FLORIDA DEPARTMENT OF
Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Noah Valenstein
Secretary

June 15, 2020

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

RE: Picayune Strand State Forest – Lease No. 3927

Dear Mr. Rowell:

On **June 12, 2020**, the Acquisition and Restoration Council (ARC) recommended approval of the **Picayune Strand 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 **Picayune Strand State Forest** management plan. The next management plan update is due June 12, 2030.

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

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
Office of Environmental Services
Division of State Lands

TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

PICAYUNE STRAND STATE FOREST

Approved by:

Erin Albury, Director
Florida Forest Service

6/17/20
Date

James Roberts, Chief
Forest Management Bureau

6/16/20
Date

TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

PICAYUNE STRAND STATE FOREST

COLLIER COUNTY

PREPARED BY THE

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

FLORIDA FOREST SERVICE

APPROVED ON

June 15, 2020

TEN-YEAR LAND MANAGEMENT PLAN
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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service
COMMON NAME: Picayune Strand State Forest
LOCATION: Collier County
ACREAGE TOTAL: 74,008 acres

Historic Natural Communities	Approximate Acreage
Strand swamp	42,458
Wet flatwoods	16,394
Mesic flatwoods	3,881
Marl prairie	3,082
Mesic hammock	1,803
Dome swamp	1,564

Historic Natural Communities	Approximate Acreage
Hydric hammock	1,157
Salt marsh	855
Basin marsh	449
Wet prairie	310
Mangrove swamp	33
Swamp lake	8

TIITF LEASE AGREEMENT NUMBER: 3927
USE: Single ___ Multiple _X_

MANAGEMENT AGENCY	RESPONSIBILITY
FDACS, Florida Forest Service	General Forest Resource Management
Florida Fish and Wildlife Conservation Commission	Wildlife Resources & Laws
South Florida Water Management District	Water Resource Protection & Restoration
Department of State, Division of Historical Resources	Historical and Archaeological Resource Management
U.S. Army Corps of Engineers	Hydrologic Restoration
U.S. Fish & Wildlife Service	Hydrologic Restoration

DESIGNATED LAND USE: Multiple-Use State Forest
SUBLEASES: None
ENCUMBRANCES: Oil and gas rights have been retained by the Barron Collier family. Numerous dedicated ingress/egress easements exist on the Belle Meade Tract.
TYPE ACQUISITION: Preservation 2000, Conservation and Recreation Lands, Florida Forever and Farm Bill
UNIQUE FEATURES: Old growth south Florida slash pine, subtropical dwarf cypress savanna, cypress stand
ARCHAEOLOGICAL / HISTORICAL: Eighty-nine (89) known sites
MANAGEMENT NEEDS: Restoration and maintenance of native ecosystems and distributed site restoration
ACQQUISITION NEEDS: Remainder of the South Belle Meade Project
SURPLUS ACREAGE: None
PUBLIC INVOLVEMENT: 2013 and 2018 Land Management Reviews, Management Plan Advisory Group and Public Hearing, and DEP Acquisition and Restoration Council Public Hearing

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

ARC Approval Date: ______________________ TIITF Approval Date: ________________

Comments:

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I. Introduction

Picayune Strand State Forest is the fourth largest state forest in Florida and is named after the largest of several cypress strands that once occupied much of the eastern portion of the property. The 74,008-acre forest is comprised of two tracts, the South Golden Gates Estates Tract to the east and the Belle Meade Tract to the west.

Picayune Strand State Forest is in the heart of the Big Cypress Basin. The majority of this hydric forest is under water during the wet season. The forest is a mosaic of cypress strands, wet prairie, and pine flatwoods in the lowlands and subtropical hardwood hammocks in the uplands. The northern section of the Belle Meade Tract contains many second-growth south Florida slash pine, with many remnant trees being over 100 years old.

Picayune Strand State Forest offers a number of recreational opportunities, including, but not limited to, camping, horseback riding, hiking, hunting, wildlife viewing, trail bike riding, scenic drives, wildlife viewing, fishing, kayaking, and geo-caching. Horseback riding is focused along the 22-mile Belle Meade Horse Trail and accompanied by 29 paddocks, non-potable water, and an equestrian camping area at the trailhead. Hiking the 3.2 - mile Sabal Palm Hiking Trail provides plant and wildlife viewing opportunities in a pine flatwoods community that meanders through cypress strands. Picnic and restroom facilities are available at many of the sites. Fishing at the Port of the Islands Recreation Area provides an opportunity for freshwater fishing in the Faka-Union Canal. Hunting is available and coordinated through FWC on the Picayune Strand Wildlife Management Area. Camping is available at a limited number of primitive tent and RV campsites. Cycling over an extensive road system provides excellent terrain for off-road biking. PSSF is an Operation Outdoor Freedom (OOF) program site and provides recreational opportunities to wounded veterans.

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 PSSF 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 PSSF 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 to water resources and the health of associated wetland 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, and was prepared utilizing guidelines outlined in Section 18-2.021 of the Florida Administrative Code. It is not an annual work plan or detailed operational plan but provides general guidance for the management of PSSF for the next ten-year period and outlines the major concepts that will guide management activities on the forest.

B. Past Accomplishments

A compilation of management activities and public use on PSSF has been completed monthly and is available from the forest manager. A table has been prepared for this plan that summarizes the accomplishments for each of the past ten years in 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 2008, there have been many events, developments, and accomplishments. Among the most noteworthy have been the following:

- Forest Management
  - Forest inventory of 92,142 acres (includes stands inventoried twice in 10 years)
  - Treatment of 22,973 acres of invasive plant species by Florida Forest Service employees and contracted agents
  - Palm frond sales conducted on 16,502 acres created $312,576.40 in revenue
  - $17,075 dollars received through apiary contracts since 2012
  - Harvest of non-timber forest products such as firewood and hearts of cabbage palm
  - Completed 4 orders for sabal palm wood to finish state tree wood collections
  - Leased one 10-acre parcel for cattle grazing and assessed other areas for grazing
- Fire Management
  - Conducted 57,195 acres of prescribed burning
  - Extinguished 75 wildfires on 40,834 acres
  - Completed a FWC/National Wild Turkey Federation/FFS wild turkey cost-share grant to burn 5,131 acres in 2016
  - Assisted in prescribed burning on other public lands surrounding PSSF to reduce risk including Rookery Bay NERR, Fakahatchee Strand State Preserve, and Florida Panther National Wildlife Refuge
- Road / Boundary Management
  - 397 miles of roads graded, 111 miles of roads repaired, small pot holes repeatedly filled
  - 85 miles of maintenance and sign replacement conducted on boundaries or borders
- Recreation Management
  - Estimated 562,283 day-use visits, 18,050 overnight camping visits

- Scouts of America volunteer projects have helped build planter boxes at the horse shoe campground and to construct portable bathroom screens
- Offered 166 veterans' opportunities to participate in outdoor activities through Operation Outdoor Freedom totaling 17 hunts
- Hosted the Annual Festival in the Woods event for four years
- Hosted a variety of other annual events such the Tour de Picayune bike ride and South Florida Trail Riding club rides
- Expanded camping at Kirkland hammock by adding an additional 2 primitive camp sites
- Created a Challenge Course in conjunction with South Florida Trail Riders on the green trail for horses and riders to utilize

- Biological Research and Management
  - Tree frog capturing techniques – Outside research
  - Sabal palm growth and control – FFS led
  - Short-tail shrew populations - Outside research
  - Red cockaded woodpecker management – FFS contracted, Outside research
  - Mosquitoes and mosquito-borne viruses - Outside research
  - Avian and avian guild monitoring - Outside research
  - Citrus canker and citrus greening - Outside research
  - Florida panther management - Outside research
  - Cogon grass genetics - Outside research
  - Turkey populations - Outside research
  - Songbird populations and presence – Outside research and FFS-led
  - Florida bonneted bat – Outside research.
- Education / Public Outreach
  - 91 programs, tours, radio broadcasts, and interviews about PSSF
  - Supported the 15,407-acre Traditional Use Area utilized by indigenous people for the harvesting of cypress trees, palm fronds, and medicinal plants.
- Research Conducted since 2008
  - Archeological sites – 79 sites are present on Picayune Strand State Forest with nearly half of these discovered as a result of the Comprehensive Everglades Restoration Plan (CERP) / PSRP project to protect these important resources from any ground-disturbing activities. These are visited for monitoring on a rotating basis with cooperation from the Department of State-Division of Historic Resources.

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

The following goals and objectives provide direction and focus management resources for the next ten-year planning period. Funding, agency program priorities, and the potential for wildfires and other weather events during the planning period will determine the degree to which these objectives can be met. Management activities on PSSF during this management period must serve to conserve, protect, utilize, and/or enhance the natural and historical resources and manage resource-based public outdoor recreation that are compatible with the conservation and protection of this forest. The majority of the management operations will be conducted by the FFS through personnel and volunteers, although appropriate activities will be contracted to private sector vendors or completed

with the cooperation of other agencies or entities. 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 Management Plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (Ongoing Goal)

Performance Measures:

- Annual updates of the Five-Year Silviculture Management Plan completed
- Continued implementation of the Five-Year Silviculture Management Plan (# acres treated)
- Annual treatment acreage of cabbage palms to reduce competition with mature south Florida slash pine

Objective 2: Secure Florida Natural Areas Inventory (FNAI) survey and mapping update of all current natural communities within PSSF as needed.

Performance Measures:

- Utilize 2017 mapping work on management decisions
- Obtain new mapping of parcels as acquired/required
- Obtain new mapping from other agencies, as available

Objective 3: Continue to implement the FFS process for conducting stand descriptions and forest inventory including updating a GIS database containing forest stands, roads, and other attributes (including but not limited to: rare, threatened, and endangered species, archaeological resources, non-native invasive species locations, and historical areas).

Performance Measures:

- Complete 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 recreational opportunities to allow for a recreational carrying capacity of 700 visitors per day. (Ongoing Goal)

Performance Measure: Number of visitor opportunities per day

Objective 2: Develop additional public access and recreational opportunities to allow for a carrying capacity of 700 visitors per day for typical recreation.

Performance Measures:

- Number of additional visitor opportunities per day utilizing FY 2018/2019 visitation levels
- Number of interpretive display materials and programs

Objective 3: Assess additional public access and recreational opportunities. (Short-term Goal)
Performance Measures:
- Number of additional visitor opportunities
- Number of commercial vendor permits
- Number of private, special events

Objective 4: In order to continue to safely integrate human use into PSSF, follow the Five-Year Outdoor Recreation Plan and update annually. (Ongoing Goal)
Performance Measures:
- Continued implementation of the Five-Year Outdoor Recreation Plan
- Annual updates of the Five-Year Outdoor Recreation Plan complete

Objective 5: Maintain cooperation with the Florida Fish and Wildlife Conservation Commission to manage hunting (Ongoing Goal)
Performance Measures:
- Provide input and attend meetings for annual hunting management to FWC of the Picayune Strand WMA
- Assist FWC in managing access and recreational facilities for hunters

Objective 5: Continue to meet with the liaison committee. The committee consists of a mix of local residents, community leaders, and special interest group representatives (vendors, hunters, trail hikers, military, organized equestrian groups, etc.), environmental groups, and other public / private entities appointed through the state office in Tallahassee to establish communication, provide management updates, and seek constructive feedback regarding the management of PSSF. (Ongoing Goal)
Performance Measures:
- Liaison Committee remains organized
- Meetings continue twice per year

Objective 6: Develop additional community partnerships and outreach to strengthen land management and public use of PSSF. (Ongoing Goal)
Performance Measures:
- Grow Friends of Florida State Forests PSSF group
- Meet with key user groups at least twice a year to implement volunteer upkeep of forest resources and amenities
- Hold annual public awareness and education events in the forest
- Hold volunteer work days on the forest

GOAL 3: Habitat Restoration and Improvement

Objective 1: Improve the composition and structure of flatwoods by reducing hardwood and cabbage palm encroachment in pine stand mid-stories utilizing chemical, mechanical, and/or prescribed burning treatments, as appropriate. (Long Term Goal)

Performance Measure: Number of acres improved

- **Objective 2**: Enhance restoration of native groundcover and other plant stratum layers. Evaluate areas where native groundcover has been eliminated or heavily impacted from historical land use on a case by case basis to create right sized methods to address reestablishment of native groundcover plants. Restore native groundcover where it has been eliminated or heavily impacted from historical land use. (Ongoing Goal)

  Performance Measure: Number of acres treated and restored

  Objective 3: Continue to cooperate with the Picayune Strand Restoration Project. (Ongoing Goal)

  Performance Measures:
  - Obtain information on all activities that are occurring on the forest relating to the PSRP, including non-native invasive treatments, roads graded, and wildlife surveys
  - Complete MOU for turnover of PSRP lands to FFS
  - Attend conference calls and meetings

- **GOAL 4: Fire Management**

  Objective 1: Based on available natural community data, PSSF will contain approximately 23,984 acres of fire-dependent communities after all hydrologic restoration activities are completed. PSSF staff will conduct habitat / natural community improvement activities on the forest annually. In order to achieve an average fire return interval of three to five years across the forest, approximately 4,796 acres to 7,994 acres will be prescribed burned annually. Currently, FFS staff estimates 4,099 acres at PSSF are within the desired fire rotation. Hydrologic restoration activities may lead to acreage changes on upland areas. (Ongoing Goal)

  Performance Measures:
  - Number of acres burned during the dormant and growing seasons
  - 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.

  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)

- **GOAL 5: Listed and Rare Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration**

  Objective 1: In cooperation with the Florida Fish and Wildlife Conservation Commission, develop a Wildlife Management Strategy that addresses fish and wildlife species for PSSF, with emphasis on imperiled species and associated management prescriptions for their

habitats. (Long Term Goal)

Performance Measures:
- Imperiled species management strategy completed
- Update listed and rare species list for PSSF annually

Objective 2: In consultation with FWC, implement survey and monitoring protocols, where feasible, for listed and rare species.
Performance Measure: Number of species for which monitoring is ongoing.

- **GOAL 6: Non-Native Invasive Species Maintenance and Control**

Objective 1: Continue to follow and annually update the Five-Year Ecological Plan for PSSF, specifically to locate, identify, and control non-native invasive species. Continue to coordinate with other agencies working on PSSF to treat non-native invasive species. (Ongoing Goal)
Performance Measures:
- Total number of acres identified and successfully treated
- Annual updates of the Five-Year Ecological Plan completed

- **GOAL 7: Cultural and Historical Resources**

Objective 1: Ensure all known sites are recorded in the Department of State, Division of Historical Resources (DHR) Florida Master Site file. (Ongoing Goal)
Performance Measure:
- Spreadsheet with number of recorded sites and details
- Make new supervisors and personnel aware of sites, as appropriate

Objective 2: Monitor recorded sites and send updates to the DHR Florida Master Site File as needed.
Performance Measure: Number of sites monitored; reports submitted to DHR

Objective 3: Ensure that all district resource staff members are trained archaeological site monitors.
Performance Measure: Percentage of district resource staff trained within a year of employment

- **GOAL 8: Hydrological Preservation and Restoration**

Objective 1: Protect water resources through the implementation of Silviculture Best Management Practices (BMPs) that are applicable to PSSF during management activities including, but not limited to, forest road construction and maintenance, construction of pre-suppression firelines, recreation facility development, etc. (Ongoing Goal)
Performance Measure: Percent compliance with state lands BMPs

Objective 2: Close, rehabilitate, or restore those roads, firelines, and trails that have evidence of erosion into surrounding water bodies causing alterations to the hydrology and/or water quality.

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

Objective 3: Incorporate management of the Picayune Strand Restoration Project when sections of the project are turned over to FFS for management.
Performance Measure: Number of acres and miles of road managed after turnover

- **GOAL 9: Capital Facilities and Infrastructure**

Objective 1: PSSF staff, along with help from volunteers and/or user groups, will continue maintenance of parking areas and trailheads, campsites, gates, trails, and all primary, secondary, and tertiary roads. (Ongoing Goal)
Performance Measure: The number of existing facilities, miles of roads, gates, campsites, and miles of trails maintained

Objective 2: Continue to follow the Five-Year Roads and Bridges Management Plan and update annually. (Ongoing Goal)
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
- Examine road network for access/relocation needs on an annual basis

Objective 3: Continue to implement the Five-Year Boundary Survey and Maintenance Management Plan and update annually. The entire boundary will be remarked at minimum every five years including harrowing (where feasible), reposting signage, and repainting boundary trees. (Ongoing Goal)
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 the Picayune Strand State Forest (PSSF).

2. Legal Description and Acreage

The PSSF is comprised of 74,008 acres and is located in southwestern Florida, approximately seven miles east of the city of Naples. The forest is south of Interstate 75 (I-75), north of U.S. Highway 41 (US-41), and east of Collier Boulevard. See Exhibit B. PSSF is comprised of two tracts; the Belle Meade Tract, located three miles east of Collier Boulevard, and the Southern Golden Gate Estates Tract, located between the Belle Meade Tract to the west and Fakahatchee Strand Preserve State Park to the east. PSSF is located in Sections 1 through 36, Township 50 South, Range 28 East. Sections 1 through 23, 25, 27 through 33, and that part of Section 36 that lies north of

U. S. Highway 41, Township 51 South, Range 28 East. Section 4 and those parts of Sections 5, 6, and 9 that lie north of U. S. Highway 41, Township 52 South, Range 28 East. Sections 1, 12, 13, 24, 25, and 36 of Township 50 South, Range 27 East. Sections 1, 12, 13, and 24 of Township 51 South, Range 27 East.

Table 1. PSSF Acreage by Funding Source

	Funding Source	Acres*
CARL	Conservation and Recreation Lands	18,068.25
P2000	Preservation 2000	13,991.34
FF	Florida Forever	5,427.26

*Funding Source totals do not reconcile due to multiple programs used to purchase the same acreage within the PSSF.

A complete legal description of lands owned by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) is on record at the PSSF Forest 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 government for conservation of natural or cultural resources that are located within approximately 20 miles of PSSF are included in Exhibit F as well as the table below:

Table 2. Nearby Public Conservation Land and Easements

Tract	Agency	Distance
Florida Panther National Wildlife Refuge	USFWS	Adjacent NE
Fakahatchee Strand Preserve State Park	DEP	Adjacent E
Ten Thousand Islands National Wildlife Refuge	USFWS	Adjacent S
Collier-Seminole State Park	DEP	Adjacent SE
Rookery Bay National Estuarine Research Reserve	DEP, NOAA	3 miles SE
Golden Gate Community Park	CC	4 miles N
Big Cypress National Preserve	NPS	7 miles E
Sugden Regional Park	CC	7 miles W
Max A. Hasse Jr. Community Park	CC	8 miles N
Vineyards Community Park	CC	10 miles NW
Lowdermilk Beach	CC	10 miles W
Everglades National Park	NPS	11 miles SE
North Naples Regional Park	CC	12 miles NW
Clam Pass County Park	CC	14 miles NW
Corkscrew Swamp Sanctuary	NAS	15 miles NW
Corkscrew Regional Ecosystem Watershed	SFWMD	15 miles NW

Tract	Agency	Distance
Vanderbilt Beach	CC	16 miles NW
Delnor-Wiggins Pass State Park	DEP	18 miles NW
Barefoot Beach Preserve County Park	CC	19 miles NW

DEP – Florida Department of Environmental Protection
CC – Collier County
NAS – National Audubon Society
NOAA – National Oceanic and Atmospheric Administration
SFWMD – South Florida Water Management District
NPS – National Park Service
USFWS – United States Fish & Wildlife Service

4. Property Acquisition and Land Use Considerations

Land acquisition began in 1983 as part of the Save Our Everglades project under the Conservation and Recreation Lands (CARL) program. Acquisition continued in the following decades using funds from the Preservation 2000 and Florida Forever programs. Additional acquisition funds totaling approximately 38 million dollars were provided by the federal government (Department of the Interior, DOI). In addition to acquisitions, federal dollars were used to fund the relocation expenses of homeowners whose properties were acquired. Federal relocation funds provided compensation to each homeowner for the value of their home plus the difference between that value and those of comparable homes outside the project area, as well as reimbursement for moving expenses. Completed in 2006, acquisitions in SGGE totaled 19,993 parcels encompassing 55,371 acres. Parcels located to the south and east of the canal system (formerly Prairie Canal, east of Merritt Canal at roads numbered 126-134, and Faka-Union Canal to the south of 134 to US-41) are managed by the Florida Department of Environmental Protection (DEP) as part of FSPSP.

