

TEN-YEAR RESOURCE MANAGEMENT PLAN

FOR THE

WELAKA STATE FOREST

PUTNAM COUNTY



PREPARED BY

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

FLORIDA FOREST SERVICE

APPROVED ON
AUGUST 15, 2014

TEN-YEAR RESOURCE MANAGEMENT PLAN
FOR THE
WELAKA STATE FOREST



Approved by:



Jim Karels, Director
Florida Forest Service

6.3.14

Date



David Core, Assistant Director
Florida Forest Service

5-19-14

Date



Brad Ellis, Chief
Forest Management Bureau

5/19/2014
Date

TEN-YEAR RESOURCE MANAGEMENT PLAN
WELAKA STATE FOREST

TABLE OF CONTENTS

Executive Summary	1
I. Introduction	2
A. General Mission and Management Plan Direction	2
B. Past Accomplishments	3
C. Goals/Objectives for the Next Ten Year Period	4
II. Administration Section	8
A. Descriptive Information	8
1. Common Name of Property	8
2. Legal Description and Acreage.....	8
3. Proximity to Other Public Resource	8
4. Property Acquisition and Land Use Considerations	9
B. Management Authority, Purpose and Constraints	9
1. Purpose for Acquisition/Management Prospectus	9
2. Degree of Title Interest Held by the Board.....	10
3. Designated Single or Multiple-Use Management.....	10
4. Revenue Producing Activities.....	10
5. Conformation to State Lands Management Plan	101
6. Legislative or Executive Constraints	11
7. Aquatic Preserve/Area of Critical State Concern	11
C. Capital Facilities and Infrastructure.....	11
1. Property Boundaries Establishment and Preservation	11
2. Improvements	11
3. On-Site Housing.....	12
4. Operations Infrastructure	12
D. Additional Acquisitions and Land Use Considerations	13
1. Alternate Uses Considered.....	13
2. Additional Land Needs	13
3. Surplus Land Assessment	13
4. Adjacent Conflicting Uses	14
5. Compliance with Comprehensive Plan.....	14
6. Utility Corridors and Easements	14
E. Agency & Public Involvement.....	15
1. Responsibilities of Managing Agencies.....	15
2. Law Enforcement.....	15
3. Public and Local Government Involvement	15
4. Volunteers	16
III. Archaeological/Cultural Resources and Protection	16
A. Past Uses	16
B. Archaeological and Historical Resources	17

C. Ground Disturbing Activities.....	18
D. Survey and Monitoring	18
IV. Natural Resources and Protection	19
A. Soils and Geologic Resources.....	19
1. Resources	19
2. Soil Protection.....	19
B. Water Resources	19
1. Resources	19
2. Water Protection	19
C. Wildlife Resources.....	20
1. Threatened and Endangered Species	20
2. Game Species and Other Wildlife.....	222
3. Survey and Monitoring	22
D. Sustainable Forest Resources.....	233
E. Beaches and Dune Resources	23
F. Mineral Resources	23
G. Unique Natural Features and Outstanding Native Landscapes.....	23
H. Research Projects/Specimen Collection	23
I. Ground Disturbing Activities.....	24
V. Public Access and Recreation	24
A. Existing	25
B. Planned.....	26
C. Hunter Access	26
VI. Habitat Restoration & Management Practices	26
A. Prescribed Fire	26
B. Sustainable Forestry & Silviculture	27
1. Strategies.....	27
2. Silvicultural Operations	27
3. Timber Inventory Control	28
4. Timber Sales	29
C. Non-Native Invasive Species Control.....	29
D. Insects, Disease and Forest Health.....	31
E. Use of Private Land Contractors.....	31
VII. Proposed Management Activities for Natural Communities	32
A. Mesic Flatwoods	33
B. Sandhill	34
C. Floodplain Swamp	35
D. Scrubby Flatwoods.....	36
E. Baygall	37
F. Wet Flatwoods	38
G. Alluvial Forest	39
H. Floodplain Marsh	40
I. Flatwoods/Prairie Lake	41

J. Depression Marsh	42
K. Xeric Hammock	43
L. Wet Prairie	44
M. Spring-run Stream.....	45
VIII. References.....	46
IX. Glossary of Abbreviations	47

TEN-YEAR RESOURCE MANAGEMENT PLAN WELAKA STATE FOREST

EXHIBITS

Ten-Year Management Accomplishment Summary	Exhibit A
General Location Map, with Nearby Public Lands	Exhibit B
WeSF Roads, Buildings and Improvements Map	Exhibit C
Optimal Management Boundary Map	Exhibit D
Compliance with Local Comprehensive Plan	Exhibit E
Land Management Review Team Recommendations	Exhibit F
State Forest Management Plan Advisory Group Summary	Exhibit G
Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands	Exhibit H
Soil Map and Descriptions.....	Exhibit I
Water Resources Map	Exhibit J
Florida Natural Areas Inventory Managed Area Tracking Record	Exhibit K
Public Access and Recreation Map.....	Exhibit L
WeSF 2009 Hydrological Restoration Summary	Exhibit M
Non-Native Invasive Plant Map.....	Exhibit N
Historic Natural Communities Map.....	Exhibit O
Current Natural Communities Map	Exhibit P
Mud Springs and Sulfur Springs Water Quality Data	Exhibit Q

TABLES

Table 1. WeSF Acreage by Parcel	Page 8
Table 2. Nearby Public Conservation Land and Easements	Page 8
Table 3. Archaeological and Historical Sites on WeSF.....	Page 17
Table 4. Endangered or Threatened Species on WeSF.....	Page 21
Table 5. Non-Native Invasive Species Found on WeSF.....	Page 29
Table 6. Vegetation Types Found on WeSF.....	Page 32

LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services, Florida Forest Service
COMMON NAME: Welaka State Forest (WeSF)
LOCATION: Putnam County
ACREAGE TOTAL: 2,287.1

<i>Historical Natural Communities</i>	<i>Acreage</i>	<i>Historical Natural Communities</i>	<i>Acreage</i>
Mesic flatwoods	618	Floodplain marsh	106
Sandhill	492	Flatwoods/prairie lake	73
Floodplain swamp	332	Depression Marsh	61.1
Scrubby flatwoods	206	Xeric hammock	9
Baygall	141	Wet prairie	4
Wet flatwoods	125	~~Shell mound~~	~~1.2~~
Alluvial forest**	120	Spring-run Stream	< 1

** includes Shell Mound site

LEASE/MANAGEMENT AGREEMENT NO.: 3979 USE: Single___ Multiple X

MANAGEMENT AGENCY

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

RESPONSIBILITY

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

DESIGNATED LAND USE: Multiple-use State Forest

SUBLEASE(S): None

ENCUMBRANCES: None

TYPE ACQUISITION: Fee Simple Conveyance of Deeds from Federal Government.

UNIQUE FEATURES: Continuum of sandhills to flatwoods to floodplain swamps, along with depression ponds and marshes; two springs and 2 ½ miles of undeveloped river frontage; high degree of biological diversity.

ARCHAEOLOGICAL/HISTORICAL: Four known archaeological sites and one resource group.

MANAGEMENT NEEDS: Restoration and maintenance of scrub, sandhill, and floodplain marsh native ecosystems through more frequent prescribed burning, and hardwood control. Thin slash pine plantations in mesic flatwoods to promote forest health and natural regeneration. Restore stream and wetland crossings thorough installation of culverts, hardened low water crossings. Complete interpretive / forest education trails and exhibits, evaluate additional primitive camping sites and consider installation of observation decks and fishing platforms. Replace and improve signage on boundary fence. Provide park ranger position to implement resource/ recreation programs. Pursue purchase of heavy equipment and tools needed to manage land. Increase presence of law enforcement agencies.

ACQUISITION NEEDS: Adjacent parcels to the south, north, and east (183.5 acres) (Exhibit D).

SURPLUS LANDS/ACREAGE: None

PUBLIC INVOLVEMENT: Management Plan Advisory Group and a Public Hearing, and the Acquisition and Restoration Council public hearing.

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

ARC Approval Date: _____ BTIITF Approval Date: _____

Comments: _____

I. Introduction

Welaka State Forest (WeSF) consists of one tract of 2,287.2 acres located in the southeastern portion of Putnam County. WeSF is located along the east bank of the beautiful and historic St. Johns River. In 1992, the forest was assigned for management to the Department of Agriculture and Consumer Services through a transfer of lease from the Florida Board of Regents (previously named State Board of Education of Florida). Unique features of the forest include two springs and 2½ miles of undeveloped river frontage. Natural communities on the forest include depression marsh, alluvial forest, floodplain marsh and swamp, mesic, scrubby and wet flatwoods, hydric and xeric hammocks, sandhills, and baygalls. A large variety of trees and plant life flourish along the river swamps of the St. Johns River. Mud Spring empties 13,750 gallons per hour of clear, spring water into a half-mile spring run that flows into the St. John's River.

In addition to implementing sound ecosystem management principles in the natural communities of WeSF, the FFS operates a training center at this location. The FFS is the primary user of these training facilities, but other groups are also encouraged to use them on a space available basis. This includes 4-H youth in the summer months, when they stay in the dormitories and take horsemanship classes in the horse facility area.

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 WeSF 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. Multiple-use management for WeSF 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 nongame wildlife and plants;
- Protect known archaeological, historical, cultural and paleontological resources;
- Restore, maintain and protect hydrological functions related water resources and the health of associated wetland and aquatic communities.

