the Five-Year Silviculture Action Plan completed
- Continued implementation of the Five-Year Silviculture Action Plan (acres treated)

Objective 2: Continue to implement the FFS process for developing stand descriptions and conducting forest inventory, including maintaining a GIS database containing forest stands, roads, and other attributes (including, but not limited to: rare, threatened, and endangered species, archaeological and historical resources, and non-native, invasive species locations). (Ongoing objective)

Performance Measures:

- Update GIS database and re-inventory all attributes as required by FFS procedures
- Number of acres inventoried

➤ **GOAL 2: Public Access and Recreational Opportunities**

Objective 1: Maintain public access and recreation activities that are compatible with multiple-use management. (Ongoing objective)

Performance Measure: Number of visitor opportunities per day

Objective 2: Continue to safely integrate human use into TBSF, following the Five-Year Outdoor Recreation Plan, and update annually. (Ongoing objective)

Performance Measures:

- Continued implementation of the Five-Year Outdoor Recreation Plan
- Annual updates of the Five-Year Outdoor Recreation Plan completed

Objective 3: Continue to involve and meet with the Liaison Committee. The purpose of Liaison Committee meetings is to facilitate communication between the FFS and committee members (and the groups they represent) about state forest management and to obtain feedback from these entities. The Liaison Committee consists of local residents, community leaders, special interest group representatives (vendors, hunters and other recreational users, etc.), environmental group representatives, and other public / private entities. (Ongoing objective)

Performance Measures:

- Liaison Committee remains organized
- Annual meetings continue

Objective 4: Maintain cooperation with Florida Fish and Wildlife Conservation Commission (FWC) to develop specific hunting season quotas and bag limits, and to address hunting issues which are to be agreed upon at an annual cooperator meeting between FFS and FWC. (Ongoing objective)

Performance Measures:

- Annual letter on agreed-upon hunting issues
- Updated rules posted and WMA brochures available online at MyFWC.com

Objective 5: Evaluate the potential for additional public access and recreational areas on

TBSF that are compatible with multiple-use management. Recreational opportunities will fall under the scope of multi-use management in accordance with watershed protection, conservation, and ecosystem restoration; and as detailed in the purpose for acquisition. (Short-term objective)

Performance Measure: List of viable access points and visitor opportunities for consideration

Objective 6: Recruit volunteers and volunteer organizations to assist with recreation and / or resource management. (Ongoing objective)

Performance Measures:

- Number of volunteers and organizations that assist with projects
- Number of hours provided by volunteers

➤ **GOAL 3: Habitat Restoration, Improvement, and Fire Management**

Objective 1: The TBSF currently contains approximately 14,945 acres of fire-dependent communities. TBSF staff will plan and conduct prescribed burns in a manner that benefits these fire-dependent natural communities within the forest. To achieve an average fire-return interval of two (2) to four (4) years for most fire-dependent communities, FFS will attempt to conduct prescribed burns on an average of approximately 3,700 to 7,500 acres per year. Currently, FFS staff estimates 4,800 acres at TBSF are within the desired fire-return interval. (Ongoing objective)

Performance Measures:

- Annual number of acres burned
- Number of acres burned within target fire-return interval

Objective 2: Continue to annually update and implement the Five-Year Prescribed Burning Management Plan and the prescribed burning goals. (Ongoing objective)

Performance Measures:

- Annual updates of the Five-Year Prescribed Burning Management Plan completed
- Continued implementation of the Five-Year Prescribed Burning Management Plan (acres treated)

Objective 3: Reduce the threat of wildfire within the wildland urban interface on TBSF and the surrounding community through a comprehensive mitigation strategy that includes evaluating vegetative fuels near residential areas and identifying potential fuel reduction projects. (Ongoing objective)

Performance Measures:

- Evaluations complete
- Should the evaluations determine that fuel reduction is necessary, number of acres treated for fuel reduction

Objective 4: Utilize prescribed fire to enhance restoration of native groundcover. Evaluate areas where native groundcover has been eliminated or heavily impacted from historical land use on a case by case basis for alternative methods to address reestablishment of native groundcover. Restore native groundcover where practical or heavily impacted from historical land use. (Long-term objective)

Performance Measure: Number of acres restored

➤ **GOAL 4: Listed and Rare Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration**

Objective 1: In cooperation with FWC, develop a Wildlife Management Strategy addressing wildlife species for TBSF, with emphasis on imperiled species and associated management prescriptions for their habitats. (Ongoing objective)

Performance Measures:

- Imperiled species management strategy completed
- Baseline listed and rare species list completed for TBSF

Objective 2: In consultation with FWC, implement survey and monitoring protocols, where feasible, for listed and rare species. (Ongoing objective)

Performance Measure: Number of species for which monitoring is ongoing

➤ **GOAL 5: Non-native Invasive Species Management and Control**

Objective 1: Continue to follow and annually update the Five-Year Ecological Plan for TBSF, to locate, identify, and control non-native invasive species. (Ongoing objective)

Performance Measures:

- Total number of acres identified and successfully treated
- Annual updates of the Five-Year Ecological Plan completed
- Continue to maintain TBSF non-native invasive database information annually

➤ **GOAL 6: Cultural and Historical Resource Management**

Objective 1: Ensure all known cultural and historical sites are recorded in the Department of State, Division of Historical Resources (DHR) Florida Master Site File. (Ongoing objective)

Performance Measure: Documentation of known sites

Objective 2: Monitor recorded sites and send updates to the DHR Florida Master Site File as needed. (Ongoing objective)

Performance Measure: Number of sites monitored. Reports submitted to DHR

Objective 3: Maintain at least one (1) qualified staff member as an Archaeological Resource Management (ARM) Monitor. (Ongoing objective)

Performance Measure: Number of local staff trained as ARM monitors

➤ **GOAL 7: Hydrological Preservation and Restoration**

Objective 1: Protect water resources during management activities through the implementation of all applicable Silviculture Best Management Practices (BMPs). (Ongoing objective)

Performance Measure: Percent compliance with Silviculture BMPs

Objective 2: Conduct or obtain a site assessment/study to identify potential hydrological restoration needs. (Short-term objective)

Performance Measure: Assessment conducted

Objective 3: Close, rehabilitate, or restore roads, firelines, and trails that are causing hydrologic alterations or negatively impacting water quality. (Ongoing objective)

Performance Measure: Total number of roads, firelines, and trails closed, rehabilitated, and / or restored

➤ **GOAL 8: Capital Facilities and Infrastructure**

Objective 1: TBSF staff, along with help from volunteers and / or user groups, will continue maintenance of visitor center, picnic pavilion, primitive camping sites, eight (8) parking areas and trailheads, 14 miles of trails, and 21 miles of primary and service roads. (Ongoing objective)

Performance Measure:

- The number of existing facilities, miles of roads, and miles of trails maintained

Objective 2: Continue to follow the Five-Year Roads and Bridges Management Plan and update annually. (Ongoing objective)

Performance Measures:

- Continued implementation of the Five-Year Roads and Bridges Management Plan
- Annual updates of the Five-Year Roads and Bridges Management Plan completed

Objective 3: Continue to implement the Five-Year Boundary Survey and Maintenance Management Plan and update annually. Approximately 20 percent of the forest boundary will be evaluated and remarked annually as necessary, which includes harrowing, reposting signage, and repainting boundary trees. (Ongoing objective)

Performance Measures:

- Continued implementation of the Five-Year Boundary Survey and Maintenance Management Plan
- Percentage of forest boundary maintained each year
- Annual updates of the Five-Year Boundary Survey and Maintenance Management Plan completed

II. Administration Section

A. Descriptive Information

1. Common Name of Property

The common name of the property is Tiger Bay State Forest.

2. Legal Description and Acreage

The TBSF is comprised of three (3) tracts: The Tiger Bay Tract, the Rima Ridge Tract, and the Clark Bay Tract totaling 27,365 acres. The legal description is found in lease agreements #4086, #3902 and #4326. The property is located in all or part of Sections 28, 29, 31, 32, and 33 of Township 14S, Range 31E; Sections 2, 3, 4, 9, 10, 11, 13, 14, 15, 16, 23, 24, 25, 26, 27, 28, 29, 32, 33, 34, 35, and 36 of Township 15S, Range 31E; Sections 30, 31, and 32 of Township 15S, Range 32E; Section 5 of Township 16S, Range 32E; and Sections 2, 3, 4, 5, 8, 9, 10, 11, 12, 13, 14, 15, 22, 23, 24, 26, and 27 of Township 16S, Range 31E, Volusia County, Florida. See Exhibit E. Acreage acquired by funding source is identified in Table 1.

Table 1. TBSF Acreage by Funding Source

Funding Source	Acres*
Environmentally Endangered Lands	6,975.60
Preservation 2000	16,450.83
Florida Forever	3,898.51

* Remaining acreage acquired through other sources

A complete legal description of lands owned by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) and the St. Johns River Water Management District (SJRWMD) is on record at the TBSF Forestry Station Office, Florida Department of Environmental Protection (DEP), and the FFS State Office in Tallahassee.

3. Proximity to Other Public Resources

Lands managed by state, federal, or local governments for conservation of natural or cultural resources that are located within approximately 12 miles of the TBSF are included in Exhibit F and Table 2.

Table 2. Nearby Public Conservation Land and Easements

Tract	Agency	Distance
Samuels Conservation Easement	Volusia County	Adjacent E
University Highlands Parcels	Volusia County	Adjacent E
Longleaf Pine Preserve	Volusia County	Adjacent SE
Port Orange City Forest	City of Port Orange	Adjacent SE
Plum Creek Conservation Easement	SJRWMD	Adjacent W
Clark Bay Conservation Area	SJRWMD	Adjacent W
Heart Island Conservation Area	SJRWMD	4 miles NW
Spruce Creek Preserve	Volusia County	5 miles SE
Tomoka State Park	DRP	6 miles NE
West Ormond Wetlands Park	City of Ormond Beach	7 miles E
Doris Leeper Spruce Creek Preserve	Volusia County	7 miles SE
Hagstrom Conservation Easement	SJRWMD	7 miles NW
DeLeon Springs State Park	DRP	7 miles W
Lake Woodruff National Wildlife Refuge	USFWS	7 miles W
Lake George State Forest	FFS	8 miles W
Bulow Creek State Park	DRP	8 miles NE
Relay Tract Conservation Easement	SJRWMD	9 miles NW
Blue Springs State Park	DRP	11 miles SW
Hontoon Island State Park	DRP	11 miles SW
Lower Wekiwa River Preserve State Park	DRP	12 miles SW

DRP – Florida Department of Environmental Protection, Division of Recreation and Parks

FFS – Florida Forest Service

SJRWMD – St. Johns River Water Management District

USFWS – US Fish and Wildlife Service

4. Property Acquisition and Land Use Considerations

The initial acquisition of TBSF was completed in 1979 under the Environmentally Endangered Lands Program (EEL). Additional parcels were acquired using Preservation 2000 and Florida Forever funds between 1994 and 2004. The largest addition was in 2001 when more than 11,000 acres were acquired with both Preservation 2000 and Save Our River funds as a joint acquisition project with the SJRWMD. This area is now known as the Rima Ridge Tract. The most recent addition was the Weiner-Krumholz parcel acquired in 2008. All TIITF parcel acquisitions are identified in Table 3.

Table 3. Parcel Acquisition

Parcel Name	Lease Date	TIITF Lease No.	Acres
EEL	7/24/1992	3902	6,975.60
Georgia Pacific	7/21/1995	4086	4,320.97
Tucker	1/9/1996	4086	10.76
W. Woody	12/24/1997	4086	955.86
Tomoka*	7/26/2001	4326	11,155.97
H. Paul	2/26/2002	4086	7.27
Strickland	7/22/2004	4086	15.50
Volusia Conservation Corridor	7/22/2004	4086	3,883.01
Weiner-Krumholz	6/4/2008	3902	65.00

* Joint lease held by TIITF and SJRWMD

B. Management Authority, Purpose, and Constraints

1. Purpose for Acquisition / Management Prospectus

Acquisition of TBSF began in 1979 with funding from the Environmentally Endangered Lands (EEL) program. The goals and objectives defined by these acquisitions include:

- Conservation and protection of environmentally unique and irreplaceable lands that contains native, relatively unaltered flora and fauna representing a natural area unique to, or scarce within, a region of this state or a larger geographical area;
- Conservation and protection of native species habitat and listed species;
- Conservation, protection, management and restoration of important ecosystems, landscapes, and forests, if the protection and conservation of such lands is necessary to enhance or protect significant surface water, ground water, coastal, recreational, and timber resources, or to protect fish or wildlife resources which cannot otherwise be accomplished through local and state regulatory programs;
- Providing areas for nature-based recreation;
- Preserving archaeological or historical sites; and
- Providing research and educational opportunities related to natural resource management.

2. Degree of Title Interest Held by the Board

The TIITF holds fee simple title to the Tiger Bay and Clark Bay Tracts under lease agreements 4086 and 3902 to provide authority to FFS. Copies of this agreement and related deeds are on file at the FFS State Office, the Department of Environmental Protection, office in Tallahassee and at the DeLeon Forestry Station.

The SJRWMD and TIITF hold joint fee title to the Rima Ridge Tract. Intergovernmental Management Agreement 4326 provides management authority to the Rima Ridge Tract to FFS.

3. Designated Single or Multiple-Use Management

TBSF is managed under a multiple-use concept by the FFS, under the authority of Chapters 253 and 589, F.S. The FFS is the lead managing agency as stated in TIITF Management Lease numbers 3902, 4086, and 4326.

Multiple-use management is the harmonious and coordinated management of timber, recreation, conservation of fish and wildlife, forage, archaeological and historic sites, habitat and other biological resources, and water resources so they are utilized in the combination that will best serve the people of the state, making the most judicious use of the land for some or all these resources and considering the relative values of the various resources. Local demands, acquisition objectives, and other factors influence the array of uses that are compatible with and allowed on any specific area of the forest. This management approach is believed to provide for the greatest public benefit, by allowing compatible uses while protecting overall forest health, native ecosystems, and the functions and values associated with them.

4. Revenue Producing Activities

Numerous activities on TBSF provide for multiple-use as well as generate revenue to offset management costs. Revenue producing activities will be considered when they have been determined to be financially feasible and will not adversely impact management of the forest. Current and potential revenue producing activities for the TBSF include, but are not limited to:

- Timber Harvests – Timber harvests on TBSF will be conducted to improve forest health, promote wildlife habitat, restore plant communities, and provide additional benefits.
- Recreation Fees – Fees are currently collected for some day-use areas, all campgrounds, annual passes, and vendor / special use permits.
- Apiary Leases – There are currently no apiary leases on TBSF. The feasibility of pursuing and establishing apiary leases on TBSF in areas where appropriate will be evaluated in accordance with guidelines stated in the State Forest Handbook.
- Miscellaneous Forest Product Sales – Other miscellaneous forest product sales, including but not limited to, palm fronds and berries, pine cones, pine straw and firewood, may be considered.

5. Conformation to State Lands Management Plan

Management of the forest under the multiple-use concept complies with the State Lands Management Plan and provides optimum balanced public utilization of the property. Specific authority for the FFS's management of public land is derived from Chapters 253, 259, and 589 F.S.

6. Legislative or Executive Constraints

There are no known legislative or executive constraints specifically directed toward TBSF.

FFS makes every effort to comply with applicable statutes, rules, and ordinances when managing the forest. For example, when public facilities are developed on state forests, every effort is made to comply with Public Law 101-336, the Americans with Disabilities Act. As new facilities are developed, the universal access requirements of this law are followed in all cases except where the law allows reasonable exceptions (e.g., where handicap access is structurally impractical or where providing such access would change the fundamental character of the facility being provided).

7. Aquatic Preserve / Area of Critical State Concern

This area is not within an aquatic preserve or an area of critical state concern, nor is it in an area under study for such designation.

C. Capital Facilities and Infrastructure

1. Property Boundaries Establishment and Preservation

TBSF boundaries, 68 miles in total, are managed by state forest personnel in accordance with the guidelines of the State Forest Handbook. There are 29 gates throughout TBSF that require periodic maintenance. State forest boundaries are maintained by periodic clearing, repainting and reposting, and placement of state forest boundary signs by FFS personnel.

2. Improvements

Major FFS facilities on TBSF include the Forestry Station office/visitor center and equipment maintenance/storage shops. Major recreation facilities include the Indian Lake Recreation Area and multiple picnic pavilions. See Exhibit D for a map of the buildings and improvements at TBSF.

Buildings / Recreation infrastructure present on the TBSF include:

- Office/visitor center, 1,655 sq. ft.
- Public restroom, 61 sq. ft.
- Shop building, 1,800 sq. ft.
- Three (3) pole barns for equipment storage, 1080 sq. ft., 2880 sq. ft., and 1980 sq. ft.
- One (1) Conex Box for storage, 224 sq. ft.
- One (1) utility shed for herbicide storage, 159 sq. ft.
- Indian Lake Pier
- Pavilion at Tram Road Equestrian Day Use Area, 480 sq. ft.
- Pavilion at Indian Lake Day Use Area, 288 sq. ft.
- Pavilion at Tiger Bay Office, 400 sq. ft.
- Vault Toilet at Bennett Field Campground, 48 sq. ft.
- One (1) 252 sq. ft. mobile home parking concrete pad

In the ten-year period contemplated by this plan, FFS will locate and construct a borrow pit on TBSF, to provide needed fill material for the maintenance and repair of the TBSF

road system. The proposed borrow pit will be located at the intersection of Danny Hole Road and Service Road 603 on the Rima Ridge Tract in the TBSF. For over 20 years, the proposed location remained as a cutover flatwoods site. In 2008, the site was cleared and used to stockpile road base material for road improvement projects on the Rima Ridge tract. In 2018, FWC established a wildlife food plot on part of this site. The remainder of the site is being used to stockpile road base material and as a heavy equipment training site for new forest rangers.

The construction of this borrow pit will be accomplished by FFS crews and will be done on an as-needed basis. When the borrow pit is completed it will be approximately two and a half acres in size with a depth of eight to ten feet. The pit will be constructed in a manner (sloped edges, irregular shape, etc.) that will facilitate rehabilitation as a fishing pond for public use. FFS staff will obtain all necessary permits required for construction of the borrow pit. See Exhibit X.

3. On-Site Housing

There are no residences on TBSF. There is one 252 sq. ft. concrete pad with water, electric, and sewer hook-ups available for personnel if they provide their own residence and enter into a lease with FFS. The pad is located adjacent to the office building.

FFS may establish on-site housing (mobile / manufactured home) on TBSF if deemed necessary to alleviate security and management issues. The need and feasibility for the state forest will be evaluated and established if considered appropriate by the District Manager and approved by the FFS Director. Prior to the occurrence of any ground disturbing activity for establishing on-site housing, a notification will be sent to the DHR and Florida Natural Areas Inventory (FNAI) for review and recommendations. This type of housing will not exceed three homes per location with the possibility of more than one on-site housing location occurring if considered necessary by the District Manager and approved by the Director.

4. Operations Infrastructure

a. Operations Budget

For Fiscal Year 2020-2021 the total annual budget for TBSF was \$364,834. This amount includes expenses, contractual services, Other Personal Services Employment (OPS), etc. A summary budget for TBSF is contained in Exhibit V. Implementation of any of the activities within this management plan is contingent on availability of funding, other resources, and other statewide priorities.

b. Equipment

To carry out the mission of the FFS, equipment assigned to the TBSF includes: three (3) type II tractor plow/transport units, one (1) type VI engine, six (6) pickup trucks, one (1) ATV, one (1) UTV, three (3) farm tractors, one (1) front-end loader, one (1) motor grader, one (1) lawn mower, and eight (8) attachments for the farm tractors.

c. Staffing

Nine (9) individuals are assigned to TBSF: one (1) Forestry Supervisor II, two (2) Senior

Forest Rangers, three (3) Forest Rangers, one (1) Forester, one (1) Park Ranger, and one (1) OPS Park Ranger. Other personnel from the Bunnell District are occasionally used to assist with management activities at TBSF.

The Forester will work to achieve the goals outlined in this management plan. Recreation planning and management activities as well as resource management and planning activities, such as trail flagging / identification, recreational facility placement, timber cruising, and sale administration, etc., are the responsibility of the Forester under the direction of the Forestry Supervisor II, Resource Administrator, and District Manager. Forest operations, such as road maintenance, operations / recreational facility maintenance, prescribed burning, etc., are the responsibility of the Forest Area Supervisor under the direction of the District Manager.

To supplement the staff assigned to TBSF, the Resource Administrator is responsible for recruiting interested volunteers who can bring needed experience and skills to assist with the management of the forest recreation program, as well as resource management activities.

Additionally, a state forest Liaison Committee comprised of private citizens and representatives of forest user groups meets bi-annually to provide input on forest management activities and share ideas with FFS staff to improve the state forest.

D. Additional Acquisitions and Land Use Considerations

1. Alternate Uses Considered

No alternate uses are being considered at this time. Alternate uses will be considered as requests are made and will be accommodated as appropriate if they are determined to be compatible with existing uses and with the management goals and objectives of the forest. Uses determined as incompatible include but are not limited to: water resource development projects, water supply projects, storm-water management projects, sewage treatment facilities, linear facilities, off highway vehicle use, dumping, mining, and oil well stimulation (e.g. hydraulic fracturing / fracking), or as determined by law, regulation, or other incompatible uses as described elsewhere in the management plan. Deadhead logging is not compatible with nor considered an appropriate use within or adjacent to the state forest boundaries. Although no water resource projects are being considered at this time on SJRWMD-owned lands within TBSF, they should not be precluded.

2. Additional Land Needs

There are 4,773 parcels of land comprised of 15,305.26 acres adjacent to the property which should receive priority for acquisition because they would benefit the management of the property. The FFS will work with these property owners, on a willing seller basis, to acquire these parcels.

Purchasing of additional land within the optimal management boundary would facilitate restoration, protection, maintenance, and management of the natural resources on TBSF. See Exhibit C.

3. Surplus Land Assessment

On conservation lands where FFS is the lead manager, FFS assesses and identifies areas for potential surplus land. This assessment consists of an examination of resource and operational management needs, public access and recreational use, and GIS modeling and analysis.

The evaluation of TBSF by FFS has determined that all portions of the area are being managed and operated for the original purposes of acquisition, as well as, center on the multiple-use concept, as defined in sections 589.04(3) and 253.034(2)(a) F.S. Implementation of this concept will utilize and conserve state forest resources in a harmonious and coordinated combination that will best serve the people of the state of Florida. Therefore, no portion of the TBSF is recommended for potential surplus.

4. Adjacent Conflicting Uses

Nearby developed areas and adjoining highway systems including I-4, US-92, and SR-40 may hinder prescribed burning due to smoke management concerns.

FFS will cooperate with adjacent property owners, prospective owners, or prospective developers to discuss methods to minimize negative impacts on management, resources, facilities, roads, recreation, etc., and discuss ways to minimize encroachment onto the forest.

5. Compliance with Comprehensive Plan

This plan was submitted to the Volusia County Council for review and compliance with their local comprehensive plans. See Exhibit T.

6. Utility Corridors and Easements

FFS does not favor the fragmentation of natural communities with linear facilities. Consequently, easements for such uses will be discouraged to the greatest extent practical. The FFS does not consider TBSF suitable for any new linear facilities.

When such encroachments are unavoidable, previously disturbed sites will be the preferred location. The objectives, when identifying possible locations for new linear facilities, will be to minimize damage to sensitive resources (e.g., listed species and archaeological sites), minimize habitat fragmentation, limit disruption of management activities, including prescribed burns, and limit disruption of resource-based multiple use activities such as recreation.

Collocation of new linear facilities with existing corridors will be considered but will be used only where expansion of existing corridors does not increase the level of habitat fragmentation and disruption of management and multiple-use activities. FFS will further encourage the use of underground cable where scenic considerations are desirable as well as encourage the development and use of wildlife crossings for unavoidable roadway development projects. Easements for such utilities are subject to the review and approval of the TIITF and the SJRWMD. Requests for linear facility uses will be handled according to the Governor and the Cabinet's linear facilities policy.

Current utility easements are held by Florida Power and Light Company (FPL) and BellSouth. These easements are along Bear Island Road and Gopher Ridge Road and provide power and telecommunications services to the Federal Aviation Administration (FAA) tower. An FPL easement on the west side of the office site provides power to the office. An FPL easement also runs along Clark Bay Road to provide power to the residents within the out parcel of Clark Bay Tract. A main 500KW FPL-owned utility corridor runs along the middle of the Tiger Bay Tract, on the portion north of US-92 and diagonally through the southwestern corner of the Tract, south of US-92. FPL and BellSouth have easements along the southern and northern end of Rima Ridge Road that provide power to the wells and telecommunications services to the communication towers located in the area. American Tower Corp. has leased space for a communication tower on the Rima Ridge Tract. An additional communication tower exists on an out-parcel owned by SprintCom, Inc. on the southern end of Clark Bay Road.

The cities of Daytona Beach and Ormond Beach have waterline easements related to the well fields on the Rima Ridge Tract. The City of Ormond Beach has a utility easement for a raw water transmission pipeline from the existing wells along Rima Ridge Road to SR-40 and has received approval for the addition of three new water supply wells along this route. The City of Daytona Beach has received approval for an easement to construct four water mains crossing the state forest from its water treatment plant on LPGA Boulevard. The City of Daytona Beach easement is for seven well sites. The current Consumptive Use Permit (CUP) # 8834-11 was issued by the SJRWMD on February 26, 2019 and expires June 11, 2023. The City of Daytona Beach has completed the installation of a pipeline from the water treatment plant on LPGA Boulevard into the Bennett Swamp on TBSF. This pipeline is part of a rehydration project that will carry treated water from the water treatment plant to the Bennett Swamp where it will be dispersed across the swamp.

E. Agency and Public Involvement

1. Responsibilities of Managing Agencies

FFS is the lead managing agency, responsible for overall forest management and public recreation activities, as stated in TIITF Management Lease numbers 3902, 4086, and 4326. Pursuant to the management lease, the lead managing agency may enter into further agreements or to subleases on any part of the forest.

FFS will cooperate with the DHR regarding appropriate management practices on historical or archaeological sites on the property as stated in Section 267.061, F.S. FFS will consult DHR prior to the initiation of ground disturbing activities as required per DHR guidelines.

FWC assumes law enforcement responsibilities, enforces hunting regulations, cooperatively sets hunting season dates with FFS, and conducts other wildlife management activities with input from FFS.

The SJRWMD has granted management authority of the Rima Ridge Tract to the FFS

through the Intergovernmental Management Agreement 6346. The SJRWMD will be consulted and involved in matters relating to water management and hydrological restoration, as appropriate.

2. Law Enforcement

Primary law enforcement responsibilities will be handled by FWC law enforcement officers. Rules governing the use of TBSF are stated in Chapter 5I-4, F.A.C. FWC will enforce fish and wildlife regulations and aid in enforcing state forest rules. FWC does not currently have an officer dedicated to patrolling and enforcement on TBSF. This task is shared among multiple FWC officers who also patrol and enforce laws on properties and waterways outside of TBSF.

The FDACS Office of Agricultural Law Enforcement (OALE) will assist with open burning and wildfire investigations as needed. The Volusia County Sheriff's Office provides additional assistance as needed.

Special rules under Chapter 5I-4, F.A.C. were promulgated for FDACS-FFS to manage the use of state lands and better control traffic, and to oversee camping and other uses on TBSF.

3. Wildland Fire

The FFS has the primary responsibility for prevention, detection, and suppression of wildfires wherever they may occur. The FFS shall provide leadership and direction in the evaluation, coordination, allocation of resources, and monitoring of wildfire management and protection (F.S. 590.01). The FFS also has the responsibility of authorizing prescribed burns (F.S. 590.02 [1][i]).

4. Public and Local Government Involvement

This plan has been prepared by FFS and will be carried out primarily by the FFS. FFS responds to public involvement through liaison committees, management plan advisory groups, public hearings, and through ongoing direct contact with user groups. Land Management Review Teams, as coordinated by the Division of State Lands, have conducted reviews of management plan implementation in 2014 and 2018. See Exhibit S. The review team's recommendations were addressed in this plan, as appropriate.

The plan was developed with input from the TBSF Management Plan Advisory Group and was reviewed at a public hearing on June 9, 2022. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in Exhibit U. The Acquisition and Restoration Council (ARC) public hearing and meeting serve as an additional forum for public input and review of the plan.

5. Volunteers

Volunteers are important assets to TBSF. Volunteer activities may occur as one-time events or in association with long-term recurring projects and routine maintenance. Additional volunteer recruitment will continue to assist furthering the FFS's mission.

6. Friends of Florida State Forests

Friends of Florida State Forests, Inc. (FFSF) is a Direct Support Organization (DSO) of the Florida Forest Service. FFSF supports management activities and projects on Florida's state forests. FFSF is established by Florida Statute, supports programs within Florida's state forests and is governed by a board of directors representing all areas of the state. Through community support, FFSF assists the FFS to expand opportunities for recreation, environmental education, fire prevention, and forest management within Florida's state forests.

The FFSF program is referenced in Chapter 589.012, F.S. For more information visit: www.floridastateforests.org.

III. Archaeological / Cultural Resources and Protection

A. Past Uses

Under previous ownership by the Consolidated Tomoka Land Company and Hudson Pulp and Paper (Georgia Pacific Corporation (GP) purchased Hudson in 1979), both the EEL parcel and the 1995 GP addition were managed primarily for timber production. Most of the EEL parcel was clear-cut except for portions of the loblolly bay (*Gordonia lasianthus*) swamps. Some areas were bedded and replanted with slash pine. At the time of the state acquisition, the tract consisted of pine plantations and understocked second-growth pine stands. After acquisition, 126 acres of the Tiger Bay Tract was removed from the FFS state forest lease and transferred to the Florida Department of Corrections to develop the Tomoka Correctional Institution.

The 1994 GP addition included pine islands with planted slash pine plantations of various ages, some of which were thinned prior to state purchase. Most of the areas were bedded prior to tree planting. As a result of the 1998 wildfires, most of the pine stands were clear-cut and replanted.

At the time of purchase in 1997, the Woodrow 'Woody' parcel consisted of slash pine stands that had naturally regenerated after being harvested in the 1970s. This parcel suffered extensive damage during the 1998 wildfires and almost all the merchantable pine acres had to be harvested during salvage operations and replanted. Presently, the FFS manages this tract for silviculture, ecological values, and as a Wildlife Management Area (WMA).

Rima Ridge Tract

Most of the tract was owned by Consolidated Tomoka since the 1920s, with some of the property acquired by the company as early as 1912. Historic uses of the tract include cattle grazing, turpentine production, timber management, hunting, and apiary use. A Boy Scout camp was located on the southeastern side of Indian Lake from about 1928 to 1930. The property was designated a WMA from 1950 through 1979. From 1979 until state acquisition, it was leased to Lighter Knots Hunt Club.

Sun Oil Company had an oil and gas lease on a portion of the property from 1941 to 1950. Sunray Oil Company had an oil and gas lease on a portion of the property from 1952 through 1962. The Civil Aeronautics Administration leased a portion of the property in 1950 for a

radio tower.

The City of Daytona Beach and the City of Ormond Beach easements for water supply, well, and pumping station locations within the property originated when the tract was still under ownership by Consolidated-Tomoka Land Company.

The City of Ormond Beach has an easement for four existing water supply wells; two were installed in 1987, and two in 1991. A 24-inch water main was constructed within the roadbed of Rima Ridge Road to convey the water following an ARC easement approval in 2003. An easement for three additional supply wells (0.6 acres) was granted by ARC in 2007. The City's Consumptive Use Permit number 8932 was last renewed January 8, 2008 and extends through January 8, 2028. Presently, the FFS manages this tract for silviculture, ecological values, and as a WMA.

Clark Bay Tract

The Clark Bay Tract is located on the west side of the Tiger Bay Tract and north of US- 92. It was owned by Plum Creek Timberlands, L.P., until it was purchased by SJRWMD in July 2002, and subsequently conveyed to TIITF in June 2004 for FFS management. While under Plum Creek ownership, it was managed for timber production. Presently, this tract is managed primarily for silviculture, ecological values, and as a WMA.

B. Archaeological and Historical Resources

A review of information contained in the Florida Department of State, DHR, Florida Master Site File has determined there are eight (8) recorded archaeological sites, three (3) resource groups, one (1) cemetery, and one (1) bridge found within the designated area for TBSF. Currently, none of the known sites on TBSF are listed in the National Register of Historic Places. See Table 4 and Exhibit H for a cultural resource roster.

Table 4. Historical Sites on TBSF

Site ID	Site Name	Site Type
VO02595	Missing Truck Mound	Archaeological
VO07196	Pershing Highway	Resource Group
VO07197	Buncombe Hill Turpentine Camp	Archaeological
VO07203	The Crosses	Cemetery
VO07204	Fryman's Sawmill	Archaeological
VO07205	Indian Lake	Archaeological
VO07206	Indian Lake Round Mound	Archaeological
VO07207	Bates Mound	Archaeological
VO07208	Rawlins Mound	Archaeological
VO07209	Honey Bear Mound	Archaeological
VO07210	Dukes Islands Canal	Resource Group
VO07211	Tiger Bay Canal	Resource Group
VO09788	Tiger Bay Bridge	Bridge

A one-mile section of the Pershing Highway exists south of US-92 and a one-mile section is also located just north of the TBSF office site. The Pershing Highway was the first highway

to connect DeLand to Daytona Beach. It was part of the Pershing Triangle, which stretched 63 miles from Deland to Daytona Beach to New Smyrna Beach. This brick road was opened in 1917 and was used until US-92 opened in 1947. DHR reports the overall condition as excellent. The section north of US-92 is utilized by vehicles and logging trucks, while vehicular traffic is restricted on the section south of US-92; remaining gated to protect it. Future historical interpretation and use as a short hiking / bicycling trail are planned for this southern section. The Buncombe Hill/Stillman Turpentine Camp was located on the Rima Ridge Tract. It was owned and operated by Consolidated Tomoka Land Company, prior to state ownership, and included several structures dating back to the 1920s or earlier. This site is now part of the Buncombe Hill Interpretive Trail. DHR reports the condition as fair, and it is overgrown with sand pine and oaks.

Fryman's Sawmill was located near the Gator Head Swamp off of Tram Road. While no structures remain at this site, a barrel well from this sawmill is still present. The DHR reported condition is fair, although the site needs more evaluation and general protection.

Indian Lake Recreation Area has a history which includes use as a cypress lumber camp in the 1920s as well as a Boy Scout camp in the 1920s, a sawmill in the 1930s and 40s, and a homestead in the mid-1900s. This area has also produced prehistoric artifacts. The Boy Scout camp is interpreted through old photographs and the area is protected from undue equipment disturbance both for cultural and ecological reasons, since Indian Lake is designated as an Outstanding Florida Water and much of the adjacent natural community is scrub. DHR rates the condition of the site as "Unknown" due to limited testing and previous disturbances.

Duke's Island Canal, south of US-92, was constructed in the 1940s to drain water away from US-92. Tiger Bay Canal, located north of US-92, was constructed during the same period and probably for the same purpose. The DHR report indicates the condition of both of these as good and indicates the need for more evaluation and protection until sufficient information is available to evaluate them further.

The Rima Ridge Tract contains several mounds and possible burial sites. The sites are in variable condition ranging from good to poor. Degradation was the result of vandalism and silvicultural activities prior to State acquisition.

Most of the archaeological and / or historical sites on TBSF have insufficient information to deem them eligible for the National Register. The Bunnell District Recreation Coordinator is trained as archaeological monitor and serves as contact for historical issues. As the Archeological Resource Management Monitor training is offered, selected state forest staff members will be trained as monitors to facilitate protection of cultural resources. Sensitive Areas maps are provided to personnel to help identify locations where protection is critical. Periodic monitoring by staff and law enforcement is also important to protection efforts. Where cultural sites are part of current or future public use areas and DHR approves, interpretation may be utilized to inform and educate the public. Opportunities have been identified above and in the Recreation Management Plan.

C. Ground Disturbing Activities

Representatives of DHR and FNAI will be consulted prior to the initiation of proposed ground disturbing activity as required per DHR guidelines. FFS will make every effort to protect known archaeological and historical resources, utilizing the internal approval process explained in chapter two of the State Forest Handbook. FFS will follow the “Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands” and will comply with all appropriate provisions of Section 267.061(2)(a,b), F.S. See Exhibit I. Any significant ground disturbing activity proposal will be submitted to DHR’s Compliance and Review office for review prior to undertakings and allow the Division a reasonable opportunity to comment. Ground disturbing activities not specifically covered by this plan will be conducted under the parameters of the Interim Management Guidelines.

D. Survey and Monitoring

Currently, eight (8) local district FFS staff are trained by DHR as Archaeological Resource Management (ARM) monitors. FFS will pursue opportunities for additional personnel to receive ARM Monitor training. FFS will consult with public lands archaeologists at DHR as necessary to determine an appropriate priority and frequency of monitoring at each of the listed sites, and any protection measures that might be required. Unless required on a more frequent basis, all archaeological and historical sites within the state forest will be monitored at least annually. FFS field staff will monitor the listed sites to note condition and any existing or potential threats.

Any known archaeological and historical sites will be identified on maps to aid state forest personnel and if necessary, law enforcement personnel in patrolling and protecting sites. Applicable surveys will be conducted by ARM monitors or contracted archaeologists during the process of planning and implementing multiple-use management activities. FFS personnel will remain alert for any environmentally significant resource discoveries and protective actions will be taken as necessary. In addition, FFS will seek the advice and recommendations of DHR regarding any additional archaeological survey needs. Trained monitors may oversee limited types of ground disturbing activities in which DHR recommends monitoring. FFS will utilize the services of DHR Public Lands archaeologists, when available, to locate and evaluate unknown resources, and to make recommendations in the management of known resources.

IV. Natural Resources and Protection

The primary purpose for FFS management of TBSF is protection of the Tiger Bay Swamp and the surrounding forest uplands through a stewardship ethic to assure these resources will be available for future generations. Management activities will be executed in a manner to minimize soil erosion and maintain and protect / enhance the hydrological resources on TBSF. If problems arise, corrective action will be implemented by FFS staff under the direction of FFS’s Forest Hydrology Section. Efforts will be made to monitor and protect TBSF’s waterbodies and their associated water quality and native plants and animals.

TBSF falls within the jurisdiction of the SJRWMD. FFS will coordinate with SJRWMD and / or DEP, as necessary, on activities pertaining to water resource protection and management. Any activities requiring water management district permits will be handled accordingly. FFS will

work with SJRWMD to ensure that levels and quality of ground and surface water resources are appropriately monitored.

A. Soils and Geologic Resources

1. Resources

Soil information for TBSF was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS). The major soils listed by the NRCS include: Samsula muck, Pomona fine sand, Hontoon muck, Tomoka muck, Pomona-St. Johns complex, St. Johns fine sand, Smyrna wet fine sand, Myakka wet fine sand, and Immokalee sand. Detailed information on all soils present on the forest may be found in Exhibit J.

2. Soil Protection

Management activities will be executed in a manner to that minimizes negative impacts to the soil. As problems arise, corrective action will be implemented by FFS staff under the direction of the FFS Forest Hydrology section in conjunction with recommendations as contained in the most current version of the Florida Silviculture BMP Manual.

Currently there are no major or significant soil erosion problems on TBSF.

B. Water Resources

The water resources on TBSF perform essential roles in the protection of water quality, groundwater recharge, flood control, and aquatic habitat preservation. In the interest of maintaining these valuable resource functions, state forest management personnel will work with the FFS Hydrology Section to incorporate wetlands restoration into the overall resource management program as opportunities arise, particularly where wetlands systems have been impaired or negatively impacted by previous management activities or natural disasters. See Exhibit L for map of the water resources on TBSF.

1. Resources

Water bodies found on the forest include Indian Lake, Scoggin Lake, Sawgrass Lake, Duke's Island Canal, Tiger Bay Canal, and several ponds. Coon Pond is a natural water body, while Rattlesnake Pond, Woody Pond, Bear Pond, and Ranch Pond are man-made ponds that are available to the public for fishing.

2. Water Classification

The Florida Department of Environmental Protection, Standards Development Section reports that there are no waters on or near TBSF as exceptions to Class III in subparagraph 62-302.400(17)(b)64, F.A.C.; therefore, all of the surface waters on or adjacent to the site are classified as Class III waters (Fish Consumption, Recreation, Propagation and Maintenance of a healthy, Well-Balanced Population of Fish and Wildlife), which is the statewide default classification under subsection 62-302.400(15), F.A.C.

According to subsection 62-302.400(15), F.A.C., there are two OFWs on, adjacent to, or near TBSF. These OFWs are the Tomoka River "Special Water" (62-

302.700(9)(i)35, F.A.C.) and the Volusia Water Recharge Area (subsection 62-302.700(9)(f)63, F.A.C). See Exhibit K.

3. Water Protection

An objective for the acquisition and management of this public land was to optimize ecological restoration, protect and manage existing natural resources, and facilitate sustainable public use. Concerns over a continuous, usable source of fresh water requires emphasis on protecting this vital resource. Water resource protection measures, at a minimum, will be accomplished using BMPs as described in the most current version of Silviculture BMP Manual.

A weir located at Thayer Canal was installed in 2003 by Volusia County, under a September 1999 Memorandum of Understanding (FDACS Contract #5125) between SJRWMD, Volusia County, and FFS to promote surface water retention in Bennett Swamp. Volusia County is responsible for operating, maintaining, and adjusting water levels, and SJRWMD is responsible for monitoring the water levels and making recommendations to the County for adjustments. In 2016, the SJRWMD constructed an additional weir located on the west side of Indian Lake Road. This additional weir was identified by the SJRWMD as part of a Wetland Impact Avoidance and Mitigation (WIAM) plan required of the City of Daytona Beach as a result of wetland impacts from previous well withdrawals (Consumptive Use Permit [CUP] #8834, March 2005).

The City of Daytona Beach's seven existing supply wells are 14-inch diameter wells, 300 feet in total depth. Each well is encased in a pumphouse and is located within a grassy buffer area. The original easement permits the future addition of two supply wells; however, there are currently no specific plans or requests to add any. The CUP #8834-11 permits the use of 15.05 million gallons per day (mgd) for all of the City's wells. At the time of approval, a shortened CUP period was issued in order to evaluate the effectiveness of mitigative or remedial actions or corrections due to adverse impacts to wetlands systems which have already occurred both on and adjacent to the Rima Ridge Tract (City of Daytona Beach WIAM Plan), and the following circumstances cited in the SJRWMD Consumptive Use Technical Staff Report:

- Modeling completed by District staff indicates the potential for adverse impacts to wetland systems associated with increased withdrawals through 2011.
- If the wetland augmentation projects are implemented there is still a potential for impacts, but it is greatly reduced.
- Additional ground water and wetland monitoring data are needed to evaluate the effectiveness of impact avoidance measures and to determine whether or not the proposed groundwater withdrawals are sustainable without adverse impacts.

In 2005, six additional monitoring wells were installed by St. Johns River Water Management District in the Indian Lake vicinity after approval by FFS. Locations of the monitoring wells are shown on Exhibit Y.

In 2019, the City of Daytona Beach completed the construction of a pipeline system that

would transport treated water from its water treatment plant located on LPGA Boulevard, to Bennett Swamp on the Rima Ridge Tract. The purpose of the project is to enhance 1,425 acres of Bennett Swamp, recharge the sole source aquifer, and reduce nutrient loads to the Halifax River. This system will disperse up to six (6) million gallons of water per day to Bennett Swamp. The City of Daytona Beach will be responsible for maintaining the rehydration system and monitoring the impact of the system on the Bennett Swamp.

The CUP #8932-14 for the City of Ormond Beach supply wells capped the total annual pumping allowance within the Rima Ridge Wellfield at 3.15 mgd through 2024 due to uncertainty in prediction models beyond that point. Each of the four existing supply wells is 10 inches in diameter and 300 feet in total depth. In 2006, three additional monitoring wells were installed by the City of Ormond Beach pursuant to Consumptive Use Permit requirements from the SJRWMD.

The following two paragraphs outline the St. Johns River Water Management District's procedure for monitoring the effects of the Daytona Beach and Ormond water supply wells that are located on the Rima Ridge Tract. Exhibit Y shows the location of existing water supply wells and their related monitoring wells.

The SJRWMD Minimum Flows and Levels (MFL) Program, based on the requirements of Section 373.042 and 373.0421, F.S., establishes MFLs for lakes, streams and rivers, wetlands, springs, and groundwater aquifers. The MFLs designate hydrologic conditions, below which significant ecological harm would occur, and identify levels and/or flows above which water is available for reasonable-beneficial uses (Section 373.019 (13), F.S.). The MFL Program provides technical support to the District's regional water supply planning process (Section 373.0361, F.S.) and the consumptive use-permitting program (Chapter 40C-2, F.A.C.). SJRWMD develops hydrologic and hydraulic models for specific water resources in the District. The hydrologic modeling and associated data analysis provide the framework to implement and evaluate MFLs. Analyzing the output from hydrologic models informs the SJRWMD about the best way to manage and limit consumptive uses and to protect natural resources from significant ecological harm.

Measurement of surficial aquifer water levels at Indian Lake and Rima Ridge are necessary in order to develop hydrologic models for these areas. Monitoring wells have been established at selected locations around Indian Lake and Rima Ridge well fields to monitor long-term surficial aquifer water levels and to determine the direction of surficial aquifer flow. Additionally, information about the near surface soil characteristics and geology, obtained during monitor well installation, will also be incorporated into hydrologic model to improve its performance.

4. Swamps, Marshes, and Other Wetlands

In addition to the waterways, TBSF contains approximately 14,340 acres in seven (7) hydric communities: basin marsh, basin swamp, baygall, depression marsh, dome swamp, wet prairie, and swamp lake. Maintenance of naturally occurring wetland communities is a high priority and will be accomplished through appropriate management activities, including prescribed fire and adherence to Silviculture BMPs.

5. Wetland Restoration

Wetland restoration objectives on the state forest include erosion control, restoration of hydrology and / or hydroperiod, and restoration of wetland plant and animal communities. To achieve these objectives, restoration activities may involve road and soil stabilization, water level control structure removal or installation, non-native invasive species control, site preparation and re-vegetation with native wetlands species, and project monitoring. These activities may be conducted individually or concurrently; implemented by FFS personnel or by non-FFS personnel under mitigation or grant contractual agreements. Wetland restoration projects should be conducted in conjunction with other restoration activities indicated elsewhere in this plan.

Where applicable, TBSF, with assistance from the FFS Forest Management Bureau, may pursue funding to develop and implement wetlands restoration projects. Additionally, cooperative research among FFS, other state agencies, and the federal government will provide valuable information in determining future management objectives of wetland restoration.

Wetland restoration will be coordinated with the SJRWMD. Any activities requiring permits from the water management district will be handled accordingly and will follow the latest edition of the FFS Silviculture Best Management Practices Manual.

6. Florida Department of Environmental Protection Basin Management Action Plan

A Basin Management Action Plan (BMAP) is a "blueprint" for restoring impaired waters by reducing pollutant loadings to meet the allowable loadings established in a Total Maximum Daily Load (TMDL). It represents a comprehensive set of strategies, including, but not limited to: permit limits on wastewater facilities, urban and agricultural best management practices, conservation programs, financial assistance, and revenue generating activities, all designed to implement the pollutant reductions established by the TMDL. These broad-based plans are developed with local stakeholders, as they rely on local input and local commitment, and are adopted by Secretarial Order to be enforceable.

The BMAP provides for phased implementation under Subparagraph 403.067(7)(a)1, F.S. The phased BMAP approach allows for the implementation of projects designed to achieve incremental reductions, while simultaneously monitoring and conducting studies to better understand the water quality dynamics (sources and response variables) in the watershed.

A portion of TBSF resides in the Lower St. Johns River Basin Main Stem BMAP.

7. TBSF Hydrologic Restoration Plan

In September 2010 through March 2011, FFS conducted a Wetland Restoration Needs Assessment (WRNA) on TBSF. Wetland conditions were evaluated at 428 points and along six (6) wetlands transects. The findings are listed below.

For the Tiger Bay Tracts (north and south), 233 assessment points were established.

Of the total points surveyed, 64 point were identified as high priority for restoration. Further evaluation of the high priority sites, identified 19 sites large enough for potential wetlands restoration projects. All of these restoration areas will need to be further evaluated by local FFS personnel to determine if the restoration projects are compatible with current land management plans.

The wetlands restoration work on the Tiger Bay Tract will encounter challenges. Past wetland alteration projects have been suspended due to potential negative impacts to the Pershing Highway. Along the Pershing Highway, a major historic drainage canal runs south to north on the Tiger Bay Tract. This canal impedes the natural sheet flow of water across the landscape. Because of the historic nature of the canal, restoration efforts to the canal will likely have greater negative impacts on the site characteristics than benefits. Therefore, all restoration projects located along US 92 must include consideration for current and future impacts to the remaining portions of the Pershing Highway.

This assessment proposed several activities that can be completed, that have little or no impact on identified sensitive areas. One of the activities proposed in this assessment is replacing damaged culverts along Dukes Island Canal Road. Lateral service road ditches, both east of the canal and on the Woody Parcel, may be plugged or filled to enhance sheet flow across wetland landscapes in these areas. Culvert replacement on Dark Entry Road, in conjunction with fireline rehabilitation, may restore function to some wetlands north of US-92. Further north in the Wampee Strand area, where access for timber management or fire control is not critical, ditch filling may enhance wetland functions there.

For the Clark Bay Tract, 69 points were established; 39 were considered high priority, and 20 sites were identified for potential wetland restoration. This area needs special consideration because of the private community located at the end of Clark Bay Road. This assessment identified several locations in which roads and ditches are abovegrade and impede and re-direct natural surface flows. The assessment also identified one area that had pine encroachment into the wetland.

For the Rima Ridge Tract, 112 points were established with 59 being high priority. This area of TBSF has water wells for Daytona Beach and Ormond Beach. The directives presented in the assessment include not replanting historic wetlands that have been converted to plantation, fireline rehabilitation, and avoiding wetland soils when constructing new firelines.

All the projects discussed have been taken into consideration by FFS. FFS continues to monitor and assess the wetlands of TBSF.

In 2018, the Bennett Swamp Rehydration and Conservation Project was completed. This project takes water from the City of Daytona Beach water reclamation facility on LPGA Boulevard and disperses it into the Bennett Swamp. This project was completed to enhance the wetlands, recharge the aquifer, and reduce the nutrient loads in the Halifax

River. When operating, an estimated six (6) million gallons of water a day will be dispersed into the swamp.

C. **Floral and Faunal Resources**

1. **Rare, Endangered, and Threatened Species**

The intent of FFS is to manage TBSF in a manner that will minimize the potential for wildlife species to become imperiled. FFS employees continually monitor the forest for threatened or endangered species while conducting management activities. Specialized management techniques may be used, as necessary, to protect or increase protection of rare, threatened, and endangered species, as applicable for both plants and animals. See Table 5.

The forest is part of an extensive wildlife corridor that provides habitat needed for federally and state-listed endangered and threatened species such as the Florida sandhill crane (*Antigone canadensis pratensis*), Florida scrub-jay (*Aphelocoma coerulescens*), wood stork (*Mycteria americana*), gopher tortoise (*Gopherus polyphemus*), and indigo snake (*Drymarchon couperi*).

