

# Florida Department of Environmental Protection

Marjory Stoneman Douglas Building 3900 Commonwealth Boulevard Tallahassee, Florida 32399-3000 Rick Scott Governor

Carlos Lopez-Cantera Lt. Governor

> Noah Valenstein Secretary

October 19, 2018

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

#### **RE:** Jennings State Forest - Lease No. 3946

Dear Mr. Davis:

On October 19, 2018, the Acquisition and Restoration Council (ARC) recommended approval of the Jennings State Forest management plan. Therefore, Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the Jennings State Forest management plan. The next management plan update is due October 19, 2028.

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.

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.

Raymond V. Spaulding Chief, Office of Environmental Services Division of State Lands Department of Environmental Protection

# **TEN-YEAR LAND MANAGEMENT PLAN**

### FOR THE

# JENNINGS STATE FOREST

### CLAY AND DUVAL COUNTIES



# PREPARED BY THE

#### FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

#### FLORIDA FOREST SERVICE

APPROVED ON

OCTOBER 19, 2018

# TEN-YEAR LAND MANAGEMENT PLAN

# FOR THE

# JENNINGS STATE FOREST



Approved by: Jim Karels, Director Florida Forest Service 2018

Date

John Sabo, Chief of Field Operations

10/19/208

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#### LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY:Florida Department of Agriculture and Consumer Services, Florida Forest ServiceCOMMON NAME:Jennings State ForestLOCATION:Clay County and Duval CountyACREAGE TOTAL:25,152.12 acres (more or less)

Historic Natural	Approximate
Communities	Acreage
Basin Swamp	974
Blackwater Stream	33
Depression Marsh	120
Floodplain Swamp	Unknown *
Mesic Hammock	45
Scrubby Flatwoods	72
Wet Flatwoods	3,834

\* Inclusions in bottomland forest and mesic hammock

# TIITF LEASE AGREEMENT NUMBER: 3946 USE: Single \_\_\_\_\_ Multiple \_X

MANAGEMENT AGENCY

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

Historic Natural	Approximate
Communities	Acreage
Baygall	1,050
Bottomland Forest	3,139
Dome Swamp	594
Mesic Flatwoods	7,521
Sandhill	7,687
Upland Mixed Woodland	52
Xeric Hammock	114

#### RESPONSIBILITY

General Forest Resource Management Wildlife Resources & Laws Water Resource Protection & Restoration Historical & Archaeological Resource Management

DESIGNATED LAND USE:	Multiple-Use State Forest
SUBLEASES:	One (1) grazing agreement
ENCUMBRANCES:	Multiple, See II.D.6
TYPE ACQUISITION:	Preservation 2000, Conservation and Recreation Lands, and Save Our
	Rivers programs
UNIQUE FEATURES:	North Fork of Black Creek, Yellow Water Creek, Blackwater stream
ARCHAEOLOGICAL / HIS	TORICAL: Twenty-seven (27) known sites
MANAGEMENT NEEDS:	Ecosystem Restoration
ACQQUISITION NEEDS:	Approximately 16,000 additional acres located in the Optimal
	Management Boundary
SURPLUS ACREAGE:	None
PUBLIC INVOLVEMENT:	2009 and 2013 Land Management Reviews, Management Plan Advisory
	Group and Public Hearing, and DEP Acquisition and Restoration Council
	Public Hearing.

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

Comments:

ARC Approval Date: \_\_\_\_\_ BTIITF Approval Date: \_\_\_\_\_

#### I. Introduction

Jennings State Forest (JSF) is located in both northwestern Clay County and southern Duval County; with more than 15 different natural community types comprising approximately 25,152 acres. Some of the communities found here include sandhill, flatwoods, blackwater stream, and dome swamp. The high-quality condition of these communities is exemplified by the diversity of plants and animals found within them.

In 1990, the first major acquisitions of JSF were purchased by the State of Florida's Conservation and Recreation Lands, Preservation 2000, and the Save Our Rivers programs. The goal of these programs is to protect the North Fork of Black Creek and Yellow Water Creek, as well as the upland areas that border these outstanding waterways.

The forest is open for hiking, bicycling, canoeing, horseback riding, and wildlife viewing. Drive-up, primitive campsites are available at the Hammock Campground, as well as hike-incamping at the North Fork Black Creek and Dunn's Creek Primitive Camp Zones. JSF is open to regulated hunting and fishing under the direction of the Florida Fish and Wildlife Conservation Commission. We encourage non-hunting recreationists to check the Jennings Wildlife Management Area regulations and season dates before visiting JSF.

#### 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 JSF 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 JSF will be accomplished with the following strategies:

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

next ten-year period and outlines the major concepts that will guide management activities on the forest.

#### B. <u>Past Accomplishments</u>

A compilation of management activities and public use on JSF 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 [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 2007, there have been many events, developments, and accomplishments. Among the most noteworthy have been the following:

- Forest Management
  - Annual forest inventory averaged greater than 10% annually 33,193 acres total
  - o 334 acres planted in longleaf pine
  - Six (6) timber sales covering approximately 1,400 acres
- Fire Management
  - Conducted 26,399 acres of prescribed fire
  - Maintained hundreds of miles of fireline, eliminated firelines where appropriate
  - o Extinguished 26 wildfires on JSF
- Road / Boundary Management
  - o 23 miles of forest road were rebuilt / improved
  - o 554 miles of road grading
  - o 17 culverts replaced, one (1) low water crossing installed
  - Maintained 77 miles of forest boundary
- Recreation Management
  - Estimated over 333,000-day use forest visits, 1,343 overnight camping visits
  - o 12 recreation sites overall maintained
  - o Two (2) new recreation sites created
  - Two (2) new horse trails established
  - One (1) new hiking trail established
  - One (1) new campground opened (Bootlegger's Campground)
- Biological Management
  - o Groundcover restoration project on 40 acres of sandhill
  - o Invasive species control of nine (9) species on 196 acres
  - Herbicide treatments on 565 acres for timber stand improvement
  - o 16 academic studies / surveys throughout the forest
- Education / Public Outreach
  - 199 forest related program events, programs include, local schools, clubs, and professional groups
  - o 39 radio, television, and print articles featuring forest activities

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

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

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

#### > <u>GOAL 1</u>: 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 Objective)

#### **Performance Measures:**

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

**Objective 2**: Continue to implement the FFS process for conducting stand descriptions and forest inventory including 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). (Ongoing Objective)

#### **Performance Measures:**

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

**Objective 3**: Conduct forest inventory updates each year according to established criteria in the State Forest Handbook. (Ongoing Objective)

Performance Measure: Number of acres inventoried annually.

#### **<u>GOAL 2</u>**: Public Access and Recreational Opportunities

**Objective 1**: Maintain public access and recreational opportunities that are compatible with multiple-use management. (Ongoing Objective)

Performance Measure: Number of visitor opportunities per day.

**Objective 2**: Evaluate additional public access and recreational opportunities that are compatible with multiple-use management. (Long Term Objective) **Performance Measure**: Number of additional visitor opportunities evaluated.

**Objective 3**: In order to continue to safely integrate human use into JSF, follow the Five-Year Outdoor Recreation Plan and update annually. (Ongoing Objective)

#### **Performance Measures:**

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

**Objective 4**: Continue to involve and meet with the liaison panel. The panel consists of a mix of local residents, community leaders and special interest group representatives (canoe vendors, hunters, trail hikers, military, organized equestrian groups, etc.), environmental groups, and other public / private entities to establish communication and seek constructive feedback regarding the management of JSF. (Ongoing Objective)

#### **Performance Measures:**

- Liaison group remains organized.
- Annual meetings continue.

**Objective 5**: Assess the development of creekside recreation areas accessible from the Old Jennings and Long Branch Tracts. (Short Term Objective)

#### **Performance Measures:**

• Evaluation complete.

#### **<u>GOAL 3</u>**: Habitat Restoration and Improvement

**Objective 1**: Utilize prescribed fire to enhance restoration of native groundcover. Evaluate areas where native groundcover has been eliminated or heavily impacted from historical land use on a case by case basis for alternative methods to address reestablishment of native groundcover plants. Restore native groundcover where it has been eliminated or heavily impacted from historical land use. (Long Term Objective) **Performance Measure**: Number of acres restored.

#### **GOAL 4:** Fire Management

**Objective 1**: The JSF currently contains approximately 18,110 acres of fire dependent communities. JSF staff will conduct habitat / natural community improvement on the forest annually. In order to achieve an average fire return interval of two (2) to five (5) years across the forest, FFS will attempt to prescribe burn an average of approximately 3,600 to 9,000 acres per year. Currently, FFS staff estimates 7,466 acres at JSF are within the desired fire management interval. (Ongoing Objective)

#### **Performance Measures**:

- Number of acres burned during the dormant and growing seasons, and number of acres burned within target fire return interval.
- Number of acres with restoration underway. This restoration would include prescribed burning.

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

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

**Objective 3**: Reduce the threat of wildfire within the Wildland Urban Interface on JSF and the surrounding community through a comprehensive mitigation strategy that includes evaluating vegetative fuels near residential areas and identifying potential fuel reduction projects. (Long Term Objective)

#### **Performance Measures:**

- Evaluation complete.
- Should the evaluation determine that fuel reduction is necessary, number of acres treated for fuel reduction.

#### 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 (FWC), develop a Wildlife Management Strategy addressing the wildlife species for JSF, with emphasis on imperiled species and associated management prescriptions for their habitats. (Long Term Objective)

#### **Performance Measures:**

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

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

Performance Measure: Number of species for which monitoring is ongoing.

#### **<u>GOAL 6</u>**: Non-Native Invasive Species Maintenance and Control

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

#### **Performance Measures:**

- Total number of acres identified and successfully treated.
- Annual updates of the Five-Year Ecological Plan completed.
- Continue to maintain JSF invasive database for maintaining and updating invasive information annually.

#### **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 Objective) **Performance Measure**: Number of recorded sites.

**Objective 2**: Monitor recorded sites and send updates to the DHR Florida Master Site File as needed. (Ongoing Objective) **Performance Measure**: Number of sites monitored. Reports submitted to DHR.

**Objective 3**: Maintain at least one (1) qualified staff member as an archaeological resource monitor. (Ongoing Objective) **Performance Measure**: Number of local staff trained.

#### **<u>GOAL 8</u>**: Hydrological Preservation and Restoration

**Objective 1**: Conduct or obtain a site assessment / study to identify potential hydrology restoration needs. (Long Term Objective) **Performance Measure**: Assessment conducted.

**Objective 2**: Protect water resources during management activities through the implementation of Silviculture Best Management Practices (BMPs) that are applicable to JSF and may include, but not limited to forest roads, construction of pre-suppression firelines, timber stand improvement activities, sinkholes, etc. (Ongoing Objective) **Performance Measure**: Percent compliance with state lands BMPs.

**Objective 3**: 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. (Ongoing Objective)

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

#### **<u>GOAL 9</u>**: Capital Facilities and Infrastructure

**Objective 1**: JSF staff, along with help from volunteers and/or user groups, will continue maintenance of 16 parking areas and trailheads, 57 miles of trails, and 65 miles of primary, secondary, and tertiary roads. (Ongoing Objective)

**Performance Measure**: The number of existing facilities, miles of roads, and miles of trails maintained.

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

#### **Performance Measures**:

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

**Objective 3**: Continue to implement the Five-Year Boundary Survey and Maintenance Management Plan and update annually. The entire boundary will be reworked at minimum every five years including harrowing, reposting signage, and repainting boundary trees. (Ongoing Objective)

#### **Performance Measures:**

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

• Annual updates of the Five-Year Boundary Survey and Maintenance Management Plan completed.

#### II. Administration Section

#### A. Descriptive Information

#### 1. <u>Common Name of Property</u>

The common name of the property is the Jennings State Forest.

#### 2. Legal Description and Acreage

The JSF is comprised 25,152.12 acres, more or less.

JSF is located in Clay County and Duval County in northeastern Florida. The forest is approximately 10 miles southwest of Jacksonville and 5 miles west of Orange Park.

The boundaries and the major parcels are identified in Exhibit B. The JSF is located in all or part of Sections 20, 29, 32-33, Township 3 South, Range 24 East, Duval County, Florida; Sections 1, 2, 10-15, 22-24, 26, 27, and 35, Township 4 South, Range 23 East; Sections 3-11, 14-22, 27-29, and 32-34, Township 4 South, Range 24 East; Sections 2-4, 9-11, and 14, Township 5 South, Range 23 East; and Sections 4 & 5, Township 5 South, Range 24 East, Clay County, Florida.

	FUNDING SOURCE	ACRES*
CARL/SOR	Conservation and Recreation Lands/Save Our Rivers	7,918.34
P2000	Preservation 2000	12,648.73
P2000/SOR	Preservation2000/Save Our Rivers	3,331.99
SOR	Save Our Rivers	1,159.00

#### Table 1. JSF Acreage by Funding Source

\* Remaining acreage acquired through other sources

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

#### 3. Proximity to Other Public Resources

Lands managed by state, federal, or local government for conservation of natural or cultural resources that are located within approximately 25 miles of the JSF are included in Exhibit F as well as the table below:

TRACT	AGENCY	DISTANCE
Cecil Commerce Center	City of Jacksonville	Adjacent to northeast
Camp Blanding	DMA	Adjacent to south
Branan Field Mitigation Park	FWC	1 mile northeast
Black Creek Ravines Conservation Area	SJRWMD	3 miles southeast
Raiford Wildlife Management Area	FWC	7 miles west
Cary State Forest	FFS	15 miles north
Mike Roess Gold Head Branch State Park	DRP	20 miles south
Belmore State Forest	FFS	20 miles southeast
Bayard Conservation Area	SJRWMD	23 miles southeast

 Table 2. Nearby Public Conservation Land and Easements

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

FFS – Florida Forest Service DMA – Department of Military Affairs FWC – Florida Fish and Wildlife Conservation Commission SJRWMD – St. Johns River Water Management District

#### 4. Property Acquisition and Land Use Considerations

The primary mission of the FFS in managing JSF is to protect the Upper Black Creek watershed and surrounding forest uplands through a stewardship ethic to assure these resources will be available for future generations. These parcels are assigned to the FFS for management under Lease Agreement number 3946. JSF was purchased under the CARL and SOR acquisition programs, utilizing CARL, P2000, and SOR funds as part of the Upper Black Creek CARL project. The 15,303.55 acres of land owned by the Board of Trustees of the Internal Improvement Trust Fund was purchased through use of CARL and P2000 funds. The 9,206.59 acres owned by the SJRWMD was purchased with P2000 and SOR funds and 40.07 acres were acquired through mitigation. Also, acreage in JSF was acquired through donation and Murphy Act lands.

#### **Table 3. Parcel Acquisition**

Parcel Name	Deed Date	Lease Date	Lease No.	Acres (County)
JENNINGS, S. BRYAN JR.	10/22/1991	6/4/1992	3946	6,265.00 (Clay)
ODUM, LINDA JENNINGS	2/11/1992	6/4/1992	3946	814.12 (Clay)
JENNINGS	8/15/1990	9/23/1992	WMD	3,861.99 (Clay)
JENNINGS	10/31/1990	9/23/1992	WMD	2,466.67 (Clay)
SAN LEBRYDO LUMBER CO.	4/14/1992	9/23/1992	WMD	588.65 (Clay)
WARD, MARJORIE S. & FRED W. FOREHAND	6/16/1992	3/25/1993	3946	621.13 (Clay)
HUNTLEY	7/1/1993	9/14/1994	WMD	639.39 (Clay)
SPENSER, PHILIP	7/1/1993	9/14/1994	WMD	361.64 (Clay)
SANDRIDGE, DOROTHY J. & GORDON R.	3/30/1993	8/17/1994	3946	4,914.46 (Clay)
THOMAS, PATRICIA A.	12/28/1995	10/14/1998	WMD	15.93 (Clay)
WALLACE - JEA	8/29/1994	10/14/1998	WMD	40.07 (Clay)
DEESE, DEBRA	3/30/1995	9/10/1997	3946	34.02 (Clay)
JACKSON, BENNETT F. ESTATE & HATCHER	1/2/2002	5/3/2002	WMD	73.25 (Clay)
LONGLEAF TIMBER CO., BLACK TIMBER INVESTMENTS	5/24/2001	11/17/2003	3946	402.34 (Duval)
LONGLEAF TIMBER CO., COCHISE PINES INVESTMENTS	5/24/2001	11/17/2003	3946	324.77 (Duval)
TPL, LONG BRANCH FARMS	11/27/2001	11/17/2003	3946	1,839.61 (Clay)
LONGLEAF TIMBER CO., LONGLEAF TIMBER INVESTMENTS	5/24/2001	11/17/2003	3946	372.73 (Duval)
LONGLEAF TIMBER CO., TIMBER FOREST TRAIL INVESTMENTS	5/24/2001	11/17/2003	3946	80.58 (Duval)
LONGLEAF TIMBER CO., YELLOW WATER INVESTMENTS	5/24/2001	11/17/2003	3946	278.71 (Duval)
SANDRIDGE & JENNINGS.	4/25/1973	12/4/2009	3946	2.02 (Clay)
SEACOAST GAS TRANSMISSION, LLC.	5/3/2012	9/13/2013	3946	36.04 (Clay)
PARTIAL RELEASE OF LEASE – LONGLEAF TIMBER CO., YELLOWWATER INVESTMENTS	5/24/2001	1/29/2014	3946	-40.00 (Duval)
301 LAND INVESTMENTS – PHASE I ROMA	5/19/2011		WMD	378.00 (Clay)
301 LAND INVESTMENTS – PHASE II ROMA	8/15/2011		WMD	781.00 (Clay)

# B. Management Authority, Purpose, and Constraints

#### 1. <u>Purpose for Acquisition / Management Prospectus</u>

Management is conducted by The Florida Department of Agriculture and Consumer Services, FFS, with assistance, as warranted, from other agencies. FFS is the manager of forest resources, recreation, water resource protection, watershed protection, and land use planning on JSF.

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

Multiple-use management for JSF 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 native ecosystems ensuring the long-term viability of populations and species listed as endangered, threatened, or rare, and other components of biological diversity, including game and non-game wildlife and plants;
- Protect known archaeological, historical, and cultural resources;
- Restore, maintain and protect hydrological functions related water resources and the health of associated wetland and aquatic communities;
- 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. The St. Johns River Water Management District (SJRWMD) holds a portion of the fee simple title on part of JSF.

#### 3. Designated Single or Multiple-Use Management

JSF 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 3946.