Table 3. Parcel Acquisition

Tract Name	Deed Date	Lease Date	Acres
Southern Golden Gate Estates (19,993 parcels)	12/28/1999	01/10/2001	54,960
Belle Meade (463 parcels)	09/18/2002	03/18/2002	18,675

B. Management Authority, Purpose and Constraints

1. Purpose for Acquisition/Management Prospectus

Management is conducted by the Florida Department of Agriculture and Consumer Services, FFS, with assistance from cooperating agencies. FFS is the manager of forest resources, non-hunting recreation, water resource protection, watershed protection, and land use planning on PSSF.

Revenue derived from timber and non-timber product sales is used to offset incurred expenses, capital improvements, and other personnel services (OPS).

Multiple-use management of PSSF will be accomplished through the integration of 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 natural communities to ensure the long-term viability of endangered, threatened, or rare plant and wildlife populations and species and other components of biological diversity including native plants and game and non-game wildlife;
- Protect known archaeological, historical, and cultural resources;
- Restore, maintain, and protect hydrological functions, related water resources, and the health of associated wetland and aquatic communities; and
- Provide research and educational opportunities related to natural resource management.

2. Degree of Title Interest Held by the Board

The Board of Trustees of the Internal Improvement Trust Fund (TIITF) holds fee simple title.

3. Designated Single or Multiple-Use Management

PSSF is managed under a multiple-use concept by the FFS, under the authority of Chapters 253 and 589, Florida Statutes. The FFS is the lead managing agency as stated in TIITF Management Lease Number 3927.

Multiple-use management is the harmonious and coordinated management of timber, recreation, wildlife, habitat, and other biological resources, archaeological and historic sites, and water resources that ensures that these resources are utilized in a manner that will best serve the people of the State. Multiple-use management enables the most judicious use of the land for some or all of these resources and considers their relative values. 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 provides the greatest public benefit by allowing compatible uses while protecting forest health, natural communities and the functions and values associated with them.

4. Revenue Producing Activities

Activities compatible with multiple-use management on PSSF that generate revenue to offset management costs will be pursued. Revenue generating activities will be considered if they are financially feasible and will not adversely impact forest management. Current and potential revenue generating activities include, but are not limited to:

- Timber Harvests – Timber harvests may be conducted on PSSF periodically to improve forest health and wildlife habitat, restore native plant communities, and provide other benefits.
- Non-timber Forest Product Harvests – Palm fronds are currently being harvested from designated areas of the forest. Cabbage palms have also been sold in the past.
- Recreation Fees – Fees are collected for day use activities and camping.
- Cattle Grazing - There are currently no cattle leases in PSSF, though areas have been offered in the past.
- Apiary Permitting - Numerous apiaries have been established in PSSF. Apiaries are managed by external vendors via annual permits.

- Horse riding - fees are collected for stall rental and commercial vendor permits are sold annually to stables operating in the northwestern corner of the forest.

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 589, 259 and 253, Florida Statutes.

6. Legislative or Executive Constraints

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

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

The PSSF lies within multiple Conservation Designation areas: a portion within Natural Resource Protection Area (NRPA), a portion within Big Cypress Area of Critical State Concern (ACSC), and a portion within Coastal High Hazard Area (CHHA). Only that portion of PSSF within the ACSC Overlay, as designated in the Collier County Growth Management Plan (GMP), is subject to ACSC regulations. All of Southern Golden Gate Estates is within the NRPA Overlay, as designated in the Collier County GMP, which provides that allowable land uses shall be those set forth in the Conservation Designation.

C. Capital Facilities and Infrastructure

1. Property Boundaries Establishment and Preservation

PSSF boundary lines, 110 miles in total, are managed by state forest personnel in accordance with the guidelines of the State Forest Handbook. There are 17 gates on PSSF that require periodic maintenance. The state forest boundary lines are to be maintained by periodic clearing, repainting and reposting, and placement of state forest boundary signs by FFS personnel.

2. Improvements

Major facilities on Picayune Strand State Forest include the Picayune Strand State Forest Headquarters and Equipment maintenance shop. Major recreational facilities include:

a. Horseshoe Campground with a Picnic Pavilion

Major infrastructure components include 2 concrete bridges on 52nd Avenue SE, 3 water pumping stations managed by the South Florida Water Management District for

flood risk management, and a tie back levee for supporting the water pumping stations. See Exhibit D for a map of the buildings and improvements at PSSF.

3. On-Site Housing

Housing is provided on-site for employees of the Florida Forest Service. Currently, there are 2 single family homes, 2 mobile homes, and 2 mobile home pad locations that can be leased.

FFS may establish additional on-site housing (mobile/manufactured homes) in PSSF if deemed necessary to alleviate security and management issues. Additional housing will be evaluated by the Center Manager and approved by the FFS Director. A ground-disturbing activity proposal will be submitted for approval per the process outlined in the FFS State Forest Handbook prior to conducting any ground-disturbing activity for the purpose of establishing on-site housing. 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 Center Manager and approved by the Director.

4. Operations Infrastructure

a. Operations Budget

For Fiscal Year 2018-2019, the total annual budget for PSSF is $527,000. This amount includes salaries, expenses, contractual services, and OPS. A summary budget for PSSF is contained in Exhibit W. Implementation of any of the activities within this management plan is contingent on available funding, other resources, and other statewide priorities.

b. Equipment

To carry out the mission of the FFS, PSSF maintains a diverse range of equipment such as a road grader, loader, swamp buggies, medium and heavy dozers, heavy equipment transports and trailers, all-terrain vehicles, farm tractors, pick-ups, and mowers. Additional equipment can be used from other work areas within Caloosahatchee Forestry Center, when needed, for management activities on PSSF.

c. Staffing

Forest staff consists of one forester, one senior forest ranger, six forest rangers, and two OPS park rangers. One forest area supervisor, two senior forest rangers, and four forest rangers assigned to nearby Collier Forestry Station provide project support.

Additional resource planning, administrative, and project support is provided by several personnel based out of the district's headquarters. One district biologist oversees the management of the ecological resources. One district recreation/forester and volunteer coordinator oversee the recreation and volunteer programs. A Forestry Resources Administrator oversees natural resources operations on the forest. Other district personnel also assist with forest management activities as needed.

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 if they are determined to be compatible with existing uses and with the management goals and objectives of the forest. Incompatible uses include but are not limited to: water resource development projects, water supply projects, storm-water management projects, sewage treatment facilities, linear facilities, unmanaged off-highway vehicle (OHV) use, communication towers and antennas, dumping, mining, and oil well stimulation (e.g. hydraulic fracturing/fracking), or as determined by law, regulation or as described elsewhere in the management plan.

2. Additional Land Needs

Lands within the optimal management boundary are recommended for future inclusion in PSSF and acquisition of these lands would facilitate restoration, protection, maintenance, and management of the resources on PSSF. See Exhibit C.

Numerous private inholdings are located within the Belle Meade Tract, which provides valuable habitat for numerous threatened and endangered plant and animal species. These inholdings present many challenges to restoration and management of the forest, primarily through the limitations they place on the ability of the FFS to conduct prescribed burns and manage non-native invasive species. Private landowners typically do not control non-native invasive plants on their properties. When not controlled, these plants serve as a seed source for infestation or re-infestation of adjacent state lands that lead to habitat degradation and can complicate prescribed burning. Additionally, increased human activity often associated with private inholdings can adversely affect threatened and endangered species, such as the Florida panther (*Puma concolor coryi*) and red-cockaded woodpecker (*Dryobates borealis*). Other challenges presented by private inholdings include altered hydrologic functioning caused by land use and/or modification and the presence of trash and/or hazardous materials by dumping or mismanagement.

Belle Meade is designated as a sending area for the transfer of development rights (TDR) program under the Collier County Comprehensive Plan.

3. Surplus Land Assessment

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

The evaluation of PSSF 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 PSSF is recommended for potential surplus.

4. Adjacent Conflicting Uses

During the development of this management plan, FFS staff identified and evaluated adjacent land uses, reviewed current comprehensive plans, and future land use maps. It was determined that commercial and agricultural development by existing inholdings does pose a conflicting adjacent land use without acceptable buffers. Additionally, FFS staff have met with adjacent land owners and maintain liaisons with those land owners to ensure that any conflicting future land uses may be readily identified and addressed.

Residential development of adjacent property and adjoining state roads may hinder prescribed burning due to smoke management concerns.

FFS will cooperate with adjacent property owners, prospective owners, and/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 Board of County Commissioners in Collier County for review and compliance with their local comprehensive plans. See Exhibit U.

6. Utility Corridors and Easements

The following are reservations or easements on PSSF:

a. DOT access easement bordering the forest to the north

b. An ingress-egress easement was granted to Mike and Lea McAuley on December 18, 2013

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

When such encroachments are unavoidable, previously disturbed sites will be preferred locations. 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), to minimize habitat fragmentation, to limit disruption of management activities, including prescribed burning, and to 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. Easements for such utilities are subject to the review and approval of the TIITF and the South Florida Water Management District (SFWMD). Requests for

linear facility uses will be handled per the Governor and the Cabinet's linear facilities policy.

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 numbered 3927. Pursuant to the management lease, the lead managing agency may enter into further agreements or to subleases on any part of the forest.

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.

FFS will cooperate with the DHR regarding appropriate management practices on historical or archaeological sites on the property as stated in Section 267.061, Florida Statutes. DHR will be notified prior to the initiation of any ground disturbing activities by the FFS or any other agency involved with the forest.

The SFWMD will be consulted and involved in matters relating to water resources as appropriate.

2. Law Enforcement

Primary law enforcement responsibilities will be handled by FWC law enforcement officers. Rules governing the use of PSSF are stated in Chapter 5I-4 of the Florida Administrative Code. FWC will enforce fish and wildlife regulations and provide assistance in enforcing state forest rules. One FWC officer is dedicated to patrol of and enforcement on the Picayune Strand State Forest. More FWC officers are available to assist as needed.

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

Special rules under Chapter 5I-4 of the Florida Administrative Code were promulgated for Department of Agriculture and Consumer Services, Florida Forest Service, to manage the use of state lands and better control traffic, camping, and other uses in PSSF.

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 (Florida Statute 590.01). The FFS also has the responsibility of authorizing prescribed burns (F.S. 590.02 (1i))

4. Public and Local Government Involvement

This plan has been prepared by FFS and will be carried out primarily by this agency. FFS responds to public interests and concerns through a liaison committee, management plan advisory groups, public hearings, and ongoing contact with user groups. Land Management Review Teams as coordinated by the Division of State Lands have conducted two reviews of management plan implementation in 2013 and 2018. See Exhibit T. The review teams' recommendations were addressed in this plan, as appropriate.

The plan was developed with input from the PSSF Management Plan Advisory Group and was reviewed at a public hearing on November 14, 2019. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in Exhibit V. 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 PSSF. Depending upon the type of volunteer service needed, volunteer activities may occur as one-time events or in support of long-term projects and routine maintenance. Additional volunteer recruitment will be encouraged to assist with other activities to further 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 is an organization established by Florida Statute that supports forest management and 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 Florida Forest Service to expand opportunities for recreation, environmental education, fire prevention, and forest management within Florida's state forests.

The Friends of Florida State Forests program is referenced in Chapter 589.012 of the Florida Statutes. For more information visit: www.floridastateforests.org.

III. Archaeological/Cultural Resources and Protection

A. Past Uses

In the 1940s and 1950s, much of the area of the PSSF was logged for cypress by the Lee Tidewater Cypress Company. Gulf American Corporation purchased the tract in the 1960s with an aim to construct houses and residential amenities, then known as the Golden Gate Estates (GGE). In total, 173 square miles (111,053 acres) were to be developed, and the project was to become the largest subdivision in America. Two extensive canal systems, Golden Gate and Faka-Union were constructed to drain the land during seasonal flooding, which in turn created a large pulse of freshwater releases into Naples Bay and Faka-Union Bay. The GGE subdivision eventually included 183 miles of drainage canals with 25 water control structures, and 813 miles of paved roads spaced at intervals of one-quarter mile. Much of the land was seasonally flooded wetland and unsuitable for development. Most of the buyers never saw their land on the ground. The corporation later merged with

General Acceptance Corporation (GAC) and by the early 1970s, the company was increasingly coming under fire for its selling practices and eventually went bankrupt.

Public use began soon after the subdivision was constructed. In the 1970s, riding swamp buggies, camping, target shooting, fishing, and hunting were popular activities. The homes and infrastructure constructed in the area were placed alongside thousands of acres of undeveloped property. Many homes utilized generators for their power.

Consequences for the natural systems soon appeared. The construction of the large canal systems, alteration of the hydrology, and increased illegal off-road vehicle use has had long term consequences. As early as 1971, the area experienced many large and highly intense wildfires, resulting in tremendous damage to the ecosystems through the loss of second growth cypress stands that were established following logging in the 40s and 50s. The increased drainage from the canals created a generally drier system which allowed for increased off-road vehicle use, and for non-native invasive plants to gain a foothold over much of the landscape. Damage to the overstory by wildfires allowed more frequent frosts into areas previously protected by canopy and standing fresh water. Fresh water was now more quickly transported into the downstream salt water estuaries during the height of the rainy season, leaving less freshwater on the landscape as the dry season began. Increased and largely unregulated recreation on (what is now) the forest, associated with illegal OHV use, illegal and un-managed hunting, illegal target practice, and trespass had increased to severe levels by the 1990s.

A plan started to develop to slow down and reverse the environmental damage that was occurring because of development in the area. In response to local environmental and other interests, a study was commissioned by the Collier County Board of Commissioners in 1975 to study the feasibility of restoring the area south of I-75, much of which is now PSSF. In September of 1977, the State of Florida submitted a request for federal funding for the environmental restoration of GGE. Authorization of a GGE Feasibility Study was initiated by the United States Army Corp of Engineers (USACE) in 1978 to consider various alternatives for GGE. A Reconnaissance Report subsequently concluded that there was a federal interest in conducting a second phase study of GGE. In 1985, the project area was identified as a component of Florida's Save our Everglades program. In 1986, the USACE released a GGE Feasibility Report. Analysis of six alternative plans resulted in a determination that the project did not qualify for federal implementation. The report did conclude that the plans that were evaluated, particularly Plan C (Flow way/Conservation Area), would be generally beneficial to improve environmental concerns. Plan C included establishment of a conservation area on the western portion of the Picayune Strand Restoration Project (PSRP), and restoration of a flow way on the eastern portion of the project, using canal plugs.

Acquisition of property that makes up the forest today occurred alongside the efforts to plan for restoration of the forest's ecosystems. In 1983, Southern Golden Gate Estates (SGGE) was added to the CARL acquisition list by the Land Acquisition Advisory Council, through establishment of the SGGE CARL project. Land acquisition began in 1985 by FDEP. The SGGE subdivision originally included 22,000 lots with more than

17,000 individual landowners scattered worldwide. The Belle Meade CARL project and the SGGE CARL project were combined to form PSSF. Between 1985 and 1997, FDEP had acquired only 31% of the 55,247 acres in SGGE. In 1990, DEP estimated that it would take staff 10 to 20 years to acquire the area of the PSRP project. The Conservancy of Southwest Florida initiated a cooperative effort with DEP in August 1991 to expedite the acquisition process under a grant from the Harder Foundation. Acquisition was moved along and in February 1992, as Governor Lawton Chiles issued a directive to the SFWMD to "develop a conceptual hydrologic restoration plan for SGGE, using the USACE Feasibility Report as a primary reference." By May of 1993, the first round of acquisition offers had been sent to all 17,000 landowners. In February 1996, the Big Cypress Basin of the SFWMD completed the "Hydrologic Restoration of SGGE-Conceptual Plan." Acquisition was accelerated beginning in early 1998 as a result of the settlement of a lawsuit with funds going to FDEP from the DOI pursuant to Section 390 of the Federal Agriculture Improvement and Reform Act of 1996 (also known as the "Farm Bill").

A plan was finally starting to take full shape for the PSRP. In March 1999, it was determined that the total project cost of $144 million would exceed the $50 million federal limit for critical projects since the project was 50/50 cost-shared. The USACE subsequently included the PSRP in the overall CERP to provide alternative authorization and funding authority. A Project Management Plan (PMP) was approved in March 2001.

Work on PSRP planning continued into 2001 and a Project Management Plan (PMP) was approved in March 2001 to move PSRP into construction. In October 2001, the Interagency Technical Advisory Committee reorganized to become the Project Delivery Team (PDT) for the PSRP. The USACE, SFWMD, and the PDT began development of a Project Implementation Report (PIR) in 2002. In November 2002, the USACE prioritized the PSRP to prepare it for inclusion in a potential Water Resources Development Act 2003. In February 2003, after preparation of a preliminary draft PIR, the USACE and SFWMD project management directed the PDT to develop additional alternatives to reduce project costs. An Alternatives Formulation Briefing (AFB) for the project was conducted on May 14, 2003. A Memorandum of Understanding between the State of Florida, SFWMD, and Collier County vacated county easements on approximately 279 miles of roadway within the restoration project in September 2003, providing for settlement of the last significant legal issue that would delay project implementation. Development of additional project alternatives narrowed the preferred alternative selection process to three alternatives in November 2003, when the project was once again prioritized for inclusion into Water Resources Development Act 2004. A CERP-PSRP Draft PIR/EIS was provided for public review in April 2004. A public hearing conducted for NEPA compliance was conducted on June 17, 2004. Work has been underway ever since to complete the CERP-PSRP project and the work has built 3 pump stations, plugged 2 canals, levelled hundreds of miles of roads and logging trams to allow for sheet flow. The project has been estimated for completion in 2024.

B. Archaeological and Historical Resources

A review of information contained in the Florida Department of State, Division of Historical Resources, Florida Master Site file has determined there are eighty-five

previously recorded archeological sites and four resource groups on PSSF.