Table 5. Rare, Endangered, and Threatened Species Documented on TBSF

Common Name	Scientific Name	FNAI Global Rank*	FNAI State Rank*	Federal Status*	State Status*
Florida sandhill crane	<i>Antigone canadensis pratensis</i>	G5T2	S2	N	ST
Celestial lily	<i>Nemastylis floridana</i>	G2	S2	N	E
Florida cernotinan caddisfly	<i>Cernotina truncona</i>	G4	S3	N	N
Gopher tortoise	<i>Gopherus polyphemus</i>	G3	S3	C	ST
Large-flowered rosemary	<i>Conradina grandiflora</i>	G3	S3	N	T
Pine snake	<i>Pituophis melanoleucus mugitus</i>	G4T3	S3	N	FT
Porter's long-horn caddisfly	<i>Oecetis porteri</i>	G3G4	S2S3	N	N
Rugel's pawpaw	<i>Deeringothamnus rugelii</i>	G1	S1	E	E
Tavares white miller caddisfly	<i>Nectopsyche tavana</i>	G3	S3	N	N

* STATUS / RANK KEY

Federal Status (USFWS): LE= Listed Endangered, LT= Listed Threatened, N= Not currently listed, C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened. SAT, T(S/A) = threatened due to similarity of appearance. A species that is threatened due to similarity of appearance with another listed species and is listed for its protection. Species listed as T(S/A) are not biologically endangered or threatened and are not subject to Section 7 consultation

State Status (FWC): Animals: FE = Listed as Endangered Species at the Federal level by the USFWS, FT = Listed as Threatened Species at the Federal level by the USFWS, F(XN) = Federal listed as an experimental population in Florida, FT(S/A) = Federal Threatened due to similarity of appearance, ST = State population listed as Threatened by the FWC, SSC = Listed as Species of Special Concern by the FWC, N = Not currently listed, nor currently being considered for listing.

Plants: LE = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act; LT = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered; CE = Commercially Exploited; N = Not currently listed, nor currently being considered for listing.

FNAI Global Rank: G1= Critically Imperiled, G2 = Imperiled, G3= Very Rare, G4= Apparently Secure, G5= Demonstrably Secure, GNR = Element not yet ranked (temporary), G#? = Tentative rank, T#= Taxonomic Subgroup; numbers have same definition as G#'s.

FNAI State Rank: S1= Critically Imperiled, S2= Imperiled, S3= Very Rare, S4= Apparently Secure, S5 = Demonstrably secure in Florida, S#?= Tentative Rank.

2. Florida Natural Areas Inventory

The Florida Natural Areas Inventory (FNAI) is the single most comprehensive source of information available on the locations of rare species and significant ecological resources throughout Florida.

FNAI has reported the following:

a. Element Occurrences

FNAI element occurrences data layer includes occurrences of rare species and natural communities. For animals and plants, element occurrences usually indicate a viable population of the species. Based on the information available, this site appears to be located on or very near a significant region of scrub habitat, a natural community in decline that provides important habitat for several rare species within a small area.

Documented habitat includes: Basin marsh, basin swamp, baygall, depression marsh, dome swamp, mesic flatwoods, pine plantation, sandhill, scrub, scrubby flatwoods, swamp lake, wet flatwoods, wet prairie, and xeric hammock.

b. Likely and Potential Habitat for Rare Species

In addition to documented occurrences, other rare or threatened species may occur near TBSF. Rare species and communities that have not been documented but that are likely or potential at the site are listed in Exhibit M.

c. Land Acquisition Projects

Portions of the site are within the Volusia Conservation Corridor. This project, sponsored by the SJRWMD, will increase the protection of Florida's biodiversity at the species, natural community, and landscape levels and provide a continuous corridor of environmentally significant land from the TBSF, through the central wetlands and flatwoods of Volusia County, to the marshes of the St. Johns River. The project is part of the CARL Acquisition Program. See Exhibit G.

Another Florida Forever project in the area is Spruce Creek. The Spruce Creek project protects one of the largest tracts of undeveloped land left in the region along the estuary of Spruce Creek and helps to maintain the water quality of the contiguous creeks and bays. See Exhibit G.

FNAI recommends that professionals familiar with Florida's flora and fauna conduct a site-specific survey to determine the current presence or absence of rare, threatened, or endangered species before expansions or alterations are made to any facilities.

3. Florida Fish and Wildlife Conservation Commission

The FWC Fish and Wildlife Research Institute (FWRI) reports numerous records of listed species occurrences or critical habitats within the confines of the property. This includes

state and federally listed endangered or threatened species.

Other findings by the FWC include:

- a. The property is located adjacent to a Strategic Habitat Conservation Area for bald eagle (*Haliaeetus leucocephalus*), Florida scrub-jay (*Aphelocoma coerulescens*), and eastern indigo snake (*Drymarchon couperi*).
- b. TBSF is located within an area of moderate Species Richness which indicates the total number of species within potential habitat identified in a specific location.
- c. TBSF is adjacent to Priority Wetlands, which are wetlands significant to listed wetland-dependent vertebrates.
- d. FWC's response includes a map indicating multiple species locations.

These data represent only those occurrences recorded by FWC staff and other affiliated researchers. The database does not necessarily contain records of all listed species that may occur in a given area. Also, data on certain species are not entered into the database on a site-specific basis. Therefore, one should not assume that an absence of occurrences in their database indicates that species of significance do not occur in the area. See Exhibit N.

FWC recommends the review of management guidelines in the published FWC Gopher Tortoise Species Management Plan to guide management actions for the gopher tortoise (*Gopherus polyphemus*) on the forest. The FWC Gopher Tortoise Species Management Plan provides beneficial resource guidelines for habitat management and monitoring of the gopher tortoise. For reference, the FWC Gopher Tortoise Species Management Plan can be accessed at www.MyFWC.com.

FWC recommends the review of management guidelines in FWC's published Species Action Plans for the management of imperiled, rare, and focal bird species. The FWC Species Action Plans provide beneficial resource guidelines for habitat management and monitoring of the respective species. For reference, the FWC Species Action Plans can be accessed at www.MyFWC.com.

4. Game Species and Other Wildlife

Wildlife management plays an important role in the management of resources on the forest. FWC provides cooperative technical assistance in managing the wildlife and fish populations, determining hunting seasons, establishing bag and season limits, and overall law enforcement on the forest.

TBSF is divided into two FWC WMAs: the TBSF Wildlife Management Area (TBSFWMA) comprised of 19,644 acres; and the Tiger Bay Rima Ridge Unit WMA with 11,584 acres. Management of these areas will be directed to the production of biological diversity and species composition consistent with existing natural community types. Such communities will be restored and / or maintained through habitat management. All biological resources will be managed to maintain diversity.

Notable wildlife species inhabiting the forest include white-tailed deer (*Odocoileus*

virginianus), wild turkey (*Meleagris gallopavo*), Florida black bear (*Ursus americanus floridanus*), wood stork (*Mycteria americana*), and Bachman's sparrow (*Peucaea aestivalis*). Hunting for white-tailed deer and small game is permitted during designated seasons. TBSF also supports a moderate population of wild hogs (*Sus scrofa*). Hunter harvest pressure on wild hogs and nuisance trapping helps to control this population.

FFS and FWC cooperatively maintain approximately 173 acres of permanent wildlife openings and planted food plots on the TBSF. Wildlife openings and food plots are established and maintained in accordance with the FFS State Forest Handbook.

Non-game species will be managed and protected through the restoration and maintenance of native ecosystems found on the forest. The current State Forest Handbook gives additional details for such things as snag management and retention.

5. Survey and Monitoring

FFS will implement species-specific management plans developed by FWC and other agencies as applicable. FFS will cooperate with FWC and other agencies in the development of new wildlife management plans and monitoring protocols, as necessary. Such plans will be consistent with rule and statute promulgated for the management of such species.

a. Gopher Tortoises

Presently, TBSF is ranked by FWC as a Tier 2 priority (out of 10) for Line Transect Distance Sampling across potential gopher tortoise habitat. Ongoing belt transect surveys for gopher tortoise burrows have been conducted by FFS and FWC staff intermittently, as needed. As of the most recent survey in 2017, 41 acres of belt transect surveys over 255 acres of habitat yielded a burrow density estimate of two burrows per acre. All surveys are done in cooperation with FWC.

The FFS follows and utilizes the Best Management Practices for gopher tortoises to assist in meeting management objectives for both the species and the communities in which it is found.

b. Florida Black Bear

FFS will continue to cooperate with FWC to implement FWC's Florida Black Bear Management Plan, with emphasis on maintaining sustainable black bear populations in suitable habitats throughout Florida for the benefit of the species and people.

c. Listed Plant Species

All known locations of listed or rare flora are GIS mapped and location data are shared with FNAI.

d. Other Rare Biota Surveys

Surveys are done as time and staffing allow. High quality plant communities continue to incur ad hoc surveys for both invasive plants and animals. The FFS will utilize FWC

Species Action Plans for guidance both monitoring populations and for habitat management recommendations for rare and imperiled species, where appropriate.

Most of the isolated TBSF wetlands have received a cursory biological survey, with rare and significant plant and animal species observed and documented. Assistance will be offered to FWC for gopher tortoise burrow commensals monitoring, as well as monitoring for other rare species, as appropriate.

During routine management activities, incidental sightings of rare animals and plants are GIS mapped by FFS staff. All rare species data is collected and sent to FNAI annually.

D. Sustainable Forest Resources

FFS practices sustainable multiple-use forestry to meet the forest resource needs and values of the present without compromising the similar capability of the future. Sustainable forestry involves practicing a land stewardship ethic that integrates the reforestation, managing, growing, nurturing, and harvesting of trees for useful products with the conservation of soil, air and water quality, wildlife and fish habitat, and aesthetics. This is accomplished by maintaining and updating accurate estimates of standing timber in order to assure that the timber resources retain their sustainability. Forest inventories will be updated on a continual basis according to guidelines established by the FFS Forest Management Bureau.

E. Beaches and Dune Resources

No beaches or dunes occur on the TBSF.

F. Mineral Resources

No mineral deposits of commercial value are known to exist on TBSF.

G. Unique Natural Features and Outstanding Native Landscapes

The forest is important to aquifer recharge and surface water storage. Unique features include the globally imperiled scrub community of Rima Ridge and the OFW that encompass Tiger Bay, Scoggins Pond, Coon Pond, the west side of Indian Lake and the portion of the Little Tomoka River basin on the northeast corner of TBSF.

H. Research Projects / Specimen Collection

Research projects may be conducted on the forest on a temporary or permanent basis for the purpose of obtaining information that furthers the knowledge of forestry and related fields. FFS cooperates with other governmental agencies, non-profit organizations, and educational institutions, whenever feasible, on this type of research. FFS will consider assisting with research projects when funds and manpower are available.

All research to be considered on TBSF must be in accordance with the guidelines stated in the State Forest Handbook. Any requests for research should be submitted in writing to the appropriate field staff to be forwarded to the Forest Management Bureau for approval. Requests must include: a letter outlining the purpose, scope, methodology, and location of the proposed research. Requests are subject to review by FFS Foresters, Biologists, the Forest Health Section, and the Forest Hydrology Section, as appropriate. Authorization to conduct

research will require that the investigator provide copies of any reports or studies generated from any research to the FFS and the TBSF staff. Other special conditions may be applicable, and the authorization may be terminated at any point if the study is not in compliance.

Research projects / specimen collections that have been initiated on the property include:

- Halifax River Audubon- Nightjar observation (2010-Current)
- Stetson University- Student labs (2010-Current)
- University of Florida Herbarium- Plant specimen collection (2014-2016)
- Bethune Cookman College Plant Phys. Lab- Student lab (2016-Current)
- University of Florida- Pocket Gopher survey (2016-2017)
- University of Texas at El Paso- amphibian/reptile collection (2018-2019)
- Rare Plant Conservation Program-research on Rugel's pawpaw (2018-2019)

I. Ground Disturbing Activities

Although the FFS's approach to handling ground disturbing activities is identified in other sections of this plan, the FFS's overall approach to this issue is summarized here. FFS recognizes the importance of managing and protecting sensitive resources and will take steps to ensure that such resources are not adversely impacted by ground disturbing activities. Sensitive resources include areas such as known sensitive species locations; archaeological, fossil, and historical sites; ecotones, wetlands, and water resources. The process for evaluating and obtaining approval for ground disturbing activities is outlined in Appendix 2.A.5. of the State Forest Handbook.

When new pre-suppression firelines, recreational trails, or other low-impact recreational site enhancements are necessary, their placement will be reviewed by state forest field staff to avoid sensitive areas. For ground disturbing activities such as construction of buildings, parking lots, and new roads, the FFS will consult with FNAI, DHR, WMD, and ARC, as appropriate.

V. Public Access and Recreation

The primary recreation objective is to provide the public with dispersed outdoor recreational activities that are dependent on the natural environment. FFS will continue to promote and encourage public access and recreational use by the public while protecting resources and practicing multiple-use management.

Periodic evaluations will be conducted by FFS staff to monitor recreational impacts on resources. Modifications to recreational uses will be implemented should significant negative impacts be identified. New recreation opportunities and facilities, which are compatible with the primary goals and responsibilities of the FFS, will be considered only after FFS determines their compatibility with other forest uses and forest resources. Assessment of visitor impacts, outdoor recreation opportunities and facilities, and proposed changes will all be addressed in the Five-Year Outdoor Recreation Plan updates.

A. Existing

A variety of recreational opportunities are available on the forest. Visitors can enjoy hiking, horseback riding, bicycling, fishing, boating, camping, hunting, picnicking, nature study, and

photography. Horseback riding and bicycling are allowed only on forest roads, firelines, and designated trails. See Exhibit D for a map of the Recreation, Facilities, and Improvements.

1. Hiking Trails

The Rima Ridge Tract provides recreational trails for hikers and horseback riders. Buncombe Hill Interpretive Trail is a two-mile, self-guided interpretive nature trail leading from Indian Lake Recreation Area and is part of the FFS Trailwalker program. Picnic tables, grills, a pavilion, and restrooms are available at the Indian Lake Recreation Area (fee area).

The Pershing Highway Interpretive Trail is a short scenic hike over one mile of brick road constructed in 1917.

At Tiger Bay, a footbridge across Duke's Islands Canal at Rattlesnake Pond enables a short loop trail around Rattlesnake Pond.

2. Horse Trail

A dedicated equestrian trail is located on the north side of the Rima Ridge Tract. The 10-mile loop trail is part of the Trailtrotter program. The trailhead is located at the equestrian parking area just off SR-40.

3. Fishing and Boating

Rattlesnake Pond, Woody Pond, and Ranch Pond are available for shoreline fishing. Indian Lake, Scoggin Lake, Coon Pond, Woody Pond, Bear Pond, and Rattlesnake Pond are accessible for fishing and boating (electric motors only).

4. Camping

Primitive camping is available at the Bennett Field Campground on the Rima Ridge Tract with six designated campsites, a small group camping area, and a vault toilet. The maximum camping capacity is 30 people (five per campsite) for the single campsites and 30 people for the group campsite.

The Tram Road Equestrian Campground is a designated semi-primitive equestrian campground available on the Rima Ridge Tract at Tram Road. There are four designated campsites with picnic table, grill, fire ring, and tie-downs. Maximum camping capacity is 20 people (five per campsite). Non-potable water, a water trough, small horse corrals, and a group picnic area are also accessible for equestrian users.

5. Hunting

Currently hunting is divided into two WMA Units, the Rima Ridge WMA and the Tiger Bay WMA, each with different hunting schedules. Participation in big game hunts is limited through a randomly drawn quota permit.

B. Planned

FFS will continue to assess plans for additional recreational opportunities based on demand, carrying capacity, demographics, and impact to the resources on the forest. All planned

improvements may be completed as staff and funding permits. Both terrestrial and aquatic resources and related activities will be evaluated. Any plans will be incorporated into the Five-Year Outdoor Recreational Plan on file at TBSF.

1. Public Access and Parking

Within this ten-year planning cycle, other parking and access points will be evaluated. Current parking areas and forest access points will continually be evaluated for improvements. Existing parking areas are for all recreational users on the TBSF and FFS staff use. New parking areas will be designated by appropriate FFS staff by location and may be established and installed. Listed plants, listed animals, and known archeological sites will be avoided. The size of parking areas will be determined by location for public access. Materials for these projects will be determined. Additional signage for both tracts are planned to be updated as needed.

During this ten-year planning period, the need for a parking area will be evaluated and, if needed, may be established at the end of Clark Bay Road. Currently, there is no designated area for parking on this road. Clark Bay Road ends at a private neighborhood and lacks a turn-around point outside of the neighborhood. A parking area will allow users to park and recreate in this area of the forest and will provide a turn-around point before the private neighborhood. This will reduce damage to areas on the side of Clark Bay Road from parking and turning around.

During this ten-year planning period, the need for a parking area will be evaluated and, if needed, may be established at the Rattlesnake Hiking trailhead on Dukes Island Road. Currently, there is a small clearing at the trailhead for two or three vehicles to park on this road and enjoy the hiking trail or fishing at the pond. Dukes Island Road dead-ends at the Rattlesnake Pond and depending on rainfall and water, there is no point to turn around. A parking area will allow users to park and recreate in this area of the forest and will provide a turn-around point. This will reduce damage to areas on the side of Dukes Island Road from parking and turning around and reduce the potential of vehicles being stuck on the wet closed forest road.

During this ten-year planning period, the need for a parking area, bicycle obstacle course, bicycle maintenance area, bicycle trails, and a vault toilet will be evaluated and, if warranted, may be established at the three-panel kiosk on Woody Loop. If this location is deemed inadequate, a secondary proposed location would be along the southwest side of the loop. This area is where a past, intense wildfire necessitated a large clear-cut timber sale and is currently open. At this time, there is roadside parking available but no designated parking area. Also, no restroom facility is available on this section of the forest. The proposed bicycle obstacle course and trail will require an established parking area and restroom for users. TBSF has no designated bicycle trails and this would increase the variety of resource-based recreation on the forest. A parking area will allow users to park and recreate in this area of the forest and a restroom will benefit not only bicycle users, but also hunters, anglers, and other individuals looking to recreate in this area. Designating a parking area will reduce damage to areas on the side of the road.

During this ten-year planning period, the need for a larger parking area will be evaluated and, if needed, may be established at the Pershing Highway Interpretive Hiking Trailhead. Currently, there is a small clearing at the trailhead for two or three vehicles to park and enjoy the hiking trail or hunt this area. On several occasions, this parking area has been full and only a few users may enjoy this area of the forest at a time. A larger parking area will allow users to park and recreate in this area of the forest and will provide a parking area for hunters. Larger vehicles (e.g., school busses) would then be able to use this area and more educational opportunities will be available on TBSF.

2. Recreational Trails

Within this ten-year planning cycle, suitable locations will be explored for additional recreational trails. The construction, maintenance, and improvements of multi-use, equestrian, cycling, nature, and hiking trails will be ongoing. Install and replace trail directional signs or re-paint blazes along all existing trails on TBSF to help with trail signage and hiking access along trail for users. Sign-in boxes and kiosks will be installed, replaced, or repaired as needed on both tracts at existing trailhead locations and future trails that are to be determined. Additional multi-use, equestrian, cycling, driving, nature, waterway, hiking trails, recreation areas, and / or observation platforms or towers may be evaluated, planned, and installed on either tract of TBSF. Materials for these projects will be determined.

During this ten-year planning period, an additional hiking trail is proposed for installation, which will connect to Buncombe Hill Interpretive Trail, meander to Coon Pond, and then connect into the existing multi-use trail system. The benefit of this spur trail would be access to a beautiful area of TBSF (Coon Pond) and to connect the existing trail on the south side of Rima Ridge Road to the existing multi-use trails. This would create a connected trail system from the SR 40 entrance all the way to Indian Lake Recreation Area.

3. Environmental Education

Environmental education on TBSF is displayed on kiosks and conducted through guided tours and hands-on events by request. Targeted groups include the general public, school and youth groups and various user groups. An interpretive self-guided hiking trail is available at the Rima Ridge Tract (Buncombe Hill Interpretive Trail) and the Tiger Bay Tract (Pershing Highway Interpretive Trail). A “State Forest Awareness Week” event is held every October to promote recreation in the forest. Each kiosk is used for display and information for all recreational activities on the State Forest. Each will be installed, replaced, or repaired as needed. Additional kiosks or educational materials or displays may be installed on the Rima Ridge Tract or Tiger Bay Tract. If a need is determined in the future, TBSF may implement an environmental education program which may include guided tours, additional self-guided tours, and hands-on events.

4. Equestrian, Hiker, Biker and Hunter Education

Within this ten-year planning cycle, FFS will continue communicating our needs and concerns with our user groups, cooperators, and our visitors. FFS will evaluate the best methods for communicating concerns and solutions to these user groups. Each kiosk is

used for display, education, and / or information on recreational activities on TBSF.

5. Amenities (Pavilions, Docks, Bathrooms, etc.)

Within this ten-year planning cycle, FFS will assess the feasibility of installing pavilions at sites that are to be determined. Pavilions may be installed on either tract of TBSF. Additional amenities that may be assessed during this ten-year planning period include but are not limited to: bear-proof trashcans, bear-proof storage containers, gates, educational displays, signs or kiosks, fencing, pitcher pumps, full flush restrooms with or without showers, potable water sources, dump stations, water and electric utilities or hook-ups, vault toilets, bicycle racks, bicycle repair stations, bicycle course materials or obstacles, lighting, tent or RV pads, screened in buildings, docks, boardwalks, bridges, culverts, viewing platforms, kayak launches, boat launches, equestrian areas, native butterfly gardens, and gazebos may be evaluated and may be installed on either tract of TBSF. Materials for these projects will be determined.

During this ten-year planning period, the dock at Rattlesnake Pond will be replaced or removed, depending on costs and resources available. In recent years, the current dock has become unsafe for use due to its age and narrow extent. Visitors to TBSF have enjoyed using the current small dock, and have expressed interest in replacement, rather than removal. Should the FFS replace the dock, the footprint of the dock will likely be increased to provide a larger space and more opportunities for recreation.

During this ten-year planning period, improvements may be made to several boat ramps or kayak launches found on TBSF. These include Indian Lake Recreation Area, Scoggin Lake, Woody Pond, Bear Pond, and / or Rattlesnake Pond. As these areas are used, additional maintenance may be needed to improve these areas. Improving and maintaining these boat and kayak launches would benefit the forest and reduce the impact of people launching in other areas around the designated launch at each body of water. This would also reduce impacts from vehicles getting gear in or out of the water.

During this ten-year planning period, the need for a vault toilet will be evaluated and, if needed, may be installed at the Indian Lake Recreation Area or the proposed Woody Loop Bicycle area. If a full facility campground is not able to be established at the Tram Road Equestrian Campground/Day-Use area, then a vault toilet may be evaluated and installed here as well. Currently, no restroom facility is available on the Woody Loop section of the forest. Providing this amenity to the public would increase cleanliness for those recreating in this area. Currently, Tram Road Equestrian Camp/Day-Use Area and the Indian Lake Day-Use Area both have port-a-lets and would benefit by upgrading to vault toilets. The appearance and aesthetics of these areas would increase from converting to vault toilets over port-a-lets.

During this ten-year planning period, two pitcher pumps may be installed on TBSF at the Bennett Field Campground and at the Bennett Field Group Campground. Currently, there is no water available at either campground. These primitive campgrounds would greatly benefit from having the additional amenity of non-potable water.

During this ten-year planning period, the need for bear-resistant food lockers or trashcans will be evaluated and, if needed, installed at the Bennett Field Campground, Bennett Field Group Campsite, Tram Road Equestrian Campground, and / or the planned RV campground at the north entrance to Rima Ridge Road. In the past, the campgrounds have had bear activity and providing these amenities may reduce human / bear conflict and allow for safe storage of food and trash.

6. Camping

Within this ten-year planning cycle, FFS will assess the feasibility of additional campgrounds or group campgrounds on either tract. The need for primitive campsites / facilities on the TBSF continues to be evaluated through camping enhancements. Campsites will be equipped with a fire ring, a grill, and a picnic table. Campsite amenities will be installed, replaced, or repaired as needed.

During this ten-year planning period, the need for a full facility campground will be evaluated and, if warranted, established at the equestrian parking area at the north entrance of Rima Ridge Road and / or at the Tram Road Equestrian Campground / Day-Use Area. A full facility shower house will be evaluated for installation at both locations. Electricity and water may be installed at each campsite and a dump station may be included at the northern campground at the entrance to Rima Ridge Road. Consistently, the public asks about water and electricity available at TBSF or RV camping. The public would benefit by having a variety of camping options available to them. The location of the forest and proximity to Daytona Beach increase the number of potential campers if electricity and water were available. The need for a campground host will be evaluated and, if needed, would utilize a site installed at either of these campgrounds depending on funding. Other areas will be evaluated on both tracts for additional campground opportunities. If an additional campground is initiated, the Bennett Field camp will be re-designed to have four primitive campsites.

The Florida Forest Service will handle permitting requests for recreational activities.

C. Hunter Access

Regulated hunting and fishing on Florida's forests are managed cooperatively with the FWC. Hunting season dates, limits, and methods are established annually by FWC, in cooperation with FFS. TBSFWMA and TBSFWMA Rima Ridge Unit regulations are updated annually and are identified in the current WMA brochures provided by FWC at www.MyFWC.com.

Non-hunting recreation users are encouraged to check the WMA regulations and season dates before visiting TBSF.

D. Education

FFS may create partnerships with local K-12 schools and / or universities for the development and implementation of educational opportunities on TBSF. Once partnerships are developed, the Five-Year Outdoor Recreation Plan will provide more insight to management activities as they pertain to future educational opportunities TBSF may provide to the public.

VI. Forest Management Practices

A. Prescribed Fire

Forest management practices on TBSF are important in the restoration and maintenance of forest ecosystems and provide a variety of socio-economic benefits to Floridians. Management practices on TBSF include prescribed fire, which is an effective tool in controlling the encroachment of shrubs and off-site hardwoods, stimulating the recovery of native herbaceous groundcover, and promoting the regeneration of native pines.

FFS utilizes a fire management program on state forests that includes wildfire prevention, detection and suppression, and prescribed burning. This program is the responsibility of FFS's Bunnell District and is detailed in the Five-Year Prescribed Burning Management Plan. Emphasis will be placed on prescribed burning, wildfire prevention, and education to help reduce wildfire occurrence on the forest.

A Fire History chart detailing the recent history of prescribed burns and wildfires at TBSF is available in Exhibit O.

FFS has three (3) fire towers, four (4) brush trucks, and nine (9) tractor-plow units located in Volusia County. Additional support is available from neighboring counties. Personnel and equipment stationed at TBSF will be used for pre-suppression practices, establishment of firebreaks, rehabilitation of existing firelines, construction of new firelines, maintenance of perimeter firebreaks, and prescribed burning.

The prescribed burning program developed for TBSF produces multiple benefits. The objectives of prescribed burning on TBSF include facilitating forest management operations, enhancing wildlife and listed species habitat; decreasing fuel loading, enhancing public safety, and restoring, maintaining, and protecting all native ecosystems, ecotones, and their ecological processes. FFS personnel are responsible for planning and implementing the annual prescribed burn program for TBSF, which will consist of dormant and growing season burns. An update to the Five-Year Prescribed Burning Management Plan is developed each year by FFS staff. All burns conducted on TBSF are executed by Florida Certified Prescribed Burn Managers in accordance with Chapters 590.125, F.S. and 5I-2 F.A.C.

According to FNAI, historic, fire-dependent natural communities on TBSF are estimated to have occupied 14,550 acres and to have burned at approximately two to four-year intervals. Current fire-dependent communities encompass 14,945 acres. Some historically fire-dependent communities have been altered through past land use practices, which inhibits the ability to meet objectives with prescribed fire alone. Based on current conditions and management objectives, TBSF will plan for 3,700 to 7,500 acres to be prescribed burned annually. Priority ranking of burn units is used to keep fire-return intervals maintained while slowly adding additional acreage. Meeting prescribed fire goals will be largely dependent on weather conditions, available personnel, and statewide emergency situations such as wildfires, hurricanes, and other natural disaster response and relief. Currently it is estimated that approximately 4,800 acres of TBSF are within the desired fire-return interval.

1. Fire Management

The fire management plan serves as a working tool and an informational document for TBSF.

The plan provides guidelines regarding wildfire suppression and prescribed fire management. It will specify burn units, burn unit prescriptions, appropriate fire return intervals, and fire pre-suppression planning. The plan may be reviewed and amended as necessary.

The use of prescribed fire in the management of timber, wildlife, and ecological resources on TBSF is necessary if the FFS is to fulfill the goals and objectives stated in this plan including: enhancing and restoring native plant communities, managing protected species, managing timber, recreation, historical, and other resource values. The fire management plan and its objectives shall reflect and incorporate these multiple-resource objectives.

- a. Prescribed Fire:** Prescribed fire is the most important land management tool, both ecologically and economically, for managing vegetation and natural communities and perpetuating existing wildlife populations in Florida. Forest operation records and staff experience should be combined with the FNAI inventory and assessment (2017) to identify areas that may require mechanical or chemical treatments in conjunction with prescribed fire to restore a more natural vegetative structure.
- b. Burn Unit Plans:** Each prescribed fire will be conducted in accordance with FFS regulations and state law (Chapter 51-2 F.A.C., Chapter 590, F.S.) and have a burn unit plan (or prescription). Each prescription will contain, at a minimum, the information, as required by Section 590.125(3), F.S., needed to complete the FFS Prescribed Burn Plan Form FDACS 11461.

Aerial ignition may be considered for large burn units where this tactic can be cost effective for larger acreages. Consideration should be given to rotating burn units between dormant and growing season burns over time. Fire return intervals for a burn unit are recommended to fall within the natural, historic range for the dominant natural community or communities within a given burn unit.

Based upon available species survey data, burn units within a prescription that have listed wildlife species shall explicitly state their presence and any restrictions or requirements relative to prescribed burning in proximity to these species or habitats. These may include time of year, pre-burn preparation, fire return intervals, and other burn parameters.

B. Wildfire Prevention and Mitigation Strategies

FFS utilizes a comprehensive wildfire management approach on state forests that includes an ongoing program of wildfire prevention, detection and suppression, and prescribed burning. Implementation of this program is the responsibility of FFS's Bunnell District. Emphasis will be placed on consistent accomplishment of prescribed burning goals and community outreach to increase public understanding of wildfire prevention and the benefits of prescribed fire.

FFS has three paramount considerations regarding wildfires and are established in priority order:

- 1) Protection of human lives
- 2) Protection of improvements
- 3) Protection of natural resources

All procedures regarding wildfire will follow the State Forest Handbook and the TBSF Fire Management Plan.

1. Suppression Strategies

If a wildfire occurs on TBSF there are two (2) alternative suppression strategies as defined below:

- a. Contain and Control** is defined as a suppression strategy where a fire is restricted to a certain area by using existing natural or constructed barriers that stop the fires spread under the prevailing and forecasted weather until it is out. This strategy allows the use of environmentally sensitive tactics based on fuels, fire behavior, and weather conditions that keep a wildfire from burning a large area or for a long duration.
- b. Direct Suppression** is defined as a suppression strategy where aggressive suppression tactics are used to establish firelines around a fire to halt its spread and to extinguish all hotspots. This alternative is used whenever there is a threat to human life, property, private lands, and / or critical natural or cultural resources. This strategy should also be used when the total district fire load dictates that crews not be involved with individual fires for any longer than necessary.

Appropriate suppression action will be that which provides for the most reasonable probability of minimizing fire suppression cost and critical resource damage, consistent with probable fire behavior, total fire load, potential resource and environmental impacts, safety, and smoke management considerations. The Incident Command System (ICS) will be used for all suppression actions.

2. Smoke Management

Caution will be exercised to prevent a public safety or health hazard from the smoke of any prescribed burn or wildfire. Prescribed burns must pass the smoke screening procedure and be conducted by a certified burner. If smoke threatens to cause a safety hazard, then direct, immediate suppression action will be taken.

3. Fire Breaks and Firelines

A system of permanent fire breaks will be developed and maintained around and within the boundaries of TBSF to guard against fires escaping from and entering the forest. Such fire breaks will consist of natural barriers, roads, trails, permanent grass strips and where appropriate, well maintained harrowed lines. All pre-suppression fire breaks will meet the established Silvicultural BMP criteria.

During wildfire suppression, the use of water and foam, permanent fire breaks, natural barriers, and existing roads and trails for firelines can be used when human life, safety, property, and resource considerations allow. Plowed and / or bladed lines will be used for initial installation of firelines in heavy fuels and in cases where it's considered necessary to protect life, property, or resources and / or to minimize threats to firefighters. Plowed and bladed lines will be rehabilitated and brought to BMP compliance as soon as practical after the fire is suppressed.

4. Sensitive Areas

TBSF retains on file in the state forest headquarters an Environmentally Sensitive Area Map that identifies protected sites such as critical wetlands and archaeological and historical sites known to occur on the state forest. FFS personnel are aware of these areas in the event of a wildfire. Special precautions will be followed when prescribed burning in sensitive areas on TBSF. When possible, fire staff will avoid line construction in wetland ecotones throughout the forest.

5. Firewise Communities

FFS has implemented a Firewise community approach for prevention statewide. Specifically, in the area adjacent to or nearby TBSF, efforts in this regard will continue to identify communities at risk and to contact their representatives.

6. Adjacent Neighbor Contacts

The staff at TBSF maintains a list of neighbors that have requested they be notified in advance of prescribed burns. These families are contacted by telephone or email with potential sites and dates of anticipated prescribed burns.

7. Post-Burn Evaluations

A post-burn evaluation is required for each wildfire and prescribed burn on the state forest to assess impacts on timber and habitat. Based on the evaluations after prescribed fires in particular, decisions will be made on the effectiveness of the prescribed burn and improvements that can be made in the future. A historical fire record for all significant fires and prescribed burns will be maintained. This will be accomplished using completed burn plans and the maintenance of GIS data. These records are intended to provide data for future management decisions.

C. Sustainable Forestry and Silviculture

Timber is a valuable economic and ecological resource, and timber harvesting for the purposes of generating revenue, improving stand viability, forest health, wildlife, and ecological restoration and maintenance is critical to the silvicultural objectives on the state forest.

1. Strategies

The following silvicultural strategies will apply to silvicultural practices on TBSF:

- a. To restore and maintain forest health and vigor through timber harvesting, prescribed burning, and reforestation, both naturally and artificially, with species native to the site.
- b. To create, through natural or artificial regeneration, uneven-aged, and even-aged management, a forest with both young and old growth components that yields sustainable economic, ecological, and social benefits.

2. Silvicultural Operations

Silvicultural operations on TBSF will be directed toward improving forest health, wildlife habitat, ecological and economical sustainability, as well as toward recovery from past management practices prior to state acquisition that are not in accordance with the objectives of this plan. Stands of off-site species with merchantable volume will be

scheduled for harvest, followed by reforestation with the appropriate tree species. Herbicide applications may be necessary to control woody competition and to re-establish desired natural species of both overstory and groundcover. Site preparation methods may include prescribed fire, mechanical vegetation control, and / or herbicide applications. Herbicides used will be registered for forestry use by the U.S. Environmental Protection Agency (EPA) and will not adversely affect water resources.

Prescribed fire is the most desirable method of vegetation control in fire-dependent ecosystems. However, due to the existence of areas where fuel loads have reached dangerous levels or urban interface dictates prescribed fire is not suitable, mechanical or chemical vegetation control may be used. Mechanical and / or chemical vegetation control will be utilized where appropriate as determined by FFS staff for wildlife enhancement, fuel mitigation, and reforestation.

Maintenance and restoration of timber stands and natural communities through timber harvesting will include thinning for maintenance, regeneration harvests applicable to the species present, and clear-cutting to remove off-site species.

All silvicultural activities, including timber harvesting and reforestation, will meet or exceed the standards in FFS's Silviculture BMPs and the State Forest Handbook, and will follow the Five-Year Silviculture Action Plan.

3. Forest Inventory

The purpose of a forest inventory is to provide FFS resource managers with information and tools for short and long-range resource management and planning. Ten percent (10%) of TBSF forest will be re-inventoried annually to provide an accurate estimation of the standing timber and to ensure that stands will be managed sustainably.

Timber / forestry resources available on the property include loblolly, longleaf, slash, and small pockets of sand pine. In addition, there are mixed hardwoods and cypress found throughout the forest.

4. Timber Sales

Timber sales are advertised for competitive bids and sold on a per unit or lump sum basis. All timber sales are conducted according to guidelines specified in the State Forest Handbook.

5. Cattle Grazing

There are currently no cattle leases on TBSF.

D. Non-Native Invasive Species Control

FFS employees continually monitor the forest for non-native invasive species while conducting management activities. FFS will locate, identify, and apply control measures with the intent to eradicate or control non-native invasive species. Table 6 lists the general treatment strategy, acres impacted, and population stability trend for non-native invasive plant species occurring on TBSF. Also see Exhibit P.

On-going maintenance and monitoring strategies are outlined in the Five-Year Ecological Management Plan which is developed to locate, identify, and control non-native invasive plant species. Occurrences of non-native invasive species are recorded in the TBSF GIS database and are monitored and treated annually as funding permits. The GIS database is updated as new infestations are discovered.

Adjacent landowners who are known to have these species on their property will be approached to cooperate on control measures. FFS works to control the spread of non-native invasive species by decontaminating agency equipment and equipment used by private contractors according to the State Forest Handbook.

FFS will enlist support from FWC in efforts to control non-native invasive animals. Feral hogs (*Sus scrofa*) are present on TBSF but are not believed to occur in significant numbers at this time. FWC has issued a feral hog control permit to FFS for WMA state forests and FFS will allow for feral hog removal on TBSF through trapping and hunting as necessary.

Training in the identification and control of invasive species will be scheduled for personnel as time and resources permit. Training concerning non-native invasive plants will be coordinated with the Forest Management Bureau's Forest Health Section. Control of non-native invasive species will be target specific and use a variety of methods including appropriately labeled and efficacious herbicides.

Table 6. Non-Native Invasive Plant Species Occurring on TBSF

Common Name	Scientific Name	Treatment Strategy	Acres Impacted	Treatment Status
Air potato	<i>Dioscorea bulbifera</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Brazilian pepper	<i>Schinus terebinthifolia</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Caesar's weed	<i>Urena lobata</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Camphor tree	<i>Cinnamomum camphora</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Chinese tallow	<i>Triadica sebifera</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Cogon grass	<i>Imperata cylindrica</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Coral ardisia	<i>Adisia crenata</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Elephant ear	<i>Xanthosoma sagittifolium</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Guinea grass	<i>Panicum maximum</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Japanese climbing fern	<i>Lygodium japonicum</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Mimosa	<i>Albizia julibrissin</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Old world climbing fern	<i>Lygodium microphyllum</i>	Spot Treatment with herbicide	Scattered plants	Decreasing

Common Name	Scientific Name	Treatment Strategy	Acres Impacted	Treatment Status
Peruvian Primrose willow	<i>Ludwigia peruviana</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Purple sesban	<i>Sesbania punicea</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Showy rattlebox	<i>Crotalaria spectabilis</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Sword fern	<i>Nephrolepis cordifolia</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Torpedo grass	<i>Panicum repens</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Tropical soda apple	<i>Solanum viarum</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Wedelia	<i>Sphagneticola trilobata</i>	Spot Treatment with herbicide	Scattered plants	Decreasing
Wild taro	<i>Colocasia esculenta</i>	Spot Treatment with herbicide	Scattered plants	Decreasing

E. Insects, Disease and Forest Health

Currently there are no significant insect or disease problems on TBSF. In the event of a forest pest outbreak, TBSF resource managers will consult with the Forest Management Bureau's Forest Health Section to formulate an appropriate and effective response.

In compliance with Section 388.4111, F.S. and in Section 5E-13.042, F.A.C., all lands have been evaluated and subsequently designated as environmentally sensitive and biologically highly productive. Such designation is appropriate and consistent with the previously documented natural resources and ecosystem values and affords the appropriate protection for these resources from arthropod control practices that would impose a potential hazard to fish, wildlife, and other natural resources existing on this property. The local arthropod control agencies in Volusia County will be notified of the approval of this plan documenting this designation.

As a result, prior to conducting any arthropod control activities on TBSF, the local agency must prepare a public lands control plan that addresses all concerns that FFS may have for protecting the natural resources and ecosystem values on the state forest. In this regard, FFS will provide the local agency details on the management objectives for TBSF. This public lands control plan must comply with FDACS guidelines and use the appropriate FDACS form. The plan must then be approved and mutually adopted by the county, FFS, and FDACS, prior to initiation of any mosquito control work. Should the local mosquito control district not propose any mosquito control operations on the property, no arthropod control plan is required. See Exhibit W.

F. Use of Private Land Contractors

The forest manager makes ongoing evaluations of the use of private contractors and consultants to facilitate the total resource management activities of this state forest. The opportunities for outsourcing land management work include, or are anticipated to include:

1. Herbicide applications
2. Restoration activities

3. Site preparation activities
4. Reforestation
5. Timber harvesting
6. Biological assessments and mapping
7. Contractors for fixed capital and infrastructure improvements

VII. Proposed Management Activities for Natural Communities

In 2017, FNAI completed an inventory and natural community mapping project on TBSF. Current and historic natural community cover types can be found in Exhibits Q and R, and Table 7. The inventory included managed and altered community types which are habitats that have been impacted by humans and do not fit into FNAI's Natural Community Classification. See Tables 8 and 9.

Table 7. Natural Community Types

Community Type	Historic Acres*	Current Acres*
Basin marsh	96	96
Basin swamp	11,270	11,227
Baygall	972	973
Depression marsh	33	30
Dome swamp	1,130	1,119
Mesic flatwoods	9,540	4,962
Sandhill	58	47
Scrub	342	307
Scrubby flatwoods	661	525
Swamp lake	123	123
Wet flatwoods	2,206	1,566
Wet prairie	879	772
Xeric hammock	N/A	41
Managed and other altered landcover types	N/A	5,523
TOTAL	27,310	27,311

* Rounding errors exist

Table 8. Managed Community Types

Community Type*	Current Acres
Pine plantation	5,125

* Protocol as described in Appendix 2 of FNAI's "Guide to the Natural Communities of Florida", 2010 Edition.

Table 9. Other Altered Landcover Types

Landcover Type*	Current Acres**
Artificial pond	44
Canal/ditch	6
Clearing/regeneration	3
Developed	49
Road	231
Utility corridor	65

Landcover Type*	Current Acres**
TOTAL	398

* Protocol as described in Appendix 2 of FNAI's "Guide to the Natural Communities of Florida", 2010 Edition

** Rounding errors exist

For the purposes of this management plan, restoration is defined as the process of returning ecosystems to the appropriate structure and species composition, based on soil type. Management during this ten-year period will begin with a forest-wide assessment of the fuel loading, timber densities, reforestation needs, and groundcover in order to develop a five-year comprehensive action plan for prescribed burning and other management activities across the forest. Strategies may include thinning pine plantations, mowing or chopping in areas of heavy fuel buildup, application of both dormant and growing season fires, and / or the use of herbicides to control hardwoods and / or hardwood regeneration. Site preparation and reforestation may be required to increase pine stocking in stands with very poor stocking or in restoration efforts. Fire-return intervals are included as a guide and may vary depending upon specific conditions and are intended to attain desired forest and resource management goals. See Table 10.

Table 10. Prescribed Fire Interval Guide on TBSF

Habitat Type	Historic Fire Return Intervals**	TBSF Fire Frequency Goal (Local)	Comments
Basin marsh	Varies	2-4	Frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from surrounding areas.
Basin swamp	Varies	5-20	Fire intervals are highly variable. Ecotones often burn in conjunction with the adjacent uplands, as frequently as every 2 to 5 years.
Baygall	Varies	N/A	Ecotones burned per frequency of adjacent upland habitat type.
Depression marsh	Varies	1-10	Ecotones burned per frequency of adjacent upland habitat type.
Dome swamp	5-100	3-5	Ecotones burned per frequency of adjacent upland habitat type.
Mesic flatwoods	2-4	2-4	Depends on pine species, density, age, and fuel conditions.
Sandhill	1-3	2-4	Frequent low intensity fire preferably within the growing season to reduce hardwood competition and perpetuate longleaf pines and grasses.
Scrub	5-20	5-20	Return intervals in general will match surrounding community types.
Scrubby flatwoods	5-15	3-8	Return intervals in general will match surrounding community types.
Swamp lake	N/A	N/A	Not a fire-dependent community.
Wet flatwoods	3-10	2-4	Depends on pine species, density, age, and fuel conditions. 2-4 years for grassy wet flatwoods, 5-10 years for shrubby wet flatwoods.
Wet prairie	2-3	2-3	Require frequent, low intensity ground fires to maintain groundcover and minimize woody vegetation encroachment.

Habitat Type	Historic Fire Return Intervals**	TBSF Fire Frequency Goal (Local)	Comments
Xeric hammock	Varies	0	When fire does occur, it is nearly always catastrophic and may convert xeric hammock into another community type.

* Includes restoration community acreage / ** As determined by FNAI

The following community descriptions, existing condition descriptions, and management recommendations are taken from a 2017 FNAI mapping project report and the Guide to the Natural Communities of Florida (FNAI 2010), as well as from the knowledge and experience gained by FFS during forest inventory efforts and routine field work on TBSF.

To achieve the objectives outlined in this plan, the following management activities will be performed in the natural and managed communities at TBSF during the next ten-year planning period. Goals, desired conditions, standards, and guidelines provide management area direction. These goals and desired conditions may take many planning cycles to attain.

A. **Basin Marsh**

Description:

Basin marshes are depressional, non-forested wetlands that are typically large and / or embedded in a non-pyrogenic community and thus are not heavily influenced by frequent fires in the surrounding landscape. This type of marsh often develops in large solution depressions that were formerly shallow lakes. The soils are generally acidic, nutrient-poor peats overlying an impervious soil layer. This community type is dominated by herbs or occasionally shrubs that can withstand inundation for most or all of the year.

Grasses and sedges such as soft rush (*Juncus effusus subsp. solutus*), needle rush (*Juncus roemerianus*), maidencane (*Panicum hemitomon*), and sand cordgrass (*Spartina bakeri*) dominate the vegetative cover in all but the deepest areas of marsh where species such as sawgrass (*Cladium jamaicense*) or pickerelweed (*Pontederia cordata*) may be present. Trees are sparse, usually only occupying higher areas in the marsh or around the edge. These can include typical swamp species such as pond cypress (*Taxodium ascendens*), swamp tupelo (*Nyssa sylvatica var. biflora*), red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), or slash pine (*Pinus elliottii*).

Current Conditions:

Basin marshes at TBSF are found as infrequent openings in the large areas of basin swamp and baygall on the northern portion of the forest. The basin marshes on TBSF are mostly isolated in large basin swamps and are difficult to reach. Due to their inaccessibility basin marshes are assumed to be generally in good condition. Some minor disturbances to some of the basin marshes have occurred due to past logging activities and wildfires in surrounding basin swamps. One basin marsh located between Scoggin and Indian Lakes appears to hold water for long periods, but is otherwise dominated by herbs with a widely scattered canopy of pond cypress and clumps of fetterbush (*Lyonia lucida*) and buttonbush (*Cephalanthus occidentalis*). Carolina redroot (*Lachnanthes caroliniana*) dominates the herbaceous groundcover in these communities.

Fire Regimes:

Fire intervals in basin marshes are highly variable, with natural fires more likely at the end of prolonged dry seasons. Frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from surrounding areas.

Management Needs:

Natural fires are presumed to have rarely burned across the basin marshes on TBSF. Prescribed fires and wildfires from surrounding upland communities would burn into the adjacent wetlands and would be extinguished just within the shallow peripheral areas of the wetlands.

Restoring historic hydrological regimes and applying fire to nearby uplands (where appropriate) is the recommended focus for forest management of basin marshes. Occasional fires within the edges of basin marshes are necessary to remove encroaching woody vegetation and reduce the buildup of organic soils. Removing feral hogs (*Sus scrofa*) is desirable in areas where these animals are impacting basin marshes and other wetlands.

B. Basin Swamp**Description:**

Basin swamps are forested depressions that are typically large and / or embedded in a non-pyrogenic community and thus are not heavily influenced by frequent fires in the surrounding landscape. The soils are generally acidic, nutrient-poor peats overlying an impervious soil layer. This community type is dominated by hydrophytic trees and shrubs that can withstand inundation for most or all of the year, including bald (or pond) cypress (*Taxodium distichum*) and / or swamp tupelo (*Nyssa sylvatica* var. *biflora*). Slash pine (*Pinus elliottii*) may be found on hummocks within the swamp. Basin swamps have variable shrub layers and sparse to dense herbaceous species cover. A mature canopy is usually closed and dominated by pond cypress, swamp tupelo, slash pine, and to a lesser extent, red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanicus*), diamond-leaved oak (*Quercus laurifolia*), loblolly bay (*Gordonia lasianthus*), swamp bay (*Persea palustris*), and sweetbay (*Magnolia virginiana*). In most cases, shrubs do not form a dense layer below the canopy or in the ecotones of the swamps but are typically scattered throughout the swamp. In densely forested portions of basin swamps, herbs are sparse. Epiphytes and vines may be common.

Basin swamps at TBSF are extensive wetlands covering more than 30% of the site. These swamps – Bennett Swamp, Tiger Bay, Little Tiger Bay, and Clark Bay – are oriented north/south and form the matrix community in the southwestern portion of the forest. Basin swamps appear much the same as baygall communities on the 1943 aerial photographs, as medium to dark gray forested patches, and are difficult to distinguish in the complex mosaic that also includes wet flatwoods and basin marsh. Ecotones between the basin swamp and adjacent flatwoods communities were historically occupied by a wet prairie community.

Current Conditions:

The basin swamps found on TBSF have experienced a variety of hydrological alterations over time. These alterations include the construction of drainage ditches, and roads and the reduction of ground water levels due to municipal water wells located within the forest.

Evidence of past logging activities can also be found in many parts of the basin swamps. In 1998, during a period of extreme drought, wildfires swept through parts of the basin swamps, killing most of the natural vegetation. After the wildfires, timber salvage and timber restoration activities were conducted in limited areas of the basin swamps. The tree canopy in the areas that were disturbed by the wildfire remain fairly open. The understory in these areas consists of shrubs and vines, such as Carolina willow (*Salix caroliniana*), saltbush (*Baccharis halimifolia*), wax myrtle (*Myrica cerifera*), dogfennel (*Eupatorium capillifolium*), muscadine (*Vitis rotundifolia*), and sawtooth blackberry (*Rubus pensilvanicus*).

In unburned areas, the basin swamp canopy is dominated by pond cypress (*Taxodium ascendens*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), slash pine (*Pinus elliottii*), red maple (*Acer rubrum*), sweetbay (*Magnolia virginiana*), and loblolly bay (*Gordonia lasianthus*). Shrub cover varies from open to dense and typically consists of fetterbush (*Lyonia lucida*), buttonbush (*Cephalanthes occidentalis*), swamp bay (*Persea palustris*), Virginia willow (*Itea virginica*), and occasional highbush blueberry (*Vaccinium corymbosum*). Herb cover is often dominated by Walter's sedge (*Carex striata*), toothed midsorus fern (*Blechnum serrulatum*), and Virginia chain fern (*Woodwardia virginica*). Other herbs include lizard's tail (*Saururus cernuus*) and sedge (*Carex* sp.). Vines include poison ivy (*Toxicodendron radicans*), greenbrier (*Smilax laurifolia*), and muscadine (*Vitis rotundifolia*). Epiphytes are commonly seen on trees, mainly Florida air-plant (*Tillandsia simulata*) and Spanish moss (*Tillandsia usneoides*).

Fire Regimes:

Fire intervals in basin swamps are highly variable. The lowest portions of basin swamps rarely, if ever, burn. Graminoid-dominated ecotones often burn in conjunction with the adjacent uplands, and these may burn as frequently as every two to five years.

Fire is more frequent in cypress dominated swamps and may be absent or rare in hardwood swamps. Slash pine (*Pinus elliottii*), pond pine (*Pinus serotina*), and cypress can establish in these areas immediately after a fire, benefiting from ample sunlight and available bare mineral soils; they are also tolerant of moderate fires once past a certain size, thus systems dominated by these two species may have been subjected to fires every 10 to 20 years.

Management Needs:

Little active management should be required for this community type. Prescribed fire from surrounding upland communities should be allowed to burn into the edges of the basin swamp as conditions permit. The construction of pre-suppression fire lines along ecotones should be avoided and fire lines that have been constructed in the past, should be rehabbed.