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

B. Past Accomplishments

A compilation of management activities and public use on WeSF has been completed monthly and are available from the forest manager. A table has been prepared for this plan that summarizes, in numerical format, 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 that are more readily quantifiable. 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 April 2002, there have been many events, developments and accomplishments. Among the most noteworthy are the following:

- An inventory of the entire forest was completed by 2011.
- WeSF staff delineated six (6) currently active Bald Eagle (*Haliaeetus leucocephalus*) nest trees in 2010 by painting a band around these trees.
- A federal American Recovery and Reinvestment Act of 2009 (ARRA) grant was received in 2010, the result of which was the eradication of the existing population of Cogon grass (*Imperata cylindrica*) and Mimosa (*Albizzia julibrission*) on the WeSF.
- A wetland restoration needs assessment survey was completed by the Forest Management Bureau/Forest Hydrology section in 2009, Exhibit M.
- In 2009, a salvage sale was conducted on 77 acres due to an excessive southern pine beetle infestation and subsequent mortality.
- A non-native invasive species plant survey was completed by the Forest Management Bureau's Forest Health Section in 2006.
- An FNAI Historical Natural Community survey was completed on approximately 2,247 acres in 2006.
- In 2003, a timber sale was held on 280 acres. The majority of the sale involved clear-cutting of off-site slash pine within larger areas of longleaf pine sandhill. Smaller areas were thinned from below, an operation where trees that are suppressed, poor-form or diseased are harvested, allowing for more growing space for trees in the intermediate, co-dominant and dominant crown classes.
- Following the loss of the original WeSF office during a devastating fire in 2002, it was rebuilt with local timber and a larger design that provided for a large, state of the art training room.
- The National Champion Sand Pine succumbed to lightning in the late 1990s, and is no longer alive.
- Approximately 27 acres of harvested mesic flatwoods have been reforested with longleaf pine.
- Many of the previously smaller burn units have been incorporated into larger burn units. The average burn unit size is now 66 acres.

C. Goals/Objectives for the Next Ten Year Period

The following goals and objectives provide direction and focus management resources for the next ten-year planning period. Funding, agency program priorities, and the wildfire situation during the planning period will determine the degree to which these objectives can be met. Management activities on WeSF during this management period must serve to conserve, protect 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. 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 shall be achievable within a two-year planning period, and long-term goals shall be achievable within a ten year planning period. Ongoing goals are those that include those year-to-year goals/activities that are routine and re-occurring in nature. Objectives are listed in priority order for each goal. Cost estimates are provided below for FFS services and contract services where sufficient information is available to make projections. Costs for some activities cannot be estimated at this time. Other activities will be completed with minimal overhead expense and existing staff.

➤ GOAL 1: Sustainable Forest Management

Objective 1: Prepare and implement a five-year silviculture management plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. There will be a one time cost of approximately \$800 to reforest approximately 4 acres of insufficiently stocked mesic flatwoods. (Short Term Goal)

Performance Measures:

- Completion of five year silviculture management plan with annual updates.
- Implementation of silviculture management plan (acres treated).

Objective 2: Implementation of the silviculture management plan. (Long Term Goal)

Performance Measure: Number of acres treated (for various practices).

Objective 3: Implement the FFS process for conducting stand descriptions and forest inventory including a GIS database containing forest stands, roads & other attributes (including but not limited to: threatened & endangered species, archaeological resources, exotic species locations, historical areas). (Ongoing Goal)

Performance Measures:

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

Objective 4: Conduct Forest Inventory updates each year, according to established criteria in State Forest Handbook. Estimated cost per year is \$3,000 (Ongoing Goal)

Performance Measure: Number of acres inventoried annually.

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

Objective 1: Maintain public access and recreational opportunities to allow for a recreational carrying capacity of 328 visitors per day. (Ongoing Goal)

Performance Measure: Number of visitor opportunities / day.

Objective 2: Develop additional public access and recreational opportunities to allow for a carrying capacity of 584 visitors / day. (Long Term Goal)

Performance Measure: Number of additional visitor opportunities/day.

Objective 3: In order to safely integrate human use into WeSF, develop and implement a 5-Year Outdoor Recreation Plan and update annually. (Ongoing Goal)

Performance Measures:

- 5-Year Outdoor Recreation Plan Completed.
- Update Completed Annually.

Objective 4: Study potential to enhance Mud Springs, such as restroom facilities/port-a-potties and a canoe / kayak landing. (Short Term Goal)

Performance Measures:

- Study Completed.

Objective 5: Maintain and enhance a liaison panel consisting of a cross section of local residents, community leaders and special interest group representatives (canoe/kayak vendors, hunters, trail hikers, military, organized horse groups, etc.), environmental groups, and other public/ private entities to establish communication and seek constructive feedback regarding the management of WeSF. (Ongoing Goal)

Performance Measures:

- Number of Meetings Conducted.

➤ **GOAL 3: Habitat Restoration and Improvement**

Objective 1: The WeSF contains approximately 1,588 acres of fire dependent natural communities. In order to increase burning to achieve an average fire return interval of two to four years across the forest, approximately 400 to 790 acres will be prescribed burned annually. Based upon the FFS's contracted burning rate, the average estimated annual cost (including fuel and maintenance) rate is \$10,000 to \$12,500 per year. (Ongoing Goal)

Performance Measure: Number of acres burned during the dormant and growing seasons and burned within target fire return interval.

Objective 2: Conduct habitat/natural community improvement on the approximately 600 acres of xeric communities, emphasizing prescribed fire in the grassier areas and mechanical/herbicide treatments to improve prescribed fire effects in the oakier areas. (Ongoing Goal)

Performance Measure: Number of acres with restoration underway. This restoration would include prescribed burning.

Objective 3: Continue sandhill community improvements on 97 acres of unhealthy sandhill. Improvements will focus on the reduction of turkey oak basal area using fire, fuel wood sales and herbicides. Estimated costs per year will depend upon treatment but are expected to average \$3,500 per year. (Ongoing Goal)

Performance Measure: Number of acres restored.

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

Objective 1: In cooperation with FWC, develop a Wildlife Management Strategy that addresses fish and wildlife species for WeSF, with emphasis on imperiled species and associated management prescriptions for their habitats. (Short Term Goal)

Performance Measure:

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

Objective 2: In cooperation with FWC, develop appropriate imperiled species survey and monitoring protocols based on site-specific occurrences, population data and sustainability potential.. (Short Term Goal)

Performance Measure: The number of listed and rare species for which monitoring protocols are developed.

Objective 3 In consultation with FWC, implement surveys and monitoring protocols, where feasible, for listed and rare species as identified in Objective 2. (Ongoing Goal)

Performance Measure: The number of species for which monitoring is ongoing.

Objective 4: Protect environmentally sensitive communities such as wetlands and ecotones when implementing forest management activities. (Ongoing Goal)

Performance Measures:

- Environmentally sensitive areas mapped.
- Number of staff trained in protection of sensitive areas.

➤ **GOAL 5: Non-Native Invasive Species Maintenance and Control**

Objective 1: Develop a plan to locate, identify, and control non-native invasive plant species. (Short Term Goal)

Performance Measure:

- Plan developed.
- Total number of acres identified and mapped.

Objective 2: Implement non-native invasive control plan to reduce/eliminate plants and animals. Estimated annual cost is \$350. (Ongoing Goal)

Performance Measure: Total number of acres successfully treated.

➤ **GOAL 6: Cultural and Historical Resources**

Objective 1: Ensure all known sites are recorded in the Division of Historical Resources (DHR) Florida Master Site file. (Ongoing Goal)

Performance Measure: Number of recorded sites.

Objective 2: Monitor annually, or as necessary, recorded sites and send updates to the DHR Florida Master Site File as needed. (Ongoing Goal)

Performance Measure: Number of sites monitored annually and reports submitted to DHR, as needed.

Objective 3: Maintain at least one qualified staff member as an archaeological site monitor. (Ongoing Goal)

Performance Measure: Number of local staff trained.

➤ **GOAL7: Hydrological Preservation and Restoration**

Objective 1: Protect water resources during management activities through the use of Silvicultural Best Management Practices (BMPs) for public lands. (Ongoing Goal)

Performance Measure: Percent compliance with state lands BMPs.

Objective 2: Close, rehabilitate, or restore those roads, firelines and trails that have evidence of erosion into surrounding water bodies causing alterations to the hydrology and/or water quality, consistent with the 2009 hydrological assessment. (Ongoing Goal)

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

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

Objective 1: WeSF staff will continue maintenance of two primitive campsites and their landings, Mud Springs boardwalk, one horse stable, one primitive group campsite, four parking areas/trailheads, 13 miles of trails, and 3 miles of primary, secondary and tertiary roads. (Ongoing Goal)

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

Objective 2: Continue annual maintenance of state forest boundary. The entire boundary will be reworked every five years including harrowing, reposting signage and repainting boundary trees. Estimated annual cost is \$1,000. (Ongoing Goal)

Performance Measure: Percentage of forest boundary maintained each year.

Objective 3: Implement a 10-Year Road Management Plan and update annually. (Short Term Goal)

Performance Measure:

- Completion of the 10-year Road Management Plan.
- Plan updated annually.

II. Administration Section

A. Descriptive Information

1. Common Name of Property

The common name of the property is the Welaka State Forest (WeSF).

2. Legal Description and Acreage

The WeSF is comprised of one (1) tract, totaling 2,287.2 acres.