Table 4. Archaeological and Historical Sites

Site ID	Site Name	Site Type
CR00184	Deer Leg	Land-terrestrial
CR00185	Lily	Land-terrestrial
CR01257	Lost in the Swamp Midden	Land-terrestrial
CR01258	Strangled Oak	Land-terrestrial
CR01259	Snakes Snakes Snakes	Land-terrestrial
CR01260	Knobbly Oak	Land-terrestrial
CR01261	Big Happy Oak	Land-terrestrial
CR01297	Switchback Midden	Land-terrestrial
CR01298	Salamander Midden	Subsurface features are present
CR01299	Crossroads Northwest	Subsurface features are present
CR01300	Stopallthedownloaden	Land-terrestrial
CR00712	Gator Hole East	Prehistoric burial(s)
CR00713	Gator Hole West	Campsite (prehistoric)
CR00720	Berm	Building remains
CR00721	Cheryl	Campsite (prehistoric)
CR00722	Dead Alligator	Campsite (prehistoric)
CR00723	Ought Abeea	Prehistoric burial(s)
CR00724	Horsefly Flat	Habitation (prehistoric)
CR00729	Lone Fallen Oak	Campsite (prehistoric)
CR00739	Mosquito Swamp	Prehistoric midden(s)
CR00740	1882 Hammock	Land-terrestrial
CR00742	Wildcat Run	Prehistoric midden(s)
CR00780	Kyle	Campsite (prehistoric)
CR00809	Twin Peaks	Prehistoric burial(s)
CR00824	CROSBY	Land-terrestrial
CR00825	Kirkland Hammock	Campsite (prehistoric)
CR00853	Exotic Orchid	Land-terrestrial
CR00854	Hardrock Hammock	Prehistoric midden(s)
CR00855	Last Day Hammock	Land-terrestrial
CR00856	North Townsend Camp	Land-terrestrial
CR00857	Old Saw Mill	Building remains
CR00858	Omar's	Prehistoric midden(s)
CR00867	Last Day Hammock West	Land-terrestrial
CR00868	Snake Skin Hammock	Prehistoric burial(s)
CR00869	Green School Bus	Prehistoric midden(s)
CR00882	Ghost Orchids	Campsite (prehistoric)
CR00887	Jungle Barry	Prehistoric midden(s)
CR00902	C-01	Habitation (prehistoric)
CR00903	C-02	Habitation (prehistoric)

Site ID	Site Name	Site Type
CR00904	I-01	Habitation (prehistoric)
CR00905	K-01	Habitation (prehistoric)
CR00907	No Name	Campsite (prehistoric)
CR00908	No Name	Land-terrestrial
CR00909	No Name	Land-terrestrial
CR00910	No Name	Campsite (prehistoric)
CR00911	No Name	Land-terrestrial
CR00912	No Name	Campsite (prehistoric)
CR00913	No Name	Campsite (prehistoric)
CR00914	No Name	Campsite (prehistoric)
CR00915	No Name	Campsite (prehistoric)
CR00916	No Name	Campsite (prehistoric)
CR00917	No Name	Campsite (prehistoric)
CR00918	No Name	Campsite (prehistoric)
CR00919	No Name	Specialized site for procurement of raw
CR00920	No Name	Campsite (prehistoric)
CR00921	No Name	Campsite (prehistoric)
CR00922	No Name	Campsite (prehistoric)
CR00923	No Name	Campsite (prehistoric)
CR00934	No Name	Campsite (prehistoric)
CR00935	No Name	Land-terrestrial
CR00936	No Name	Habitation (prehistoric)
CR00937	No Name	Land-terrestrial
CR00938	No Name	Campsite (prehistoric)
CR00939	No Name	Campsite (prehistoric)
CR00940	No Name	Land-terrestrial
CR00941	No Name	Land-terrestrial
CR00942	No Name	Land-terrestrial
CR00943	No Name	Land-terrestrial
CR00944	No Name	Land-terrestrial
CR00945	No Name	Land-terrestrial
CR00946	No Name	Land-terrestrial
CR00971	Picayune Canoe	Log Boat - Historic or Prehistoric
CR01159	Orange Tree Midden	Land-terrestrial
CR01160	50th Ave Midden	Land-terrestrial
CR01366	Rolling Rock	Land-terrestrial
CR01367	Snickers and Earplugs	Land-terrestrial
CR01389	Donut Midden	Land-terrestrial
CR01390	Sherdtown	Land-terrestrial
CR01391	Horsefly Flat East	Land-terrestrial

C. Ground Disturbing Activities

Representatives of DHR and Florida Natural Areas Inventory will be consulted prior to the initiation of any proposed significant ground disturbing activity. FFS will make every effort to protect known archaeological and historical resources. 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. 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 "List of ARC / Division of State Lands Approved Interim Management Activities". See Exhibit I.

D. Survey and Monitoring

Currently, three (3) local district FFS staff members are trained by DHR as archaeological site monitors. FFS will pursue opportunities for getting additional personnel trained. 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. FFS will consult with public lands archaeologists at DHR to determine any protection measures that may be required for sites with existing or potential threats.

Any known archaeological and historical sites will be identified on maps to aid state forest and law enforcement personnel in patrolling and protecting sites. Applicable surveys will be conducted by FFS staff or others during the process of planning and implementing multiple-use management activities. FFS personnel will remain alert for any environmentally significant resources 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

PSSF is in the heart of the Big Cypress Basin. The majority of this hydric forest is under water during the wet season. The forest is a mosaic of cypress strands, wet prairie, and pine flatwoods in the lowlands and subtropical hardwood hammocks in the uplands. The northern section of the Belle Meade Tract contains many second-growth south Florida slash pine, with some remnant trees being over 100 years old. Currently, there are no known soil or erosion problems present on PSSF given the flat nature of the forest. Management activities will be executed in a manner to minimize soil erosion. 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 PSSF's waterbodies and their associated water quality, discharge, and native plants and animals. All forest management activities relating to timber harvesting practices will comply with the BMP's for public lands. Copies of this publication are available upon request from FFS.

PSSF falls within the jurisdiction of the South Florida Water Management District. FFS will coordinate with SFWMD 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 SFWMD 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 PSSF was obtained from the United States Department of Agriculture, Natural Resources Conservation Service (NRCS). PSSF consists of 26 different soils. The predominant soils listed by the NRCS include: Hallandale fine sand; Boca fine sand; Boca, Riviera, limestone substratum; and Copeland fine sands. Detailed information on all soils present on the state forest may be found in Exhibit J.

2. Soil Protection

Currently, there are no soil erosion problems at PSSF. Management activities will be executed in a manner to minimize soil erosion. 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 Best Management Practices Manual.

B. Water Resources

The water resources on PSSF 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 wetland restoration into the overall resource management program as opportunities arise, particularly where wetland systems have been impaired or negatively impacted by previous management activities or natural disasters. See Exhibit L for map of the water resources at PSSF.

1. Resources

Water resources management will be coordinated with SFWMD. The USACE and SFWMD have developed a conceptual hydrologic restoration plan, as part of the Comprehensive Everglades Restoration Plan (CERP), to restore overall hydrology. This includes blocking the canals, removing sections of roadbed, and installing a system of spreader channels and pumps to control water north of I-75 and to distribute it onto the forest. Many aspects of the restoration project have been completed, including pump station construction, and additional work will be undertaken as project funding becomes available primarily through SFWMD and the USACE.

FFS will coordinate with SFWMD and the DEP, as necessary, on activities pertaining to water resource protection and management.

2. Water Classification

The Florida Department of Environmental Protection, Standards Development

Section reports much of the site has been designated as Outstanding Florida Waters (OFW) under subparagraph 62-302.400(9)(f)62., Florida Administrative Code (FAC). All of the surface waters on or adjacent to the site are classified as Class III waters, which is the statewide default classification. See Exhibit K.

3. Water Protection

Water resource protection measures, at a minimum, will be accomplished through the use of Best Management Practices (BMPs) as described in the most current version of Silviculture Best Management Practices Manual.

4. Swamps, Marshes, and Other Wetlands

Cypress strands, hydric hammocks, depression marshes, and wet flatwoods all occur on PSSF. Maintenance of naturally occurring wetland communities is a high priority and will be accomplished through prescribed fire when necessary. Maintenance will ensure proper planning and mitigation of activities that would threaten natural hydrology.

Consideration will be given to eliminating ditches if it can be accomplished without flooding necessary roads, structures, or adjacent landowners. Wetland restoration will be coordinated with SFWMD and DEP as necessary. Any activities requiring SFWMD or DEP permits will be handled accordingly.

Maintenance of these wetland communities is a high priority and will be accomplished through prescribed fire and a cautious avoidance of activities that would threaten the natural hydrology of these areas.

5. Wetlands 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 wetland 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, and with assistance from the FFS Forest Management Bureau, PSSF may pursue funding to develop and implement wetland 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.

Wetlands restoration will be coordinated with the SFWMD. Any activities requiring permits from the water management district will be handled accordingly

and will follow the latest edition of the FFS's Silviculture Best Management Practices Manual.

6. Florida Department of Environmental Protection Basin Management Action Plans (BMAP)

A Basin Management Action Plan 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 was developed as part of the Department's TMDL Program and represents the collaborative efforts of stakeholders to identify current and planned management actions to achieve pollutant load reductions required by the TMDL.

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.

Currently, the PSSF does not reside in an active BMAP.

Agriculture Nonpoint Sources

The primary agricultural land uses in a BMAP are improved pastures, unimproved pastures, citrus groves, and woodland pastures. Other agricultural land uses include field crops (e.g., sugar cane), dairies, croplands and pasture, row crops, tree nurseries, specialty farms, and ornamentals. Per Section 403.067, F.S., all agricultural nonpoint sources in the BMAP area are statutorily required either to implement appropriate BMPs or to conduct water quality monitoring that demonstrates compliance with state water quality standards.

C. Wildlife Resources

1. Threatened and Endangered Species

The intent of FFS is to manage PSSF in a fashion 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 will be used, as necessary, to protect or increase rare, threatened, and endangered species and species of special concern, as applicable for both plants and animals.

Table 5. Endangered or Threatened Species Documented on PSSF

Common Name	Scientific Name	State Status	Federal Status
Reptiles			
American alligator	*Alligator mississippiensis*	LT(S/A)	LT(S/A)
Eastern indigo snake	*Drymarchon corais couperi*	LT	LT
Gopher tortoise	*Gopherus polyphemus*	LT	---
Birds			
Roseate spoonbill	*Ajaia ajaja*	LT	---
White-crowned pigeon	*Patagioenas leucocephala*	LT	---
Little blue heron	*Egretta caerulea*	LT	---
Reddish egret	*Egretta rufescens*	LT	---
Tricolored heron	*Egretta tricolor*	LT	---
Southeastern American kestrel	*Falco sparverius paulus*	LT	---
Florida sandhill crane	*Antigone canadensis pratensis*	LT	---
Wood stork	*Mycteria americana*	LT	LT
Red-cockaded woodpecker	*Dryobates borealis*	LE	LE
Everglades snail kite	*Rostrhamus sociabilis plumbeus*	LE	LE
Crested caracara	*Caracara cheriway*	LT	LT
Mammals			
Florida panther	*Puma concolor coryi*	LE	LE
Big Cypress fox squirrel	*Sciurus niger avicennia*	LT	---
West Indian manatee	*Trichechus manatus*	LT	LT
Plants			
Bird's nest fern	*Asplenium serratum*	LE	---
Pine pink orchid	*Bletia purpurea*	LT	---
Many-flowered grass pink	*Calopogon multiflorus*	LE	---
Tailed strap fern	*Campyloneurum costatum*	LE	---
Yellow catopsis	*Catopsis berteroniana*	LE	---
Satin leaf	*Chrysophyllum oliviforme*	LT	---
Cowhorn (cigar) orchid	*Cyrtopodium punctatum*	LE	---
Clamshell orchid	*Prosthechea cochleata*	LE	---
Dingy-flowered epidendrum	*Epidendrum anceps*	LE	---
Night-scented epidendrum	*Epidendrum nocturnum*	LE	---
Rigid epidendrum	*Epidendrum rigidum*	LE	---
Rein orchid	*Habeneria distans*	LE	---
Delicate ionopsis	*Ionopsis utricularioides*	LE	---
Simpson's ironwood	*Myrcianthes fragrans*	LT	---
Sword fern	*Nephrolepis biserrata*	LT	---
Hand fern	*Ophioglossum palmatum*	LE	---
Cinnamon fern	*Osmunda cinnamomea*	CE	---
Royal fern	*Osmunda regalis*	CE	---
Ghost orchid	*Dendrophylax lindenii*	LE	---
Royal palm	*Roystonea regia*	LE	---
Southern ladies' tresses	*Spiranthes torta*	LE	---
Inflated (=reflexed) wild pine	*Tillandsia balbisiana*	LT	---

Common Name	Scientific Name	State Status	Federal Status
Common (=stiff-leaved) wild pine	*Tillandsia fasciculata*	LE	---
Twisted (=banded) air plant	*Tillandsia flexuosa*	LT	---
Fuzzy-wuzzy (=hoary) air plant	*Tillandsia pruinosa*	LE	---
Giant wild pine; giant air plant	*Tillandsia utriculata*	LE	---
Soft-leaved wild pine	*Tillandsia valenzuelana*	LT	---

STATUS/RANK KEY

Federal Status (USFWS): LE= Listed Endangered, LT= Listed Threatened, LT(S/A) = Listed Threatened due to similarity of appearance.

State Status (FWC- Animals, DPI- Plants): LE= Listed Endangered, LT=Listed Threatened, SC= Listed Species of Special Concern, CE = Commercially Exploited.

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. FNAI has reported the following:

a. Element Occurrences

The Florida Natural Inventories reports several documented Element Occurrences of rare or endangered species within the vicinity of the property. See Exhibit M. Documented species are listed in Table 5.

Documented habitat includes: Rockland Hammock and Wet Flatwoods.

b. Likely and Potential Habitat for Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near PSSF. See Exhibit M for more information.

c. Land Acquisition Projects

Portions of the site appear to be located within the Belle Meade and Save Our Everglades Florida Forever Projects. These are part of the State of Florida's Conservation and Recreation Lands Acquisition Program. See Exhibit G.

Other Florida Forever Projects within Collier County include: Corkscrew Regional Ecosystem Watershed, Devil's Garden, and Half Circle L Ranch; however, the additional Florida Forever projects in Collier County are not within the same Section, Township, and Range as Picayune Strand State Forest.

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 any expansions or alterations are made to any facilities.

3. Florida Fish and Wildlife Conservation Commission

The Florida Fish and Wildlife Conservation Commission, 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. The FWRI uses species-occurrence data, habitat data, and the analytical capabilities of Geographic Information Systems (GIS) to assess the security of rare and imperiled species on lands managed for conservation and to identify important habitat areas. These areas, known as Strategic Habitat Conservation

Areas (SHCA), depict areas needed for protection and serve as a foundation for conservation planning in Florida. See Exhibit N.

Other findings by the FWC include:

a. The property is located adjacent to and within multiple Strategic Habitat Conservation Areas.
b. PSSF is located within an area of moderate to high Species Richness which is the number of species within a given sample, community, or area.
c. Multiple Priority Wetlands are located on and near PSSF.
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 each area. Also, data on certain species, such as gopher tortoises, 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.

The FWC recommends the use of management guidelines in the published FWC Gopher Tortoise Species Management Plan to guide management actions for the gopher tortoise (*Gopherus polyphemus*) on the area. 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 this web address:
http://myfwc.com/wildlifehabitats/managed/gopher-tortoise/management-plan/

The FWC recommends the use of management guidelines in FWC's published Species Action Plans for the management of imperiled, rare, and focal 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 this web address:
http://myfwc.com/wildlifehabitats/imperiled/species-action-plans/

4. <u>Game Species and Other Wildlife</u>

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

PSSF provides habitat for a variety of wildlife species. Common species include: wild turkey (*Meleagris gallopavo*), red-shouldered hawk (*Buteo lineatus*), bald eagle (*Haliaeetus leucocephalus*), bobcat (*Lynx rufus*), Eastern cottontail (*Sylvilagus floridanus*), coyote (*Canis latrans*), white-tailed deer (*Odocoileus virginianus*), and northern bobwhite (*Colinus virginianus*).

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 management activities such as snag management and retention.

Wildlife are an important attractant for forest visitors and improve forest recreation visits when they can be seen.

5. Survey and Monitoring

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

a. Listed Animal Species

Surveys have been done by FFS and FWC staff intermittently, as needed. All surveys are done in cooperation with FWC.

b. Listed Plant Species

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

c. Other Rare Biota Surveys

Surveys are done as time and staffing allow. High quality plant communities continue to have ad hoc surveys for both invasive weeds and listed plants.

Most of the isolated PSSF wetlands have received a cursory biological survey, with rare and significant plant and animal species observed and documented.

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 twice 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 PSSF.

F. Mineral Resources

Small amounts of oil have been discovered in the nearby area and may be present on PSSF.

G. Unique Natural Features and Outstanding Native Landscapes

The strands of southwestern Florida have one of the highest concentrations of unique plant and animal species in the state, due to the subtropical climate and high humidity levels maintained within the cypress swamps. Within upland areas, there are subtropical hammocks which exhibit a high diversity of plants and animals.

H. Research Projects / Specimen Collection

Research projects may be performed 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 PSSF must be considered 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 PSSF 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:

- Exotic Ticks – Suzanne Edwards de Vargas, Research Technician, Florida Field Station, Southeastern Cooperative Wildlife Disease Study, College of Veterinary Medicine, University of Georgia, July 2011.
- Deer Breeding Chronology Collection Survey, FWC, April 2013.
- Wild Turkey harvest rate estimation, Tyler Pittman, FWC – Fish and Wildlife Research Institute, October 2017
- Florida Bonneted Bat population assessments, Elizabeth Braun de Torrez, FWC – Fish and Wildlife Research Institute, March 2018
- Brown-headed nuthatch, assessment of genetic and behavioral traits for reintroduction, Mary Mack Gray, University of Florida, June 2018

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. This includes areas such as known sensitive species locations; archaeological, fossil, and historical sites; ecotones, and wetlands.

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, SFWMD, the Acquisition and Restoration Council (ARC), as appropriate.

V. Public Access and Recreation

The primary recreation objective is to provide the public with outdoor recreation activities within the multiple-use context of the forest. FFS will continue to promote and encourage public access and recreational use by the public while protecting resources and practicing multiple-use management. Recreation activities available on PSSF include: hiking; horseback riding; biking; hunting; freshwater boating; birding; nature study; picnicking; geo-caching, and fishing.

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

A. Existing

A wide variety of recreational opportunities exist at PSSF. Hiking, horseback riding, biking, picnicking, birding, and nature study can be enjoyed using improved named roads and established trails. PSSF is part of the Florida Great Birding Trail, the FFS Trailwalker Program, and the FFS Trailtrotter Program. See Exhibit D for a map of the current Facilities and Improvements.

1. Public Access and Parking

Public access for PSSF is primarily through the main entrance along Everglades Blvd. and at the secondary entrance off Sabal Palm Road. Public roads are those designated by Florida Administrative Code Rule 5I-4. The forest has multiple parking areas with edge-of-road parking available along many public roads within the forest.

- South Golden Gate Tract – Two (2) parking areas. The first is located at the Horseshoe Campground just east of the field office. This parking area, located at 2121 52nd Ave. SE, also accesses 29 paddocks for horses and three temporary restrooms. The other parking area is located at 52nd Ave. SE and Everglades Blvd. near the entrance kiosk.
- Belle Meade Tract – Two (2) parking areas. One, located at the entrance to the Sabal Palm Trail, has space for up to 6 cars and a temporary restroom. The second, for Forest Use Permit holders associated with the stables off of Newmann Drive and Benfield Road, can fit 3 cars.