Long-term timber management activities in this community will be limited to timber inventory and monitoring. In areas where the hydrology has been altered by the construction of roads, ditches or firelines, all efforts should be made to restore normal hydrological function.

C. Baygall

Description:

Baygall is an evergreen, forested wetland typically at the base of sandy slopes where water seepage maintains a saturated peat substrate. It may form an ecotone between uplands and

swamps, or it may develop as a larger bay swamp in isolated basins or broad areas of seepage. These forests are dominated by a tall canopy of abundant loblolly bay (*Gordonia lasianthus*), sweetbay (*Magnolia virginiana*), and slash pine (*Pinus elliottii*), with swamp bay (*Persea palustris*) and fetterbush (*Lyonia lucida*) often forming a dense thicket in the understory.

Current Conditions:

Many of the baygalls on TBSF retain a dense canopy, with scattered areas of open canopies and a dense understory of shrubs. Due to the absence of fire in these communities on TBSF, in some areas baygalls have expanded into adjacent flatwoods. The ecotones of some of the lakes and swamps have also been invaded by baygall species resulting in a composition of upland and wetland species within these zones.

Baygall vegetation includes a canopy dominated by loblolly bay (*Gordonia lasianthus*), slash pine (*Pinus elliotti*), and sweetbay (*Magnolia virginiana*). Shrubs are abundant, forming an impenetrable thicket in the absence of a canopy, and composed of mostly fetterbush (*Lyonia lucida*) and swamp bay (*Persea palustris*), but swamp doghobble (*Leucothoe racemosa*), coastal doghobble (*Leucothoe axillaris*), wax myrtle (*Myrica cerifera*), sawtooth blackberry (*Rubus pensilvanicus*), saw palmetto (*Serenoa repens*), and highbush blueberry (*Vaccinium corymbosum*) may also be found. Vines such as laurel greenbrier (*Smilax laurifolia*) and eastern poison ivy (*Toxicodendron radicans*) may be frequent.

Fire Regimes:

Baygall should burn infrequently, perhaps only a few times each century in the deepest baygalls. Although the saturated soils and humid conditions within baygalls typically inhibit fire, droughts may create conditions that allow them to burn catastrophically. These fires not only destroy the canopy, but also may ignite the deep peat layers that can smolder for weeks, or even months.

Management Needs:

As conditions warrant, prescribed fires in adjacent uplands should be allowed to burn into baygall edges to maintain grassy ecotones. Plowed firebreaks and ditches should be restored, and hydrology should be returned to its natural state where possible. Areas of previous disturbance should be monitored and treated as needed for non-native invasive plants.

D. Depression Marsh

Description:

Depression marshes are isolated, non-forested wetland basins that are imbedded in a pyrogenic matrix community such as pine flatwoods or sandhill. These marshes typically have concentric zones of vegetation related to the length of hydroperiod and depth of flooding. Depression marshes are distinguished from basin marshes principally by their landscape position which subjects them to more frequent fires. The desired future condition for a depression marsh is a diverse herb dominated community where grasses, sedges, and emergent broadleaf herbs such as soft rush (*Juncus effusus* subsp. *solutus*), Carolina redroot (*Lachnanthes carolina*), maidencane (*Panicum hemitomon*), swamp smartweed (*Polygonum hydropiperoides*), and pickerelweed (*Pontederia cordata*) dominate. Shrub cover is typically very low, and trees are found only on edges.

Current Conditions:

Depression marshes at TBSF are rare; most isolated depressions were historically forested. Moreover, herb dominated depressions tend to be very shallow and may have been small wet prairies rather than marshes with zones of vegetation. Most depression marshes on TBSF have been impacted by past forestry activities, and some have been partly or entirely converted to slash pine (*Pinus elliottii*) plantations. Hydrology alteration by ditching and road construction also affects many depression marshes on TBSF. The depression marshes that have not been converted to pine plantation have an open shrub layer of peelbark St. John's wort (*Hypericum fasciculatum*), and a dense cover of maidencane (*Panicum hemitomon*) and Virginia chain fern (*Woodwardia virginica*).

Fire Regimes:

Fire is an important factor in maintaining a depression marsh. Without fire, shrubs and trees can encroach and peat can accumulate. Depression marshes likely burned irregularly every one to 10 years depending on water levels and when adjacent communities burned. Fires generally occurred early (April - June) in the lightning season when water was low and surrounding communities were dry.

Management Needs:

Management of depression marshes on TBSF should focus on the removal of planted slash pine where possible. Prescribed burns in adjacent uplands should be allowed to burn into depression marshes. Early growing season burns are recommended to control shrub encroachment. Pre-suppression firelines should be avoided and firelines that have been constructed in the past should be rehabbed if possible.

E. Dome Swamp**Description:**

Dome swamps are isolated, shallow, forested wetland basins that are imbedded in a pyrogenic matrix community such as pine flatwoods. These swamps often have domed profiles resulting from smaller trees growing around the edges and larger trees growing in the interior. Dome swamps have peat soils that are thickest toward the center and are generally underlain with acidic soils. Dome swamps are distinguished from basin swamps principally by their often more circular shape, smaller size, and higher historical fire frequency due to landscape position.

The mature canopy is dominated by pond cypress (*Taxodium ascendens*) and / or swamp tupelo (*Nyssa sylvatica* var. *biflora*) and may also have a mixture of bay species such as sweetbay (*Magnolia virginiana*) as well as a midstory of scattered tall shrubs including dahoon (*Ilex cassine*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), and swamp bay (*Persea palustris*). The herbaceous layer is sparse in the interior, becoming denser on the edges, and dominated by various hydrophytic herbs. Species composition and hydroperiods are similar to basin swamps, but generally with fewer shrubs and greater herbaceous cover and diversity. Dome swamps usually have a diverse herbaceous ecotone with the surrounding pine dominated community, created through frequent fires that extinguish naturally along the edge of the dome.

Current Conditions:

Dome swamps are widely distributed at TBSF embedded in flatwoods and prairies. Many of the dome swamps on TBSF have been disturbed by past silvicultural activities. Prior to acquisition, merchantable cypress and pine were harvested out of select dome swamps and some of the smaller dome swamps were planted with slash pine (*Pinus elliottii*) during reforestation activities. Many other dome swamps have also been disturbed by the encroachment of loblolly bay (*Gordonia lasianthus*) and slash pine (*Pinus elliottii*)

Relatively intact and good quality dome swamps on TBSF have a canopy dominated by pond cypress (*Taxodium ascendens*), slash pine (*Pinus elliottii*), and swamp tupelo (*Nyssa sylvatica* var. *biflora*). The subcanopy consists of young cypress, dahoon (*Ilex cassine*), and occasionally swamp red bay (*Persea palustris*). The shrubs are peelbark St. John's wort (*Hypericum fasciculatum*), wax myrtle (*Myrica cerifera*), fetterbush (*Lyonia lucida*), common buttonbush (*Cephalanthus occidentalis*), and occasionally highbush blueberry (*Vaccinium corymbosum*). The groundcover is a mixture of Virginia chain fern (*Woodwardia virginica*), maidencane (*Panicum hemitomon*), Walter's sedge (*Carex striata*), ten-angled pipewort (*Eriocaulon decangulare*), and witchgrass (*Panicum scabriusculum*). Spanish moss (*Tillandsia usneoides*) and southern needleleaf (*Tillandsia setacea*) are common epiphytes found on the cypress trees.

Fire Regimes:

Fire is essential for the maintenance of dome swamps, limiting hardwood encroachment, particularly by bay species, and peat buildup while encouraging herbaceous growth. The fire frequency is greatest at the periphery of the dome swamp where a normal fire cycle might be as short as three to five years. The interior of large dome swamps burn less frequently because of standing water or soil saturation.

Management Needs:

Prescribed fires from adjacent upland communities should be allowed to burn into dome swamps and extinguish naturally, as conditions permit. Pre-suppression firelines should not be established around this community and previously established firelines should be rehabbed when possible. Timber management activities for this community will primarily consist of timber inventory, monitoring and restoration activities. Non-native invasive plants will be monitored and treated, as needed.

F. Mesic Flatwoods (including restoration areas)**Description:**

Mesic flatwoods are forests consisting of various southern pine species, but most often containing longleaf pine (*Pinus palustris*). Slash pine (*Pinus elliottii*) is present more frequently in transitions to adjacent wetlands or on more calcareous soils. There is little or no subcanopy and tall shrub layer other than pine recruitment. The shrub layer is moderately dense with an average height that does not generally exceed four feet. Typical species include saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), tarflower (*Bejaria racemosa*), coastal plain staggerbush (*Lyonia fruticosa*), wax myrtle (*Myrica cerifera*), winged sumac (*Rhus copallinum*), netted pawpaw (*Asimina reticulata*), running oak (*Quercus elliottii*), dwarf live

oak (*Quercus minima*), shiny blueberry (*Vaccinium myrsinites*), and a diversity of other low shrubs. Herb cover is also moderately dense and dominated by grasses which help to carry frequent fires, especially wiregrass (*Aristida stricta*). Herbaceous species diversity is high in good quality mesic flatwoods. Vines occur rarely. Community types embedded within mesic flatwoods include dome swamp, basin swamp, depression marshes, wet flatwoods, and hydric hammocks.

Current Conditions:

Mesic flatwoods were historically widespread throughout TBSF. All of the flatwoods communities on TBSF have been disturbed by past logging of the natural longleaf pine (*Pinus palustris*) and the establishment of slash pine (*Pinus elliottii*) plantations. Although large areas of unthinned plantations remain, ongoing thinning operations, as well as severe wildfires, have transformed much of the former closed canopy plantations into an open canopied forest with an understory dominated by shrubs and herbs. These areas of open canopy have been designated as “restoration” mesic flatwoods. A few areas have either been in restoration condition for many years or were possibly never converted to slash pine (*Pinus elliottii*) plantations; these were designated as mesic flatwoods, although this distinction is not entirely obvious.

The 1998 wildfires burned a large percentage of the flatwoods communities. After the wildfires, most of the burned timber was harvested during salvage operations. Site preparation activities were conducted after the salvage operation was completed. Slash pine (*Pinus elliottii*), longleaf pine (*Pinus palustris*) and a small amount of loblolly pine (*Pinus taeda*) were planted in these areas. Today, these areas consist of a dense canopy of pine, with an understory dominated by saw palmetto and gallberry.

Typical vegetation includes an open canopy of mature slash pine (*Pinus elliottii*) over saw palmetto that average three to four feet tall. Other shrubs include gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), Coastal Plain staggerbush (*Lyonia fruticosa*), tarflower (*Bejaria racemosa*), dwarf huckleberry (*Gaylussacia dumosa*), and shiny blueberry (*Vaccinium myrsinites*). Herb cover is highly variable, but good quality sites have wiregrass, white top aster (*Oclemena reticulata*), narrowleaf silkgrass (*Pityopsis graminifolia*), bracken fern (*Pteridium aquilinum*), blackroot (*Pterocaulon pycnostachyum*), and lopsided Indian grass (*Sorghastrum secundum*). One block of planted longleaf pine has intact shrub and herbaceous strata with short saw palmetto and dwarf live oak (*Quercus minima*) and abundant wiregrass.

Several populations of the federally endangered Rugel’s pawpaw (*Deeringothamnus rugelii*) are located in restoration mesic flatwoods on TBSF.

Fire Regimes:

Mesic flatwoods depend on frequent, low-intensity fires to maintain a diverse herbaceous layer and provide mineral soils for longleaf pine regeneration. Repeated applications of prescribed fires on a two to four-year cycle are critical to restoring high quality groundcover to the flatwoods.

Management Needs:

Management of mesic flatwoods will be achieved primarily through the application of prescribed fire and silvicultural operations. As mesic flatwoods stands continue to mature, fire will be introduced into these stands during the dormant season. These early fires will help to reduce fuel load, promote forest health and promote the growth of natural groundcover. After repeated applications of dormant season fires, the stands may be transitioned into growing season burns. At this point frequent, low-intensity fires can be used to establish and maintain a diverse herbaceous groundcover layer.

Timber management in the mesic flatwoods on TBSF will continue to be focused on creating uneven-aged stands of long leaf pine and even-aged stands of slash pine. These management strategies will be accomplished by a variety of silvicultural techniques.

In mesic flatwoods communities, where uneven-aged management is best suited, a strategy of thinning and prescribed burning will be used to meet the long-term goal. The long-term goal is for these communities to develop at least three distinct age classes that are intermingled within the stand, and at least one of the age classes exhibiting old growth characteristics. This will be accomplished through a series of timber harvests that create an age distribution in which most of the trees in the stand are in the younger age classes.

G. Sandhill (including restoration areas)**Description:**

Sandhills get their name from the gently rolling hills of sand on which they are located. Their soils are composed of deep, well drained sands. Sandhills are well-drained, relatively open pinelands of longleaf pines (*Pinus palustris*) and other southern pines with a sparse understory of deciduous oaks, in particular turkey oak (*Quercus laevis*). Shrubs are sparse and include scrub oaks, turkey oak, gopher apple (*Licania michauxii*), and prickly pear (*Opuntia humifusa*). Herbs are dense and diverse dominated by wiregrass (*Aristida stricta*), but with a diversity of other species such as narrowleaf silkgrass (*Pityopsis graminifolia*), bracken fern (*Pteridium aquilinum*), queen's delight (*Stillingia sylvatica*), anisescented goldenrod (*Solidago odora*), milk peas (*Galactia* spp.), white top aster (*Symphotrichum tortifolius*), tall ironweed (*Vernonia angustifolia*), summer farewell (*Dalea pinnata*), greeneyes (*Berlandiera pumila*), gayfeather (*Liatris* spp.), pinweeds (*Lechea* spp.), frostweeds (*Helianthemum* spp.), and pineywoods dropseed (*Sporobolus junceus*).

Current Conditions:

At TBSF, a few small patches of sandhill occurred historically within larger areas of scrubby flatwoods in the northern portion of the forest. All of the historic sandhill communities on TBSF have been subjected to years of fire suppression and intensive timber production, largely occurring prior to state ownership. Some restoration activities have been conducted on these sites. These restoration activities include harvesting of off-site sand pine (*Pinus clausa*), the selected removal of large sand live oaks (*Quercus geminata*) and periodic removal of sand pine (*Pinus clausa*) regeneration.

The remnant vegetation in the restoration sandhills includes turkey oak, bluejack oak (*Quercus incana*), scattered shrubs and small trees of Chapman's oak (*Quercus chapmanii*),

sand live oak (*Quercus geminata*), and myrtle oak (*Quercus myrtifolia*), plus Adam's needle (*Yucca filamentosa*), gopher apple (*Licania michauxii*), rusty staggerbush (*Lyonia ferruginea*), pricklypear (*Opuntia humifusa*), winged sumac (*Rhus copallinum*), and saw palmetto (*Serenoa repens*). The herbaceous layer is sparse and contains wiregrass, pinewoods milkweed (*Asclepias humistrata*), Carolina frostweed (*Helianthemum carolinianum*), narrowleaf silkgrass (*Pityopsis graminifolia*), and tread softly (*Cnidoscolus stimulosus*).

Fire Regimes:

Historically, sandhill burned from wildfires ignited by lightning during the early thunderstorm season (April - June) every one to three years. Low intensity surface fires are required to maintain a healthy sandhill community. These fires reduce hardwood encroachment as well as stimulate regeneration of longleaf pines and seed germination of herbs. Without frequent fires, sandhills will succeed to xeric hammock or other hardwood-dominated system.

Management Needs:

Restoration of this community should focus on the control of sand pine seedlings and groundcover restoration. Both tasks can be accomplished with the use of frequent prescribed burns. The timing of fires should ideally be during the early lightning season or as close to this period as possible.

Groundcover restoration should focus on increasing wiregrass abundance. Application of growing season prescribed burns at two to four-year intervals will be most effective for restoring and managing the natural ground cover. Areas of cut sand live oaks will require more frequent growing season burns or mechanical treatments to suppress root sprouting. FFS may consider seeding or transplanting of wiregrass to facilitate burning through these areas. Roller chopping should be avoided to protect the remaining native groundcover and to prevent weedy competition.

H. Scrub**Description:**

Scrub is generally found on sandy, acidic, well-drained soils. There may or may not be a canopy of sand pine (*Pinus clausa*). Both the tall and short shrub layers are moderate to dense and dominated by scrub oaks: sand live oak (*Quercus geminata*), Chapman's oak (*Quercus chapmanii*), and myrtle oak (*Quercus myrtifolia*). The overall height is below six feet, and patches of bare sand are common. A diversity of other xerophytic shrubs may be present. The herbaceous layer, though sparse, consists primarily of sandyfield beaksedge (*Rhynchospora megalocarpa*). Vines are infrequent.

Current Conditions:

Several areas of historic scrub are present at TBSF on a series of white sand islands along both sides of Rima Ridge Road. The native scrub communities on TBSF were largely converted to pine plantation decades ago. These scrub communities were planted with longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) and were managed for timber production. Growth of the trees planted in these plantations was usually stunted due to the xeric conditions. Other scrub communities that were not converted to pine plantation have a dense canopy of sand pine (*Pinus clausa*) and sand live oak (*Quercus geminata*).

Over the past 10 years, restoration activities have been conducted on portions of the scrub on TBSF. These activities include timber harvest of offsite sand pine (*Pinus clausa*), mowing, chopping, burning, and selective removal of sand live oak (*Quercus geminata*). The understory layer in these areas have been burned or treated mechanically at least once every two to five years.

Typical scrub vegetation on TBSF consists of an open canopy of sand pine or slash pine, with a dense shrub layer and exposed patches of white sand. The tall shrub layer is often 10 to 15 feet tall, sparse to moderately dense, and composed of sand live oak (*Quercus geminata*), myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), and rusty staggerbush (*Lyonia ferruginea*). The short shrub layer is typically dense and composed of sand live oak, Chapman's oak, myrtle oak, saw palmetto (*Serenoa repens*), and shiny blueberry (*Vaccinium myrsinites*). Herb cover is sparse, represented by large-fruited beakrush (*Rhynchospora megalocarpa*) and threeawn grass (*Aristida gyrans*). Florida rosemary (*Ceratiola ericoides*) is occasionally present.

Several small populations of large-flowered rosemary (*Conradina grandiflora*), state-listed as threatened, have been observed growing in the scrub communities located along Rima Ridge Road. The distribution of this plant has benefitted from the more open habitat created by mechanical treatments.

Fire Regimes:

Scrub fire regimes are highly variable, depending on landscape settings and dominant vegetation. Current scientific research suggests oak-dominated scrub would have naturally burned every six to 19 years. More frequent fires maintain optimal shrub heights for scrub jay habitat. Scrub fires are often high intensity and require careful application.

Management Needs:

The overall goal of scrub management, is to return the community back to a condition where it can be managed with regular prescribed fire. Prescribed fire is the preferred management tool for scrub communities. However, in areas where the height of the vegetation precludes the safe and effective use of prescribed fire, mechanical treatments may be used alone or in conjunction with prescribed fire to reduce the height of the midstory. As the scrub communities reach their desired conditions, prescribed fire from surrounding upland communities may be allowed to burn into the scrub. This will create a more mosaic pattern of unburned fuels, that will benefit a wide variety of plants and animals. Timber harvesting will be used selectively within scrub communities where appropriate and economically feasible.

A network of roads and firelines have been developed through the scrub community. This network has fragmented the community and created unnatural firebreaks. All unnecessary roads and firebreaks should be blocked off and rehabilitated.

I. Scrubby Flatwoods (including restoration areas)

Description:

Scrubby flatwoods are a well-drained pine-dominated community intermediate between scrub and mesic flatwoods. These communities are characterized by a relatively open canopy of southern pine species with a sparse shrubby understory and areas of open white sand. The vegetation consists of a combination of scrub and mesic flatwoods species.

Scrubby flatwoods have a tree canopy of longleaf pine (*Pinus palustris*) and/ or slash pine (*Pinus elliottii*) growing over a shrub stratum dominated by scrub species such as sand live oak (*Quercus geminata*), rusty staggerbush (*Lyonia ferruginea*), Chapman's oak (*Quercus chapmanii*), and myrtle oak (*Quercus myrtifolia*) mixed with typical mesic flatwoods species including saw palmetto (*Serenoa repens*), and a diversity of other low mesic shrubs. The herbaceous groundcover is patchy and usually has some wiregrass (*Aristida stricta*), and a mix of other herbs. Vines are present occasionally.

Current Conditions:

The northern half of TBSF has several patches of historic scrubby flatwoods. Scrubby flatwoods at TBSF occur along with scrub on a series of white sand islands along both sides of Rima Ridge Road. The scrubby flatwoods communities on TBSF have largely been converted to longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*) plantation. Many of these plantations were destroyed by wildfires in 1998. Subsequently, they have been replanted with longleaf pine (*Pinus palustris*). Due to the xeric nature of this community, most of the pines that were planted exhibit stunted growth.

Vegetation in both scrubby flatwoods and restoration scrubby flatwoods has a regenerating canopy of young longleaf pine or slash pine and may have a remnant tall canopy of slash pine. Some areas of scrubby flatwoods are dominated by tall sand live oaks (*Quercus geminata*) verging on the formation of a xeric hammock due to fire exclusion. The shrub layer may be dense but is usually shorter and more open in restoration areas with ongoing management. Shrubs are dominated by sand live oak, myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*), fetterbush (*Lyonia lucida*), Coastal Plain staggerbush (*Lyonia fruticosa*), deerberry (*Vaccinium stamineum*) and saw palmetto (*Serenoa repens*). The groundcover often has some wiregrass (*Aristida stricta*).

Fire Regimes:

Scrubby flatwoods natural fire regime ranges from five to 15 years, and prescribed fire regimes generally range from three to eight years. In TBSF, scrubby flatwoods likely burned along with the adjacent mesic flatwoods, sandhill, or scrub. Sparse groundcover and incombustible scrub oak leaf litter may reduce the occurrence of fires leading to a slightly longer average fire return interval than is the case for mesic flatwoods. Variability in season and frequency of prescribed fires should produce a mosaic of burned and unburned patches desirable for maintaining high biotic diversity in this community.

Management Needs:

The continued removal or thinning of planted slash pine (*Pinus elliottii*) should be a priority. As the planted longleaf (*Pinus palustris*) stands continue to mature, prescribed fire should be

introduced into the stands. In areas where wiregrass (*Aristida stricta*) is not present, roller chopping maybe considered to help reduce the woody understory and re-establish a natural fire-return interval. After the natural fire-return intervals have been established, prescribed fires from adjacent mesic flatwoods should be allowed to burn into the scrubby flatwoods.

A network of roads and firelines has been developed through the scrubby flatwoods community. This network has fragmented the community and created unnatural firebreaks within the community. All unnecessary roads and firebreaks should be blocked off and rehabilitated.

J. Swamp Lake

Description:

Swamp lakes are shallow open water zones, with or without floating and submerged aquatic plants, that are surrounded by swamp. They are generally permanent water bodies, although water levels often fluctuate substantially, and they may become completely dry during extreme droughts. They are typically lentic water bodies occurring in confined basins or depressions with a substrate composed primarily of peats or sands.

Swamp Lakes may have originated from one or more of the following geological processes: (1) solution of the underlying limestone and subsequent collapse of the surface to form a depression; (2) lowering of sea levels to isolate ancient coastal features, such as lagoons or dune swales; or (3) isolation of ancient river systems within relatively confined basins.

Current Conditions:

The lakes on TBSF appear to be unchanged in overall size and shape from 1943. These lakes are open water with a fringe of mostly herbaceous vegetation around the edges that includes sawgrass (*Cladium jamaicense*), dogfennel (*Eupatorium capillifolium*), maidencane (*Panicum hemitomon*), panic grass (*Panicum* sp.), and broadleaf cattail (*Typha latifolia*). The invasive exotic Peruvian primrosewillow (*Ludwigia peruviana*) was seen colonizing the edges of Sawgrass and Indian lakes.

Fire Regimes:

Not a fire dependent community.

Management Needs:

Management of lakes should focus on maintaining surrounding upland habitats. Logging and road maintenance may increase sediment runoff to adjacent water bodies. Monitor water quality.

K. Wet Flatwoods (including restoration areas)

Description:

Wet flatwoods are characterized as relatively open-canopy forests of pines with a thick shrubby understory and very sparse groundcover, or a fire-maintained, sparse understory and a dense groundcover of hydrophytic herbs and shrubs. Vegetation may be very similar to mesic flatwoods, but often with little or no saw palmetto. The canopy is typically longleaf pine (*Pinus palustris*) or slash pine (*Pinus elliottii*).

Current Conditions:

Most of the historic wet flatwoods on TBSF were converted to slash pine (*Pinus elliottii*) plantation by previous land owners. The slash pine (*Pinus elliottii*) in these plantations are planted on bedded rows and form stands that now exhibit closed canopies. The natural groundcover in most of these communities has been greatly reduced by site-preparation operations, shading, and fire exclusion. However, recent management activities, as well as some wildfires, have thinned some of the thicker pine stands which has allowed light to reach the groundcover and promote a more natural shrub and herbaceous layer. As these stands continue to experience more frequent fire, stand structures and compositions should begin to resemble those of natural wet flatwoods.

In general, the native herbaceous groundcover of wet flatwoods on TBSF (including restoration areas) is sparse and weedy. The former pine plantations are typically even-aged, thinned stands of slash pine over a fire-suppressed shrub layer dominated by gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), blue huckleberry (*Gaylussacia frondosa* var. *tomentosa*), saw palmetto (*Serenoa repens*), and / or loblolly bay. Bushy bluestem (*Andropogon glomeratus*), blue maidencane (*Amphicarpum muhlenbergianum*), spadeleaf (*Centella asiatica*), woolly witchgrass (*Dichanthelium scabriusculum*), Carolina redroot (*Lachnanthes caroliniana*), cinnamon fern (*Osmunda cinnamomea*), royal fern (*Osmunda regalis* var. *spectabilis*), rosy camphorweed (*Pluchea baccharis*), Virginia chain fern (*Woodwardia virginica*), beaksedges (*Rhynchospora* spp.), and yellow-eyed grasses (*Xyris* spp.) are common herbs. Wiregrass (*Aristida stricta*) is very rare.

Fire Regimes:

Historically, natural fires may have occurred every three to 10 years in wet flatwoods communities. For management purposes, prescribed fires may be more advisable on a two to four-year cycle. This reduces woody encroachment, sustains herbaceous species, and aids in preventing heavy fuel loads that can lead to catastrophic wildfires.

Management Needs:

Management of wet flatwoods will be achieved primarily through the application of prescribed fire and silvicultural operations. Fire will be introduced into unburned wet flatwood stands during the dormant season. These initial fires will help to reduce fuel loads, promote forest health and the growth of natural groundcover. After repeated applications of dormant season fire, the stands may be transitioned into growing season burns. Low-intensity fires can be used to establish and maintain a diverse herbaceous groundcover layer.

Timber management in the wet flatwoods on TBSF will continue to be focused on creating uneven-aged stands of long leaf pine and even-aged stands of slash pine. These management strategies will be accomplished using a variety of timber harvesting techniques. Each stand will be evaluated to determine which harvest technique will be used.

In wet flatwoods communities, where uneven-aged management is best suited, a strategy of thinning and prescribed burning will be used to meet the long-term goal of developing at least three distinct age classes, with at least one of the age classes exhibiting old growth

characteristics. This will be accomplished through a series of timber harvests that create an age distribution in which most of the trees in the stand are in the younger age classes.

L. Wet Prairie (including restoration areas)

Description:

Wet prairie is a herbaceous community found on continuously wet, but not inundated, soils on somewhat flat or gentle slopes between lower lying marshes, shrub bogs, or swamps and slightly higher wet or mesic flatwoods. Trees and shrubs are absent or very sparse. These communities are often dominated by wiregrass (*Aristida stricta*) but may be composed of other graminoids.

Current Conditions:

At TBSF, historic wet prairies occur as sometimes broad ecotones between flatwoods and swamps. Extensive planting of slash pine plantations has affected most historic wet prairies on TBSF. Slash pine was usually planted well into the edge of the prairie, and seedlings have invaded even further.. Recent management activities have thinned many planted slash pine stands, and prescribed fires have been effective in reducing pine encroachment.

Wet prairies that appeared to have a reduced pine canopy were mapped as “restoration” wet prairies. Some of these areas have a relatively high-quality groundcover with wiregrass (*Aristida stricta*) present.

The less disturbed restoration wet prairies often have a planted or invading young slash pine canopy as well as scattered pond cypress (*Taxodium ascendens*). The shrub cover consists almost entirely of peelbark St. John's wort (*Hypericum fasciculatum*) with an occasional wax myrtle (*Myrica cerifera*). The dense herbaceous vegetation includes yellow colic-root (*Aletris lutea*), blue maidencane (*Amphicarpum muhlenbergianum*), bluestem (*Andropogon* sp.), wiregrass, spadeleaf (*Centella asiatica*), woolly witchgrass (*Dichanthelium scabriusculum*), pink sundew (*Drosera capillaris*), tenangle pipewort (*Eriocaulon decangulare*), dogfennel (*Eupatorium capillifolium*), Carolina redroot (*Lachnanthes caroliana*), whitehead bogbutton (*Lachnocaulon anceps*), royal fern (*Osmunda regalis* var. *spectabilis*), panic grass (*Panicum* sp.), rosy camphorweed (*Pluchea baccharis*), starrush white-top (*Rhynchospora colorata*), beaksedge (*Rhynchospora* sp.), rosegiant (*Sabatia* sp), Virginia chain fern (*Woodwardia virginica*), and yellow-eyed grass (*Xyris* sp.). Hooded pitcherplant (*Sarracenia minor*), state-listed as threatened, occurs infrequently.

Fire Regimes:

Wet prairie naturally burns on a frequency similar to that of wet and mesic flatwoods, every two to three years during the months of April through June. Wet prairies require frequent, low- intensity fire to maintain graminoid groundcover and minimize woody vegetation. The fine fuels that dominate this community, especially sand cordgrass, are highly flammable and carry fire quickly across the landscape. Frequent fires may be helpful in limiting further pine encroachment into already disturbed prairies.

Management Needs:

As with the flatwoods, management goals for the wet prairies on TBSF should focus on

restoring areas through frequent prescribed fires, reduction of pine overstory, groundcover restoration, and returning hydrology to natural conditions. Fire at short intervals (every two to three years) is important to maintain the diversity of these communities and prevent shrub encroachment. Timing of fires ideally should be during the early lightning season (April - June) or as close to this period as practicable. Frequent prescribed fires should also be applied to disturbed areas to reduce the dense shrub cover and encourage native species recruitment and colonization. Pine plantations within historic prairies should be clear-cut. In areas where bedding from past pine plantations disrupts natural hydrology, restoration should focus on leveling the beds, wherever possible.

M. Xeric Hammock

Description:

Xeric hammock is characterized as a scrubby, closed-canopied forest with large sand live oaks (*Quercus geminata*) and little understory other than saw palmetto (*Serenoa repens*). It is often considered an advanced successional stage of scrub or sandhill. The exact vegetation composition depends on the original community from which it developed.

Current Conditions:

Xeric hammocks at TBSF currently occupy xeric uplands along Rima Ridge, but were probably not present historically. Xeric hammocks along Rima Ridge Road appear to have developed from historic scrubby flatwoods and sandhill communities. Some hammocks are also sites for campgrounds and have a cleared understory.

The canopy is of large sand live oak (*Quercus geminata*) and a few longleaf pine (*Pinus palustris*) or slash pine (*Pinus elliotii*). Small trees or shrubs of sandhill and scrub oaks are scattered and include Chapman's oak (*Quercus chapmanii*), sand live oak, bluejack oak (*Quercus incana*), turkey oak (*Quercus laevis*), and myrtle oak (*Quercus myrtifolia*), as well as netted pawpaw (*Asimina reticulata*), American beautyberry (*Callicarpa americana*), gopher apple (*Licania michauxii*), rusty staggerbush (*Lyonia ferruginea*), wax myrtle (*Myrica cerifera*), deerberry (*Vaccinium stamineum*), saw palmetto (*Serenoa repens*), and Adam's needle (*Yucca filamentosa*). The shaded groundcover is sparse and may include broomsedge bluestem (*Andropogon virginicus*), wiregrass (*Aristida stricta*), yankeeweed (*Eupatorium compositifolium*), Elliott's milkpea (*Galactia elliotii*), bracken fern (*Pteridium aquilinum*), sandyfield beaksedge (*Rhynchospora megalocarpa*), whip nutrush (*Scleria triglomerata*), sarsaparilla vine (*Smilax pumila*), and sweet goldenrod (*Solidago odora*).

Fire Regimes:

The sparsity of herbs and the relatively incombustible oak litter preclude most fires from invading xeric hammock. When fire does occur, it is nearly always catastrophic and may convert xeric hammock into another community type. Xeric hammock only develops on sites that have been protected from fire for 30 or more years.

Management Needs:

If the goal is to return current xeric hammock to scrub or sandhill, measures should be taken to introduce fire into the hammock. This may also require other measures to reduce oak dominance such as mechanical removal or herbicide treatment. However, such restoration is

unlikely to be worth the high cost.

N. Managed Community Types

Pine plantations and pastures represent vegetative communities that the FFS manages as integral components of the agency's multi-use management approach. These managed communities provide both ecological benefits, such as wildlife habitat and ground and surface water filtration, as well as opportunities for generating revenue that can be used to help offset management costs. Management of plantations and pastures within the state forests is conducted at a low level of intensity that further ensures compatibility with other management goals and objectives.

1. Pine Plantation

Description:

Pine plantations on TBSF have been established on historic pine flatwoods, scrub, and sandhill. These plantations consist of planted slash pine (*Pinus elliottii*), longleaf pine (*Pinus palustris*), or loblolly pine (*Pinus taeda*) that have been established utilizing intensive site-preparation techniques.

Current Conditions:

Approximately 30% of the total acreage of TBSF consists of pine plantations. The average age of these plantations is 27 years.

The quality of groundcover in pine plantations on TBSF varies greatly. In most areas, the groundcover consists of a heavy layer of saw palmetto and gallberry, and little herbaceous cover. Other stands resemble the historic community in regard to the structure and composition of the shrub and herbaceous layers.

Fire Regimes:

Burn frequency in pine plantations is highly variable and dependent on many factors, including stand composition and structure, and fuel loading, among others.

Management Needs:

Both even-aged and uneven-aged management strategies will be used on TBSF. Each pine plantation will be evaluated to determine which strategy is most appropriate. Several different considerations are made when determining the most important strategy which include, but are not limited to, appropriate species for the site/soil type, the condition of the understory/groundcover species present, past management history, access, and ability to actively manage the stand. General guidelines for even and uneven-age management are provided below.

In pine stands where even-aged management is best suited, stands will be thinned to achieve a desired stocking basal area. As the stand matures, prescribed fire will be used to reduce fuel loading, promote stand health, and help restore natural ground cover. When the stands reach the rotation age set by the FFS, they will be evaluated for a final harvest. Depending on the current site conditions, this final harvest may be a clear-cut or a seed tree cut. If the stand has been clear-cut, the stand will be site-prepped and planted with

the appropriate pine species. For stands in which a seed tree operation is conducted, natural regeneration will be used, though artificial reforestation should be considered in instances where stands do not naturally establish.

In pine stands where uneven-aged management is best suited, a strategy of thinning and prescribed burning will be used to meet the long-term goal. The overall long-term goal is for these stands to contain multiple, distinct age classes intermingled within the stand, with at least one age class exhibiting old growth characteristics. To accomplish this goal, a series of timber harvests will be used. The goal of the timber harvest is to create a diameter distribution in which the majority of the trees are in the smaller sized diameter classes. As the stands continue to grow, they will be monitored and thinned when appropriate.

O. Other Altered Landcover Types

Description:

Altered landcover types are areas where the natural community has been overwhelmingly altered as a result of human activity. Pine plantation and restoration natural communities are described in separate sections of this report.

The altered landcover types described in this section are often not appropriate areas for restoration. If restoration is desired, the target future condition of the ruderal habitat is dependent on the historic community. Please refer to the appropriate community type for a more specific explanation of the desired future condition.

Current Conditions:

Altered landcover types on TBSF comprise artificial ponds, canals / ditches, clearing / regeneration, developed areas, roads, and utility corridors.

Artificial pond (44 acres) – There are seven artificial ponds mapped on TBSF, apparently built as part of the construction of US 92 and I-4. These ponds occupy former flatwoods adjacent to basin swamp. Most have standing water, but at least one was dry in a recent aerial photograph. Pond edges have scattered shrubs of common buttonbush (*Cephalanthus occidentalis*) and peelbark St. John's wort (*Hypericum fasciculatum*), along with stands of hydrophytic herbs such as maidencane (*Panicum hemitomon*), smallfruit beggarticks (*Bidens mitis*), and flatsedge (*Cyperus* sp.). Floating waterlilies (*Nymphaea* sp.) or other deep-water marsh species may be present.

Canal / ditch (6 acres) – TBSF has several large ditches located mainly in the southern half of the forest. Most of these are mapped along the elevated road that they parallel.

Clearing / regeneration (3 acres) – A few small clearings are mapped currently. One of these appears to be a particularly large firebreak.

Developed (49 acres) – Numerous small parking and picnic areas, as well as campsites are mapped throughout TBSF.

Road (231 acres) – TBSF has a network of dirt and gravel roads. Roads ≥ 5 meters wide are delineated on the current natural community map and may include associated ditches.

Utility corridor (65 acres) – A large powerline right of way runs north / south through the southwestern portion of TBSF. This corridor contains an access road. Vegetation is open and weedy, although some areas of nicer wet prairie vegetation were observed with populations of the state listed threatened species hooded pitcherplants (*Sarracenia minor*) and rose pogonias (*Pogonia ophioglossoides*).

Fire Regimes:

N / A

Management Needs:

How ruderal areas should be managed depends on the specific site under consideration. These areas may be useful for placement of support facilities or may be targeted for restoration of the historic natural community. If left alone, most of these areas are likely to remain in a ruderal state. It may not be practical or desirable to restore some of the altered landcover types (e.g., developed land, roads, etc.) to the historic natural community.

VIII. References

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IX. Glossary of Abbreviations

ARC	Acquisition and Restoration Council
BMP	Best Management Practice
CARL	Conservation and Recreation Lands Acquisition Program
CUP	Consumption Use Permit
DEP	Department of Environmental Protection
DHR	Division of Historical Resources
DRP	Division of Recreation and Parks
FAA	Federal Aviation Administration
F.A.C.	Florida Administrative Code
FDACS	Florida Department of Agriculture and Consumer Services
FFS	Florida Forest Service
FNAI	Florida Natural Areas Inventory
FPL	Florida Power and Light
F.S.	Florida Statutes
FWC	Florida Fish and Wildlife Conservation Commission
NRCS	Natural Resources Conservation Service
SJRWMD	St. Johns River Water Management District
SOR	Save Our Rivers
OALE	DACS Office of Agricultural Law Enforcement
OFW	Outstanding Florida Waters
OPS	Other Personal Services Employment
TBSF	Tiger Bay State Forest
TIITF	Board of Trustees of the Internal Improvement Trust Fund
USFWS	United States Fish and Wildlife Service
WIAM	Wetland Impact Avoidance and Mitigation
WMA	Wildlife Management Area

TIGER BAY STATE FOREST
2022 LAND MANAGEMENT PLAN

EXHIBITS

Exhibit A

Ten-Year Management Accomplishment Summary

Tiger Bay State Forest
10-Year Accomplishments Summary

Site Preparation	Chop Single Pass	Acres	186
	Chop Double Pass	Acres	54
	Burning	Acres	166

Planting	Slash Bareroot	No.	116,200
		Acres	166

Seedling survival checks	Planting Checks	Acres	166
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Timber Stand Improvement	Herbicide Treatment	Acres	45
	Mowing	Acres	926
	Chopping	Acres	221

Timber Sales	Marking	Acres	355
	Cruising	Acres	3,056
	Harvest	Acres	1,782
		Tons	65,035

Timber Inventory	Inventory Update	Acres	31,429
	Plots	Number	2,465

Invasive Species Control	Cogon Grass	Acres	31
	Chinese Tallow	Acres	17
	Rattle Box	Acres	15
	Air Potato	Acres	12
	Camphor Tree	Acres	11
	Peruvian Primrose-willow	Acres	7
	Caesar Weed	Acres	7
	Sword Fern	Acres	5
	Japanese Climbing Fern	Acres	4
	Brazilian Pepper	Acres	1
	Wild Tarrow	Acres	1
	Old World Climbing Fern	Acres	1
	Natal Grass	Acres	1
	Lantana	Acres	1
	Wedelia	Acres	1
	Tropical Soda Apple	Acres	1
	Coral Ardisia	Acres	<1

	Mimosa	Acres	<1
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Fire	Wildfire	No.	23
		Acres	487
	Prescribed Burning	No.	127
		Acres	13,268
	Disked fire breaks	Miles	67

Recreation	Day Use Estimated Forest Visitors	No.	719,587
	Overnight Camping	No.	24,515
	Annual Entrance Pass	No.	4
	State Forest Use Permit	No.	181

Roadwork	Roads Graded	Miles	860
	Roads Rebuilt	Miles	52
	Roads Recapped	Feet	2
	Bridge Repaired	No.	2
	Culverts Installed	No.	38
	Low Water Crossing	No.	2
	Other	No.	158

Boundary Maintenance	Maintenance/Marking	Miles	41
-----------------------------	---------------------	-------	----

I&E Activities	Programs/Tours	No.	29
	Radio/TV Articles	No.	9
	Education/Research	No.	68

Other Activities	Archaeological Sites Monitored	No.	9
	Commercial Vendor Permit	No.	2
	Firelines Disked	Miles	67
	Permits, State Forest Use	No.	15
	Permits, SUV Special Use	No.	28
	Road Mowed	Miles	769
	Volunteer hours	No.	8,803

Exhibit B

Boundary and Road Map



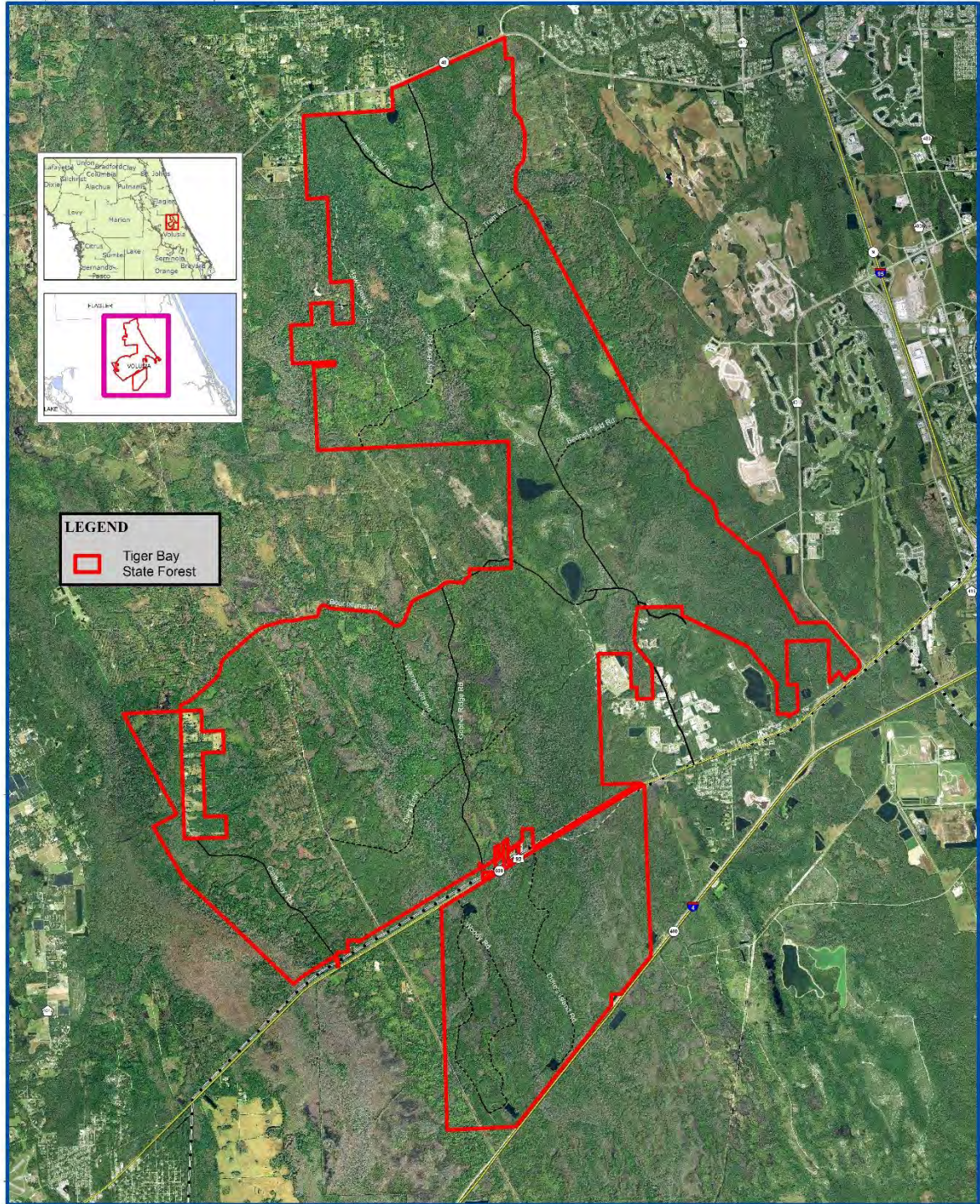
Florida Forest Service

Tiger Bay State Forest Boundary and Road Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

DISCLAIMER:
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The Florida Forest Service is not responsible for any
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from the use of this map.

Boundary lines shown on the map of
the Florida National Forest Inventory
are based on the 1980's
from the US Army Corps of Engineers



0.5 0.25 0 0.5 1 1.5
Miles



Map Month/Year: May 2020

3,000 1,500 0 3,000 6,000 9,000 12,000 15,000
Feet

Exhibit C

Optimal Management Boundary Map



Florida Forest Service

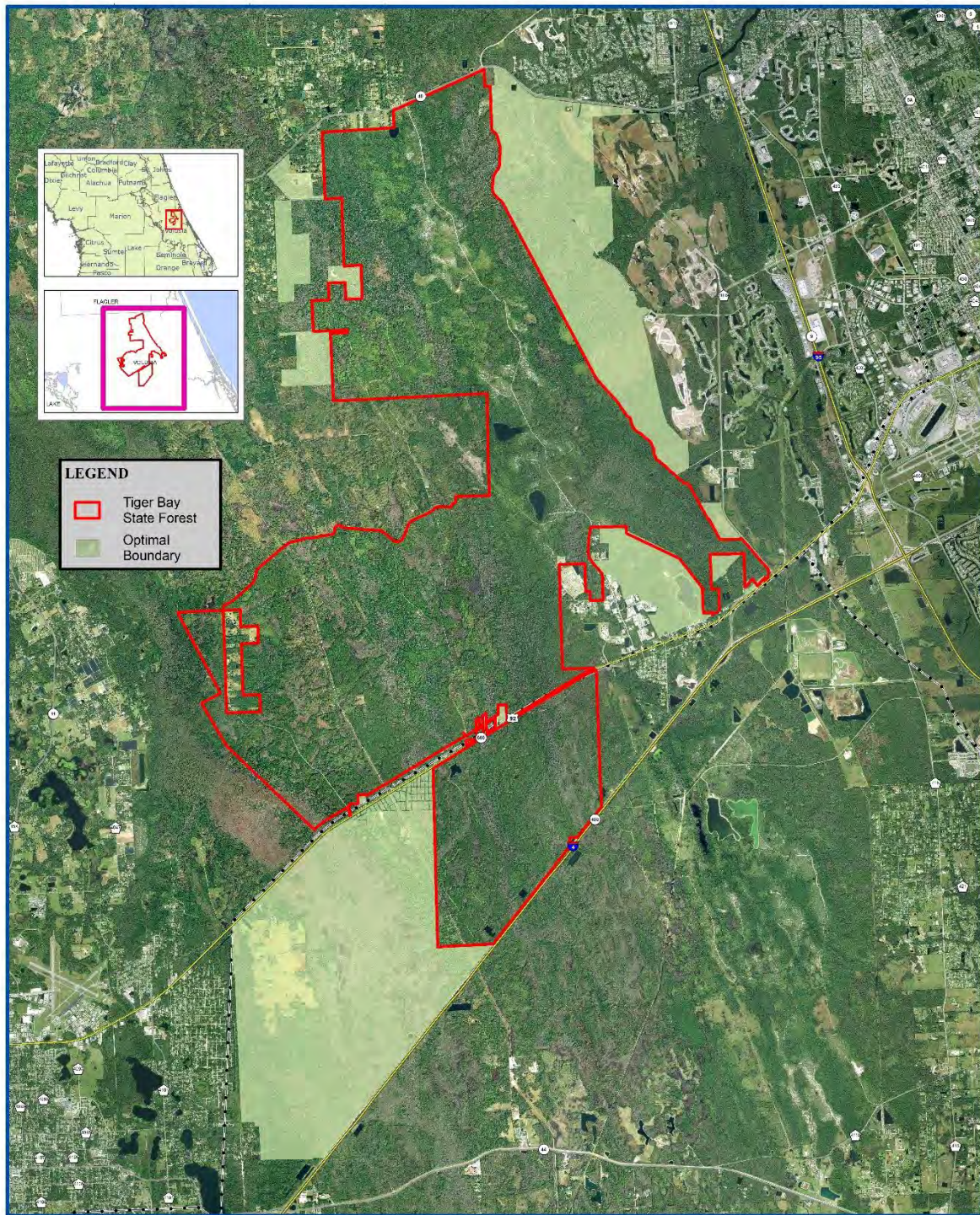
Tiger Bay State Forest Optimal Management Boundary Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

81° 27' W

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Boundary Area Calculated as the base of the 100 Year National Forest Inventory. Boundary from 2004 National Forest Inventory. From the US Army Corps of Engineers.