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

#### 4. <u>Revenue Producing Activities</u>

Numerous activities on JSF provide for multiple-use as well as generate revenue to offset management costs. Revenue producing activities will be considered when they have been determined to be financially feasible and will not adversely impact

management of the forest. Current and potential revenue producing activities for the JSF include, but are not limited to:

- Timber Harvests Timber harvests on JSF will be conducted on a regular basis to improve forest health, promote wildlife habitat, restore plant communities, and provide other benefits.
- Recreation Fees Fees are currently collected for day use activities, camping, annual passes, and vendor / special use permits.
- Apiary Leases Apiary leases will be issued to local vendors as space allows.
- Fuelwood Permits Fuelwood permits will be issued for the cutting of oak trees in designated removal areas.
- The Griffin grazing agreement (15.2 acres) was executed on May 24, 2006 and is expired needing to be assessed for renewal.

#### 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. <u>Legislative or Executive Constraints</u>

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

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

#### 7. Aquatic Preserve / Area of Critical State Concern

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

#### C. Capital Facilities and Infrastructure

#### 1. <u>Property Boundaries Establishment and Preservation</u>

JSF boundary lines, 78 miles in total, are managed by state forest personnel in accordance with the guidelines of the State Forest Handbook. There are 38 gates throughout JSF 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. <u>Improvements</u>

Buildings / Recreation infrastructure present on the JSF include:

**a.** Main Office Headquarters (Resource Staff)

- b. Auxiliary Office (Operations Staff)
- c. Cecil Field / Duval County Office Headquarters (In progress)
- **d.** Pole Barn with attached workshop
- e. Three (3) Storage Sheds / Two (2) Federal Excess Conex Buildings
- **f.** Three (3) Well Pumphouses
- **g.** Four (4) Recreation Restroom Facilities
- **h.** Four (4) Recreational Picnic Pavilions
- i. Two (2) Viewing Platforms
- j. Two (2) Wildlife Viewing Blinds
- k. 15 Kiosks

See [Exhibit D] for a map of the facilities, recreation, and improvements at JSF.

#### 3. <u>On-Site Housing</u>

There are no residences located on JSF.

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

#### 4. **Operations Infrastructure**

#### a. Operations Budget

For Fiscal Year 2015-2016, the total annual budget for JSF was \$663,152.00. This amount includes salaries, expenses, contractual services, OPS, etc. A summary budget for JSF is contained in [Exhibit W]. Implementation of any of the activities within this management plan is contingent on availability of funding, other resources, and other statewide priorities.

#### b. Equipment

Equipment assigned to the JSF includes: four (4) pick-up trucks, a type-6 engine, tractor plow and transport unit, stake body dump truck, dump truck, farm tractor, road tractor, lowboy trailer, grader, packer, backhoe, ATV (4-wheeler) and UTV.

JSF also provides support for fuel and maintenance for vehicles assigned District wide for a Mechanic, Resource Administrator, and Recreation Coordinator.

#### c. Staffing

Six (6) people are assigned to JSF – Forestry Supervisor II, Forester, two (2) Senior Forest Rangers, Forest Ranger, and Administrative Secretary. Additional FFS employees provide support to forest resource planning, administrative function, and

work project coordination support including the Clay County Forest Area Supervisor, District Recreation Coordinator, OPS Biologist, and additional Clay County based forest rangers. Other personnel and equipment from the Jacksonville District are occasionally used to assist with management activities at JSF.

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

#### D. Additional Acquisitions and Land Use Considerations

#### 1. Alternate Uses Considered

No alternate uses are being considered at this time. Alternate uses will be considered as requests are made and will be accommodated as appropriate if they are determined to be compatible with existing uses and with the management goals and objectives of the forest. Uses determined as incompatible include but are not limited to: water resource development projects, water supply projects, storm-water management projects, pivot irrigation, sewage treatment facilities, linear facilities, sustainable agriculture, off highway vehicle use, dumping, mining, and oil well stimulation (e.g. hydraulic fracturing/fracking), or as determined by law, regulation, or other incompatible uses as described elsewhere in the management plan.

#### 2. Additional Land Needs

The acquisition of additional land within the optimal management boundary would serve to facilitate the restoration and protection of the natural resources found on JSF.

The land adjacent to JSF on the eastern, northern, southern, and western borders should be considered for acquisition [Exhibit C]. In addition to the remainder of this CARL project, three inholding parcels have been identified as desirable for acquisition as additions to this state forest. Each parcel is described below:

- Griffin Inholding 120-acre inholding, property is currently being used by landowner for hunting and cattle grazing
- Warth Inholding 40-acre inholding, property did have a single resident but is now currently vacant
- Carter Inholding 5-acre inholding currently only used for hunting purposes by current owner

#### 3. <u>Surplus Land Assessment</u>

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 JSF 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 JSF is recommended for potential surplus.

#### 4. Adjacent Conflicting Uses

Residential and commercial development adjacent to and within several miles of the JSF boundary may hinder prescribed burning due to smoke management concerns.

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

#### 5. <u>Compliance with Comprehensive Plan</u>

This plan was submitted to the Board of County Commissioners in Clay County and Duval County for review and compliance with their local comprehensive plans [Exhibit U].

#### 6. <u>Utility Corridors and Easements</u>

The following are reservations or easements on JSF:

- **a.** An adjoining Florida Power and Light Company (FPL) power line right-of-way and underground TECO Gas Line bisects the northern portion of the forest in Clay County in a northwest to southeast direction. The right-of-way is 425 feet wide and over 4.75 miles long.
- **b.** Sea Coast/TECO Gas Line This underground gas line follows the JSF boundary on the north side of the Long Branch Tract, west boundary south of Long Branch Road, west boundary north of Long Branch Road to Duval County Line, then east along north boundary to connect to the FPL right-of-way. The right-of-way is 75 feet wide and approximately 4 miles long.
- **c.** Peoples Gas Systems This underground gas line bisects the Long Branch Tract from SR 217 in a northeasterly direction. The right-of-way is 100 feet wide and approximately one-mile long.
- **d.** An FPL owned parcel divides part of the Long Branch Tract. This utility corridor runs in a south to north direction. It is 328 feet wide and approximately one-mile long.
- e. American Telephone and Telegraph Company (AT&T) bisects the upper northern section of the Yellow Water Tract in a southwest to northeast direction, south of Normandy Blvd. The right-of-way is 40 feet wide and 0.3 miles long.
- **f.** Houston Texas Gas and Oil Corporation This underground gas and oil line bisects the upper northern section of the Yellow Water Tract in a southwest to northeast direction, just south of the AT&T right-of-way. The right-of-way is 40 feet wide and 0.7 miles long.

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

When such encroachments are unavoidable, previously disturbed sites will be the preferred location. The objectives, when identifying possible locations for new linear facilities, will be to minimize damage to sensitive resources (e.g., listed species and archaeological sites), to minimize habitat fragmentation, to limit disruption of management activities, including prescribed burns, 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 SJRWMD. Requests for linear facility uses will be handled according to the Governor and the Cabinet's linear facilities policy.

#### E. Agency & Public Involvement

#### 1. <u>Responsibilities of Managing Agencies</u>

FFS is the lead managing agency, responsible for overall forest management and public recreation activities, as stated in TIITF Management Lease number 3946. Pursuant to the management lease, the lead managing agency may enter into further agreements or to subleases on any part of the forest.

FWC has law enforcement responsibilities, enforces hunting regulations, cooperatively sets hunting season dates with FFS, and conducts other wildlife management activities with input from FFS. FWC has established a Wildlife Management Area on JSF.

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. FFS will consult DHR prior to the initiation of ground disturbing activities as required per DHR guidelines

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

#### 2. Law Enforcement

Primary law enforcement responsibilities will be handled by law enforcement officers from FWC. Rules governing the use of JSF 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. FWC does not currently have an officer dedicated to patrolling and enforcement on JSF. This task is shared among multiple FWC officers who also patrol and enforce laws on properties and waterways outside of JSF.

The Office of Agricultural Law Enforcement (OALE) will assist with open burning and wildfire investigations as needed. The Clay County and Jacksonville Sheriff's Offices provide 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 JSF.

#### 3. Public and Local Government Involvement

This plan has been prepared by FFS and will be carried out primarily by the FFS. FFS responds to public involvement through liaison panels, management plan advisory groups, public hearings, and through ongoing direct contact with user groups. Land Management Review Teams as coordinated by the Division of State Lands have conducted two (2) reviews of management plan implementation in 2009 and 2013 [See Exhibit T]. The review teams' recommendations were addressed in this plan, as appropriate.

The plan was developed with input from the JSF Management Plan Advisory Group and was reviewed at a public hearing on May 23, 2018. 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.

#### 4. Volunteers

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

#### 5. Friends of Florida State Forest

Friends of Florida State Forests Inc. (FFSF) is a Direct Support Organization (DSO) of the Florida Forest Service. FFSF supports management activities and projects on Florida's state forests. FFSF is established by Florida statute, supports programs within Florida's state forests and is governed by a board of directors representing all areas of the state. Through community support, FFSF assists the 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

Past uses of JSF include: timber harvesting, naval stores production, cattle grazing, agriculture, hunting, fishing, and swimming. Most of JSF was leased to hunt clubs prior to state acquisition. A large portion of the state forest was owned by the S. Bryan Jennings

family since the early 1900s. Much of the forest was clear-cut in the late 1800's and early 1900's.

#### 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 20 previously recorded archeological sites, six (6) historic cemeteries, and one (1) standing structure found within the designated area for JSF. Currently, there are no known sites listed in the National Register of Historic Places on JSF.

SITE ID	SITE NAME	SITE TYPE
CL00053	FP&L D-P#1 Land-terrestrial	
CL00054	FP&L D-P#2	Land-terrestrial
CL00055	FP&L D-P#3	Land-terrestrial
CL00102	DUCK POND SCHOOL	Standing Structure
CL00647	WILBANKS	Campsite (prehistoric)
CL00658	SPENCER HOMESTEAD	Building remains
CL00659	GRIFFIN HOMESTEAD	Farmstead
CL00660	SECTION 21 SIDE CAMP	Campsite (prehistoric)
CL00661	DOUBLE DIPS	Farmstead
CL00662	SECTION 33 HOMESTEAD	Farmstead
CL00663	SECTION 29 CAMP	Campsite (prehistoric)
CL00664	HUGH-BRINSON TURPENTINE CAMP	Building remains
CL00665	WADE NOLAN HOMESTEAD	Building remains
CL00666	WILLARDS UNCLE PADGETT HOMESTEAD	Building remains
CL00667	NUGRAPE HOMESTEAD	Building remains
CL00668	HARRIS HOMSTEAD	Farmstead
CL00669	PADGETT HOMESTEAD	Farmstead
CL00670	BARREL STAVE DUMP	Land-terrestrial
CL00671	GIANT LARRY	Land-terrestrial
DU00651	YELLOW WATER CREEK	Lithic scatter/quarry
CL00642	PADGETT CEMETERY	Historical cemetery
CL00643	BELL CEMETERY	Historical cemetery
CL00644	JOHN YOUNGBLOOD CEMETERY	Historical cemetery
CL00645	NOLAN RIDGE CEMETERY	Historical cemetery
CL00646	DUNN'S CEMETERY	Historical cemetery

#### Table 4. Historical Sites on JSF

SITE ID	SITE NAME	SITE TYPE		
CL01310	ECT-2	Archeological		
DU14283 MANNING CEMETERY		Historical cemetery		

See [Exhibit H] for a complete list of all archeological sites on JSF.

#### C. <u>Ground Disturbing Activities</u>

Representatives of DHR and Florida Natural Areas Inventory will be consulted prior to the initiation of proposed ground disturbing activity by FFS or any other public agency as required per DHR guidelines. 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" [Exhibit I] and will comply with all appropriate provisions of Section 267.061(2) Florida Statutes. 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".

#### D. Survey and Monitoring

Currently, three (3) local district FFS staff are trained by DHR as archaeological site monitors. FFS will pursue opportunities for additional personnel to receive Archeological Resource Monitoring training. FFS will consult with public lands archaeologists at DHR as necessary to determine an appropriate priority and frequency of monitoring at each of the listed sites, and any protection measures that might be required. 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.

As information becomes available, and as staffing allows, any known archaeological and historical sites will be identified on maps to aid state forest and if necessary, 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

The primary reason for FFS management of JSF is protection of the Upper Black Creek watershed and the surrounding forest uplands through a stewardship ethic to assure these resources will be available for future generations. Management activities will be executed in a manner to minimize soil erosion and maintain and protect/enhance the hydrological resources on JSF. 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 JSF's waterbodies and their associated water quality and native plants and animals. All forest management activities relating to timber harvesting practices will comply with the BMP's for public lands within the latest Silviculture BMPs publication.

JSF falls within the jurisdiction of the SJRWMD. FFS will coordinate with SJRWMD and/or DEP, as necessary, on activities pertaining to water resource protection and management. Any activities requiring water management district permits will be handled accordingly. FFS will work with SJRWMD to ensure that levels and quality of ground and surface water resources are appropriately monitored.

#### A. Soils and Geologic Resources

#### 1. <u>Resources</u>

Soil information for JSF was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS). JSF contains 57 different soils. The predominant soils listed by the NRCS include: Rutlege-Osier complex, Penney fine sand, Sapelo fine sand, Ortega fine sand, and Blanton fine sand. Detailed information on all soils present on the state forest may be found in [Exhibit J].

#### 2. Soil Protection

Currently, there are no major or significant soil erosion problems on JSF. 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. <u>Water Resources</u>

The water resources on JSF 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 JSF.

#### 1. <u>Resources</u>

Long Branch Creek and Yellow Water Creek join the North Fork of Black Creek and represent the main hydrologic features on JSF. Numerous tributaries feed these main creeks.

Major creeks traverse approximately 31 miles, with 8 miles appropriate for canoeing and kayaking. In addition to blackwater creek and stream communities, dome swamps,

basin swamps, strand swamps, and basin marshes occur throughout the forest. FFS will coordinate with SJRWMD and the DEP, as necessary, on activities pertaining to water resource protection and management.

#### 2. <u>Water Classification</u>

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 the surface waters on or adjacent to the site in Clay and Duval Counties are classified as Class III waters, which is the statewide default classification. [Exhibit K]

#### 3. <u>Water Protection</u>

The acquisition and management of this public land had among its objectives to optimize ecological restoration, protect and manage existing natural resources, and facilitate sensible public use. Concern over a continuous usable source of fresh water requires emphasis on protecting this vital resource. The North Fork of Black Creek and Yellow Water Creek bisect a large portion of this forest. Branches and seepage streams occur along these creeks. All the watersheds within the forest feed Black Creek and eventually flow into the St. Johns River.

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

#### 4. Swamps, Marshes, and Other Wetlands

JSF contains ten (10) wetland community types. In addition to blackwater creek and stream communities, dome swamps, basin swamps, strand swamps, and basin marshes occur throughout the forest. However, there are several other small isolated wetlands found within the forest. 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. <u>Wetlands Restoration</u>

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, JSFmay 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 SJRWMD. 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. <u>Florida Department of Environmental Protection Basin Management Action</u> <u>Plans (BMAP)</u>

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.

JSF resides in the Lower St. Johns River Basin Main Stem BMAP [Exhibit L]. It was developed as part of DEP'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.

#### C. <u>Wildlife Resources</u>

#### 1. <u>Threatened and Endangered Species</u>

The intent of FFS is to manage JSF 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, Threatened, and Rare Species Documented on 551
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Scientific Name	Common Name	FNAI Global Rank	FNAI State Rank	Federal Status	State Status
Balduina atropurpurea	Purple Honeycomb-head	G2	S1	UR	Е

Scientific Name	Common Name	FNAI Global Rank	FNAI State Rank	Federal Status	State Status
Calopogon multiflorus	Many-flowered Grass-pink	G2G3	S2S3	Ν	Т
Calydorea coelestina	Bartram's lxia	G2G3	S2S3	Ν	Е
Carex chapmanii	Chapman's sedge	G3	S3	Ν	Т
Cleistes divaricata	Large Rosebud Orchid	G4	S1	Ν	Е
Ctenium floridanum	Florida Toothache Grass	G2	S2	N	Е
Hartwrightia floridana	Hartwrightia	G2	S2	UR	Т
Linum westii	West's Flax	G1	S1	UR	Е
Orbexilum virgatum	Pineland Scurfpea	G1	S1	Ν	Е
Platanthera chapmanii	Chapman's Fringed Orchid	G2	SNR	Ν	Ν
Pteroglossaspis ecristata	Giant Orchid	G2G3	S2	Ν	Т
Spiranthes floridana	Florida Ladies-tresses	G1	S1	Ν	Ν
Rudbeckia nitida	St. John's Black-eyed Susan	G3	S2	Ν	Е
Schoenolirion croceum	Yellow Sunnybell	G4	S2	N	Е
Verbesina heterophylla	Variable-leaf Crownbeard	G2	S2	N	Е
Elliptio monroensis	St. Johns Elephantear	G2G3	S2S3	UR	Ν
Procambarus pictus	Black Creek Crayfish	G2	S2	Ν	ST
Baetisca gibbera	A Mayfly	G5	S1S2	Ν	Ν
Cordulegaster sayi	Say's Spiketail	G3	S3	UR	Ν
Dromogomphus armatus	Southeastern Spinyleg	G4	S3	Ν	Ν
Tachopteryx thoreyi	Gray Petaltail	G4	S3	N	Ν
Chimarra florida	Floridian Finger-net Caddisfly	G4	S3S4	Ν	Ν
Hydroptila berneri	Berner's Microcaddisfly	G4G5	S3	N	Ν
Oxyethira elerobi	Elerob's Microcaddisfly	G3G4	S2S3	N	Ν
Oxyethira pescadori	Pescador's Bottle-Cased Caddisfly	G3G4	S3	Ν	Ν
Callophrys gryneus sweadneri	Florida Olive Hairstreak	G5T2	S2	Ν	Ν
Callophrys irus	Frosted Elfin	G3	S1	Ν	Ν
Erynnis baptisiae	Wild Indigo Duskywing	G5	S2S3	N	Ν
Euphyes berryi	Berry's Skipper	G2	S2	Ν	Ν
Euphyes dion	Dion Skipper	G4	S2S3	Ν	Ν
Hesperia meskei straton	Eastern Meske's Skipper	G3G4T3	S2S3	Ν	Ν
Megathymus cofaqui cofaqui	Cofaqui Giant-Skipper	G3G4T3	S2S4	Ν	Ν
Poanes yehl	Yehl Skipper	G4	S2S3	Ν	Ν

Scientific Name	Common Name	FNAI Global Rank	FNAI State Rank	Federal Status	State Status
Satyrium liparops floridensis	Sparkleberry Hairstreak	G5T1T2	S1S2	N	Ν
Desmognathus auriculatus	Southern Dusky Salamander	G4	S1S2	N	Ν
Lithobates capito	Gopher Frog	G3	<b>S</b> 3	UR	Ν
Notophthalmus perstriatus	Striped Newt	G2G3	S2	С	N
Crotalus adamanteus	Eastern Diamondback Rattlesnake	G4	S3	N	N
Gopherus polyphemus	Gopher Tortoise	G3	S3	С	ST
Heterodon simus	Southern Hognose Snake	G2	S2	Ν	Ν
Pituophis melanoleucus	Pine Snake	G4	S3	UR	ST
Pseudemys concinna concinna	Eastern River Cooter	G5T5	S3	Ν	Ν
Grus canadensis pratensis	Florida Sandhill Crane	G5T2T3	S2S3	Ν	ST
Egretta caerulea	Little Blue Heron	G5	S4	Ν	ST
Egretta thula	Snowy Egret	G5	S3	N	Ν
Elanoides forficatus	Swallow-tailed Kite	G5	S2	N	N
Falco sparverius paulus	Southeastern American Kestrel	G5T4	S3	N	ST
Haliaeetus leucocephalus	Bald Eagle	G5	S3	N	N
Mycteria americana	Wood Stork	G4	S2	Т	FT
Peucaea aestivalis	Bachman's Sparrow	G3	S3	N	N
Picoides villosus	Hairy Woodpecker	G5	S3	N	N
Podomys floridanus	Florida Mouse	G3	S3	N	Ν
Sciurus niger shermani	Sherman's Fox Squirrel	G5T3	S3	Ν	SSC
Ursus americanus floridanus	Florida Black Bear	G5T2	S2	N	N

#### \* STATUS/RANK KEY

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

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

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

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

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

#### 2. Florida Natural Areas Inventory

The Florida Natural Areas Inventory (FNAI) is the single most comprehensive source of information available on the locations of rare species and significant ecological resources. 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. [Exhibit M] Documented species are listed in Table 5.