The WeSF is located in Putnam County, Florida. County Road 309 bisects the forest, and the city of Palatka is approximately 13 miles to the north, and the town of Welaka is approximately two (2) miles to the north. The boundaries and the major parcels are identified in Exhibit B. The legal description is found in lease agreement Number 3979. The property is located in all or part of Sections 14, 15, 16, 21, 22, Land Grant 40, Township 12 South, Range 26 East.

Table 1. WeSF Acreage by Parcel

Lease Date	Lease No.	Funding Source	County	Acres
3/8/1994	3979	Other	Putnam	2,190.03
3/8/1994	3979	Other	Putnam	20.5
7/5/1994	3979	Other	Putnam	77.26
6/20/2002	3779	Other	Putnam	-0.68

Total Acres: 2,287.11

3. Proximity to Other Public Resource

Lands managed by state, federal or local government for conservation of natural or cultural resources that are located within approximately 30 miles of the WeSF are included in Exhibit B as well as the table below:

Table 2. Nearby Public Conservation Land and Easements

TRACT	AGENCY	DISTANCE
Welaka National Fish Hatchery	USFWS	Adjacent
Welaka 40 acre Park	Town of Welaka	Adjacent
Ocala National Forest	USFS	1 mile West
Lake George Conservation Area	SJRWMD	6 miles Southeast
Caravelle Ranch Wildlife Management Area	FWC	1 mile Northwest
Dunns Creek Conservation Area	SJRWMD	7 miles Northeast
Dunns Creek State Park	DRP	3 miles Northeast
Murphy Creek Conservation Area	SJRWMD	8 miles Northeast
Seven Sisters Islands Conservation Area	SJRWMD	8 miles North

TRACT	AGENCY	DISTANCE
Horseshoe Point Conservation Area	SJRWMD	9 miles Northeast
Cross Florida Greenway	DRP	10 miles Northwest
Ravine State Gardens	DRP	11 miles North
Carl Duval Moore State Forest and Park	FFS	14 miles Northwest

DRP - Florida Dept. of Environmental Protection, Division of Recreation and Parks

FFS - Florida Forest Service

FWC - Florida Fish and Wildlife Conservation Commission

SJRWMD - St. Johns River Water Management District

USFS - United States Forest Service

USFWS - United State Fish & Wildlife Service

4. Property Acquisition and Land Use Considerations

Ninety-six percent of the state forest acreage (2,190.03 acres) was obtained by the State of Florida from the United States of America, at no cost, under the auspices of the Bankhead Jones Farm Tenant Act. Other federal laws allowed for the transfer of ownership of the remaining 97.76 acres from the federal government to the State of Florida.

The property was leased to the Florida Board of Regents by the Board of Trustees of the Internal Improvement Trust Fund (BOT) until the early 1990s, when it was released back to the BOT. The 2,190.03 acre and 20.5 acre parcels were then leased to the Florida Department of Agriculture and Consumer Services by the BOT under Lease Number 3979, dated March 8, 1994. Amendment Number 1 to Lease Number 3979, dated July 5, 1994, added the final 77.26 acres to the Department's Lease. In June 2002, 0.68 acres designated as the Ferry Landing Fish Camp was released from WeSF lease for assignment to Putnam County.

B. Management Authority, Purpose and Constraints

1. Purpose for Acquisition/Management Prospectus

The main objectives for the original conveyance of the property from the Federal government in 1954 were for forest research and education.

Multiple-use management for WeSF 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 nongame wildlife and plants;
- Protect known archaeological, historical, cultural and paleontological resources;
- Restore, maintain and protect hydrological functions related water resources and the health of associated wetland and aquatic communities.
- To provide research and educational opportunities related to natural resource management.

2. Degree of Title Interest Held by the Board

On March 11, 1954, 77.26 acres of the property was deeded by the United States of America to the State Board of Education of Florida (later named Florida Board of Regents). This deed has a requirement that the land be used for educational purposes, primarily concerned with conservation of natural resources, land utilization, forestry, biology, botany, and natural history. On October 19, 1954, 2,190.03 acres of the property was deeded by the United States of America to the State Board of Education of Florida. This deed has certain reservations, including that the land be used for public purposes, or it will revert to the United States of America. On December 4, 1972, both these parcels were deeded by the State Board of Education to the State of Florida BOT, who then leased the lands back to the State Board of Education of Florida for management.

On September 23, 1975, the United States of America deeded 20.5 acres to the BOT. This brought the total acreage of the tract to its current amount of 2,287.79 acres. The deed for the 20.5-acre parcel is actually a Quitclaim Deed and requires that the property be used for educational purposes.

Copies of these property deeds and the land management lease (Lease Number 3979) from the BOT are kept in the FFS state office and can be made available by contacting the forest manager.

3. Designated Single or Multiple-Use Management

The WeSF 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 Management Lease Number 3979.

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 that 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 of these resources and giving consideration to the relative values of the various resources. Local demands, acquisition objectives, and other factors influence the array of uses that are compatible with and allowed on any specific area of the forest. This management approach is believed to provide for the greatest public benefit, by allowing compatible uses while protecting overall forest health, native ecosystems and the functions and values associated with them.

4. Revenue Producing Activities

Numerous activities on the state forest 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. The potential for income producing activities is quite varied and some are listed below:

- *Recreation/Training Center* - Honor fees are collected for all day use activities. Other recreation / training center receipts include annual family and horse passes, summer 4H camps, primitive camping, equestrian stable/arena rental, training

center dorm and kitchen rental. For FY 2011-12, recreation revenue was \$10,540.69.

- *Timber Harvests* - Amounts received from timber sales vary each year, but as a general rule, timber sales on WeSF are infrequent.
- *Palmetto Fronds* - A palm frond sale (primarily saw palmetto) may also be set up on a trial basis in designated areas of the forest within this planning period.
- *Palmetto Drupes* – A palmetto drupe sale may be set up on a trial basis.
- *Fuelwood* – WeSF staff may issue fuelwood permits as requested.

5. Conformation to State Lands Management Plan

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

6. Legislative or Executive Constraints

There are no known legislative or executive constraints specifically directed towards the WeSF. The United States of America deeded the property with a clause to the State Board of Education of Florida (later named Florida Board of Regents) in 1954, stating that a portion of the property must be used for educational purposes, which has become a part of the Parent Lease for WeSF.

7. Aquatic Preserve/Area of Critical State Concern

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

C. Capital Facilities and Infrastructure

1. Property Boundaries Establishment and Preservation

The WeSF boundary lines (12.8 miles total) are managed by state forest personnel in accordance with the guidelines of the State Forest Handbook (FFS 2008). There are 20 gates on WeSF that require periodic maintenance.

2. Improvements

Buildings present on the WeSF (Exhibit C) include:

- 4,030 sq. ft. pole barn for equipment storage
- 3,940 sq. ft. maintenance / equipment shop
- 1,025 sq. ft. pump house / storage building
- 810 sq. ft. storage building
- 3,035 sq. ft. equestrian pavilion
- 820 sq. ft. residential apartment (equestrian area)
- 100 ft. tall fire tower
- 2,560 sq. ft. dormitory
- 3,290 ft² Forest office/training center
- 1,730 sq. ft. kitchen/dining hall
- 430 sq. ft. laundry building

- Three state-owned frame houses used as employee residences
- Three 7,200 sq. ft. horse barns, 24 stalls each
- 50 foot Mud Springs Boardwalk and adjacent pavilion

3. On-Site Housing

There are currently (3) three residences on WeSF; two (2) are occupied by the WeSF Park Rangers and the third is vacant at this time. These two residences are constructed of cinderblock with stucco exterior. The third unoccupied residence at the north end of WeSF on CR 309 is wooden. All three of these buildings were constructed in the 1930s.

FFS may establish additional on-site housing (mobile/manufactured home) on WeSF if deemed necessary to alleviate security and management issues. The need and feasibility specific for the state forest will be evaluated and established if considered appropriate by the Center Manager and approved by the FFS Director. Prior to the occurrence of any ground disturbing activity for the purpose of establishing on-site housing, a notification will be sent to the DHR and 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 Center Manager and approved by the Director.

4. Operations Infrastructure

The current total annual budget (2011-2012) for WeSF is \$228,021; however, annual appropriations are subject to change. This amount includes salaries, expenses, contractual service and OPS, and is broken down as follows:

- Operating Budget (general costs for fuel, supplies, etc): \$30,404
- Salary and benefits: \$122,478
- Other expenses and OPS: \$75,139

Implementation of any of the activities within this management plan is contingent on availability of available funding, other resources, and other statewide priorities.

To carry out the resource management work on the state forest as well as to maintain forest improvements such as trails, roads and facilities the following equipment has been assigned or is immediately available for work on WeSF:

- 1988 4-yard dump truck
- 1995 ATV 4x4/with trailer
- 1995 12-passenger van
- 1995 4wd pickup w/ 50 gallon tank and electric pump
- 1993 2wd pickup
- 1999 ATV Gator 6 x 4
- 1993 farm tractor w/ 6' tiller, 7' harrow, bush hog
- 1993 60" lawnmower
- 1967 150 gallon fuel trailer

Utilities serving the public and forest staff are as follows:

- 6" well for potable water located 300 feet north of office building
- 4" well for equestrian horse use 20 feet west of stable C
- Six (6) septic tank/drain field systems at training center/office complex, Forest Education Trail trailhead, and at the equestrian center
- Five (5) telephone lines (three lines for training center/administration; one fax line; and one Internet access line) provided by BellSouth
- Electric service provide by Florida Power and Light

Staff currently assigned to WeSF includes a Groundskeeper Supervisor, 2 Park Rangers and 1 Park Attendant. One (FTE) fire control forest ranger is also stationed at WeSF and is available to assist with various land management activities.