29° 10' N

29° 10' N

0.5 0.25 0 0.5 1 1.5 2 Miles



81° 27' W

Map Month/Year: May 2020

3,000 1,500 0 3,000 6,000 9,000 12,000 15,000 18,000 Feet

Exhibit D

Facilities, Recreation, and Improvements Map



Florida Forest Service

Tiger Bay State Forest

Facilities, Recreation and Improvements Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

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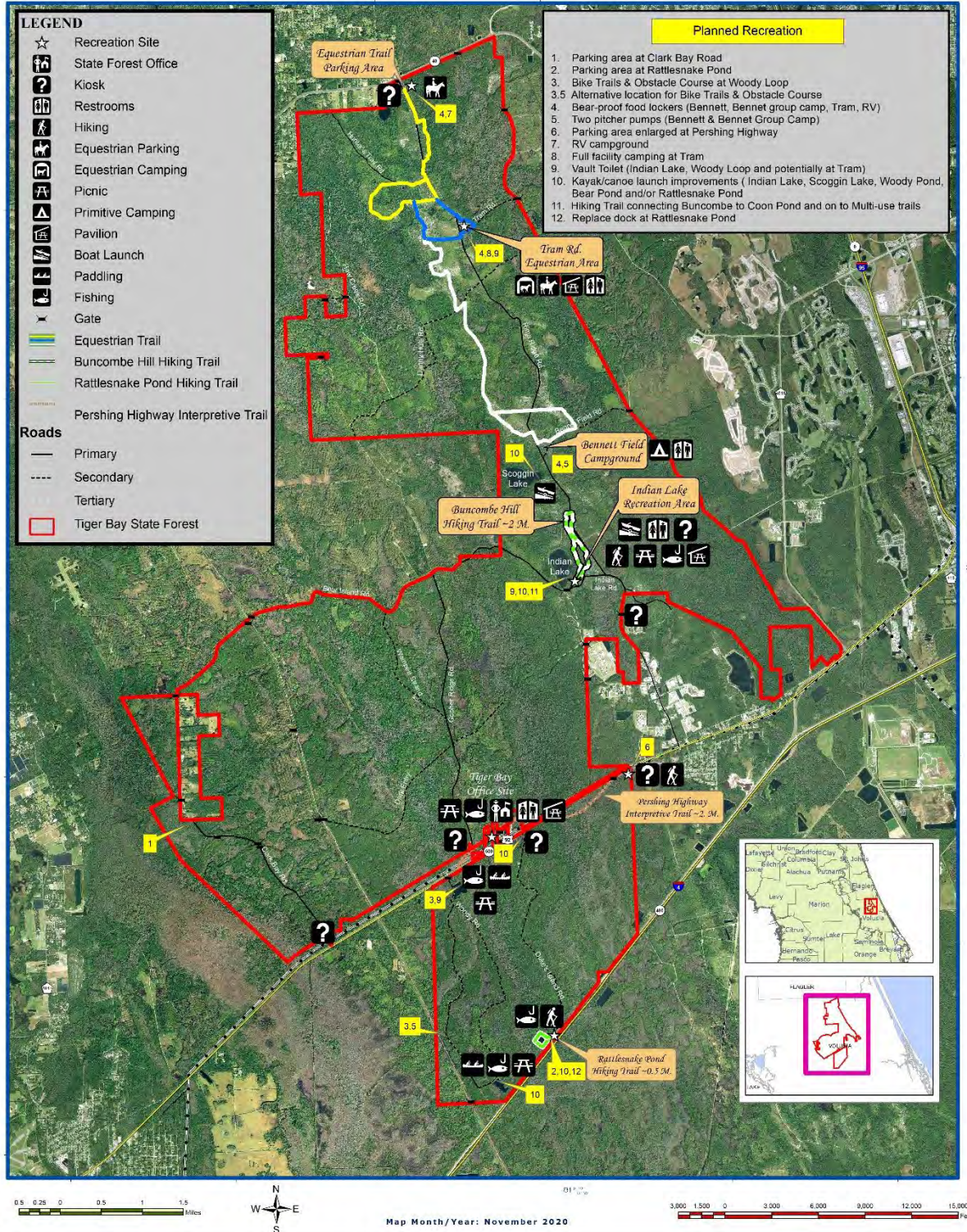


Exhibit E

Tract and Acreage Map



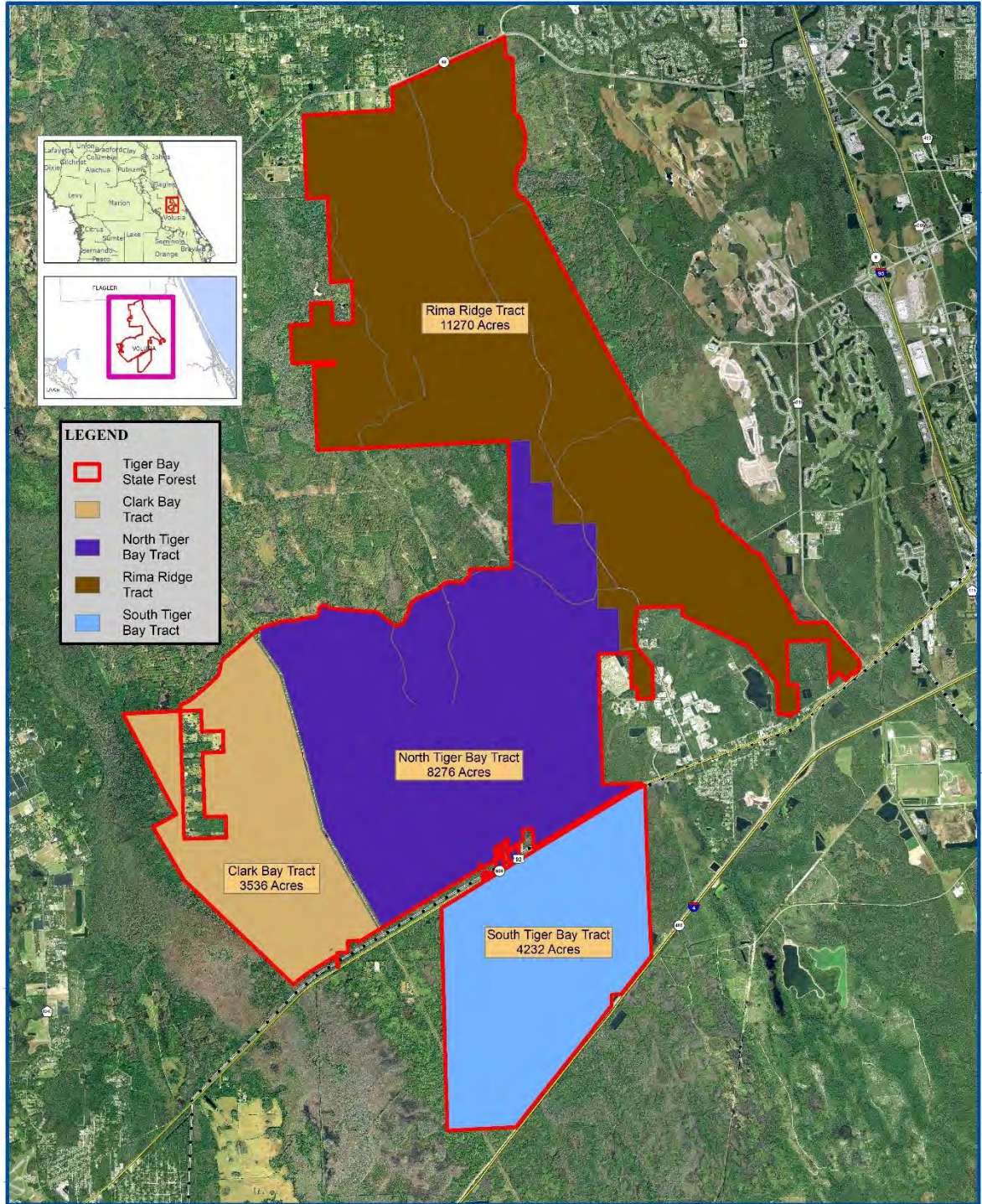
Florida Forest Service

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

Tiger Bay State Forest Tract and Acreage Map 27,310 Acres

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Revised May 2020 at the base of the 2019 National Wetlands Inventory. Reverts to the 2019 National Wetlands Inventory from the US Army Corps of Engineers.



0.5 0.25 0 0.5 1 1.5 Miles



Map Month/Year: June 2020

3,000 1,500 0 3,000 6,000 9,000 12,000 15,000 Feet

Exhibit F

Proximity to Significant Managed Lands



Florida Forest Service

Tiger Bay State Forest

Proximity to Significant Managed Lands

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

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for the U.S. Army Corps of Engineers
Florida District Office
from the U.S. Army Corps of Engineers
maps.

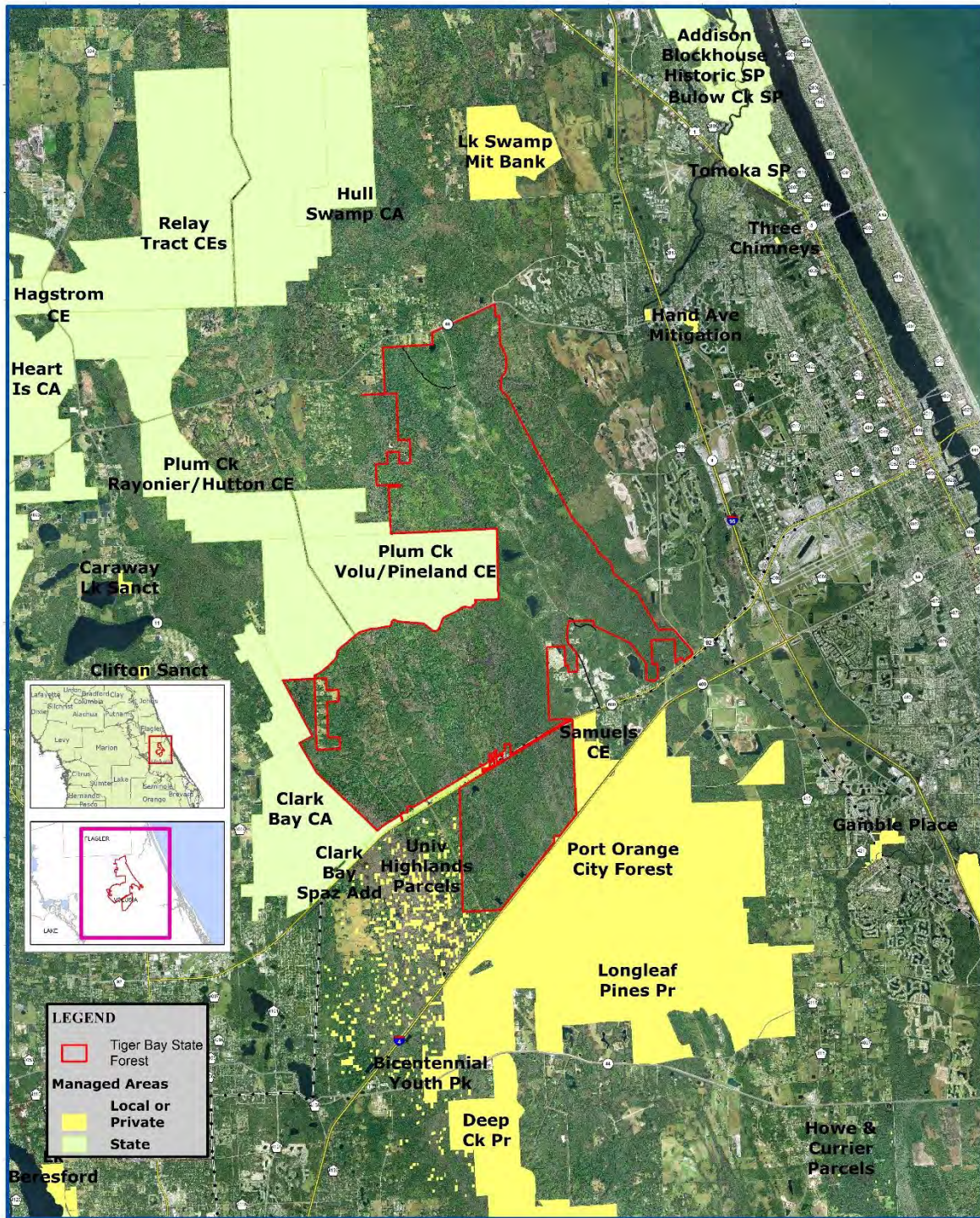


Exhibit G

Florida Forever Projects

2021 Florida Forever Five-Year Plan
Volusia Conservation Corridor

Summary of Recommendations and Status
as of
December 2020



Division of State Lands
Florida Department of Environmental Protection



Volusia Conservation Corridor

Partnerships & Regional Incentives Project
 Flagler, Volusia

Project-at-a-Glance

Year Added to Priority List	2001
Project Acres	79,074
Acquired Acres	61,242
Cost of Acquired Acres	\$76,566,247
Remaining Project Acres	17,832
2019 Assessed Value of Remaining Acres	\$55,292,276

Purpose for State Acquisition

Public acquisition of this project sponsored by the St. Johns River Water Management District (SJRWMD) will increase the protection of Florida's biodiversity at the species, natural community, and landscape levels and provide a continuous corridor of environmentally significant land from the Tiger Bay State Forest, through the central wetlands and flatwoods of Volusia County, to the marshes of the St. Johns River. This project will also increase natural resource-based public recreation, education opportunities, and potential for recreation or other public uses on the fee-simple acquisition lands. This project will help ensure that sufficient quantities of water are available to meet current and future needs of natural systems and the citizens of the state. Some areas contain moderate to good recharge to the Florida aquifer, which mainly occurs through rainfall.

Manager(s)

SJRWMD and Volusia County are the recommended managers.

General Description

The property is in central Volusia County, stretching from north of SR44, fourteen miles south to the St. Johns River. It is generally low and wet, consisting of alternating flatwoods and

swamp, which occupy the northwest/southeast-trending ridge and swale topography on the eastern edge of the DeLand Ridge. It includes the parallel, southward-flowing drainages of Deep Creek and Lake Ashby canal, which empty into the St. Johns River. Natural communities include: Basin Swamp and Hydric Hammock, Mesic Flatwoods, Scrub, and Dome Swamp.

FNAI Element Occurrence

<u>FNAI Elements</u>	<u>Score</u>
Gopher tortoise	G3/S3
Florida black bear	G5T4/S4
Rugel's pawpaw	G1/S1
lake-side sunflower	G1G2/S1S2
Florida sandhill crane	G5T2/S2
large-flowered rosemary	G3/S3
Bachman's sparrow	G3/S3
Bald eagle	G5/S3

8 rare species are associated with the project

Public Use

Fee acquisition areas have the potential of providing a variety of resource-based outdoor recreation opportunities such as, but not necessarily limited to, hiking, nature study, horseback riding, bicycling, camping, picnicking, freshwater fishing and hunting. Further review may reflect cabins to be suitable, particularly if a combination of lands is acquired that would allow for a more complete park or environmental education center atmosphere.

Acquisition Planning

2001

On January 25, 2001, the Acquisition and Restoration Council (ARC) added the Volusia Conservation Corridor project to Group B of the Florida Forever (FF) 2001 Priority list. This fee-simple and less-than-fee acquisition, sponsored by the SJRWMD, consisted of approximately 33,503 acres and multiple owners. The essential parcels were defined as Leffler Co., Le Fils Corp. (easement acquired), Julia Menard (acquired), GJPS Lukas Inc., Jonathan S. Lukas, Gertrude G. Lukas, Donald Ray Fore (acquired), Norman N. Fore (acquired), Marvin Kelley Fore (acquired), Mark Fore et al., Lynda Russell Schroeder, and JAS Properties LTD ownerships.

2002

On June 6, 2002, the ARC moved the project to Group A of the FF 2002 Priority list.



On August 15, 2002, the ARC approved a less-than-fee 11,723-acre and fee-simple 7,654-acre addition to the project boundary. The 19,369-acre addition, sponsored by the SJRWMD, consisted of two owners, Plum Creek and Rayonier.

2003

On June 6, 2003, the ARC approved a less-than-fee addition, in Flagler and Volusia counties, to the project boundary. The 26,740-acre addition, sponsored by the SJRWMD, consisted of one owner, Plum Creek Timberlands LP.

2004

In December 2004, Volusia County, with help from SJRWMD and the United States Department of Agriculture (USDA), acquired a 1,711-acre conservation easement over the Le Fils Corporation property.

2007

In April 2007, the SJRWMD and Volusia County acquired 2,272 acres as a joint acquisition. Each partner owns an undivided 50-percent interest in the property acquired from State Road 44 Properties, LLC.

On December 15, 2010, Volusia County closed on the 4,806-acre Leffler Ranch. The County will manage this property.

2011

On November 22, 2011, SJRWMD purchased the Lukas Ranch Conservation Easement (1,093 acres) from Jonathan S. Lukas, as Trustee of the Jonathan S. Lukas Trust Agreement for \$1,912,697.50, comprised of a donation of value (\$478,174.38) from the Seller, \$956,348.75 from a USDA/NRCS Farm and Ranch Lands Protection Program grant, and \$478,174.38 from SJRWMD.

On December 9, 2011, ARC placed this project in the Partnerships and Regional Incentives category of Florida Forever projects.

Coordination

The SJRWMD, the Florida Forest Service (FFS) of the Florida Department of Agriculture and Consumer Services, Volusia County and United States Department of Agriculture (USDA) are acquisition partners. Volusia County passed two bond measures in 2000 that will generate approximately \$80 million for open space land acquisition, historic preservation and improvements over the next twenty years.

Management Policy Statement

The primary goals of management of the Volusia Conservation Corridor project are to conserve and protect significant water resources in a priority water resource caution area; and to conserve, protect, manage, or restore important ecosystems, landscapes, and forests, to enhance or protect significant timber, recreation, fish or wildlife resources which local or state regulatory programs cannot adequately protect.

Management Prospectus

Qualifications for state designation

The need to protect water resources within the caution area, combined with the restorable pine plantations, make it desirable for management by the SJRWMD.

Manager

The SJRWMD is recommended as Manager.

Conditions affecting intensity of management

The wildfires of 1998 impacted properties within the project, but most of the affected areas have been salvaged and replanted. Consequently, there are no known major disturbances that will require extraordinary attention, so management intensity is expected to be typical for water management district lands.

Timetable for implementing management and provisions for security and protection of infrastructure

Once the core area is acquired, the SJRWMD will provide public access for low intensity, non-facilities related outdoor recreation. Initial activities will include securing the site, providing public and fire management accesses, inventorying resources, and removing trash. The District will provide access to the public while protecting sensitive resources. The site's natural resources and threatened and endangered plants and animals will be inventoried to provide the basis for a management plan. Long-range plans for this project will generally be directed toward restoring disturbed areas to their original conditions, as far as possible, as well as protecting threatened and endangered species. Some of the pinelands have been degraded by timbering and wildfire and will require restoration. An all-season burning program will use, whenever possible, existing roads, black lines, foam lines and natural breaks to contain fires. Timber management will mostly involve improvement thinning and regeneration harvests. Plantations will be thinned and where appropriate, reforested with species found in natural ecosystems. Stands will not have a targeted rotation age. Infrastructures will primarily be

located in disturbed areas and will be the minimum required for management and public access.

Revenue-generating potential

The District will sell timber as needed to improve or maintain desirable ecosystem conditions. These sales will provide a variable source of revenue, but the revenue-generating potential for this project is expected to be low.

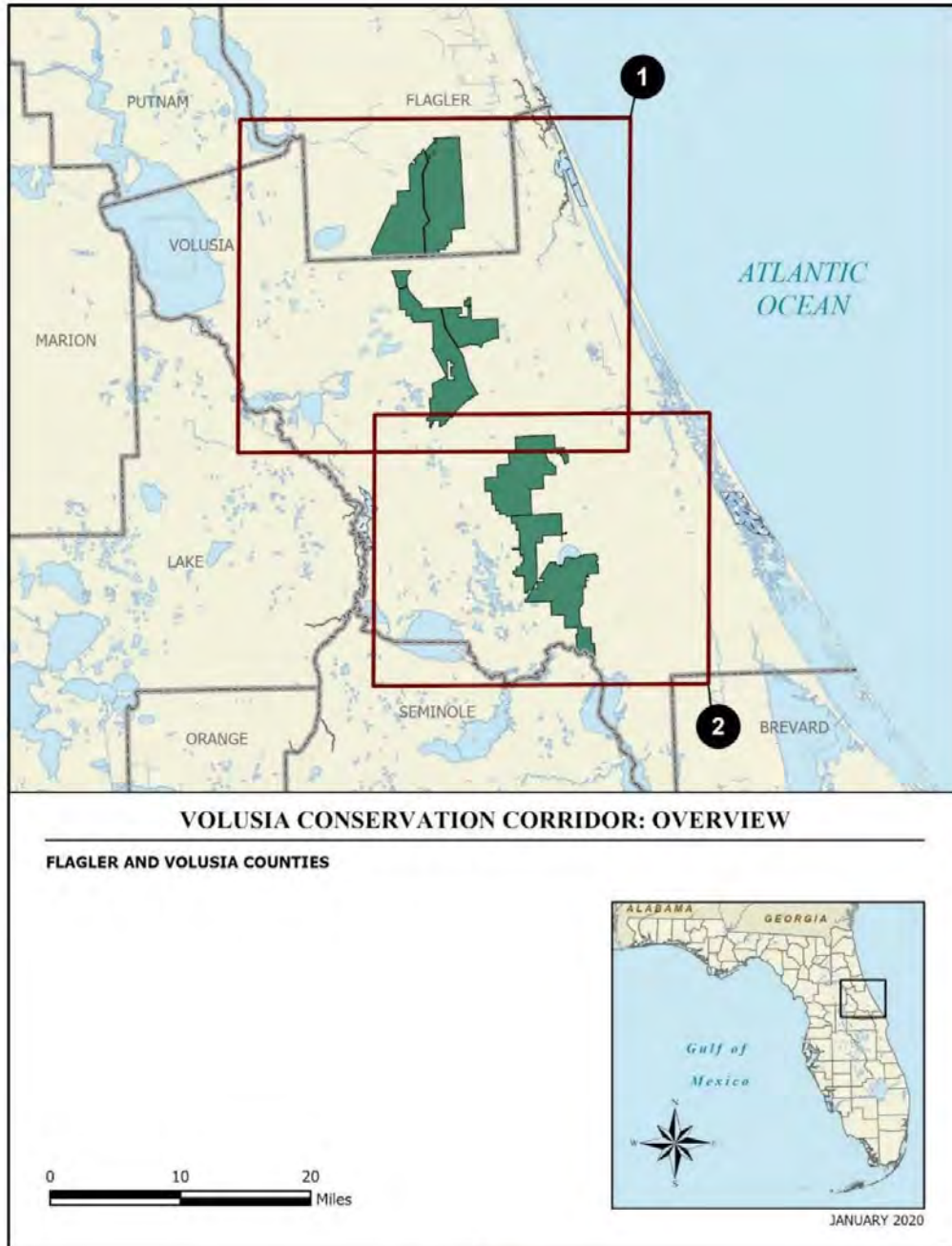
Cooperators in management activities

The District will cooperate with Volusia County and seek the assistance of other state agencies, local government entities and interested parties as appropriate.

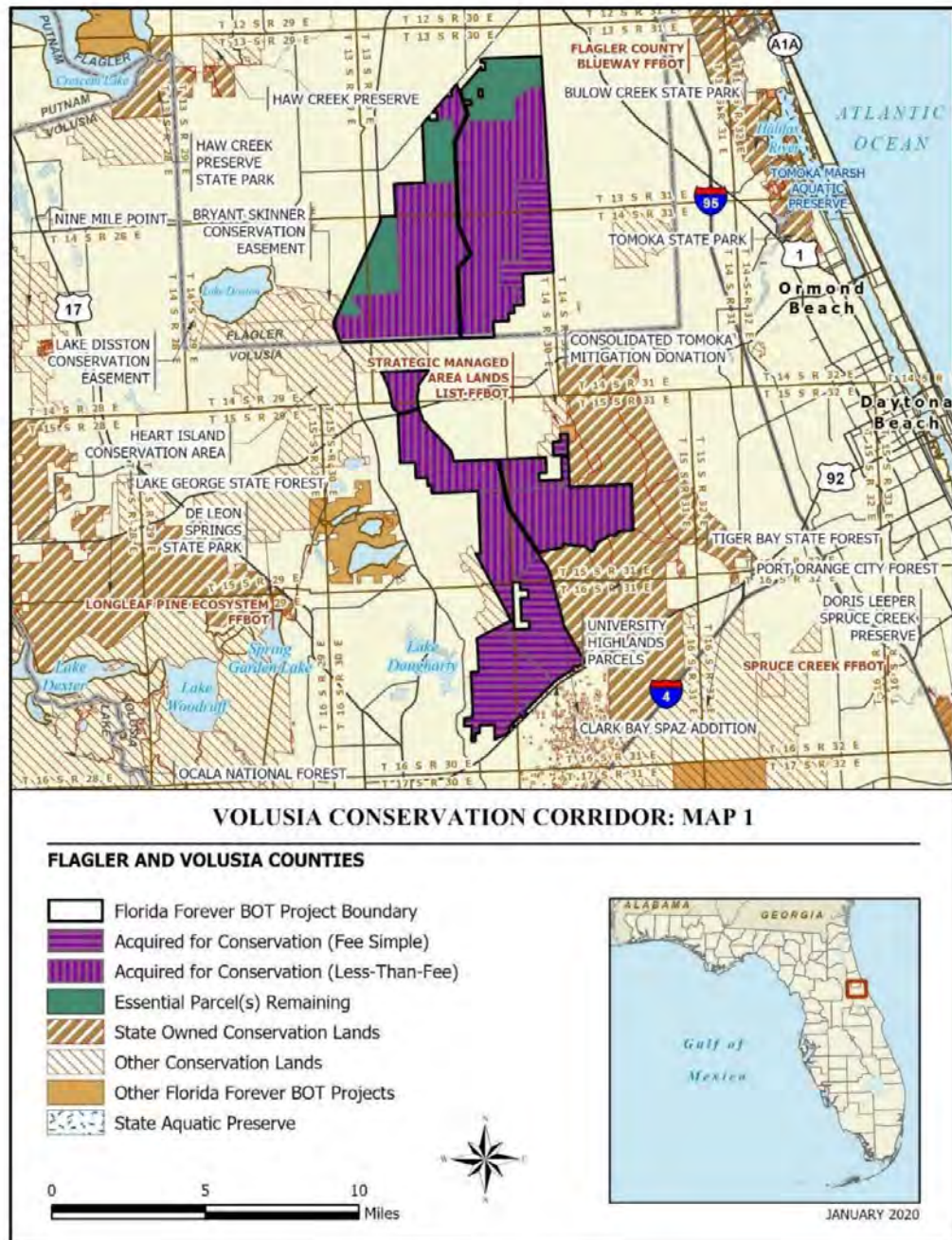
Management Cost Summary

<u>SIRWMD</u>	<u>Startup</u>	<u>Recurring</u>
Source of Funds	WMLTF	WMLTF
Salary	\$45,000	\$45,000
OPS	\$0	\$0
Expense	\$80,000	\$80,000
OCO	\$20,000	\$60,000
FCO	\$100,000	\$0
TOTAL	\$345,000	\$185,000

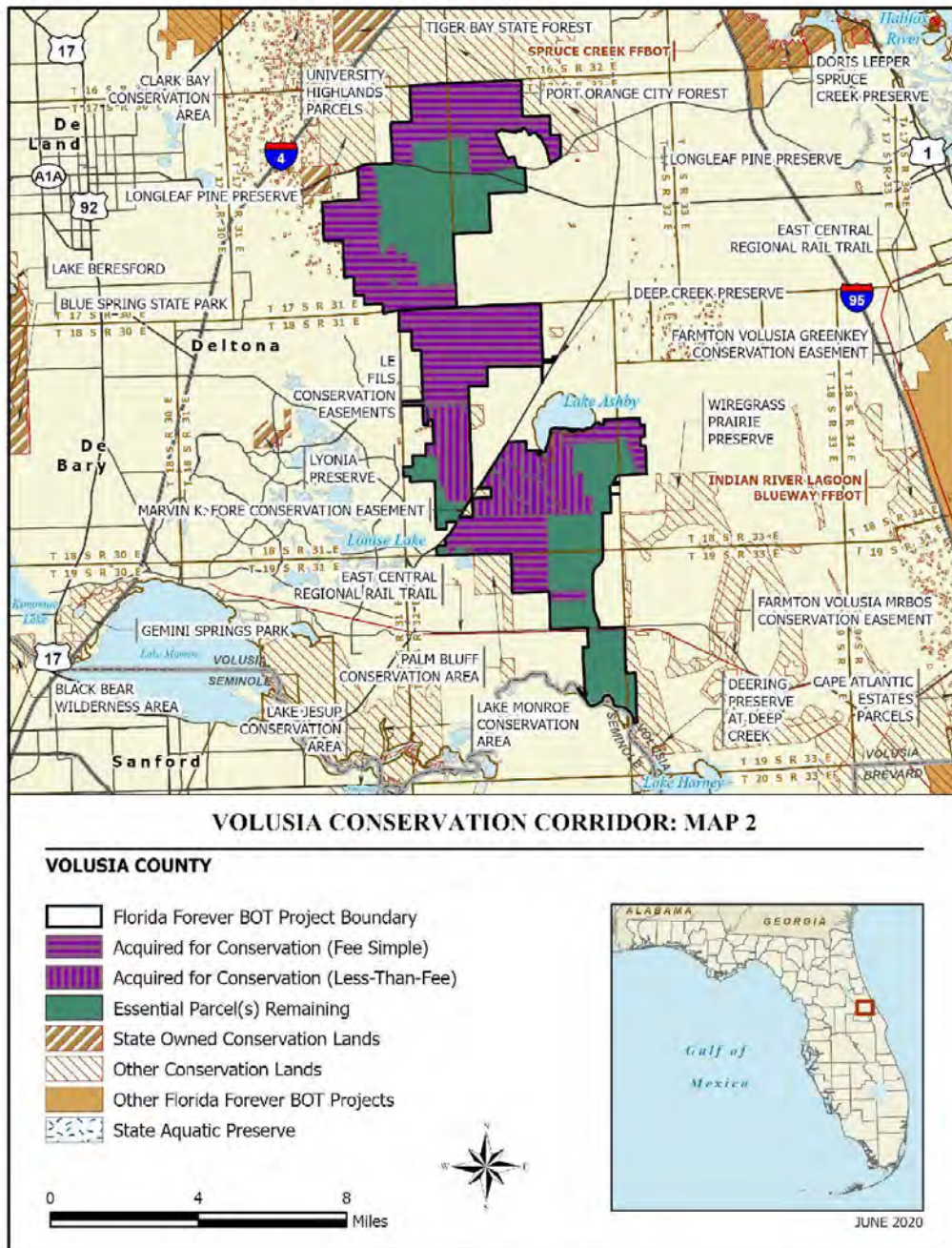
Source: Management Prospectus as originally submitted



Map 1: FNAI, January 2021



Map 2: FNAI, January 2021



Map 3: FNAI, January 2021

2021 Florida Forever Five-Year Plan

Spruce Creek

Summary of Recommendations and Status
as of
December 2020



Division of State Lands
Florida Department of Environmental Protection



Spruce Creek

Substantially Complete Project
Volusia

Project-at-a-Glance

Year Added to Priority List	1990
Project Acres	2,841
Acquired Acres	2,475
Cost of Acquired Acres	\$19,118,050
Remaining Project Acres	366
2019 Assessed Value of Remaining Acres	\$6,313,774

Purpose for State Acquisition

Natural areas along the coast of Volusia County are becoming scarce as residential developments expand from Daytona Beach and New Smyrna Beach. The Spruce Creek project protects one of the largest tracts of undeveloped land left in this region along the estuary of Spruce Creek and helps to maintain the water quality of the creeks and bays here, thus protecting a fishery. Additionally, this project will conserve what may be the site of Andrew Turnbull's 18th-century plantation and provide a recreation area where people can do anything from hiking and fishing to simply learning about the plants and animals of this scenic landscape.

Manager(s)

Volusia County is the recommended manager.

General Description

The original Spruce Creek project area, north and west of Strickland Bay, contains good estuarine tidal swamps, hammocks, scrub, and flatwoods. It protects habitat for such endangered or threatened species as bald eagles, wood storks and manatees. The addition, between U.S. 1 and Turnbull Bay, contains good Maritime or Xeric Hammock, with live oaks, cabbage palms, and several tropical shrubs near their northern limits. Flatwoods also cover a



large part of the addition, and tidal marsh with remnants of black mangrove fringes it. Disturbed areas include an historic house at the north end and the remains of a fish camp and marina east of U.S. 1. No FNAI-listed plants are known from the addition; of FNAI-listed animals, gopher tortoises have been found. The area is adjacent to several Outstanding Florida Waters, and the aquatic resources Florida Waters, and the aquatic resources are important to both recreation and commercial fisheries. There are two archaeological sites recorded within the project area: Spruce Creek Mound site, a prehistoric and historic burial mound; and J. D. site, a prehistoric and historic shell midden and burial site. The project may also contain historic archaeological sites related to the British Colonial Period occupation in this area of NE Florida (ca. 1763–1783 AD). The area is experiencing significant growth, so developable acreage is likely to be lost relatively soon.

FNAI Element Occurrence Summary

<u>FNAI Elements</u>	<u>Score</u>
Florida scrub-jay	G27/S2
Gopher tortoise	G3/S3
Florida black bear	G5T4/S4
Florida beargrass	G3/S3
Bald eagle	G5/S3

5 rare species are associated with the project

Public Use

This project is designated as a recreation area with uses such as cultural and environmental education, hiking, fishing, camping and picnicking.

Acquisition Planning

1989

On December 1, 1989, the Land Acquisition Advisory Council (LAAC) added the original Spruce Creek project to the CARL Priority list. This fee-simple acquisition, sponsored by Volusia County, consisted of approximately 1,718 acres, nine owners, and a 1989 taxable value of \$2,675,000.

1990

On December 7, 1990, an owner-sponsored 54-acre parcel was added to the boundary.

1992

The project was removed on December 10, 1992 due to unwilling sellers. At that time, it was less than 90 percent complete.



1994

On December 6, 1994, LAAC added the current Spruce Creek project to the 1995 CARL Priority list. This fee-simple proposal was sponsored by Volusia County, as the previous one had been, and had the same name, but consisted of 524 acres -a 208-acre portion of the original project and a 316-acre addition and had a 1993 taxable value of \$2,124,141. The project boundary, as approved by LAAC, however, included the portions of the 1989 project that had already been acquired. The resulting project acreage equaled 1,593 acres with a taxable value of \$3,406,991.

2002

On October 24, 2002, the Acquisition and Restoration Council (ARC) approved a fee-simple 648-acre addition to the project boundary. It was sponsored by Volusia County and consisted of five owners.

2009

On October 9, 2009, ARC voted to remove 6 sites with 54 individual parcels (97 acres) containing residential and commercial buildings or infrastructure. The total acreage removed had a just value of \$9,166,381.

2011

On December 9, 2011, ARC placed this project in the Substantially Complete category of Florida Forever projects.

Coordination

Volusia County is a partner in the acquisition of this project as well as being identified as the manager. SJRWMD and City of Port Orange are acquisition partners also.

Management Policy Statement

The primary goals of management of the Spruce Creek project are to conserve, protect, manage, or restore important ecosystems, landscapes, and forests, in order to enhance or protect significant surface water, coastal, recreation, timber, fish or wildlife resources which local or state regulatory programs cannot adequately protect; to provide areas, including recreation trails, for natural-resource based recreation; and to preserve significant archaeological or historical sites.



Management Prospectus

Qualifications for state designation

The Spruce Creek Recreation Area has the size, natural, cultural, and recreation resources, and surrounding population density to qualify as a State Recreation Area.

Manager

Volusia County in cooperation with the State of Florida.

Conditions affecting intensity of management

The project includes moderate-need tracts requiring more than basic resource management and protection. These lands will contain more highly developed resource-related recreation facilities. Large portions of the property, however, would be considered low-need tracts requiring only basic resource management and protection. Recreation use will be incorporated but in a more dispersed and less intensive manner.

Timetable for implementing management and provisions for security and protection of infrastructure

Within the first year after acquisition, management activities will concentrate on site security and resource inventory. Volusia County will provide appropriate access to the site to maintain existing and historic uses while protecting sensitive resources on the site. The site's natural resources and listed plants and animals will be inventoried, recreation opportunities and uses identified, and a management plan formulated. Long-range plans for Spruce Creek will be specified in the management plan and will generally be directed as follows: Development of recreation facilities, a comprehensive trail management program, a comprehensive educational and interpretive program, and a comprehensive historic resource management program; restoration of disturbed areas; maintenance of natural communities through a program of selected harvest and fire management; and habitat enhancement for listed species.

Revenue-generating potential

This will be determined by the concepts in the Management Plan. Some revenues will probably be generated by user and concession fees at recreation sites. Some revenues may be generated through sale of forest products, but any such revenues will be minimal. Use of small portions of the area as mitigation for development elsewhere would not only restore damaged areas on-site but would yield revenue as well. It will be several years before potential revenue sources could be fully developed.



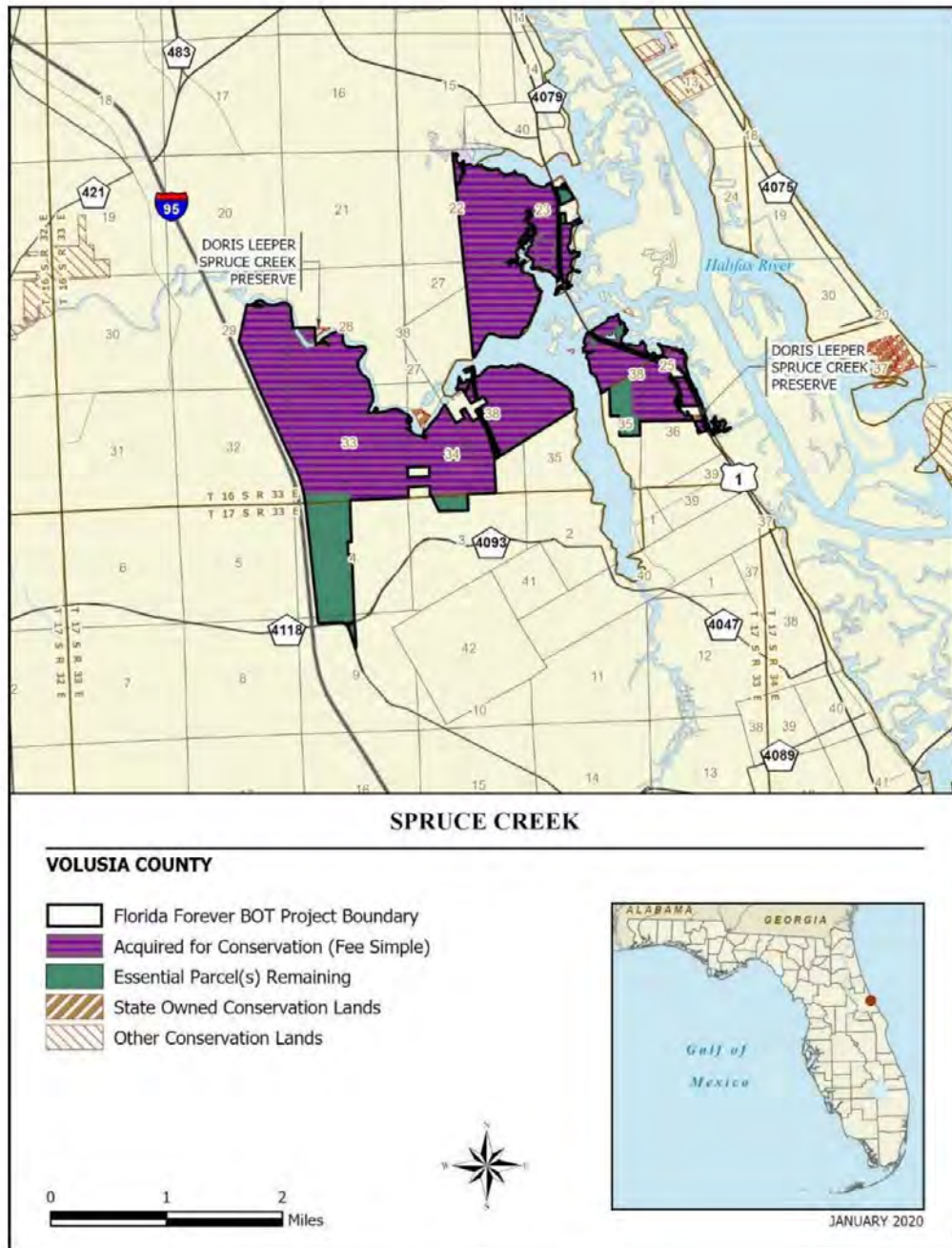
Cooperators in management activities

Port Orange and New Smyrna Beach both will be involved in the planning of the project. The Museum of Arts and Sciences and the Atlantic Center for the Arts may prove to be valuable partners in optimizing the educational and interpretive opportunities on this site. The Nature Conservancy still owns the 150 acres that is managed by the Museum of Arts and Sciences. The Environmental Council and Sierra Club have played important roles in the early protection of the creek including sponsoring OFW status in 1986. The Southeast Volusia Historical Society and Volusia Anthropological Society have had long-standing interest in protection and interpretation of the cultural, historical and archaeological resources located on the project site. Volunteers will be invaluable in developing, managing, and interpreting the site.

Management Cost Summary

<u>Volusia County</u>	<u>1996/97</u>	<u>1997/98</u>
Source of Funds	Volusia County	Volusia County
OPS	\$0	\$0
Expense	\$0	\$0
OCO	\$0	\$0
FCO	\$0	\$0
TOTAL	\$6,240	\$6,240

Source: Management Prospectus as originally submitted



Map 1: FNAI, January 2021

Exhibit H

Archaeological and Cultural Sites



This record search is for informational purposes only and does NOT constitute a project review. This search only identifies resources recorded at the Florida Master Site File and does NOT provide project approval from the Division of Historical Resources. Contact the Compliance and Review Section of the Division of Historical Resources at CompliancePermits@dos.MyFlorida.com for project review information.

April 8, 2020

Patti Anderson
Land Management Planner
Florida Forest Service
Florida Department of Agriculture and Consumer Services
(850) 681-5889
Patricia.Anderson@FDACS.gov

Re: Tiger Bay State Forest

In response to your inquiry of April 8, 2020 the Florida Master Site File lists eight archeological sites, one cemetery, three resource groups and one bridge located at Tiger Bay State Forest in Volusia County

When interpreting the results of our search, please consider the following information:

- This search area may contain *unrecorded* archaeological sites, historical structures or other resources even if previously surveyed for cultural resources.
- Because vandalism and looting are common at Florida sites, we ask that you limit the distribution of location information on archaeological sites.
- While many of our records document historically significant resources, the documentation of a resource at the Florida Master Site File does not necessarily mean the resource is historically significant.
- Federal, state and local laws require formal environmental review for most projects. This search **DOES NOT** constitute such a review. If your project falls under these laws, you should contact the Compliance and Review Section of the Division of Historical Resources at 850-245-6333.

Please do not hesitate to contact us if you have any questions regarding the results of this search.

Sincerely,

Eman M. Vovsi, Ph.D.
Florida Master Site File
Eman.Vovsi@DOS.MyFlorida.com



AR=8
 SS=0
 CM=1
 RG=3
 BR=1
 Total=13

Cultural Resource Roster

SiteID	Type	Site Name	Address	Additional Info	SHPO Eval	NR Status
VO02595	AR	MISSING TRUCK MOUND	DAYTONA BEACH	Human Remains May Be Present		
VO07196	RG	PERSHING HIGHWAY	DAYTONA BEACH	Linear Resource		
VO07197	AR	BUNCOMBE HILL TURPENTINE CAMP	DAYTONA BEACH			
VO07203	CM	THE CROSSES	DAYTONA BEACH	Established 1900+, Graves = 2		
VO07204	AR	FRYMAN'S SAWMILL	DAYTONA BEACH			
VO07205	AR	INDIAN LAKE	DAYTONA BEACH			
VO07206	AR	INDIAN LAKE ROAD MOUND	Daytona Beach	Human Remains May Be Present		
VO07207	AR	BATES MOUND	DAYTONA BEACH			
VO07208	AR	RAWLINS MOUND	DAYTONA BEACH	Human Remains May Be Present		
VO07209	AR	HONEY BEAR MOUND	DAYTONA BEACH	Human Remains May Be Present		
VO07210	RG	DUKES ISLANDS CANAL	Daytona Beach	Linear Resource		
VO07211	RG	TIGER BAY CANAL	Daytona Beach	Linear Resource		
VO09788	BR	Tiger Bay Bridge	drainage ditch		Not Eligible	

Exhibit I

Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands

Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Properties
(revised June 2021)

These procedures apply to state agencies, local governments, and non-profits that manage state-owned properties.

A. Historic Property Definition

Historic properties include archaeological sites and historic structures as well as other types of resources. Chapter 267, Florida Statutes states: “*‘Historic property’ or ‘historic resource’ means any prehistoric district, site, building, object, or other real or personal property of historical, architectural, or archaeological value, and folklife resources. These properties or resources may include, but are not limited to, monuments, memorials, Indian habitations, ceremonial sites, abandoned settlements, sunken or abandoned ships, engineering works, treasure trove, artifacts, or other objects with intrinsic historical or archaeological value, or any part thereof, relating to the history, government, and culture of the state.*”

B. Agency Responsibilities

Per Chapter 267, F.S. and state policy related to historic properties, state agencies of the executive branch must provide the Division of Historical Resources (Division) the opportunity to comment on any undertakings with the potential to affect historic properties that are listed, or eligible for listing, in the National Register of Historic Places, whether these undertakings directly involve the state agency, i.e., land management responsibilities, or the state agency has indirect jurisdiction, i.e. permitting authority, grants, etc. No state funds should be expended on the undertaking until the Division has the opportunity to review and comment on the undertaking. (267.061(2)(a))

State agencies must consult with the Division when, as a result of state action or assistance, a historic property will be demolished or substantially altered in a way that will adversely affect the property. State agencies must take timely steps to consider feasible and prudent alternatives to the adverse effect. If no feasible or prudent alternatives exist, the state agency must take timely steps to avoid or mitigate the adverse effect. (267.061(2)(b))

State agencies must consult with Division to establish a program to locate, inventory and evaluate all historic properties under ownership or controlled by the agency. (267.061(2)(c))

State agencies are responsible for preserving historic properties under their control. State agencies are directed to use historic properties available to the agency when that use is consistent with the historic property and the agency’s mission. State agencies are also directed to pursue preservation of historic properties to support their continued use. (267.061(2)(d))

C. Statutory Authority

The full text of Chapter 267, F.S. and additional information related to the treatment of historic properties is available at:

<https://dos.myflorida.com/historical/preservation/compliance-and-review/regulations-guidelines/>

D. Management Implementation

Although the Division sits on the Acquisition and Restoration Council and approves land management plans, these plans are conceptual and do not include detailed project information. Specific information for individual projects must be submitted to the Division for review and comment.

Managers of state lands must coordinate any land clearing or ground disturbing activities with the Division to allow for review and comment on the proposed project. The Division's recommendations may include, but are not limited to: approval of the project as submitted, recommendation for a cultural resource assessment survey by a qualified professional archaeologist, and modifications to the proposed project to avoid or mitigate potential adverse effects.

Projects such as additions or alterations to historic structures as well as new construction must also be submitted to the Division for review. Projects involving structures fifty years of age or older must be submitted to the Division for a significance determination. In rare cases, structures under fifty years of age may be deemed historically significant.

Adverse effects to historic properties must be avoided when possible, and if avoidance is not possible, additional consultation with the Division is necessary to develop a mitigation plan. Furthermore, managers of state property should make preparations for locating and evaluating historic properties, both archaeological sites and historic structures.

E. Archaeological Resource Management (ARM) Training

The ARM Training Course introduces state land managers to the nature of archaeological resources, Florida archaeology, and the role of the Division in managing state-owned archaeological resources. Participants gain a better understanding of the requirements of state and federal laws with regard to protecting and managing archaeological sites on state managed lands. Participants also receive a certificate recognizing their ability to conduct limited monitoring activities in accordance with the Division's Review Procedure, thereby reducing the time and money spent to comply with state regulations. Additional information regarding the ARM Training Course is available at:

<https://dos.myflorida.com/historical/archaeology/education/arm-training-courses/>

F. Matrix for Ground Disturbance on State Lands

The matrix is a tool designed to help streamline the Division's Review Procedure. The matrix allows state land managers to make decisions about balancing ground disturbance and stewardship of historic resources. The matrix establishes types of undertakings that are either minor or major disturbances and then guides the land manager to consult the Division, conduct ARM-trained project monitoring, or proceed with the project. Additional information regarding the matrix is available at:

<https://dos.myflorida.com/historical/archaeology/education/dhr-matrix-for-ground-disturbance-on-state-lands/>

G. Human Remains Treatment

Chapter 872, *Florida Statutes* makes it illegal to willfully and knowingly disturb human remains. In the event human remains are discovered, cease all activity in the area that may disturb the remains. Leave the bones and nearby items in place. Immediately notify law enforcement or the local district medical examiner of the discovery and follow the provisions of Chapter 872, FS. Additional information regarding the treatment of human remains and cemeteries is available at:

<https://dos.myflorida.com/historical/archaeology/human-remains/>
<https://dos.myflorida.com/historical/archaeology/human-remains/abandoned-cemeteries/what-are-the-applicable-laws-and-regulations/>

H. Division of Historical Resources Review Procedure

Projects on state owned or controlled properties may submit projects to the Division for review using the streamlined State Lands Consultation Form. The form provides instructions to submit projects for review and outlines the necessary information for the Division to complete the review process. The State Lands Consultation Form and additional information about the Division's review process is available at:

<https://dos.myflorida.com/historical/preservation/compliance-and-review/state-lands-review/>

* * *

Questions relating to the treatment of archaeological and historic resources on state lands should be directed to:

Compliance and Review Section
Bureau of Historic Preservation
Division of Historical Resources
R. A. Gray Building
500 South Bronough Street
Tallahassee, FL 32399-0250

StateLandsCompliance@dos.myflorida.com

Phone: (850) 245-6333
Toll Free: (800) 847-7278
Fax: (850) 245-6435

Exhibit J

Soil Types Map and Descriptions



Florida Forest Service

Tiger Bay State Forest

Soils Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum
81° 2' 0" W

81° 2' 0" W

DISCLAIMER:
This map was prepared by the Florida Forest Service
and is not intended to be used for any purpose other than
general information. It is not a legal document and should not
be used for any legal purpose. The Florida Forest Service
does not warrant the accuracy or completeness of the
information contained herein. The Florida Forest Service
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map. The Florida Forest Service is not responsible for
any damages or losses resulting from the use of this
map.

Revised and corrected by courtesy of
the Florida Forest Service, January 2022
Florida Forest Service
From the US Army Corps of Engineers



LEGEND

Tiger Bay State Forest

SOIL TYPE

- ARENTS
- BASINGER FINE SAND; DEPRESSIONAL
- CASSIA FINE SAND
- DAYTONA SAND; 0 TO 5 PERCENT SLOPES
- DELAND FINE SAND; 0 TO 5 PERCENT SLOPES
- EAUGALLIE FINE SAND
- EAUGALLIE FINE SAND; DEPRESSIONAL
- ELECTRA FINE SAND; 0 TO 5 PERCENT SLOPES
- FARMTON FINE SAND
- HONTOON MUCKY PEAT
- IMMOKALEE SAND
- IMMOKALEE SAND; DEPRESSIONAL
- MALABAR FINE SAND
- MYAKKA FINE SAND
- MYAKKA FINE SAND; DEPRESSIONAL
- MYAKKA-ST. JOHNS COMPLEX
- ORSINO FINE SAND; 0 TO 5 PERCENT SLOPES
- PAISLEY FINE SAND
- PINEDA FINE SAND
- PLACID FINE SAND; DEPRESSIONAL
- POMONA FINE SAND
- POMONA FINE SAND; DEPRESSIONAL
- POMONA-ST. JOHNS COMPLEX
- POMPANO FINE SAND
- POMPANO-PLACID COMPLEX
- RIVIERA FINE SAND
- SAMSULA MUCK
- SATELLITE SAND
- SCOGGIN SAND
- SMYRNA FINE SAND
- ST. JOHNS FINE SAND
- TAVARES FINE SAND; 0 TO 5 PERCENT SLOPES
- TEQUESTA MUCK
- TOMOKA MUCK
- WABASSO FINE SAND
- WABASSO FINE SAND; DEPRESSIONAL
- WAUCHULA FINE SAND
- WAUCHULA FINE SAND; DEPRESSIONAL

0.5 0.25 0 0.5 1 1.5 2 Miles



Map Month/Year: January 2022

0 1,000 2,000 3,000 4,000 5,000 6,000 7,000 8,000 9,000 10,000 11,000 12,000 13,000 14,000 15,000 16,000 Feet

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
3	Arents	1.6	0.0%
8	Basinger fine sand, frequently ponded, 0 to 1 percent slopes	650.5	2.4%
13	Cassia fine sand, 0 to 2 percent slopes	105.3	0.4%
17	Daytona sand, 0 to 5 percent slopes	531.9	1.9%
19	Deland fine sand, 0 to 5 percent slopes	160.2	0.6%
20	EauGallie fine sand	68.6	0.3%
21	EauGallie fine sand, frequently ponded, 0 to 1 percent slopes	36.5	0.1%
22	Electra fine sand, 0 to 5 percent slopes	20.0	0.1%
23	Farmton fine sand	20.2	0.1%
27	Hontoon muck, frequently ponded, 0 to 1 percent slopes	1,847.3	6.8%
29	Immokalee sand	1,135.5	4.2%
30	Immokalee sand, depressional	9.0	0.0%
31	Malabar fine sand	149.1	0.5%
32	Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes	1,197.7	4.4%
33	Myakka fine sand, frequently ponded, 0 to 1 percent slopes	24.8	0.1%
34	Myakka-St. Johns complex	312.4	1.1%
37	Orsino fine sand, 0 to 5 percent slopes	22.7	0.1%
38	Paisley fine sand, 0 to 1 percent slopes, rarely flooded	0.1	0.0%
45	Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes	44.9	0.2%
48	Placid fine sand, frequently ponded, 0 to 1 percent slopes	42.3	0.2%
49	Pomona fine sand	5,337.3	19.5%
50	Pomona fine sand, depressional, 0 to 2 percent slopes	504.1	1.8%
51	Pomona-St. Johns complex	1,358.2	5.0%

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
52	Pompano fine sand	110.9	0.4%
53	Pompano-Placid complex	555.4	2.0%
55	Riviera fine sand	0.8	0.0%
56	Samsula muck, frequently ponded, 0 to 1 percent slopes	7,431.2	27.2%
57	Satellite sand, 0 to 2 percent slopes	235.1	0.9%
59	Scoggin sand	193.3	0.7%
60	Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes	1,219.6	4.5%
61	St. Johns fine sand	1,228.2	4.5%
63	Tavares fine sand, 0 to 5 percent slopes	119.0	0.4%
64	Tequesta muck, frequently ponded, 0 to 1 percent slopes	4.2	0.0%
66	Tomoka muck, frequently ponded, 0 to 1 percent slopes	1,509.8	5.5%
73	Wabasso-Wabasso, wet, fine sand, 0 to 2 percent slopes	165.6	0.6%
75	Wauchula fine sand	760.9	2.8%
76	Wauchula fine sand, depressional	36.7	0.1%
99	Water	165.9	0.6%
Totals for Area of Interest		27,314.5	100.0%

Map Unit Description (Brief, Generated)

The map units delineated on the detailed soil maps in a soil survey represent the soils or miscellaneous areas in the survey area. The map unit descriptions in this report, along with the maps, provide information on the composition of map units and properties of their components.