Documented habitat includes: Basin Swamp, Baygall, Blackwater Stream, Bottomland Forest, Depression Marsh, Dome Swamp, Floodplain Swamp, Mesic Flatwoods, Mesic Hammock, Pine Plantation, Sandhill, Scrubby Flatwoods, Successional Hardwood Forest, Upland Mixed Woodland, Wet Flatwoods, Xeric Hammock, and Other Altered Landcover Types.

#### 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 JSF. [Exhibit M]

#### c. Land Acquisition Projects

Portions of the site appear to be located within the Northeast Florida Timberlands and Watershed Reserve Florida Forever Project. These are part of the State of Florida's Conservation and Recreation Lands Acquisition Program. [Exhibit G]

Other Florida Forever Projects within Clay County include: Etoniah/Cross Florida Greenway. Within Duval County: Northeast Florida Blueway, Baldwin Bay/St. Mary's River, Pumpkin Hill Creek; however, the additional Florida Forever projects in Clay and Duval Counties are not within the same Section, Township, and Range as JSF.

#### 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. [Exhibit N]

Other findings by the FWC include:

- **a.** The property is located adjacent to and within multiple Strategic Habitat Conservation Areas for Florida black bear and the striped newt.
- **b.** JSF is located within an area of Species Richness.
- c. Multiple Priority Wetlands are located on and in close proximity to JSF.
- **d.** FWC's response includes a map indicating multiple species locations.

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

occurrences in their database indicates that species of significance do not occur in the area. [Exhibit N]

The FWC recommends the review of management guidelines in the published FWC Gopher Tortoise Species Management Plan to guide management actions for the gopher tortoise (*Gopherus polyphemus*) on the forest. The FWC Gopher Tortoise Species Management Plan provides beneficial resource guidelines for habitat management and monitoring of the gopher tortoise. For reference, the FWC Gopher Tortoise Species Management Plan can be accessed at this web address: http://myfwc.com/wildlifehabitats/managed/gopher-tortoise/management-plan/

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

http://myfwc.com/wildlifehabitats/imperiled/species-action-plans/

#### 4. Game Species and Other Wildlife

Wildlife management will play an important role in the management of resources on JSF. 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.

JSF has a Wildlife Management Area (WMA), which is known as the Jennings State Forest Wildlife Management Area (JSFWMA). Management of this area will be directed to the production of biological diversity and species composition consistent with existing natural community types. Such communities will be restored and/or maintained through habitat management. All biological resources will be managed to maintain diversity.

JSF is home to many species. JSF has an abundance of white-tailed deer (*Odocoileus virginianus*) and wild turkey (*Meleagris gallopavo*). Obtaining a quota permit is extremely competitive, and a highly sought-after commodity. Hunting is regulated by permit only (during archery, muzzleloading, general gun, and spring turkey), thus the reason why it remains a high-quality area. JSF also supports a moderate population of wild hogs (*Sus scrofa*). Hunter harvest pressure on wild hogs is able to control this population at the current time. However, if habitat destruction occurs on a wide spread basis, nuisance trapping may be needed to reduce the population size. The bobwhite quail (*Colinus virginianus*) population has rebounded due to continued habitat restoration as a result of controlled burning. A prescribed burn regime is essential for future management of quail and numerous other species of flora and fauna.

JSF provides habitat for a number of different species of wildlife. More common species include: wild turkey (*Meleagris gallaparvo*), red shouldered hawk (*Buteo lineatus*), bobcat (*Lynx rufus*), rabbit (*Sylvilagus* sp.), coyote (*Canis latrans*), white
tailed deer (*Odocoileus virginianus*), southeastern fox squirrel, and bobwhite quail (*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 such things as snag management and retention.

### 5. <u>Survey and Monitoring</u>

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

#### a. Gopher Tortoises

Surveys for gopher tortoise burrows have been conducted by FFS and FWC staff intermittently, as needed. In 2017, FNAI completed a Line Transect Distance Sampling (LTDS) gopher tortoise survey on JSF under a contract with FWC (FNAI 2017). From this survey, it was estimated that the population totaled over 3,800 tortoises and was a viable population. Per FWC's Gopher Tortoise Survey Prioritization Blueprint (FWC 2017), JSF ranks as a Tier 1 priority for gopher tortoise population surveys in Florida. FFS will work cooperatively with FWC to schedule another full gopher tortoise survey in 5-10 years, as FWC gopher tortoise funding allows, in order to monitor population trends over time.

### b. Florida Black Bear

FFS will continue to cooperate with FWC to implement FWC's state-wide Florida Black Bear Management Plan, with an emphasis on establishing and maintaining connectivity.

#### c. Listed Plant Species

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

### d. Other Rare Biota Surveys

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

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

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

### D. Sustainable Forest Resources

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

### E. <u>Beaches and Dune Resources</u>

No beaches or dunes occur on the JSF.

### F. Mineral Resources

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

### G. Unique Natural Features and Outstanding Native Landscapes

Sixteen unique natural features are listed for JSF, including geological peculiarities and odd plant associations that are artifacts of past land uses. Additional unique features identified include: three (3) ravines with seepage streams, two (2) seeps with strikingly intact hydrology, two (2) seeps covered in ferns, an upland sandhill lake, a hard limestone crossing on the North Fork of Black Creek (Indian Ford), a scenic island on the creek, and an isolated xeric hammock on a disturbed longleaf pine island in the creek bottom.

Almost all JSF is in remarkably good condition, making the designation of outstanding native landscapes challenging. Three (3) general categories stand out on JSF: the blackwater stream and bottomland forest communities associated with the North Fork of Black Creek and Yellow Water Creek, the three (3) seepage streams and their ravines located in the Clay Hill Tract, and finally, seeps and baygalls of various kinds with intact hydrological connection to the sandhills and mesic flatwoods.

The ecological and recreational value of Black Creek is self-evident. The ravine systems on JSF are valuable because they are rare and intact.

## H. <u>Research Projects / Specimen Collection</u>

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 JSF 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 JSF 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:

- Research on Trail Ridge through geoprobe coring (2007)
- Ornate Chorus Frog DNA sampling and natural selection pressure (2007)
- Northern Bobwhite Call Counts Spring (2007-2017) annually
- Northern Bobwhite Covey Call Counts (2007-2017) annually
- Wood Duck Nest Box Monitoring (2007-2017) annually
- Bluebird Nest Box Monitoring (2007-2017) annually
- Southeastern Kestrel Nest Box Monitoring (2007-2017) annually
- Black Creek Crayfish Survey (2007-2008)
- Florida Mouse Survey (2011-2012)
- Coleoptera (Beetle) Collecting (2012)
- Gopher Tortoise Burrow Survey (2010 and 2015)
- Northern Cardinals (2014)
- Herp Drift Fence Survey (2015-2016)
- Flatwoods Salamander and Striped Newt Survey (2007- 2017)
- Gopher Frog and Ornate Chorus Frog Surveys (2014-2017)
- Striped Bass Spawning Survey-North Fork Black Creek (2015)
- Full LTDS Gopher Tortoise Survey Forest Wide (2017)
- S.E Pocket Gophers Survey (2016)
- Trachymyrmet septemtrionlis (Ant) Survey (2016)
- Black Bear Survey (2016)
- Asclepias (milkweed) Genetic Research (2016)
- Ornate Chorus Frog Research (2016)
- Scorpion Flies Research (2014-2016)
- Lepidoptera (butterfly), Diptera (flies), Hymenoptera (bees, wasps, and ant) Surveys (2017)
- Culicoldes spp. (midge) Survey (2017)
- Atlantic Botanical Gardens Orchid Survey (2016-2017)
- Trichostema Survey (2017)

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

### V. Public Access and Recreation

The primary recreation objective is to provide the public with dispersed outdoor recreational activities that are dependent on the natural environment. FFS will continue to promote and encourage public access and recreational use by the public while protecting resources and practicing multiple-use management. Recreation activities available on JSF include hiking, biking, horseback riding, camping, canoeing, kayaking, nature study, bird watching, picnicking, hunting, and fishing.

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

## A. Existing

A wide variety of recreational opportunities are available at JSF. Hiking, biking, horseback riding, camping, canoeing, kayaking, nature study, bird watching, picnicking, hunting, and fishing can be enjoyed using existing service roads, old road beds, and established trails. JSF is part of the Great Florida Birding and Wildlife Trail, Audubon's Important Birding Areas, the FFS Trailwalker Program, and the FFS Trailtrotter Program. JSF will be implementing new camping reservations options for making reservations to designated campsites through a Campground Reservation System, please contact JSF for more information. See [Exhibit D] for a map of the Recreation, Facilities and Improvements.

- 1. The Old Jennings Recreation Area provides access to three (3) hiking trails, two (2) horseback trails, pavilion, picnic tables, cooking grills, and a flush restroom facility. A wildlife viewing blind and primitive camp zone can be found along the hiking trails.
  - a. Bird Blind Hiking Loop 0.5 miles
  - b. Longleaf Hiking Loop 1.5 miles
  - c. North Fork Black Creek Trail 5 miles
  - d. Evans Horseback Blue Loop 9.1 miles
  - e. Evans Horseback Yellow Loop 16.75 miles
- 2. The Fire and Water Recreation Area provides access to the Fire and Water Nature Trail. Picnic tables can be found at the trailhead. A wildlife viewing blind and platform can be found along this hiking trail.
- **3.** Wildlife Observation Tower an elevated, covered viewing platform that overlooks a powerline corridor, and mesic and wet flatwoods communities.

- **4.** Hammock Campground a primitive campground that provides ten (10) drive up sites with picnic tables, grills, and tent pads. There is a centrally located pavilion and Clivus Multrum Restroom on site.
- 5. Bell Cemetery Picnic Area picnic area that provides grills and tables.
- 6. Indian Ford Recreation Area provides direct access to the North Fork of Black Creek. Picnic tables and grills are located here.
- 7. Knights Landing Recreation Area provides direct access to the North Fork of Black Creek.
- 8. Ellis Ford Recreation Area provides direct access to the North Fork of Black Creek.
- 9. Powell Ford Recreation Area provides direct access to the North Fork of Black Creek.
- **10.** North Fork Recreation Area provides direct access to the North Fork of Black Creek. Picnic tables, grills, and a covered pavilion may be found here.
- 11. Long Branch Recreation Area provides picnic tables, grills, and access to two (2) horseback trails (Blue Loop 4.3 miles / Yellow Loop 12.2 miles). Both recreational sites share a flush restroom.
- **12.** Bootleggers Primitive Campground a primitive campground that provides eight (8) drive up sites with picnic tables, grills, and tent pads. There is a pavilion and vault restroom present.
- **13.** Dunn's Farm Recreation Area a trail head with a picnic table and grill that provides access to the Dunn's Farm Trail.
- 14. Dunn's Farm Camp Zone primitive camping found along Dunn's Farm Trail
- 15. North Fork Black Creek Camp Zone found along North Fork Black Creek Trail
- **16.** The Pioneer Hiking Trail 2.5 miles long and currently connect two (2) creek access points, Indian Ford and Knight's Landing. There is a campzone located at the midway point. The long-term goal of this trail is to connect all creek access points.

## B. Planned

FFS will continue to assess plans for additional recreational opportunities based on demand, carrying capacity, demographics, and impact to the resources on the forest. All planned improvements may be completed as staff and funding permits. Both terrestrial and aquatic resources and relative activities will be evaluated. Any plans will be incorporated into the Five-Year Outdoor Recreational Plan on file at JSF.

## 1. Public Access and Parking

Within this ten-year planning cycle, the potential for new parking and forest access points will be evaluated and considered for use. In addition, current parking and forest access points will continually to be evaluated for updates and improvements.

## 2. <u>Recreational Trails</u>

Suitable locations are being explored for additional hiking trails. The construction, maintenance, and improvements of nature and hiking trails will be on-going. In addition, there is the potential of having a long-distance trail cross JSF through a cooperative venture between the FFS, Florida Greenways and Trails, FDOT, City of Jacksonville and Clay County.

## 3. Camping

Suitable locations are being explored for additional camp zones. The addition of a group campsite at the Old Jennings Recreation Area may be considered. May assess/update current camp zones to semi-primitive campground standards.

# 4. <u>Recreational Vehicle (RV) Camping</u>

Locations within the Longbranch Tract off Longbranch Cemetery Road may be explored for the addition of a full-service campground. A full-service campground may include sites with electric and water hookups, concrete pads, and a central septic dump station. [Exhibit Y]

# 5. <u>Environmental Education</u>

Currently, only self-guided tours are available. If a need is determined in the future, JSF may implement an environmental education program which may include guided tours, additional self-guided tours, and hands-on events.

## 6. Bird Watching

JSF is a member of The Great Florida Birding and Wildlife Trail. This trail is composed of 510 premier wildlife viewing sites across the state of Florida. Internally, a birding checklist for JSF has been developed and will be updated as needed.

# 7. Equestrian, Hunter, and Hiker Education

Continuing education concerning littering is required. FFS will evaluate the best methods for communicating concerns and solutions to all user groups.

# 8. <u>Mountain Bike Trail</u> - [Exhibit Z]

A proposed location within the Old Jennings Tract has been identified and approved for the construction of an 11-mile mountain bike trail. The FFS is currently working with the Southern Off-Road Biking Association (SORBA) to complete this trail. SORBA is currently in the process of acquiring funding. Once funding is complete trail construction will begin. A second trail, two (2) miles in length may be considered for construction. Trails will be monitored for impacts from recreational use. Negative impacts will be mitigated and may include blocking access and rerouting the trail away from environmentally sensitive areas, as appropriate.

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

## C. <u>Hunter Access</u>

JSF is open to regulated hunting. The Florida Fish and Wildlife Conservation Commission (FWC) manages hunting on JSF. Hunting season dates, limits, and methods are established annually by FWC, in cooperation with FFS. Jennings State Forest Wildlife Management Area (JSFWMA) regulations are updated annually and are identified in the current WMA brochure provided by FWC.

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

## D. <u>Education</u>

FFS may create partnerships with local K-12 schools and/or universities for the development and implementation of educational opportunities on JSF. Once developed,

the Five-Year Outdoor Recreation Plan may lead more insight to management activities as they pertain to future educational opportunities JSF may provide to the public.

## VI. Forest Management Practices

## A. Prescribed Fire

Forest management practices on JSF are important in the restoration and maintenance of forest ecosystems and provide a variety of socio-economic benefits to Floridians. Management practices on JSF include a prescribed fire program which is an effective tool in controlling the growth of hardwood trees, 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 Jacksonville District and is detailed in the Five-Year Prescribed Burning Management Plan. Emphasis will be placed on prescribed burning, wildfire prevention, and education to help reduce wildfire occurrence on the forest.

A Fire History spreadsheet detailing the recent history of prescribed burns and wildfires at JSF is available in [Exhibit O].

FFS has one (1) fire tower and five (5) tractor-plow units located in Clay County. Additional support is available from neighboring counties. Personnel and equipment stationed at JSF will be used for pre-suppression practices, establishment of firebreaks, rehabilitation of existing firelines, construction of new firelines, maintenance of perimeter firebreaks, and prescribed burning.

The annual forest prescribed burning program produces multiple benefits. The purposes of prescribed burning on JSF 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 JSF, which will consist of growing and dormant season burns. An update to the Five-Year Prescribed Burning Management Plan is developed each year by FFS staff. All burns conducted on JSF 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 JSF are estimated to have occupied approximately 20,375 acres and to have burned at approximately 2 to 10 year intervals. Current fire dependent communities encompass 18,110 acres. Some historically non-fire dependent communities, such as Upland Hardwood Forest, are in a fire dependent current condition (pine plantation). 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, JSF will plan for 3,600 to 9,000 acres to be prescribed burned

annually. Priority ranking of burn units is used to keep fire return intervals maintained while slowly adding additional acreage. Meeting prescribed fire goals will be largely dependent on weather conditions, available personnel, and statewide emergency situations such as wildfires, hurricanes, and other natural disaster response and relief. Currently, it is estimated that approximately 7,466 acres of JSF are within the desired fire return interval.

### 1. Fire Management

FFS will develop a fire management plan that will serve as a working tool and an informational document for JSF. The plan will provide guidelines in regard to 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 JSF 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 (2016) 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.

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

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

# B. <u>Wildfires, Prevention, Fire / Prescribed Fire Strategies</u>

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 Jacksonville District. Emphasis will be placed on consistent accomplishment of prescribed burning goals and community outreach to increase public understanding of wildfire prevention and the benefits of prescribed fire.

FFS has three paramount considerations regarding wildfires, and these are listed in priority order:

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

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

## 1. Suppression Strategies

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

- **a.** Contain is defined as a suppression strategy where a fire is restricted to a certain area by using existing natural or constructed barriers that stop the fires spread under the prevailing and forecasted weather until it is out. This strategy allows the use of environmentally sensitive tactics based on fuels, fire behavior, and weather conditions that keep a wildfire from burning a large area or for a long duration.
- **b.** Control 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 JSF 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

JSF has on file in the state forest headquarters an Environmentally Sensitive Area Map that identifies protected sites such as critical wetlands and archaeological and historical sites known to occur on the state forest. FFS personnel are aware of these areas in the event of a wildfire. Special precautions will be followed when prescribed burning in sensitive areas on JSF. 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 JSF, 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 JSF maintains a list of neighbors that have requested they be notified in advance of prescribed burns. These families are contacted by telephone or email with potential sites and dates of anticipated prescribed burns.