The Forestry Supervisor II, located at Etoniah Creek State Forest, will work to achieve the goals outlined in this management plan. Day to day resource management (timber cruising, planning, etc) will be the responsibility of the Forestry Supervisor II, under the direction of the Waccasassa Resource Administrator. Day to day forest operations (road maintenance, prescribed burning, etc) will be the responsibility of the FFS fire control personnel, under the direction of the Putnam Forest Area Supervisor. Additional assistance, such as biological support, will be provided as needed by staff of the Waccasassa Forestry Center.

D. Additional Acquisitions and Land Use Considerations

1. Alternate Uses Considered

During this management period the following uses were considered and determined not compatible: water resource development projects, water supply development projects, storm-water management projects, linear facilities and communication towers and antennas, except as otherwise outlined in this plan. Communication towers and antennas will be allowed as determined by the FFS as outlined in 589.011(6), F.S. Deadhead logging is not compatible, and is not considered an appropriate use within or adjacent to the state forest boundaries. Other 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.

2. Additional Land Needs

Purchasing of additional land within the optimal management boundary (Exhibit D) would facilitate restoration, protection, maintenance, and management of the resources on WeSF.

3. Surplus Land Assessment

It is the assessment of FFS staff that, at this time, that all of the property within WeSF is suitable for and necessary for the management of WeSF, and none should be declared surplus.

4. Adjacent Conflicting Uses

During the development of this management plan, FFS staff identified and evaluated adjacent land uses, reviewed current comprehensive plans, and future land use maps in making the determination that there are currently no known conflicting adjacent land uses. Additionally, FFS staff makes effort to meet with adjacent landowners and to maintain liaison with these land owners to ensure that any conflicting future land uses may be readily identified and addressed.

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

A mobile home subdivision on the west side of WeSF could create challenges with prescribed burning, due to the proximity of some of these dwellings to the WeSF boundary. County Road 309 bisects the forest, creating smoke management concerns.

5. Consistent with Local Comprehensive Plan

This plan was submitted to the Board of County Commissioners in Putnam County for review and consistency with their local comprehensive plans. On January 30, 2014, the Putnam County Planning & Development Services office confirmed that they had reviewed the management plan and determined it consistent with the goals, objectives, and policies of the adopted Putnam County Comprehensive Plan (Exhibit E).

6. Utility Corridors and Easements

A Clay Electric Cooperative power line currently runs along the east boundary of WeSF and bisects one small portion of the tract. This is the only recorded easement and is on file with DEP's Division of State Lands.

The FFS does not favor the fragmentation of natural communities with utility lines - consequently, easements for such uses will be discouraged to the greatest extent practical. The FFS does not consider WeSF 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, and to limit disruption of management activities and 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. The 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 BOT. Requests for linear facility uses will be handled according to the Governor and the Cabinet's linear facilities policy.

E. Agency & Public Involvement

1. Responsibilities of Managing Agencies

The FFS is the lead managing agency, responsible for overall forest management and public recreation activities, as stated in BOT Management Lease Number 3979. Pursuant to the management lease, the lead managing agency may enter into further agreements or to sub-leases on any part of the forest. The Florida Fish and Wildlife Conservation Commission (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. The FFS will cooperate with the DHR regarding appropriate management practices on historical sites on the property as stated in Section 267.061, Florida Statutes. They will be notified prior to the initiation of any ground disturbing activities by the FFS or any other agency involved with the forest. The St. Johns River Water Management District (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 the FWC. The Office of Agricultural Law Enforcement will assist with open burning and wildfire investigations as needed. Additional assistance is provided by the Putnam County Sheriff's Office as needed. In light of the current statewide budget limitations the FFS feels that law enforcement is adequate on WeSF. There may be some flexibility in managing the current staff schedules to get better FFS presence on the weekends. Present law enforcement measures are that at least one fire control forest ranger is on duty during the weekends, during normal business hours.

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 the State Forest.

3. Public and Local Government Involvement

This plan has been prepared by FFS and will be carried out primarily by that agency. The FFS responds to public involvement through direct communication with individuals, user groups and government officials.

The FFS responds to public involvement through its Liaison Committees, Advisory Groups, public hearings, and through direct contact with user groups. A DEP Land Management Review Team conducted a review of management plan implementation in 2006 and in 2011 (Exhibit F). The recommendations from both review teams were incorporated into this plan as appropriate.

The plan was developed with input from the WeSF Management Plan Advisory Group and was reviewed at a public hearing on April 1, 2014. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in Exhibit G. 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 WeSF. Depending upon the type of volunteer service needed, volunteer activities may be one-time events or long-term recurring projects and routine maintenance. Volunteers have assisted with painting the bleachers at the horse arena, renovated the horse arena, and cleaned the horse stall roof of pine straw. Additional volunteer recruitment will be encouraged to assist with other activities to further the FFS's mission.

III. Archaeological/Cultural Resources and Protection

A. Past Uses and History

The local area, including Welaka State Forest, has been inhabited for thousands of years. Several groups of Native Americans have occupied the site. Spanish friars established a mission nearby in the 1500s which was last known to exist in 1699. Spanish and later English plantations were located in this area. William Bartram visited and described the area with his father in 1765 and again in 1774, while traveling up and down the St. Johns River.

Federal Resettlement Administration officials started the Welaka Forestry and Wildlife Conservation Project in 1935. In 1938, the fish hatchery portion of "The Project" was turned over to the U.S. Bureau of Fisheries. This area is still managed as a fish hatchery today. In 1939, the forestry and wildlife units of "The Project," including most of the administrative and housing facilities, were taken over by the University of Florida (Florida Board of Regents) through a 99-year lease, and the property was named the "University of Florida Conservation Reserve, Welaka". In 1954, the United States of America deeded the property to the Florida Board of Education. Subsequently, the property was assigned to the Institute of Food and Agricultural Sciences (IFAS) of the University of Florida in Gainesville, Florida, for management, and its name was changed to the Welaka Research and Education Center (WREC).

Under the management of the University of Florida, numerous studies and research projects were conducted on the WREC. In 1942, Albert M. Laessle began studying long-term succession in plant communities (Laessle 1942). The associated "involute areas" are no longer in existence. Other than Laessle's studies, there was little or no active research taking place at WREC during the late 1980s and early 1990s.

At one time, the University of Florida's School of Forest Resources and Conservation held forestry summer camp at WREC; however, this function has been moved to the

Austin Cary Forest campus north of Gainesville. The WREC was available for instruction in the biological sciences by the University of Florida and other colleges and universities. It was also available to state agencies for conducting research and educational programs, but was little-used by any of these groups. Public schools occasionally used the area for field trips.

The WREC was primarily designated for research and remained essentially closed to the public due to limited staffing. The primary user of the forest had been the state's 4-H program. Different 4-H groups visited the WREC for a one week horsemanship class each summer. Approximately 50 persons attended each week for a period of four to six weeks. An adult horsemanship school was also sponsored by 4-H at WREC for extended weekends in April and October. Adults were trained at these sessions so that they could return home and properly instruct children. Other 4-H groups used the area for other purposes during the year, but this was minimal. High school students used WREC for a two-week period in the summer months through a program sponsored by Safari International.

Historically, other groups such as horseback riding clubs, Girl Scouts and Boy Scouts had expressed an interest in using the area, but little or no use by these groups actually occurred.

Following the transfer of management responsibility from the University of Florida to the Florida Forest Service (formerly the Division of Forestry), public use (especially hiking and equestrian use) of the forest has increased dramatically. In addition, a more active program of natural resource management has been initiated including prescribed fire, trail construction and sandhill restoration.

B. Archaeological and Historical Resources

A review of information contained in the DHR's Florida Master Site file has determined that there are four (4) known recorded sites and one (1) resource group on WeSF.

Table 3. Archaeological and Historical Sites on WeSF

SITE ID	SITE NAME	SITE TYPE
PU00035	Mount Royal Mound and Midden	Prehistoric mound(s); Prehistoric burial mound(s)
PU01632	Deer Run Road Cistern	Cistern
PU00068	Gateway	Prehistoric Midden(s)
PU00105	Orange Point Midden	Prehistoric Midden(s); ceramic scatter
PU1616	Welaka State Forest Fish Hatchery Ponds	Designated historic landscape

Two of these recorded sites (PU00068 and PU00105) are small shell middens located along the shoreline of the St. Johns River. The third is a significant cultural site (PU0035) located adjacent to the southern boundary of the forest, known as Mt. Royal.

A small portion of the site boundary lies on the forest. This site is listed on the National Register of Historic Places. Built by the Timucuan Indians between 1200 and 1500 AD, this burial and temple mound is the largest sand mound in Florida. The mound itself occurs on a one acre, fenced site owned by the State of Florida and leased to DHR and is currently 24 feet in height and 210 feet in diameter. The mound is also considered unique in that it is believed that the Indians built it over time by hauling sand, one basket at a time, from an area one half mile to the north-creating a small lake. This artificial lake is on the state forest. William Bartram in the late 1700s visited the area twice and described the mound and the associated “causeway” which was purported to be 50 yards wide, running from the lake to the mound (Bartram 1791). At the time, a person on the mound could look south and west and have a clear view of the St. Johns River in two different directions. At one time DHR was attempting to acquire the lands that were once part of this causeway. Due to financial constraints, DHR is no longer pursuing buying any additional properties. This could change in the future.