A map unit delineation on a soil map represents an area dominated by one or more major kinds of soil or miscellaneous areas. A map unit is identified and named according to the taxonomic classification of the dominant soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural phenomena, and they have the characteristic variability of all natural phenomena. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of other taxonomic classes. Consequently, every map unit is made up of the soils or miscellaneous areas for which it is named and some minor components that belong to taxonomic classes other than those of the major soils.

The Map Unit Description (Brief, Generated) report displays a generated description of the major soils that occur in a map unit. Descriptions of non-soil (miscellaneous areas) and minor map unit components are not included. This description is generated from the underlying soil attribute data.

Additional information about the map units described in this report is available in other Soil Data Mart reports, which give properties of the soils and the limitations, capabilities, and potentials for many uses. Also, the narratives that accompany the Soil Data Mart reports define some of the properties included in the map unit descriptions.

Report—Map Unit Description (Brief, Generated)

Volusia County, Florida

Map Unit: 3—Arents

Component: Arents (51%)

The Arents component makes up 51 percent of the map unit. Slopes are 0 to 2 percent. This component is on fills, rises on marine terraces on coastal plains. The parent material consists of altered marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 24 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Arents (49%)

The Arents component makes up 49 percent of the map unit. Slopes are 0 to 2 percent. This component is on sanitary landfills on marine terraces on coastal plains, rises on marine terraces on coastal plains. The parent material consists of altered marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 36 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 0 percent. Nonirrigated land capability classification is 7s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Map Unit: 8—Basinger fine sand, frequently ponded, 0 to 1 percent slopes**Component: Basinger (90%)**

The Basinger component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Smyrna (5%)

Generated brief soil descriptions are created for major soil components. The Smyrna soil is a minor component.

Component: Samsula (3%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Floridana (2%)

Generated brief soil descriptions are created for major soil components. The Floridana soil is a minor component.

Map Unit: 13—Cassia fine sand, 0 to 2 percent slopes

Component: Cassia (80%)

The Cassia component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy-marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Myakka (7%)

Generated brief soil descriptions are created for major soil components. The Myakka soil is a minor component.

Component: Pomello (6%)

Generated brief soil descriptions are created for major soil components. The Pomello soil is a minor component.

Component: Satellite (4%)

Generated brief soil descriptions are created for major soil components. The Satellite soil is a minor component.

Component: Jonathan (3%)

Generated brief soil descriptions are created for major soil components. The Jonathan soil is a minor component.

Map Unit: 17—Daytona sand, 0 to 5 percent slopes**Component: Daytona (85%)**

The Daytona component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy marine deposits and/or eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 50 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Immokalee (4%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Component: Cassia (4%)

Generated brief soil descriptions are created for major soil components. The Cassia soil is a minor component.

Component: Orsino (2%)

Generated brief soil descriptions are created for major soil components. The Orsino soil is a minor component.

Component: St. Lucie (2%)

Generated brief soil descriptions are created for major soil components. The St. Lucie soil is a minor component.

Component: Satellite (2%)

Generated brief soil descriptions are created for major soil components. The Satellite soil is a minor component.

Component: Pompano (1%)

Generated brief soil descriptions are created for major soil components. The Pompano soil is a minor component.

Map Unit: 19—Deland fine sand, 0 to 5 percent slopes**Component:** Deland (85%)

The Deland component makes up 85 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. There is no zone of water saturation within a depth of 72 inches. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 4s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Tavares (5%)

Generated brief soil descriptions are created for major soil components. The Tavares soil is a minor component.

Component: Apopka (5%)

Generated brief soil descriptions are created for major soil components. The Apopka soil is a minor component.

Component: Astatula (5%)

Generated brief soil descriptions are created for major soil components. The Astatula soil is a minor component.

Map Unit: 20—EauGallie fine sand**Component: EauGallie, non-hydric (70%)**

The EauGallie, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: EauGallie, hydric (10%)

The EauGallie, hydric component makes up 10 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Farmton, non-hydric (7%)

Generated brief soil descriptions are created for major soil components. The Farmton, non-hydric soil is a minor component.

Component: Pinellas, non-hydric (7%)

Generated brief soil descriptions are created for major soil components. The Pinellas, non-hydric soil is a minor component.

Component: Wabasso, non-hydric (6%)

Generated brief soil descriptions are created for major soil components. The Wabasso, non-hydric soil is a minor component.

Map Unit: 21—EauGallie fine sand, frequently ponded, 0 to 1 percent slopes

Component: EauGallie (85%)

The EauGallie component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Immokalee (6%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Component: Basinger (5%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Pineda (2%)

Generated brief soil descriptions are created for major soil components. The Pineda soil is a minor component.

Component: Malabar (2%)

Generated brief soil descriptions are created for major soil components. The Malabar soil is a minor component.

Map Unit: 22—Electra fine sand, 0 to 5 percent slopes

Component: Electra (75%)

The Electra component makes up 75 percent of the map unit. Slopes are 0 to 5 percent. This component is on rises on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 33 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Cassia (15%)

Generated brief soil descriptions are created for major soil components. The Cassia soil is a minor component.

Component: Daytona (10%)

Generated brief soil descriptions are created for major soil components. The Daytona soil is a minor component.

Map Unit: 23—Farmton fine sand

Component: Farmton, non-hydric (70%)

The Farmton, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Farmton, hydric (10%)

The Farmton, hydric component makes up 10 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: EauGallie, non-hydric (4%)

Generated brief soil descriptions are created for major soil components. The EauGallie, non-hydric soil is a minor component.

Component: Immokalee, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Immokalee, non-hydric soil is a minor component.

Component: Myakka, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Myakka, non-hydric soil is a minor component.

Component: Pomona, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Pomona, non-hydric soil is a minor component.

Component: Wauchula, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Wauchula, non-hydric soil is a minor component.

Map Unit: 27—Hontoon muck, frequently ponded, 0 to 1 percent slopes

Component: Hontoon (80%)

The Hontoon component makes up 80 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 50 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Samsula (7%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Placid (5%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Basinger (4%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Pompano (2%)

Generated brief soil descriptions are created for major soil components. The Pompano soil is a minor component.

Component: Myakka (2%)

Generated brief soil descriptions are created for major soil components. The Myakka soil is a minor component.

Map Unit: 29—Immokalee sand

Component: Immokalee, non-hydric (65%)

The Immokalee, non-hydric component makes up 65 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during January, February, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Immokalee, hydric (10%)

The Immokalee, hydric component makes up 10 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Placid (4%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Daytona (4%)

Generated brief soil descriptions are created for major soil components. The Daytona soil is a minor component.

Component: Myakka, non-hydric (4%)

Generated brief soil descriptions are created for major soil components. The Myakka, non-hydric soil is a minor component.

Component: St. Johns, hydric (3%)

Generated brief soil descriptions are created for major soil components. The St. Johns, hydric soil is a minor component.

Component: Satellite (3%)

Generated brief soil descriptions are created for major soil components. The Satellite soil is a minor component.

Component: Smyrna, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Smyrna, non-hydric soil is a minor component.

Map Unit: 30—Immokalee sand, depressional

Component: Immokalee, depressional (80%)

The Immokalee, depressional component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains, drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Placid (4%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Pompano, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Pompano, depressional soil is a minor component.

Component: Basinger, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: St. Johns, hydric (4%)

Generated brief soil descriptions are created for major soil components. The St. Johns, hydric soil is a minor component.

Component: Myakka, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Myakka, depressional soil is a minor component.

Map Unit: 31—Malabar fine sand**Component:** Malabar, hydric (80%)

The Malabar, hydric component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 2 inches during June, July, August, September. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Malabar, non-hydric (5%)

Generated brief soil descriptions are created for major soil components. The Malabar, non-hydric soil is a minor component.

Component: Basinger, depressional (3%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Pineda, hydric (3%)

Generated brief soil descriptions are created for major soil components. The Pineda, hydric soil is a minor component.

Component: Holopaw, hydric (3%)

Generated brief soil descriptions are created for major soil components. The Holopaw, hydric soil is a minor component.

Component: Riviera, hydric (2%)

Generated brief soil descriptions are created for major soil components. The Riviera, hydric soil is a minor component.

Component: Pompano, hydric (2%)

Generated brief soil descriptions are created for major soil components. The Pompano, hydric soil is a minor component.

Component: Valkaria (2%)

Generated brief soil descriptions are created for major soil components. The Valkaria soil is a minor component.

Map Unit: 32—Myakka-Myakka, wet, fine sands, 0 to 2 percent slopes**Component: Myakka (70%)**

The Myakka component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Myakka, wet (15%)

The Myakka, wet component makes up 15 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods, coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: EauGallie (5%)

Generated brief soil descriptions are created for major soil components. The EauGallie soil is a minor component.

Component: Placid (5%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Basinger (5%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Map Unit: 33—Myakka fine sand, frequently ponded, 0 to 1 percent slopes

Component: Myakka (85%)

The Myakka component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 4 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pompano (4%)

Generated brief soil descriptions are created for major soil components. The Pompano soil is a minor component.

Component: Placid (3%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: St. Johns (3%)

Generated brief soil descriptions are created for major soil components. The St. Johns soil is a minor component.

Component: Immokalee (3%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Component: Samsula (1%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Floridana (1%)

Generated brief soil descriptions are created for major soil components. The Floridana soil is a minor component.

Map Unit: 34—Myakka-St. Johns complex.

Component: Myakka, depressional (60%)

The Myakka, depressional component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: St. Johns, depressional (25%)

The St. Johns, depressional component makes up 25 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains, drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, April, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger, depressional (3%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Pompano, depressional (3%)

Generated brief soil descriptions are created for major soil components. The Pompano, depressional soil is a minor component.

Component: Placid (3%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Pomona, depressional (2%)

Generated brief soil descriptions are created for major soil components. The Pomona, depressional soil is a minor component.

Component: Samsula (2%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Valkaria (2%)

Generated brief soil descriptions are created for major soil components. The Valkaria soil is a minor component.

Map Unit: 37—Orsino fine sand, 0 to 5 percent slopes

Component: Orsino (82%)

The Orsino component makes up 82 percent of the map unit. Slopes are 0 to 5 percent. This component is on ridges on marine terraces on coastal plains. The parent material consists of sandy marine deposits and/or eolian deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 50 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Paola (6%)

Generated brief soil descriptions are created for major soil components. The Paola soil is a minor component.

Component: Cassia (4%)

Generated brief soil descriptions are created for major soil components. The Cassia soil is a minor component.

Component: Tavares (3%)

Generated brief soil descriptions are created for major soil components. The Tavares soil is a minor component.

Component: Daytona (3%)

Generated brief soil descriptions are created for major soil components. The Daytona soil is a minor component.

Component: Basinger (1%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Immokalee (1%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Map Unit: 38—Paisley fine sand, 0 to 1 percent slopes, rarely flooded

Component: Paisley (90%)

The Paisley component makes up 90 percent of the map unit. Slopes are 0 to 1 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer, abrupt textural change, is 10 to 14 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately low. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is high. This soil is rarely flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Immokalee (5%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Component: Wabasso (3%)

Generated brief soil descriptions are created for major soil components. The Wabasso soil is a minor component.

Component: Tequesta (2%)

Generated brief soil descriptions are created for major soil components. The Tequesta soil is a minor component.

Map Unit: 45—Pineda-Pineda, wet, fine sand, 0 to 2 percent slopes

Component: Pineda (45%)

The Pineda component makes up 45 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pineda, wet (40%)

The Pineda, wet component makes up 40 percent of the map unit. Slopes are 0 to 1 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Felda (6%)

Generated brief soil descriptions are created for major soil components. The Felda soil is a minor component.

Component: Wabasso (3%)

Generated brief soil descriptions are created for major soil components. The Wabasso soil is a minor component.

Component: Valkaria (2%)

Generated brief soil descriptions are created for major soil components. The Valkaria soil is a minor component.

Component: Cypress Lake (2%)

Generated brief soil descriptions are created for major soil components. The Cypress Lake soil is a minor component.

Component: Brynwood (2%)

Generated brief soil descriptions are created for major soil components. The Brynwood soil is a minor component.

Map Unit: 48—Placid fine sand, frequently ponded, 0 to 1 percent slopes**Component: Placid (80%)**

The Placid component makes up 80 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger (7%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Myakka (5%)

Generated brief soil descriptions are created for major soil components. The Myakka soil is a minor component.

Component: Gentry (3%)

Generated brief soil descriptions are created for major soil components. The Gentry soil is a minor component.

Component: Samsula (3%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Felda (2%)

Generated brief soil descriptions are created for major soil components. The Felda soil is a minor component.

Map Unit: 49—Pomona fine sand**Component: Pomona, non-hydric (70%)**

The Pomona, non-hydric component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 10 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pomona, hydric (10%)

The Pomona, hydric component makes up 10 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 4 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: EauGallie, non-hydric (4%)

Generated brief soil descriptions are created for major soil components. The EauGallie, non-hydric soil is a minor component.

Component: Basinger, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Farnton, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Farnton, non-hydric soil is a minor component.

Component: Myakka, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Myakka, non-hydric soil is a minor component.

Component: Immokalee, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Immokalee, non-hydric soil is a minor component.

Component: Wauchula, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Wauchula, non-hydric soil is a minor component.

Map Unit: 50—Pomona fine sand, depressional, 0 to 2 percent slopes**Component:** Pomona (80%)

The Pomona component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: St. Johns (5%)

Generated brief soil descriptions are created for major soil components. The St. Johns soil is a minor component.

Component: Immokalee (5%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Component: Malabar (5%)

Generated brief soil descriptions are created for major soil components. The Malabar soil is a minor component.

Component: Basinger (5%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Map Unit: 51—Pomona-St. Johns complex**Component:** Pomona, depressional (60%)

The Pomona, depressional component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains, drainageways on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: St. Johns, depressional (30%)

The St. Johns, depressional component makes up 30 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains, drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger, depressional (2%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: EauGallie, depressional (2%)

Generated brief soil descriptions are created for major soil components. The EauGallie, depressional soil is a minor component.

Component: Scoggin (1%)

Generated brief soil descriptions are created for major soil components. The Scoggin soil is a minor component.

Component: Placid (1%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Samsula (1%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Immokalee, non-hydric (1%)

Generated brief soil descriptions are created for major soil components. The Immokalee, non-hydric soil is a minor component.

Component: Malabar, hydric (1%)

Generated brief soil descriptions are created for major soil components. The Malabar, hydric soil is a minor component.

Component: Pompano, depressional (1%)

Generated brief soil descriptions are created for major soil components. The Pompano, depressional soil is a minor component.

Map Unit: 52—Pompano fine sand

Component: Pompano, non-hydric (65%)

The Pompano, non-hydric component makes up 65 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 10 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pompano, hydric (16%)

The Pompano, hydric component makes up 16 percent of the map unit. Slopes are 0 to 2 percent. This component is on drainageways on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 2 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger, depressional (7%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Placid (6%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Immokalee, non-hydric (6%)

Generated brief soil descriptions are created for major soil components. The Immokalee, non-hydric soil is a minor component.

Map Unit: 53—Pompano-Placid complex

Component: Pompano, depressional (55%)

The Pompano, depressional component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Placid (25%)

The Placid component makes up 25 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, March, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 6 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Tequesta (4%)

Generated brief soil descriptions are created for major soil components. The Tequesta soil is a minor component.

Component: Holopaw, hydric (4%)

Generated brief soil descriptions are created for major soil components. The Holopaw, hydric soil is a minor component.

Component: Malabar, hydric (4%)

Generated brief soil descriptions are created for major soil components. The Malabar, hydric soil is a minor component.

Component: Samsula (4%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Riviera, hydric (4%)

Generated brief soil descriptions are created for major soil components. The Riviera, hydric soil is a minor component.

Map Unit: 55—Riviera fine sand**Component:** Riviera, hydric (55%)

The Riviera, hydric component makes up 55 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Riviera, non-hydric (20%)

The Riviera, non-hydric component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 10 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Holopaw, hydric (5%)

Generated brief soil descriptions are created for major soil components. The Holopaw, hydric soil is a minor component.

Component: Basinger, depressional (4%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Pineda, hydric (4%)

Generated brief soil descriptions are created for major soil components. The Pineda, hydric soil is a minor component.

Component: Tuscawilla (4%)

Generated brief soil descriptions are created for major soil components. The Tuscawilla soil is a minor component.

Component: Paisley (4%)

Generated brief soil descriptions are created for major soil components. The Paisley soil is a minor component.

Component: Winder (4%)

Generated brief soil descriptions are created for major soil components. The Winder soil is a minor component.

Map Unit: 56—Samsula muck, frequently ponded, 0 to 1 percent slopes**Component:** Samsula (85%)

The Samsula component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 75 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Myakka (3%)

Generated brief soil descriptions are created for major soil components. The Myakka soil is a minor component.

Component: Kaliga (3%)

Generated brief soil descriptions are created for major soil components. The Kaliga soil is a minor component.

Component: Basinger (3%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Anclote (2%)

Generated brief soil descriptions are created for major soil components. The Anclote soil is a minor component.

Component: Floridana (2%)

Generated brief soil descriptions are created for major soil components. The Floridana soil is a minor component.

Component: Sanibel (2%)

Generated brief soil descriptions are created for major soil components. The Sanibel soil is a minor component.

Map Unit: 57—Satellite sand, 0 to 2 percent slopes

Component: Satellite (85%)

The Satellite component makes up 85 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is somewhat poorly drained. Water movement in the most restrictive layer is very high. Available water to a depth of 60 inches (or restricted depth) is very low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 1 percent. Nonirrigated land capability classification is 6s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Myakka (5%)

Generated brief soil descriptions are created for major soil components. The Myakka soil is a minor component.

Component: Immokalee (4%)

Generated brief soil descriptions are created for major soil components. The Immokalee soil is a minor component.

Component: Basinger (3%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Cassia (2%)

Generated brief soil descriptions are created for major soil components. The Cassia soil is a minor component.

Component: Pompano (1%)

Generated brief soil descriptions are created for major soil components. The Pompano soil is a minor component.

Map Unit: 59—Scoggin sand

Component: Scoggin (80%)

The Scoggin component makes up 80 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during January, February, June, July, August, September, October, November, December. Organic matter content in the surface horizon is about 50 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Wabasso, depressional (5%)

Generated brief soil descriptions are created for major soil components. The Wabasso, depressional soil is a minor component.

Component: Wauchula, depressional (5%)

Generated brief soil descriptions are created for major soil components. The Wauchula, depressional soil is a minor component.

Component: Pompano, hydric (5%)

Generated brief soil descriptions are created for major soil components. The Pompano, hydric soil is a minor component.

Component: Riviera, hydric (5%)

Generated brief soil descriptions are created for major soil components. The Riviera, hydric soil is a minor component.

Map Unit: 60—Smyrna-Smyrna, wet, fine sand, 0 to 2 percent slopes**Component:** Smyrna, non-hydric (76%)

The Smyrna, non-hydric component makes up 76 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 7 percent. Nonirrigated land capability classification is 4w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 0 within 30 inches of the soil surface.

Component: Smyrna, hydric (20%)

The Smyrna, hydric component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September. Organic matter content in the surface horizon is about 7 percent. Nonirrigated land capability classification is 4w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 0 within 30 inches of the soil surface.

Component: Basinger, depressional (2%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: EauGallie, hydric (1%)

Generated brief soil descriptions are created for major soil components. The EauGallie, hydric soil is a minor component.

Component: Pomona, non-hydric (1%)

Generated brief soil descriptions are created for major soil components. The Pomona, non-hydric soil is a minor component.

Map Unit: 61—St. Johns fine sand**Component: St. Johns, hydric (60%)**

The St. Johns, hydric component makes up 60 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 3 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: St. Johns, non-hydric (20%)

The St. Johns, non-hydric component makes up 20 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 10 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 3 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Smyrna, hydric (5%)

Generated brief soil descriptions are created for major soil components. The Smyrna, hydric soil is a minor component.

Component: Myakka, hydric (5%)

Generated brief soil descriptions are created for major soil components. The Myakka, hydric soil is a minor component.

Component: Placid (5%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Component: Basinger, depressional (5%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Map Unit: 63—Tavares fine sand, 0 to 5 percent slopes**Component: Tavares (83%)**

The Tavares component makes up 83 percent of the map unit. Slopes are 0 to 5 percent. This component is on hills on marine terraces on coastal plains. The parent material consists of eolian or sandy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is moderately well drained. Water movement in the most restrictive layer is high. Available water to a depth of 60 inches (or restricted depth) is low. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 30 inches during June, July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3s. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Cassia (5%)

Generated brief soil descriptions are created for major soil components. The Cassia soil is a minor component.

Component: Pomello (4%)

Generated brief soil descriptions are created for major soil components. The Pomello soil is a minor component.

Component: Apopka (3%)

Generated brief soil descriptions are created for major soil components. The Apopka soil is a minor component.

Component: Astatula (3%)

Generated brief soil descriptions are created for major soil components. The Astatula soil is a minor component.

Component: Adamsville (2%)

Generated brief soil descriptions are created for major soil components. The Adamsville soil is a minor component.

Map Unit: 64—Tequesta muck, frequently ponded, 0 to 1 percent slopes**Component: Tequesta (87%)**

The Tequesta component makes up 87 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 75 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Basinger (4%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Component: Sanibel (3%)

Generated brief soil descriptions are created for major soil components. The Sanibel soil is a minor component.

Component: Holopaw (3%)

Generated brief soil descriptions are created for major soil components. The Holopaw soil is a minor component.

Component: Kaliga (3%)

Generated brief soil descriptions are created for major soil components. The Kaliga soil is a minor component.

Map Unit: 66—Tomoka muck, frequently ponded, 0 to 1 percent slopes

Component: Tomoka (85%)

The Tomoka component makes up 85 percent of the map unit. Slopes are 0 to 1 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of herbaceous organic material over sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is very high. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during July, August, September, October. Organic matter content in the surface horizon is about 75 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Hontoon (4%)

Generated brief soil descriptions are created for major soil components. The Hontoon soil is a minor component.

Component: Floridana (3%)

Generated brief soil descriptions are created for major soil components. The Floridana soil is a minor component.

Component: Canova (2%)

Generated brief soil descriptions are created for major soil components. The Canova soil is a minor component.

Component: Samsula (2%)

Generated brief soil descriptions are created for major soil components. The Samsula soil is a minor component.

Component: Terra Ceia (2%)

Generated brief soil descriptions are created for major soil components. The Terra Ceia soil is a minor component.

Component: St. Johns (1%)

Generated brief soil descriptions are created for major soil components. The St. Johns soil is a minor component.

Component: Placid (1%)

Generated brief soil descriptions are created for major soil components. The Placid soil is a minor component.

Map Unit: 73—Wabasso-Wabasso, wet, fine sand, 0 to 2 percent slopes**Component:** Wabasso (70%)

The Wabasso component makes up 70 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September, October, November. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Wabasso, wet (15%)

The Wabasso, wet component makes up 15 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 6 inches during July, August, September, October. Organic matter content in the surface horizon is about 2 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: EauGallie (5%)

Generated brief soil descriptions are created for major soil components. The EauGallie soil is a minor component.

Component: Riviera (3%)

Generated brief soil descriptions are created for major soil components. The Riviera soil is a minor component.

Component: Malabar (3%)

Generated brief soil descriptions are created for major soil components. The Malabar soil is a minor component.

Component: Aripeka (2%)

Generated brief soil descriptions are created for major soil components. The Aripeka soil is a minor component.

Component: Paisley (1%)

Generated brief soil descriptions are created for major soil components. The Paisley soil is a minor component.

Component: Basinger (1%)

Generated brief soil descriptions are created for major soil components. The Basinger soil is a minor component.

Map Unit: 75—Wauchula fine sand**Component:** Wauchula, non-hydric (75%)

The Wauchula, non-hydric component makes up 75 percent of the map unit. Slopes are 0 to 2 percent. This component is on flatwoods on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 12 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil does not meet hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Wauchula, hydric (10%)

The Wauchula, hydric component makes up 10 percent of the map unit. Slopes are 0 to 2 percent. This component is on flats on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is not ponded. A seasonal zone of water saturation is at 5 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 3w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Scoggin (4%)

Generated brief soil descriptions are created for major soil components. The Scoggin soil is a minor component.

Component: Pomona, non-hydric (4%)

Generated brief soil descriptions are created for major soil components. The Pomona, non-hydric soil is a minor component.

Component: Pineda, hydric (4%)

Generated brief soil descriptions are created for major soil components. The Pineda, hydric soil is a minor component.

Component: Wabasso, non-hydric (3%)

Generated brief soil descriptions are created for major soil components. The Wabasso, non-hydric soil is a minor component.

Map Unit: 76—Wauchula fine sand, depressional

Component: Wauchula, depressional (80%)

The Wauchula, depressional component makes up 80 percent of the map unit. Slopes are 0 to 2 percent. This component is on depressions on marine terraces on coastal plains. The parent material consists of sandy and loamy marine deposits. Depth to a root restrictive layer is greater than 60 inches. The natural drainage class is very poorly drained. Water movement in the most restrictive layer is moderately high. Available water to a depth of 60 inches (or restricted depth) is moderate. Shrink-swell potential is low. This soil is not flooded. It is frequently ponded. A seasonal zone of water saturation is at 0 inches during June, July, August, September. Organic matter content in the surface horizon is about 5 percent. Nonirrigated land capability classification is 7w. This soil meets hydric criteria. There are no saline horizons within 30 inches of the soil surface. The soil has a maximum sodium adsorption ratio of 1 within 30 inches of the soil surface.

Component: Pomona, depressional (7%)

Generated brief soil descriptions are created for major soil components. The Pomona, depressional soil is a minor component.

Component: Basinger, depressional (7%)

Generated brief soil descriptions are created for major soil components. The Basinger, depressional soil is a minor component.

Component: Wauchula, non-hydric (6%)

Generated brief soil descriptions are created for major soil components. The Wauchula, non-hydric soil is a minor component.

Map Unit: 99—Water

Component: Water (100%)

Generated brief soil descriptions are created for major soil components. The Water is a miscellaneous area.

Data Source Information

Soil Survey Area: Volusia County, Florida
Survey Area Data: Version 20, Aug 27, 2021

Exhibit K

Department of Environmental Protection
Outstanding Florida Waters



FLORIDA DEPARTMENT OF Environmental Protection

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

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

January 10, 2019

Ms. Patti Anderson
Florida Forest Service Land Management Plan Coordinator
Florida Department of Agriculture and Consumer Services
3125 Conner Boulevard, Suite I-262, Mail Stop C-25
Tallahassee, FL 32399-1650

RE: Tiger Bay State Forest

Dear Ms. Anderson:

Thank you for your inquiry regarding the surface water quality classification of waters on and near Tiger Bay State Forest in Volusia County. There are no waters on or near the site listed as exceptions to Class III in subparagraph 62-302.400(17)(b)64., Florida Administrative Code (F.A.C.); therefore, all of the surface waters on or adjacent to the site are classified as Class III waters (Fish Consumption; Recreation, Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife), which is the statewide default classification under subsection 62-302.400(15), F.A.C.

As requested, we also checked to see if there are any Outstanding Florida Waters (OFWs) near the state forest. According to subsection 62-302.700(9), F.A.C, there are two OFWs on, adjacent to, or near the state forest. These OFWs are the Tomoka River "Special Water" (62-302.700(9)(i)35., F.A.C.) and the Volusia Water Recharge Area (subsection 62-302.700(9)(f)63., F.A.C). While there are several other parcels on, adjacent, or nearby that are considered conservation lands at a Federal, State or Local level (according to the Florida Natural Areas Inventory Managed Areas data layer), these have not been designated OFWs beyond what is described above.

If you have any questions or need additional information, please feel free to contact me at the letterhead address (mail station 6511), by phone at 850-245-8427, or via E-mail at Janet.Klemm@FloridaDEP.gov.

Sincerely,

A handwritten signature in cursive script, appearing to read "Janet Klemm".

Janet Klemm
Environmental Specialist
DEP Water Quality Standards Program

Exhibit L

Water Resources Map



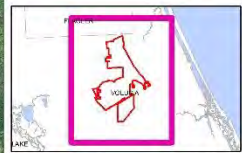
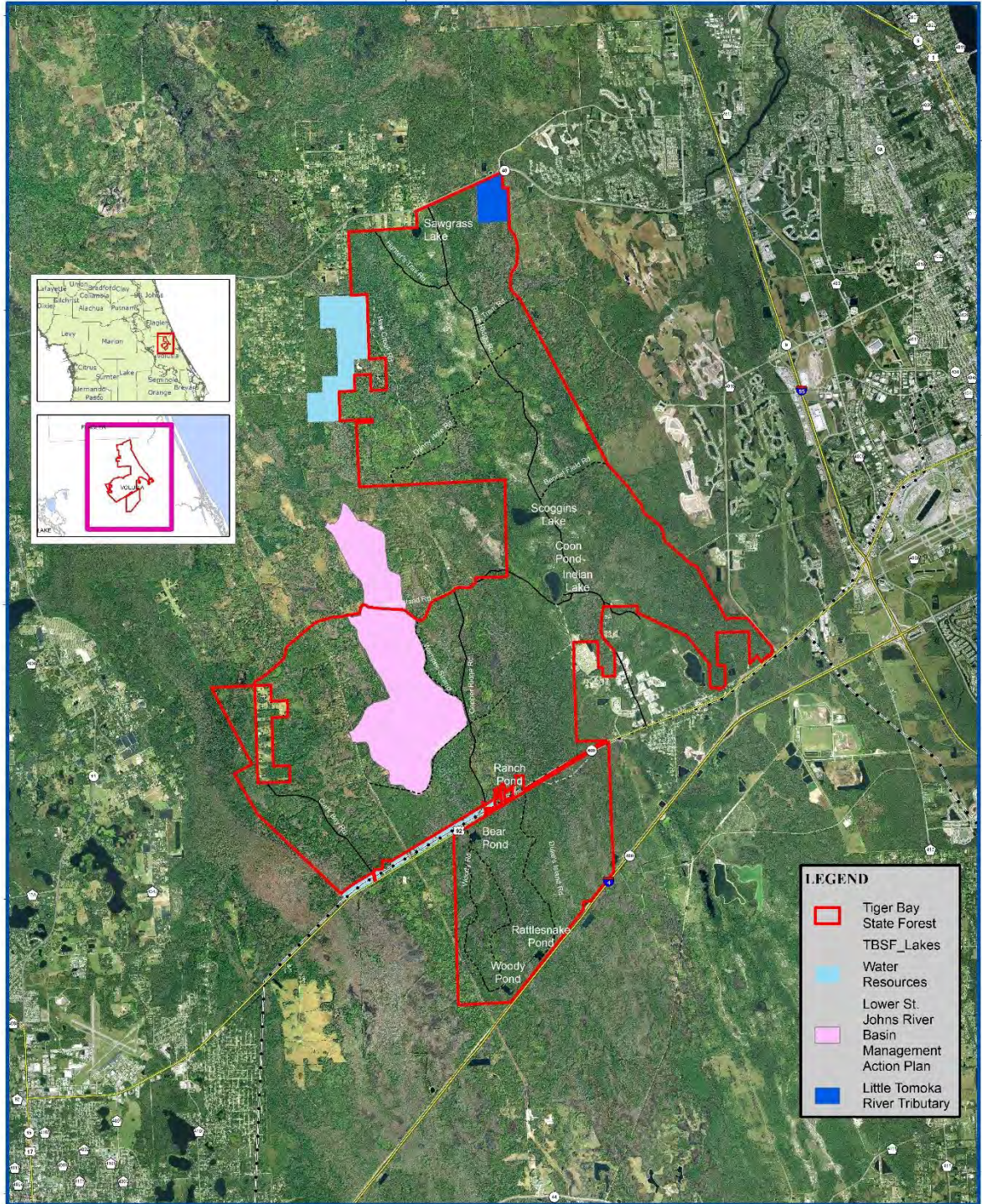
Florida Forest Service

Tiger Bay State Forest Water Resources Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

DISCLAIMER:
This map was prepared by the Florida Forest Service, and the Florida Department of Natural Resources, and is not intended to be used for any purpose other than for general information. The Florida Forest Service, and the Florida Department of Natural Resources, are not responsible for any errors or omissions on this map. The Florida Forest Service, and the Florida Department of Natural Resources, are not responsible for any damages or injuries resulting from the use of this map. The Florida Forest Service, and the Florida Department of Natural Resources, are not responsible for any damages or injuries resulting from the use of this map.

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- LEGEND**
- Tiger Bay State Forest
 - TBSF Lakes
 - Water Resources
 - Lower St. Johns River Basin Management Action Plan
 - Little Tomoka River Tributary

0.5 0.25 0 0.5 1 1.5 2 Miles



Map Month/Year: May 2020

0 3,000 6,000 9,000 12,000 15,000 18,000 Feet

Exhibit M

Florida Natural Areas Inventory Managed Area Data Report



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Tallahassee, FL 32303
850-224-8207
fax 850-681-9364
www.fnai.org

April 15, 2020

Patti Anderson
Florida Forest Service
3125 Conner Boulevard, Suite I-258
Mail Stop C-25
Tallahassee, FL 32399-1650

Dear Ms. Anderson,

Thank you for requesting information from the Florida Natural Areas Inventory (FNAI). At your request we have produced the following report for your project area.

The purpose of this Standard Data Report is to provide objective scientific information on natural resources located in the vicinity of a site of interest, in order to inform those involved in project planning and evaluation. This Report makes no determination of the suitability of a proposed project for this location, or the potential impacts of the project on natural resources in the area.

Project: Tiger Bay State Forest
Date Received: 4/9/2020
Location: Volusia County

Based on the information available, this site appears to be located on or very near a significant region of scrub habitat, a natural community in decline that provides important habitat for several rare species within a small area.

Element Occurrences

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

Federally Listed Species

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



Florida Resources
and Environmental
Analysis Center

Institute of Science
and Public Affairs

The Florida State University

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

Tracking Florida's Biodiversity

Likely and Potential Rare Species

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

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

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

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

CLIP

The enclosed map shows natural resource conservation priorities based on the Critical Lands and Waters Identification Project. CLIP is based on many of the same natural resource data developed for the Florida Forever Conservation Needs Assessment, but provides an overall picture of conservation priorities across different resource categories, including biodiversity, landscapes, surface waters, and aggregated CLIP priorities (that combine the individual resource categories). CLIP is also based primarily on remote sensed data and is not intended to be the definitive authority on natural resources on a site.

For more information on CLIP, visit <http://www.fnai.org/clip.cfm>.

Managed Areas

Portions of the site appear to be located within the Tiger Bay State Forest, managed by the FL Dept. of Agriculture and Consumer Services, Florida Forest Service.

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

Land Acquisition Projects

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

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

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

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

The database maintained by the Florida Natural Areas Inventory is the single most comprehensive source of information available on the locations of rare species and other significant ecological resources. However, the data are not always based on comprehensive or site-specific field surveys. Therefore this information should not be regarded as a final statement on the biological resources of

the site being considered, nor should it be substituted for on-site surveys. Inventory data are designed for the purposes of conservation planning and scientific research, and are not intended for use as the primary criteria for regulatory decisions.

Information provided by this database may not be published without prior written notification to the Florida Natural Areas Inventory, and the Inventory must be credited as an information source in these publications. **The maps contain sensitive environmental information, please do not distribute or publish without prior consent from FNAI.** FNAI data may not be resold for profit.

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

Sincerely,

Kerri Brinegar

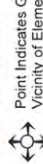
Kerri Brinegar
GIS / Data Services

Encl

FLORIDA
Natural Areas
INVENTORY

Element Occurrences

- Animals
Plants
Communities
Other
Data Sensitive

U.S. Fish & Wildlife Service
Scrub Jay Survey 1992-96

Conservation Lands

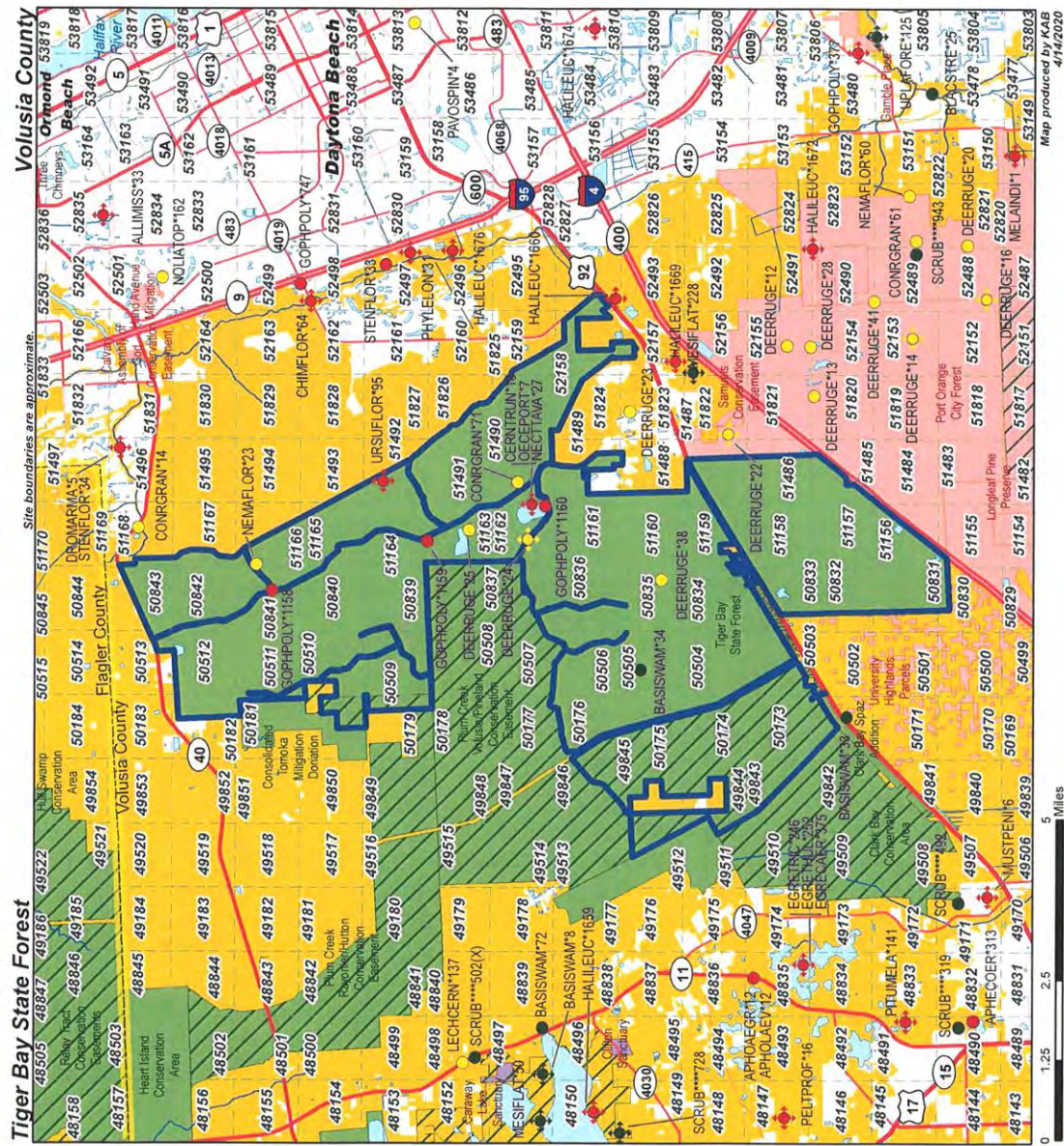
- Federal
State
Local
Private

Land Acquisition Projects

-
- Florida Forever**
Board of Trustees Projects

- FNAI Rare Species
Habitat**

NOTE
This map contains environmentally sensitive information. Please do not distribute or publish without prior consent from FNAI. Map should not be interpreted without accompanying documents.



Map produced by KAB
4/14/2020



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www.fnai.org

CLIP v4.0 Resource Priorities

Biodiversity Resource Category

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Landscape Resource Category

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Surface Water Resource Category

- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Aggregated CLIP Priorities

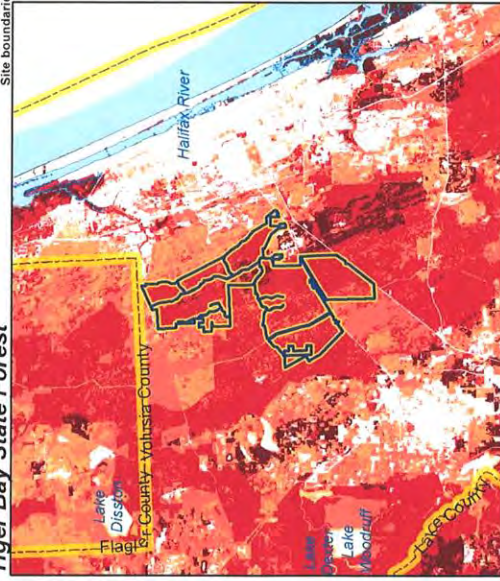
- Priority 1 - highest
- Priority 2
- Priority 3
- Priority 4
- Priority 5

Site Boundary

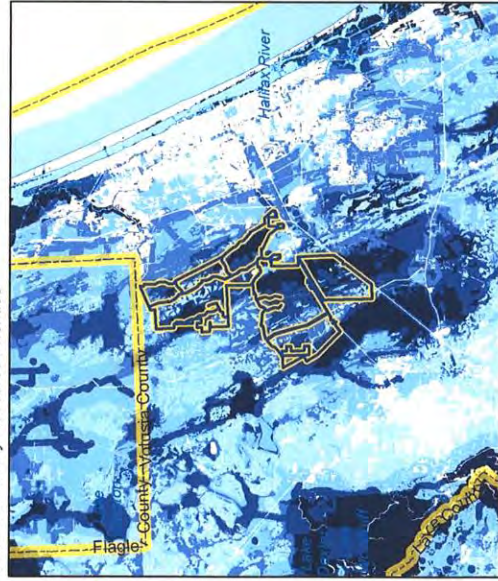
Map should not be interpreted without accompanying documents.

Critical Lands and Waters Identification Project (CLIP) is a cooperative effort between the FSU Florida Natural Areas Inventory, UF Center for Fish & Wildlife Conservation, and the Florida Department of Environmental Protection, with additional funding from the U.S. Department of Environmental Protection and the U.S. Fish & Wildlife Service.

Tiger Bay State Forest

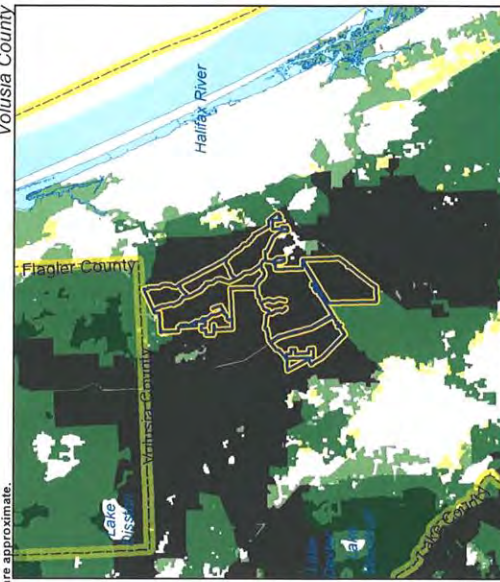


CLIP Biodiversity Resource Priorities



CLIP Surface Water Resource Priorities

Volusia County



CLIP Landscape Resource Priorities



CLIP Aggregated Resource Priorities



Map produced by KAB
4/14/2020



FNAI ELEMENT OCCURRENCE REPORT on or near Tiger Bay State Forest



Global State Federal State Observation		EO Comments	
Map Label	Scientific Name	Common Name	Description
BASISWAM*33	Basin swamp	G4 S3 N N	2004
		<p>Large basin swamp extending from US 92 south to I-4. Large depression marshes at south end. Pine plantations dominated surrounding uplands with many recent clearcuts. City of Deland ca. 0.6 mi W.</p> <p>2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1994-08-25) (U05FNA02ELUS). Basin swamp covering over 3 mi N-S and 1.5 mi E-W. Visual estimates of dominant species were: canopy- Taxodium ascendens [95% cover, 4-8" (16") DBH, 50' tall]; subcanopy- Ilex cassine (5%, 4-6", 20-30'); understory- Lyonia lucida (20%, 4-8'); groundcover- Panicum hemitomon (20%). Rhynchospora inundata (10%), and Carex sp. (5%). Cladium jamaicense (50%) dominated the ground cover to the E. Water was 12-18" deep on 1994-08-25; ordinary high water estimated to be ca. 24"; no flow was evident.</p>	



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FNAI ELEMENT OCCURRENCE REPORT on or near Tiger Bay State Forest



Global State Federal State Observation

Map Label	Scientific Name	Common Name	Rank	Status	Listing	Date	Description	EO Comments
BASISWAM*34	Basin swamp		G4	S3	N	N	2004	2004: Update to last obs date was based on interpretation of aerial photography (previous value was 1994-08-25) (U05FNA02FLUS). Irregular-shaped basin swamp extending over 2.5 mi N-S and 0.5 mi E-W. No evidence of recent logging in swamp. Visual estimates of dominant species were made in two locations. In Section 4 NW/4, average tree DBH was ca. 8". Dominant species were: canopy - Taxodium ascendens [50% cover, 4-8" (16") DBH, 50' tall]; Nyssa biflora (20%, 6-8"); Gordonia lasianthus (10%, 6-10"); and Pinus elliotii (10%, 6-8"); subcanopy - Gordonia lasianthus (20%, 3-6") and Ilex cassine (5%, 4-6"); understory - Lyonia lucida (30%, 4-8"); and Myrica cerifera (5%), groundcover - Woodwardia virginica (60%) and Osmunda cinnamomea (10%). Water ca. 12-16" deep on 1994-08-25; ordinary high water ca. 18". No flow was evident. In Section 8 NW/4NW/4SE4, dominant species were: canopy - Taxodium ascendens [60% cover, 4-8" (12") DBH, 50' tall]; Nyssa biflora [20%, 6-8" (12")]; and Pinus elliotii (5%, 12-18"); subcanopy - Ilex cassine (35%, 4-6" (20-30")); understory - Lyonia lucida (50%, 4-8") and Myrica cerifera (5%); and groundcover sparse. Open water covered 65% of ground; ca. 12-18" deep on 1994-08-25. No flow was evident.
CERNTRUN*10	Cernotina truncona	Florida Cernotina Caddisfly	G4	S3	N	N	2007-06-22	2007-06-22: Seventeen specimens were collected using a 15 watt black light over an alcohol-filled white pan (U09RAS01FLUS).
CONRGRAN*14	Conradina grandiflora	large-flowered rosemary	G3	S3	N	T	1955-03-31	WOODY STEM PLANTS UP TO 2' HIGH; FLOWERS WHITE TO PURPLISH LVS IN WHORLS; COMMON IN SCRUB.
CONRGRAN*71	Conradina grandiflora	large-flowered rosemary	G3	S3	N	T	2017-05-03	2017: 85 counted, most in leaf, some in bud/flower (F17FNA17FLUS). 2005: 11-50 plants to 3' tall, in flower/bud; scattered clumps in scrub (F05FNA03FLUS; PNDSCH03FLUS).



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FNAI ELEMENT OCCURRENCE REPORT on or near Tiger Bay State Forest



Map Label	Scientific Name	Common Name	Global State Rank	Federal Rank	State Status	Observation Date	Description	EO Comments
DEERRUGE*13	<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E	1995-06-13 Flatwoods to east of road - 30% cover Pinus elliptici; 40% Pinus palustris; 90% 3 to 4' tall Serenoa repens; 50% Lyonia lucida; 20% Aristida stricta; roller-chopped with few pines left to west.	Medium density of Deeringothamnus plants - 10 plants counted E of road in open flatwoods; 8 plants seen W of road in area cutover and roller-chopped.
DEERRUGE*22	<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E	2009 1996: Low, open, grassy flatwoods with Asimina reticulata also present	1996-05-10: ca 193 plants found - only 10 with flowers. In 1998, 37 plants were found in another area north of hwy 92 to west. At another site just south of I-4 an unknown number were found almost annually from 2003 to 2009.
DEERRUGE*23	<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E	1997-05-21 1997-05-21: harvested, bedded, and re-planted pine plantation (PNDMIL08FLUS).	1998-09-08: area searched - no plants seen (PNDIOH01FLUS); 1997-05-21: Plants in flower but not in fruit. Private property - no estimate of population (PNDMIL08FLUS).
DEERRUGE*24	<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E	2017-05-02 High quality Mesic Flatwoods	Plants have been documented in this area many times from 1998 to 2017. In 2017, a total of 11 vegetative plants were seen at 5 points. In 2016, 59 plants were observed. In 2012, 50+ plants counted-37 in cleared area and 23 in mesic flatwoods disturbed by plowlines. In 2009, 17 individuals, 3 in flower were seen. In 2005, ca. 6 plants were seen, in leaf. In 2003, 12 plants were seen north of road and in 2002, 24 were seen south of road. In 1999, 45 plants total were seen along this road and in 1998 about the same number were seen in 3 clusters along the N side of the road.
DEERRUGE*25	<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E	2017-05-03 MESIC FLATWOODS	12 plants, 1 vegetative plant and 11 flowering seen in 2017, 3 plants total in 2012, 7 plants in 1998.
DEERRUGE*38	<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E	2017-05-02 Recently thinned and burned (2010) mesic flatwoods. Not recently burned as of 2017-05-02	In 2012, 9 plants total, a couple with flowers but most without. In 2017, a search of the same area found only a single plant in flower. Also in 2017, in two nearby locations 44 plants were observed.