#### 7. Post-Burn Evaluations

A post-burn evaluation is required for each wildfire and prescribed burn on the state forest to assess impacts on timber and habitat. Based on the evaluations, 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 completed burn plans and the maintenance of GIS data. These records are intended to provide data for future management decisions.

## C. Sustainable Forestry & 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. <u>Strategies</u>

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

- **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. <u>Silvicultural Operations</u>

Silvicultural operations on JSF 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 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 (10) percent of JSF forest will be re-inventoried annually to provide an accurate estimation of the standing timber and to ensure that stands will be managed sustainably.

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

## 4. <u>Timber Sales</u>

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.

## D. <u>Non-Native Invasive Species Control</u>

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 JSF 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*) are present on JSF but are not believed 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 feral hog removal on JSF through trapping and hunting if necessary.

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

Scientific Name	Common Name	Treatment Strategy	Acres Impacted	Increasing /Decreasing
Albizia julibrissin	Mimosa	Spot Treatment with herbicide	Scattered plants	Stable

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

Scientific Name	ific Name Common Name Treatment		Acres	Increasing
Sapium sebiferum	Chinese tallow tree	Spot Treatment with herbicide	Scattered plants	Stable
Sesbania punicea	Sesbania	Spot Treatment with herbicide	Scattered plants	Stable
Lygodium japonicum	Japanese climbing fern	Spot Treatment with herbicide	Scattered plants	Stable
Imperata cylindrica	Cogon grass	Spot Treatment with herbicide	Scattered plants	Stable
Panicum repens	Torpedo grass	Spot Treatment with herbicide	Scattered plants	Stable
Wisteria floribunda	Wisteria	Spot Treatment with herbicide	Scattered plants	Stable
Solanum viarum	Tropical Soda Apple	Spot Treatment with herbicide	Scattered plants	Stable
Cinnamomum camphora	Camphor	Spot Treatment with herbicide	Scattered plants	Stable

## E. Insects, Disease and Forest Health

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

In compliance with Section 388.4111, 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 Clay County and Duval 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 JSF, 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 JSF. This public lands control plan must be in compliance with DACS guidelines and using the appropriate DACS form. The plan must then be approved and mutually adopted by the county, FFS, and DACS, prior to initiation of any mosquito control work. Should the local mosquito control district not propose any mosquito control operations on the property, no arthropod control plan is required. See [Exhibit X].

## F. <u>Use of Private Land Contractors</u>

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. Outsourcing land management work includes, but is not limited to:

- **1.** Herbicide applications
- **2.** Restoration activities
- **3.** Tree reforestation
- **4.** Timber harvesting
- **5.** Biological assessments and mapping

### G. Sustainable Forestry Initiative (SFI)

In 2018, JSF took steps to receive SFI certification. The SFI 2015-2019 Forest Management Standard promotes sustainable forestry practices based on 13 Principles, 15 Objectives, 37 Performance Measures and 101 Indicators. These requirements include measures to protect water quality, biodiversity, wildlife habitat, species at risk, and forests with exceptional conservation value.

The SFI program is committed to continuously improve responsible forest management. SFI Program Participants must meet or exceed applicable water quality laws and regulations, with measures to manage and protect water, wetlands, and riparian zones on certified lands. They must continually evaluate habitat and biodiversity impacts from forest activities – which leads to improved habitat quality and protection of imperiled or critically imperiled species.

### VII. Proposed Management Activities for Natural Communities

In 2016, FNAI completed an inventory and natural community mapping project on JSF. Current and historic natural community cover types can be found in [Exhibits Q and R].

Natural Community Type	Historic acres*	Current acres*	Acres in Restoration*
Basin Swamp	974	943	N/A
Baygall	1,050	1,107	N/A
Blackwater Stream	33	33	N/A
Bottomland Forest	3,139	3,127	N/A
Depression Marsh	120	55	N/A
Dome Swamp	594	589	N/A
Floodplain Swamp	Unknown**	Unknown**	N/A
Mesic Flatwoods	7,521	5,714	97
Mesic Hammock	45	45	N/A
Sandhill	7,687	6,023	284
Scrubby Flatwoods	72	68	N/A
Upland Mixed Woodland	52	141	N/A
Wet Flatwoods	3,834	3,241	7
Xeric Hammock	114	456	N/A
TOTAL	25,235	24,849***	388

### Table 7. Natural Community Types

\* Note rounding errors exist

\*\* Inclusions in bottomland forest and mesic hammock

Altered Landcover Type*	Current Acres Mapped
Developed	30
Clearing/Regeneration	44
Utility Corridor	236
Artificial Pond	2
Spoil Area	3
Road	441
Successional Hardwood Forest	269
Pine Plantation	2,282
TOTAL	3,307

#### Table 8. Altered Landcover Types Found on JSF

\*Protocol as described in Appendix 2 of 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.

Habitat Type	Historic Fire Return Intervals**	JSF Fire Frequency Goal (Local)	Comments
Basin Swamp	Varies	2 - 10	Ecotones burned per frequency of adjacent upland habitat type. Interior portions of this community type will have longer return intervals.
Baygall	Varies	2 - 5	Ecotones burned per frequency of adjacent upland habitat type. Interior portions of this community type will have longer return intervals.
Blackwater Stream	N/A	N/A	Not a fire dependent community.
Bottomland Forest	Varies	3 - 5	Ecotones burned per frequency of adjacent upland habitat type. Interior portions of this community type will have longer return intervals
Depression Marsh	1 - 8	1 - 8	Ecotones burned per frequency of adjacent upland habitat type. Interior portions of this community type will have longer return intervals
Dome Swamp	3-100	3 - 5	Ecotones burned per frequency of adjacent upland habitat type. Interior portions of this community type will have longer return intervals
Floodplain Swamp	N/A	N/A	Not a fire dependent community.
Mesic Flatwoods*	2-4	2-5	Depends on pine species, density, age, and fuel conditions.
Mesic Hammock	N/A	N/A	Will be burned with the majority community type it falls within – majority of mesic hammock stands are found contained within other community types
Pine Plantation	Varies	1 - 7	Historically the Pine Plantation community type was sandhill, mesic or wet flatwoods. Will burn using historical community type definition when and where it is appropriate based on stand characteristics, timeline in relation to harvesting
Sandhill*	1 - 3	1 - 3	Frequent low intensity fire within the growing season to reduce hardwood competition and perpetuate pines and grasses.
Scrubby Flatwoods	5 - 15	5 - 8	Return intervals in general will match surrounding community types. Fire is important in maintaining ecotones.
Successional Hardwood Forest	Fire Excluded	3 - 5	Ecotones burned per frequency of adjacent upland habitat type. Recommend mechanical/chemical treatment for natural community restoration.
Upland Mixed Woodland	Varies	3 - 5	Ecotones burned per frequency of adjacent upland habitat type. Interior portions of this community type will have longer return intervals.
Wet Flatwoods*	3 - 10	2 - 7	Depends on pine species, density, age, and fuel conditions. In general, wet flatwoods are transition communities sandwiched between mesic flatwoods,

Table 9. Prescribed Fire Interval Guide on JSF

		basin, and dome swamps. Burning usually aligns with mesic flatwoods.
Xeric Hammock N/A	3 - 5	Return intervals in general will match surrounding community types. Fire is important in maintaining ecotones

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

The following community descriptions, existing condition descriptions, and management recommendations are taken from a 2016 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 JSF.

To achieve the objectives outlined in this plan, the following management activities will be performed in the natural communities at JSF 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 Swamp

### **Description:**

Basin swamps are forested depressions highly variable in size, shape, and species composition. Typically, these swamps are large, irregularly shaped and not associated with rivers. The soils are generally acidic, nutrient-poor peats overlying an impervious soil This community type is dominated by hydrophytic trees and shrubs that can laver. withstand inundation for most or all of the year, including pond cypress (Taxodium ascendens), swamp tupelo (Nyssa sylvatica var. biflora), slash pine (Pinus elliottii), and fetterbush (Lyonia lucida). Basin swamps have variable shrub layers and sparse to dense herbaceous species cover. A mature canopy is dominated by pond cypress, swamp tupelo, slash pine, and to a lesser extent, loblolly bay (Gordonia lasianthus), swamp bay (Persea palustris), and sweetbay (Magnolia virginiana). In most cases, shrubs do not form a dense layer below the canopy or in the ecotones of the swamps. Shrubs are typically scattered throughout the swamp, although some areas may have heavier concentrations. Subcanopy tree and shrub species primarily include myrtle dahoon (Ilex cassine var. myrtifolia), fetterbush, large gallberry (Ilex coriacea), sweetbay, and highbush blueberry (Vaccinium corymbosum). In densely forested portions of basin swamps, herbs are sparse and consist mostly of netted chain fern (Woodwardia areolata), Virginia chain fern (W. virginica), cinnamon fern (Osmunda cinnamomea), and lizard's tail (Saururus cernuus).

Judging from historic aerial photographs, the large slash pines in the canopy and the frequency of pine stumps, many of the basin swamps on JSF had relatively open canopies and subcanopies and a higher density of shrubs or herbaceous species. This vegetation structure and species composition may be obtained, and maintained, by allowing more frequent fire into these systems.

In the 1943 aerial photograph, the much darker, rougher textured basin swamps are easily distinguished from the much lighter, smoother textured flatwoods in which they tend to be imbedded. The typical graminoid ecotones appear as light gray, smooth (relatively treeless) areas with intermixed, slightly darker shaded areas (standing water) adjacent to

the much darker and rougher textured (forested) basin swamps. In some cases, graminoid areas grade into wet flatwoods with apparently a very sparse overstory. Basin swamp ecotones that are adjacent to mesic and wet flatwoods are dominated by similar herbaceous and graminoid species, including wiregrass (*Aristida stricta*), various species of beaksedges (*Rhynchospora* spp.) and yellow-eyed grasses (*Xyris* spp.), Carolina redroot (*Lachnanthes caroliana*), tenangle pipewort (*Eriocaulon decangulare*), netted chain fern, Virginia chain fern, and hooded pitcher plants (*Sarracenia minor*).

### **Current Conditions:**

Previous anthropogenic disturbances, such as logging and ditching, are evident in many of the basin swamps. These disturbances likely have changed the vegetation species composition and structure from the historic condition. Evidence of fire breaks along the outer edge of most of the basin swamps persists and has led to undesirable, fire-suppressed ecotones.

Generally, the basin swamp canopies at JSF are dominated by stunted pond cypress (Taxodium ascendens) and swamp tupelo (Nyssa sylvatica var. biflora) overtopped by slash pine. Many of the existing slash pine trees and stumps in the basin swamps have cat-faces. These scars date back to the early 1900s and were incurred during turpentine operations. The cat-faces suggests that slash pine was an important historic component of relatively shallow portions of the basin swamps. The subcanopy is comprised primarily of myrtle dahoon (*Ilex cassine* var. *myrtifolia*), which is often guite abundant just below the cypress and swamp tupelo. Shrub cover is dense in most locations, particularly in the ecotones, and consists primarily of fetterbush (Lyonia lucida) and myrtle dahoon, and to a lesser extent young swamp bay (Persea palustris), loblolly bay (Gordonia lasianthus), and sweetbay (Magnolia virginiana), and occasionally highbush blueberry (Vaccinium corymbosum), titi (Cyrilla racemiflora), evergreen bayberry (Myrica caroliniensis), gallberry (Ilex glabra), and large gallberry (Ilex coriacea). In densely forested portions of the basin swamp, where the basal area of all trees is 90 to130 square feet per acre, herbs represent fewer than 10 percent of total cover. In areas where the canopy is less dense, and along the fire-maintained ecotones, there is often an abundance of herbs such as Carolina redroot (Lachnanthes caroliana), cinnamon fern (Osmunda cinnamomea), netted chain fern (Woodwardia areolata), Virginia chain fern (Woodwardia virginica), maidencane (Panicum hemitomon), fascicled beaksedge (Rhynchospora fascicularis), beaksedges (Rhynchospora spp.), and sphagnum (Sphagnum spp.). The abundance of epiphytes and vines is variable. The epiphytes primarily consist of Bartram's airplant (Tillandsia bartramii), and Spanish moss (Tillandsia usneoides) and the dominant vines are laurel greenbrier (Smilax laurifolia), and muscadine (Vitis rotundifolia).

Several basin swamps on JSF appear as relatively shallow depressions. Herbaceous species in these depressions, and in the basin swamps that burn frequently (e.g., 3-10 years), are similar to those for the desired future conditions of wet flatwoods.

### **Fire Regimes:**

The fire interval is highly variable in basin swamps and dependent on the vegetative makeup, fire frequency in the surrounding uplands, and hydrology. Fire intervals in basin swamps vary between 5 and 150 years. The lowest portions of basin swamps may rarely, if ever, burn. Graminoid-dominated ecotones often burn in conjunction with the adjacent uplands, and these may burn as frequently as every 2 to 5 years. Non-forested basin swamp inclusions, such as scattered shrub bogs and basin marshes, historically burned at more frequent intervals than the forested portions. These non-forested, species-diverse areas of the basin swamps' interiors and edges provide important habitat for rare species of plants and animals. Given the relative shallowness of many basin swamps on JSF, this community most likely burned at a higher frequency than basin swamps elsewhere in Florida. Fire frequencies closer to every 5 to 15 years may have been typical for JSF.

### Management Needs:

Many of the ecotones between basin swamps and wet or mesic flatwoods have been disturbed by past silvicultural activities. Restoring historic hydrological regimes and applying fire to adjacent uplands is a recommended focus for forest management.

Allow fires to burn into the basin swamps and extinguish naturally. These practices will assist the recovery of historically graminoid-dominated ecotones. Prescribed fire will also reduce heavy fuel loads that might otherwise facilitate catastrophic wildfires during drier years. Entry of occasional fires into the basin swamps is also necessary to maintain cypress and pine components; swamp tupelo and hardwoods dominate basin swamps that burn less often. Cypress and pines are tolerant of light surface fires, but muck-fires burning into the peat layer can kill these trees and lower the ground surface, possibly transforming the swamp into a lake, pond, or basin marsh.

Removing feral hogs (*Sus scrofa*) may be desirable in areas where these animals are impacting basin swamps and other wetlands. Monitor and treat non-native invasive plant populations.

## B. <u>Baygall</u>

### **Description:**

Baygall is a freshwater forested wetland dominated by evergreen hardwood trees, primarily bay trees. Baygalls develop where water seeps from surrounding uplands or high-water tables maintain saturated soil. Soils are generally composed of peat and are acidic.

Characteristic canopy trees of baygalls include loblolly bay (Gordonia lasianthus), sweetbay (Magnolia virginiana), swamp bay (Persea palustris), pond pine (Pinus serotina), slash pine (Pinus elliottii), red maple (Acer rubrum), and swamp tupelo (Nyssa sylvatica var. biflora). Common shrubs and small trees include fetterbush (Lyonia lucida), wax myrtle (Myrica cerifera), dahoon (Ilex cassine), large gallberry (Ilex coriacea), and highbush blueberry (Vaccinium corymbosum). A dense overstory and low light levels typically restrict development of herbaceous plants. However, herbs such as Virginia chain fern (Woodwardia virginica), beaksedges (Rhynchospora spp.), sedges (Carex spp.), sphagnum moss (Sphagnum spp.), Carolina redroot (Lachnanthes caroliniana), and cinnamon fern (Osmunda cinnamomea) may be present. Baygall associated with streams may have lizard's tail (Saururus cernuus) and goldenclub (Orontium aquaticum).

Epiphytes are infrequent to absent. Vines are found occasionally and may include laurel greenbrier (*Smilax laurifolia*) and muscadine (*Vitis rotundifolia*).

On the 1943 geo-rectified photographs, baygall appears as a grainy, nearly black signature that is darker in color than any other community found on JSF. Some darker areas on these photographs appear to have the same signature but were characterized as a different community: mostly wet flatwoods with baygall inclusions. Similarly, it is difficult to separate bottomland forest with narrow seepage stream-drains from baygall with seepage stream inclusions. In these situations, even ground-truthing is difficult because the two community types share many of the same species.

### **Current Conditions:**

Baygall occurs throughout JSF in lower areas within mesic and wet flatwoods communities. Baygall is also adjacent to and included in bottomland forest and at the base of sandhills.

Characteristic canopy trees of baygall on JSF include loblolly bay (Gordonia lasianthus), sweetbay (Magnolia virginiana), swamp bay (Persea palustris), pond pine (Pinus serotina), loblolly pine (Pinus taeda), and slash pine (Pinus elliottii). Red maple (Acer rubrum), and swamp tupelo (Nyssa sylvatica var. biflora) are also usually present. Common shrubs and small trees include fetterbush (Lyonia lucida), Florida hobblebush (Agarista populifolia), titi (Cyrilla racemiflora), blue huckleberry (Gaylussacia frondosa var. tomentosa), wax myrtle (Myrica cerifera), dahoon (Ilex cassine), large gallberry (Ilex coriacea), highbush blueberry (Vaccinium corymbosum), coastal doghobble (Leucothoe axillaris), swamp doghobble (Leucothoe racemosa), poison sumac (Toxicodendron vernix), saw palmetto (Serenoa repens), and swamp azalea (Rhododendron viscosum). Herbs are scarce and include Virginia chain fern (Woodwardia virginica), beaksedges (Rhynchospora spp.), sphagnum moss (Sphagnum spp.), and cinnamon fern (Osmunda cinnamomea). Vines are occasional and include laurel greenbrier (Smilax laurifolia), cat greenbrier (Smilax glauca), and muscadine (Vitis rotundifolia). The latter often forms thickets around the edges of baygall and where canopy trees are sparse. Currently, what might be considered baygall on JSF was historically more open wet flatwoods with baygall inclusions. Because bay trees have encroached due to fire exclusion, the community superficially appears to be baygall.

Generally, the interior of the majority of the baygall on JSF is in a desirable condition. In many areas, the ecotones have been excluded from fire and bay trees have spread into the adjacent natural communities. Fires from the surrounding pyrogenic communities should be allowed to burn into baygall during periods of high water and to extinguish naturally. This may be critical for restoring any seepage slope communities that might occur on JSF. While no seepage slope was identified on the historical photographs, this community will succeed into baygall with fire exclusion. Thus, several of the baygall polygons may have inclusions of the seepage slope community type. Seepage slopes are an important community to several rare plants and animals and are often associated with, or adjacent to, baygall.

### **Fire Regimes:**

When conditions allow, fires from the surrounding pyrogenic communities should be allowed to burn into baygalls during periods of high water and to extinguish naturally. Growing season fires in the baygall/flatwoods ecotones would benefit several rare plant populations.

### Management Needs:

Management activities for baygall on JSF should focus on maintaining historically occurring baygall. Avoid any further hydrologic alterations, such as the creation of ditches or roads. Where practical, restore natural hydrology and limit mechanical soil disturbance in ecotones between baygall and the adjacent uplands.