C. Ground Disturbing Activities

Representatives of DHR and FNAI will be consulted prior to the initiation of any proposed significant ground disturbing activity, not listed in this plan, by FFS or any other public agency. The FFS will make every effort to protect known archaeological and historical resources. The FFS will follow the “Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands” (Exhibit H) 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 there are four (4) local district FFS personnel trained by DHR as archaeological site monitors. FFS will pursue opportunities for getting additional personnel trained. FFS will consult with public lands archaeologists at DHR to determine an appropriate priority and frequency of monitoring at each of these listed sites, as well as any protection measures that might be required. 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 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. Presently, DHR is not making any recommendations regarding additional archaeological surveys. When the economic climate improves, DHR will revisit this policy. Interpretation of the historic buildings is also being considered by DHR, but seems unlikely to happen in the immediate future. In addition, FFS will seek the advice and recommendations of DHR regarding any additional archaeological needs. Trained monitors will oversee ground disturbing activities in which DHR recommends monitoring. The 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

A. Soils and Geologic Resources

1. Resources

Soils information for WeSF was obtained from the Putnam County Soil Surveys. For detailed information on soils see Exhibit I.

2. Soil Protection

Currently there are no known soil or erosion problems present on WeSF. Management activities will be executed in a manner to minimize soil erosion. If problems arise, corrective action will be implemented by FFS staff under the direction of the FFS Forest Hydrology section in conjunction with recommendations as contained in the most current version of the Florida Silviculture Best Management Practices Manual.

B. Water Resources

The water resources on WeSF 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's 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.

1. Resources

All waters contained in or flowing from the WeSF classified as Class III Surface Waters - Recreation, Propagation, and Maintenance of a Healthy Well-balanced Population of Fish and Wildlife in accordance with Rule 62-302.400 Florida Administrative Code. There are approximately 543 acres of FNAI-classified alluvial forest, marsh and swamp that are connected to, or drain into, the St. Johns River. State forest lands border the eastern shore of the St. Johns River for a distance of approximately 2.5 miles.

WeSF has two 4th magnitude springs (Mud Spring and Sulfur Springs), approximately ten flatwoods prairie/lakes (~73 acres), numerous depression marshes (~68 acres), and three wet prairies (~3.5 acres) within its boundaries (Exhibit J).

2. Water Protection

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

In compliance with Chapter 5.2.2 of the Florida Forest Service (FFS) State Forest Handbook a Wetland Assessment was conducted on the WeSF in 2009 by the FFS Forest Hydrology Section. One hundred sixty-seven sites were evaluated during the assessment. Included in the assessment was a baseline assessment of drainage under CR 309 which involved 40 points.

Most points were established in or at the edge of those waterways and wetland communities that were considered likely to have been altered or impacted by previous or current land management activities such as road installation, fireline establishment, recreation facility development, or timber production. Over half of the sites involved firelines (old and new) and/or road ditches which appeared to accelerate drainage of wetland areas or inhibit surface flow into isolated wetland systems.

Of the 167 sites evaluated 46 were found to be potentially suitable for enhancement or restoration efforts (Priority 1 or 2). These efforts may be conducted by FFS or an outside entity through wetland mitigation. Many of the sites simply need to be monitored by the State Forest staff for changes. None of the priority sites were considered to be in need of immediate attention. While there are no significant wetlands restoration needs at this time some observations made during the 2009 Welaka assessment were:

- In general, the surface flow is toward the St. Johns River, west of WeSF. Forest roads, firelines and County Road 309, which runs through the forest north-to-south are major impediments to the natural drainage.
- Some road ditches such as those associated with Eagles Nest Row Road and others trap and divert wetland drainage from its natural flow pattern in many parts of WeSF. The St. Johns River Water Management District ceased water sampling of Mud and Sulfur Springs in September 2011.

C. Wildlife Resources

1. Threatened and Endangered Species

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 endangered and threatened species and species of special concern, as applicable for both plants and animals.

Presence of listed species is based on information compiled from FNAI tracking records (Exhibit K), and FWC as well as field observations by FFS. The following listed species were identified:

Table 4. Endangered or Threatened Species on WeSF

Common Name	Scientific Name	Federal Status *	State Status*	FNAI Global Rank *	FNAI State Rank *
Amphibians					
Gopher Frog	<i>Lithobates capito</i>	N	SSC	G3	S3
Gopher Tortoise	<i>Gopherus polyphemus</i>	C	ST	G3	S3
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	N	N	G5	S3
Southeastern American Kestrel	<i>Falco sparverius paulus</i>	N	ST	G5 T4	S3
Invertebrates					
Blue Purse-web Spider	<i>Sphrodos abboti</i>	N	N	G4 G5	S4
Seminole Skipper	<i>Hesperia attalus slossonae</i>	N	N	G3 G4 T3	S3
Volusia grasshopper	<i>Melanoplus adelogyrus</i>	N	N	G1 G2	S1 S2
Mammals					
Round-tailed Muskrat	<i>Neofiber alleri</i>	N	N	G3	S3
Sherman's Fox Squirrel	<i>Sciurus niger shermani</i>	N	SSC	G5 T3	S3
Plants					
Giant Orchid	<i>Pteroglossaspis ericstata</i>	N	LT	G2 G3	S2

*** STATUS/RANK KEY**

Federal Status (USFWS): LE= Listed Endangered, LT= Listed Threatened, N= Not currently listed, C = Candidate species for which federal listing agencies have sufficient information on biological vulnerability and threats to support proposing to list the species as Endangered or Threatened.

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. Game Species and Other Wildlife

Wildlife management will play an important role in the management of resources on WeSF. The state forest currently is not a Wildlife Management Area. Wildlife openings and food plots will be established and maintained in accordance with Chapter 7 of the FFS State Forest Handbook.

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

3. Survey and Monitoring

Species-specific management plans will be developed when necessary, with assistance from FWC. Such plans will be consistent with rule and statute promulgated for the management of such species. Specialized forest management and habitat restoration practices will be utilized where appropriate. These practices will aim to protect and, when possible, increase imperiled plants and animals species occurring on the forest. Continued efforts will be made to identify and implement biological surveys, as appropriate, including those species associated with the habitats adjacent to the St. Johns River.

Presently, actions taken to mitigate around eagle nesting trees in the various burn units consist of mowing an approximately 50 foot diameter circle around each tree prior to initiation of a burn. This should effectively reduce fuel loads around eagle nesting trees, so as not to cause harm to these trees. Habitat and nesting tree guidelines for bald eagles have been created by FWC, and they are implemented on WeSF in consultation with FWC.

A gopher tortoise survey was conducted on WeSF in May of 2011. FNAI staff surveyed 128 acres of transects within 632 acres of potential gopher tortoise habitat at WeSF. This habitat was predominately sandhill, but also included scrubby flatwoods and xeric hammock. A total of 69 active, 14 inactive, and 40 abandoned tortoise burrows were observed. Of these, there were 108 large, 13 medium, and 2 small burrows; this indicates at least some recent reproduction and multiple age classes of tortoises. The high percentage of large burrows is typical for this long-lived animal. The number of abandoned burrows relative to active and inactive is higher than typical. This is often attributed to declining habitat conditions, but is an unreliable indicator. Nevertheless, a large portion of the sandhill has not burned in several years. More frequent burning in sandhill (every 2 or 3 years) is necessary to improve and maintain habitat for gopher tortoises. The tortoise density of active burrows in the sandhill (.82/acre) is below the typical range of 1 to 2 per acre for a sandhill. The xeric hammock and scrubby flatwoods are marginally suitable to unsuitable because of dense shrub, midstory or canopy layers. Some of this area may have been historically unsuitable because its position on the landscape may have prevented regular burning. The larger tracts, however, appear to have been sandhill and could be managed to improve their suitability for gopher tortoises. Future surveys for

gopher tortoises will include strategies to look for burrow commensals that are not currently known from the site and gopher frogs.

D. Sustainable Forest Resources

The 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. Inventories will be updated on a continual basis according to guidelines established by FFS's Forest Management Bureau.

E. Beaches and Dune Resources

No beaches or dunes occur on the WeSF.

F. Mineral Resources

There are no known significant mineral deposits of commercial value on WeSF.

G. Unique Natural Features and Outstanding Native Landscapes

The important features of WeSF's natural resources are two 4th magnitude springs, 2½ miles of undeveloped frontage on the St. Johns River, and many functioning ecosystems, such as sandhill, scrubby flatwoods, xeric hammock, mesic flatwoods, hydric hammock, baygall, floodplain swamp, depression ponds, and marshes.

H. Research Projects/Specimen Collection

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

All research projects to be considered on WeSF must be considered according to the guidelines stated in Chapter 4 of the State Forest Handbook (FFS 2008). Any requests for research projects 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 project. 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 research projects to the WeSF 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:

- Hydrology of Natural Communities, SJRWMD (ongoing).
- Loblolly Pine Seed Genetics Study, University of Florida (current).
- Laessle, Albert M. 1942. The plant communities of the Welaka area: with special reference to correlations between soils and vegetational succession.

I. Ground Disturbing Activities

Although the FFS's approach to handling ground disturbing activities is identified in various sections of this plan, the FFS's overall approach to this issue is summarized here. The 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 archaeological, fossil, and historical sites, ecotones, wetlands, and sensitive species.

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 the FNAI, DHR, and when necessary, the ARC.

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. The 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 WeSF include hiking, horseback riding, bicycling, paddling, picnicking and camping (Exhibit L). Leashed pets are also allowed on the forest.