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FNAI ELEMENT OCCURRENCE REPORT on or near Tiger Bay State Forest



Global State Federal State			Observation			Description	EO Comments		
Map Label	Scientific Name	Common Name	Rank	Status	Listing			Date	
GOPHPOLY1158	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	2005-04-13	2005-04-13: Scrubby flatwoods impacted by roads, firebreaks, and fire suppression (PNDSCH03FLUS).	2005-04-13: One large and one small active burrow seen in scrubby flatwoods (PNDSCH03FLUS).
GOPHPOLY1159	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	2005-04-19	2005-04-19: scrubby flatwoods (PNDSCH03FLUS).	2005-04-19: one large active burrow seen (PNDSCH03FLUS).
GOPHPOLY1160	<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST	2005-04-20	2005-04-20: within a large state forest, flatwoods, sandhill, and scrub habitats impacted by roads, ORV trails, and logging operations (PNDSCH03FLUS).	2005-04-20: G. Shultz recorded 6 active burrows and 1 adult tortoise in flatwoods, scrub, and sandhill (PNDSCH03FLUS; F05FNA03FLUS).
HALILEUC1660	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S3	N	N	2000	2005-07-12: Source does not provide a description.	Nest status: Active, 2000; Not active, 2003, 2002, 2001; Unknown status or not assessed, 1999;(U03FWC01FLUS)
HALILEUC1669	<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S3	N	N	2003	2005-07-12: Source does not provide a description.	Nest status: Active, 2003, 2002, 2001; Unknown status or not assessed, 2000, 1999;(U03FWC01FLUS)
MESIFLAT228	Mesic flatwoods.		G4	S4	N	N	1996-05-10	Low, open, grassy flatwoods with <i>Asimina reticulata</i> .	1996-05-10: Open grassy flatwoods with widely scattered south Florida slash pines and an understory of wiregrass (<i>Aristida stricta</i>), saw palmetto (<i>Serenoa repens</i>), <i>Lyonia lucida</i> , <i>Ilex glabra</i> <i>Quercus minima</i> , <i>Asimina reticulata</i> and ca 240 plants of PDANN03020 found in ca 5 patches - only 10 with flowers (F96J0H01FLUS).
MUSTPEN16	<i>Mustela frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3	N	N	1957-01-17	No general description given	MUSEUM SPECIMEN, #01214 COLLECTED BY R.F. HARLOW 1957-01-17.
NECTTAV27	<i>Nectopsycha lavara</i>	Tavares White Miller Caddisfly	G3	S3	N	N	2007-06-22	2007-06-22: No description given other than that the locality was near a lake (U09RAS01FLUS).	2007-06-22: Twelve specimens were collected using a 15 watt black light over an alcohol-filled white pan (U09RAS01FLUS, U08RAS01FLUS).
NEMAFLO23	<i>Nemastylis floridana</i>	celestial Iily	G2	S2	N	E	1998-11-12	1998-11-12: IN OR NEAR CABBAGE PALM HAMMOCK (U98GRA01FLUS).	1998-11-12: PLANT FOUND FLOWERING IN BURNED AREA (U98GRA01FLUS).
OCEPORT7	<i>Ocellis porteri</i>	Porter's Long-horn Caddisfly	G3G4	S2S3	N	N	2007-06-22	2007-06-22: No description given other than that the locality was near a lake (U09RAS01FLUS).	2007-06-22: Sixty-five specimens were collected using a 15 watt black light over an alcohol-filled white pan (U09RAS01FLUS, U08RAS01FLUS).
PHYLELON31	<i>Phyllophaga elongata</i>	Elongate June Beetle	G3	S3	N	N	1935-07-05	1935-07-05: No description given (B89W0001FLUS).	1935-07-05: One specimen was collected by I.J. Cantrall (B89W0001FLUS).



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FLORIDA
Natural Areas
INVENTORY

FNAI ELEMENT OCCURRENCE REPORT on or near Tiger Bay State Forest



Map Label	Scientific Name	Common Name	Global State Rank	Federal Status	State Listing	Observation Date	Description	EO Comments
URSUFOR'96	<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N	2016	<p>2002: 1,025-1,539 bears estimated in the primary ranges in the Ocala-St. John's region. Part of a larger population that includes Okefenokee Swamp National Wildlife Refuge in Georgia (U05SIM01FLUS). 2014: 1,198 bears estimated in the Ocala-St. John's region and 495 estimated in the Osceola region (A16HUM01FLUS). 2016: polygons created to show where bears are considered 'Abundant' and 'Common' (U16FWC01FLUS)

Primary is the FWC-designated core area that represents breeding range and contains documented evidence of reproduction or female bears within available habitat, and Secondary is the FWC-designated area where bears occur within available habitat but outside primary bear range (evidence of bears without documented evidence of reproduction) (U12FWC02FLUS, U05SIM01FLUS). These boundaries are based on decades of bear observations, roadkill distribution, nuisance bear locations, and bear research projects. For detailed location data contact the FWC.</p> <p>Large area of pine plantation, mesic and wet flatwoods, and dome and basin swamps. Largely private commercial timberland, nurseries, and small neighborhoods; public lands are dominated by pine plantation but also have flatwoods interspersed with dome swamps and patches of scrub. Large area of sand pine and oak scrub, mesic flatwoods, sandhill, depression marshes and hardwood swamps, pine plantation, regular harvesting of sand pine (U05SIM01FLUS).</p>

Florida Natural Areas Inventory

Aggregated Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
Documented					
Basin swamp		G4	S3	N	N
<i>Conradina grandiflora</i>	large-flowered rosemary	G3	S3	N	T
<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST
<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S3	N	N
Mesic flatwoods		G4	S4	N	N
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
Likely					
<i>Cernotina truncona</i>	Florida Cernotin Caddisfly	G4	S3	N	N
<i>Drymarchon couperi</i>	Eastern Indigo Snake	G3	S3	T	FT
<i>Mycteria americana</i>	Wood Stork	G4	S2	T	FT
<i>Nectopsyche tavana</i>	Tavares White Miller Caddisfly	G3	S3	N	N
<i>Nemastylis floridana</i>	celestial lily	G2	S2	N	E
<i>Oecetis porteri</i>	Porter's Long-horn Caddisfly	G3G4	S2S3	N	N
Sandhill		G3	S2	N	N
Sandhill upland lake			S2	N	N
Scrub		G2	S2	N	N
Potential					
<i>Antigone canadensis pratensis</i>	Florida Sandhill Crane	G5T2	S2	N	ST
<i>Aphelocoma coerulescens</i>	Florida Scrub-Jay	G27	S2	T	FT
<i>Arnoglossum diversifolium</i>	variable-leaved Indian-plantain	G2	S2	N	T
<i>Athene cunicularia floridana</i>	Florida Burrowing Owl	G4T3	S3	N	ST
<i>Calopogon multiflorus</i>	many-flowered grass-pink	G2G3	S2S3	N	T
<i>Carex chapmannii</i>	Chapman's sedge	G3	S3	N	T
<i>Centrosema arenicola</i>	sand butterfly pea	G2Q	S2	N	E
<i>Coelorachis tuberculosa</i>	Piedmont jointgrass	G3	S3	N	T
<i>Corynorhinus rafinesquii</i>	Rafinesque's Big-eared Bat	G3G4	S1	N	N
<i>Dryobates borealis</i>	Red-cockaded Woodpecker	G3	S2	E	FE
<i>Gymnopogon chapmanianus</i>	Chapman's skeletongrass		S3	N	N
<i>Hartwrightia floridana</i>	hartwrightia	G2	S2	N	T
<i>Heterodon simus</i>	Southern Hognose Snake		S2S3	N	N
<i>Illicium parviflorum</i>	star anise		S2	N	E
<i>Lechea cernua</i>	nodding pinweed	G3	S3	N	T
<i>Lithobates capito</i>	Gopher Frog		S3	N	N
<i>Litsea aestivalis</i>	pondspice	G3?	S2	N	E
<i>Matelea floridana</i>	Florida spiny-pod	G2	S2	N	E
<i>Mustela frenata peninsulae</i>	Florida Long-tailed Weasel	G5T3?	S3	N	N
<i>Neofiber alleni</i>	Round-tailed Muskrat	G2	S2	N	N
<i>Nolina atopocarpa</i>	Florida beargrass	G3	S3	N	T
<i>Notophthalmus perstriatus</i>	Striped Newt	G2G3	S2	N	N
<i>Phyllophaga elongata</i>	Elongate June Beetle	G3	S3	N	N
<i>Podomys floridanus</i>	Florida Mouse		S3	N	N
<i>Pteroglossaspis ecristata</i>	giant orchid	G2G3	S2	N	T
<i>Pycnanthemum floridanum</i>	Florida mountain-mint	G3	S3	N	T
<i>Salix floridana</i>	Florida willow	G2	S2	N	E
<i>Sciurus niger niger</i>	Southeastern Fox Squirrel	G5T5	S3	N	N

Definitions: Documented - Rare species and natural communities documented on or near this site.
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.



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Florida Natural Areas Inventory

Aggregated Biodiversity Matrix Report



Scientific Name	Common Name	Global Rank	State Rank	Federal Status	State Listing
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Definitions: Documented - Rare species and natural communities documented on or near this site.
Documented-Historic - Rare species and natural communities documented, but not observed/reported within the last twenty years.
Likely - Rare species and natural communities likely to occur on this site based on suitable habitat and/or known occurrences in the vicinity.
Potential - This site lies within the known or predicted range of the species listed.



Florida Natural Areas Inventory

Managed Area Element Summary

Tiger Bay State Forest



SCIENTIFIC NAME	COMMON NAME	Global rank	State rank	Federal status	State status
PLANTS					
<i>Conradina grandiflora</i>	large-flowered rosemary	G3	S3	N	T
<i>Deeringothamnus rugelii</i>	Rugel's pawpaw	G1	S1	E	E
<i>Nemastylis floridana</i>	celestial lily	G2	S2	N	E
REPTILES					
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	C	ST
MAMMALS					
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T4	S4	N	N
INVERTEBRATES					
<i>Ceratomyza trunca</i>	Florida Cernotinan Caddisfly	G4	S3	N	N
<i>Nectopsyche tavares</i>	Tavares White Miller Caddisfly	G3	S3	N	N
<i>Oecetis porteri</i>	Porter's Long-horn Caddisfly	G3G4	S2S3	N	N

POTENTIAL

This species added at the request of the Florida Fish and Wildlife Conservation Commission based on nearby historical occurrences. The historical records cited do not meet FNAI criteria for inclusion in the FL Natural Heritage Database due to unknown source, date, and locational uncertainty.

REPTILES

<i>Pituophis melanoleucus</i>	Pine Snake	G2	S3	N	ST
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Note: Summary includes all documented and likely species occurrence records currently in the FNAI database.



Florida Natural Areas Inventory

Managed Area Element Summary

Tiger Bay State Forest



SCIENTIFIC NAME	COMMON NAME	Global rank	State rank	Federal status	State status
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Using a ranking system developed by NatureServe and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks for each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element Occurrences (EOs), estimated abundance (number of individuals for species; area for natural communities), geographic range, estimated number of adequately protected EOs, relative threat of destruction, and ecological fragility.

FNAI GLOBAL ELEMENT RANK

- G1 = Critically imperiled globally because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- G2 = Imperiled globally because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- G4 = Apparently secure globally (may be rare in parts of range).
- G5 = Demonstrably secure globally.
- GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).
- GX = Believed to be extinct throughout range.
- GXC = Extirpated from the wild but still known from captivity or cultivation.
- G#? = Tentative rank (e.g., G2?).
- G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).
- G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).
- G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).
- G#T#Q = Same as above, but validity as subspecies or variety is questioned.
- GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).
- GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
- GNR = Element not yet ranked (temporary).
- GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

FNAI STATE ELEMENT RANK

- S1 = Critically imperiled in Florida because of extreme rarity (5 or fewer occurrences or less than 1000 individuals) or because of extreme vulnerability to extinction due to some natural or man-made factor.
- S2 = Imperiled in Florida because of rarity (6 to 20 occurrences or less than 3000 individuals) or because of vulnerability to extinction due to some natural or man-made factor.
- S3 = Either very rare and local in Florida (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.
- S4 = Apparently secure in Florida (may be rare in parts of range).
- S5 = Demonstrably secure in Florida.
- SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).
- SX = Believed to be extirpated throughout Florida.
- SU = Unrankable; due to a lack of information no rank or range can be assigned.
- SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).
- SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

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Definitions derived from U.S. Endangered Species Act of 1973, Sec. 3. Note that the federal status given by FNAI refers only to Florida populations and that federal status may differ elsewhere.

C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

LE = Endangered: species in danger of extinction throughout all or a significant portion of its range.

LE, LT = Species currently listed endangered in a portion of its range but only listed as threatened in other areas

LE, PDL = Species currently listed endangered but has been proposed for delisting.

LE, PT = Species currently listed endangered but has been proposed for listing as threatened.

LE, XN = Species currently listed endangered but tracked population is a non-essential experimental population.

LT = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.

SC = Not currently listed, but considered a "species of concern" to USFWS.

STATE LEGAL STATUS

Provided by FNAI for information only. For official definitions and lists of protected species, consult the relevant state agency.

Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service

FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service

F(XN) = Federal listed as an experimental population in Florida

FT(S/A) = Federal Threatened due to similarity of appearance

ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future. (ST* for *Ursus americanus floridanus* (Florida black bear) indicates that this status does not apply in Baker and Columbia counties and in the Apalachicola National Forest. ST* for *Neovison vison* pop.1 (Southern mink, South Florida population) indicates that this status applies to the Everglades population only.)

SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* indicates that a species has SSC status only in selected portions of its range in Florida. SSC* for *Pandion haliaetus* (Osprey) indicates that this status applies in Monroe county only.)

N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: <http://www.doacs.state.fl.us/pi/>.

LE = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant



Florida Natural Areas Inventory
Managed Area Element Summary
Tiger Bay State Forest



to the U.S. Endangered Species Act

LT = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.

N = Not currently listed, nor currently being considered for listing.

Elements and Element Occurrences

An **element** is any exemplary or rare component of the natural environment, such as a species, natural community, bird rookery, spring, sinkhole, cave, or other ecological feature.

An **element occurrence (EO)** is an area of land and/or water in which a species or natural community is, or was, present. An EO should have practical conservation value for the Element as evidenced by potential continued (or historical) presence and/or regular recurrence at a given location.

Element Ranking and Legal Status

Using a ranking system developed by NatureServe and the Natural Heritage Program Network, the Florida Natural Areas Inventory assigns two ranks for each element. The global rank is based on an element's worldwide status; the state rank is based on the status of the element in Florida. Element ranks are based on many factors, the most important ones being estimated number of Element Occurrences (EOs), estimated abundance (number of individuals for species; area for natural communities), geographic range, estimated number of adequately protected EOs, relative threat of destruction, and ecological fragility.

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G3 = Either very rare and local throughout its range (21-100 occurrences or less than 10,000 individuals) or found locally in a restricted range or vulnerable to extinction from other factors.

G4 = Apparently secure globally (may be rare in parts of range).

G5 = Demonstrably secure globally.

GH = Of historical occurrence throughout its range, may be rediscovered (e.g., ivory-billed woodpecker).

GX = Believed to be extinct throughout range.

GXC = Extirpated from the wild but still known from captivity or cultivation.

G#? = Tentative rank (e.g., G2?).

G#G# = Range of rank; insufficient data to assign specific global rank (e.g., G2G3).

G#T# = Rank of a taxonomic subgroup such as a subspecies or variety; the G portion of the rank refers to the entire species and the T portion refers to the specific subgroup; numbers have same definition as above (e.g., G3T1).

G#Q = Rank of questionable species - ranked as species but questionable whether it is species or subspecies; numbers have same definition as above (e.g., G2Q).

G#T#Q = Same as above, but validity as subspecies or variety is questioned.

GU = Unrankable; due to a lack of information no rank or range can be assigned (e.g., GUT2).

GNA = Ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).

GNR = Element not yet ranked (temporary).

GNRTNR = Neither the element nor the taxonomic subgroup has yet been ranked.

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S5 = Demonstrably secure in Florida.

SH = Of historical occurrence in Florida, possibly extirpated, but may be rediscovered (e.g., ivory-billed woodpecker).

SX = Believed to be extirpated throughout Florida.

SU = Unrankable; due to a lack of information no rank or range can be assigned.

SNA = State ranking is not applicable because the element is not a suitable target for conservation (e.g. a hybrid species).

SNR = Element not yet ranked (temporary).

FEDERAL LEGAL STATUS

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C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

E = Endangered: species in danger of extinction throughout all or a significant portion of its range.

E, T = Species currently listed endangered in a portion of its range but only listed as threatened in other areas

E, PDL = Species currently listed endangered but has been proposed for delisting.

E, PT = Species currently listed endangered but has been proposed for listing as threatened.

E, XN = Species currently listed endangered but tracked population is a non-essential experimental population.

T = Threatened: species likely to become Endangered within the foreseeable future throughout all or a significant portion of its range.

PE = Species proposed for listing as endangered

PS = Partial status: some but not all of the species' infraspecific taxa have federal

PT = Species proposed for listing as threatened

SAT = Treated as threatened due to similarity of appearance to a species which is federally listed such that enforcement personnel have difficulty in attempting to differentiate between the listed and unlisted species.

SC = Not currently listed, but considered a "species of concern" to USFWS.

STATE LEGAL STATUS

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Animals: Definitions derived from "Florida's Endangered Species and Species of Special Concern, Official Lists" published by Florida Fish and Wildlife Conservation Commission, 1 August 1997, and subsequent updates.

C = Candidate for listing at the Federal level by the U. S. Fish and Wildlife Service

FE = Listed as Endangered Species at the Federal level by the U. S. Fish and Wildlife Service

FT = Listed as Threatened Species at the Federal level by the U. S. Fish and Wildlife Service

FXN = Federal listed as an experimental population in Florida

FT(S/A) = Federal Threatened due to similarity of appearance

ST = State population listed as Threatened by the FFWCC. Defined as a species, subspecies, or isolated population which is acutely vulnerable to environmental alteration, declining in number at a rapid rate, or whose range or habitat is decreasing in area at a rapid rate and as a consequence is destined or very likely to become an endangered species within the foreseeable future.

SSC = Listed as Species of Special Concern by the FFWCC. Defined as a population which warrants special protection, recognition, or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species. (SSC* for *Pandion haliaetus* (Osprey) indicates that this status applies in Monroe county only.)

N = Not currently listed, nor currently being considered for listing.

Plants: Definitions derived from Sections 581.011 and 581.185(2), Florida Statutes, and the Preservation of Native Flora of Florida Act, 5B-40.001. FNAI does not track all state-regulated plant species; for a complete list of state-regulated plant species, call Florida Division of Plant Industry, 352-372-3505 or see: <http://www.doacs.state.fl.us/pi/>.

E = Endangered: species of plants native to Florida that are in imminent danger of extinction within the state, the survival of which is unlikely if the causes of a decline in the number of plants continue; includes all species determined to be endangered or threatened pursuant to the U.S. Endangered Species Act.

T = Threatened: species native to the state that are in rapid decline in the number of plants within the state, but which have not so decreased in number as to cause them to be Endangered.

N = Not currently listed, nor currently being considered for listing.

Element Occurrence Ranking

FNAI ranks of quality of the element occurrence in terms of its viability (EORANK). Viability is estimated using a combination of factors that contribute to continued survival of the element at the location. Among these are the size of the EO, general condition of the EO at the site, and the conditions of the landscape surrounding the EO (e.g. an immediate threat to an EO by local development pressure could lower an EO rank).

A = Excellent estimated viability
A? = Possibly excellent estimated viability
AB = Excellent or good estimated viability
AC = Excellent, good, or fair estimated viability
B = Good estimated viability
B? = Possibly good estimated viability
BC = Good or fair estimated viability
BD = Good, fair, or poor estimated viability
C = Fair estimated viability
C? = Possibly fair estimated viability
CD = Fair or poor estimated viability
D = Poor estimated viability
D? = Possibly poor estimated viability
E = Verified extant (viability not assessed)
F = Failed to find
H = Historical
NR = Not ranked, a placeholder when an EO is not (yet) ranked.
U = Unrankable
X = Extirpated

*For additional detail on the above ranks see: <http://www.natureserve.org/explorer/eorankguide.htm>

FNAI also uses the following EO ranks:

H? = Possibly historical
F? = Possibly failed to find
X? = Possibly extirpated

The following offers further explanation of the H and X ranks as they are used by FNAI:

The rank of H is used when there is a lack of recent field information verifying the continued existence of an EO, such as (a) when an EO is based only on historical collections data; or (b) when an EO was ranked A, B, C, D, or E at one time and is later, without field survey work, considered to be possibly extirpated due to general habitat loss or degradation of the environment in the area. This definition of the H rank is dependent on an interpretation of what constitutes "recent" field information. Generally, if there is no known survey of an EO within the last 20 to 40 years, it should be assigned an H rank. While these time frames represent suggested maximum limits, the actual time period for historical EOs may vary according to the biology of the element and the specific landscape context of each occurrence (including anthropogenic alteration of the environment). Thus, an H rank may be assigned to an EO before the maximum time frames have lapsed. Occurrences that have not been surveyed for periods exceeding these time frames should not be ranked A, B, C, or D. The higher maximum limit for plants and communities (i.e., ranging from 20 to 40 years) is based upon the assumption that occurrences of these elements generally have the potential to persist at a given location for longer periods of time. This greater potential is a reflection of plant biology and community dynamics. However, landscape factors must also be considered. Thus, areas with more anthropogenic impacts on the environment (e.g., development) will be at the lower end of the range, and less-impacted areas will be at the higher end.

The rank of X is assigned to EOs for which there is documented destruction of habitat or environment, or persuasive evidence of eradication based on adequate survey (i.e., thorough or repeated survey efforts by one or more experienced observers at times and under conditions appropriate for the Element at that location).

Exhibit N

Florida Fish and Wildlife Conservation Commission Listed Species Occurrence Records



**Florida Fish
and Wildlife
Conservation
Commission**

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Panama City

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Vice Chairman
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Assistant Executive Director

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*Managing fish and wildlife
resources for their long-term
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Tallahassee, Florida
32399-1600
Voice: 850-488-4676

Hearing/speech-impaired:
800-955-8771 (T)
800-955-8770 (V)

MyFWC.com

01/08/2019

Patti Anderson
Land Planning Coordinator
Florida Forest Service
3125 Conner Boulevard
Tallahassee, FL
32399

Dear Patti Anderson:

This letter is in response to your request for listed species occurrence records and Strategic Habitat Conservation Areas (SHCA's), on the following properties: Little-Big Econ, Charles H. Bronson, Holopaw, Pine log, Carl Duval Moore, Watson Island, Tiger Bay, and Myakka. Records from The Florida Fish and Wildlife Conservation Commission's database indicate that listed species occurrence data and critical habitats are located within the project areas. The Florida Fish and Wildlife Conservation Commission's database indicates that SHCA's for short-tailed hawk occur on Carl Duval Moore. SHCA's for Cooper's hawk, swallow-tailed kite, and short-tailed hawk occur in Charles H. Bronson. SHCA's for Cooper's hawk and Florida black bear were found on Pine Log, and SHCA's for Cooper's hawk and Florida black bear occur on Tiger Bay. Enclosed are 8.5 x 11 maps showing prioritized SHCA's, priority wetlands, landcover, species richness, and species locations for all projects. Additional species records were found on, or within a 1-mile distance of, the properties will be included in a spreadsheet; these species records are maintained by FNAI and cannot be distributed through FWC.

This letter and attachments should not be considered as a review or an assessment of the impact upon threatened or endangered species of the project site. It provides FWC's most current data regarding the location of listed species and their associated habitats.

Our SHCA recommendations are intended to be used as a guide. Land development and ownership in Florida is ever-changing and priority areas identified as SHCA might already have been significantly altered due to development or acquired into public ownership. Onsite surveys, literature reviews, and coordination with FWC biologists remain essential steps in documenting the presence or absence of rare and imperiled species and habitats within the project area.

Our fish and wildlife location data represents only those occurrences recorded by FWC staff and other affiliated researchers. It is important to understand that our database does not necessarily contain records of all listed species that may occur in a given area. Also, data on certain species, such as gopher tortoises, are not entered into our database on a site-specific basis.

Therefore, one should not assume that an absence of occurrences in our database indicates that species of significance do not occur in the area.

The Florida Natural Areas Inventory (FNAI) maintains a separate database of listed plant and wildlife species, please contact FNAI directly for specific information on the location of element occurrences within the project area.

Because FNAI is funded to provide information to public agencies only, you may be required to pay a fee for this information. County-wide listed species information can be located at their website (<http://www.fnai.org>).

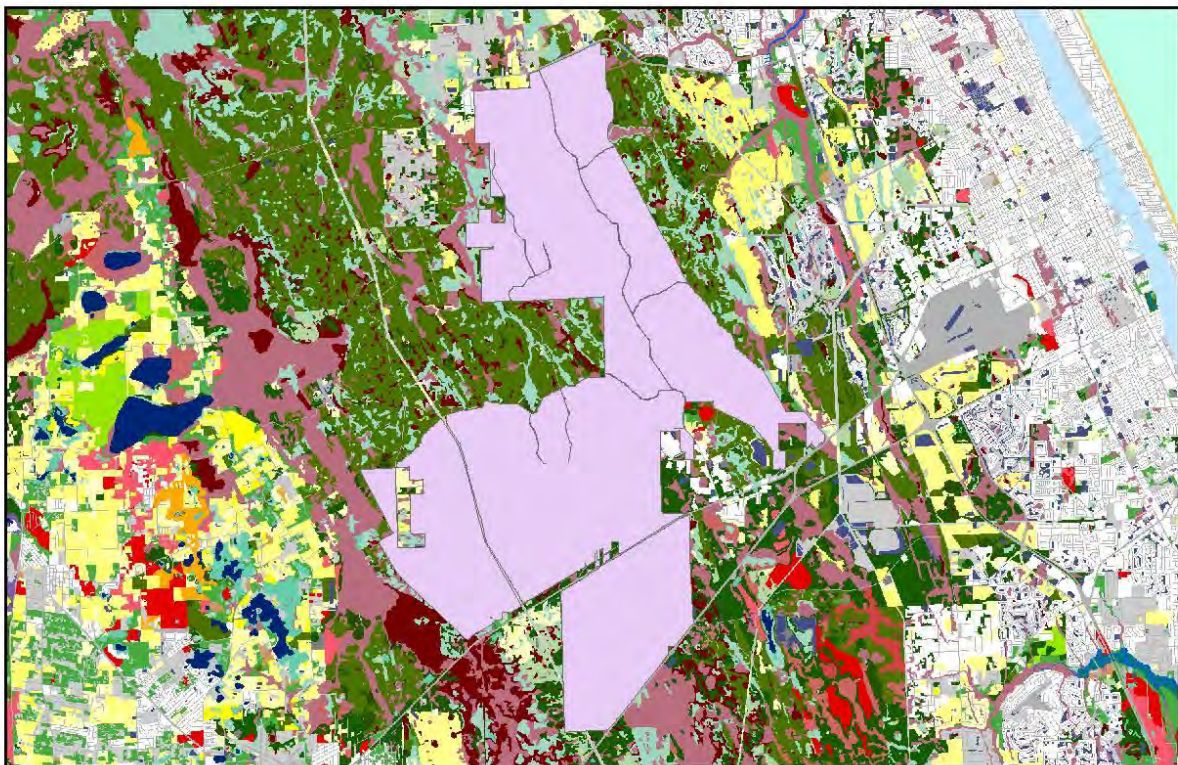
Please credit the Florida Fish and Wildlife Conservation Commission in any publication or presentation of these data. If you have any questions or further requests, please contact me at (850) 488-0588 or gisrequests@myfwc.com.

Sincerely,

A handwritten signature in black ink, appearing to be 'ES' with a stylized flourish at the end.

Eva Salinas
Research Assistant

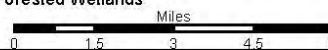
ES
2019_6826
Enclosures



Cooperative Land Cover -- State Classes

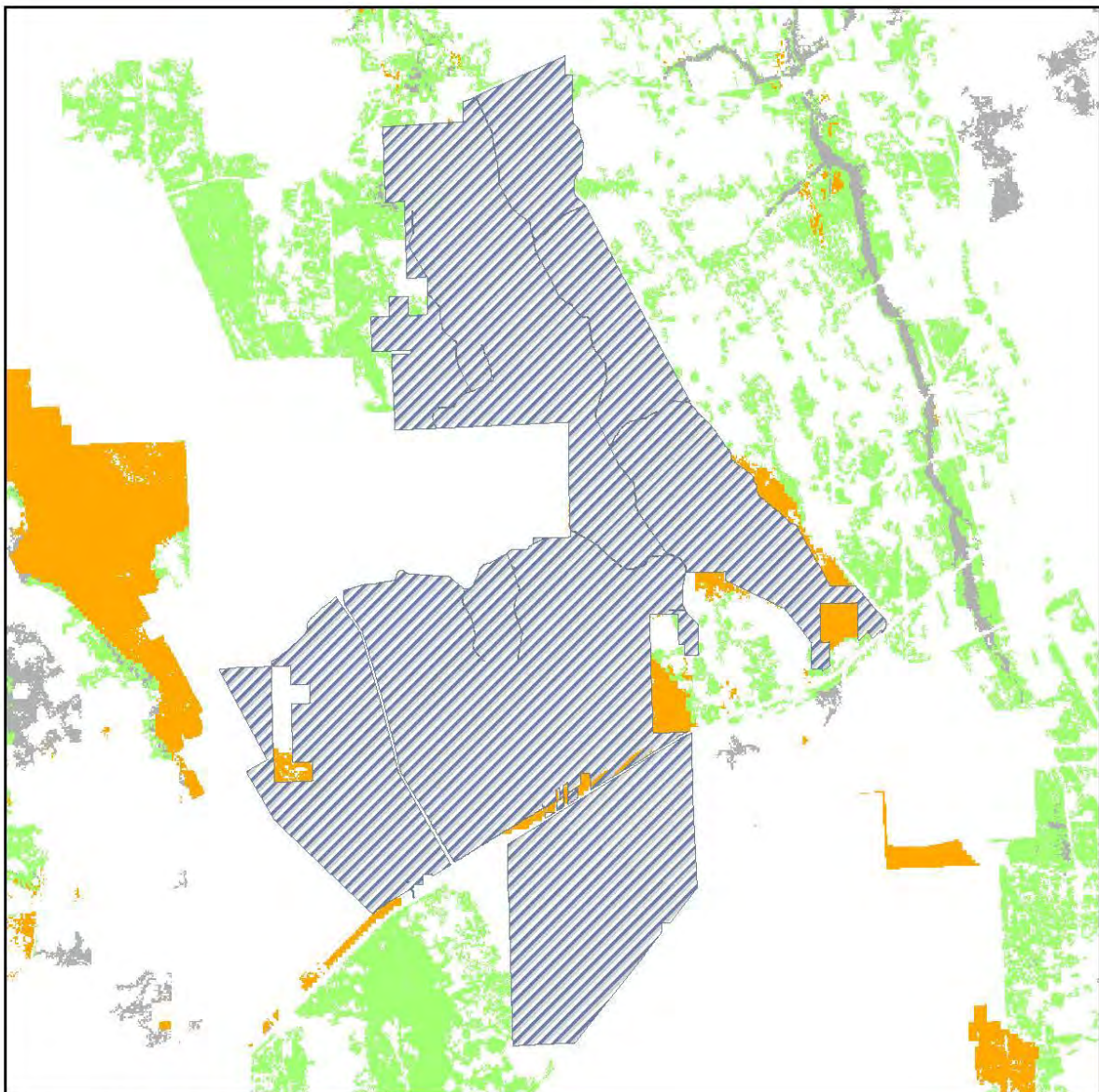
Tiger Bay

TB	Rural	Cypress
Hardwood Forested Uplands	Cropland/Pasture	Dome Swamp
Xeric Hammock	Improved Pasture	Basin Swamp
High Pine and Scrub	Orchards/Groves	Wet Flatwoods
Scrub	Tree Plantations	Atlantic White Cedar
Sand Pine Scrub	Vineyard and Nurseries	Baygall
Coastal Scrub	Other Agriculture	Hydric Hammock
Sandhill	Transportation	Lacustrine
Mesic Flatwoods	Communication	Natural Lakes and Ponds
Scrubby Flatwoods	Utilities	Cultural - Lacustrine
Mixed Hardwood-Coniferous	Extractive	Riverine
Shrub and Brushland	Bare Soil/Clear Cut	Cultural - Riverine
Coastal Strand	Freshwater Non-Forested Wetlands	Estuarine
Sand Beach (Dry)	Prairies and Bogs	Salt Marsh
Cultural - Terrestrial	Marshes	Mangrove Swamp
Low Intensity Urban	Isolated Freshwater Marsh	Marine
High Intensity Urban	Freshwater Forested Wetlands	



Florida Fish and Wildlife
Conservation Commission
MyFWC.com

FWC ID: 2019_6326 January 7th, 2019



Tiger Bay

Prioritized SHCA's

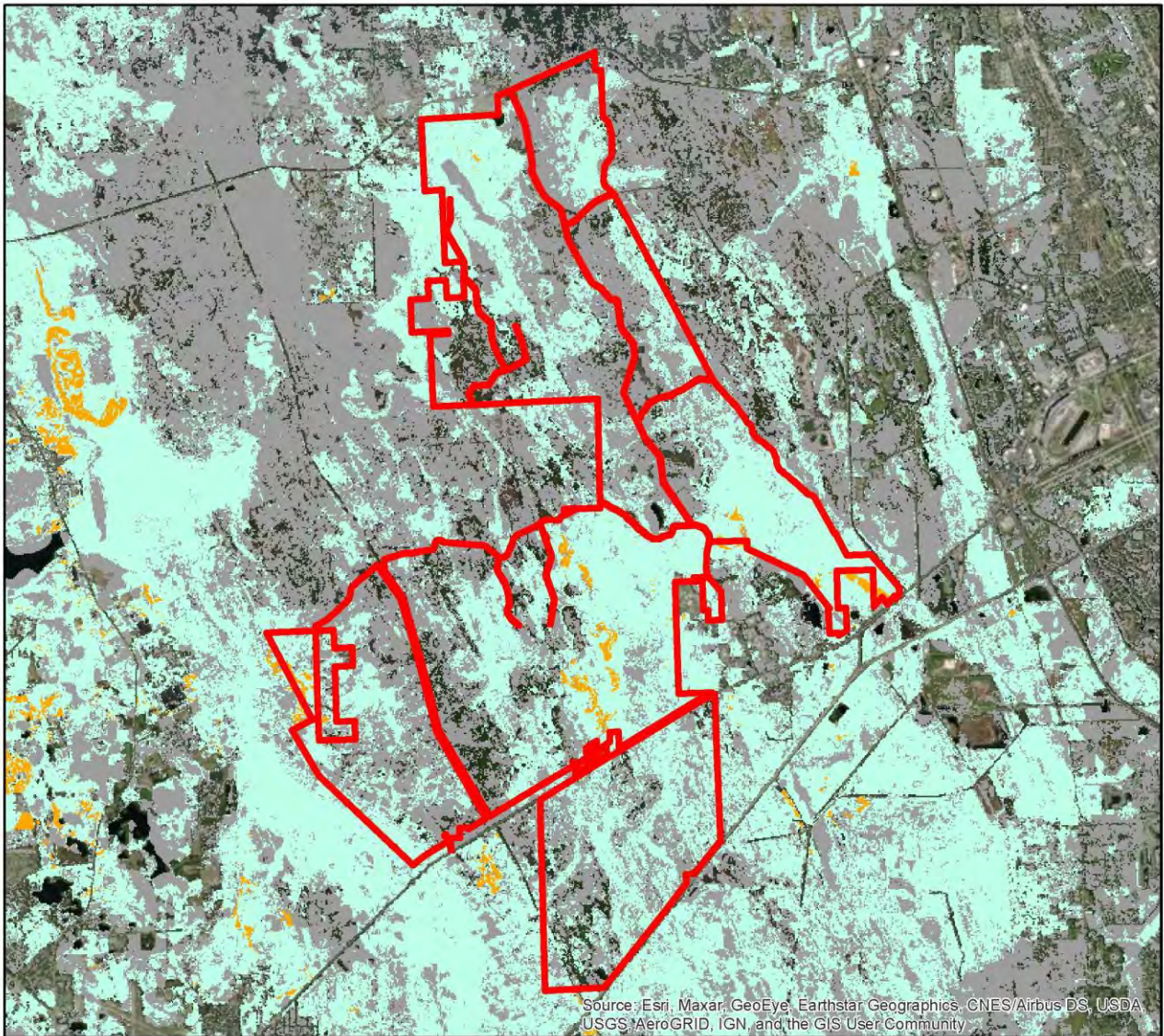


The prioritized SHCA map identifies 5 classes of SHCA based upon Heritage ranking criteria developed by The Nature Conservancy, the Natural Heritage Program Network, and the Florida Natural Areas Inventory. There are 2 possible ranks used to prioritize a species' SHCA: 1) the global rank based on a species worldwide status, and 2) the state rank based upon the species status in Florida. The state and global ranks are based upon many factors such as known occurrence locations, estimated abundance, range, amount of habitat currently protected, perceived levels of threats towards the species, and ecological fragility.



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Species Richness



1-3 4-6 7-9 10-13

 State Forest site boundary

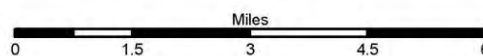


Tiger Bay State Forest

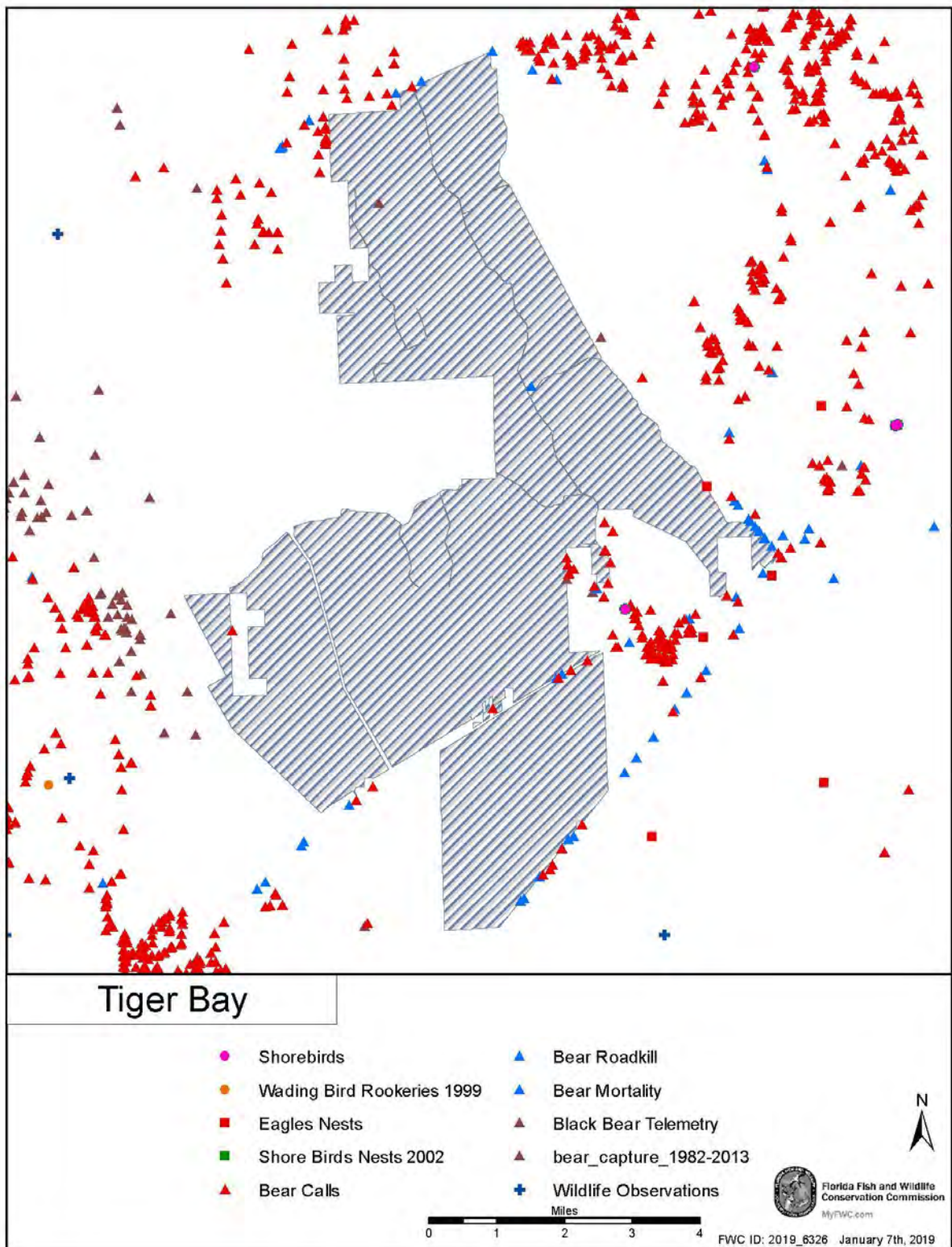
This dataset represents the richness of potential habitat for selected focal species in Florida. Potential habitat includes areas that have been occupied by the species and areas where occupancy is unknown based on available occurrence records. We combined the potential habitats generated for Florida into a single grid layer indicating diversity. Pixel cell value indicates the total number of species potential habitat identified at the specific location.

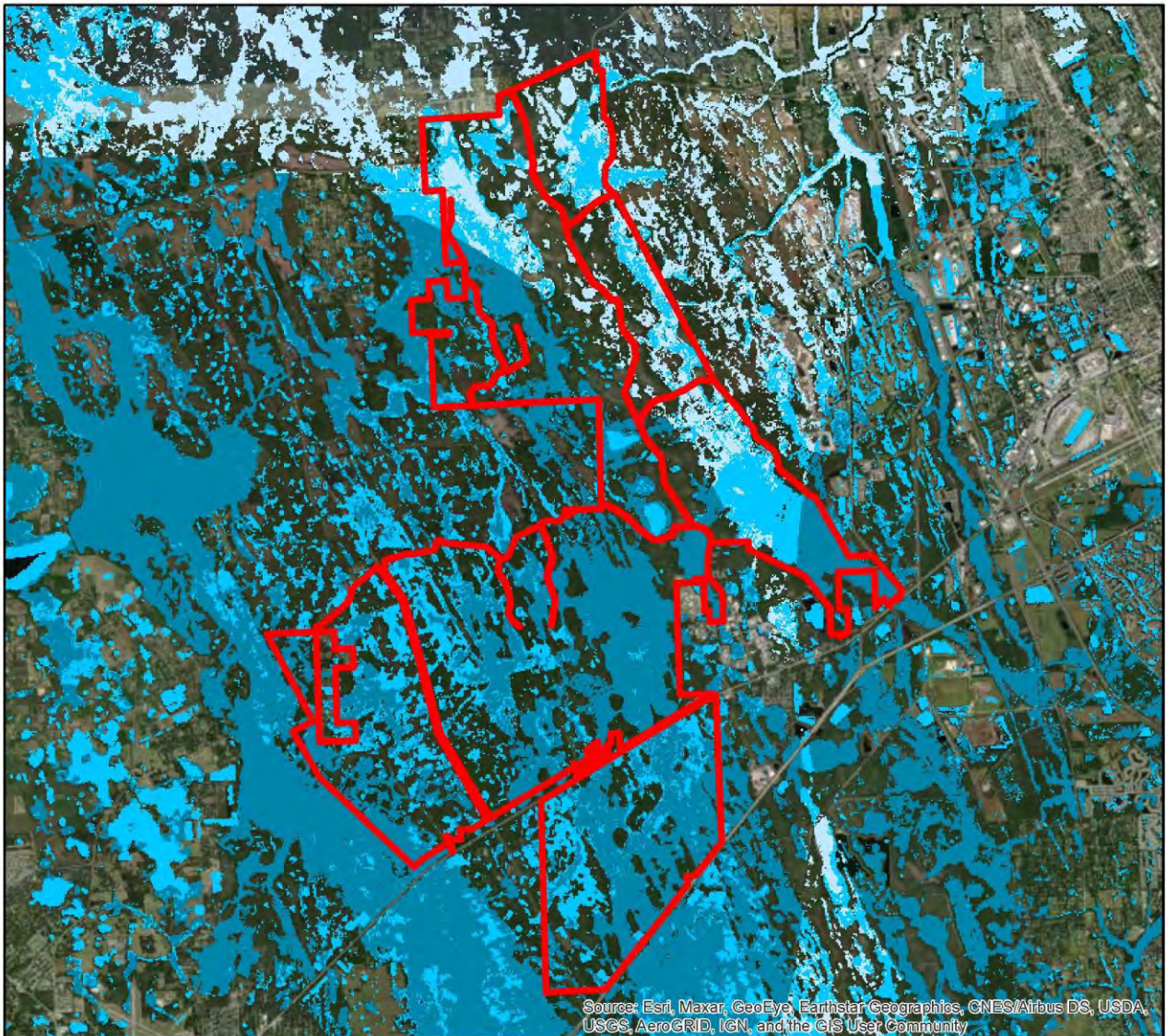


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FWC ID: 2021_6532 December 21, 2021





Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AeroGRID, IGN, and the GIS User Community

Priority Wetlands

- 1-3 Species, Wetlands habitat
- 4-6 Species, Wetlands habitat
- 7-9 Species, Wetlands habitat
- 10-11 Species, Wetlands habitat

State Forest site boundary



Tiger Bay State Forest

This raster dataset identifies Florida wetlands important to wetland-dependent vertebrates listed by the State of Florida as endangered, threatened, or species of special concern. The dataset also ranks the relative importance of wetland areas based on species richness of the selected vertebrate species.



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FWC ID: 2021_6532 December 21, 2021

Exhibit O

Fire History

Tiger Bay State Forest Burn Acres by Fiscal Year

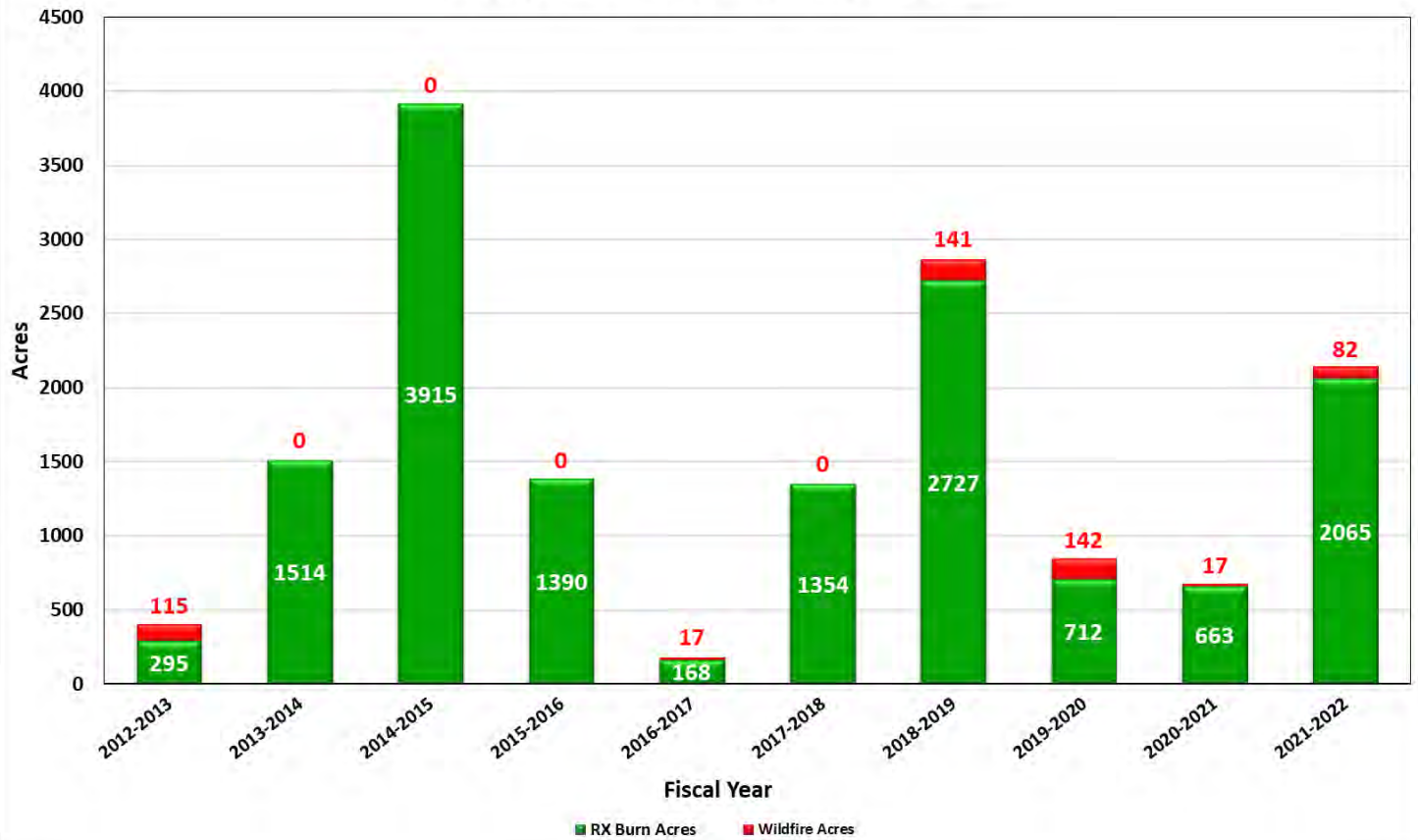


Exhibit P

Non-Native Invasive Species



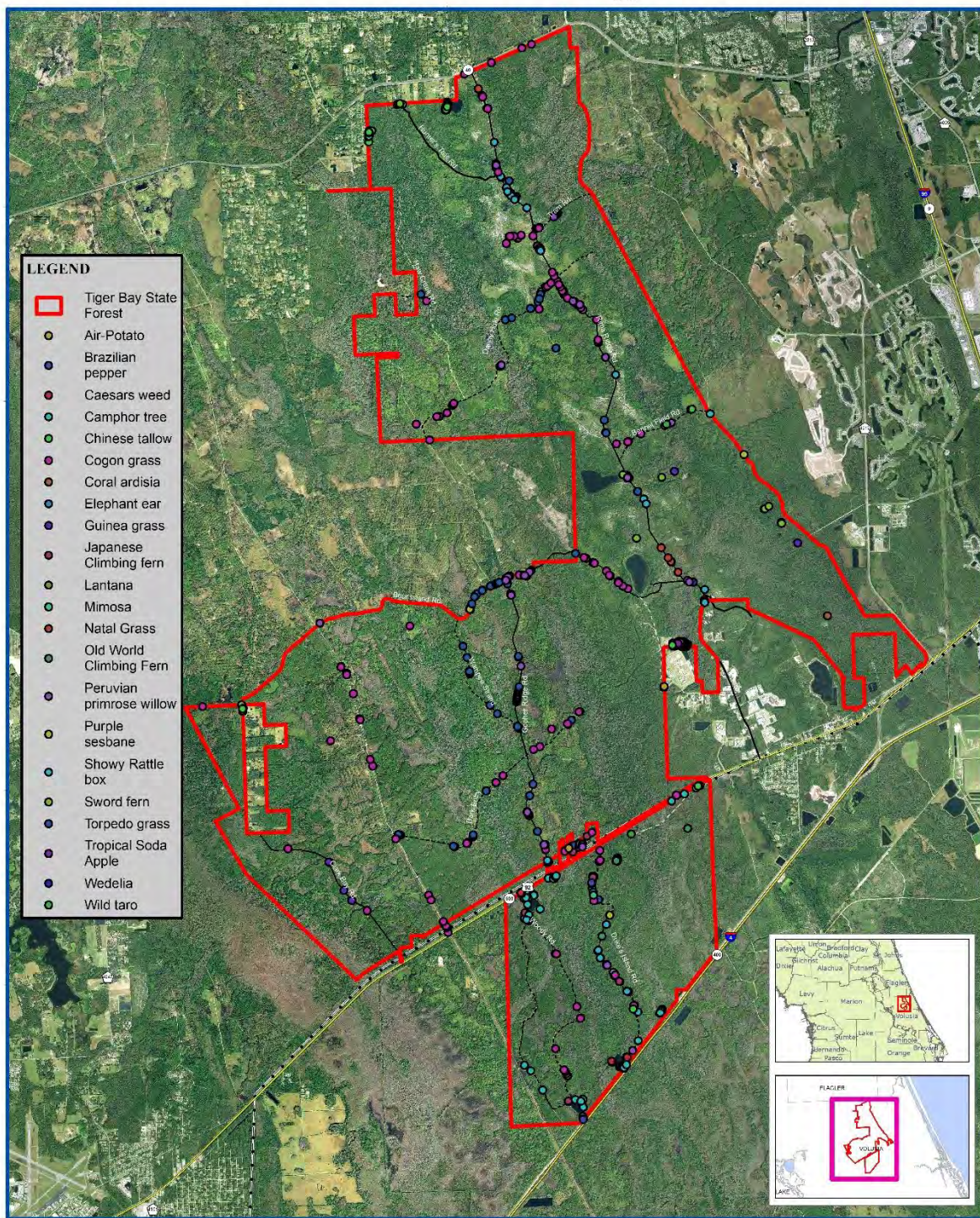
Tiger Bay State Forest
Non-Native Invasive Species Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

81 $\frac{1}{2} \frac{1}{2}$

DISCUSSION:
This study was approved by the Princeton Institutional Review Board (IRB). Computerized Decision System (CDS) and coding were performed on the data. These analyses by IRB are designed to protect your data and for use in medical practice, education, research and other legal proceedings or documents.
The System Administrator assumes the right to access, review, analyze, or modify, with products and without notification, the System and/or the data in any way necessary, without notice or restriction, for the purpose of development of the System or to comply with the law.