Fires from adjacent pyrogenic communities should be allowed to burn into the baygall to maintain ecotones. This may be particularly important where historic seepage slopes have succeeded into baygalls. Locating former seepage slopes on JSF is extremely difficult given the current condition of most flatwoods and baygall ecotones due to years of fire exclusion and forestry operations. A survey for areas with historic seepage slopes may be necessary in order to direct restoration activities for this particularly rare and vulnerable community type. Fire should also be used to control baygall vegetation, primarily loblolly bay that has encroached into flatwoods. Allow baygall to burn during wetter periods, if possible, especially in areas where pond pine is dominant and where bays are spreading into the adjacent flatwoods.

The removal of feral hogs (*Sus scrofa*) may be desirable in areas where wetlands are being impacted. Monitor and treat non-native invasive plant populations.

### C. <u>Blackwater Stream</u>

#### **Description:**

Blackwater streams are watercourses that typically flow through forested communities. Tannins derived from swamps and marshes cause the water to be dark brown and often acidic. Among the named blackwater creeks at JSF are Moore Branch, Yellow Water Creek, Sal Taylor Creek, Big Branch of Yellow Water Creek, Mill Branch, Wheeler Branch, North Fork Black Creek, Big Branch of North Fork of Black Creek, Boggy Branch, Camp Branch, Gum Branch, and Long Branch (names from 1994 USGS 7.5-minute topographic map). There are also several unnamed creeks.

Blackwater streams are mostly free of vegetation except for occasional goldenclub (*Orontium aquaticum*), submersed macrophytes, and algae. Because of its narrow width, the canopy is partially closed over a majority of the system. Common bottomland forest species dominate, including live oak (*Quercus virginiana*), swamp laurel oak (*Quercus laurifolia*), sweetbay (*Magnolia virginiana*), swamp tupelo (*Nyssa sylvatica var. biflora*), sweetgum (*Liquidambar styraciflua*), bald cypress (*Taxodium distichum*), and red maple (*Acer rubrum*). A subcanopy of younger canopy species is present along the riverbank. Understory species composition is as variable as the canopy, with shrubs being the dominant component. Shrubs include saw palmetto (*Serenoa repens*), American beautyberry (*Callicarpa americana*), wax myrtle (*Myrica cerifera*), American hornbeam

(Carpinus caroliniana), white fringetree (Chionanthus virginicus), titi (Cyrilla racemiflora), Gulf sebastian bush (Sebastiania fruticosa), Carolina ash (Fraxinus caroliniana), Elliot's blueberry (Vaccinium elliottii), and highbush blueberry (Vaccinium corymbosum), among others. Herbs along the riverbank are generally sparse but may be dense in areas that receive sufficient amounts of sunlight. Species may include woods grass (Oplismenus hirtellus), woodoats (Chasmanthium laxum), and St. John's worts (Hypericum spp.). Epiphytes are infrequent to occasional and include Spanish moss (Tillandsia usneoides), resurrection fern (Pleopeltis polypodioides), and ball moss (Tillandsia recurvata). Vines are infrequent to common and include muscadine (Vitis rotundifolia) and poison ivy (Toxicodendron radicans).

On the 1943 geo-rectified photographs, blackwater stream has a dark, smooth signature and a sinuous form. Delineation was only possible in the southern portion of JSF along portions of North Fork of Black Creek with an open canopy. Blackwater stream and associated seepage streams could not be delineated when the canopy cover was greater than 40 percent. In these situations, the streams are identified as inclusions of the adjacent forested system.

### **Current Conditions:**

Only one blackwater stream was delineated on JSF. The closed bottomland forest canopy obscures the majority of blackwater stream and all seepage streams within the forest. The habitat is generally in the later stages of succession and species composition is typical of riverbank vegetation and bottomland forests in northeast Florida.

Riverbanks along the blackwater streams show some evidence of past logging. There is often an emergent canopy of usually loblolly pine (Pinus taeda) over a lower canopy of live oak (Quercus virginiana), swamp laurel oak (Quercus laurifolia), sweetbay (Magnolia virginiana), ogeechee tupelo (Nyssa ogeche), swamp tupelo (Nyssa sylvatica var. biflora), sweetgum (Liquidambar styraciflua), bald cypress (Taxodium distichum), and red maple (Acer rubrum). The shrub layer is dominated by wax myrtle (Myrica cerifera), American hornbeam (Carpinus caroliniana), white fringetree (Chionanthus virginicus), titi (Cyrilla racemiflora), Carolina ash (Fraxinus caroliniana), Gulf sebastian bush (Sebastiania fruticosa), saw palmetto (Serenoa repens), Elliot's blueberry (Vaccinium elliottii), and highbush blueberry (Vaccinium corymbosum). Herbs present include woods grass (Oplismenus hirtellus), woodoats (Chasmanthium laxum), witch-grasses (Dichanthelium spp.), shaggy hedgehyssop (Gratiola pilosa), Fakahatchee grass (Tripsacum dactyloides), and St. John's worts (Hypericum spp.). Epiphytes are infrequent to occasional and include Spanish moss (Tillandsia usneoides) and resurrection fern (Pleopeltis polypodioides). Vines are infrequent to common and include muscadine (Vitis rotundifolia), cat greenbrier (Smilax glauca), trumpet creeper (Campsis radicans), and poison ivy (Toxicodendron radicans).

### **Fire Regimes:**

Fire is not a component of this community. When adjacent to flatwoods communities, blackwater streams may function as a natural firebreak.

### **Management Needs:**

Management activities for blackwater streams on JSF should focus on maintaining natural hydrologic patterns and allowing prescribed fires from adjacent communities to burn into the adjacent communities. Water quality may be a concern as more land is developed outside of JSF. It may be beneficial to work with local communities and officials to help maintain the water quality of streams flowing into JSF.

### D. Bottomland Forest

### **Description:**

Bottomland forests are hardwood forests with a closed canopy of mixed mesophytic species that usually border streams. Bottomland forests are infrequently inundated and dry out during the dry season. The dense canopy maintains relatively high humidity levels thus fire rarely carries through the community. Scattered inclusions of mesic hammock, floodplain swamp, and upland hardwood forest often occur within bottomland forest.

Bottomland forest canopy trees include live oak (*Quercus virginiana*), swamp laurel oak (Quercus laurifolia), sweetbay (Magnolia virginiana), swamp tupelo (Nyssa sylvatica var. biflora), sweetgum (Liquidambar styraciflua), slash pine (Pinus elliottii), loblolly pine (Pinus taeda), bald cypress (Taxodium distichum), American elm (Ulmus americana), and red maple (Acer rubrum). A subcanopy of younger canopy species is present. Understory species composition is as variable as the canopy, with shrubs being the dominant Shrubs include saw palmetto (Serenoa repens), American beautyberry component. (Callicarpa americana), American hornbeam (Carpinus caroliniana), common buttonbush (Cephalanthus occidentalis), swamp dogwood (Cornus foemina), titi (Cyrilla racemiflora), Carolina ash (Fraxinus caroliniana), large gallberry (Ilex coriacea), Virginia willow (Itea virginica), sweet pinxter azalea (Rhododendron canescens), wax myrtle (Myrica cerifera), fetterbush (Lyonia lucida), and highbush blueberry (Vaccinium corymbosum), among others. Herbs are generally sparse due to the closed canopy and dense shrub layer. Species may include woods grass (Oplismenus hirtellus), bracken fern (Pteridium aquilinum), Virginia chain fern (Woodwardia virginica), woodoats (Chasmanthium laxum), and lizard's tail (Saururus cernuus). Epiphytes are infrequent to occasional and include Spanish moss (Tillandsia usneoides), resurrection fern (Pleopeltis polypodioides), and ball moss (Tillandsia recurvata). Vines are infrequent to common and include muscadine (Vitis rotundifolia) and poison ivy (Toxicodendron radicans).

On the 1943 geo-rectified photographs, bottomland forest has a dark, rough grained signature. Delineation was aided by ground-truthing in the field.

### **Current Conditions:**

At JSF, bottomland forest occurs along portions of two large stream systems, Yellow Water Creek and North Fork of Black Creek (names from 1994 USGS 7.5-minute topographic map) and their tributaries. Floodplain swamp is often included within the bottomland forest and consists of a network of relatively narrow drains.

There is evidence of past logging events within the bottomland forests on JSF. The majority of logging appears to have occurred more than 60 years ago and most of the

canopy consists of older mature trees. In what manner past logging has affected the species composition, species relative densities, and vegetation structure is largely unknown. Generally, the habitat is in the later stages of succession and species composition is typical of bottomland forests in northeast Florida.

Bottomland forests associated with blackwater streams often have an emergent canopy of slash pine (*Pinus elliottii*) and loblolly pine (*Pinus taeda*) and infrequently pond pine (*Pinus serotina*). The remaining canopy trees include swamp laurel oak (*Quercus laurifolia*), live oak (*Quercus virginiana*), red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), sweetgum (*Liquidambar styraciflua*), ogeechee tupelo (*Nyssa ogeche*), blackgum (*Nyssa sylvatica*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), pond cypress (*Taxodium ascendens*), pignut hickory (*Carya glabra*), tuliptree (*Liriodendron tulipifera*), southern magnolia (*Magnolia grandiflora*), sweetbay (*Magnolia virginiana*), swamp chestnut oak (*Quercus michauxii*), and American elm (*Ulmus americana*). The canopy of bottomland forests associated with seepage streams typically includes tuliptree, sweetbay, swamp bay (*Persea palustris*), and swamp chestnut.

The shrub layer is dominated by Florida hobblebush (*Agarista populifolia*), American hornbeam (*Carpinus caroliniana*), common buttonbush (*Cephalanthus occidentalis*), hazel alder (*Alnus serrulata*), swamp dogwood (*Cornus foemina*), parsley hawthorn (*Crataegus marshallii*), titi (*Cyrilla racemiflora*), Carolina ash (*Fraxinus caroliniana*), loblolly bay (*Gordonia lasianthus*), dahoon (*Ilex cassine*), large gallberry (*Ilex coriacea*), Virginia willow (*Itea virginica*), fetterbush (*Lyonia lucida*), sweetbay (*Magnolia virginiana*), wax myrtle (*Myrica cerifera*), swamp bay (*Persea palustris*), swamp laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), swamp azalea (*Rhododendron viscosum*), saw palmetto (*Serenoa repens*), highbush blueberry (*Vaccinium corymbosum*), southern arrowwood (*Viburnum dentatum*), and possumhaw (*Viburnum nudum*) and shorter shrubs such as St.Andrew's cross (*Hypericum hypericoides*), coastal doghobble (*Leucothoe axillaris*), evergreen bayberry (*Myrica caroliniensis*), needle palm (*Rhapidophyllum hystrix*), and dwarf palmetto (*Sabal minor*). Florida hobblebush and bay species tend to have higher shrub densities in bottomland forest that are associated with seepage streams.

Herbs are generally sparse due to the closed canopy and dense shrub layer. Herbs present include switchcane (*Arundinaria gigantea*), Chapman's sedge (*Carex chapmannii*), warty sedge (*Carex verrucosa*), slender woodoats (*Chasmanthium laxum*), witchgrasses (*Dichanthelium spp.*), southern wood fern (*Dryopteris ludoviciana*), partridgeberry (*Mitchella repens*), cinnamon fern (*Osmunda cinnamomea*), green arrow arum (*Peltandra virginica*), millet beaksedge (*Rhynchospora miliacea*), sugarcane plumegrass (*Saccharum giganteum*), lizard's tail (*Saururus cernuus*), *Sphagnum spp.*, Fakahatchee grass (*Tripsacum dactyloides*), netted chain fern (*Woodwardia areolata*), and Virginia chain fern (*Woodwardia virginica*).

Epiphytes are infrequent to occasional and include Spanish moss (*Tillandsia usneoides*), and Bartram's airplant (*Tillandsia bartramii*). Vines are infrequent to common and include rattan vine (*Berchemia scandens*), crossvine (*Bignonia capreolata*), climbing hydrangea (*Decumaria barbara*), yellow jessamine (*Gelsemium sempervirens*), Virginia creeper

(Parthenocissus quinquefolia), earleaf greenbrier (Smilax auriculata), cat greenbrier (Smilax glauca), coral greenbrier (Smilax walteri), eastern poison ivy (Toxicodendron radicans), and muscadine (Vitis rotundifolia).

### **Fire Regimes:**

Fire is infrequent in bottomland forests, occurring only during times of drought. These infrequent fires are important in shaping the variable species composition. This community should be considered as a natural fire-break that may experience some burning at its margins. Prescribed fires from surrounding communities should be allowed to spread and extinguish themselves in the bottomland forest. Fire-breaks should not be needed.

## **Management Needs:**

Management activities in bottomland forest on JSF should focus on maintaining natural hydrologic patterns and allowing prescribed fires from adjacent communities to burn into the community and maintain ecotones. Variable water levels and infrequent fires allow this community to support a diverse assemblage of species. This community can be considered as a natural fire-break that may experience some burning at its margins. Prescribed fires from surrounding communities should be allowed to spread and extinguish themselves in the bottomland forest. Fire-breaks are usually unnecessary.

Removing feral hogs (*Sus scrofa*) may be desirable in areas where these animals are impacting bottomland forest vegetation. Monitor and treat non-native invasive plant populations.

# E. <u>Depression Marsh</u>

## **Description:**

Depression marshes are generally circular, shallow, herb-dominated wetlands found in clumps in sand substrate. Depression marshes most often occur within mesic or wet flatwoods. Frequently there are concentric zones of vegetation that respond to both the hydroperiod and the edaphic conditions within each zone. A common series of vegetation zones in depression marshes includes blue maidencane (*Amphicarpum muhlenbergianum*) closest to, and grading into, the adjacent flatwoods. Peelbark St.John's wort (*Hypericum fasciculatum*) dominates the shallow outer zone, followed by an often extensive area of maidencane (*Panicum hemitomon*). In the deeper center, bulltongue arrowhead (*Sagittaria lancifolia*) and pickerelweed (*Pontederia cordata*) often are dominant. All of these zones may be present within a depression marsh or a subset that is largely dependent on the bathymetry of the depression.

Depression marshes are dominated by herbaceous species, particularly maidencane and blue maidencane, but may also include sawgrass (*Cladium jamaicense*), tenangle pipewort (*Eriocaulon decangulare*), rough hedgehyssop (*Gratiola hispida*), Carolina redroot (*Lachnanthes caroliana*), meadowbeauty (*Rhexia spp.*), beaksedges (*Rhynchospora spp.*), sugarcane plumegrass (*Saccharum giganteum*), yellow hatpins (*Syngonanthus flavidulus*), Virginia chain fern (*Woodwardia virginica*), and yellow eyed grasses (*Xyris spp.*). Shrubby species of St. John's wort (*Hypericum spp.*) are prevalent. Most other shrubs

occur infrequently, such as fetterbush (*Lyonia lucida*), myrtle dahoon (*Ilex cassine* var. *myrtifolia*), and wax myrtle (*Myrica cerifera*). Swamp tupelo (*Nyssa sylvatica* var. *biflora*) is often widely scattered but trees are usually absent or infrequent. Epiphytes and vines are usually absent as well.

### **Current Conditions:**

The highest concentrations of depression marsh are located in the northeast portion of the forest. While several may have historically been wet prairie or even logged wet flatwoods, their present condition precludes accurate identification. Regardless, the management and fire regimes are similar for all three natural community types.

Currently, many of the depression marshes on JSF are encroached by woody species due to lack of frequent fire. Species that are encroaching into the depression marshes include red maple (*Acer rubrum*), common persimmon (*Diospyros virginiana*), gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), common buttonbush (*Cephalanthus occidentalis*), and slash pine (*Pinus elliottii*). Slash pine has been planted through many of the depression marshes where there is also evidence of past ditching and bedding.

Depression marshes are dominated by herbaceous species, particularly maidencane and blue maidencane. Other frequent species are sawgrass (*Cladium jamaicense*), tenangle pipewort (*Eriocaulon decangulare*), rough hedgehyssop (*Gratiola hispida*), Carolina redroot (*Lachnanthes caroliana*), meadowbeauty (*Rhexia* spp.), beaksedges (*Rhynchospora* spp.), sugarcane plumegrass (*Saccharum giganteum*), yellow hatpins (*Syngonanthus flavidulus*), Virginia chain fern (*Woodwardia virginica*), and yellow eyed grasses (*Xyris* spp.).

Weedy herbs, possibly associated with forestry-related soil disturbances, are also present, including broomsedge bluestem (*Andropogon virginicus*), spadeleaf (*Centella asiatica*), and vaseygrass (*Paspalum urvillei*). Some of the common shrubs include common buttonbush (*Cephalanthus occidentalis*), myrtle-leaved holly (*Ilex cassine var. myrtifolia*), fourpetal St. John's wort (*Hypericum tetrapetalum*), peelbark St. John's wort (*Hypericum fasciculatum*), and myrtleleaf St. John's wort (*Hypericum myrtifolium*). Epiphytes and vines are generally absent.

## **Fire Regimes:**

Depression marshes depend on fire to maintain the herbaceous layer and prevent shrub overgrowth. Historically, depression marshes likely burned irregularly every 1 to 8 years depending on water levels at the time of fires. Fires generally occurred early in the lightning season (April-June) when water was low and surrounding communities were dry. Prescribed fire in surrounding flatwoods should be encouraged to burn through depression marshes. The marshes will burn more completely during dry periods, and those marshes with dense shrub cover should be burned more often during spring and early summer.

## Management Needs:

Decrease woody species abundance with prescribed fire and minimize hydrologic and soil disturbances. Depression marshes require frequent, low-intensity fires to maintain a high

herbaceous species component and to reduce woody encroachment. Avoid placing firebreaks in depression marsh ecotones.

Identify and mark depression marsh boundaries prior to logging to minimize impacts by heavy equipment. Removing feral hogs (*Sus scrofa*) may be desirable in areas where wetland soils are being impacted.

### F. Dome Swamp

### **Description:**

Dome swamps are isolated, shallow, forested wetland basins that are typically imbedded in flatwoods communities. These swamps 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 and a limestone layer. Dome swamps are distinguished from basin swamps principally by their more circular shape, smaller size, and higher historical fire frequency.

The mature canopy is dominated by pond cypress (*Taxodium ascendens*) or swamp tupelo (*Nyssa sylvatica* var. *biflora*), with scattered slash pine (*Pinus elliottii*). The subcanopy and shrub layers are sparse. Typical dominant shrubs include myrtle dahoon (*Ilex cassine var. myrtifolia*), gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), and highbush blueberry (*Vaccinium corymbosum*). The herbaceous layer is sparse to dense, especially where fire frequency and woody plant mortality is high.