WeSF is also a part of the Great Florida Birding Trail. St Johns River adjacent to WeSF and Mud Springs Run is a part of the Putnam County Blueways designation through the Office of Greenways and Trails, a paddling trail. Boat access to WeSF is allowed from the St. Johns River, however no means currently exists to monitor or assess the amount of boat traffic and for the general public to pay the required user fee when accessing the forest from boat at the time of arrival. Vehicle access to the forest is allowed on Indian Pond Run, a forest road that was opened to public vehicular access in 2009. WeSF is part of the Bartram Trail, an educational project highlighting the Travels of William Bartram including his stop at Mt. Royal (Bartram 1791). Parking is also allowed at the Mud Springs trailhead, the Environmental Education trailhead and another trailhead/parking area east of the WeSF office.

FFS is willing to work in partnership with appropriate ecotourism/local interest groups and local government agencies to further develop projects that lead to increased public recreational use and access.

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 the FFS determines their compatibility with other forest uses and forest resources.

A. Existing

Almost all access onto WeSF comes off County Road 309. County Road 309 divides the forest into eastern and western sections. The forest headquarters and equestrian trailhead are located on the eastern side of County Road 309 while the Mud Spring and Forest Education trailheads are on the western side of County Road 309.

The forest headquarters is located at the intersection of CR 309 and Arabian Road. The main building located at this site is administrative offices with adjacent training room. This building serves as the main point of contact for the public and provides restrooms. Annual entrance passes, general forest information, and special use permits may be obtained at this location. The forest also maintains two dormitories, an apartment, and a kitchen facility which can be rented by the public. Except for the administrative office with training room, these facilities need to be upgraded and expanded to better serve the projected needs of the state and public.

The equestrian area is also located on Arabian Road, 500 yards past the forest headquarters. This site has a designated trailhead for day use visitors, 18 miles of trail riding, four (4) show horse arenas, three (3) 24-stall stables, a covered pavilion with restrooms, and 10 primitive campsites. Fees in this area are collected using a self-service honor pay station. Horses are only permitted on the east side of County Road 309.

The Mud Spring Trailhead and trail system is located on the western side of County Road 309 across from the forest headquarters. The parking area has a kiosk, garbage can, and parking for twenty vehicles. The hiking trail leads visitors on a 1.7 mile walk to Mud Spring picnic area and back. The picnic area at the site of the spring has a covered pavilion with picnic tables and trash receptacles. There is also a 50 foot boardwalk following the spring run out towards the St. Johns River. Fees are collected at the trailhead using a self-service honor pay station.

The third and final trailhead is the Environmental Education Trailhead. The trailhead is one (1) mile south of the forest headquarters on the west side of County Road 309. From this trailhead you can hike the half-mile environmental education trail with interpretive signage along the route. This trailhead is also the access point for the John's Landing Trail. Visitors have the option on the John's Landing Trail of the 4.5 mile loop trail or the shorter 3 mile trail. Two primitive camping sites, Orange Point and John's Landing, are located along the St. Johns River off the John's Landing Trail. These primitive camping sites are designed for small groups of trail users with less than 10 people. The trailhead also has two restrooms, a covered pavilion with picnic tables, interpretive signs, trash receptacles, kiosk, and a self-service honor pay station.

There is a fourth self-service honor pay station located on the north end of the eastern side of the forest. This pay station was installed at an opening on the forest boundary where an adjacent development has been constructed.

Indian Pond Road was opened to vehicular traffic in 2008. This road is located on the western side of the forest just south of the Environmental Education Trailhead and is one mile in length.

B. Planned

Considerable discussion and review of opportunities to restore a 20 plus acre fish hatchery pond area just northwest of the office has occurred. FFS will continue to assess the site and encourage further research as to appropriate restoration and/or public use. No significant recreation changes are planned at this time. With the current quantity and quality of recreational opportunities available on WeSF the focus will be the improvement and upgrades to current facilities. Currently no additional camping sites are planned for this planning period.

C. Hunter Access

WeSF is currently not open to hunting as a FWC Wildlife Management Area. The FFS conducts Operation Outdoor Freedom hunts each year on WeSF. Operation Outdoor Freedom hosts wounded service members and veterans at Florida State Forests, other public lands and private lands. As part of Operation Outdoor Freedom, areas within select State Forests have been designated as special hunt areas in honor of and for use by active service members and veterans of the U.S. military who were injured in the line of duty. These areas are fully equipped to accommodate any veteran, despite his or her injuries. All funding for the hunts is generated through private donations and support, and veterans participate in the hunts at no charge.

VI. Habitat Restoration & Management Practices

A. Prescribed Fire

The FFS utilizes a total fire management program on state forests that includes wildfire prevention, detection and suppression, and prescribed burning. This program is the responsibility of the FFS's Waccasassa Forestry Center. Emphasis will be placed on prescribed burning, wildfire prevention and education to help reduce wildfire occurrence on the forest. The FFS has three paramount considerations regarding wildfires, and these are listed in priority order: 1) protection of human lives, both the firefighter's and the general public, 2) protection of improvements, and 3) protection of natural resources.

The annual forest prescribed burning program produces multiple benefits. The purposes of prescribed burning on WeSF are to facilitate timber management operations, to enhance wildlife and listed species habitat, to decrease fuel loading, and to 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 WeSF. Burns are planned by the State Forest staff with input from

cooperating agencies as appropriate. A WeSF Prescribed Burn Plan is developed each year, which identifies the individual burn unit prescriptions, whether the unit is on a growing or dormant season rotation, map of burn unit, and other information specific to that burn unit. The smoke screening system will be used as a smoke management tool to minimize the adverse impact of smoke that may affect residential communities, public roads, schools, and other smoke sensitive areas.

Approximately 70% of the acreage (roughly 1,588 acres) of WeSF supports vegetative communities that are fire dependent. Past land uses have left some of these historically fire dependent communities in a condition unable to carry prescribed fire. Currently, approximately 361 acres are in a fire maintenance condition. Fire return intervals range from 1-3 years in the sandhills, to 2-4 years in the mesic flatwoods and their associated marshes, to 3-10 years in the wet flatwoods, and to 5-8 years in the scrubby flatwoods. Based on current conditions and management objectives, WeSF will plan for a minimum of 400 acres, up to a maximum of 790 acres, to be prescribe burned annually. Meeting prescribed fire goals will be largely dependent on weather conditions, personnel, and statewide emergency situations such as wildfires, hurricanes and other natural disaster response and relief.

Pre-suppression firelines will be constructed in accordance with BMPs. Whenever possible, alternatives to plowed firelines, such as harrowed lines or natural breaks should be used. Efforts will be made to avoid and/or remove firelines from wetland ecotones zones. Post burn evaluations will be performed to monitor effectiveness of the prescribed burns. The procedures for conducting post burn evaluations are outlined in the State Forest Handbook. Forestry staff will re-evaluate the need of all the existing fire lines, and close the ones that are not needed. All staff will be briefed on the importance of maintaining the integrity of all wetland/upland ecotones. The last three wildfires on WeSF burned 39 acres; one for two acres in June 2010, two for 37 acres in May and June of 2011.

B. 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, and biological restoration and maintenance, is critical to the silvicultural objectives on the state forest.

1. Strategies

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

- 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.
- To create, through natural regeneration, uneven-aged, and even-aged management, a forest with old growth characteristics that yields sustainable economic, ecological, and social benefits.

2. Silvicultural Operations

Silvicultural operations on WeSF will be directed toward improving forest health, wildlife habitat, biological and economical sustainability, as well as toward recovery

from past management practices that are not in accordance with the objectives of this plan. Herbicide applications may be necessary to control woody competition and to re-establish desired natural species of both overstory and ground cover. Site preparation methods may include prescribed fire, mechanical vegetation control, and herbicide applications.

Prescribed fire is the most desirable method of vegetation control for 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 vegetation control may be used. Mechanical 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 plant communities through timber harvesting will include, but is not limited to, thinning such as single tree selection, group selection and shelterwood; for regeneration purposes, and clear-cutting methods. There are no stands on WeSF considered to have off-site species. Therefore, there are no plans to conduct any off-site timber harvests.

All silvicultural activities (including timber harvesting and reforestation) will meet or exceed the standards in the FFS's Silviculture Best Management Practices (BMPs) and the State Forest Handbook.

3. Forest Inventory

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

A timber inventory is completed annually on WeSF, whereby 10% of the pine dominated stands (approximately 1,439 acres) are cruised, and 5% of the cypress and hardwood dominated stands (approximately 541 acres) are cruised. This annual forest inventory is crucial to making sound forest management decisions, based on the current conditions of the stand(s) being inventoried. The first comprehensive inventory was completed in 2003, with subsequent inventories completed in 2004, 2008, 2009, 2010, 2011, 2012 and 2013.

There are approximately 798 acres of planted pine stands on WeSF, ranging from an origin year of 1936 to 2010.

For the merchantable pine stands on WeSF, as of 2012 there are approximately 4,434 tons of pine pulpwood, 4,953 tons of pine chip-n-saw, 15,652 tons of pine sawtimber, 1,012 tons of hardwood sawtimber and 2,762 tons of hardwood pulpwood. The average basal area of these stands is 51 square feet/acre; the mean stem diameter at breast height is 12 inches.