Managed Area boundary as courtesy of the Florida Natural Areas Inventory formerly titled Defense Sites (DIDS) from the US Army Corps of Engineers.



Map Month/Year: September 2022

818-11
12-22

Exhibit Q

Current Natural Communities Map



Florida Forest Service

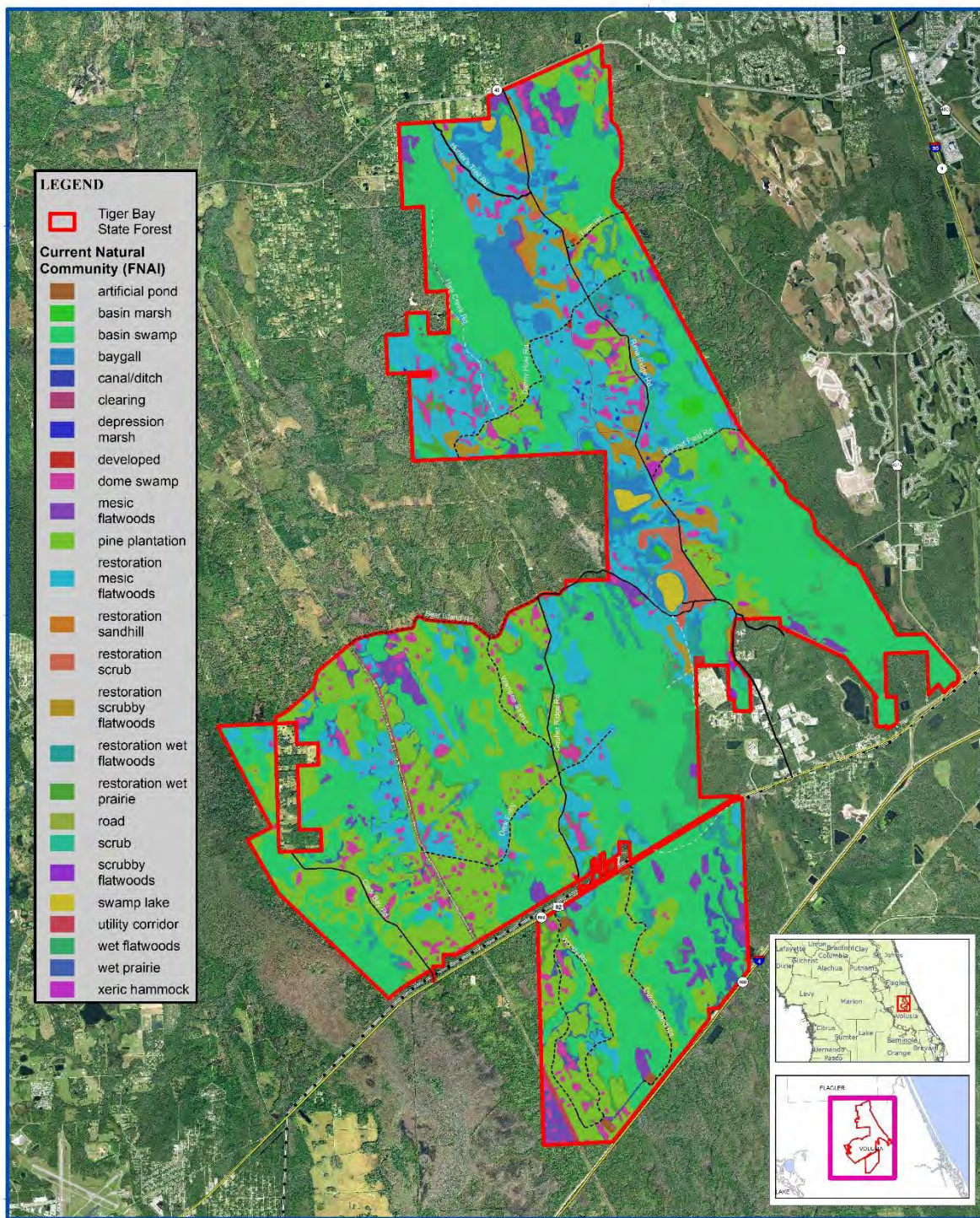
Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

Tiger Bay State Forest

Current FNAI Natural Communities Map

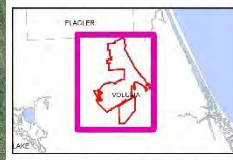
DISCLAIMER:
This map was prepared as a technical report for the Florida Forest Service and is not intended for use as a legal document. The Florida Forest Service does not warrant the accuracy or completeness of the information contained herein. The Florida Forest Service is not responsible for any errors or omissions in this report. The Florida Forest Service is not responsible for any damages or losses resulting from the use of this report.

Map was prepared as the base of the Florida Natural Communities Inventory. Prepared by the Florida Forest Service, 1990-2000. From the US Army Corps of Engineers.



LEGEND

- Tiger Bay State Forest
- Current Natural Community (FNAI)**
- artificial pond
- basin marsh
- basin swamp
- baygall
- canal/ditch
- clearing
- depression marsh
- developed
- dome swamp
- mesic flatwoods
- pine plantation
- restoration mesic flatwoods
- restoration sandhill
- restoration scrub
- restoration scrubby flatwoods
- restoration wet flatwoods
- restoration wet prairie
- road
- scrub
- scrubby flatwoods
- swamp lake
- utility corridor
- wet flatwoods
- wet prairie
- xeric hammock



0.5 0.25 0 0.5 1 1.5 Miles



Map Month/Year: May 2020

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 Feet

0 1000 2000 3000 4000 5000 6000 7000 8000 9000 10000 Feet

Exhibit R

Historic Natural Communities Map



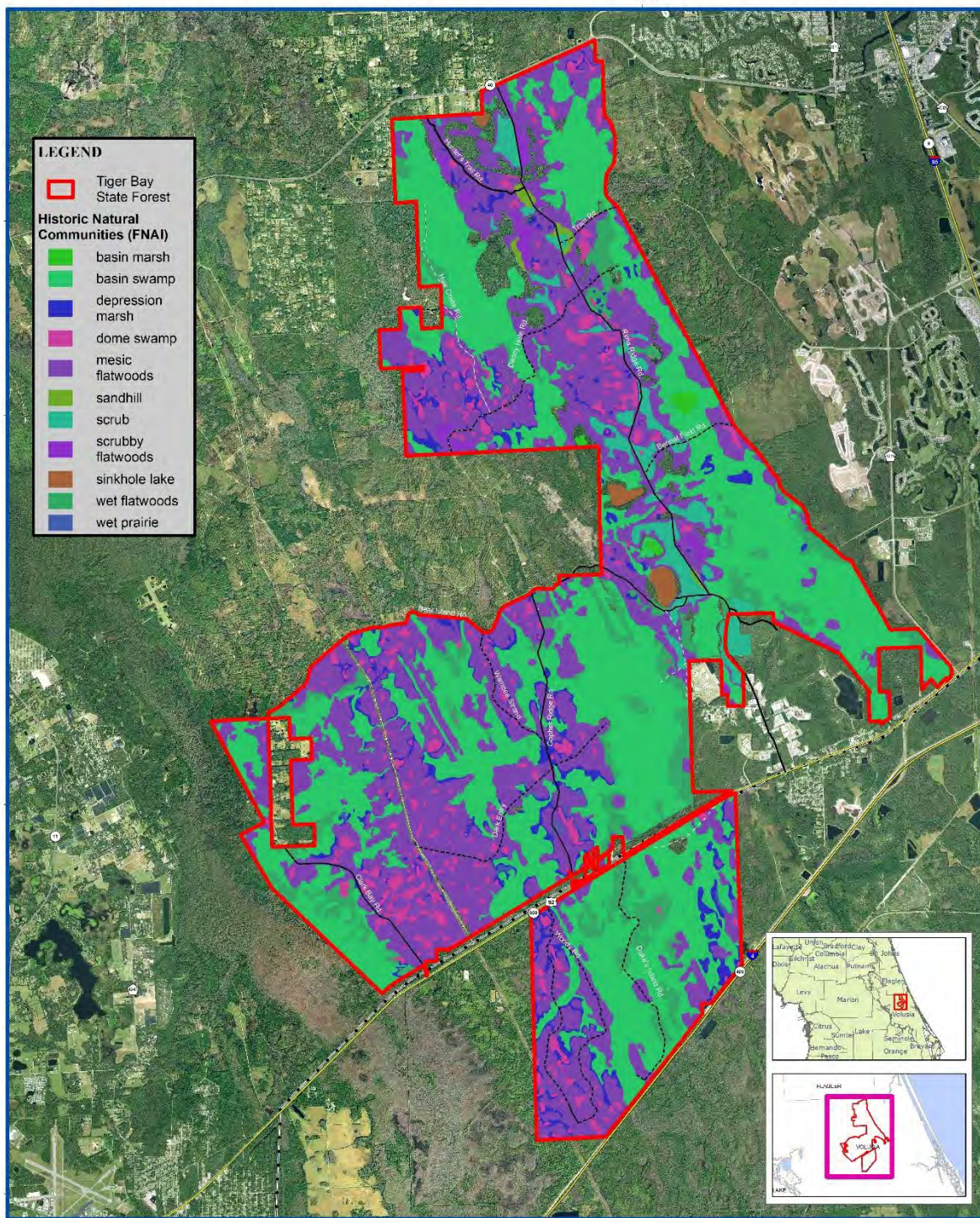
Florida Forest Service

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

Tiger Bay State Forest Historic FNAI Natural Communities Map

DISCLAIMER:
This map was prepared as a planning tool only. It is not intended to be used for legal purposes. The Florida Forest Service does not warrant the accuracy or completeness of the information contained herein. The Florida Forest Service is not responsible for any errors or omissions in this map. The Florida Forest Service is not responsible for any damages, including consequential damages, arising from the use of this map. The Florida Forest Service is not responsible for any claims, including consequential claims, arising from the use of this map. The Florida Forest Service is not responsible for any claims, including consequential claims, arising from the use of this map.

Map was prepared as the base of the Tiger Bay State Forest Inventory. Prepared by the Florida Forest Service, January 2000. Data from the US Army Corps of Engineers.



0.5 0.25 0 0.5 1 1.5 Miles



Map Month/Year: May 2020

0 3,000 6,000 9,000 12,000 15,000 Feet

Exhibit S

Land Management Reviews (2014 & 2018)

2014 Land Management Review Team Report for Tiger Bay State Forest

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1. Introduction

Section 259.036, F.S. requires a periodic on-site review of conservation and recreation lands titled in the name of the Board of Trustees to determine (1) whether the lands are being managed for the purposes for which they were acquired and (2) whether they are being managed in accordance with their land management plan adopted pursuant to s. 259.032, F.S. In case where the managed areas exceed 1,000 acres in size, such a review must be scheduled at least every five years. In conducting this review, a statutorily constructed review team "shall evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan."

The land management review teams are coordinated by the Division of State Lands and consist of representatives from the Division of Recreation and Parks (DEP), the Florida Forest Service (DACS), the Fish and Wildlife Conservation Commission, the local government in which the property is located, the DEP District in which the parcel is located, the local soil and water conservation district, a conservation organization member, and a local private land manager.

Each Land Management Review Report is divided into three sections. Section 1 provides the details of the property being reviewed as well as the overall results of the report. Section 2 provides details of the Field Review, in which the Review Team inspects the results of management actions on the site. Section 3 provides details of the Land Management Plan Review, in which the team determines the extent to which the Management Plan provides for and documents adequate natural and recreational resource protection.

Finally, each report may also contain an Appendix that lists individual team member comments. This is a compilation of feedback, concerns or other thoughts raised by individual team members, but not necessarily indicative of the final consensus reached by the Land Management Review Team.

1.1. Property Reviewed in this Report

Name of Site: Tiger Bay State Forest

Managed by: Florida Forest Service

Acres: 27, 395.68

County(ies): Volusia County

Purpose(s) for Acquisition:

Acquisition Program(s): EEL/SOR/CARL/P2000/Florida Forever

Original Acquisition Date: 3/5/79

Area Reviewed: 7,012.36

Last Management Plan Approval Date: 10/21/10

Review Date: 2/5/2014

Agency Manager and Key Staff Present:

- Cathy Lowenstein, Manager

Review Team Members Present (voting)

- DRP: Amy Copeland
- FWC: Cindy Bennett
- FFS: Bill Korn
- DEP: Kristin Benbow

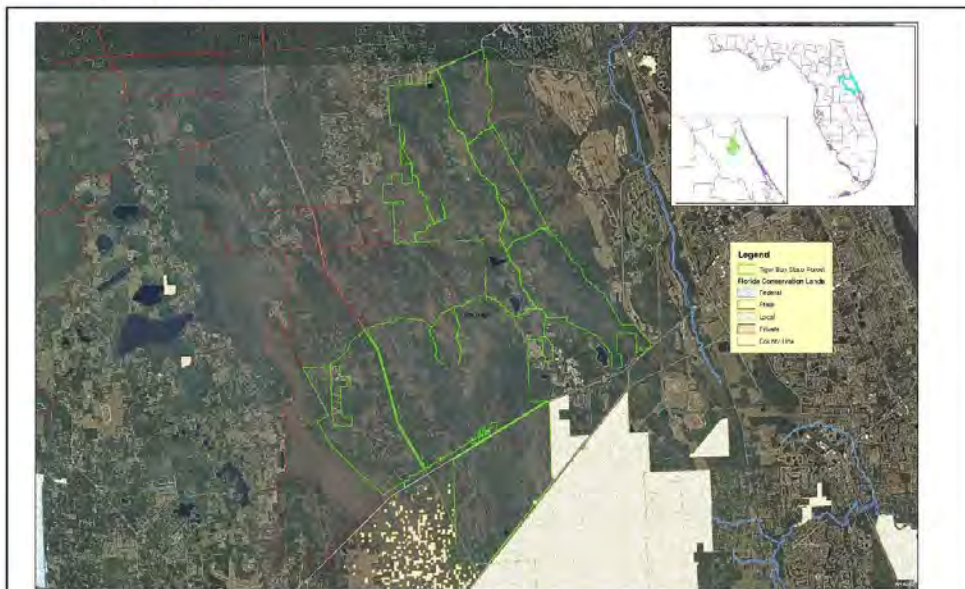
Other Non-Team Members Present (attending)

- Keith Singleton, DEP/DSL
- Jason Leonard, FFS
- Todd Hannah, FFS

-
- SWCD:
- Local gov't: Nick Dunnam
- Conservation organization: Danny Young
- Private land manager: Clay Benedict

- Will Raulerson, FFS
- Anthony Petellat, FFS

1.2 Property Map



1.3. Overview of Land Management Review Results

Is the property managed in accordance with the purposes for which it was acquired?

Yes = 7, No = 0

Are the management practices, including public access, in compliance with the management plan?

Yes = 7, No = 0

Table 1 shows the average scores received for each applicable category of review. *Field Review* scores refer to the adequacy of management actions in the field, while *Management Plan Review* scores refer to adequacy of discussion of these topics in the management plan. Scores range from 1 to 5 with 5 signifying excellence. For a more detailed key to the scores, please see Appendix A.

Table 1: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	3.65	4.38
Prescribed Fire / Habitat Restoration	3.94	4.24
Hydrology	3.92	3.93
Imperiled Species	3.88	4.15
Exotic / Invasive Species	4.09	3.97
Cultural Resources	4.43	4.43
Public Access / Education / Law Enforcement	4.08	3.93
Infrastructure / Equipment / Staffing	3.79	N/A

Color Code (See Appendix A for detail)

1.3.1 Consensus Commendations for the Managing Agency

The following commendations resulted from discussion and vote of the review team members:

1. The team commends the FFS and forest staff for their efforts to assess high priority habitat areas in order to increase fire frequencies, and commend the extra efforts being made by staff to increase the burning accomplishments at this forest. In particular, staff has done an excellent job initiating burning in long unburned young longleaf pine plantations using night burns. (7+, 0-)
2. The team commends the FFS and forest staff for their monitoring and treating of invasive plants which has kept known population sizes to a minimum. (7+, 0-)
3. The team commends the FFS and forest staff for their ongoing efforts to improve the camping and recreational sites and respond to visitor demands while retaining the natural resources and aesthetic values. (7+, 0-)

4. The team commends the FFS and forest staff for their efforts to assess conditions in depression/basin marshes, and to determine needs for controlling/removing pine and hardwoods from the marshes and/or their ecotones. (7+, 0-)
5. The team commends the FFS for their efforts to identify and clear vegetation from the Old Pershing Road and their work to initiate a public use site and develop interpretive materials. (7+, 0-)
6. The team commends the FFS for their documentation, prioritization and cooperation with the FNPS Pawpaw chapter on protection and restoration of Rugel's pawpaw. (7+, 0-)

1.3.2. Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The next management plan update should include information about how these recommendations have been addressed:

1. The team recommends that FFS and forest staff continue to focus efforts on increasing long term burn accomplishments. In addition, continue to implement shorter term burn intervals in young planted pine/ reforestation areas. Continue to implement different burning techniques to accomplish this (winter and/or night burns), mechanical treatments followed by burning. (7+, 0-)

Managing Agency Response: FFS and forest staff concur with the recommendations and will continue to focus on strategies to increase accomplishments including implementation of various burning techniques and treatments as feasible.

2. The team recommends that FFS and forest staff continue efforts to identify areas of marsh/wet prairie that have an undesired pine component and seek opportunities to harvest or burn these sites as conditions or circumstances allow. (7+, 0-)

Managing Agency Response: FFS and forest staff concur with the recommendation. The current management plan narrative on wet prairie recognizes these restoration needs and efforts in the field will continue to pursue this objective.

3. The team recommends that FFS and forest staff continue to experiment with different mechanical treatments/methods in scrub to aid in restoration. (7+, 0-)

Managing Agency Response: FFS and forest staff agree with this recommendation and will continue to experiment with various methods and utilize mechanical treatments as available resources allow.

2. Field Review Details

2.1 Field Review Checklist Findings

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

1. Natural Communities, specifically basin swamp, baygall and hydric hammock:
2. Listed Species Protection and Preservation, specifically animals, gopher tortoise, and plants, rugel's pawpaw:
3. Natural Resources Survey/Monitoring Resources, specifically fire effects monitoring and invasive species survey and monitoring:
4. Cultural Resources, specifically cultural resource survey and protection and preservation:
5. Restoration, specifically wildfire firelane restoration:
6. Forest Management, specifically timber inventory and timber harvesting:
7. Non-Native, Invasive & Problem Species, specifically prevention and control of plants and pests/pathogens, and control of animals:
8. Hydrologic/Geologic function Hydro-Alteration, specifically roads/culverts and ditches:
9. Ground Water Monitoring, specifically ground water quality and quantity:
10. Resource Protection, specifically boundary survey, gates and fencing and signage:
11. Adjacent Property Concerns, specifically expanding development, well fields and inholdings/additions:
12. Public Access and Education, specifically roads and parking:
13. Environmental Education & Outreach, specifically interpretive facilities and signs, recreational opportunities and management of visitor impacts:
14. Management Resources, specifically waste disposal, sanitary facilities, buildings, equipment and staff:

2.2. Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 3.0 score on average).

Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The management plan update should include information on how these items have been addressed:

1. The maintenance condition of the Natural Communities, specifically depression marsh/basin marsh, mesic flatwoods, wet flatwoods, wet prairie/ecotone, sandhill and scrub, received below average scores. The review team is asked to evaluate, based on their perspective, what percent of the natural community is in maintenance condition. The scores range from 1 to 5, with 1 being 0-20% in maintenance condition, 2 being 21-40%, 3 being 41-60%, 4 being 61-80% and 5 being 81-100%.

Managing Agency Response: Forest staff will continue to work to increase acres in maintenance condition in these communities by increasing and maintaining prescribed burning acreage accomplishments, continuing the focus on increasing acres in fire return interval, thinning to reduce overstocked stands, and removal of off-site pines.

2. Management Resources, specifically funding, received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether management resources are sufficient.

Managing Agency Response: FFS and forest staff will continue to explore funding sources such as grants and to initiate requests for additional funding.

2.3. Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Dome Swamp	I.A.1	3	3	4	3	3	4	3		3.29
Basin Swamp	I.A.2	4	4	4	5	4	4	4		4.14
Depression Marsh/Basin Marsh	I.A.3	2	2	3	3	3	3	3		2.71
Baygall	I.A.4	4	4	4	4	4	4	4		4.00
Mesic Flatwoods	I.A.5	1	1	2	2	4	4	2		2.29
Wet Flatwoods	I.A.6	2	2	2	3	4	3	3		2.71
Sinkhole Lake	I.A.7	5	2	4	4	3	3	4		3.57
Wet Prairie/ECOTONE	I.A.8	2	3	4	4	3	2	2		2.86
Sandhill	I.A.9	3	2	3	2	4	3	2		2.71
Scrub	I.A.10	3	3	3	2	3	3	2		2.71
Scrubby Flatwoods	I.A.11	3	3	4	3	3	4	2		3.14
Hydric Hammock	I.A.12	5	4	5	5	4	5	4		4.57
Natural Communities Average Score										3.23
Listed species:Protection & Preservation (I.B)										
Animals	I.B.1	3	2	3	4	4	4	4		3.43
Gopher Tortoise	I.B.1.a	4	3	4	4	4	5	4		4.00
Plants	I.B.2	3	3	4	4	4		4		3.67
Rugel's Pawpaw	I.B.2.a	5	3	5	4	4	5	5		4.43
Listed Species Average Score										3.88

Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	3	3	4	4	4	3		3.57
Fire effects monitoring	I.C.4	4	3	X	5	4	4	5		4.17
Other habitat management effects monitoring	I.C.5	3	3	5	5	3	3	3		3.57
Invasive species survey / monitoring	I.C.6	5	3	5	5	5	4	5		4.57
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	4	3	4	5	5	5	4		4.29
Protection and preservation	II.B	4	3	5	5	5	5	5		4.57
Cultural Resources Average Score										4.43
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	5	3	2	2	4	3	3		3.14
Frequency	III.A.2	5	3	3	3	4	3	4		3.57
Quality	III.A.3	5	4	2	4	4	4	4		3.86
Resource Management, Prescribed Fire Average Score										3.52
Restoration (III.B)										
Scrub Restoration	III.B.1	4	3	3	2	4	4	4		3.43
Wildfire Firelane Restoration	III.B.2		4	5	4		4	4		4.20
Restoration Average Score										3.81
Forest Management (III.C)										
Timber Inventory	III.C.1	3	5	5	5	4	4	5		4.43
Timber Harvesting	III.C.2	4	4	5	5	4	3	4		4.14
Reforestation/Afforestation	III.C.3	3	4	3	5	4	4	4		3.86
Site Preparation	III.C.4	5	4	4	4	3	3	4		3.86
Forest Management Average Score										4.07
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	5	3	4	5	4	3	4		4.00
prevention - animals	III.D.1.b	5	3	X	5	4	2	4		3.83
prevention - pests/pathogens	III.D.1.c	5	3	5	5	4	3	4		4.14
Control										
control - plants	III.D.2.a	5	4	5	5	4	3	5		4.43
control - animals	III.D.2.b	5	3	4	5	4	3	4		4.00
control - pest/pathogens	III.D.2.c	5	3	5	5	4	3	4		4.14
Non-Native, Invasive & Problem Species Average Score										4.09
Hydrologic/Geologic function Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	4	3	5	5	4	4	5		4.29
Ditches	III.E.1.b	4	3	5	4	4	4	4		4.00
Hydro-period Alteration	III.E.1.c	4	3	3	4	4	4	4		3.71
Water Level Alteration	III.E.1.d	4	3	3	3	4	4	4		3.57
Hydrologic/Geologic function, Hydro-Alteration Average Score										3.89
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	4	3	4	5	4	4	5		4.14
Ground water quantity	III.E.2.b	4	3	4	5	4	4	5		4.14

Ground Water Monitoring Average Score										4.14
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	4	3	3	4	4	3	5		3.71
Surface water quantity	III.F.3.b	4	3	3	4	4	3	5		3.71
Surface Water Monitoring Average Score										3.71
Resource Protection (III.F)										
Boundary survey	III.F.1	4	4	5	5	4	5	5		4.57
Gates & fencing	III.F.2	5	4	5	5	4	5	5		4.71
Signage	III.F.3	5	4	4	5	4	4	4		4.29
Law enforcement presence	III.F.4	4	2	4	3	3	3	3		3.14
Resource Protection Average Score										4.18
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.G.1.a	4	4	X	4	4	4	4		4.00
Well Fields	III.G.1.b	4	4	4	4	4	4	5		4.14
Inholdings/additions	III.G.2	4	4	4	5	4	4	4		4.14
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	4	4	4	5	4	4	5		4.29
Parking	IV.1.b	4	4	4	5	4	4	4		4.14
Environmental Education & Outreach										
Wildlife	IV.2.a	3	3	4	4	4	3	3		3.43
Invasive Species	IV.2.b	3	3	4	4	4	3	4		3.57
Habitat Management Activities	IV.2.c	3	3	4	4	4	4	3		3.57
Interpretive facilities and signs	IV.3	4	3	5	5	4	4	4		4.14
Recreational Opportunities	IV.4	3	5	4	5	4	4	4		4.14
Management of Visitor Impacts	IV.5	4	5	5	5	4	4	5		4.57
Public Access & Education Average Score										3.98
Management Resources (V.1, V.2, V.3, V.4)										
Maintenance										
Waste disposal	V.1.a	4	4	5	5	4	4	4		4.29
Sanitary facilities	V.1.b	4	4	5	5	4	4	3		4.14
Infrastructure										
Buildings	V.2.a	4	4	4	5	4	4	4		4.14
Equipment	V.2.b	4	4	3	5	4	4	4		4.00
Staff	V.3	3	5	4	4	5	4	4		4.14
Funding	V.4	3	1	2	2	2	2	2		2.00
Management Resources Average Score										3.79

Color Code:

Excellent	Above Average	Below Average	Poor	See Appendix A for detail
	Missing Vote	Insufficient Information		

3. Land Management Plan Review Details

3.1 Items Requiring Improvements in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than 3.0 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The next management plan update should address the checklist items identified below:

1. **Natural Communities, specifically sinkhole lake, received a below average score. This is an indication that the management plan does not sufficiently address current or desired condition and/or future management actions to protect or restore.**

Managing Agency Response: FNAI did not include a description of Sinkhole Lake in the 2005 Survey Report. FFS will seek guidance in addressing current and desired conditions and management actions for the 2020 management plan update.

3.2 Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										
Dome Swamp	I.A.1	5	4	5	5	3	4	5		4.43
Basin Swamp	I.A.2	5	4	5	5	3	3	5		4.29
Depression Marsh/Basin Marsh	I.A.3	5	4	5	5	3	4	5		4.43
Baygall	I.A.4	5	4	5	5	4	4	5		4.57
Mesic Flatwoods	I.A.5	5	4	5	5	4	5	5		4.71
Wet Flatwoods	I.A.6	5	4	5	5	3	4	5		4.43
Sinkhole Lake	I.A.7	2	2	3	2	3	3	2		2.43
Wet Prairie/Ecotone	I.A.8	5	4	5	5	4	4	4		4.43
Sandhill	I.A.9	5	4	5	5	4	4	5		4.57
Scrub	I.A.10	5	4	5	5	4	5	4		4.57
Scrubby Flatwoods	I.A.11	5	4	5	5	4	4	5		4.57
Hydric Hammock	I.A.12	5	4	5	5	4	5	4		4.57
Natural Communities Average Score										4.33
Listed species: Protection & Preservation (I.B)										
Animals	I.B.1	4	2	5	4	5	3	4		3.86
Gopher Tortoise	I.B.1.a	5	2	5	4	5	5	4		4.29
Plants	I.B.2	5	2	5	4	5		4		4.17
Rugel's Pawpaw	I.B.2.a	5	2	5	4	5	5	4		4.29
Listed Species Average Score										4.15
Natural Resources Survey/Management Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	2	4	4	3	3	4		3.43

Fire effects monitoring	I.C.4	3	3	5	5	4	4	4		4.00
Other habitat management effects monitoring	I.C.5	3	3	5	5	3	2	3		3.43
Invasive species survey / monitoring	I.C.6	5	3	5	5	4	4	5		4.43
Cultural Resources (Archeological & Historic sites) (II.A,II.B)										
Cultural Res. Survey	II.A	4	3	5	5	4	5	5		4.43
Protection and preservation	II.B	4	3	5	5	4	5	5		4.43
Cultural Resources Average Score										4.43
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	5	3	5	5	5	5	5		4.71
Frequency	III.A.2	5	3	5	5	5	5	5		4.71
Quality	III.A.3	5	4	4	4	5	5	4		4.43
Resource Management, Prescribed Fire Average Score										4.62
Restoration (III.B)										
Scrub Restoration	III.B.1	4	3	3	4	4	4	4		3.71
Wildfire Firelane Restoration	III.B.2		3	5	4		4	4		4.00
Restoration Average Score										3.86
Forest Management (III.C)										
Timber Inventory	III.C.1	5	5	5	5	4	4	5		4.71
Timber Harvesting	III.C.2	4	4	5	5	4	4	5		4.43
Reforestation/Afforestation	III.C.3	5	4	4	5	4	4	5		4.43
Site Preparation	III.C.4	4	4	5	5	3	3	5		4.14
Forest Management Average Score										4.43
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.E.1.a	4	3	4	5	4	4	4		4.00
prevention - animals	III.E.1.b	4	3		4	4	3	4		3.67
prevention - pests/pathogens	III.E.1.c	4	3	5	5	4	4	4		4.14
Control										
control - plants	III.E.2.a	4	3	5	5	4	3	5		4.14
control - animals	III.E.2.b	4	3	3	4	4	3	5		3.71
control - pest/pathogens	III.E.2.c	4	3	5	5	4	3	5		4.14
Non-Native, Invasive & Problem Species Average Score										3.97
Hydrologic/Geologic function, Hydro-Alteration (III.E.1)										
Roads/culverts	III.F.1.a	4	3	5	5	4	3	4		4.00
Ditches	III.F.1.b	4	3	5	5	4	3	4		4.00
Hydro-period Alteration	III.F.1.c	4	3	5	3	4	3	4		3.71
Water Level Alteration	III.F.1.d	4	3	3	3	4	3	4		3.43
Hydrologic/Geologic function, Hydro-Alteration Average Score										3.79
Ground Water Monitoring (III.E.2)										
Ground water quality	III.F.2.a	4	3	5	5	4	4	5		4.29
Ground water quantity	III.F.2.b	4	3	5	5	4	4	5		4.29
Ground Water Monitoring Average Score										4.29
Surface Water Monitoring (III.E.3)										

Surface water quality	III.F.3.a	4	3	4	3	4	3	5		3.71
Surface water quantity	III.F.3.b	4	3	4	3	4	3	5		3.71
Surface Water Monitoring Average Score										3.71

Resource Protection (III.F)										
Boundary survey	III.G.1	4	4	5	5	4	5	4		4.43
Gates & fencing	III.G.2	4	4	5	3	4	4	4		4.00
Signage	III.G.3	4	4	4	3	4	4	4		3.86
Law enforcement presence	III.G.4	4	2	5	4	4	4	4		3.86
Resource Protection Average Score										4.04

Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.H.1.a	4	4		5	4	3	4		4.00
Well Fields	III.H.1.b	4	4	5	5	4	4	5		4.43
Inholdings/additions	III.H.2	4	4	4	5	4	3	4		4.00
Discussion of Potential Surplus Land Determination	III.H.3	4	4	1	1	4	3	4		3.00
Surplus Lands Identified?	III.H.4	4	4	5	4	4	4	4		4.14

Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	4	4	5	5	4	4	5		4.43
Parking	IV.1.b	4	4	5	5	4	4	5		4.43
Environmental Education & Outreach										
Wildlife	IV.2.a	3	3	4	3	4	3	4		3.43
Invasive Species	IV.2.b	3	3	4	3	4	4	4		3.57
Habitat Management Activities	IV.2.c	3	3	4	3	4	3	4		3.43
Interpretive facilities and signs	IV.3	4	3	4	5	4	3	5		4.00
Recreational Opportunities	IV.4	3	5	4	5	4	4	5		4.29
Management of Visitor Impacts	IV.5	4	5	4	4	4	3	4		4.00
Public Access & Education Average Score										3.95

Managed Area Uses (VI.A, VI.B)										
Existing Uses										
Hunting	VI.A.1	4	4	5	5	5	4	5		4.57
Fishing	VI.A.2		4	5	5	5	4	5		4.67
Hiking	VI.A.3	3	5	5	5	5	4	5		4.57
Horseback Riding	VI.A.4	4	4	4	5	5	5	5		4.57
Picnicking	VI.A.5	3	5	4	5	5	4	5		4.43
Nature Study	VI.A.6	3	5	3	5	5	5	5		4.43
Wildlife Viewing	VI.A.7	3	5	4	5	5	5	5		4.57
Camping	VI.A.8	4		4	5	5		5		4.60
Geocaching	VI.A.9	4	5	4	5	5	4	5		4.57
Proposed Uses										

Color Code: Excellent Above Average Below Average Poor See Appendix A for detail

Missing Vote Insufficient Information

Appendix A: Scoring System Detail

Explanation of Consensus Commendations:

Often, the exceptional condition of some of the property's attributes impress review team members. In those instances, team members are encouraged to offer positive feedback to the managing agency in the form of a commendation. The teams develop commendations generally by standard consensus processes or by majority vote if they cannot obtain a true consensus.

Explanation of Consensus Recommendations:

Subsection 259.036(2), F.S., specifically states that the managing entity shall consider the findings and recommendations of the land management review. We ask team members to provide general recommendations for improving the management or public access and use of the property. The teams discuss these recommendations and develop consensus recommendations as described above. We provide these recommendations to the managing agency to consider when finalizing the required ten-year management plan update. We encourage the manager to respond directly to these recommendations and include their responses in the final report when received in a timely manner.

Explanation of Field Review Checklist and Scores, and Management Plan Review Checklist and Scores:

We provide team members with a checklist to fill out during the evaluation workshop phase of the Land Management Review. The checklist is the uniform tool used to evaluate both the management actions and condition of the managed area, and the sufficiency of the management plan elements. During the evaluation workshop, team members individually provide scores on each issue on the checklist, from their individual perspective. Team members also base their evaluations on information provided by the managing agency staff as well as other team member discussions. Staff averages these scores to evaluate the overall conditions on the ground, and how the management plan addresses the issues. Team members must score each management issue 1 to 5: 1 being the management practices are clearly insufficient, and 5 being that the management practices are excellent. Members may choose to abstain if they have inadequate expertise or information to make a cardinal numeric choice, as indicated by an "X" on the checklist scores, or they may not provide a vote for other unknown reasons, as indicated by a blank. If a majority of members failed to vote on any issue, that issue is determined to be irrelevant to management of that property or it was inadequately reviewed by the team to make an intelligent choice. In either case staff eliminated the issue from the report to the manager.

Average scores are interpreted as follows:

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*

2018 Land Management Review Team Report for Tiger Bay State Forest

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1. Introduction

Section 259.036, F.S. requires a periodic on-site review of conservation and recreation lands titled in the name of the Board of Trustees to determine (1) whether the lands are being managed for the purposes for which they were acquired and (2) whether they are being managed in accordance with their land management plan adopted pursuant to s. 259.032, F.S. In cases where the managed areas exceed 1,000 acres in size, such a review must be scheduled at least every five years. In conducting this review, a statutorily constructed review team "shall evaluate the extent to which the existing management plan provides sufficient protection to threatened or endangered species, unique or important natural or physical features, geological or hydrological functions or archaeological features. The review shall also evaluate the extent to which the land is being managed for the purposes for which it was acquired and the degree to which actual management practices, including public access, are in compliance with the adopted management plan."

The land management review teams are coordinated by the Division of State Lands and consist of representatives from the Division of Recreation and Parks (DEP), the Florida Forest Service (DACS), the Fish and Wildlife Conservation Commission, the local government in which the property is located, the DEP District in which the parcel is located, the local soil and water conservation district or jurisdictional water management district, a conservation organization member, and a local private land manager.

Each Land Management Review Report is divided into three sections. Section 1 provides the details of the property being reviewed as well as the overall results of the report. Section 2 provides details of the Field Review, in which the Review Team inspects the results of management actions on the site. Section 3 provides details of the Land Management Plan Review, in which the team determines the extent to which the Management Plan provides for and documents adequate natural and recreational resource protection.

Finally, each report may also contain an Appendix that lists individual team member comments. This is a compilation of feedback, concerns or other thoughts raised by individual team members, but not necessarily indicative of the final consensus reached by the Land Management Review Team.

1.1. Property Reviewed in this Report

Name of Site: Tiger Bay State Forest

Managed by: Department of Agriculture and Consumer Services, Florida Forest Service

Acres: 27,396

County: Volusia

Purpose(s) for Acquisition: to protect and restore the natural and cultural values of the property and provide the greatest benefit to the citizens of the state.

Acquisition Program(s): EEL/SOR/CARL/P2000/Florida Forever **Original Acquisition Date:** 3/5/79

Area Reviewed: Entire Property

Last Management Plan Approval Date: 10/21/10

Review Date: 10/24/18

Agency Manager and Key Staff Present:

- Justina Jones, Manager
- Kenny Fanelli
- Conrad Wysocki
- Donald King

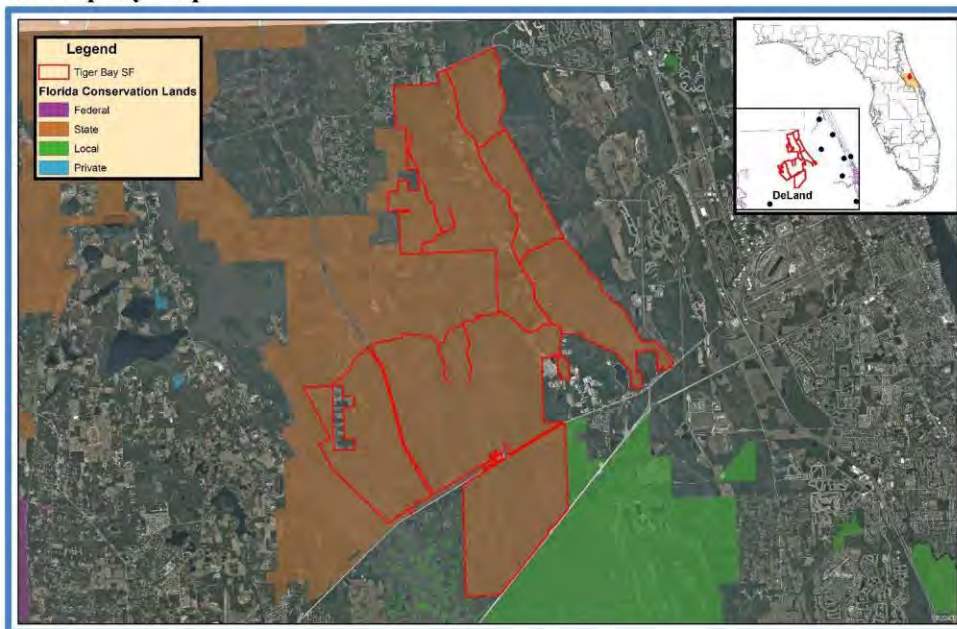
Review Team Members Present (voting)

- Jason DePue, DRP District
- Danielle Dangleman, Local Gov't.
- Travis Blunden, FWC
- Amanda Krok, DEP District
- Heather Schmiede, FFS
- R. H. Davis, SJRWMD
- Paul Rebmman, Cons. Organization
- Mike Brown, Private Land Manager

Other Non-Team Members Present (attending)

- Keith Singleton, DEP/DSL
- Andrew Lawrence, FWC/IPMS

1.2 Property Map



1.3. Overview of Land Management Review Results

Is the property managed for purposes that are compatible with conservation, preservation, or recreation?

Yes = 8, No = 0

Are the management practices, including public access, in compliance with the management plan?

Yes = 8, No = 0

Table 1 shows the average scores received for each applicable category of review. *Field Review* scores refer to the adequacy of management actions in the field, while *Management Plan Review* scores refer to adequacy of discussion of these topics in the management plan. Scores range from 1 to 5 with 5 signifying excellence. For a more detailed key to the scores, please see *Appendix A*.

1.3.1 Consensus Commendations for the Managing Agency

The following commendations resulted from discussion and vote of the review team members:

1. The team commends the Florida Forest Service (FFS) for their active treatment and control of invasive plants. The area looks great! (8+, 0-)
2. The team commends the FFS for their progress in pine plantation thinning on the north tracts of the forest. (8+, 0-)
3. The team commends the FFS for providing excellent public access and passive recreational opportunities throughout the forest. (8+, 0-)
4. The team commends the FFS for the number of staff that have recently participated in archaeological resource monitor training. (8+, 0-)

1.3.2. Consensus Recommendations to the Managing Agency

The following recommendations resulted from a discussion and vote of review team members. The next management plan update should include information about how these recommendations have been addressed:

1. The team recommends that the FFS update the natural community typing in future revisions of the management plan to be updated to include the current FNAI natural community descriptions, including altered land cover or restoration community types. (8+, 0-)

Managing Agency Response: *If funding allows, the FFS will update the natural community typing in the next management plan revision to include the current FNAI natural community descriptions, including altered land cover and restoration community types.*

Table 1: Results at a glance.

Major Land Management Categories	Field Review	Management Plan Review
Natural Communities / Forest Management	3.83	4.04
Prescribed Fire / Habitat Restoration	3.46	3.54
Hydrology	4.33	3.77
Imperiled Species	3.82	3.92
Exotic / Invasive Species	3.76	3.68
Cultural Resources	4.44	4.38
Public Access / Education / Law Enforcement	4.17	3.97
Infrastructure / Equipment / Staffing	3.68	N/A

Color Code (See Appendix A for detail)

Excellent	Above Average	Below Average	Poor
-----------	---------------	---------------	------

2. The team recommends that the FFS amend the management plan to include the desired basal area for mesic and wet flatwoods, to include a broader range of acceptable densities. (7+, 1-)

Managing Agency Response: The basal areas included in the current management plan follow the FFS State Forest Handbook guidelines for timber management.

3. The team recommends that the FFS develop and implement the scrub management plan as specified in the 10-year resource management plan. (8+, 0-)

Managing Agency Response: The FFS will develop and implement a scrub management plan.

4. The team recommends that the FFS partner with FWC to survey for imperiled reptiles and amphibians. (8+, 0-)

Managing Agency Response: The FFS will coordinate with FWC to seek opportunities to survey for imperiled reptiles and amphibians.

5. The team recommends that the FFS increase the annual number of acres burned throughout the forest, attempting to reach the appropriate fire return intervals. (8+, 0-)

Managing Agency Response: The FFS will continue to work toward increasing the acres burned and reaching the appropriate fire return intervals.

6. The team recommends that the FFS take a more aggressive approach to reducing the fuel loads on the south tracts of the forest and consider using mechanical mowing treatments so that it can be burned safely. (8+, 0-)

Managing Agency Response: The FFS will seek opportunities to reduce the fuel loads on the south tracts of the forest.

2. Field Review Details

2.1 Field Review Checklist Findings

The following items received high scores on the review team checklist, which indicates that management actions exceeded expectations.

1. Natural communities, specifically basin swamp, baygall, and sinkhole lake.
2. Listed species, animals in general, and specifically gopher tortoise
3. Natural resource survey/monitoring resources, specifically fire effects monitoring, and invasive species survey and monitoring.
4. Cultural resources, specifically protection and preservation.
5. Resource management (prescribed fire), specifically quality.
6. Forest management, specifically timber inventory, timber harvesting, reforestation/afforestation and site preparation.
7. Non-native, invasive, and problem species, specifically prevention and control of plants.

8. Hydrologic/geologic function, specifically roads and culverts, ditches, hydroperiod alteration, and water level alteration.
9. Ground water and surface water monitoring, specifically quality and quantity.
10. Resource protection, specifically boundary survey, gates and fencing, and signage.
11. Adjacent property concerns, land use, specifically expanding development, well fields, and inholdings and additions.
12. Public access, specifically roads.
13. Environmental education and outreach, specifically habitat management activities, interpretive facilities and signs, recreational opportunities, and management of visitor impacts.
14. Management resources, specifically waste disposal, sanitary facilities, and buildings.

2.2. Items Requiring Improvement Actions in the Field

The following items received low scores on the review team checklist, which indicates that management actions noted during the Field Review were not considered sufficient (less than 3.0 score on average). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The management plan update should include information on how these items have been addressed:

1. *The maintenance condition of the Natural Communities, specifically mesic flatwoods, wet flatwoods, wet prairie/ecotone, and sandhill, received below average scores. The review team is asked to evaluate, based on their perspective, what percent of the natural community is in maintenance condition. The scores range from 1 to 5, with 1 being 0-20% in maintenance condition, 2 being 21-40%, 3 being 41-60%, 4 being 61-80% and 5 being 81-100%.*

Managing Agency Response: The age of a majority of the timber in these areas is a contributing factor to the current condition of these communities. Restoration efforts, including thinning and burning, are ongoing, and will continue as forest stands mature. The off-site pine will be removed from the wet prairie/ecotone as the surrounding areas are harvested.

2. *Management Resources, specifically funding, received a below average score. The review team is asked to evaluate, based on information provided by the managing agency, whether management resources are sufficient.*

Managing Agency Response: Funding is determined by the legislature. The FFS will pursue additional funding opportunities as they become available.

2.3. Field Review Checklist and Scores

Field Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	

Natural Communities (I.A)										
Dome Swamp	I.A.1	4	5	3	2	2	5	4	4	3.63
Basin Swamp	I.A.2	5	5	3	2	5	4	5	5	4.25
Depression Marsh/Basin Marsh	I.A.3	3		4	3		3	3	4	3.33
Baygall	I.A.4	5	4	2	5	5	5	4	5	4.38
Mesic Flatwoods	I.A.5	3	3	3	2	2	2	1	3	2.38
Wet Flatwoods	I.A.6	3	3	3	1	2	1	1	2	2.00
Sinkhole Lake	I.A.7	5	5	3	5	5	5	5	5	4.75
Wet Prairie/Ecotone	I.A.8	3	4	2	1	2	1	2	2	2.13
Sandhill	I.A.9	2	4	3	1	3	3	2	2	2.50
Scrub	I.A.10	3	4	2	3	3	3	3	3	3.00
Scrubby Flatwoods	I.A.11	4	4	3	4	4	3	3	4	3.63
Natural Communities Average Score										3.27
Listed species: Protection & Preservation (I.B)										
Animals	I.B.1	4		4				4	4	4.00
Gopher Tortoise	I.B.1.a	5	4	4	5	4	3	4	4	4.13
Plants	I.B.2	3		4	4	3		4	4	3.67
Rugel's Pawpaw	I.B.2.a	4	4	4			3	2	4	3.50
Listed Species Average Score										3.82
Natural Resources Survey/Monitoring Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	3	3	5	4	2	3	4	3.50
Fire effects monitoring	I.C.4	5	4	5	5	4	4	4	5	4.50
Other habitat management effects monitoring	I.C.5	3	4	4	4	3	3	3	3	3.38
Invasive species survey / monitoring	I.C.6	5	4	3	5	4		3	5	4.14
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	4	4	5	5	5	4	5	5	4.63
Protection and preservation	II.B	4	4	4	5	5	4	4	4	4.25
Cultural Resources Average Score										4.44
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	4	4	3	3	3	2	2	3	3.00
Frequency	III.A.2	4	3	3	3	4	2	2	3	3.00
Quality	III.A.3	5	4	4	4	4	4	4	4	4.13
Resource Management, Prescribed Fire Average Score										3.38
Restoration (III.B)										
Scrub Restoration	III.B.1	4	4	3	4	3		3	4	3.57
Mesic Flatwoods Restoration	III.B.3	5	4	3	4	4	2	2	4	3.50
Restoration Average Score										3.54
Forest Management (III.C)										
Timber Inventory	III.C.1	5	3	4	5	4	5	5	5	4.50
Timber Harvesting	III.C.2	5	4	3	4	4	2	5	5	4.00
Reforestation/Afforestation	III.C.3	5	5	4	5	4		5	5	4.71
Site Preparation	III.C.4	5	5	4	5	4	2	5	5	4.38

Forest Management Average Score										4.40
Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.D.1.a	5	4	4	5	3	4	4	3	4.00
prevention - animals	III.D.1.b	3	4	4	5	4	2	4	3	3.63
prevention - pests/pathogens	III.D.1.c	4	3	x	5	4	3	3	3	3.57
Control										
control - plants	III.D.2.a	5	4	4	4	4	4	4	5	4.25
control - animals	III.D.2.b	3	4	4	5	3	2	3	3	3.38
control - pest/pathogens	III.D.2.c	4	4	4	4	5	3	3	3	3.75
Non-Native, Invasive & Problem Species Average Score										3.76
Hydrologic/Geologic function Hydro-Alteration (III.E.1)										
Roads/culverts	III.E.1.a	5	4	4	5	5	4		3	4.29
Ditches	III.E.1.b	4	4	4	5	5	3		x	4.17
Hydro-period Alteration	III.E.1.c	5	4	4	5	5	4		3	4.29
Water Level Alteration	III.E.1.d	5	4	4	4	4	4		3	4.00
Hydrologic/Geologic function, Hydro-Alteration Average Score										4.18
Ground Water Monitoring (III.E.2)										
Ground water quality	III.E.2.a	5	4	5	4	5	4	4	4	4.38
Ground water quantity	III.E.2.b	5	4	5	5	5	4	4	4	4.50
Ground Water Monitoring Average Score										4.44
Surface Water Monitoring (III.E.3)										
Surface water quality	III.E.3.a	5	4	5	4	5	4	4	4	4.38
Surface water quantity	III.F.3.b	5	4	5	4	5	4	4	4	4.38
Surface Water Monitoring Average Score										4.38
Resource Protection (III.F)										
Boundary survey	III.F.1	3	4	5	5	5	4	4	5	4.38
Gates & fencing	III.F.2	5	4	5	5	5	4	4	4	4.50
Signage	III.F.3	5	4	5	5	4	4	4	4	4.38
Law enforcement presence	III.F.4	4	3	4	4	4	3	5	3	3.75
Resource Protection Average Score										4.25
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.G.1.a	5	4	4	4	5	3	4	3	4.00
Well Fields	III.G.1.b	5	4	4	5	5	4	4	3	4.25
Inholdings/additions	III.G.2	5	3	3	4	5	4		4	4.00
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	5	4	4	5	5		4	4	4.43
Parking	IV.1.b	4	4	4	3	3	3	5	4	3.75
Environmental Education & Outreach										
Wildlife	IV.2.a	4	4	3	5	5	2	3	3	3.63
Invasive Species	IV.2.b	4	4	3	5	5	3	3	3	3.75

Habitat Management Activities	IV.2.c	4	4	3	5	5	3	5	3	4.00
Interpretive facilities and signs	IV.3	4	4	4	5	4	3	4	5	4.13
Recreational Opportunities	IV.4	5	4	4	5	5	4	5	5	4.63
Management of Visitor Impacts	IV.5	5	4	5	5	5	2	5	4	4.38
Public Access & Education Average Score										4.08
Management Resources (V.1, V.2, V.3, V.4)										
Maintenance										
Waste disposal	V.1.a	5	4	5	5	4	4	5	4	4.50
Sanitary facilities	V.1.b	5	4	5	5	4	4	4	2	4.13
Infrastructure										
Buildings	V.2.a	4	4	5	5	5		4	3	4.29
Equipment	V.2.b	3	4	4	3	4	2	3	3	3.25
Staff	V.3	4	4	4	3	3	3	3	3	3.38
Funding	V.4	3	4	3	3	1		2	2	2.57
Management Resources Average Score										3.68
Color Code:	Excellent	Above Average	Below Average	Poor	See Appendix A for detail					
		Missing Vote	Insufficient Information							

3. Land Management Plan Review Details

3.1 Items Requiring Improvements in the Management Plan

The following items received low scores on the review team checklist, which indicates that the text noted in the Management Plan Review does not sufficiently address this issue (less than 3.0 score on average.). Please note that overall good scores do not preclude specific recommendations by the review team requiring remediation. The next management plan update should address the checklist items identified below:

1. *Adjacent Property Concerns, specifically discussion of potential surplus land determination, received a below average score. This is an indication that the management plan does not sufficiently address adjacent property concerns.*

Managing Agency Response: The FFS will include a discussion about potential surplus land determination in the next management plan revision.