Like basin swamps, dome swamps have species-diverse, fire-maintained, herbaceous ecotones that are important for rare plants and animals. These ecotones are dominated by wiregrass (*Aristida stricta*) and also include blue maidencane (*Amphicarpum muhlenbergianum*), beaksedges (*Rhynchospora* spp.), yellow-eyed grasses (*Xyris* spp.), Carolina redroot (*Lachnanthes caroliana*), netted chain fern (*Woodwardia areolata*), Virginia chain fern (*W. virginica*), tenangle pipewort (*Eriocaulon decangulare*), flattened pipewort (*Eriocaulon compressum*), fox club moss (*Lycopodiella alopecuroides*), sphagnum (*Sphagnum* spp.), peelbark St. John's wort (*Hypericum fasciculatum*), and hooded pitcher plant (*Sarracenia minor*).

### **Current Conditions:**

Dome swamps of JSF typically have canopies dominated by pond cypress (*Taxodium ascendens*) and/or swamp tupelo (*Nyssa sylvatica* var. *biflora*) with scattered emergent slash pine (*Pinus elliottii*). The density of swamp tupelo corresponds with the dome's fire history. Domes with little to no swamp tupelo have burned more regularly or had higher intensity fires in the past than domes dominated by swamp tupelo. Subcanopy and shrub species consists of myrtle dahoon (*Ilex cassine var. myrtifolia*), swamp bay (*Persea palustris*), fetterbush (*Lyonia lucida*), gallberry (*Ilex glabra*), highbush blueberry (*Vaccinium corymbosum*), and wax myrtle (*Myrica cerifera*). The density of the herbaceous layer in the dome swamps of JSF is highly variable and likely a result of fire frequency and fire intensity. Some of the more common constituents of the herbaceous layer include beaksedges (*Rhynchospora* spp.), cinnamon fern (*Osmunda cinnamomea*), tenangle pipewort (*Eriocaulon decangulare*), yellow-eyed grasses (*Xyris* spp.), narrowfruit

horned beaksedge (*Rhynchospora inundata*), Virginia marsh St. John's wort (*Triadenum virginicum*), fox club moss (*Lycopodiella alopecuroides*), and sphagnum (*Sphagnum* spp.). Dome swamps with an intact, fire-maintained outer fringe frequently have wiregrass (*Aristida stricta* var. *beyrichiana*), blue maidencane (*Amphicarpum muhlenbergianum*), hooded pitcher plant (*Sarracenia minor*), dwarf sundew (*Drosera brevifolia*), and peelbark St. John's wort (*Hypericum fasciculatum*).

Many dome swamps at JSF have an unnatural vegetation structure caused by the combination of logging, fire exclusion, and the planting of slash pines. In most cases, restoration may only require the reintroduction of growing season fire.

### **Fire Regimes:**

Fire frequency is greatest at the periphery of a dome swamp, where a normal fire cycle might be as short as 3 to 5 years. Fires in the interior portions may occur infrequently.

### Management Needs:

At JSF, the herbaceous ecotones surrounding dome swamps have largely been disturbed by past silvicultural practices, firebreaks, and/or a lack of fire. Restoration of these ecotones will require the application of frequent prescribed fire, the removal of fire breaks, the closure of drainage channels, and the thinning of dense stands of planted slash pine. Initially, burning around dome swamps during years of normal precipitation (as opposed to drought years) will reduce heavy fuel loads that can facilitate catastrophic fires and resulting muck fires.

The removal of feral hogs (*Sus scrofa*) may be desirable in areas where wetlands are being impacted.

## G. <u>Floodplain Swamp</u>

## **Description:**

Floodplain swamps are forested wetlands associated with rivers or streams and which are inundated for much of the year.

The dominant canopy species in floodplain swamp are pond cypress (*Taxodium ascendens*) and/or bald cypress (*Taxodium distichum*), and swamp tupelo (*Nyssa sylvatica* var. *biflora*). The semi-closed to closed canopy may also include water tupelo (*Nyssa aquatica*), swamp laurel oak (*Quercus laurifolia*), sweetgum (*Liquidambar styraciflua*), swamp bay (*Persea palustris*), red maple (*Acer rubrum*), and Carolina ash (*Fraxinus caroliniana*). The understory is comprised mostly of shrubs such as dwarf palmetto (*Sabal minor*), titi (*Cyrilla racemiflora*), coastal sweet pepperbush (*Clethra alnifolia*), buttonbush (*Cephalanthus occidentalis*), hawthorn (*Crataegus spp.*), and highbush blueberry (*Vaccinium corymbosum*). Herbs are frequent to abundant where light gaps occur but are otherwise sparse in most areas. Herbs include wood oats (*Chasmanthium spp.*), sedge (*Carex spp.*), green arrow arum (*Peltandra virginica*), switchcane (*Arundinaria gigantea*), witchgrass (*Dichanthelium spp.*), panic grass (*Panicum spp.*), and cinnamon fern (*Osmunda cinnamomea*). Epiphytes are infrequent to occasional and consist of Spanish moss (*Tillandsia usneoides*). Vines are frequent and include laurel greenbrier (*Smilax*).

*laurifolia*), Carolina jessamine (*Gelsemium sempervirens*), and climbing hydrangea (*Decumaria barbara*).

### **Current Conditions:**

Floodplain swamp exists as small, unmappable pockets or drainages in the larger mosaic of bottomland forest or, to a lesser extent, within mesic hammock. These areas are lower than the surrounding community and are usually dominated by pond cypress (Taxodium ascendens), bald cypress (Taxodium distichum), ogeechee tupelo (Nyssa ogeche), swamp tupelo (Nyssa sylvatica var. biflora), and red maple (Acer rubrum). The subcanopy is usually sparse and made up of swamp laurel oak (Quercus laurifolia), red maple, American hornbeam (Carpinus caroliniana), dahoon (Ilex cassine), and Carolina ash (Fraxinus caroliniana). The understory is typically open, with few herbs. Shrubs include titi (Cyrilla racemiflora), large gallberry (Ilex coriacea), fetterbush (Lyonia lucida), dwarf palmetto (Sabal minor), and buttonbush (Cephalanthus occidentalis). Herbs include wood oats, switchcane (Arundinaria gigantea), witchgrass (Dichanthelium spp.), panic grass (Panicum spp.), and cinnamon fern (Osmunda cinnamomea). Epiphytes are infrequent but include resurrection fern (Pleopeltis polypodioides var. michauxiana), and Spanish moss (Tillandsia usneoides). Vines are occasional and consist of laurel greenbrier (Smilax laurifolia), coral greenbrier (Smilax walteri), and eastern poison ivy (Toxicodendron radicans).

## Fire Regimes:

Floodplain swamps are usually too wet to support fires. However, fires in surrounding uplands that creep into the swamp edges are important in reducing pine and bay species invasion. At JSF, the small floodplain swamps imbedded within the bottomland forest rarely, if ever, burn. The paucity of shrubs and herbs will likely not carry fire, thereby allowing floodplain swamps to act as natural firebreaks.

## Management Needs:

Maintain natural hydrology and allow fires from surrounding uplands to enter into the swamp ecotones. Natural hydrology is crucial for maintaining species diversity and water quality. Hydrologic alterations associated with roads should be minimized as much as possible. Allowing fires from surrounding uplands to creep into the swamps will enhance diversity in ecotones and decrease baygall and pine encroachment. The removal of feral hogs (*Sus scrofa*) may be desirable in areas where wetlands are being impacted.

## H. <u>Mesic Flatwoods (Including restoration areas)</u>

## **Description:**

Mesic flatwoods are forests of longleaf pine (*Pinus palustris*) in more mesic sites, and slash pine (*Pinus elliottii*) in wetter areas. There is little or no subcanopy but a dense ground cover of herbs and shrubs. Mesic flatwoods are noted for their herbaceous diversity, which includes many rare species. Historically, the community structure of mesic flatwoods was maintained by frequent, low-intensity, growing season fires. Soils are mainly in the spodosol family (bearing a spodic horizon -- i.e., a clay hardpan -- that develops beneath poorly drained conditions), and are characterized by low levels of nutrients and organic matter and a low but variable pH.

Common shrubs include saw palmetto (Serenoa repens), fetterbush (Lyonia lucida), rusty staggerbush (Lyonia ferruginea), coastalplain staggerbush (Lyonia fruticosa), gallberry (Ilex glabra), wax myrtle (Myrica cerifera), tarflower (Bejaria racemosa), dwarf huckleberry (Gaylussacia dumosa), blue huckleberry (Gaylussacia frondosa var. tomentosa), highbush blueberry (Vaccinium corymbosum), shiny blueberry (Vaccinium myrsinites), gopher apple (Licania michauxii), running oak (Quercus elliottii), and dwarf live oak (Quercus minima). Herbaceous species include wiregrass (Aristida stricta var. beyrichiana), arrowfeather threeawn (Aristida purpurascens), bottlebrush threeawn (Aristida spiciformis), Curtiss' dropseed (Sporobolus curtissii), lopsided Indiangrass (Sorghastrum secundum), witchgrasses (Dichanthelium spp.), beaksedges (Rhynchospora spp.), and queensdelight (Stillingia sylvatica).

Most mesic flatwoods areas in JSF have inclusions of wetter habitats such as wet flatwoods and dome swamps. The ecotone between mesic flatwoods and wetland communities is an important area for many rare species and is maintained with frequent, low-intensity, growing season fires, typically every 2-5 years.

### **Current Conditions:**

There are many good examples of mesic flatwoods at JSF. Much of the flatwoods acreage within recently acquired parcels (e.g., Yellow Water Tract) suffers from years of fire exclusion while supporting dense stands of planted pines. The groundcover has suffered as a result of these conditions, as well as from past ditching and bedding. Areas that were agriculture fields in the 1943 historical aerial photos have since succeeded into a "weedy" form of mesic flatwoods. Areas of planted pine that have been clearcut are also generally weedy and in poor to fair condition. These stands are mapped as "restoration mesic flatwoods."

Longleaf (Pinus palustris) and slash pine (Pinus elliottii) are the dominant overstory species within the higher quality mixed-aged stands of mesic flatwoods. The subcanopy and tall shrubs are largely absent as a result of frequent growing season fires. The short shrub layer is dominated by saw palmetto (Serenoa repens), fetterbush (Lyonia lucida), rusty staggerbush (Lyonia ferruginea), coastalplain staggerbush (Lyonia fruticosa), gallberry (Ilex glabra), wax myrtle (Myrica cerifera), tarflower (Bejaria racemosa), dwarf huckleberry (Gaylussacia dumosa), blue huckleberry (Gaylussacia frondosa var. tomentosa), highbush blueberry (Vaccinium corymbosum), shiny blueberry (Vaccinium myrsinites), running oak (Quercus elliottii), and dwarf live oak (Quercus minima). The most common herbaceous/graminoid species of the fire-maintained mesic flatwoods include wiregrass (Aristida stricta var. beyrichiana), lopsided Indiangrass (Sorghastrum secundum), toothache grass (Ctenium aromaticum), Curtiss' dropseed (Sporobolus curtissii), broomsedge (Andropogon virginicus), bottlebrush threeawn, (Aristida spiciformis), witchgrasses (Dichanthelium spp.), beaksedges (Rhynchospora spp.), savannah meadowbeauty (Rhexia alifanus), hairy chaffhead (Carphephorus paniculatus), and blackroot (*Pterocaulon pycnostachyum*). Vines and epiphytes are rarely encountered.

Loblolly (*Pinus taeda*) and slash pine are typically the dominant canopy trees in the planted stands of mesic flatwoods. The mesic flatwoods with planted pines have generally had a history of fire exclusion and thus have a subcanopy of sweetgum, laurel oak, water oak (*Quercus nigra*), loblolly bay (*Gordonia lasianthus*), and swamp bay (*Persea palustris*). Shrubs are dominated by gallberry, wax myrtle, saw palmetto, sand blackberry (*Rubus cuneifolius*) and shiny blueberry. Dominant herbs include bushy bluestem (*Andropogon glomeratus*), broomsedge bluestem, bottlebrush threeawn, wiregrass, and bracken fern (*Pteridium aquilinum*). Many of these herbs and grasses are still present in fire-suppressed stands but in greatly reduced densities. Vines and epiphytes are infrequent.

### **Fire Regimes:**

Mesic flatwoods on JSF are burned with prescribed fire on a 2-5 year cycle.

### Management Needs:

Managers are encouraged to return a more natural fire regime to pine plantations that were historically mesic flatwoods. Using prescribed fire to reduce competition prior to planting could be a viable alternative to the more costly and time-consuming application of herbicides.

Priority should be given to burning areas of higher quality groundcover and using frequent growing-season fires to encourage herbaceous species, especially wiregrass, to reproduce naturally. With restoration, these areas may become seed sources for future reseeding projects. Groundcover plants may need to be seeded in areas that were formerly agriculture fields.

## I. <u>Mesic Hammock</u>

## **Description:**

Mesic hammocks are hardwood forests with a closed canopy of mixed mesophytic species dominated by live oak (*Quercus virginiana*) with cabbage palm (*Sabal palmetto*) often present in the subcanopy. It occurs primarily as scattered small stands or fringing borders in a matrix of floodplain marsh, bottomland forest, hydric hammock, or other naturally fire-protected areas. Mesic hammocks are infrequently inundated. The dense canopy maintains relatively high humidity levels; thus, fires are a rare occurrence. At JSF, mesic hammock occurs primarily along portions of the creeks. Floodplain swamp is included within the mesic hammock community and the two form a ridge and swale type of topography, with the mesic hammock ridges being dominant.

Canopy species include live oak (*Quercus virginiana*), pignut hickory (*Carya glabra*), sweetgum (*Liquidambar styraciflua*), slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*) and laurel oak (*Quercus hemisphaerica*). There is a subcanopy of younger canopy species and also includes red maple (*Acer rubrum*) and American holly (*Ilex opaca*). Shrubs can be abundant and often include American hornbeam (*Carpinus caroliniana*), white fringetree (*Chionanthus virginicus*), southern magnolia (*Magnolia grandiflora*), black cherry (*Prunus serotina*), sweet pinxter azalea (*Rhododendron canescens*), saw palmetto (*Serenoa repens*), sparkleberry (*Vaccinium arboreum*), Elliot's blueberry (*Vaccinium elliottii*), deerberry (*Vaccinium stamineum*), red buckeye (*Aesculus pavia*),

smallflower pawpaw (*Asimina parviflora*), among others. Herbs are generally sparse due to the closed canopy and dense shrub layer. Species may include woodoats (*Chasmanthium laxum*), woods grass (*Oplismenus hirtellus*), bracken fern (*Pteridium aquilinum*), partridgeberry (*Mitchella repens*), and whip nutrush (*Scleria triglomerata*). Epiphytes are infrequent to occasional and include Spanish moss (*Tillandsia usneoides*), resurrection fern (*Pleopeltis polypodioides*), and ball moss (*Tillandsia recurvata*). Vines are infrequent to common and include muscadine (*Vitis rotundifolia*) and poison ivy (*Toxicodendron radicans*).

On the 1943 geo-rectified photographs, mesic hammock has a dark, rough grained signature, but not as rough as bottomland forest. Individual live oak trees can almost be identified from the aerial images, giving the entire community a signature somewhat analogous to a head of black cauliflower. Mesic hammock is difficult to separate from the more common bottomland forest community on the historical aerial photos and may be more abundant than what has been identified. Delineation was aided by ground-truthing in the field.

### **Current Conditions:**

Mesic hammock on JSF is likely more abundant than what was delineated given the difficulty separating the signature of bottomland forest from mesic hammock.

Canopy species include live oak (Quercus virginiana), pignut hickory (Carya glabra), sweetgum (Liquidambar styraciflua), blackgum (Nyssa sylvatica), slash pine (Pinus elliottii), southern magnolia (Magnolia grandiflora), loblolly pine (Pinus taeda) and laurel oak (Quercus laurifolia). There is a subcanopy of younger canopy species and also includes red maple (Acer rubrum) and American holly (Ilex opaca). Shrubs can be abundant and often include American hornbeam (Carpinus caroliniana), white fringetree (Chionanthus virginicus), flowering dogwood (Cornus florida), American witchhazel (Hamamelis virginiana), sweetgum, swamp bay (Persea palustris), laurel oak, water oak (Quercus nigra), cabbage palm (Sabal palmetto), horse sugar (Symplocos tinctoria), southern arrowwood (Viburnum dentatum), Walter's viburnum (V. obovatum), black cherry (Prunus serotina), sweet pinxter azalea (Rhododendron canescens), saw palmetto (Serenoa repens), sparkleberry (Vaccinium arboreum), Elliot's blueberry (V. elliottii), deerberry (V. stamineum), red buckeye (Aesculus pavia), devil's walkingstick (Aralia spinosa), smallflower pawpaw (Asimina parviflora), among others. Herbs are generally sparse due to the closed canopy and dense shrub layer. Species may include woodoats (Chasmanthium laxum), woods grass (Oplismenus hirtellus), bracken fern (Pteridium aquilinum), partridgeberry (Mitchella repens), nodding nixie (Apteria aphylla), and whip nutrush (Scleria triglomerata). Epiphytes are infrequent to occasional and include Spanish moss (Tillandsia usneoides), resurrection fern (Pleopeltis polypodioides), and ball moss (Tillandsia recurvata). Vines are infrequent to common and include muscadine (Vitis rotundifolia), crossvine (Bignonia capreolata), sarsaparilla vine (Smilax pumila), and poison ivy (Toxicodendron radicans).

There is evidence of past timbering within the community. Generally, the habitat is in the later stages of succession and species composition is typical of mesic hammocks in

northeast Florida. Species more typical of mesic hammock are increasing along the creek bottoms and populating areas that were historically mesic flatwoods. Mesic flatwoods along the creeks are often surrounded by bottomland forest or wetland communities and are currently somewhat protected from fire.

#### **Fire Regimes:**

Mesic hammock is not generally considered a fire adapted community although hammock occurring adjacent to fire maintained communities may experience occasional low intensity ground fires that generally do not burn through the understory of the community.

### Management Needs:

Because mesic hammocks are often associated with various types of wetlands, either occurring as a matrix with hydric communities or as a transition to uplands, it is important to maintain the hydrological integrity of the hammocks. Management activities in mesic hammock on JSF should focus on maintaining natural hydrologic patterns and allowing prescribed fires from adjacent communities to burn into the community. This will help maintain ecotones and decrease the spread of mesic hammock species into adjacent flatwoods communities.

Fire is infrequent in mesic hammocks, occurring only during times of drought. These infrequent fires may be important in shaping the variable species composition. This community should be considered a natural firebreak that may experience some burning at its margins. Prescribed fires from surrounding communities should be allowed to spread and extinguish themselves in the mesic hammock. Firebreaks should not be needed.

### J. Pine Plantation

### **Description:**

A large proportion of the mesic flatwoods, wet flatwoods, and sandhill habitats on JSF have been converted to pine plantation. The desired future condition is dependent on which historical community had been converted into pine plantation.

Refer to mesic flatwoods, wet flatwoods and sandhill desired future conditions for guidance on these communities.