4. Timber Sales

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

C. Non-Native Invasive Species Control

FFS employees continually monitor the forest for non-native invasive plant species while conducting management activities. The practice of the FFS is to locate, identify, and apply control measures with the intent to eradicate or control non-native invasive species. When these species are discovered, an eradication or management plan will be developed with the assistance of the Forest Management Bureau's Forest Health Section as needed. The plan will be implemented based upon the severity of the infestation and the availability of personnel and funding. State Forests are periodically surveyed by FFS staff, and detection of populations of non-native invasive species are noted and prioritized for appropriate control action. Known occurrences of non-native invasive species are prioritized and treated as funding and personnel allow, with the intention of ultimately eradicating such pests from State Forest property. These occurrences are recorded in the GIS database and updated as new plants 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.

A detailed non-native invasive plant survey was completed in June 2008 by FFS, which included mapping the locations of nine (9) non-native invasive species (Exhibit N). Most of these species have been treated with the appropriate herbicide. The non-native invasive plant species that have been identified on WeSF include Caesar's weed (*Urena lobata*), Cogon grass (*Imperata cylindrica*), Chinese tallow (*Sapium sebiferum*), Camphor tree, (*Cinnamomum camphora*), Torpedo grass (*Panicum repens*), Natal grass (*Rhynchelytum repens*), Mimosa (*Albizia julibrissin*), Peruvian Primrose Willow (*Ludwigia peruviana*) and Japanese climbing fern (*Lygodium japonicum*) (Table 5). Herbicide application has been used to initiate control of these species. An American Recovery and Reinvestment Act of 2009 (ARRA) grant was executed in the fall of 2010, which provided for herbicide application specifically for Mimosa and Cogon grass. Most of these species were located in small pockets. All areas treated were small enough that they could be treated in-house. Forest staff will continue to monitor all areas where non-native exotics are known to exist and apply treatments as needed.

Table 5. Non-Native Invasive Plant Species Occurring on WeSF

Common Name	Scientific Name	Treatment Strategy	Acres Impacted	Increasing/Decreasing
FLEPPC Category I				
Air-potato	<i>Dioscorea bulbifera</i>	May/Oct application with Glyphosate	scattered clumps	Stable
Camphor tree	<i>Cinnamomum camphora</i>	June- September application with Garlon 3A	3.1 (scattered singles or clumps)	Decreasing

Common Name	Scientific Name	Treatment Strategy	Acres Impacted	Increasing/Decreasing
Chinese tallow	<i>Sapium sabiferum</i>	Stem injections with Arsenal AC anytime except for March-April	0.01	Eradicated
Cogon grass	<i>Imperata cylindrica</i>	June to September: Chopper Gen2* as a 2-percent solution or Arsenal AC* as a 1-percent solution	0.02	Eradicated
Japanese climbing fern	<i>Lygodium japonicum</i>	July-September foliar application with Glyphosate herbicide as a 4% solution	0.001	Eradicated
Mimosa	<i>Albizzia julibrissin</i>	Stem injections using Arsenal AC, or Garlon 3A in dilutions as specified on the herbicide label (anytime except March and April)	0.03	Eradicated
Natal grass	<i>Rhynchelytum repens</i>	Glyphosate treatment according to label instructions	1.02 (scattered plants)	Stable
Peruvian Primrose-willow	<i>Ludwiga peruviana</i>	Clearcast according to label instructions	2	Decreasing
Torpedo grass	<i>Panicum repens</i>	Glyphosate treatment according to label instructions	3.08 (scattered plants to some areas with dense patches)	Stable
FLEPPC Category II				
Caesar's weed	<i>Urena lobata</i>	Remedy according to label instructions	0.001	Eradicated
Hydrilla	<i>Hydrilla verticillata</i>	Herbicides containing Endothall	<0.001	Stable

Wild Taro (*Colocasia esculenta*), water lettuce (*Pistia stratiotes*), and water hyacinth (*Eichhornia crassipes*) have been reported to be present in the Mud Springs Run. FFS will investigate as to their existence and take appropriate control and eradication actions if these are present.

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 FFS's Forest Health Section. Control of non-native invasive

pest plants will be target specific and use a variety of methods including appropriately labeled and efficacious herbicides.

D. Insects, Disease and Forest Health

Currently, there are no insect or disease problems on WeSF, although the WeSF had a history of Southern Pine Beetle. In the event of an outbreak of Southern Pine Beetle, consultation with the Forest Management Bureau's Forest Health Section will be sought to formulate an appropriate and effective response.

In compliance with section 388.4111, Florida Statutes and in Sec. 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. With the approval of this plan documenting this designation, the local arthropod control agency in Putnam County will be notified of this designation.

As a result, prior to conducting any arthropod control activities on WeSF, 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 WeSF. 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.

E. Use of Private Land Contractors

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

- *Reforestation* – A private equipment / forestry operations company was hired to machine plant 24 acres with containerized longleaf seedlings in 2010. FFS paid \$1,092 for this contract.
- *Site Prep* - Any needed site preparation work for reforestation would be bid out to private contractors.
- *Timber Harvests* - Several timber sales may be bid out during this planning period.

VII. Proposed Management Activities for Natural Communities

In 2006, FNAI completed an inventory and natural community mapping project on 2,248 acres of WeSF and a historic natural community type map (Exhibit O) was created. Current natural communities and cover types can be found in Exhibit P.

Strategies may include thinning of overly dense pine plantations, mowing or chopping in areas of heavy fuel buildup and/or application of prescribed fire. The results of these initial efforts will be monitored and more refined and detailed restoration plans will be made. Fire return intervals are included as a guide and may vary depending upon specific conditions. The intention is to use fire in a manner and frequency that will attain the desired habitat goals. Fire frequency is generally increased or decreased depending upon the conditions of the specific area.

Table 6. Natural Community Types Found on WeSF

Natural Community Type		Acres Mapped (Historical)	Acres Mapped (Current)	Burn Interval (Years)
Mesic Flatwoods		618	609	2-4
Sandhill		492	441	1-3
Floodplain Swamp		332	327	Rare
Scrubby Flatwoods		206	186	5-8
Baygall		141	136	50-100
Wet Flatwoods		125	122	3-10
Alluvial Forest		120	119	Infrequent, dependent upon drought
Floodplain Marsh		106	105	1-5, dependent upon water depth
Flatwoods/Prairie Lake		73	73	3-5
Depression Marsh		61.1	61	1-8
Xeric Hammock		9	9	30
Wet Prairie		4	4	2-4
Spring-run Stream		< 1	< 1	N/A
Ruderal	Developed	N/A	33.1	
	Abandoned Ponds	N/A	32	

Natural Community Type		Acres Mapped (Historical)	Acres Mapped (Current)	Burn Interval (Years)
	Plantation	N/A	29	
	Sand Pit	N/A	1	

The following historical conditions, existing condition descriptions, and management recommendations are taken from this 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 WeSF.

A. Mesic Flatwoods

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Mesic flatwoods are the largest natural community on WeSF. Mesic flatwoods are characterized by stands of longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*), and a dense, low ground layer of low shrubs, grasses, and forbs. There is little or no stocking of species that are not considered flatwoods species, such as water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), and laurel oak (*Quercus laurifolia*). Characteristic shrubs include saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), coastalplain staggerbush (*Lyonia fruticosa*), and fetterbush (*Lyonia lucida*). Rhizomatous dwarf shrubs, usually less than two feet tall, are common and include dwarf live oak (*Quercus minima*), runner oak (*Q. elliottii*), shiny blueberry (*Vaccinium myrsinites*), Darrow's blueberry (*V. darrowii*), and dwarf huckleberry (*Gaylussacia dumosa*). The herbaceous layer is predominantly grasses, including wiregrass (*Aristida stricta*), dropseeds (*Sporobolus curtissii*, *S. floridanus*), panicgrasses (*Dichanthelium* spp.), and broomsedges (*Andropogon* spp.), plus a large number of showy forbs. Soils are acidic, nutrient-poor fine sands with upper layers darkened by organic matter. The soils are generally droughty during dry periods and saturated, or even inundated, after heavy rains. Fire return interval is two to four years. Such fires are essential for maintaining the structure of the flatwoods, preventing hardwood encroachment from bordering hammock or baygall, and reducing weedy competition.

Current Condition

The majority of the mesic flatwoods on WeSF already have the desired structural conditions for this community type. Slash pine is the dominant overstory species, which likely was planted following harvest of longleaf pine. Longleaf pine is found sporadically, and pond pine is found in wetter areas, sometimes as the dominant canopy species. The understory is dominated by shrubs, and the herbaceous component of the understory is quite sparse in most areas and absent in some. Most exotic vegetation has been eradicated, and remaining populations are stable or declining. A harvesting operation was completed in 2006 (began in 2003) in various parts of the forest where off-site slash and sand pine were harvested. The current fire interval is 2-4 years for this

community type. . There was one wildfire in 2010 (2 acres), and two wildfires in 2011; the two 2011 wildfires burned a portion of mesic flatwoods.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. At WeSF, because most of the mesic flatwoods already have the desired structural conditions, a 2-4 year burn schedule will be implemented and maintained. Management activities for mesic flatwoods on WeSF will focus on groundcover recovery and restoration, especially establishment of wiregrass. This can be achieved through the use of prescribed burns during the growing season, which will be most effective in encouraging flowering of existing wiregrass. On sites with little or no remaining wiregrass, seeding and/or plugging may be considered. Stand appropriate harvesting activities will also be implemented, based on the current stocking levels and diameter distribution.