Additional recreational facilities include:

- Horseshoe Campground Picnic Pavilion – A large pavilion may be reserved through Reserve America© holding eight to ten picnic tables adjacent to the Horseshoe Equestrian Group Camp.
- Sabal Palm Pavilion – A 20' x 30' open air pavilion at the Sabal Palm Birding Trail Picnic Area. An ADA compliant ramp runs along the eastern side of the pavilion.

2. Recreational Trails

Currently, PSSF provides trail access for hiking, equestrian use, and biking:

- Belle Meade Horse Trail – 22 miles of trails broken into four color-coded equestrian trails in the Belle Meade area (blue, green, yellow, and purple). The trail loops between the field office and Newman Drive along the northwestern edge of the forest, and is designated as a part of the FFS Trailtrotter program;
- Sabal Palm Birding Trail – A double looping 3.2-mile hiking trail designated a part of the Florida Great Birding Trail and a part of the FFS Trailwalker program;
- Tieback Levee Multi-Use Trail – A 9.2 looping multiple-use (bicycle and hiking) trail along the elevated tie back levee in between three newly constructed pumping stations, a part of CERP and run by SFWMD. The trails run will be supported by multiple parking/picnicking areas and allow visitors to explore areas near canals, spreader berms, and three reservoir ponds that are increasingly frequented by multiple bird species, and;
- Tamiami Trail National Scenic Byway – a section of the byway is on the southern end of the forest on the edge of the road on Tamiami Trail from CR 92 in Collier County to the boundary with Fakahatchee Strand Preserve State Park. The trail continues east to the Forty Mile Bend in Broward County and is the first national scenic byway to be designated in the state of Florida. FFS is a member of the Corridor Management Team responsible for the management plan for the byway and will work to promote the byway.

Please note: The Blue Trail is also an open tertiary forest road that is subject to encounter vehicular traffic.

3. Camping

Currently, PSSF manages four primitive camping areas:

- Sabal Palm Birding Trail Recreation Area – Requires a Special Use Permit - open to primitive tent only camping at the picnic/recreation area (two stand grills and multiple picnic tables available).
- Kirkland Hammock – remote camp with two tent-only sites, one reserved through Reserve America©), a small pavilion with a fire ring and picnic tables, and a pump for non-potable cleaning water.
- Horseshoe Primitive Campground – Six designated campsites (six are available only through Reserve America©), each with a fire ring and a picnic table. Additional campsites are available at the campground with coordination through the Picayune Strand State Forest Field Office for walk-up campers.

- Horseshoe Primitive Group Camp – A group campsite for up to 18 persons. This site is available only through Reserve America© and has access to fire rings and picnic tables.

All camping areas are equipped with or have access to fire rings/grills and picnic tables and each is within access of a kiosk and a yellow "iron ranger" self-pay station.

4. Environmental Education

Self-guided tours are available with literature from the PSSF Field Office and maps/information at the kiosks. Two staff guided tours are held on an annual basis with additional tours during the drier winter months. An annual working forests event is also held each year in late winter at the Sabal Palm trailhead and picnic area.

5. Bird Watching

A birding checklist for PSSF, which is periodically updated and revised, provides guidance to novice and expert birders alike. This brochure is shared via field office, online download, and all forest kiosks.

6. Recreational User Education

Current education efforts focus on passive messaging through brochure and visitor signage available at the field office and multiple kiosks throughout the forest, as well as multiple-use trail courtesy. The Picayune Strand State Forest website also provides a short history of the property and other available resources.

B. Planned

FFS will continue to assess and plan for additional recreational opportunities based on demand, carrying capacity, demographics, restoration project results, and impact to the natural resources on the forest. All planned improvements may be completed as staff and funding permits. Recreation related facilities are planned out through incorporation into the Five-Year Outdoor Recreational Plan. Improvements and additions must consider ongoing maintenance.

1. Public Access and Parking

Additional signage for PSSF parking areas, facilities, and trails is currently in design and will be installed throughout the forest on an as-needed basis. Additional signage will include interpretive signage for self-guided tours, natural features that are of interest, and historical landmarks of the forest that recall the archeological features and events that took place in the area. FFS shall continue to investigate and implement public access and parking development as needed within PSSF.

Future additional facilities to include:

- Port of the Islands – Completion of a planned site improvement including utilities upgrades, parking, improved seating, picnic sites, wildlife viewing, and a short hiking trail.

- Faka-Union Boat Ramp – A multi-launch, notched concrete boat ramp and parking/picnic area along Naomi Road near 52nd Avenue SE.
- Parking Area Additions – Creation of additional parking areas, including a southern parking area/support site at the intersection of Everglades Boulevard and Stewart Boulevard. Parking area plans may include restroom facilities and interpretive kiosks.
- User Specific Additions – FFS will periodically review the potential for user-specific recreation facilities such as an archery range, shooting range, or a remote-control plane field.
- Work with SFWMD and Fakahatchee Strand State Preserve to provide additional access to the northeastern part of the forest.

2. Recreational Trails

Proposed Trail developments include:

- Tomato Road Hiking Trail – Develop a minimum 2.5-mile interpretive trail in the southwestern edge of the forest. This planned trail may include portions of the proposed Southwestern Protection feature of the Picayune Strand Restoration Project.
- Outback hiking trail – Develop a new trail along the cypress tram, old road beds, and old firelines with a long-term goal of partnering with Collier Seminole State Park (CSSP), Fakahatchee Strand Preserve State Park (FSPSP), and the Florida Trails Association (FTA). FFS will use the tram, old road beds, and firelines to connect with the three state management areas to form at least a single 20-mile multi-use trail for all weather use.
- Bike Trails – Develop a minimum of 30 miles at-grade bike trails throughout the forest. Parking areas will be co-located with the Tie Back Levy Trail, the Everglades Blvd. and Stewart Blvd. support site, and existing parking areas. Create additional day use and parking areas to support the bike trails. See Exhibit Y.
- Water trails – As the ERP project continues, the restored hydrology may increase water-based recreational opportunities in the form of canoeing, kayaking, etc. FFS staff will periodically review and assess these changes for feasibility in developing additional forms of water-based recreation, such as a water trail that follows the historical tram and road footprints, new wildlife viewing areas, and new camping options.
- Horse Trails – Assess the need to relocate and/or add an additional trailhead to the Belle Meade Tract to provide better access to equestrian trails and to reduce potential conflicts. Rutting and damage to the trails occurs frequently on all of the horse trails as vehicles traverse the roads, particularly during the rainy season. Additional gates will be installed on the horse trails to help minimize damage by vehicles and to help promote the safety of horseback riders. Create additional day use picnic and horse stall areas along the trail.
- Sabal Palm Hiking Trail – Extend the length of Sabal Palm Hiking Trail from the current 3.2 miles to 8 miles. Include nearby areas to make better use of the parking at Sabal Palm Trailhead and offer a more extensive hiking feature. Create more day use picnic and parking areas.

The construction, maintenance, and improvement of recreational trails remains an ongoing process and FFS will periodically review the potential for additional trail expansion as user impacts and dynamics require.

3. Camping

Future camping improvements include:

- 48th Ave. SE - The addition of an RV camping area with up to 50 RV or camping sites, each with a picnic table and fire ring. The facility would offer electric hook-ups, on-site water, and a dump station. This improvement, currently under examination for feasibility.
- Possible Dry Season Camping – At both Miller Blvd.'s southern terminus and Stewart Blvd. at Janes Scenic Drive, the potential exists to install a remote campsite at each location for primitive camping.
- Camping Additions – Creation of 3 additional camping sites and/or campgrounds. The first would be located in the Broken Wing area of the northeast corner of PSSF. The second would be located in the eastern Belle Meade area in the Lee Williams/Miller Blvd. area. The third will be located south of the Faka-Union pump station spreader berm on 2 former Quonset hut concrete pads as a potential dry season group camping/event site. See Exhibit Y.

Continuing maintenance and improvement of camping areas and opportunities in PSSF will enable FFS to evaluate and consider adding additional camping amenities and areas as demand increases.

4. Environmental Education

PSSF and district staff will further develop an environmental education program to include additional guided tours and events, and additional, more long distance self-guided explorations. Development of these programs will attempt to coordinate educational programs with the expertise of local chapters of trail, historical, and other conservation associations.

5. Bird Watching

A birding checklist for PSSF developed in the past ten years will continue to be updated and re-released as needed. The updates based upon the annual Christmas bird count conducted in cooperation with the Collier County Audubon Society and periodic checks performed by the FFS district biologist, other FFS staff, and volunteers.

6. Recreation User Education

The need for education concerning refuse and debris (Leave No Trace) remains among users. FFS will continue to evaluate the best methods for communicating concerns and solutions to the different recreational user groups in the forest. There is also the need to help user groups understand the recreation needs of other user groups to give all visitors to the forest as peaceful a visit as possible. The PSSF website will become the future forum for keeping user groups informed. The main tool for education will be maintenance of effective kiosks at entrances and recreational facility entrances.

7. Off-highway vehicle use in the forest

Off-highway vehicle use on trails and named/numbered roads is currently allowed for verified mobility limitations through the issuance of a special use permit in coordination with FWC. Given likely higher water levels and longer periods of inundation in PSSF due to the CERP, and the continued interest in the use of off highway vehicles such as UTV's and swamp buggies, FFS is examining the feasibility of allowing OHV on named/numbered roads per the PSSF state forest map in limited cases. The FFS will determine the allowed uses of OHV's for hunting and will continue to work with FWC to manage any OHV's for hunting. Areas to consider include tire or track types, water depth design, gross vehicle weight, vehicle height and width, training for use in PSSF, and necessary vehicle cleaning protocols before accessing the forest. OHVs will not be allowed to travel across vegetation outside of existing roads.

Off-highway vehicle use on trails and named/numbered roads is currently allowed for verified mobility limitations through the issuance of a special use permit in coordination with FWC. Given likely higher water levels and longer periods of inundation in PSSF due to the CERP, and the continued interest in the use of off highway vehicles such as UTV's and swamp buggies, FFS is currently utilizing a part of the forest for quota permit holders due to loss of access on roads for hunting in the Golden Gate Tract where the Picayune Strand Restoration Project has reduced existing road footprint and accessibility. This action was done through the rule making process of the Picayune Strand Wildlife Management Area. The Fall 2019 Hunting Season saw this action go into action. The FFS will determine the allowed uses of OHV's for hunting and will continue to work with FWC to manage any OHV's for hunting. Factors to consider include tire or track types, water depth design, gross vehicle weight, vehicle height and width, training for use in PSSF, and necessary vehicle cleaning protocols before accessing the forest. OHVs will not be allowed to travel across vegetation outside of existing roads.

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

C. Hunter Access

Hunting season dates, limits, and methods are established annually by FWC, in cooperation with FFS. The forest is open to the public year-round. Hunters and fishermen are subject to site-specific fish and wildlife laws as well as those that apply on private lands. Hunts are managed by FWC, consistent with the "Picayune Strand State Forest and Wildlife Management Area Regulations Summary and Area Map," modified annually. A review process is in place for consultation with the Florida Forest Service prior to any rule or season changes. There are a series of short, primitive weapon (archery and muzzle-loading) and general gun hunts based on a permit and quota system. The FFS provides land management and general supervision and coordinates with FWC regarding habitat management of wildlife and fish populations (e.g. setting hunting seasons and establishing bag and season limits) and overall wildlife and fish law enforcement. The FWC regulates hunting activities to restrict illegal hunting and game harassment. Hunter education stations are used to relay information to the hunting community, and the reinstatement of

check stations remains a priority for wildlife management. The WMA brochure is on file at the PSSF field office or can be found through FWC's website.

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

D. Education, Volunteering, and Partnerships

FFS will seek partnerships with local K-12 schools, community groups, and/or universities for the development and implementation of educational opportunities on PSSF. Once developed, the Five-Year Outdoor Recreation Plan will designate management activities related to future educational and volunteer opportunities that will take place. Additionally, FFS intends to strengthen educational programs for visitors, which will highlight the historical and archeological features, natural resource management, and hydrology that makes PSSF unique.

FFS will seek to strengthen the current Friends of Florida State Forests (FFSF) Group associated with Picayune Strand State Forest. The Friends group enables supporters and stakeholders, through volunteer and donation efforts, to support continuing activities and important projects in the forest. The policy and procedures of the FFSF will be followed as the group conducts business.

All work and projects will be completed as funding and resources are available on PSSF.

VI. Forest Management Practices

A. Prescribed Fire

Forest management practices on Picayune Strand State Forest are important in the restoration and maintenance of forest ecosystems and provide a variety of socio-economic benefits to Floridians. Management practices on PSSF include a prescribed fire program which is an effective tool in controlling the growth of hardwood trees and shrubs, 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 Caloosahatchee Forestry Center 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 graph detailing the recent history of prescribed burns and wildfires at PSSF is available in Exhibit O.

FFS has one (1) fire tower, six (6) medium tractor-plow units, one (1) heavy dozer, two (2) Type VI brush trucks, and two (2) swamp buggies located in Collier County. Additional support is available from Lee and Hendry Counties. Personnel and equipment stationed at PSSF will be used for pre-suppression practices, establishment of firebreaks, rehabilitation

of existing firelines, construction of new firelines (where absolutely necessary), maintenance of perimeter firebreaks, and prescribed burning.

The annual forest prescribed burning program produces multiple benefits. The purposes of prescribed burning on PSSF are to facilitate forest management operations; enhance wildlife and listed species habitat; decrease fuel loading; enhance public safety; and restore, maintain, and protect all native ecosystems, ecotones, and their ecological processes. FFS personnel are responsible for planning and implementing the annual prescribed burn program for PSSF. An update to the Five-Year Prescribed Burning Management Plan is developed each year by FFS staff. All burns conducted on PSSF are executed by Florida Certified Prescribed Burn Managers in accordance with F.S.-590.125 and F.A.C. 5I-2.

According to FNAI, historic, fire dependent natural communities on PSSF are estimated to have occupied approximately 23,984 acres and to have burned at approximately 3 to 10-year intervals. Current fire dependent communities encompass 29,726 acres. Some historically non-fire dependent communities, such as Strand Swamp Forest, now exist as fire-dependent habitats due to altered hydrologic conditions. Concurrently, 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, PSSF will plan for 5,945 to 9,909 acres to be prescribed burned annually. 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 4,099 acres of PSSF are within the desired fire return interval.

1. Fire Management

FFS will continue to update a fire management plan that will serve as a working tool and an informational document for PSSF. The plan will provide guidelines regarding wildfire suppression and prescribed fire management. It will specify burn units, burn unit prescriptions, appropriate fire return intervals, and fire 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 PSSF 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 (2018) to identify areas that may require mechanical 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 (Rule Chapter 5I-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.

Consideration should be given to rotating burn units so that fire intensity and return intervals 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.

Aerial ignition may be considered for large burn units where this tactic can be cost effective for higher burn acreages.

B. Wildfires, Prevention, Fire / Prescribed Fire 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 Caloosahatchee Forestry Center. 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 these are listed in priority order:

1) Protection of human lives, both that of the firefighter and the public
2) Protection of improvements
3) Protection of natural resources

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

1. Suppression Strategies

If a wildfire occurs on PSSF there are two 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 fire's 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 condition 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 absolutely 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 PSSF 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 Best Management Practices (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 bulldozed 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. Plow and bulldozed lines will be rehabilitated and BMPs implemented as soon as practical after the fire is suppressed.

4. Sensitive Areas

PSSF has on file in the state forest headquarters an Environmentally Sensitive Area Map that identifies protected sites such as critical wetlands, remediated areas, 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 PSSF. 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 PSSF, efforts in this regard will continue

to identify communities at risk and to make contact with their representatives.

6. Adjacent Neighbor Contacts

The staff at PSSF maintains a list of neighbors that have requested they be notified in advance of prescribed burns. These individuals, communities, or groups 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, decisions will be made on timber salvage operations. A historical fire record for all fires and prescribed burns will be maintained. This will be accomplished using the burn plans in the Forester's files and through 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 PSSF:

- **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 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 PSSF will be directed toward improving forest health, wildlife habitat, ecological and economical sustainability, as well as toward recovery from past management practices that are not in accordance with the objectives of this plan. Stands of off-site species, when identified, 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 Best Management Practices (BMPs) and the State Forest Handbook, and will follow the Five-Year Silviculture Management 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 of PSSF 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 south Florida slash pine, cypress, cabbage palms, and mixed hardwoods. Mature stands of non-native invasive plants are available, but these stands are not managed to obtain a product as treatments continue to eradicate their presence from the forest.

4. Timber Sales

Timber sales are generally 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 and in accordance with Forestry Policy and Procedures.

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.

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 PSSF 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 in an effort 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*) have been present on some tracts of PSSF in the past but are not known to occur in any substantial numbers at this time. FWC has issued a feral hog control permit

to FFS for all state forests and FFS will allow for hog removal on PSSF through trapping and hunting if necessary.

Since 2017, FFS has worked with FWC to create a Memorandum of Agreement (MOA) between FFS, FWC, and DEP that will allow for additional management for non-native invasive animals, with a focus on reptiles. The MOA will expand the access area and duration for FWC contractors to conduct non-native invasive animal removal, which includes pythons, on state lands managed by each agency. Given the harm that non-native invasive animals can do to other animal populations, the MOA will assist in the management of PSSF. FFS has participated in several python round-ups with the Southwest Florida Cooperative Invasive Species Management Area and FWC and works to encourage accurate identification of native and non-native invasive animals through posters and education efforts with FWC. Additional cooperative efforts for the control of non-native invasive animals will continue as opportunities appear and fit in with the management efforts of PSSF.

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

Scientific Name	Common Name	Treatment Method	Acres Treated	Population Trend -Increasing -Decreasing -Stable
Abrus precatorius	Rosary pea	Spot	13	Increasing
Acacia auriculiformis	Earleaf acacia	Spot	317	Increasing
Albizia lebbeck	Woman's tongue			
Bauhinia variegate	Orchid tree			
Bischofia javanica	Bischofia			
Casuarina equisetifolia	Australian pine	Spot	6	
Colubrina asiatica	Latherleaf			
Cupaniopsis anacardioides	Carrotwood			
Dactyloctenium aegyptium	Durban crowfootgrass			
Dalbergia sissoo	Indian rosewood			
Dioscorea alata	Winged yam			
Dioscorea bulbifera	Air potato	Spot	11	
Eichhornia crassipes	Water hyacinth			
Ficus microcarpa	Laurel fig	Spot	47	
Hydrilla verticillate	Hydrilla			
Hymenachne amplexicaulis	West Indian marsh grass			
Hyparrhenia rufa	Jaragua			
Imperata cylindrica	Cogon grass	Spot	797	Stable
Lantana strigocamara	Lantana			
Leucaena leucocephala	Lead tree	Spot	65	

Scientific Name	Common Name	Treatment Method	Acres Treated	Population Trend -Increasing -Decreasing -Stable
Ludwigia peruviana	Peruvian primrosewillow			
Lygodium microphyllum	Old world climbing fern	Spot	58	Decreasing
Lygodium japonicum	Japanese climbing fern	Spot	161	
Manilkara zapota	Sapodilla			
Melaleuca quinquenervia	Melaleuca	Spot, Aerial, Biocontrol	8,698	Decreasing
Melinis repens	Natal grass			
Nephrolepis brownie	Asian sword fern			
Nephrolepis cordifolia	Sword fern			
Neyraudia reynaudiana	Burma reed			
Panicum repens	Torpedo grass			
Pennisetum polystachion	West Indian pennisetum			
Pennisetum purpureum	Napier grass			
Phyllostachys aurea	Golden bamboo	Spot	10	
Pistia stratiotes	Water-lettuce			
Psidium guajava	Guava	Spot	47	
Rhodomyrtus tomentosa	Downy rose-myrtle	Spot	324	Stable
Ricinus communis	Castor bean			
Schinus terebinthifolia	Brazilian pepper	Spot	6,013	Decreasing
Sesbania punicea	Purple sesban			
Sphagneticola trilobata	Wedelia	Spot	2	
Spermacoce verticillate	Shrubby false buttonweed			
Syzygium cumini	Java plum	Spot	132	
Terminalia catappa	Tropical almond			
Tradescantia spathacea	Oyster plant			
Triadica sebifera	Chinese tallowtree	Spot	45	
Urena lobate	Caesar's weed	Spot	1,234	Decreasing
Urochloa maxima	Guinea grass			
Urochloa mutica	Para grass			
Syzygium jambos	Rose-apple*			

Points included in prior observations, but identification is questionable; likely *S. cumini*

E. Insects, Disease and Forest Health

In the event of an outbreak of any disease or insects, consultation with the Forest Management Bureau's Forest Health Section will be sought to formulate an appropriate and effective response.