### **Current Conditions:**

The canopy layer of the pine plantations is typically dominated by planted slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*), or longleaf (*Pinus palustris*). The sub-canopy layer of the pine plantations includes red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), dahoon (*Ilex cassine*), sweetgum (*Liquidambar styraciflua*), loblolly pine, sand live oak (*Quercus geminata*), laurel oak (*Quercus laurifolia*), and water oak (*Quercus nigra*). Common plants in the shrub layer include red maple, titi (*Cyrilla racemiflora*), large gallberry (*Ilex coriacea*), gallberry (*Ilex glabra*), sweetgum, wax myrtle (*Myrica cerifera*), swamp bay (*Persea palustris*), black cherry (*Prunus serotina*), laurel oak, saw palmetto (*Serenoa repens*), blue huckleberry (*Gaylussacia frondosa var. tomentosa*), myrtle dahoon (*Ilex cassine var. myrtifolia*), sawtooth blackberry (*Rubus cuneifolius*), Elliott's blueberry (*Vaccinium elliottii*), shiny blueberry

(Vaccinium myrsinites), and deerberry (Vaccinium stamineum). The most common herbaceous species of the pine plantations include broomsedge bluestem (Andropogon virginicus), wiregrass (Aristida stricta var. beyrichiana), switchcane (Arundinaria gigantea), spadeleaf (Centella asiatica), dogfennel (Eupatorium capillifolium), yankeeweed (Eupatorium compositifolium), Carolina frostweed (Helianthemum carolinianum), and bracken fern (Pteridium aquilinum). Several vine species are common throughout the pine plantations and include yellow jessamine (Gelsemium sempervirens), earleaf greenbrier (Smilax auriculata), saw greenbrier (Smilax bona-nox), cat greenbrier (Smilax glauca), eastern poison ivy (Toxicodendron radicans), and muscadine (Vitis rotundifolia).

### **Fire Regimes:**

Please refer to the appropriate historical community type.

In order to restore some of the pine plantations, they may require more frequent fire in the beginning than is typical for the historic natural community. In some stands where community structure is still intact but somewhat overgrown, prescribed fire alone should be sufficient for restoration. In more extreme cases where woody encroachment possibly precludes safe and effective burning, mechanical removal of hardwoods and thinning of the planted pines may be necessary, followed shortly by prescribed burning.

### Management Needs:

Return a more natural fire regime to pine plantations that were historically flatwoods and sandhill. Use of prescribed fire to reduce competition prior to planting could be a viable alternative to the more costly and time-consuming application of herbicides. Priority should be given to burning areas of higher quality groundcover, using frequent growing-season fires to encourage herbaceous species, especially wiregrass, to reproduce naturally.

In all cases the habitat will return to a more natural state with the thinning of dense stands of planted pines and reintroduction of frequent growing season ground fires. With repeated prescribed fire, the pine plantations will slowly regain the habitat structure and species composition more typical of the natural communities that were replaced. More specifically, the canopy will be more open and have fewer hardwood species, and the groundcover will be denser and more species diverse with the advent of prescribed fire.

Currently, in most of the pine plantations the herbaceous plants, which are important in fueling growing-season fires, have been drastically reduced. Species such as wiregrass (*Aristida stricta*), bottlebrush threeawn (*Aristida spiciformis*), lopsided Indiangrass (*Sorghastrum secundum*), pineywoods dropseed (*Sporobolus junceus*), and Curtiss' dropseed (*Sporobolus curtissii*), are infrequently found within the pine plantations and are at much lower densities then what is typical for each of the communities replaced by the pine plantations. Some of these species may need to be seeded in areas where the native groundcover has been excluded. Similarly, pine species, most often longleaf pine (*Pinus palustris*), typical of each community that was replaced by pine plantation may need to be planted in areas where there is not a seed source.

#### K. <u>Sandhill</u> (Including restoration areas) Description:

North Florida sandhills are forests of longleaf pine (Pinus palustris) trees, typically with a sub canopy of turkey oak (Quercus laevis) and or sand post oak (Q. margarettae), with a sparse understory of deciduous oaks and a fairly dense groundcover of herbs. Sandhills are fire-maintained communities that occur on relatively well-drained, deep sands. Sandhill typically has a canopy dominated by longleaf pine. The sub canopy is slightly denser than the canopy and consists of young longleaf pine and turkey oak. The understory is composed of a mixture of shrubs, herbs, and bare sand. Shrubs make up 30%-40% of the understory and include saw palmetto (Serenoa repens), wooly pawpaw (Asimina incana), deerberry (Vaccinium stamineum), shiny blueberry (Vaccinium myrsinites), Chapman's oak (Quercus chapmannii), gopher apple (Licania michauxii), littleleaf buckbrush (Ceanothus microphyllus), wax myrtle (Myrica cerifera), Adam's needle (Yucca filamentosa), and dwarf huckleberry (Gaylussacia dumosa). Herbs make up 50%-60% of the understory, with wiregrass (Aristida stricta) being the dominant species. Other herbs present are lopsided Indian grass (Sorghastrum secundum), pineywoods dropseed (Sporobolus junceus), shortleaf gayfeather (Liatris tenuifolia), fragrant eryngo (Eryngium aromaticum), whitetop aster (Sericocarpus tortifolius), snakeroot (Pterocaulon pycnostachyum), witch grasses (Dichanthelium spp.), summer farewell (Dalea pinnata), queensdelight (Stillingia sylvatica), tall jointweed (Polygonella gracilis), narrowleaf silkgrass (Pityopsis graminifolia), Elliott's milkpea (Galactia elliottii), coastalplain chaffhead (Carphephorus corymbosus), pinewoods milkweed (Asclepias humistrata), whorled milkweed (Asclepias verticillata), rabbitbells (Crotalaria rotundifolia), sensitive brier (Mimosa quadrivalvis), coastalplain goldenaster (Chrysopsis scabrella), coastalplain dawnflower (Stylisma patens), coastalplain honeycombhead (Balduina angustifolia), dogtongue wild buckwheat (Eriogonum tomentosum), and Florida Indian plantain (Arnoglossum floridanum). Bare sand occupies approximately 5-10% of the groundcover. Epiphytes are infrequent and include Spanish moss (Tillandsia usneoides), ball moss (Tillandsia recurvata), and Bartram's airplant (Tillandsia bartramii). Vines are also found infrequently and may include low densities of muscadine (Vitis rotundifolia) and earleaf greenbrier (Smilax auriculata).

On the 1943 geo-rectified photographs, sandhills appear as a grainy, light peppered signature. Delineation was aided by ground-truthing.

### **Current Conditions:**

There are several excellent examples of sandhill on JSF. However, there are also areas that have dense stands of planted pine and/or areas that have experienced years of fire exclusion. A third subset of sandhill is areas that were agriculture land on the 1943 aerial photo and have subsequently converted into successional hardwood forest. Areas of planted pine that have been clearcut are generally weedy and in poor to fair condition. These stands are mapped as "restoration sandhill."

The canopy of the mixed-aged fire maintained sandhill consists of longleaf pine (*Pinus palustris*) with a subcanopy of longleaf pine, bluejack oak (*Quercus incana*), turkey oak (*Quercus laevis*), and sand post oak (*Quercus margarettae*). Common shrubs include

bluejack oak, saw palmetto (Serenoa repens), sparkleberry (Vaccinium arboreum), woolly pawpaw (Asimina incana), netted pawpaw (Asimina reticulata), chinquapin (Castanea pumila), dwarf huckleberry (Gaylussacia dumosa), gopher apple (Licania michauxii), Chapman's oak (Quercus chapmanii), running oak (Quercus elliottii), dwarf live oak (Quercus minima), shiny blueberry (Vaccinium myrsinites), and deerberry (Vaccinium stamineum). Wiregrass (Aristida stricta var. beyrichiana) is abundant in the groundcover along with Elliott's bluestem (Andropogon gyrans), pineland wild indigo (Baptisia lecontei), coastalplain chaffhead (Carphephorus corymbosus), tread softly (Cnidoscolus stimulosus), summer farewell (Dalea pinnata), dogtongue wild buckwheat (Eriogonum tomentosum), trailing ratany (Krameria lanceolata), lady lupine (Lupinus villosus), narrowleaf silkgrass (Pityopsis graminifolia), bracken fern (Pteridium aquilinum), blackroot (Pterocaulon pycnostachyum), dollarleaf (Rhynchosia reniformis), little bluestem (Schizachyrium scoparium), kidneyleaf rosinweed (Silphium compositum), lopsided indiangrass (Sorghastrum secundum), pineywoods dropseed (Sporobolus junceus), and queensdelight (Stillingia sylvatica).

The dominant overstory species in planted stands consists of either longleaf pine, slash pine (*Pinus elliottii*), or loblolly pine (*Pinus taeda*) with encroaching hardwoods such as sand live oak (*Quercus geminata*) and laurel oak (*Quercus laurifolia*). The midstory contains scattered turkey oak, sand live oak, water oak (*Quercus nigra*), and black cherry (*Prunus serotina*). The understory is generally shaded and in most stands, has been excluded from fire. Evidence of bedding is common. Shrubs present include sand blackberry (*Rubus cuneifolius*), saw palmetto, sparkleberry, shiny blueberry, deerberry, and gopher apple. Dominant groundcover species include wiregrass, blackroot, broomsedge bluestem (*Andropogon virginicus*), and bracken fern. Epiphytes are absent. Vines are infrequent and consist of Elliott's milkpea (*Galactia elliottii*), yellow jessamine (*Gelsemium sempervirens*), earleaf greenbrier (*Smilax auriculata*), and muscadine (*Vitis rotundifolia*).

### **Fire Regimes:**

Sandhill is considered to be a fire climax community. Frequent prescribed fire reduces hardwood competition and perpetuate pines, forbs, and grasses. The natural fire frequency is every 1 to 3 years. Naturally, fires would ignite principally during the early summer (April-June) when lightning strikes are frequent and fuels are not yet saturated by afternoon rains. Without frequent fires, sandhills may eventually succeed to xeric hammock.

### Management Needs:

Management activities in sandhill on JSF should focus on regular prescribed burning and minimizing practices that disturb the soil. Prescribed burning is the preferred method to reduce woody species abundance in the understory. Prescribed burning during early summer should provide the greatest benefit in reducing woody species abundance.

During all management activities, efforts should be made to minimize any detrimental effects to the gopher tortoise (*Gopherus polyphemus*) population (and its burrows) within this community, as this species is considered a keystone ecosystem component.
# L. <u>Scrubby Flatwoods</u>

# **Description:**

Scrubby flatwoods are characterized as forests of pine trees with a shrub dominated understory and numerous areas of bare sand. Scrubby flatwoods can occur along slightly elevated relict sandbars and dunes, along creeks and streams, or downslope from a more xeric community such as sandhill. Because the sandy soil can be more than a meter deep and drains rapidly, scrubby flatwoods normally do not flood even under extremely wet conditions.

Scrubby flatwoods are forests of longleaf pine (Pinus palustris) or possibly slash pine (Pinus elliottii) in wetter areas. There is little or no subcanopy but a dense ground cover of herbs and shrubs. The understory is a mosaic of moderately dense, scrubby, shrub patches and open areas of herbs and bare sand. Typical shrubs are saw palmetto (Serenoa repens), Chapman's oak (Quercus chapmannii), myrtle oak (Q. myrtifolia), sand live oak (Q. geminata), dwarf live oak (Q. minima), sand holly (Ilex ambigua), rusty staggerbush (Lyonia ferruginea), coastalplain staggerbush (L. fruticosa), shiny blueberry (Vaccinium myrsinites), deerberry (V. stamineum), wooly pawpaw (Asimina incana), winged sumac (Rhus copallinum), pricklypear (Opuntia humifusa), wild olive (Osmanthus americanus), tarflower (Bejaria racemosa), and huckleberry (Gaylussacia spp.). The herbaceous layer consists primarily of wiregrass (Aristida stricta), along with sandyfield beaksedge (Rhynchospora megalocarpa), gayfeather (Liatris spp.), bracken fern (Pteridium aquilinum), anise scented goldenrod (Solidago odora), Florida Indian plantain (Arnoglossum floridanum), tall elephants foot (Elephantopus elatus), rabbitbells (Crotalaria rotundifolia), and Elliott's milkpea (Galactia elliottii). Epiphytes are infrequent and may include Spanish moss (Tillandsia usneoides) and ball moss (Tillandsia recurvata). Vines are scattered and include such species as earleaf greenbriar (Smilax auriculata), Carolina jessamine (Gelsemium sempervirens), and muscadine (Vitis rotundifolia).

Most scrubby flatwoods areas in JSF have inclusions of wetter habitats such as wet flatwoods and dome swamps. The ecotone between scrubby flatwoods and wetland communities is an important area for many rare species and should be maintained with frequent fire (approximately 2-5yrs).

On the 1943 geo-rectified photographs, scrubby flatwoods can be discerned as a grayer, rough grained signature with white patches that are areas of exposed sand. In general, the signature appears to be a cross between the lighter sandhill and the more uniformly dark mesic flatwoods signatures.

# **Current Conditions:**

On JSF, scrubby flatwoods are relatively uncommon and were only found in the southeastern portion of the forest. Several mesic flatwoods adjacent to the North Fork of Black Creek had scrubby flatwoods inclusions. This community may prove to be slightly more common than what was identified during mapping due to the difficulty of separating the mesic and scrubby flatwoods signatures.

Longleaf pine (*Pinus palustris*) is the dominant canopy tree of the scrubby flatwoods community and sweetgum (*Liquidambar styraciflua*), sand live oak (*Quercus geminata*), sand post oak (*Q. margarettae*), and water oak (*Q. nigra*) are common in the sub-canopy layer. The shrub layer is dense and contains the following species: dwarf huckleberry (*Gaylussacia dumosa*), blue huckleberry (*G. frondosa* var. tomentosa), rusty staggerbush (*Lyonia ferruginea*), coastalplain staggerbush (*L. fruticosa*), Chapman's oak (*Quercus chapmanii*), sand live oak, laurel oak (*Q. laurifolia*), bluejack oak (*Q. incana*), myrtle oak (*Q. myrtifolia*), sparkleberry (*Vaccinium arboreum*), deerberry (*V. stamineum*), tarflower (*Bejaria racemosa*), saw palmetto (*Serenoa repens*), and shiny blueberry (*Vaccinium myrsinites*). Herbs are sparse and include wiregrass (*Aristida stricta* var. *beyrichiana*), grassleaf roseling (*Callisia graminea*), coastalplain chaffhead (*Carphephorus corymbosus*), vanillaleaf (*C. odoratissimus*), Elliott's milkpea (*Galactia elliottii*), bracken fern (*Pteridium aquilinum*), Curtiss' dropseed (*Sporobolus curtissii*), and a lichen (*Cladina evansii*). Epiphytes and vines are infrequent.

## **Fire Regimes:**

Fires would have likely swept across flatwoods every 1-8 years in summer, when thunderstorms generate numerous lightning strikes. These fires are essential for maintaining the structure of the scrubby flatwoods, preventing hardwood encroachment from bordering hammock or baygall, and reducing woody competition. Scrubby flatwoods do not burn as often as mesic flatwoods due to the general incombustibility of the oak litter. Natural fire frequency was likely every 5 to 15 years with most burns occurring during late spring and early summer (April-June).

## Management Needs:

Scrubby flatwoods do not burn as often as mesic flatwoods due to the general incombustibility of the oak litter. Return a more natural fire regime.

# M. Successional Hardwood Forest

## **Description:**

Successional hardwood forests are closed-canopied forests dominated by fast growing hardwoods. Typical canopy species include laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), and loblolly pine (*Pinus taeda*). This community type consists of forests that are either natural habitats like mesic flatwoods, sandhill, upland pine, and upland mixed woodland that have experienced years of fire-suppression or former agricultural fields/improved pastures that have succeeded to forest.

For desired future conditions refer to the historic natural community. On JSF, the majority of the areas identified as successional hardwood forest were agricultural fields, evident on the 1943 aerial photography, on former mesic flatwoods and sandhill.

## **Current Conditions:**

Typical canopy and sub-canopy tree species found on the former agricultural fields include sweetgum, laurel oak, water oak, sand live oak (*Quercus geminata*), black gum (*Nyssa sylvatica*), slash pine (*Pinus elliottii*), and loblolly pine (*Pinus taeda*), and in some

instances even longleaf pine (*Pinus palustris*). The shrub layer often contains the following species: laurel oak, water oak, sweetgum, red bay (*Persea borbonia*), sparkleberry (*Vaccinium arboreum*), deerberry (*V. stamineum*), wax myrtle (*Myrica cerifera*), wooly pawpaw (*Asimina incana*), and, at lower densities than typical mesic flatwoods, saw palmetto (*Serenoa repens*) and shiny blueberry (*Vaccinium myrsinites*). The groundcover is sparse and often only includes weedy species such as bahiagrass (*Paspalum notatum*), broomsedges (*Andropogon* spp.), witchgrasses (Dichanthelium spp.), maidencane (*Panicum hemitomon*), yankeeweed (*Eupatorium compositifolium*), yellow jessamine (*Gelsemium sempervirens*), earleaf greenbrier (*Smilax auriculata*), muscadine (*Vitis rotundifolia*), Elliott's milkpea (*Galactia elliottii*), bracken fern (*Pteridium aquilinum*), and lichens (*Cladinia evansii* and *C. subtenuis*).

# **Fire Regimes:**

The historic fire return interval would have been around 1-3 years for mesic flatwoods and sandhill; and 2-10 years for upland mixed woodland. Most burns should occur during late spring and early summer (April-June).

# Management Needs:

Management should focus on increasing the frequency of prescribed burns. Restoration of these communities will likely take many years of prescribed fires and may be enhanced by planting native groundcover.

# N. <u>Upland Mixed Woodland</u>

# **Description:**

Upland mixed woodland is comprised of primarily deciduous hardwood trees tolerant of periodic fires along with scattered longleaf pines (*Pinus palustris*); often on rolling topography or transitions from higher to lower elevations. The partially-closed canopy maintains relatively high humidity levels and thus fires are not as frequent as in sandhill or flatwoods communities. This community type typically occurs between sandhill and hardwood dominated communities such as upland hardwood forest or bottomland forest. The dominant hardwood species are more resistant to fire than upland hardwood species and bottomland forest species. Upland mixed woodland soils are typically loamy, well drained, and are never inundated. In some areas, there is limestone or phosphatic rock near the surface with soils containing slightly elevated levels of phosphorus, potassium, and calcium.