3.2 Management Plan Review Checklist and Scores

Plan Review Item	Reference #	Anonymous Team Members								Average
		1	2	3	4	5	6	7	8	
Natural Communities (I.A)										

Dome Swamp	I.A.1	4	3	4	3	4	4	4	4	3.75
Basin Swamp	I.A.2	4	3	4	4	4	4	4	4	3.88
Depression Marsh/Basin Marsh	I.A.3	4	3	4	4	4	4	4	4	3.88
Baygall	I.A.4	4		4	4	4		4	4	4.00
Mesic Flatwoods	I.A.5	4	4	3	4	4	2	2	3	3.25
Wet Flatwoods	I.A.6	4	4	4	4	4	2	2	4	3.50
Sinkhole Lake	I.A.7	4	5	4	4	2	4	5	4	4.00
Wet Prairie/Ecotone	I.A.8	4	4	3	4	4	4	4	3	3.75
Sandhill	I.A.9	4	4	3	4	3	3	4	3	3.50
Scrub	I.A.10	4	4	3	4	3		4	3	3.57
Scrubby Flatwoods	I.A.11	4	4	3	4	3		4	3	3.57
Natural Communities Average Score										3.69
Listed species: Protection & Preservation (I.B)										
Animals	I.B.1	4		3				4	4	3.75
Gopher Tortoise	I.B.1.a	5	5	3	5	4	4	4	4	4.25
Plants	I.B.2	4		3	4	4		4	4	3.88
Rugel's Pawpaw	I.B.2.a	4	3	4				4	4	3.88
Listed Species Average Score										3.92
Natural Resources Survey/Monitoring Resources (I.C)										
Listed species or their habitat monitoring	I.C.2	4	3	4	5	4	4	2	4	3.75
Fire effects monitoring	I.C.4	5	4	4	5	4	3	3	4	4.00
Other habitat management effects monitoring	I.C.5	3	4	3	4	3	3	3	3	3.25
Invasive species survey / monitoring	I.C.6	5	4	4	4	4		3	4	4.00
Cultural Resources (Archeological & Historic sites) (II.A, II.B)										
Cultural Res. Survey	II.A	5	4	4	5	5	4	4	5	4.50
Protection and preservation	II.B	4	4	4	5	5	4	4	4	4.25
Cultural Resources Average Score										4.38
Resource Management, Prescribed Fire (III.A)										
Area Being Burned (no. acres)	III.A.1	4	4	3	4	4	3	4	4	3.75
Frequency	III.A.2	4	4	3	4	3		4	4	3.71
Quality	III.A.3	5	4	3	4	3	3	3	4	3.63
Resource Management, Prescribed Fire Average Score										3.70
Restoration (III.B)										
Scrub Restoration	III.B.1	4	3	3	4	3		2	3	3.14
Mesic Flatwoods Restoration	III.B.3	4	3	3	5	4	3	3	4	3.63
Restoration Average Score										3.38
Forest Management (III.C)										
Timber Inventory	III.C.1	5	3	4	5	5	4	4	5	4.38
Timber Harvesting	III.C.2	5	4	4	5	5	4	4	4	4.38
Reforestation/Afforestation	III.C.3	5	5	3	5	5		4	4	4.43
Site Preparation	III.C.4	5	5	3	5	5	4	4	4	4.38
Forest Management Average Score										4.39

Non-Native, Invasive & Problem Species (III.D)										
Prevention										
prevention - plants	III.E.1.a	4	3	3	5	4	4	3	3	3.63
prevention - animals	III.E.1.b	3	4	3	5	4	4	3	3	3.63
prevention - pests/pathogens	III.E.1.c	4	3	3	5	4		3	3	3.57
Control										
control - plants	III.E.2.a	5	4	3	5	4	4	4	3	4.00
control - animals	III.E.2.b	3	4	3	5	3	4	3	3	3.50
control - pest/pathogens	III.E.2.c	4	4	3	5	4	4	3	3	3.75
Non-Native, Invasive & Problem Species Average Score										3.68
Hydrologic/Geologic function, Hydro-Alteration (III.E.1)										
Roads/culverts	III.F.1.a	4	4	4	5	5	3	3	3	3.88
Ditches	III.F.1.b	4	4	4	5	4	3	3	2	3.63
Hydro-period Alteration	III.F.1.c	4	4	4	5	5	3	3	2	3.75
Water Level Alteration	III.F.1.d	5	4	4	4	4	3	3	3	3.75
Hydrologic/Geologic function, Hydro-Alteration Average Score										3.75
Ground Water Monitoring (III.E.2)										
Ground water quality	III.F.2.a	5	4	3	4	5	4	3	2	3.75
Ground water quantity	III.F.2.b	5	4	3	4	5	4	3	3	3.88
Ground Water Monitoring Average Score										3.81
Surface Water Monitoring (III.E.3)										
Surface water quality	III.F.3.a	5	4	3	4	5	4	3	2	3.75
Surface water quantity	III.F.3.b	5	3	3	4	5	4	3	3	3.75
Surface Water Monitoring Average Score										3.75
Resource Protection (III.F)										
Boundary survey	III.G.1	5	4	4	4	5	4	4	3	4.13
Gates & fencing	III.G.2	4	4	4	4	5	4	4	3	4.00
Signage	III.G.3	4	4	4	4	4	4	4	3	3.88
Law enforcement presence	III.G.4	4	3	4	4	4	4	4	3	3.75
Resource Protection Average Score										3.94
Adjacent Property Concerns (III.G)										
Land Use										
Expanding development	III.H.1.a	4	3	3	4	5	4	4	3	3.75
Well Fields	III.H.1.b	5	4	3	4	5	4	4	3	4.00
Inholdings/additions	III.H.2	5	3	3	4	5	4	4	3	3.88
Discussion of Potential Surplus Land Determination	III.H.3	2	4		1	2	4	1	3	2.43
Surplus Lands Identified?	III.H.4	5	4		5	5	4	5	5	4.71
Public Access & Education (IV.1, IV.2, IV.3, IV.4, IV.5)										
Public Access										
Roads	IV.1.a	5	4	4	4	5	4		3	4.14
Parking	IV.1.b	4	4	4	4	3	4		3	3.71

Environmental Education & Outreach										
Wildlife	IV.2.a	4	4	3	4	5	4	4	3	3.88
Invasive Species	IV.2.b	4	4	3	4	5	4	4	3	3.88
Habitat Management Activities	IV.2.c	4	4	3	4	5	4	4	3	3.88
Interpretive facilities and signs	IV.3	4	4	4	5	4		4	4	4.14
Recreational Opportunities	IV.4	5	4	4	5	5		4	5	4.57
Management of Visitor Impacts	IV.5	4	4	4	4	5	3	3	4	3.88
Public Access & Education Average Score										4.01
Managed Area Uses (VI.A, VI.B)										
Existing Uses										
Hunting	VI.A.1	5	5	5	4	4	5	5	5	4.75
Fishing	VI.A.2	5	5	5	5	4	5	5	5	4.88
Hiking	VI.A.3	5	5	5	5	5	5	5	5	5.00
Horseback Riding	VI.A.4	5	5	5	4	5	5	5	2	4.50
Picnicking	VI.A.5	5	5	5	5	5	5	5	5	5.00
Nature Study	VI.A.6	5	5	5	5	5	5	5	4	4.88
Wildlife Viewing	VI.A.7	5	5	5	5	5	5	5	4	4.88
Camping	VI.A.8	5	5	5	5	5	5	4	3	4.63
Geocaching	VI.A.9	5	5	5	5	4	5	4	1	4.25
Color Code:		Excellent	Above Average		Below Average		Poor		See Appendix A for detail	
			Missing Vote		Insufficient Information					

Appendix A: Scoring System Detail

Explanation of Consensus Commendations:

Often, the exceptional condition of some of the property's attributes impress review team members. In those instances, team members are encouraged to offer positive feedback to the managing agency in the form of a commendation. The teams develop commendations generally by standard consensus processes or by majority vote if they cannot obtain a true consensus.

Explanation of Consensus Recommendations:

Subsection 259.036(2), F.S., specifically states that the managing entity shall consider the findings and recommendations of the land management review. We ask team members to provide general recommendations for improving the management or public access and use of the property. The teams discuss these recommendations and develop consensus recommendations as described above. We provide these recommendations to the managing agency to consider when finalizing the required ten-year management plan update. We encourage the manager to respond directly to these recommendations and include their responses in the final report when received in a timely manner.

Explanation of Field Review Checklist and Scores, and Management Plan Review Checklist and Scores:

We provide team members with a checklist to fill out during the evaluation workshop phase of the Land Management Review. The checklist is the uniform tool used to evaluate both the management actions and condition of the managed area, and the sufficiency of the management plan elements. During the evaluation workshop, team members individually provide scores on each issue on the checklist, from their individual perspective. Team members also base their evaluations on information provided by the managing agency staff as well as other team member discussions. Staff averages these scores to evaluate the overall conditions on the ground, and how the management plan addresses the issues. Team members must score each management issue 1 to 5: 1 being the management practices are clearly insufficient, and 5 being that the management practices are excellent. Members may choose to abstain if they have inadequate expertise or information to make a cardinal numeric choice, as indicated by an "X" on the checklist scores, or they may not provide a vote for other unknown reasons, as indicated by a blank. If a majority of members failed to vote on any issue, that issue is determined to be irrelevant to management of that property or it was inadequately reviewed by the team to make an intelligent choice. In either case staff eliminated the issue from the report to the manager.

Average scores are interpreted as follows:

Scores 4.0 to 5.0 are *Excellent*

Scores 3.0 to 3.99 are *Above Average*

Scores 2.0 to 2.99 are *Below Average*

Scores 1.0 to 1.99 are considered *Poor*

Exhibit T

Compliance with Local Comprehensive Plan Volusia County

FLORIDA FOREST SERVICE
(850) 681-5800



THE CONNER BUILDING
3125 CONNER BOULEVARD
TALLAHASSEE, FLORIDA 32399-1650

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES
COMMISSIONER NICOLE "NIKKI" FRIED

June 23, 2022

Ms. Carol McFarlane
Volusia County Planning and Development Services
123 W. Indiana Avenue
DeLand, FL 32720
(386) 736-2700
cmcfarlane@volusia.org

RE: Tiger Bay State Forest 10-Year Land Management Plan

Dear Carol McFarlane,

Greetings from the Florida Forest Service (FFS). Attached is a draft copy of the Ten-Year Land Management Plan and Exhibits for Tiger Bay State Forest, prepared in accordance with F.S. 253.034. Please review the draft plan at your earliest convenience and reply as to whether the plan is consistent with Volusia County's Comprehensive Plan.

Please address all correspondence concerning the Management Plan on official letterhead to the above mailing address or via e-mail. I can be reached by telephone at (850) 681-5889 or by email at Patricia.Anderson@FDACS.gov if you have any questions.

Thank you for assisting us in managing Tiger Bay State Forest resources through a stewardship ethic to ensure they are available for future generations.

Sincerely,

Patti Anderson
FFS Land Management Planner

cc: Donald King, FFS Bunnell District Forestry Supervisor II

Exhibit U

State Forest Management Plan Advisory Group Summary

Management Plan Advisory Group Public Hearing
Tiger Bay State Forest
10-Year Land Management Plan

June 9, 2022

10:30 A.M.

Meeting Minutes

MPAG Members Present:

- | | |
|--------------------|--|
| • Anthony Petellat | Bunnell District Manager, Florida Forest Service (FFS) |
| • Caitlyn Crawford | Wildlife Biologist III, FWC |
| • Jeremy Olson | Land Manager, SJRWMD (Representing Rufus Davis) |
| • Wendy Anderson | Volusia County Soil & Water District |
| • Troy Rentz | Local Property Manager |

MPAG Members Not Present:

- | | |
|-------------------------------|---|
| • Ricky Lackey | District Biologist, National Wild Turkey Federation |
| • Don Dunn | Local Property Manager |
| • Representative Heather Post | Volusia County Elected Official |

FFS Staff:

- | | |
|-------------------|--|
| • Alan Davis | Land Planning Coordinator |
| • Brian Camposano | Forest Management Assistant Bureau Chief |
| • Justina Jones | Forestry Resource Administrator |
| • Sam Kergel | Forester |
| • Donald King | Forestry Supervisor II |
| • Melinda Avni | Bunnell District Recreation Coordinator |
| • Patti Anderson | Land Management Planner |

Guests:

- Rob Bird
- Nick Dunnam
- Sonya Guidry (written comments)
- Cathy Lowenstein
- Suze Peace
- Paul Rebmam
- Susanne Shaeffer
- Peter Sigmann
- Alex Zelenski
- Kendra Highly
- Cindy Venuti
- David Hartgrove

Public Meeting Start Time: 10:30 A.M.

- Land Planning Coordinator, Alan Davis opened the meeting by introducing himself and explained the purpose and statutory framework for the Tiger Bay State Forest 10-Year Land Management Plan process.

He explained that the Plan is not an annual work plan or detailed operational plan but provides general and conceptual guidance for management of Tiger Bay State Forest (TBSF) for the next 10-year period.

- Mr. Davis confirmed compliance with the Florida Sunshine Law advising MPAG members to not discuss the draft outside of the public meetings. He stated that the meetings are open to the public, recorded, and minutes taken.
- Mr. Davis stated both MPAG meetings are open to the public and proper notice was given. The meetings were advertised to the public in the Daytona Beach News Journal on May 11, 2022; Florida Administrative Register, FFS webpage, as well as posted at the kiosks on TBSF. The meetings were announced at the Volusia County Council meeting on May 17, 2022. He noted that the draft plan goes through various approvals before and after the MPAG meetings but that the FFS Director is granted final authority on changes to the draft plan. He described the day's two meetings: The first meeting is informational and provides opportunity for public comment; the 1:00 p.m. Workshop meeting provides opportunity for the MPAG members to discuss the public input and to share their personal comments on the draft plan. The public is welcome to attend the Workshop, but participation is limited to MPAG members.
- Mr. Davis introduced Brian Camposano who explained the technical logistics and how to use the webinar tools to share comments.
- Mr. Davis then requested MPAG Member introductions and attendance was noted.
- Mr. Davis asked the advisory group to elect an MPAG chairperson. Anthony Petellat was elected to serve as chairperson at the impending workshop.
- Mr. Davis reiterated the purpose of this meeting is to receive public input which would be discussed in the Workshop. He acknowledged the in-person location and asked the FFS administrators to apprise of any attendees. Justina Jones stated that no attendees were present.
- Mr. Davis then introduced Forester Sam Kergel who presented the PowerPoint presentation of the 10-Year Plan.
- Mr. Davis then read aloud the written comments received from Sonya Guidry of the Florida Native Plant Society (attached).
- Mr. Camposano said that a few attendees requested to speak.
- Mr. Paul Rebmann of the Florida Native Plant Society who served as prior MPAG appointee, noted that the Rugel's pawpaw is a species of pawpaw found only in Volusia County, including extensive populations on TBSF making TBSF an important factor in protecting the plant and has shared data with FFS and Florida Natural Areas Inventory. He commended FFS's prescribed burn program and personally approved of the recreation plans noted in the land management draft plan.
- Ms. Peace then spoke of her concerns over ATVs, noting their noise, damage to trails, and sighting them on the forest. Ms. Jones noted that FFS has no plans to allow ATVs on the forest.
- Mr. Hartgrove, president of Halifax River Audubon Society, has conducted research on nightjar birds and thanked FFS for cooperating in his work and for good management of the forest. He added that AEMS (Aquatic Environmental Marine Science), a high school group looking for potential internship and volunteer opportunities. Mr. Davis encouraged Mr. Hartgrove to contact Justina Jones to further discuss.
- Ms. Schaeffer was happy to hear there are no plans to add ATV access and thanked FFS for a great presentation.
- Mr. Davis then thanked everyone for participating and adjourned the public hearing portion of the meetings.

Public Meeting End Time: 11:15 A.M.

Management Plan Advisory Group Workshop Meeting
Tiger Bay State Forest
10-Year Land Management Plan

June 9, 2022

1:00 P.M.

Meeting Minutes

MPAG Members Present:

- | | |
|--------------------|--|
| • Anthony Petellat | Bunnell District Manager, Florida Forest Service (FFS) |
| • Caitlyn Crawford | Wildlife Biologist III, FWC |
| • Jeremy Olson | Land Manager, SJRWMD (Representing Rufus Davis) |
| • Wendy Anderson | Volusia County Soil & Water District |
| • Troy Rentz | Local Property Manager |

MPAG Members Not Present:

- | | |
|-------------------------------|---|
| • Ricky Lackey | District Biologist, National Wild Turkey Federation |
| • Don Dunn | Local Property Manager |
| • Representative Heather Post | Volusia County Elected Official |

FFS Staff:

- | | |
|-------------------|--|
| • Alan Davis | Land Planning Coordinator |
| • Brian Camposano | Forest Management Assistant Bureau Chief |
| • Justina Jones | Forestry Resource Administrator |
| • Sam Kergel | Forester |
| • Donald King | Forestry Supervisor II |
| • Melinda Avni | Bunnell District Recreation Coordinator |
| • Patti Anderson | Land Management Planner |

Guests:

- Nick Dunnam
- Alex Zelenski
- Kendra Hively
- Cindy Venuti
- Michael Bishop

Workshop Meeting Start Time: 1:00 P.M.

- Land Planning Coordinator, Alan Davis introduced himself and opened the TBSF MPAG Workshop by conducting an MPAG member sound check. He reminded the MPAG members of the Florida Sunshine law and that the purpose of the workshop is to review and discuss the draft and that any edits made to the draft would be presented to the FFS Director for approval. He noted that minutes will be emailed to the MPAG members and will be approved via negative response review. MPAG member appointment will terminate when the final draft is submitted to the Acquisition Restoration Council. He noted that the goal is place the draft plan on the October Acquisition and Restoration Council (ARC) for final approval. Forester Sam Kergel was available to make proposed changes to the draft during the page-by-page review.
- Mr. Davis asked if any MPAG members had comments regarding the public hearing conducted earlier. None followed. No attendees were reported at the in-person venue.

- Ms. Anderson was glad to hear of the support of the Rugel's pawpaw and that ATVs are not allowed and had further questions regarding law enforcement. Mr. Davis noted that those items could be discussed in their corresponding sections.
- Page 5. I. Introduction Section C. Goal 2. Public Access and Recreational Opportunities: Ms. Anderson asked what organizations are represented on the liaison group. Ms. Jones stated that committee members include the Audubon Society, equestrian and hunting groups, FWC, Volusia County Council, and SJRWMD.
- Page 6. I. Introduction Section C. Goal 3. Habitat Restoration, Improvement, and Fire Management: Ms. Anderson inquired about the fire-return interval of 2 to 4 years being too general for the varied natural communities. Mr. Davis noted that individual community fire-return intervals are listed in the appropriate section further down in the draft plan.
- Page 11. II. Administration Section B. 4. Revenue Producing Activities: Mr. Olson inquired about any immediate plans to harvest palmetto berries. Ms. Jones replied that palmetto berry harvesting is currently not conducted on forests statewide. Mr. Camposano noted that the reference is boilerplate to avoid plan amendments should future harvesting become favorable.
- Page 12. II. Administration Section B. 7. Aquatic Preserve: Ms. Anderson questioned the language as she noted the primary aquifer recharge area is the sole source aquifer for Volusia County and asked if the area could be evaluated as an area of critical state concern. Mr. Davis suggested adding a comment to inquire to DEP to confirm the designation. Mr. Camposano stated that the designation is determined by the state and not FFS independently, and that a designation study is not feasible to supplement this plan before it's completion. However, the area must meet the criteria determined by DEP for study which may be considered over the next 10-year period. FFS will discuss designation criteria and procedures with DEP.
- Page 13. II. Administration Section C. Capital Facilities and Infrastructure 2. Improvements: Ms. Anderson noted that Volusia County has recently studied the width of borrow pit buffers needed to prevent hydrologic impact on surrounding wetlands. She inquired about buffers needed for the planned borrow pit. Ms. Jones replied that the planned area for the borrow pit is an upland community with no nearby wetlands. Mr. Petellat commented that the area has been used for staging lime rock for road improvements and has not been used for a borrow pit.
- Page 14. II. Administration Section D. Additional Acquisitions and Land Use Considerations 1. Alternate Uses Considered: *"Uses determined as incompatible include but are not limited to: water resource development projects, water supply projects, storm-water management projects, sewage treatment facilities, linear facilities, etc."*; Ms. Anderson inquired about "alternate uses except as needed" noting that Daytona Beach and Ormond Beach direct reclaimed water onto the property. Mr. Davis replied that the language is boilerplate and that proper channels are established for any potential alternate uses. Mr. Camposano added that FFS highly discourages alternate land use except in instances where there are zero alternatives such as opting for a DOT road-widening project over building a new road through the forest, as an example. By putting this language in the plan, FFS can better discourage or mitigate incompatible alternate uses. The water treatment project was an unavoidable alternate use in this instance.
- Page 15. II. Administration Section D. Additional Acquisitions and Land Use Considerations 1. Adjacent Conflicting Uses: Ms. Anderson inquired about concerns over prescribed burns and wildfire with the expansion of residential areas. Mr. Petellat noted that all FFS prescribed burn prescriptions address smoke management. FFS continually monitors the effects of smoke as a priority to community health and safety. FFS works with communities to become fire-wise and ensures there are proper buffers in place prior to development. FFS maintains access to those buffers in a wildfire threat or occurrence. FFS also works with established communities in town hall settings to educate and explain the purpose of prescribed burning.
- Page 19. Table 4 Historical Sites on TBSF: Mr. Olson indicated a typo.
- Page 21. III. Archaeological/Cultural Resources and Protection Section C. Ground Disturbing Activities: Mr. Olson inquired if the "State Lands Handbook" should be "State Forest Handbook." Correction was made.
- Page 22. IV. Natural Resources and Protection Section B. Water Resources 2. Water Classification: Ms. Anderson, though admittedly unfamiliar with geography of the site, inquired about the pulling of groundwater from municipal areas and pumping reclaimed water back: what the impact is on the Outstanding Florida

Waterways (OFW) and acknowledged SJRWMD's likely monitoring of the function. Mr. Davis noted that DEP provided OFW information for this draft plan and said that Mr. Olson may remark should he choose. Mr. Olson replied that OFW is a separate unit within the District, therefore he could not comment. Ms. Anderson further asked about Daytona's regard of nutrient load and filtration effects by the system. Mr. Petellat noted that when the project began, the water district was the lead agency. Their study reported that the nutrient level impacting the Halifax River would be significantly lower than the direct piping into the river that was occurring at that time. Mr. Davis stated that DEP's website has additional information on the Lower St. Johns River Basin Main Stem BMAP. Mr. Camposano stated that the multi-agency management precedes the development of this plan. Mr. Davis further noted that the area is subject to numerous outside entities' involvement. Mr. Olson stated that though the pipes are installed, the recharge system has not been used.

- Page 26. IV. Natural Resources and Protection Section B. Water Resources 7. TBSF Hydrologic Restoration Plan: Ms. Anderson noted that the following plan language, *"Along the Pershing Highway, a major historic drainage canal runs south to north on the Tiger Bay Tract. This canal impedes the natural sheet flow of water across the landscape. Because of the historic nature of the canal, restoration efforts to the canal will likely have greater negative impacts on the site characteristics than benefits"* and stated that "somebody weighed some criteria there and decided that protecting a historic structure was more important than restoring sheet flow" and asked if someone could explain the rationale. Ms. Jones stated that her interpretation of the priority is that the impact of removing trees and vegetation for stabilization would likely do more harm than good to the area.
- Page 27. IV. Natural Resources and Protection Section C. Floral and Faunal Resources 1. Rare, Endangered, And Threatened Species: Ms. Anderson asked if the gopher tortoise relocation site is within the mitigation bank area and if the inhabitants are of natural or relocated populations. Mr. Rentz answered that there have been no relocation projects to date but will be considered in the future. Mr. Camposano noted that a relocation site was proposed before FWC's permitting system for gopher tortoises was established and no tortoises have been moved to the site that FFS is aware of. He further noted that in the last legislative session there was a change to Chapter 259 requiring all state agencies that manage land for natural resources to consider areas on state lands that may be established as gopher tortoise recipient sites. FFS will consider all state forests as possible recipient sites including TBSF. Should translocation be determined, the draft plan will be amended to include the location of the recipient site and other details. The statute supersedes the plan's completion thus language regarding the subject will be developed prior to this draft plan's approval.
- Page 26. Typos were corrected.
- Page 34. V. Public Access and Recreation Section B. Planned: Ms. Anderson commented that it's a good idea to install parking lots at Clark Bay Road and Dukes Island Road.
- Page 43. Mr. Olson pointed out a typo.
- Page 43. Table 6. Non-Native Invasive Plant Species: Ms. Anderson was happy with the decreasing status of invasive plant species yet found it hard to believe that they're all decreasing. Mr. Camposano noted that the status of "decreasing" can be relative based on the time of the year the species are assessed, and that some species may be labeled "stable" noting that it's important that they're not increasing. FFS has spent the last 15+ years utilizing personnel, equipment, and funds to treat invasive species. Ms. Anderson stated she was not surprised that FFS prioritizes invasive species and sees success and requested advice on treating cogon grass.
- Page 44. Table 6. Mr. Olson noted a typo.
- Page 45. Table 7. Proposed Management Activities for Natural Communities: Ms. Anderson inquired as to why every community type shows a decrease in acreage. Mr. Camposano explained that Historic Acres are recorded community types based on aerial maps from the 1940s, before the property was acquired by the state. The condition of the forest when acquired needed to be planted and restored with natural species with the intent of managing the land back to its natural state. The table demonstrates the cumulative restoration results by community type. Mr. Olson asked what criteria is used to determine community type conversion, noting plantation conversion to flatwoods as an example. Mr. Camposano replied that the stage of restoration is established when there's managed fire in the system and the site has been thinned at least once. At that point it is considered actively managed and on the path to restoration.

- Page 46. Table 10. Prescribed Fire Interval Guide: Ms. Anderson questioned why a community type that is burned at low frequency is scheduled to burn with an adjacent community of a higher burn frequency. Mr. Petellat stated that FFS uses natural barriers that fire typically will not carry through, baygall for example, to avoid constructing a fire line that will separate two stand types. Thus, as fire is put into mesic flatwoods (upland) and burns toward the baygall, it burns into the basin swamp ecosystem then naturally extinguishes. While the baygall may not burn completely, portions will be reported as burned through repeated burning. Mr. Camposano noted that the Goals section is used in planning to quantify the entire forest for a 2 to 4-year interval in natural areas that can withstand fire. The natural communities' variability in size is considered: higher acreages that don't need fire impact the entire forest's burn average.
- Page 48. Mr. Olson noted a typo.
- Page 63. VII. Proposed Management Activities for Natural Communities, Section O. Other Altered Landcover Types: Ms. Anderson inquired that with power companies' plans to modify utility corridors, does FFS anticipate major changes to easements. Mr. Davis replied that FFS foresees no changes and that proper due diligence will be performed when a proposal is received. Utility companies work within their existing easements and any work sought outside the parameters of those easements will be mitigated.
- Mr. Olson noted the spelling of the word, "borrow" (versus "barrow"). Referring to the State Forest Handbook conveyed "borrow."
- Mr. Davis asked if there were any questions or comments on the exhibits. No responses resulted. He then asked each MPAG member to comment on the draft plan. All present MPAG members commented positively.
- Mr. Davis noted that the draft will be submitted to OES in July as a possible ARC agenda item at the October 14, 2022 public meeting.
- Mr. Davis thanked everyone for their time and participation and adjourned the meeting.

Workshop Meeting End Time: 2:18 P.M.

From: [King, Donald](#)
To: [Anderson, Patti](#); [Jones, Justina](#)
Subject: FW: [External] Comment on TBSF LandManagement Hearing: for 06/09/22
Date: Wednesday, June 8, 2022 10:38:53 AM

Here is a public comment for the MPAG meeting.

Donald S King
Forestry Supervisor 2
Florida Forest Service
Florida Department of Agriculture and Consumer Services

(386) 317-3277

Donald.King@FDACS.gov

Tiger Bay State Forest
4316 W. Int'l Speedway Blvd.
Daytona Beach, FL 32124

www.FDACS.gov

Please note that Florida has a broad public records law (Chapter 119, Florida Statutes). Most written communications to or from state employees are public records obtainable by the public upon request. E-mails sent to me at this e-mail address may be considered public and will only be withheld from disclosure if deemed confidential pursuant to the laws of the State of Florida.

From: Sonya Guidry <guidry.sonya@gmail.com>
Sent: Wednesday, June 8, 2022 10:35 AM
To: Avni, Melinda <Melinda.Avni@fdacs.gov>; King, Donald <Donald.King@fdacs.gov>
Subject: [External] Comment on TBSF LandManagement Hearing: for 06/09/22

CAUTION: This email originated from outside of the organization. Do not click links or open attachments unless you recognize the sender and know the content is safe.

Attention Donald King :

Comments to submit regarding TBSF management

For June 9 , 2022

My Name is Sonya Guidry
Address:

New Smyrna Beach, FL

FNPS member of Pawpaw Chapter since 1991, and served over the years as a field trip leader, a past president, native plant propagation committee, currently serve on conservation committee and have represented FNPS on several Land Management Reviews.

The Mission of the Florida Native Plant Society is to promote the preservation, conservation, and restoration of the native plants and native plant communities of Florida. The Society promotes this mission through education, research, advocacy, land stewardship, conservation and restoration.

Our vision is for all of Florida's residents and visitors to know about and value Florida's extraordinary native flora and native plant communities, which are essential to the healthy ecosystems that support wildlife and people.

Pawpaw Chapter has been proud to offer two statewide FNPS Conferences 2006 and 2016 in Daytona Beach where members of over 30 Chapters came to learn and share information related to the FNPS Mission, and participate in one or more of its 20 field trips into Florida's natural areas. Tiger Bay State Forest was one of our prime natural areas...valued for its unique mosaic of natural habitats, one of which supports a federally listed endemic species found only in Volusia County, Rugel's Pawpaw (*Deeringothamnus rugelii*). Several populations of this rare endemic plant have been documented on TBSF lands and are currently managed and protected as required by federal law.

That being said, with all the rapid current urban development being experienced here in Florida and Volusia County we see there is a huge sustainability problem for both humans and wildlife when natural areas are fragmented, paved, overlayed with many single housing projects all demanding water and fertilizer hungry turf lawns and exotic plants that did not evolve to fit naturally into one of Florida's native plant communities.

Especially with all the urban encroachment, we in the Pawpaw Chapter strongly urge that there be no relaxation of Tiger Bay State Forest's environmental regulations that would reduce the value this part of unique Florida. Florida needs all the sustainable intact natural areas, with its unaltered hydrology, and its wildlife corridors that it can possibly retain for the benefit of its native plants, animals, human visitors well into the future.

Please keep strong conservation measures in the TBSF Management Plan.

Thank you
Sony Guidry

Sent from my iPhone

Exhibit V

State Forest Summary Budget

	TIGER BAY STATE FOREST MGT. ONLY 20-21 EXPENDITURES	Percentages Based on Total Dollar Amount of Expenditures	Assessed Needed Funding Based Upon LMUAC Resource Management
Resource Management	\$ 100,403	25.85%	\$ 134,007.15
Exotic Species Control	\$ 10,799	2.96%	\$ 15,347.35
Prescribed Burning	\$ 20,615	3.98%	\$ 20,615.22
Cultural Resources Management	\$ 392	0.10%	\$ 542.86
Timber Management	\$ 30,968	8.50%	\$ 44,063.64
Hydrological Management	\$ 1,914	0.52%	\$ 2,719.80
	\$ -		\$ -
OTHER RESOURCE MANAGEMENT	\$ 35,695	9.78%	\$ 50,728.28
Listed Species Management	\$ -		\$ -
Forest Pest and Disease	\$ -		\$ -
Plant Conservation Program	\$ -		\$ -
State Forest Research Projects	\$ -		\$ -
Boundary Surveys for State Forests	\$ -		\$ -
Other Activities Also Include:	\$ -		\$ -
Liaison Community Meetings / Boundary Line Maintenance / Forest Inventories and Various Other Activities / Wildfire Suppression on State Forests			
			\$ -
Administration	\$ 24,054	6.59%	\$ 34,184.15
Central Office Headquarters	\$ 24,054	6.59%	\$ 34,184.15
District/Regions	\$ -		\$ -
Units/Projects	\$ -		\$ -
	\$ -		\$ -
Support	\$ 120,020	32.90%	\$ 170,568.17
Land Management Planning	\$ 7,417	2.03%	\$ 10,540.93
Land Management Reviews	\$ 544	0.15%	\$ 772.55
Training/Staff Development	\$ 21,128	5.79%	\$ 30,025.85
Vehicle Purchase	\$ 1,795	0.49%	\$ 2,550.98
Vehicle Operations and Maintenance	\$ 66,119	18.12%	\$ 93,966.23
	\$ -		\$ -
OTHER SUPPORT	\$ 23,017	6.31%	\$ 32,711.63
State Forest Land Acquisition Support			\$ -
Other Support Activities Also Include:	\$ -		\$ -
Computer Maintenance / Radio Maintenance / Technical Support / Management of Apiary and Cattle Leases / State Forest Leases; Lease Amendments, Easements and Other Various Activities	\$ -		\$ -
			\$ -
Capital Improvements	\$ 82,077	22.50%	\$ 116,645.05
New Facility Construction	\$ 17,589	4.82%	\$ 24,996.48
Facility Maintenance	\$ 64,488	17.68%	\$ 91,648.57
			\$ -
Visitor Services/Recreation	\$ 44,408	12.17%	\$ 63,110.79
Information/Education	\$ 11,054	3.03%	\$ 15,710.29
Operations	\$ 33,353	9.14%	\$ 47,400.50
			\$ -
Law Enforcement	\$ -	0.00%	\$ -
Total	\$ 364,834.24	100.00%	\$518,491.56

Exhibit W

Arthropod Control Plan Response from Volusia County



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

ARTHROPOD MANAGEMENT PLAN - PUBLIC LANDS

NICOLE "NIKKI" FRIED
COMMISSIONER

Section 388.4111, F.S.
Telephone: (850) 617-7997

Return to:

Mosquito Control Program
3125 Conner Blvd, Bldg 6,
Tallahassee, Florida 32399-1650

For use in documenting an Arthropod Control Plan for lands designated by the State of Florida or any political subdivision thereof as being environmentally sensitive and biologically highly productive therein. Fill this form out if control work is necessary or planned.

Name of Designated Land:

Tiger Bay State Forest

Is Control Work Necessary: ☒ Yes ☐ No

Location:

Multiple parcels located on or near the Tiger Bay State Forest

Land Management Agency:

FL Dept. of Agriculture and Consumer Services, Florida Forest Service

Are Arthropod Surveillance Activities Necessary? ☒ Yes ☐ No

If "Yes", please explain:

Required as the primary component of an Integrated Mosquito Management (IMM) program.

Which Surveillance Techniques Are Proposed?

Please Check All That Apply:

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

If "Other", please explain:

Portable "light trap" style trap baited with adult mosquito attractant i.e. carbon dioxide, octenol and/or BG Lure.

Arthropod Species for Which Control is Proposed:

Diptera:Culicidae

***Aedes* species including but not limited to *Ae. albopictus*, *Ae. atlanticus*, *Ae. infirmatus*.**

***Culex* species including but not limited to *Cx. quinquefasciatus*, *Cx. nigripalpus* and *Cx. salinarius*.**

Others inc. but not limited to *Psorophora ferox*, *Psorophora columbiae*, *Anopheles quadrimaculatus*

Proposed Larval Control:

Proposed larval monitoring procedure: **Dipping, utilizing standard dipper methodology.**

Are post treatment counts being obtained: ☒ Yes ☐ No

Biological Control of Larvae:

Might predacious fish be stocked: ☒ Yes ☐ No

VCMC utilizes *Gambusia holbrooki* obtained from an onsite fish hatchery and natural local habitats.

Other biological controls that might be used:

See below Biorational agents including *Bti* and *Bs*.

Material to be Used for Larvaciding Applications:

(Please Check All That Apply)

☒ Bti

☒ Bs

☒Methoprene

☐Non-Petroleum Surface Film

☒Other: please specify: **Spinosad**

Please specify the following for each larvacide:

Chemical or Common name: ***Bacillus thuringiensis subsp. israelensis (Bti)*, *Bacillus sphaericus (Bs)*, *Bti/Bs* combination, Methoprene, Spinosad**

☒ Ground ☒ Aerial

Rate of application: **Application rate is based on the rates prescribed on the EPA approved product label.**

Examples of approved application rates:

VectoBac (*Bti*) = 0.25-2pts/acre (liquid) or 2.5-20lbs/acre (granular), VectoLex (*Bs*) = 5-20lbs/acre (granular), VectoMax (*Bti/Bs*) = 5-20lbs/acre (granular) or 1 WSP (water soluble pouch = 10g)/50 sq ft.

Natular (Spinosad) = 1.1-2.8fl oz/acre (liquid) or 3.5-20lbs/acre (granular) or 5-20lbs/acre (extended release granular).

Altosid (Methoprene) = 0.75-1fl oz/acre (liquid) or 5-20lbs/acre (extended release granular).

Method of application: **Hand, Backpack, Buffalo Turbine, ATV, or other Truck-mounted applicator and/or Helicopter.**

Proposed Adult Mosquito Control:

Aerial adulticiding ☒ Yes ☐ No

Ground adulticiding ☒ Yes ☐ No

Please specify the following for each adulticide:

Chemical or common name:

Bifenthrin, Etofenprox, Naled, Permethrin, Prallethrin, Sumithrin, Malathion, Chlorpyrifos

Rate of application: **Application rate is based on the rates prescribed on the EPA approved product label.**

Examples of approved application rates:

Bifenthrin = 0.056-0.225 lb AI/acre (0.25-1.0 fl oz/1000 sq ft)

Etofenprox = 0.00175-0.007 lb AI/acre (0.1513-.6054 fl oz/acre).

Naled = 0.05-0.1 lb AI/acre (0.5-1 fl oz/acre).

Permethrin = 0.00175-0.007 lb AI/acre (0.09-0.36 fl oz/acre).

(Duet) Prallethrin = 0.00024-0.00072 lb AI/acre, PBO = 0.0012-0.0036 lb AI/acre, Sumithrin = 0.0012-0.0036 lb AI/acre (all at 0.41-1.23 fl oz/acre).

Malathion = 0.03-0.06 lb AI/acre (0.38-0.75 fl oz/acre).

(Mosquito Master 412) Chlorpyrifos = 0.005-0.01 lb AI/acre, Permethrin = 0.0017-0.003 lb AI/acre (0.74-1.42 fl oz/acre).

Method of application: **Ultra Low Volume (ULV); Hand-held ULV, ATV-mounted ULV unit, Truck-mounted ULV unit and/or Aerial ULV**

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

Proposed Notification Procedure for Control Activities:

ULV adulticiding will occur following surveillance and include required FDACS criteria. Notification will occur 24 hours in advance of an adulticiding event and will include both a phone call and email to the Land Manager as well as any other previously identified land management personnel.

We coordinate closely with the local and state Dept of Health, Division of Env. Public Health that annually publishes the Surveillance and Control of Selected Arthropod-Borne Diseases in Florida -2014 Guidebook which includes a "Response Plan for Mosquito-Borne Diseases" that identifies various levels of threats, the thresholds for those levels, and their respective management responses.

Spraying by air will only commence after coordination between VCMC management and the local Land Manager. Aerial applications will only be considered after an Emergency Declaration for a mosquito-borne threat to human populations.

The treatment area will advocate for buffering of environmentally sensitive and biologically highly productive areas.

FDACS-13668 05/15

Page 3 of 4

Records:

Are records being kept in accordance with Chapter 388, F.S.:

☒ Yes ☐ No

Records Location: **VCMC, 801 South St, New Smyrna Beach, FL**

How long are records maintained: **5+ years**

Vegetation Modification:

What trimming or altering of vegetation to conduct surveillance or treatment is proposed?

Trimming would only occur if access was required for a specific area and after coordination with the Land Manager.

Proposed Land Modifications: **N/A**

Is any land modification, i.e., rotary ditching, proposed: **N/A**

Include proposed operational schedules for water fluctuations: **N/A**

List any periodic restrictions, as applicable, for example peak fish spawning times. **N/A**

Proposed Modification of Aquatic Vegetation: **N/A**

Land Manager Comments:

Arthropod Control Agency Comments:

VCMC has an extensive Integrated Pest (Mosquito) Management Program. We are governed and abide by SS Chapter 388 and FAR 5E-13. In addition to regulatory compliance, we follow Best Management Practices for MC as defined by the American Mosquito Control and Florida Mosquito Control Association.

Please find Volusia County Mosquito Control's Mission Statement as follows - To proactively use Integrated Pest Management (IPM) strategies to reduce nuisance mosquitoes and risk of mosquito-borne illness in Volusia County. To sustain quality of life, foster stewardship of the environment, provide stellar customer service, and support economic vitality for the community.

Anthony W. Petellat 07/13/2020
Signature of Land Manager or Representative Date

Suzanne Bantlett 5/19/20
Signature of Mosquito Control Director / Manager Date

Exhibit X

Proposed Borrow Pit Map



Florida Forest Service

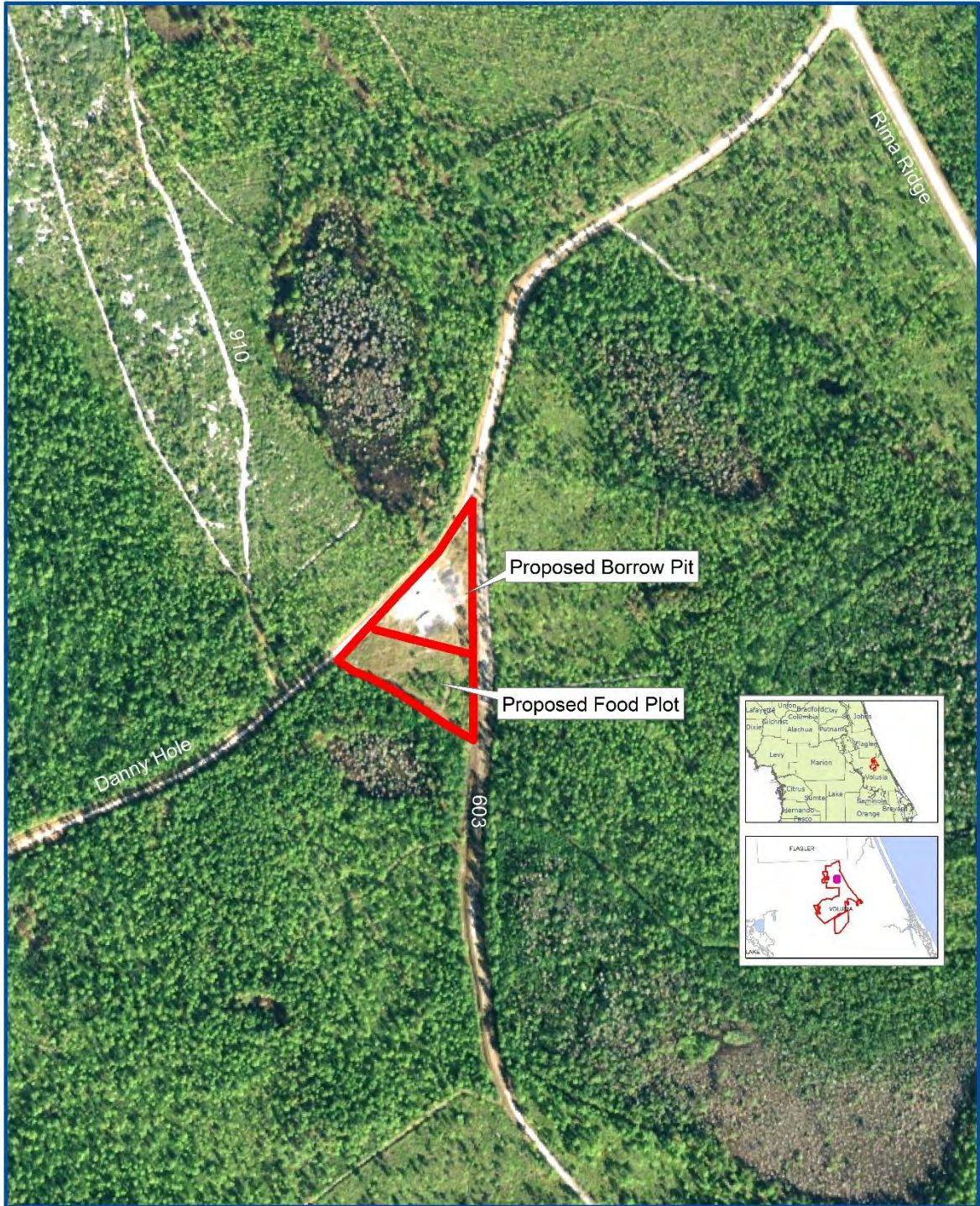
Tiger Bay State Forest

Proposed Borrow Pit & Food Plot

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

DISCLAIMER:
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Revised May 2021 at request of
the Florida Forest Service
Florida Forest Service
From the US Army Corps of Engineers



0.1 0.05 0 Miles



Map Month/Year: March 2021

100 50 0 100 Yards

Exhibit Y

Water Supply Wells and Monitoring Wells Map



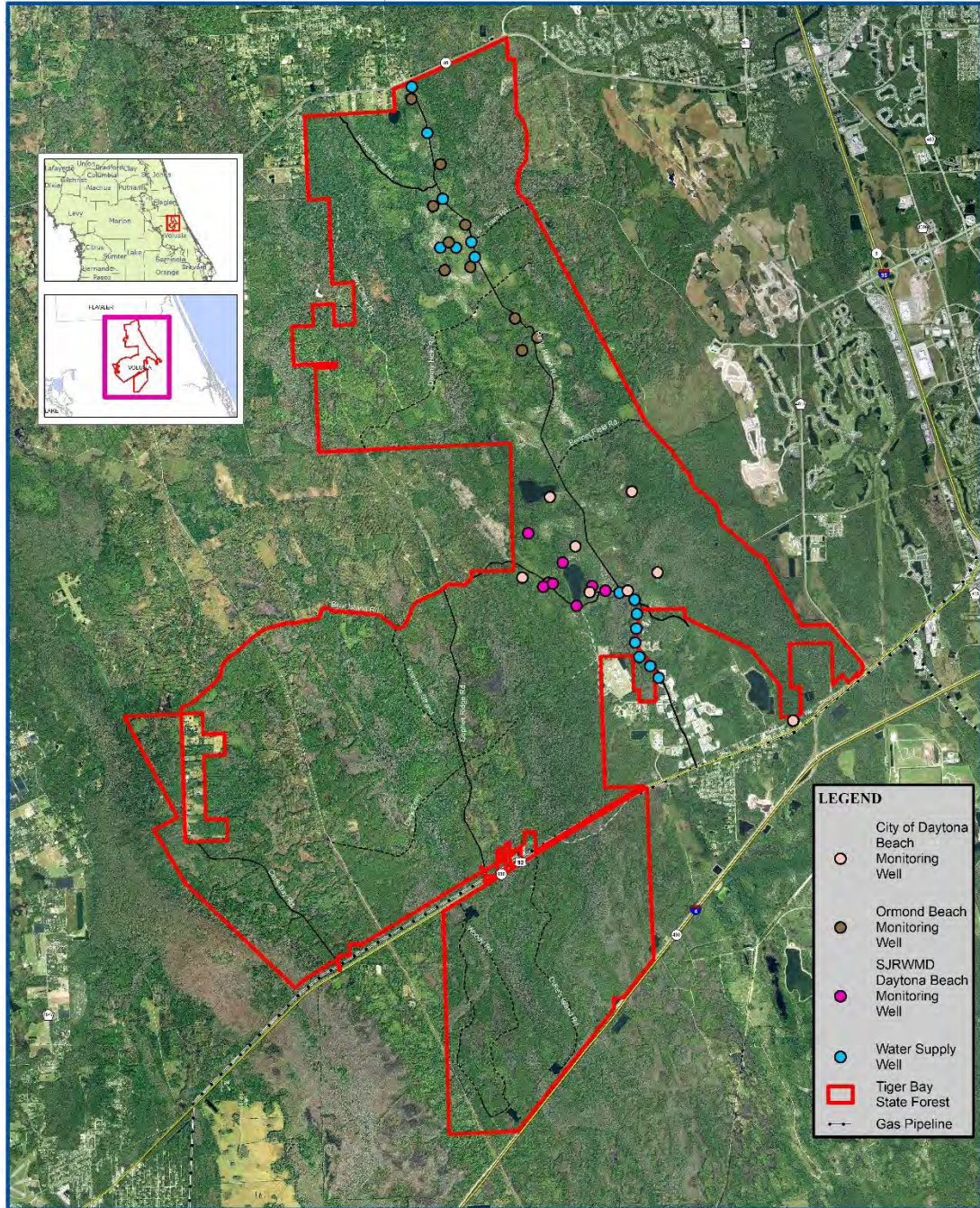
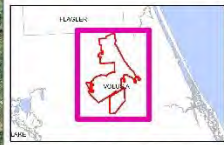
Florida Forest Service

Tiger Bay State Forest Water Supply and Monitoring Wells Map

Coordinate System: Florida Albers
High Accuracy Reference Network (HARN) Datum

DISCLAIMER:
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Map Date: 05/20/2020
Map By: J. L. Smith
Map Title: Tiger Bay State Forest
Map Scale: 1 inch = 1 mile



- LEGEND**
- City of Daytona Beach Monitoring Well
 - Ormond Beach Monitoring Well
 - SJRWMD Daytona Beach Monitoring Well
 - Water Supply Well
 - Tiger Bay State Forest
 - Gas Pipeline

0.5 0.25 0 0.5 1 1.5 Miles



Map Month/Year: May 2020

3,000 6,000 9,000 12,000 15,000 Feet