In compliance with Section 388.4111, Florida Statutes 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 Collier County will be notified of the approval of this plan documenting this designation. See Exhibit X.

As a result, prior to conducting any arthropod control activities on PSSF, 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 PSSF. This public land 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.

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. Reforestation activities
4. Timber harvesting
5. Biological assessments and mapping

VII. Proposed Management Activities for Natural Communities

In 2018, FNAI completed an inventory and natural community mapping project on PSSF and a historic natural community type map was created. See Exhibit R. Current natural communities and cover types can be found in Exhibit Q.

Table 7. Natural Community Types

Natural Community Type	Historic Acres*	Current Acres*	Acres in Restoration*
Basin Marsh	449	386	320
Dome Swamp	1,564	1,455	939
Hydric Hammock	1,157	959	934
Mangrove Swamp	33	31	31
Marl Prairie	3,082	2,734	2,734
Mesic Flatwoods	3,881	3,328	1,274
Mesic Hammock	1,803	1,491	1,448
Salt Marsh	855	831	831
Strand Swamp	43,458	33,946	26,675
Swamp Lake	8	8	7
Wet Flatwoods	16,394	17,972	8,988
Wet Prairie	310	291	158
TOTAL	72,994	63,432	44,339

* Note rounding errors exist

Table 8. Altered Landcover Types

Altered Landcover Type*	Current Acres Mapped
Abandoned field	1,315
Artificial pond	322
Canal/ditch	1,012
Clearing	5,950
Developed	183
Road	600
Spoil	179
Utility corridor	2
TOTAL	9,563

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

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 operational plan for prescribed burning and other operational plans 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 (Table 9), may vary depending upon specific conditions, and are intended to attain desired forest and resource management goals.

Table 9. Prescribed Fire Interval Guide

Habitat Type	Historic Fire Return Intervals*	PSSF Fire Frequency Goal (Local)	Comments
Basin Marsh	n/a	n/a	Will burn with surrounding fire dependent communities.
Dome Swamp	3-5	3-5	Ecotones burned in frequency of adjacent community type. Center of swamp may not burn for 100-150 years.
Hydric Hammock	n/a	3-10	Edges will be burned with surrounding fire dependent community types.
Mangrove Swamp	n/a	n/a	
Marl prairie	2-10	2-3	
Mesic flatwood	2-4	2-4	
Mesic hammock	n/a	n/a	Edges will be burned with surrounding fire dependent community types.
Salt marsh	n/a	n/a	
Strand Swamp	n/a	3-10	Edges will be burned with surrounding fire dependent community types.

Habitat Type	Historic Fire Return Intervals*	PSSF Fire Frequency Goal (Local)	Comments
Swamp Lake	n/a	n/a	Not a community type that burns.
Wet flatwoods	3-10	2-4	
Wet prairie	2-3	1-4	Emphasis is on keeping tree cover out.

* As determined by FNAI

The following community descriptions, existing condition descriptions, and management recommendations are taken from a 2018 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 PSSF.

To achieve the objectives outlined in this plan, the following management activities will be performed in the natural communities at PSSF 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 – 386 acres

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 sawgrass (*Cladium jamaicense*), and maidencane (*Panicum hemitomon*), dominate the vegetative cover, with a diversity of other graminoids and herbs such as primrose willows (*Ludwigia* spp.), dotted smartweed (*Persicaria punctata*), bulltongue arrowhead (*Sagittaria lancifolia*), giant bristlegrass (*Setaria magna*), toothed midsorus fern (*Telmatoblechnum serrulatum*), alligator flag (*Thalia geniculata*), and giant cutgrass (*Zizaniopsis miliacea*). The marsh may also be dominated by or contain large patches of coastalplain willow (*Salix caroliniana*). Other trees and shrubs usually only occupy higher areas in the marsh or around the edge. These can include typical swamp species such as pond and/or bald cypress (*Taxodium ascendens* and/or *disctichum*), red maple (*Acer rubrum*), pond apple (*Annona glabra*), common buttonbush (*Cephalanthus occidentalis*), and cabbage palm (*Sabal palmetto*).

Basin marshes are considered extremely important in providing breeding and foraging habitat for a variety of herpetofauna and wading birds. Characteristic animals include wood stork, marsh rabbit, round-tailed muskrat (*Neofiber alleni*), river otter, American alligators, a variety of fishes, mud turtles (*Kinosternon* spp.), Florida chicken turtle, pig frog (*Rana grylio*), cottonmouth, mud snake (*Farancia abacura*), birds such as the common moorhen (*Gallinula chloropus*), great blue heron (*Ardea herodias*), great egret, wood stork, anhinga (*Anhinga anhinga*) and white ibis (*Eudocimus albus*). Amphibians such as the central newt (*Notophthalmus viridescens louisianensis*), two-toed amphiuma,

Everglades dwarf siren (*Pseudobranchus striatus belli*), Florida cricket frog, green treefrog, squirrel treefrog, oak toad, and southern toad use these wetlands for breeding.

The restoration of hydrology and closing of drainage canals will likely predict the long-term future of each basin marsh site.

EXISTING CONDITION

Basin marshes at Picayune Strand State Forest are found in deep depressions within strand swamp and dome swamp communities, mainly on the SGGE tract. The surrounding cypress trees are generally much larger due to the thicker layer of peat in the depression. Basin marshes appear on the 1963 aerial photographs as darker, rounded, or elongate areas embedded in swamps.

There are several scattered basin marshes at Picayune Strand State Forest, mostly isolated in large swamps. The surrounding strand swamp has been disturbed by past logging, drainage, and wildfires. As a result, the basin marsh communities are generally very dry and usually contain large amounts of non-native invasive plant species, particularly West Indian marsh grass (*Hymenachne amplexicaulis*) and para grass (*Urochloa mutica*). However, since these marshes occupy some of the lowest elevations in the swamp, they may function as a refugium for larger cypress trees, the wetter conditions protecting the trees from wildfires. Basin marshes that are within the PSRP are experiencing a return to a more normal hydroperiod, which is facilitating the treatment of non-native invasive plants.

Fire intervals in basin marshes are highly variable, with natural fires more possible at the end of the dry season. Dense sawgrass and maidencane marshes will burn even when there is standing water. Frequency of fire varies depending on the hydrology of the marsh and its exposure to fire from surrounding areas.

MANAGEMENT RECOMMENDATIONS

Natural fires are presumed to have rarely burned across the deep marshes on the property; they likely extinguished just within shallow peripheral areas or the adjacent deep swamps. The main issue with many of the basin marshes in PSSF is that they have been hydrologically altered and have burned in drier conditions. Work will continue to restore historic hydrological regimes, and to apply fire to nearby uplands (where appropriate) and to allow these fires to move into basin marsh area. Frequent fires will help to remove encroaching woody vegetation and reduce the buildup of organic soils. The removal of non-native invasive grasses in these marshes may encourage native species recovery and treatment of non-native plants will continue to target FLEPPC Category 1 and 2 species.

B. Dome Swamp – 1,455 acres (940 acres typical, 515 acres cabbage palm-dominated)

Dome swamps are isolated, shallow, forested wetland basins that are imbedded in a pyrogenic matrix community such as pine flatwoods, but also occur in mesic hammocks. 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. At Picayune Strand

State Forest, dome swamps are distinguished from strand swamps principally by their often more circular shape, smaller size, and landscape position within flatwoods communities.

The mature canopy is dominated by pond cypress (*Taxodium ascendens*) and may also have a mixture of hydrophytic species such as red maple (*Acer rubrum*) and swamp laurel oak (*Quercus laurifolia*). The midstory is of scattered shrubs and small trees including southern bayberry (*Morella cerifera*), swamp bay (*Persea palustris*), and cabbage palm (*Sabal palmetto*). The herbaceous layer is variable in cover, often dominated by sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), or toothed midsorus fern (*Telmatoblechnum serrulatum*). Some dome swamps have a deeper basin marsh community at the center with a longer hydroperiod. Typically, shrubs such as common buttonbush (*Cephalanthus occidentalis*) and broadleaf emergent herbs such as alligatorflag (*Thalia geniculata*) may become more abundant in these marshy centers. Epiphytes may be common, particularly airplants (*Tillandsia* spp.).

Characteristic wildlife of dome swamps includes river otters, American alligators, a variety of fishes and aquatic turtles (e.g. *Kinosternon* spp.), various tree frogs (*Hyla spp.*), cottonmouth, and numerous songbird species. Additionally, wading birds such as the great egret, wood stork, and white ibis (*Eudocimus albus*) may use dome swamps for roosting and/or nesting.

Dome swamps are widely distributed at Picayune Strand State Forest embedded in flatwoods, hammocks, and prairies. These swamps usually appear on the 1963 aerial photographs as a slightly lighter, textured signature, although they can be difficult to distinguish from non-forested or sparsely canopied prairies due to the faint color of the cypress.

EXISTING CONDITION

Dome swamps at Picayune Strand State Forest have been greatly impacted by hydrology alteration, mainly on the SGGE tract, and the resulting increase in wildfire frequency and severity. Many swamps have lost most to all of their original cypress canopy and are now stands of mostly cabbage palm. Some domes on Belle Meade are severely infested with melaleuca (*Melaleuca quinquenervia*), and marshes within some domes are dominated by West Indian marsh grass (*Hymenachne amplexicaulis*).

Fair and good quality dome swamps retain a canopy of pond cypress and have a groundcover dominated by native ferns and herbs. Epiphytes such as Balbis' airplant (*Tillandsia balbisiana*), common wild-pine (*Tillandsia fasciculata*), and spreading air-plant (*Tillandsia utriculata*) are common.

Fire is essential for the maintenance of dome swamps, limiting hardwood encroachment 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 3 to 5 years. The interior of large dome swamps may burn less frequently as a result of standing water or soil saturation.

MANAGEMENT RECOMMENDATIONS

Prescribed fires from neighboring flatwoods should be allowed to burn into dome swamps and extinguish naturally at the ecotone or burn through the swamp, as conditions permit. Fires maintain diverse ecotones and interior herbaceous cover. Unnecessary fire breaks in or around dome swamps should be rehabilitated, if possible, so that fires can carry across them and sheet flow is interrupted as little as possible. Over time, ongoing hydrology restoration on the SGGE tract may help to ameliorate vegetation shifts in dome swamps.

Cabbage palm reduction in existing dome swamps will be an important component to manage these plant communities toward their desired future condition to allow for a less intense fire regime. Following cabbage palm control efforts, a planting program of native plants with a focus on pond cypress and red maple, may occur to restore the overstory component. Non-native invasive treatment will continue to target FLEPPC Category 1 and 2 plants.

C. Hydric Hammock – 959 acres

Hydric hammock occurs on low, flat, wet sites where limestone or shell deposits may be near the surface and soil moisture is kept high. In PSSF, hydric hammock is found almost exclusively on the SGGE tract. This is an evergreen oak/palm forest with a variable understory typically dominated by palms and ferns. The closed canopy is dominated by swamp laurel oak (*Quercus laurifolia*), although some live oak (*Q. virginiana*) may be present. Cabbage palm is a common to dominant component. Other canopy species include red maple (*Acer rubrum*), sugarberry (*Celtis laevigata*), sweetgum (*Liquidambar styraciflua*), and water oak (*Q. nigra*). In addition to saplings of canopy species, the understory may contain a moderate to dense cover of small trees and shrubs such as American beautyberry (*Callicarpa americana*), common buttonbush (*Cephalanthus occidentalis*), citrus (*Citrus* spp.), swamp dogwood (*Cornus foemina*), common persimmon (*Diospyros virginiana*), dahoon (*Ilex cassine*), southern bayberry (*Morella cerifera*), myrsine (*Myrsine cubana*), swamp bay (*Persea palustris*), wild coffee (*Psychotria nervosa*), shortleaf wild coffee (*Psychotria sulzneri*), and occasionally saw palmetto (*Serenoa repens*). Eastern poison ivy (*Toxicodendron radicans*) is a frequent vine.

Herb cover is usually depauperate and may include bracken fern (*Pteridium aquilinum*), millet beaksedge (*Rhynchospora miliacea*), Everglades Key false buttonweed (*Spermacoce neoterminalis*), toothed midsorus fern (*Telmatoblechnum serrulatum*), West Indian chickweed (*Drymaria cordata*), semaphore thoroughwort (*Eupatorium mikanioides*), Virginia chain fern (*Woodwardia virginica*). Rotting logs may support long strap fern (*Campyloneurum phyllitidis*).

Epiphytes are frequent on oak branches and cabbage palm trunks – golden polypody (*Phlebodium aureum*) and shoestring fern (*Vittaria lineata*) are commonly found. These hammocks also provide good habitat for the state listed endangered epiphytic hand fern (*Ophioglossum palmatum*).

Hammocks intergrade with strand swamps and may contain some cypress trees (*Taxodium*

distichum/ascendens). Wet flatwoods, particularly on the SGGE tract are often difficult to distinguish from, and may be intermediate to, hydric hammocks. South Florida slash pine (*Pinus elliottii* var. *densa*) may be occasional in these areas. Isolated, small hammocks in prairies and flatwoods are of the "prairie hammock" variety, and usually have a greater abundance of cabbage palms and fewer oaks.

At Picayune Strand State Forest, hydric hammocks occur on rises within the large strand swamp. Most hammock islands have both hydric and mesic hammocks; these are very difficult to distinguish on aerial photographs. The large canopies of live oak trees are generally the only marker for mesic hammock. Smaller acreages of the prairie hammock variety dot marl prairies and wet flatwoods communities. Hammock vegetation fringes the southern extent of pine flatwoods in the SGGE tract, and hammock islands occur almost to US 41 as rises in salt marsh.

The variable open to closed canopy of hydric hammocks provides food, cover, roosting, and nesting sites to a wide variety of wildlife species. Healthy, diverse, and sustainable faunal populations will be present throughout the community. Common animals found here include the Coopers hawk, short-tailed hawk, barred owl, flycatchers, warblers, red-bellied woodpecker, pileated woodpecker, Florida black bear, white-tailed deer, bobcat, eastern gray squirrel, Florida box turtle, green anole (*Anolis carolinensis*), southern toad, squirrel treefrog, green treefrog, southern black racer, yellow rat snake, pygmy rattlesnake, corn snake and Florida kingsnake. Species of concern found in this community include the Florida panther.

EXISTING CONDITION

Hydric hammocks at Picayune Strand State Forest are in fair to good condition. The canopy and shrub layers are generally similar to the expected historical condition. However, the extensive hydrology alteration of Picayune Strand has created unnaturally dry conditions in the historical hydric hammocks. These hammocks are also often impacted by roads and may have a dense cover of non-native invasive species, including lantana (*Lantana strigocamara*), old world climbing fern (*Lygodium microphyllum*), melaleuca (*Melaleuca quinquenervia*), Asian sword fern (*Nephrolepis brownii*), downy rose-myrtle (*Rhodomyrtus tomentosa*), Brazilian pepper (*Schinus terebinthifolia*), two-leaf nightshade (*Solanum diphyllum*), and Caesar's weed (*Urena lobata*).

On the SGGE tract, hammock vegetation appears to have developed on some areas that were likely historical wet flatwoods. Recurring wildfires on the forest, although not detrimental to cabbage palms, affect the hammocks by potentially killing epiphytes and tropical species.

The fauna currently found in many of the hydric hammock areas mimic those in the desired future conditions. The main difference is that the diversity and abundance of other species and the distribution of indicator species are somewhat limited. Faunal diversity and abundance should increase with the adoption of a frequent fire regime, along with restoration of hydrology and native plants.

The hydrology of these sites is beginning to return to a more normal state as most of this community type is located within the footprint of the PSRP and restoration efforts are in full motion.

Fires in hydric hammocks are believed to be occasional events, though on PSSF, fires can burn through these communities as a part of burns for other community types. This community type has seen frequent fire. Prairie hammocks, small hammocks surrounded by open pyrogenic communities, tolerate occasional fires that burn in from surrounding habitats. Cabbage palm is highly tolerant of ground fires, but these fires may damage tropical species and oaks.

MANAGEMENT RECOMMENDATIONS

The management of hydric hammocks at Picayune Strand State Forest will focus on the treatment of FLEPPC category 1 and 2 non-native invasive plants. The hydrological restoration underway in the forest may result in the transition to a more swamp-like habitat. When possible, work to burn near these community types while the soil and fuels will provide a less intense fire. Cabbage palm reduction should also be undertaken, especially in areas that transition to other community types that have had a proliferation in cabbage palms or where fire management continues to see a reduction in other mid and overstory plant species. On a limited basis, look to return epiphyte species to this community type.

D. Mangrove Swamp – 31 acres

Mangrove swamp is a dense forest occurring along relatively flat, low wave energy, marine and estuarine shorelines. The dominant plants of mangrove swamp are red mangrove (*Rhizophora mangle*), black mangrove (*Avicennia germinans*), white mangrove (*Laguncularia racemosa*), and buttonwood (*Conocarpus erectus*). These four species can occur either in mixed stands or often in differentiated, monospecific zones that reflect varying degrees of tidal influence, levels of salinity, and types of substrate. Red mangrove often dominates the lowest (or deep-water) zone, followed by black mangrove in the intermediate zone, and white mangrove and buttonwood in the highest, least tidally-influenced zone. Buttonwood often occupies an ecotone, or transition zone, to the adjacent upland community. Mangroves typically occur in dense stands but may be sparse, particularly in upper tidal reaches where salt marsh species predominate.

Mangrove swamps at Picayune Strand State Forest are found in the farthest southern reaches of the SGGE tract just north of US 41. Solid mangrove stands are very difficult to distinguish from the palm hammocks and shrubby wet flatwoods that extend into the salt marsh communities in that area, both on the 1963 aerial photographs and the current photographs. More often, buttonwood is found mixed into a higher salt marsh community that appears on aerial photographs as lighter in color with a splotchy texture. The solid stands are mapped as mangrove swamp, while the mixed salt marsh/buttonwood areas are mapped as a separate entity.