The canopy includes mockernut hickory (*Carya alba*), southern red oak (*Quercus falcata*), longleaf pine (*Pinus palustris*), sand post oak (*Quercus margarettae*), pignut hickory (*Carya glabra*), black cherry (*Prunus serotina*), and laurel oak (*Quercus laurifolia*). There is a subcanopy of younger canopy species along with red bay (*Persea borbonia*), flowering dogwood (*Cornus florida*), and American holly (*Ilex opaca*). The shrub species composition is as variable as the canopy and includes devil's walkingstick (*Aralia spinosa*), sand live oak (*Quercus geminata*), laurel oak, water oak (*Quercus nigra*), sparkleberry (*Vaccinium arboreum*), deerberry (*V. stamineum*), and saw palmetto (*Serenoa repens*). Herbs are generally sparse due to the closed canopy and dense shrub layer. Species may include partridgeberry (*Mitchella repens*), sweet goldenrod (*Solidago odora*), sarsaparilla

vine (*Smilax pumila*), woodsgrass (*Oplismenus hirtellus*), bracken fern (*Pteridium aquilinum*), and woodoats (*Chasmanthium laxum*). Epiphytes are infrequent to occasional and include Spanish moss (*Tillandsia usneoides*). Vines are infrequent and include earleaf greenbriar (*Smilax auriculata*) and poison ivy (*Toxicodendron radicans*).

On the 1943 geo-rectified photographs, upland mixed woodland has a dark, rough grained signature. It is very difficult to differentiate bottomland forest from upland mixed woodland. Delineation was aided by ground-truthing in the field and targeting dark signature areas located on steep slopes. There may be more upland mixed woodland on JSF than what was identified during mapping.

# **Current Conditions:**

At JSF, the documented upland mixed woodland areas are concentrated along slopes leading to the North Fork of Black Creek (name from 1994 USGS 7.5-minute topographic map) and along the slopes of the steep ravines of seepage streams flowing into the North Fork of Black Creek. The upland mixed woodland gradually grades into bottomland forest downslope and xeric hammock or sandhill upslope.

The current condition varies little from the desired condition. There is evidence of past timbering within the community. Generally, the habitat is in the later stages of succession and species composition is typical of upland mixed woodlands in northeast Florida. The canopy includes mockernut hickory (Carva alba), southern red oak (Ouercus falcata), longleaf pine (Pinus palustris), sand post oak (Quercus margarettae), pignut hickory (Carya glabra), southern magnolia (Magnolia grandiflora), black cherry (Prunus serotina), laurel oak (Quercus laurifolia), swamp chestnut oak (Quercus michauxii), and basswood (Tilia americana). There is a subcanopy of younger canopy species. The shrub species composition is as variable as the canopy and includes flowering dogwood (Cornus florida), devil's walkingstick (Aralia spinosa), sand live oak (Quercus geminata), laurel oak, water oak (Quercus nigra), sparkleberry (Vaccinium arboreum), deerberry (Vaccinium stamineum), American witchhazel (Hamamelis virginiana), red buckeye (Aesculus pavia), saw palmetto (Serenoa repens), and common sweetleaf (Symplocos tinctoria). Herb species include partridgeberry (Mitchella repens), sweet goldenrod (Solidago odora), sarsaparilla vine (Smilax pumila), woodsgrass (Oplismenus hirtellus), bracken fern (Pteridium aquilinum), Florida Indian plantain (Arnoglossum floridanum), and woodoats (Chasmanthium laxum). Epiphytes are infrequent to occasional and include Spanish moss (Tillandsia usneoides). Vines are infrequent and include earleaf greenbriar (Smilax auriculata) and poison ivy (Toxicodendron radicans).

The upslope side of the upland mixed woodland on JSF grades into xeric hammock or sandhill. The xeric hammock appears to have expanded into the adjacent sandhill since the 1943 historical photo. Return fire to the sandhill community that has converted to xeric hammock and fires should extinguish naturally once they reach the upland mixed woodland/bottomland forest ecotone.

# **Fire Regimes:**

Allow fires from adjacent sandhill communities to enter into the community and naturally extinguish or carry through to the bottomland forest.

The historic fire interval within this community type is largely unknown. Given the typical canopy species composition it is likely that periodic fires entered the community from adjacent pyrogenic community types.

# Management Needs:

On JSF, the upland mixed woodland occurs on steep slopes above sensitive seepage streams and blackwater creeks that harbor several rare species which could be negatively impacted by increased sediment loads. Direct application of prescribed fire may not be necessary in this natural community, if prescribed fires from adjacent surrounding communities were introduced. It is likely that upland mixed woodland was historically more common than what was delineated. Continue to monitor for this community type and update the natural community maps for JSF.

# **O.** <u>Wet Flatwoods</u> (Including restoration areas)

# **Description:**

Wet flatwoods are characterized by forests of pine trees with a thick shrubby understory and very sparse ground cover, or a fire-maintained, sparse understory and dense ground cover of hydrophytic herbs. Wet flatwoods exist on relatively flat, poorly drained land. The soils are generally 0.3 to 1 m (ca.1 to 3 ft.) of acidic sands overlying an organic hardpan or clay layer. The hardpan substantially reduces the percolation of water below and above its surface, and therefore wet flatwoods can be inundated for 1 or more months per year. Wet flatwoods often grade into dome swamps, basin swamps, baygall, and mesic flatwoods.

The desired future condition of wet flatwoods at JSF is a forest of even-aged and unevenaged slash pine (*Pinus elliottii*), or pond pine (*P. serotina*). Although the forest structure of wet flatwoods is similar to mesic flatwoods, species composition in wet flatwoods has more hydrophytic species. Shrub species that tend to occupy wet flatwoods are gallberry (*Ilex glabra*), myrtle dahoon (*I. cassine var. myrtifolia*), fetterbush (*Lyonia lucida*), saw palmetto (*Serenoa repens*), loblolly bay (*Gordonia lasianthus*), and titi (*Cyrilla racemiflora*). As in mesic flatwoods, the herbaceous layer in wet flatwoods includes species that help to maintain community structure by fueling growing-season fires; wiregrass (*Aristida stricta var. beyrichiana*) is dominant. Other typical species include Curtiss' dropseed (*Sporobolus curtissii*), Carolina redroot (*Lachnanthes caroliana*), meadowbeauties (*Rhexia* spp.), yellow-eyed grasses (*Xyris* spp.), several species of beaksedges (*Rhynchospora* spp.), and hooded pitcherplant (*Sarracenia minor*).

On the 1943 geo-rectified photographs, wet flatwoods appear similar to mesic flatwoods but with a slightly darker color, slightly rougher texture, more interspersed dark patches (baygall inclusions), and a somewhat wavy pattern as if the photo is out of focus in that area (i.e., area of wet flatwoods).

# **Current Conditions:**

The vegetative structure of the wet flatwoods is highly variable and partially dependent on fire history, hydroperiod, and silviculture. For example, herb-dominated wet flatwoods typically fringe many of the basin and dome swamps. A second type is shrub-dominated with little herbaceous/graminoid groundcover. Finally, a third type, currently appears to be baygall with a pine canopy but historically was much more open with small inclusions of baygall species.

In almost all instances, the wet flatwoods overstory is dominated by slash pine (Pinus elliottii) and/or pond pine (Pinus serotina) with an occasional loblolly bay (Gordonia lasianthus), loblolly pine (Pinus taeda), and pond cypress (Taxodium ascendens). When present, the subcanopy typically includes red maple (Acer rubrum), loblolly bay, swamp tupelo (Nyssa sylvatica var. biflora), swamp bay (Persea palustris), slash pine, pond pine, pond cypress, and less frequently, sweetgum (Liquidambar styraciflua), swamp laurel oak (Quercus laurifolia), water oak (Q. nigra), and live oak (Q. virginiana). Typical wet flatwoods species in the shrub layer include tarflower (Bejaria racemosa), titi (Cyrilla racemiflora), blue huckleberry (Gaylussacia frondosa var. tomentosa), peelbark St. John's wort (Hypericum fasciculatum), bedstraw St. John's wort (H. galioides), large gallberry (Ilex coriacea), gallberry (I. glabra), fetterbush (Lyonia lucida), evergreen bayberry (Myrica caroliniensis), wax myrtle (M. cerifera), swamp bay, slash pine, red chokeberry (Photinia pyrifolia), swamp azalea (Rhododendron viscosum), saw palmetto (Serenoa repens), and highbush blueberry (Vaccinium corymbosum). Common herbs and grasses include broomsedge bluestem (Andropogon virginicus), wiregrass (Aristida stricta var. beyrichiana), switchcane (Arundinaria gigantea), sawgrass (Cladium jamaicense), witchgrasses (Dichanthelium spp.), cinnamon fern (Osmunda cinnamomea), maidencane (Panicum hemitomon), sweetscent (Pluchea odorata), bracken fern (Pteridium aquilinum), sugarcane plumegrass (Saccharum giganteum), sphagnum moss (Sphagnum spp.), Curtiss' dropseed (Sporobolus curtissii), Virginia chain fern (Woodwardia virginica), and yelloweved grasses (Xyris spp.).

The herbaceous/graminoid-dominated wet flatwoods, and in some case what may have been wet prairie natural community, have decreased dramatically since the 1943 aerial photograph was taken; most have graded into shrub or bay dominated wet flatwoods as a result of fire exclusion. However, the herbaceous/graminoid dominance has returned in areas that have recently burned. Areas of planted pine that have been clear-cut are generally weedy and in poor to fair condition. These stands are mapped as "restoration wet flatwoods."

## **Fire Regimes:**

Historically, the fire return interval in wet flatwoods is 3 to 10 years. However, in areas of heavy fire exclusion and/or densely planted slash or loblolly pine, mechanical vegetation removal and/or a more frequent fire interval may need to be applied for initial restoration.

## **Management Needs:**

Return a more natural fire regime to pine plantations and areas that have experienced a dramatic increase in bay species density. Areas with remnant or restored herbaceous vegetation should be high priorities for burning, and burned with late spring/early summer

fires to stimulate wiregrass flowering and seed viability. With restoration, these areas may become potential seed sources for reseeding projects. Following harvest of plantation pines, in areas where erosion exists or where bedding impedes natural processes such as fire and hydrology, efforts should be made to improve topography prior to replanting native species. However, in areas with intact remnant groundcover, topographical restoration is not advisable, presuming that no other ecological problems are caused by the presence of the raised beds.

Prescribed burning should be applied to pine plantations in historical wet flatwoods on a 2-7 year cycle, with return intervals increasing with fuel reduction. This will reduce woody encroachment, sustain herbaceous species, and aid in prevention of catastrophic wildfires.

# P. Xeric Hammock

# **Description:**

Xeric hammocks are closed canopy forests, typically oak dominated, that occur on well drained soils that originate from old dune systems. Xeric hammocks are often considered an advanced successional stage of sandy upland communities such as sandhill, scrub, and scrubby flatwoods. Xeric hammocks may develop naturally through fire protection afforded to them by a wetland or other natural barrier such as a downward slope.

Xeric hammock has a closed (> 66% cover) canopy of predominantly sand live oak (*Quercus geminata*), but also often includes live oak (*Quercus virginiana*), laurel oak (*Q*. hemisphaerica), pignut hickory (Carya glabra), and southern red oak (Quercus falcata). The subcanopy consists of younger canopy species, as well as American holly (*Ilex opaca*), black cherry (Prunus serotina), wild olive (Osmanthus americanus), red bay (Persea borbonia), and persimmon (Diospyros virginiana). The understory is dominated by Typical species are rusty staggerbush (Lyonia ferruginea), Chapman's oak shrubs. (Quercus chapmannii), saw palmetto (Serenoa repens), sparkleberry (Vaccinium arboreum), deerberry (Vaccinium stamineum), wild olive (Osmanthus americanus), yaupon (Ilex vomitoria), and American beautyberry (Callicarpa americana). Herbs are generally sparse due to the closed canopy and high litter cover. Species may include witchgrasses (Dichanthelium spp.), sandyfield beaksedge (Rhynchospora megalocarpa), and an occasional threeawn (Aristida spp.). Epiphytes are common and consist of Spanish moss (Tillandsia usneoides) and ball moss (Tillandsia recurvata). Vines are occasional and include muscadine (Vitis rotundifolia) and earleaf greenbrier (Smilax auriculata).

On the 1943 geo-rectified photographs, xeric hammocks appear as small inclusions within sandhill and are dark rough textured areas surrounded by the grainy, light peppered signature of sandhill. Delineation was aided by ground-truthing.

## **Current Conditions:**

Currently, xeric hammock has expanded in extent in several sandhill areas due to fire exclusion. Similarly, several areas labeled historic xeric hammock have some upland mixed woodland indicators and those locations this community may have long ago converted to xeric hammock.

The dominant canopy trees are sand live oak (*Quercus geminata*) and laurel oak (*Quercus hemisphaerica*) with occasional live oak (*Quercus virginiana*), sand pine (*Pinus clausa*), longleaf pine (*Pinus palustris*), and loblolly pine (*Pinus taeda*). The subcanopy typically has canopy species with the addition of American holly (*Ilex opaca*), southern magnolia (*Magnolia grandiflora*), black cherry (*Prunus serotina*), and water oak (*Quercus nigra*). The shrub layer includes flowering dogwood (*Cornus florida*), southern magnolia, sand holly (*Ilex ambigua*), yaupon (*I. vomitoria*), rusty staggerbush (*Lyonia ferruginea*), blackgum (*Nyssa sylvatica*), wild olive (*Osmanthus americanus*), black cherry (*Prunus serotina*), sand live oak, laurel oak, water oak, sparkleberry (*Vaccinium arboreum*), common persimmon (*Diospyros virginiana*), saw palmetto (*Serenoa repens*), and deerberry (*Vaccinium stamineum*). There are few herbs encountered and include witchgrasses (*Dichanthelium spp.*), Elliott's milkpea (*Galactia elliottii*), woodsgrass (*Oplismenus hirtellus*), blackroot (*Pterocaulon pycnostachyum*) and a lichen (*Cladina evansii*). Vines are common, particularly yellow jessamine (*Gelsemium sempervirens*), earleaf greenbrier (*Smilax auriculata*), and muscadine (*Vitis rotundifolia*).

#### **Fire Regimes:**

Xeric hammocks rarely burn and typically develop after 30 or more years of fire protection. Allowing fires to burn into the xeric hammock communities and naturally extinguish may aid in reclaiming upland mixed woodland, sandhill, and scrubby flatwoods that has converted to xeric hammock because of years of fire suppression.

#### Management Needs:

Management activities in xeric hammock on JSF should focus on returning fire frequency more similar to the sandhill natural community. Allow fires from adjacent sandhill to burn into the edges of xeric hammock. In areas where sandhill has succeeded into xeric hammock within the last 60 years (i.e., since the 1943 aerial photo), ignite spot fires in the interior of the xeric hammock especially in areas that have retained wiregrass and other low growing fuel sources. It may be desirable within the xeric hammocks that have grown on areas that were formerly agriculture fields to selectively remove loblolly pine and hardwoods, leaving large turkey oaks (*Quercus laevis*) and sand post oaks (*Quercus margaretta*), apply prescribed fire, and reseed with native sandhill vegetation.

## Q. Other Altered Landcover Types

#### **Description:**

The desired future condition of each ruderal habitat is dependent on what the historical community used to be. Please refer to the appropriate community type for a more specific explanation of the desired future condition.

#### **Current Conditions:**

The ruderal habitat on JSF consists of an artificial pond and associated spoil area, clearing/regeneration (includes a large clay pit borrow area), developed areas (including small abandoned pastures), roads, and two utility corridors.

Artificial pond (2 acres) and Spoil Area (3 acres) – This is a small pond with an associated spoil area where dredge or spoil material is deposited and may be re-colonized by plants.

Ponds and spoil area are also included in a clay pit borrow area in the northwestern portion of the property.

Clearing/regeneration (44 acres) – A couple areas on JSF were mapped as clearings: 1) the edge of a bottomland forest cleared in recent decades and now overgrown with slash pine, 2) the large clay pit borrow area located in the northwestern portion of the property which contains primarily native weedy vegetation along with large areas of exposed sand, soil mounds, and two water filled pits. At this time, there are few non-native invasive plant species established within this highly disturbed portion of the forest.

Developed (30 acres) – There are several cemeteries located within JSF that typically have native trees and mowed native groundcover with interspersed planted ornamentals like crape myrtle (*Lagerstroemia indica*), and in some instances widely scattered non-native invasive plant species Chinese tallow (*Sapium sebiferum*) and mimosa (*Albizia julibrissin*). Parking areas, a helicopter landing pad, office areas, and an adjacent abandoned pasture were also mapped as developed.

Road (441 acres) – A network of improved roads and dirt vehicle trails. All roads greater than 5 meters wide were delineated.

Utility corridor (236 acres) – Two utility corridors (electric, gas, or telephone right-of-way) cross the property. Despite years of fire exclusion, disturbance from past forestry operations, and other forms of disturbance, many of the utility corridor areas have retained some of the shrub and ground layer species typical of flatwoods and sandhill communities, albeit at lower densities. Some of the species typical of natural communities found in the utility corridor areas include gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), swamp bay (*Persea palustris*), slash pine (*Pinus elliottii*), dwarf live oak (*Quercus minima*), saw palmetto (*Serenoa repens*), and deerberry (*Vaccinium stamineum*). At the same time, several weedy species are also dominant in these areas such as sawtooth blackberry (*Rubus argutus*), sand blackberry (*Rubus cuneifolius*), muscadine (*Vitis rotundifolia*), bushy bluestem (*Andropogon glomeratus*), broomsedge bluestem (*A. virginicus*), centipede grass (*Persea palum notatum*), and vaseygrass (*P. urvillei*).

# Fire Regimes:

Please refer to the appropriate historical community type.

## **Management Needs:**

Where possible return to a natural fire regime. Use of prescribed fire to reduce competition prior to planting could be a viable alternative to the more costly and time-consuming application of herbicides. Priority should be given to burning areas of higher quality groundcover, using frequent growing-season fires to encourage herbaceous species, especially wiregrass, to reproduce naturally.

It may not be practical or desirable to restore some of the ruderal habitats (e.g., cemeteries, developed land, roads, parking lots, etc.) to the historical natural community. Native trees

and shrubs should be used in the landscaping of these areas and avoid the use of non-native invasive species.

Monitor ruderal areas that are frequently disturbed, along roadways, utility corridors, cemeteries, and parking lots for the establishment of non-native invasive species.

## VIII. <u>References</u>

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# IX. <u>Glossary of Abbreviations</u>

Acquisition and Restoration Council
.Best Management Practice
.Conservation and Recreation Lands
.Department of Agriculture and Consumer Services
.Department of Environmental Protection
.Division of Historical Resources
.Division of Recreation and Parks
.Florida Communities Trust
.Florida Forest Service
.Florida Natural Areas Inventory
.Florida Fish and Wildlife Conservation Commission
.Jennings State Forest
.Natural Resources Conservation Service
.St. Johns River Water Management District
.DACS Office of Agricultural Law Enforcement
.Outstanding Florida Water
.DEP Office of Greenways & Trails
.Preservation 2000
.Board of Trustees of the Internal Improvement Trust Fund
.United States Forest Service
.United States Fish and Wildlife Service
.Wildlife Management Area