Mangroves provide habitat for approximately 220 fish species, 181 bird species, 24 reptile and amphibian species, and 18 mammal species. They serve as important breeding, feeding, and nursery grounds for many saltwater fish and invertebrate species. An

estimated 75 percent of game fish, and 90 percent of commercial species in southern Florida depend on mangrove ecosystems. Mangroves also provide critical nesting habitat for Wood Storks, Roseate Spoonbills, Cormorants, Brown Pelicans, and different egrets and herons.

EXISTING CONDITION

The denser stands of mangrove swamp appear to be dominated by red mangrove. These are more or less monocultures of shrubs up to 15' or more in height and are presumed to be in a similar condition to the historical state. However, ditching along US 41 as well as the drainage alteration from large north/south canals has impacted the distribution of mangrove species by creating habitat along lower areas. As a result, mangroves have expanded their overall footprint, increasing in abundance along US 41 in particular.

MANAGEMENT RECOMMENDATIONS

The work to restore the hydrology through the PSRP will work to create a stable flow of freshwater throughout the year. Best management practices to keep this small community type in place at PSSF include preventing further destruction of existing mangrove swamps, maintaining a natural flow of fresh and salt water into these areas to avoid stagnation, and checks for non-native invasive plants and animals in and around this community type. Management efforts will continue to target non-native reptiles that move into the forest from US 41.

E. Marl Prairie – 2,734 acres

Marl prairie is a sparsely vegetated, graminoid-dominated community found on marl substrates in southern Florida. It is seasonally inundated (two to four months) to a shallow depth averaging about eight inches. It occupies large areas at intermediate elevations between deeper wetlands with a longer hydroperiod of six to twelve months, and pinelands or oak-palm hammocks that are seldom flooded. Soils are seasonally flooded marls or sandy marls, 2-24 inches deep, underlain by limestone. Marls are fine white calcareous muds formed from calcite precipitated by a mixture of green algae, blue-green algae, and diatoms, known as periphyton. These soils are highly alkaline and impermeable, sealing off the underlying limestone and causing water to pond during the wet season.

The ground cover should be almost entirely herbaceous with Gulfdune paspalum (*Paspalum monostachyum*) and/or Gulf hairawn muhly (*Muhlenbergia capillaris* var. *filipes*), along with a diversity of other graminoids and forbs including blue maidencane (*Amphicarpum muehlenbergianum*), longleaf milkweed (*Asclepias longifolia*), showy milkwort (*Asemeia violacea*), Nuttall's thistle (*Cirsium nuttallii*), narrowleaf yellowtops (*Flaveria linearis*), alligatorlily (*Hymenocallis palmeri*), saltmarsh morning glory (*Ipomoea sagittata*), Baldwin's milkwort (*Polygala balduinii*), starrush white-top (*Rhynchospora colorata*), water pimpernel (*Samolus ebracteatus*), black bogrush (*Schoenus nigricans*), and spring ladies'-tresses (*Spiranthes vernalis*). Scattered trees and shrubs such as southern bayberry (*Morella cerifera*), South Florida slash pine (*Pinus elliottii* var. *densa*), cabbage palm *(Sabal palmetto*), and pond cypress (*Taxodium ascendens*) may be present. Slightly lower swales and depressions may have sawgrass (*Cladium jamaicense*).

Marl prairies provide habitat to microbes and algae, which serve as important food sources for a variety of fish (e.g. *Gambusia* spp.), tadpoles (e.g. *Hyla* spp. and *Lithobates* spp.), and invertebrates (e.g. *Procambarus alleni*). Many of these species, in turn, provide food for a variety of wading birds including the great egret (*Ardea alba*), little blue heron (*Egretta caerulea*), snowy egret (*Egretta thula*), tricolored heron (*Egretta tricolor*), white ibis (*Eudocimus albus*), and wood stork (*Mycteria americana*).

At Picayune Strand State Forest, marl prairies are found almost exclusively on the SGGE tract. These occur on Pennsuco silt loam and Ochopee fine sandy loam soils, often as large, open expanses appearing as a smooth, bright gray signature on the 1962-63 photographs. Small hammocks or patches of flatwoods are found scattered throughout these prairies.

EXISTING CONDITION

The southern portion of the SGGE tract contains the best quality extant marl prairies on Picayune Strand State Forest. Although the hydrology in the area is much altered due to extensive canals, the effect is milder in the southern portion of the property as the drop to sea level is lower than in the northern section. These prairies are open and herbaceous. A large population of the state listed endangered Small's flax (*Linum carteri* var. *smallii*) is found in this habitat. However, as on most of the SGGE tract, the prairies are heavily fragmented by roads and clearings. These are mostly free of non-native invasive plants, although some do occur, including cogongrass (*Imperata cylindrica*), lantana (*Lantana strigocamara*), and Brazilian pepper (*Schinus terebinthifolia*). Many of the smaller prairies on the forest have been encroached with woody vegetation.

Marl prairie normally dries out during the winter and is subject to fires during the dry season (winter); most marl prairies burn naturally in May. Fires at this time of year, in contrast to wet season (i.e. summer) fires, stimulate flowering of the dominant grasses. For the first two years after a fire this community will burn only patchily, if at all. Marl prairies with dwarf cypress stands may burn about only once a decade due to low fire-carrying capacity of their sparse understory.

MANAGEMENT RECOMMENDATIONS

Management efforts will focus on keeping frequent fire in marl prairies using prescribed fires every 2-3 years, with the majority of fires conducted during the late dry season to encourage flowering of grasses and other plants, and to limit the in growth of extensive tree canopy. Care should be taken to coordinate water releases from CERP pump stations with prescribed burns, since flooding too soon after a fire can kill re-sprouting grasses. Due to their soft soils during the wet season marl prairies are also subject to scarring from off-road vehicle tracks, so vehicle traffic should be limited when soils are wet. Control of FLEPPC category 1 and 2 non-native invasive plants will continue as they are found.

F. Mesic Flatwoods – 3,328 acres (3,198 acres typical, 130 acres cabbage palm-dominated)

In southern Florida, mesic flatwoods are open-canopy forests of widely spaced, uneven-aged south Florida slash pine (*Pinus elliottii* var. *densa*) with a low mixed shrub/herb

understory. 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*), coastalplain staggerbush (*Lyonia fruticosa*), southern bayberry (*Morella cerifera*), winged sumac (*Rhus copallinum*), 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. Herbaceous species diversity is high in good quality mesic flatwoods. Vines occur rarely. Community types embedded within mesic flatwoods include dome swamp, wet prairie, and wet flatwoods.

Healthy, diverse, and sustainable faunal populations will be present throughout the community. Indicator species such as Big Cypress fox squirrels, gopher tortoises, and RCWs will be present. In areas that there is not an active population, the habitat will be capable of sustaining them in the future. Species such as the Florida panther, bobcat, white-tailed deer and Florida black bears will also utilize these areas for forage and denning.

Mesic flatwoods were historically found throughout Picayune Strand State Forest, not as the dominant landcover, but instead occupying rises within the matrix of strand swamp and wet flatwoods. These were much wetter than typical mesic flatwoods and more transitional to wet flatwoods. Soils are also more calcareous than in typical flatwoods, and several areas surveyed had exposed limestone at the soil surface.

Mesic flatwoods appear on the 1962-63 aerial photographs as a medium gray, mostly smooth signature with darker trees dotted across the landscape. The higher density of saw palmetto is the main indication for mesic flatwoods, as well as the higher elevation indicated in the LiDAR elevation data.

Mesic flatwoods depend on frequent, low-intensity fires to maintain a diverse herbaceous layer and provide mineral soils for pine regeneration. Repeated applications of growing season fires on a 2 to 4-year cycle are critical to preserving high quality flatwoods.

EXISTING CONDITIONS

Mesic flatwoods at Picayune Strand State Forest are generally in fair to good condition. Flatwoods on the southeastern portion of the Belle Meade tract are the highest quality examples and represent the best habitat for red-cockaded woodpeckers is found in this area. Basal area ranges from 0 to 120 in this community type. The large wildfires of 2017 and 2018 heavily impacted this community type and the plant communities are still working to come to an equilibrium following the fires.

Mesic flatwoods have a multi-aged canopy of south Florida slash pine with a low shrub layer of saw palmetto and a mix of other shrubs including gallberry, coastalplain staggerbush, winged sumac, shiny blueberry (*Vaccinium myrsinites*), and netted pawpaw (*Asimina reticulata*). Herbs are very diverse and include yellow colic-root (*Aletris lutea*), blue maidencane (*Amphicarpum muehlenbergianum*), maidenhair pineland fern (*Anemia adiantifolia*), witchgrass (*Dichanthelium* spp.), Baldwin's eryngo *(Eryngium baldwinii*), hairawn muhly (*Muhlenbergia capillaris*), wild pennyroyal (*Piloblephis rigida*),

narrowleaf silkgrass (*Pityopsis graminifolia*), bracken fern (*Pteridium aquilinum*), blackroot (*Pterocaulon pycnostachyum*), beaksedge (*Rhynchospora* spp.), whip nutrush (*Scleria triglomerata*), vanillaleaf (*Carphephorus odoratissimus*), Everglades twin flower (*Dyschoriste angusta*), tall elephantsfoot (*Elephantopus elatus*), fragrant eryngo (*Eryngium aromaticum*), pineland heliotrope (*Euploca polyphylla*), Elliott's milkpea (*Galactia elliottii*), fringed yellow stargrass (*Hypoxis juncea*), whitehead bogbutton (*Lachnocaulon anceps*), glade lobelia (*Lobelia glandulosa*), seaside primrosewillow (*Ludwigia maritima*), Gulf hairawn muhly (*Muhlenbergia capillaris* var. *filipes*), wild pennyroyal (*Piloblephis rigida*), blackeyed susan (*Rudbeckia hirta*), Carolina wild petunia (*Ruellia caroliniensis*), pineywoods dropseed (*Sporobolus junceus*), yellow hatpins (*Syngonanthus flavidulus*), and Everglades Key false buttonweed (*Spermacoce neoterminalis*).

The fauna currently found in many of the mesic flatwoods areas mimic those in the desired future conditions. The main difference is that the diversity and abundance of other species and the distribution of indicator species (e.g., RCWs) are somewhat limited. Faunal diversity and abundance should increase with the adoption of a frequent fire regime, along with restoration of hydrology and native plants. In large sections of the SGGE tract, the effects of hydrology alteration and subsequent intense wildfires have promoted extensive cabbage palm (*Sabal palmetto*) growth. Mesic flatwoods in these affected areas have all but lost the original pine canopy and are now completely dominated by cabbage palms. This has happened to a smaller extent in the northwestern corner of the Belle Meade tract.

Non-native invasive plants found in mesic flatwoods include Caesar's weed (*Urena lobata*), melaleuca (*Melaleuca quinquenervia*), downy rose-myrtle (*Rhodomyrtus tomentosa*), Brazilian pepper (*Schinus terebinthifolia*), and cogongrass (*Imperata cylindrica*). Earleaf acacia (*Acacia auriculiformis*) has recently invaded the northwestern corner of the Belle Meade tract.

MANAGEMENT RECOMMENDATIONS

Management goals for mesic flatwoods at Picayune Strand State Forest should focus on frequent prescribed fire, replanting and thinning of pine stands, control of cabbage palms and non-native invasive plant control and removal.

Timing of prescribed fires should ideally be during the early lightning season or as close to this period as possible on a 2 to 4-year basis. Prior to burning, it may be advisable to protect red-cockaded woodpecker cavity trees to avoid a loss of large pines. Control lines will need to be widened through the management of flammable vegetation to allow for more frequent prescribed fires. Almost all species inhabiting these communities are fire adapted, and many of them depend on frequent fires for sustainment.

Pines may be re-planted in areas where the canopy has been severely thinned to facilitate reforestation. Site preparation can include roller chopping, forestry mowing, and chemical treatment of non-native invasive and native plants. Coordination will occur with FWC to leave some areas of large saw palmettos for panther denning. The goal for management of

south Florida slash pine is to create stands that provide for long term forestry operations that may include harvests.

Fire management is likely to occur in mesic flatwoods, and the over-use of plowed firebreaks and other practices that disturb the soil should be minimized; existing roads and wetlands should be used for firebreaks whenever possible. A network of maintained firelines will be established to coordinate with old firelines and trail/road networks. New ground disturbances should be limited to prevent elimination of the natural groundcover and establishment of weedy species. Depth of plowed firebreaks should be minimized to prevent hydrologic alteration within the surrounding community, and barriers to surface flow will be designed to allow for continuous sheet flow where possible.

A major need in this community type is to reduce the coverage of cabbage palms. While cabbage palms in the PSRP area may start to weaken with an increased hydroperiod, there still remains a need to pro-actively reduce their number to limit problem fire behavior and allow for larger pines to survive in the landscape. Non-native invasive plants frequent this community type and efforts will continue to control all FLEPPC category 1 and 2 species. Mesic flatwoods in the Belle Mead tract have higher occurrences of melaleuca while in the SGGE tract, Brazilian pepper and cogongrass are more often found.

G. Mesic Hammock – 1,491 acres

Mesic hammocks are closed canopy forests dominated by oaks and palms with a mixture of other mesic temperate hardwood species in the canopy. They occur on moderately drained areas that receive infrequent fire. Soils are calcareous with limestone occasionally outcropping. These hammocks are higher in elevation than hydric hammocks and are generally dominated by live oak rather than swamp laurel oak. In the area of Picayune Strand State Forest, the vegetation of mesic hammocks is often similar to the more tropical rockland hammocks in the understory, although they retain a primarily live oak/cabbage palm canopy. The many oaks support an abundance of epiphytes.

The canopy is dominated by live oak (*Quercus virginiana*) and cabbage palm (*Sabal palmetto*), but several other trees may be mixed in the canopy including gumbo limbo (*Bursera simaruba*), sugarberry (*Celtis laevigata*), and swamp laurel oak (*Quercus laurifolia*). The subcanopy and shrubs may be dense and dominated by cabbage palm, with myrsine (*Myrsine cubana*), saw palmetto (*Serenoa repens*). hog plum (*Ximenia americana*), wild coffee (*Psychotria nervosa*), shortleaf wild coffee (*Psychotria sulzneri*), common persimmon (*Diospyros virginiana*), American beautyberry (*Callicarpa americana*), snowberry (*Chiococca alba*), satinleaf (*Chrysophyllum oliviforme*), strangler fig (*Ficus aurea*), dahoon (*Ilex cassine*), red mulberry (*Morus rubra*), marlberry (*Ardisia escallonioides*), Simpson's stopper (*Myrcianthes fragrans*), graytwig (*Schoepfia schreberi*), and wild lime (*Zanthoxylum fagara*).

The herbaceous layer is variable in density and composition, depending on location. Common herbs include Florida Keys hempvine (*Mikania cordifolia*), wild Boston fern (*Nephrolepis exaltata*), woodsgrass (*Oplismenus hirtellus*), corkystem passion-flower (*Passiflora suberosa*), bracken fern (*Pteridium aquilinum*), Chinese brake fern (*Pteris*

vittata), rougeplant (*Rivina humilis*), toothed midsorus fern (*Telmatoblechnum serrulatum*), and southern shield fern (*Thelypteris kunthii*). Vines and epiphytes are common to abundant. Typical vines include possum grape (*Cissus verticillata*), leafless swallowwort (*Orthosia scoparia*), Virginia creeper (*Parthenocissus quinquefolia*), earleaf greenbrier (*Smilax auriculata*), saw greenbrier (*Smilax bona-nox*), eastern poison ivy (*Toxicodendron radicans*), and summer grape (*Vitis aestivalis*). Epiphytes such as golden polypody (*Phlebodium aureum*), southern needleleaf (*Tillandsia setacea*), Florida butterfly orchid (*Encyclia tampensis*), and shoestring fern (*Vittaria lineata*) grow on oaks and palms.

Mesic hammocks provide some of the best habitat for rare plant species at Picayune Strand State Forest. These may include spurred neottia (*Eltroplectris calcarata*), dingy flowered star orchid (*Epidendrum anceps*), hand fern (*Ophioglossum palmatum*), Simpson's stopper (*Myrcianthes fragrans*), common wild-pine (*Tillandsia fasciculata*), and Florida royal palm (*Roystonea regia*).

The closed canopy of mesic hammocks provides food, cover, roosting, and nesting sites to a wide variety of wildlife species. Healthy, diverse, and sustainable faunal populations will be present throughout the community. Common animals found here include the Coopers hawk (*Accipiter cooperii*), short-tailed hawk, barred owl (*Strix varia*), flycatchers (Family: Tyrannidae), warblers (Family: *Parulidae*), red-bellied woodpecker, pileated woodpecker (*Dryocopus pileatus*), white-tailed deer, bobcat, eastern gray squirrel (*Sciurus caroliniensis*), Florida box turtle (*Terrapene carolina bauri*), southern toad (*Bufo terrestris*), squirrel treefrog (*Hyla squirrella*), green treefrog (*Hyla cinerea*), southern black racer, yellow rat snake, pygmy rattlesnake (*Sistrurus miliarius barbouri*), corn snake (*Elaphe guttata guttata*) and Florida kingsnake *(Lampropeltis getulus floridana*). The species of concern found in this community is the Florida panther.

At Picayune Strand State Forest, mesic hammocks occur primarily as rises within the large strand swamp system. On the 1962-63 aerial photographs, it can be very difficult to distinguish these hammocks from surrounding strand swamp, and virtually impossible to distinguish them from hydric hammock. LiDAR elevation data were an important tool to find higher ground within swamps that might support hammock vegetation, and the presence of live oaks in the canopy helped to separate these from hydric hammocks in some cases.

Fire is infrequent in mesic hammocks, which are often naturally protected by surrounding wetlands. In most cases leaf litter and mesic conditions retard fires throughout the year.

EXISTING CONDITIONS

Current conditions in mesic hammocks on Picayune Strand State Forest are similar to desired future conditions in many cases. The primary disturbance in even the highest quality hammocks is the infestation of non-native invasive plants and, in the SGGE tract, the loss of surrounding wetland hydrology which allows fires to access these plant communities more frequently. The understory of some hammocks is a dense stand of Asian sword fern (*Nephrolepis brownii*). Other common invasive species include Brazilian

pepper (*Schinus terebinthifolia*), lantana (*Lantana strigocamara*), and Caesar's weed (*Urena lobata*).

The fauna currently found in many of the mesic hammocks mimic those in the desired future conditions. The main difference is that the diversity and abundance of other species and the distribution of indicator species are somewhat limited. Faunal diversity and abundance should increase with the adoption of a frequent fire regime, along with restoration of hydrology and native plants.

Since most of the mesic hammocks occur on the SGGE tract, many have been impacted by the development of roads. Wildfires that have increased in intensity following the installation of the canal system are now more likely to burn into hammocks and potentially damage tropical and rare understory species, leading to a continued dominance of cabbage palms.

MANAGEMENT RECOMMENDATIONS

Management of mesic hammocks at Picayune Strand State Forest will focus on removal of non-native invasive plants that are on the FLEPPC category 1 and 2 lists. The hydrology restoration underway in the forest through the PSRP may result in the transition to a more swamp-like habitat with a less dense understory and may help to protect the hammocks from wildfires by allowing surrounding community types to hold water for longer periods. Care will be taken to undertake prescribed burns in the vicinity of mesic hammocks when soil and fuel conditions are as wet as possible to achieve a successful burn that limits conversion of these community types fully to more fire dependent flatwoods.

As hammocks are brought into maintenance stage, conditions will be reviewed to plant additional native plants and trees to return missing overstory and understory components to individual mesic hammocks. The focus will be on oaks and in select hammocks, cabbage palm thinning may occur when necessary.

H. Salt Marsh – 831 acres (705 acres typical, 126 acres mixed marsh/mangrove)

Salt marsh is a largely herbaceous community that occurs in the portion of the coastal zone affected by tides and seawater and protected from large waves, either by the broad, gently sloping topography of the shore, by a barrier island, or by location along a bay or estuary. Salt marsh may have distinct zones of vegetation, each dominated by a single species of grass or rush. Saltmarsh cordgrass (*Spartina alterniflora*) dominates the seaward edge and borders of tidal creeks, areas most frequently inundated by the tides. Needle rush (*Juncus roemerianus*) dominates higher, less frequently flooded areas. A border of salt-tolerant shrubs, such as groundsel tree (*Baccharis halimifolia*), saltwater falsewillow (*Baccharis angustifolia*), marshelder (*Iva frutescens*), and christmasberry (*Lycium carolinianum*), often marks the transition to upland vegetation or low berms along the seaward marsh edge. High salinity areas are dominated by species such as saltwort (*Batis maritima*), perennial glasswort (*Salicornia ambigua*), and bushy seaside oxeye (*Borrichia frutescens*), or short grasses, such as saltgrass (*Distichlis spicata*), seashore paspalum (*Paspalum vaginatum*), and shoregrass (*Monanthochloe littoralis*).

At Picayune Strand State Forest, salt marsh is found along the extreme southern boundary of the property adjacent to US 41. The transition from marl prairie to salt marsh in this area is difficult to determine from aerial photographs. Soil maps were used to provide a dividing line between the salt marshes occurring on muck and the marl prairies occurring on silt loam. Vegetation in this area is in a broad transition from flatwoods and prairies to salt marshes and mangroves. Slightly higher areas that appear on the 1962-63 aerial photographs to be a mix of shrubby and herbaceous vegetation are delineated separately as the subtype "mixed marsh/mangrove."

Salt marshes, much like marl/wet prairies, provide important foraging habitat for southern Florida wading birds such as herons, egrets, ibis, and spoonbills. Other birds like the Florida clapper rail (*Rallus longirostris scottii*) and the rarer Black Rail (*Laterallus jamaicensis*) also utilize salt marshes. Salt marshes support native reptiles such as the Diamondback Terrapin (*Malaclemys terrapin*) and Salt Marsh Snake (*Nerodia clarkia*), and non-native species like the Burmese Python (*Python bivittatus*). Common rice rats (Oryzomys palustris) and mink (*Neovison vison*) are some of the mammalian inhabitants of salt marshes.

EXISTING CONDITIONS

In general, salt marshes at Picayune Strand State Forest are likely similar to historic conditions. The majority of the marsh is grassy, dominated by cordgrass (*Spartina* spp.) and patches of saltwort (*Batis maritima*) and saltgrass (*Distichlis spicata*). The location of the marsh in a transition area from freshwater swamps and prairies to more tidally influenced saline communities creates a mosaic of cordgrass flats and higher marshes with fimbry (*Fimbristylis* spp.), saltmarsh morning glory (*Ipomoea sagittata*), shoreline seapurslane (*Sesuvium portulacastrum*), and a mix of shrubs such as saltwater falsewillow (*Baccharis angustifolia*), black mangrove (*Avicennia germinans*), buttonwood (*Conocarpus erectus*), red mangrove (*Rhizophora mangle*), southern bayberry (*Morella cerifera*), cabbage palm (*Sabal palmetto*), and saffron plum (*Sideroxylon celastrinum*). Lower, mucky sloughs channel freshwater through the marsh and are generally more brackish and dominated by giant leather fern (*Acrostichum danaeifolium*), sawgrass (*Cladium jamaicense*), and cattail (*Typha* spp.). These species, as well as perfumed spiderlily (*Hymenocallis latifolia*), are also common in the ecotone between wet flatwoods and salt marsh.

The marsh located adjacent to the Faka-Union Canal where it intersects US 41 is presumed to be a historical salt marsh based on soils and location. However, the large volume of freshwater discharge in that area appears to have changed the character of the marsh to more of a basin marsh or marshy impoundment. Vegetation in this area may continue to shift as hydrology restoration efforts reduce point discharge of freshwater in the canal.

While there are no data on natural fire frequency in salt marshes, fires probably occurred sporadically, either by spreading from nearby uplands or from lightning strikes in the marsh itself. Wildfires and prescribed burns have occurred in the last 10 years in the salt marsh community.

MANAGEMENT RECOMMENDATIONS

The management of this community type will focus on the control of non-native invasive plants, with a focus on Early Detection and Rapid Response for saltwater invasive plants. Monitoring the restored hydrology and impacts on salt marsh vegetation will be important to understand any potential losses of this plant community that mainly occurs near US 41. New trails and vehicle traffic should be limited in this community type and scars from past recreational use are still healing.

The use of prescribed burns will continue on an opportunistic basis every 5-10 years to provide tender shoots as food for wildlife and to decrease the possibility of wildfires. Fire should be used with caution in marshes so as not to cause destructive peat fires or adversely affect rare bird or other species dependent on the marsh habitat for nesting and foraging.

I. Strand Swamp – 33,946 acres (18,911 acres typical, 13,848 acres cabbage palm-dominated, 722 acres strand swamp/wet flatwoods mosaic, 465 acres deep strand swamp)

Strand swamp is a shallow, forested, usually elongated depression or channel situated in a trough within a flat limestone plain, and dominated primarily by bald cypress (*Taxodium distichum*). Smaller, shallower strand swamps and edges may instead contain pond cypress (*T. ascendens*). Strand swamps are restricted to southern Florida, and probably do not occur north of Lake Okeechobee. The warm, humid climate in strand swamp make it ideal habitat for epiphytic orchids and bromeliads. While the greatest diversity of these epiphytes may be found along the deeper sloughs, several are common throughout the swamp. A mix of other hydrophytic trees and shrubs such as cabbage palm (*Sabal palmetto*), red maple (*Acer rubrum*), coco plum (*Chrysobalanus icaco*), strangler fig (*Ficus aurea*), dahoon (*Ilex cassine*), southern bayberry (*Morella cerifera*), swamp dogwood (*Cornus foemina*), swamp bay (*Persea palustris*), pond apple (*Annona glabra*), and Carolina ash (*Fraxinus caroliniana*) may be present. The herb layer is mostly composed of ferns such as toothed midsorus fern (*Telmatoblechnum serrulatum*) and Virginia chain fern (*Woodwardia virginica*), as well as sawgrass (*Cladium jamaicense*).

Typical strand swamp animals include white-tailed deer, gray squirrel, raccoon, river otter, little blue heron (*Egretta caerulea*), great egret (*Casmerodius albus*), blue-grey gnatcatcher (*Polioptila caerulea*), ribbon snake (*Thamnophis sauritus sackenii*), cottonmouth, opossum (*Didelphis virginianus*), wood rat (*Neotoma floridana*), bobcat, Everglades mink, marsh rabbit (*Sylvilagus palustris*), redwinged blackbird (*Agelaius phoeniceus*), common grackle (*Quiscalus quiscala*), boat-tailed grackle (*Quiscalus major*), limpkin (*Aramus guarauna*), red-shouldered hawk, barred owl, American alligator, Florida banded water snake (*Nerodia fasciata pictiventris*), soft shelled turtle (*Apalone ferox*), southern leopard frog (*Rana sphenocephala*), green treefrog, barking treefrog (*Hyla gratiosa*), squirrel tree frog, lesser siren (*Siren intermedia*), two-toed amphiuma (*Amphiuma m. means*), mosquito fish (*Gambusi*a spp.), yellow bullhead (*Ameiurus natalis*), swamp darter (*Etheostoma barratti*), sailfin molly (*Mollienesia latipinna*), flagfish (*Jordanella floridae*), least killifish (*Heterandria formosa*), bowfin (*Amia calva*), warmouth (*Chaenobryttus coronarius*), Florida gar (*Lepisosteus* spp.), and bluespotted sunfish (*Enneacanthus gloriosus*) (USFWS 1999). Federally listed species that depend upon or utilize the flowing water swamp

community in southern Florida include: Florida panther, wood stork, and eastern indigo snake (USFWS 1999).

Tropical epiphytes listed by FNAI (1990) for strand swamps include: birds nest spleenwort (*Asplenium serratum*), tailed strap fern (*Campyloneuron costatum*), many flowered catopsis (*Catopsis floribunda*), nodding catopsis (*Catopsis nutans*), cowhorn orchid (*Cyrtopodium punctatum*), clamshell orchid (*Encyclia pygmaea*), Acuna's epidendrum (*Epidendrum blancheanum*), nightscented orchid (*Epidendrum nocturnum*), pendant epidendrum (*Epidendrum strobiliferum*), Fuch's bromeliad (*Guzmania monostachia*), hanging clubmoss (*Huperzia dichotoma*), delicate ionopsis (*Ionopsis utricullariodes*), blunt leaved peperomia (*Peperomia obtusifolia*), frost-flower orchid (*Pleurothallus gelida*), ghost orchid (*Polyrrhiza lindenii*), fuzzywuzzy air plant (*Tillandsia pruiosa*), entire winged bristle fern (*Trichomanes holopterum*), and brown-flowered vanilla (*Vanilla phaeantha*). All of these species are listed as endangered by the state, all are found in Fakahatchee Strand in Collier County, and will all hopefully be found within PSSF once hydrology is restored.

Strand swamp soils are peat and sand over limestone. Swamps with larger cypress and a more diverse understory are on deep peat that acts as a wick to draw moisture from groundwater up into the root zone during droughts. Shallow swamps and edges, however, often have little organic matter over deep sand. The normal hydroperiod ranges from 100 to 300 days per year. Water levels rise with increasing rainfall around June and then decrease to their lowest levels during winter and early spring.

Strand swamp is the most extensive natural community at Picayune Strand State Forest, forming the matrix landcover over most of the SGGE tract and much of Belle Meade. On 1962-63 aerial photographs, the swamp is a textured, light gray color. Areas of pure cypress intergrade with more open prairie- or flatwoods-like expanses, particularly in Belle Meade, and early land records from 1882 indicate a landscape of mixed south Florida slash pine (*Pinus elliottii* var. *densa*) and cypress. Belle Meade also contains striking fine mosaic areas of cypress and pine where narrow ridges of higher ground occupied by pines appear as lighter gray ripples through the swamp. Strand swamps on PSSF have variable wet season water depths of 18 to 30 inches maximum above ground, with a hydroperiod of 6 to 10 months and a water table fluctuation of 3 feet (USACE and SFWMD 2004). Water is deepest and remains longest near the center where the trees are biggest. Longer hydroperiods slow growth rates and prevent cypress reproduction, since cypress do not grow when inundated and seed germination may be inhibited, or seedlings drowned.

On the SGGE tract, rich hammocks are noted within the swamp in the early land records. These hammocks are very difficult to distinguish from aerial photographs, but LiDAR elevation data make the slight rises easier to detect. Throughout the forest, deeper depressions in the strand swamp provide favorable conditions for larger bald cypress trees and less fire-tolerant hardwood species, as well as coastalplain willow (*Salix caroliniana*) and common buttonbush (*Cephalanthus occidentalis*). These depressions often have a basin marsh or swamp lake center and provide a refuge for alligators and other wildlife during the dry season.

Fire occurs rarely in deeper strand swamps. However, fires from surrounding pine-dominated communities can frequently burn into edges or shallow strand swamps. Cypress is very tolerant of light surface fires, and occasional fire contributes to the maintenance of a cypress dominated community; without fire, hardwood invasion and peat accumulation create a mixed hardwood and cypress swamp, and under certain conditions the strand may convert to hydric hammock.

EXISTING CONDITIONS

The strand swamps at Picayune Strand State Forest have been heavily impacted by the installation of the Faka-Union Canal system in the early 1970s. The resulting loss of water on the landscape, in both depth and duration, and increased wildfire occurrence and severity has altered the species composition radically in large sections of the SGGE tract. The effects are greatest in the north and central portions of the SGGE tract where the cypress canopy has been replaced by a low savannah of almost entirely cabbage palms with some mixed shrubs. In addition, pine flatwoods have increased in areas where cabbage palm density has not created too severe of fire intensity. Remnant cypress trees can still be found in these converted stands.

The SGGE tract is the site of numerous old tram lines that were used in the early 20th century for logging operations. Many of these tram lines have been degraded, but the tram lines that are still in place continue to serve as a source of non-native invasive plant seed stock for the rest of the strand swamp plant community.

The lowered water table on the Belle Meade, though less impacted without an extensive canal system intersecting the tract, has favored the expansion of a mixed cypress/pine/palm wet flatwoods community into what was likely historic cypress-dominated strand swamp. Increased wildfires have also created large areas of open, prairie-like communities with widely scattered, small cypress and pines over a grassy understory often dominated by blue maidencane (*Amphicarpum muehlenbergianum*). Many of the strand swamps and cypress/pine/palm flatwoods on Belle Meade are heavily invaded with melaleuca (*Melaleuca quinquenervia*) and torpedo grass (*Panicum repens*), particularly along roads and old home sites. Old World climbing fern (*Lygodium microphyllum*) can also be found.

Deeper swamps in depressions on both tracts appear to have lost many of the larger trees that once occupied them, replaced by a mix of cabbage palms and coastalplain willow, and often invaded with West Indian marsh grass (*Hymenachne amplexicaulis*) or para grass (*Urochloa mutica*).

The best quality strand swamps at Picayune Strand State Forest are found on the south end of the SGGE tract below Stewart Blvd., and some of the deeper areas in the central and southern portions of the Belle Meade tract. These have an intact canopy of pond or bald cypress, and often a mix of subcanopy trees that include Carolina ash, red maple, strangler fig, swamp dogwood, and swamp bay. The herb layer is a mix of ferns, sawgrass, and a variety of other species including longleaf milkweed (*Asclepias longifolia*), false nettle (*Boehmeria cylindrica*), clustered sedge (*Carex glaucescens*), smallflower thoroughwort

(*Eupatorium semiserratum*), branched hedgehyssop (*Gratiola ramosa*), clustered bushmint (*Hyptis alata*), rosy camphorweed (*Pluchea baccharis*), sweetscent (*Pluchea odorata*), pickerelweed (*Pontederia cordata*), Everglades Key false buttonweed (*Spermacoce neoterminalis*), water toothleaf (*Stillingia aquatica*), and yellow-eyed grass (*Xyris* spp.). Swamps that have been protected from severe fires have an abundance of epiphytes that include long strap fern (*Campyloneurum phyllitidis*), wild Boston fern (*Nephrolepis exaltata*), southern needleleaf (*Tillandsia setacea*), and Spanish moss (*Tillandsia usneoides*), as well as some rare species such as rigid epidendrum (*Epidendrum rigidum*), banded wild-pine (*Tillandsia flexuosa*), Balbis' airplant (*Tillandsia balbisiana*), common wild-pine (*Tillandsia fasciculata*), and fuzzy-wuzzy air-plant (*Tillandsia pruinosa*).

The fauna currently found in the strand swamp areas mimic those in the desired future conditions. The main difference is that the diversity and abundance of species and the distribution of indicator species (e.g., wood storks) are somewhat limited. Faunal diversity and abundance should increase with the restoration of hydrology and native plants. A strong population of turkey are found in this community type with the frequent burns and wildfires that have occurred.

MANAGEMENT RECOMMENDATIONS

The hydrology restoration effort currently underway on the SGGE tract and a portion of the Belle Mead tract should help to re-establish a more natural hydrology and may reverse some of the vegetation shifts that have occurred over the past few decades. Eventually, the goal is for a return to a closed canopy forest dominated by cypress. On the Belle Meade tract, conditions are likely to remain drier without additional hydrologic restoration of strand swamp communities, and pine may continue to increase in dominance. Management of the strand swamp community will focus on non-native invasive plant species removal, more frequent prescribed fires to reduce the severity of drought season wildfires, the control of cabbage palm encroachment and density, and replanting of overstory trees on select sites.

Restoration of cypress communities in SGGE to their original condition on sites where pre-development hydrology has been restored will likely take many decades. Where most of the older cypress trees are still present, but have been invaded by palms or hardwoods, it should take a few decades for the system to recover once hydrology is restored and cypress is allowed to dominate again. The application of an appropriate fire regime and/or mechanical clearing would expedite the recovery of these sites. In areas where the original canopy cypress (which was probably about 100-200 years old) has been eliminated or greatly reduced in numbers (e.g., disturbed areas), it will take even longer to restore the strand to its natural state. Non-native invasive species control will continue in the Belle Meade, and planting of cypress has been conducted within the Belle Meade Tract in the past. Wildfire lines through cypress in certain areas should be rehabilitated and may be blocked and/or planted with cypress. Certain areas are not expected to be restored to their pre-development condition, such as those located upstream of the pumps and spreader system. They will likely remain in a drier condition that would support pine flatwoods and wet prairie communities, although the vegetative composition of these communities would depend on the fire and non-native invasive plant management that will exist in the future.

Also, those areas where canals and roads have not been removed will obviously not be restored.

Acquisition of inholdings is also critical to restoration and maintenance of this area. Restoring hydrological patterns will permit accumulation of peat in drained or burned swamps, as well as buffering the wetlands from agricultural and urban runoff. The continued presence of canals on the edge of PSSF will likely create limits to restoration efforts as historic dry down continues for ongoing water management.

Non-native invasive species control will focus on removing FLEPPC Category 1 and 2 species. A major focus will be on control of melaleuca, as well as Brazilian pepper *(Schinus terebinthifolia*) and Old-World climbing fern (*Lygodium microphyllum*).

J. **Swamp Lake – 7 acres**

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 are important refuges for alligators and other wildlife during the dry season. Picayune Strand State Forest has several small lakes scattered throughout the large strand swamp system. These lakes are evident as a solid black signature on the 1962-63 aerial photographs.

EXISTING CONDITIONS

The lakes on Picayune Strand State Forest are mostly still permanently flooded, although changes in hydrology and the surrounding landscape may have changed some to more shallow marsh vegetation. These lakes are open water with a fringe of coastalplain willow (*Salix caroliniana*) and mixed shrubs and herbs. The edges are often invaded with Brazilian pepper (*Schinus terebinthifolia*).

PSRP has created numerous small lakes in its footprint with the filling of canals, and these should be monitored for inclusion in this plant community.

MANAGEMENT RECOMMENDATIONS

Management of the swamp lake community will focus on removing non-native invasive plants that are on the FLEPPC category 1 or 2 list, monitoring water quality through cooperation with FL DEP and SFWMD, and maintaining surrounding habitats that share an ecotone with this small community. New swamp lakes that may develop from hydrologic changes resulting from the PSRP will be included as part of this natural community.

K. **Wet Flatwoods – 17,972 acres (9,369 acres typical, 1,065 acres cabbage palm-dominated, 7,538 acres mixed cypress/pine/palm)**

Wet flatwoods in southern Florida are characterized as relatively open-canopy forests of pines with 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 much

less saw palmetto and more hydrophytic shrub and herb species. In southern Florida, the canopy is composed of a multi-aged stand of south Florida slash pine (*Pinus elliottii* var. *densa*). The understory shrubs are sparse, composed of a mix of saw palmetto (*Serenoa repens*), southern bayberry (*Morella cerifera*), fetterbush (*Lyonia lucida*), American beautyberry (*Callicarpa americana*), dahoon (*Ilex cassine*), and gallberry (*Ilex glabra*). Herbs are a mix of grasses such as Gulf hairawn muhly (*Muhlenbergia capillaris* var. *filipes*) and blue maidencane (*Amphicarpum muehlenbergianum*), as well as a diversity of other species including lemon bacopa (*Bacopa caroliniana*), American bluehearts (*Buchnera americana*), sawgrass (*Cladium jamaicense*), flatsedge (*Cyperus* spp.), southern umbrellasedge (*Fuirena scirpoidea*), branched hedgehyssop (*Gratiola ramosa*), heliotrope (*Heliotropium* spp.), rosy camphorweed (*Pluchea baccharis*), pine hyacinth (*Clematis baldwinii*), witchgrass (*Dichanthelium* spp.), Everglades twin flower (*Dyschoriste angusta*), bretonica peluda (*Melochia spicata*), clustered mille graines (*Oldenlandia uniflora*), maidencane (*Panicum hemitomon*), Virginia creeper (*Parthenocissus quinquefolia*), field paspalum (*Paspalum laeve*), Gulfdune paspalum (*Paspalum monostachyum*), rustweed (*Polypremum procumbens*), water pimpernel (*Samolus ebracteatus*), toothed midsorus fern (*Telmatoblechnum serrulatum*), yellow-eyed grass (*Xyris* spp.), Everglades Key false buttonweed (*Spermacoce neoterminalis*), and starrush white-top (*Rhynchospora colorata*).

PSSF supports many species of plants and animals found on the Florida Endangered Species and Threatened Species lists, published and maintained by FWC. In addition to the state status, eight of those species are federally listed threatened or endangered including: eastern indigo snake (*Drymarchon corais couperi*), American alligator, wood stork (*Mycteria americana*), red-cockaded woodpecker, snail kite (*Rostrhamus sociabilis plumbeus*) and Florida panther.

Wet pine flatwoods are one of the principal dominant forest covers that are found in southwest Florida. Healthy, diverse, and sustainable faunal populations will be present throughout the community. The diversity of wetland and upland plant life provides for an abundant variety of invertebrate and vertebrate fauna. They provide essential forested habitat for a diversity of wildlife including wide-ranging species such as the Florida panther, the Florida black bear, mid-sized carnivores, Big Cypress fox squirrels, canopy-dependent bird species including neotropical migrants, tree-cavity dependent species, and tree-nesting species. Some of the typical animals include oak toad (*Bufo quercicus*), cricket frog (*Acris gryllus dorsalis*), squirrel tree frog (*Hyla squirella*), southern black racer, yellow rat snake (*Elaphe obsolete quadrivittata*), eastern diamondback rattlesnake (*Crotalus adamanteus*), dusky pigmy rattlesnake (*Sistrurus milarius barbouri*), red-shouldered hawk, raccoon (*Procyon lotor*), bobcat (*Lynx rufus*), and white-tailed deer. This community provides essential habitat to the breeding life cycle of aquatic and wetland-dependent animals, providing both aquatic habitat for young and adults (especially amphibians) and upland habitat for more terrestrial species adult forms.

Slightly lower elevation areas support a mix of canopy pines with an understory of pond cypress (*Taxodium ascendens*) and cabbage palm (*Sabal palmetto*). These "mixed cypress/pine/palm" areas are transitional to strand swamp and share similarities in species

composition. The herbaceous layer is mostly blue maidencane (*Amphicarpum muehlenbergianum*) and/or toothed midsorus fern (*Telmatoblechnum serrulatum*).

On Picayune Strand State Forest, wet flatwoods historically occurred throughout the forest, and are the second largest natural community type. These flatwoods occupy large areas of intermediate elevation between swamps and mesic flatwoods. On the 1962-63 aerial photographs, these appear as a relatively smooth dark to light gray signature dotted with widely spaced trees. The cypress/pine/palm areas appear more as a dark gray signature with some texture from the lighter gray cypress. LiDAR elevation data is useful in separating these two types. Although pine trees are not clearly evident throughout these areas on the 1960s photographs, early land surveyor notes indicate a landscape of mixed cypress and pine.

The ultimate goal of this community is to maintain an open stand of trees representing at least three evenly-distributed age classes. To maintain this condition and mimic flare-ups caused by natural fires, there will be uneven-aged management accomplished by group selection across the stand. Restoration of native species, even-age and uneven age management of pine stands, selective thinning, removal of off-site species, and prescribed fire are all actions used to promote healthy forest stands. Mechanical and chemical treatments may be used to reduce non-native invasive plant competition where pine is desired. Protection of native groundcover will be emphasized during all silvicultural operations.

Historically, natural fires may have occurred every 3 to 10 years in wet flatwood communities. For management purposes, prescribed fires may be more advisable on a 2 to 4-year cycle. This reduces woody encroachment, sustains herbaceous species, and aids in preventing heavy fuel loads that can lead to catastrophic wildfires.

EXISTING CONDITIONS

The best quality wet flatwoods occur on Belle Meade, particularly on the southeastern portion of the tract where wet flatwoods form a matrix community with patches of high-quality mesic flatwoods and a network of lower cypress/pine/palm areas and wet prairies. The best habitat for red-cockaded woodpeckers is found in this area.

The extent of mixed cypress/pine/palm flatwoods has increased since the construction of the Faka-Union Canal system. The drier conditions are more conducive to a pine-dominated canopy, but cypress is still evident in the understory as discussed in the strand swamp natural community section. Following recent wildfires, these stands were observed to have higher pine mortality than typical wet flatwoods. In the past two decades, intense fires have converted large areas of these pine/cypress stands to open, prairie-like communities with small pines and cypress regenerating, which offers an opportunity to actively choose the next stand of overstory trees as hydrological restoration continues.

Drainage of wet flatwoods has resulted in expansion of cabbage palm dominance and decreases in plant (and animal) diversity and is also very susceptible to invasion by melaleuca when over-drained. If over-drainage continues, there could be an increase in

palmetto-dominated prairie from historic conditions. Both tracts have seen an increase in the wet flatwoods plant community.

The fauna currently found in many of the wet flatwoods areas mimic those in the desired future conditions. The main difference is that the diversity and abundance of other species and the distribution of indicator species (e.g., RCWs) are somewhat limited. Faunal diversity and abundance should increase with the adoption of a frequent fire regime, along with restoration of hydrology and native plants.

Hydrology alteration and subsequent intense wildfires have altered the structure of many flatwoods stands on the SGGE tract. The natural pine canopy of these areas has been mostly lost, and the community is now a stand of almost entirely cabbage palms, frequently all but indistinguishable from the adjacent palm-dominated strand swamps. Even in flatwoods that retain a pine canopy, cabbage palms often form a dense midstory with isolated pine islands.

Conversely, some historically pine-dominated areas in the SGGE tract that have been protected from fire by roads and clearings are now overgrown with swamp laurel oak (*Quercus laurifolia*) and other woody species. These stands, although retaining some pine trees, are probably functioning as hammocks. Dense palm stands occur on calcareous substrates in both natural uplands and uplands created by drainage.

Wet flatwoods on Picayune Strand State Forest are heavily impacted by non-native invasive plant infestation, particularly melaleuca (*Melaleuca quinquenervia*). Other problem species include cogongrass (*Imperata cylindrica*), torpedo grass (*Panicum repens*), Brazilian pepper (*Schinus terebinthifolia*), and Caesar's weed (*Urena lobata*). The large palm savannah on the northwest portion of the Belle Meade tract has an increasing population of earleaf acacia (*Acacia auriculiformis*), and frequent downy rose myrtle (*Rhodomyrtus tomentosa*).

Historical wet flatwoods were the main natural community converted to agricultural fields. Some of these now abandoned fields maintain a semblance of wet flatwoods structure, with some pines and abundant cabbage palms. However, most are completely overgrown with Brazilian pepper, and all have extensive bedding that impedes natural sheet flow.

Restoration of pine flatwoods communities to their original condition will likely take several decades, once pre-development hydrology has been restored. Since the canopy pine were probably about 50-100 years old, where they have been eliminated or greatly reduced in numbers, it will take longer. Where most of the older pine are still present, but have been invaded by palms or hardwoods, it should take less time. The application of an appropriate fire regime and/or chemical/mechanical clearing would expedite the recovery of these latter sites. Certain areas are not expected to be restored, such as those located upstream of the pumps and spreader system. Also, those areas where canals and roads have not been removed will obviously not be restored.

There has been a substantial increase in the acreage of pine flatwoods that have been heavily invaded by sabal palms, which provide 30% or more understory cover. These palms are usually of similar size and appear to be even-aged. Dense palm stands occur on calcareous substrates in both natural uplands and uplands created by drainage. The open character of the canopy and shrub strata and the dense groundcover are maintained by intense and frequent fires. Epiphytes are not common due to the small number of trees and their limited branching, as well as the frequent fires.

MANAGEMENT RECOMMENDATIONS

Management goals for wet flatwoods at Picayune Strand State Forest should focus on removal of non-native invasive plant species, increasing the use of prescribed fire, management for a sustainable red-cockaded woodpecker population, controlling cabbage palms, thinning overstocked stands, and providing conditions for pine regeneration.

Non-native invasive plant control will focus on FLEPPC category 1 and 2 listed plants, particularly melaleuca and cogon grass.

Prescribed burns should be used on a 2 to 4-year cycle with a focus on reducing fuel loads and promoting pine regeneration. Prior to burning, it is advisable to protect red-cockaded woodpecker cavity trees (through understory and midstory thinning) to avoid a loss of large pines. In abandoned fields that are surrounded by this community type and where bedding disrupts natural hydrology, the ground surface should be leveled wherever possible. A mosaic pattern of prescribed burning, simulating natural historic fire patterns, is expected to produce the highest species diversity.

The use of plowed firebreaks and other practices that disturb the soil should be minimized; existing roads and wetlands should be used for firebreaks whenever possible. New ground disturbances should be avoided to prevent elimination of the natural groundcover and establishment of weedy species. Depth of plowed firebreaks should be minimized to prevent hydrologic alteration.

To help re-establish wet flatwoods, a program to implement silvicultural practices, including harvesting, thinning, burning and reforestation, will begin to establish a healthy forest with an age distribution that best duplicates natural conditions. Well timed and executed timber harvests play an integral role in the health of the forest, to reestablish native species and thin dense forest stands to improve under-story habitat. This allows for less damaging prescribed burns and improved forest health. Swamp cabbage, cabbage palm, and palm frond harvest will be permitted to reduce densities, especially in RCW forage and recruitment areas. Site preparation can include roller chopping, forestry mowing, and chemical treatment of non-native invasive plants. Roller chopping should be limited in areas that support a high diversity of native species. Coordination will occur with FWC to leave some areas of large saw palmettos for panther denning. The goal for management of south Florida slash pine is for a basal area between 30 and 90 square feet per acre on average, and thinning operations may be necessary to help move a stand along in the recovery cycle or to limit wildfire risk.

L. Wet Prairie – 291 acres

Wet prairie is a herbaceous community found on continuously wet sites inundated from 0-12 inches for two to six months per years on somewhat flat or gentle slopes between lower elevation swamps and slightly higher wet or mesic flatwoods. Trees and shrubs are absent or very sparse. These communities are usually dominated by graminoids.

The herbaceous layer is diverse and composed mainly of hairawn muhly (*Muhlenbergia capillaris*), Gulf hairawn muhly (*Muhlenbergia capillaris* var. *filipes*), blue maidencane (*Amphicarpum muehlenbergianum*), and/or Gulfdune paspalum (*Paspalum monostachyum*), along with a diversity of other species such as sawgrass (*Cladium jamaicense*), narrow-leaved Carolina scalystem (*Elytraria caroliniensis* var. *angustifolia*), oakleaf fleabane (*Erigeron quercifolius*), rattlesnakemaster (*Eryngium aquaticum*), Baldwin's eryngo (*Eryngium baldwinii*), dogfennel *(Eupatorium capillifolium*), pineland heliotrope (Euploca polyphylla), rosy camphorweed (Pluchea baccharis), Baldwin's milkwort (*Polygala balduinii*), beaksedge (*Rhynchospora* spp.), water pimpernel (*Samolus ebracteatus*), and water toothleaf (*Stillingia aquatica*).

Shrubs and trees are sparse, composed of widely scattered southern bayberry (*Morella cerifera*), peelbark St. John's wort (*Hypericum fasciculatum*), south Florida slash pine (*Pinus elliottii* var. *densa*), cabbage palm (*Sabal palmetto*), and pond cypress (*Taxodium ascendens*).

At Picayune Strand State Forest, historic wet prairies were mainly found on the Belle Meade tract. These appear as an open, smooth signature on the 1962-63 photographs. Because of the difficulty in distinguishing these from open wet flatwoods, prairies were only mapped on areas that have remained relatively free of trees. These are calcareous wet prairies and are very similar to the marl prairies which also occur on the forest. NRCS soil maps were used to distinguish wet prairies occurring on sands from marl prairies occurring on fine sandy loam and silt loam, but there is a high degree of overlap between the two communities.

Wet prairie naturally burns on a frequency similar to that of wet and mesic flatwoods, every 2 to 3 years during the months of April – June. Wet prairies require frequent, low intensity ground fires to maintain graminoid groundcover and minimize woody vegetation encroachment. 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.

Wet prairies are considered extremely important in providing breeding and foraging habitat for a variety of herpetofauna and wading birds. Characteristic animals include wood stork, Florida panthers, round-tailed muskrat, cotton rat, river otter, American alligators, a variety of fishes, mud turtles, Florida chicken turtle, pig frog, cottonmouth, mud snake, common buckeye, marsh rabbit, the anhinga, common moorhen, wading birds such as great blue heron, great egret, wood stork, and white ibis. Amphibians such as the central newt, two-toed amphiuma, Everglades dwarf siren, Florida cricket frog, green treefrog, squirrel treefrog, oak toad, and southern toad use these wetlands for breeding.

EXISTING CONDITION

Most wet prairies appear to be similar to the presumed historical condition, although pines seem to have increased in some. Melaleuca (*Melaleuca quinquenervia*) is a frequent non-native invasive species in wet prairies at Picayune Strand State Forest.

Large areas of former strand swamps and cypress/pine/palm flatwoods on the Belle Meade tract have been impacted by severe wildfires that have removed most of the canopy. These are now open and prairie-like, but pines and cypress will likely re-colonize the areas.

MANAGEMENT RECOMMENDATIONS

The major factors regulating wet prairie dynamics are: hydroperiod, water quality, sea level change, hurricanes and tropical storms, freezes, fire regimes, non-native invasive pest species, and water control practices. Restoration of this vegetation type will focus on the three following priorities: non-native invasive and nuisance vegetation eradication and control, hydrological restoration (with seasonally variable hydroperiod to maximize vegetative diversity) and prescribed burning. Since most of the wet prairie acreage is still currently intact in the southern portion of SGGE, restoration of this habitat to pre-development condition should be relatively expeditious once the pre-development hydrology has been restored. Some small areas will not be restored, including those upstream of the pumps and spreader canals and where canals and roads are not scheduled to be removed. Otherwise the restored hydrology and an appropriate fire regime could be expected to restore most of the altered SGGE wet prairies to their original condition within a decade. Control of illegal OHV use is critical to the restoration of these areas.

Management goals should focus on maintaining wet prairies through frequent prescribed fires, hydrology restoration, and non-native invasive plant removal. Fire at short intervals (every 2 – 3 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 a practicable. All areas will be monitored for FLEPPC category I and II nonnative invasive species and will be controlled/eradicated prior to conducting any silvicultural operations.

M. Other Altered Landcover Types – 9,563 acres

Altered landcover types are mapped where the natural community has been overwhelmingly altered as a result of human activity. 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. Refer to the appropriate community type for a more specific explanation of the desired future condition.

EXISTING CONDITIONS

Altered landcover types on Picayune Strand State Forest comprise abandoned field/abandoned pasture, artificial ponds, canals/ditches, clearings, developed areas, roads, spoil areas, and utility corridors.

Abandoned field/abandoned pasture (1,315 acres) – Large areas of mostly former wet flatwoods on the south side of Belle Meade and the southwest corner of the SGGE tract were converted in the past to agriculture and then abandoned. The areas are easily recognizable from LiDAR elevation data that show the old bedding. These areas now range from wet flatwoods-like areas of mostly cabbage palm to dense stands of Brazilian pepper.

Artificial pond (322 acres) – As part of ongoing hydrology restoration on the SGGE tract, three large "spreader basins" have been installed as part of the pump stations that will distribute water back over the landscape. A few more very small ponds are found throughout the property.

Canal/ditch (1,012 acres) – Picayune Strand State Forest has four large canals that run north/south, forming the Faka-Union Canal system that merges on the south side of the SGGE tract. The two easternmost canals have been restored, now appearing as a series of ponds through a large linear clearing.

Clearing (5,950 acres) – There are numerous clearings throughout Picayune Strand State Forest. The largest acreage comes from the vast network of roads installed for the planned Golden Gates Estates development. Existing roads generally have large clearings on either side. Wide clearings also flank east/west roads that have been returned to grade. In addition, wide firebreaks plowed in Belle Meade for control of recent wildfires and old tram lines on the SGGE tract were also mapped as clearings.

Developed (183 acres) – The largest developed areas are the three pump stations on the north side of the SGGE tract. Other developed areas include smaller acreages of trailheads, offices, and campsites.

Road (600 acres) – Roads at Picayune Strand State Forest include a network of paved roads, limerock roads, and other vehicle trails. Roads ≥5 meters wide are delineated on the current natural community map and may include associated ditches.

Spoil area (179 acres) – As part of the pump station construction, a large "tieback levee" has been installed running almost all the way east/west across the SGGE tract. This is a tall berm of fill material mapped as "spoil area" on the current natural community map.

Utility corridor (2 acres) – A small powerline was mapped leading to the construction office on the north side of the SGGE tract. Although not mapped, additional powerlines are installed along several roads.

MANAGEMENT RECOMMENDATIONS

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 due to previous disturbance. 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. Monitoring of these communities will remain important. Control of all FLEPPC Category 1 and 2 non-native invasive species will be ongoing. As

opportunities appear, it may be possible to include these altered landscape types with other communities.

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IX. Glossary of Abbreviations

ACSC .....Area of Critical State Concern
ARC .....Acquisition and Restoration Council
BMP .....Best Management Practices
CARL.....Conservation and Recreation Lands
CERP.....Comprehensive Everglades Restoration Plan
CHHA .....Coastal High Hazard Area
DHR .....Division of Historical Resources
DOI .....Department of Interior
FDACS.....Florida Department of Agriculture and Consumer Services
FDEP.....Florida Department of Environmental Protection
FFS .....Florida Forest Service
FNAI .....Florida Natural Areas Inventory
FWC.....Florida Fish and Wildlife Conservation Commission
GMP.....Growth Management Plan
NRCS .....Natural Resources Conservation Service
NRPA.....National Resource Protection Area
SFWMD.....South Florida Water Management District
MOA .....Memorandum of Agreement
OALE.....DACS Office of Agricultural Law Enforcement
OFW.....Outstanding Florida Water
OOF.....Operation Outdoor Freedom
P2000 .....Preservation 2000
TIITF.....Board of Trustees of the Internal Improvement Trust Fund
PSSF.....Picayune Strand State Forest
USACE .....United States Army Corp of Engineers
USFWS .....United States Fish and Wildlife Service
WMA .....Wildlife Management Area