B. Sandhill

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Sandhills are composed of uneven-aged stands of longleaf pines with a sparse midstory of deciduous oaks and a moderate to dense groundcover of grasses, herbs, and low shrubs. The longleaf pine canopy can typically average between 60 and 80 square feet of basal area per acre, contain at least three age classes, and contain some stocking of large trees greater than 16 inches in diameter at breast height. In extremely well drained sites, basal area can drop to 20 square feet per acre or less. The midstory consists of scattered turkey oaks and longleaf regeneration. Other hardwoods in the midstory include turkey oak (*Quercus laevis*), blue jack oak (*Quercus incana*), sand post oak (*Quercus stellata*), sand live oak, and persimmon (*Diospyros virginiana*). The shrub layer is variable and generally short in height due to frequent fires. This layer is very diverse with dwarf hawthorn (*Crataegus uniflora*), dwarf huckleberry (*Gaylussacia dumosa*), gallberry, rusty staggerbush (*Lyonia ferruginea*), turkey oak, saw palmetto, and sparkleberry (*Vaccinium arboreum*). The herbaceous layer is dominated by wiregrass but includes other groundcover plants such as Florida toothache-grass (*Ctenium floridanum*), pinewoods dropseed (*Sporobolus junceus*), bracken fern (*Pteridium aquilinum*), and lopsided indiagrass (*Sorghastrum secundum*). The historic frequency of fire in sandhill is every 1-3 years.

Current Condition

Currently, approximately half of the sandhill mapped as historically occurring on WeSF is on track to meeting desired future conditions. This area, mainly along the eastern boundary, supports an open canopy of longleaf pine with a slightly denser subcanopy of turkey oak. Two of these areas were burned in 2008, and the third in 2009. Approximately 134 acres were treated in the late spring/early of summer of 2007 with Velpar ULW to control hardwood encroachment. The understory consists of a sparse shrub cover and a high herb cover, with high litter cover and little to no bare sand.

Shrubs present include saw palmetto, wooly pawpaw, and gopher apple. Herbs are dominated by wiregrass.

The other half has succeeded to xeric hammock because of infrequent fires. This area was burned in 2010, and had a small (<2 acre) wildfire in 2011. A salvage sale was conducted in 2010 on 77 acres. In areas that are developed and/or cleared, mature longleaf pine, live oak (*Quercus virginiana*), and turkey oak are scattered, with the understory dominated by Bahia grass (*Paspalum notatum*) and other weedy species. Buildings and other man-made structures dominate these areas. In areas that have succeeded to xeric hammock, a sparse canopy of longleaf pine is found above a dense, often well developed subcanopy of live oak, laurel oak, turkey oak, southern magnolia (*Magnolia grandiflora*), and cabbage palm (*Sabal palmetto*). Shrubs dominate the understory and include saw palmetto, Chapman's oak, deerberry, shiny blueberry, wax myrtle, and young subcanopy species. Herbs are sparse and consist mainly of wiregrass.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Approximately half of the community type is on track to meeting its desirable condition. Burning on a one to three year rotation will be pursued in order to keep the community in its current state.

Restoration efforts will focus on areas that have succeeded to xeric hammock or which have been cleared in the past but are no longer actively used for specific activities. Prescribed burning will be the preferred method to reduce woody species abundance in the understory. If any areas cannot be burned because of safety or smoke issues, mowing may be an acceptable substitute. Prescribed burning conducted on a 1-3 year fire return interval during late spring and early summer should provide the greatest benefit in reducing woody species abundance.

Herbicides and roller chopping or other mechanical treatments may be used to reduce hardwood encroachment if it is deemed that frequent prescribed fires are not adequate.

During all management activities, every effort will be made to minimize any detrimental effects to the gopher tortoise population within this community, as this species is considered a keystone component.

C. Floodplain Swamp

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Floodplain swamps are closed-canopy forests of hydrophytic trees occurring on frequently or permanently flooded hydric soils adjacent to permanently moving stream and river channels and in depressions and oxbows within floodplains. The overstory is composed of buttressed trees particularly with cypress, laurel oak, black tupelo (*Nyssa sylvatica*), and red maple. The groundcover is standing water, or open with bare earth, cypress knees, oak leaves, and occasional patches of herbaceous plants. Floodplain swamps become seasonally inundated with variable periods of inundation, usually

prolonged, lasting from a few days to several months depending on rainfall – which has the effect of restricting the growth of most shrubs and herbs and leaving most of the ground surface open or thinly mantled with leaf litter. Burning is seldom a factor due to moisture and lack of fuel.

Current Condition

Floodplain swamps on WeSF are of good quality despite past disturbance from logging prior to state ownership. From a river survey completed in the summer of 2012, there are no known invasive/exotic issues in this community. The canopy and subcanopy are well developed and comprised of pond cypress, swamp tupelo, American elm, red maple, green ash, water hickory, dahoon, swamp bay, sweetgum, laurel oak, slash pine, and cabbage palm. Shrubs include wax myrtle, buttonbush, Carolina willow, and bastard indigo bush. Herbs are found in low abundance and are comprised of green arrow arum, water spangles (*Salvinia minima*), duckweed, shortbristle horned beaksedge, scarlet rose mallow, royal fern, marsh fern, climbing hempsvine, lizard's tail, duckweed, sawgrass, and sand cordgrass.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Most of floodplain swamp on WeSF is at or close to desired future condition. Management activities for floodplain swamp will focus on maintaining natural hydroperiods and allowing prescribed fires from surrounding uplands to burn into the swamp edges. Exotic vegetation will be monitored and treated as appropriate.

D. Scrubby Flatwoods

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Scrubby flatwoods contain open canopies of slash pine and longleaf pine with three age classes present. The basal area averages five to ten square feet of basal area per acre. It has a low, shrubby understory dominated by sand live oak, myrtle oak, Chapman's oak, and saw palmetto, often interspersed with generally small areas of barren white sand. Groundcover is rich in species including blueberry and huckleberry spp., dwarf live oak, wiregrass, gopher apple, blazing star, Garberia, and lichens. Natural fire frequency is likely every 5 to 8 years.

Current Condition

Logging and turpentining, as well as fire suppression, have disturbed much of the historically occurring scrubby flatwoods at WeSF. Many of the scrubby flatwoods areas have not been prescribe burned. In addition, many of the scrubby flatwoods areas have a sparse overstory of longleaf pine or slash pine, or the pine overstory is absent. A subcanopy of live oak and southern magnolia is occasionally found. The understory is generally dense and dominated by scrubby oaks (Chapman's oak, myrtle oak and sand live oak), saw palmetto, and rusty staggerbush. Herbs are sparse and include wiregrass,

sandyfield beaksedge, gayfeather, bracken fern, anise scented goldenrod, Florida Indian plantain, tall elephants foot, showy milkwort, pinweeds, clusterspike false indigo bush, rabbitbells, and Elliott's milkpea. Bare sand patches are infrequent due to high shrub densities and litter cover. The northernmost scrubby flatwoods area just southeast of Orange Point has developed into xeric hammock conditions.

A three acre area along the boundary north of Beecher Spring and west of the sandhill is currently classified as scrubby flatwoods. This area was characterized as "St. Lucie scrub" by Laessle in 1942 and scrub by FNAI in 1999. The area had been roller-chopped, and so this area was referred to as scrubby flatwoods based on the surrounding habitat and the species remaining, which include longleaf pine, sand pine (*Pinus clausa*), live oak, turkey oak, cabbage palm, rusty staggerbush, saw palmetto, sand holly, and wooly pawpaw. Though currently classified as scrubby flatwoods, the area may be reconsidered as scrub if and when the vegetation has recovered from the roller chopping.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for scrubby flatwoods on WeSF will focus on implementing a prescribed burn schedule. If burning alone is not effective, herbicides will be used conjunction with burning. Prescribed fires on a 5 to 8 year rotation should effectively move most of the existing areas toward desired future conditions. In portions of scrubby flatwoods that are overgrown or succeeding into xeric hammocks, mechanical removal of hardwoods by a light roller-chop, Brown's tree cutter, or hydro-axe mower may be needed to reduce hardwood abundance and fuel loads prior to initiation of a prescribed burn schedule.

E. Baygall

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Baygalls is an evergreen forested wetland of bay species situated at the base of a slope or in a depression. The overstory is composed of generally straight boled evergreen hardwoods such as swamp redbay, loblolly bay, and sweet bay. There are variable densities of holly (*Ilex spp.*), fetterbush, gallberry, wax myrtle, and greenbrier. The groundcover is somewhat open, leafy, with exposed tree roots. Vegetation includes chain fern (*Woodwardia spp.*), cinnamon fern (*Osmunda cinnamomea*), wild grape (*Vitis spp.*), poison ivy (*Toxicodendron radicans*), sphagnum moss, etc. The dominant baygall species are fire-intolerant. When possible, fires from adjacent communities will be allowed to extinguish naturally at the edges of the baygall to prevent encroachment of bay species into other communities and to maintain open, grassy wetland/upland ecotones.

Current Condition

Currently baygalls on WeSF are more extensive than they were historically due to encroachment into what once was predominantly wet flatwoods. Characteristic trees of

baygalls on WeSF include loblolly bay, sweetbay, swamp bay, pond pine, and slash pine. Red maple, cabbage palm, persimmon (*Diospyros virginiana*), live oak, water oak, and swamp tupelo are also found. Fetterbush is typically the dominant shrub. Other common shrubs and small trees include wax myrtle, dahoon, saw palmetto, highbush blueberry, piedmont staggerbush, and dwarf huckleberry. Herbs are scarce and include Virginia chain fern, beaksedges, sphagnum moss, Carolina redroot, and cinnamon fern. Baygalls associated with creeks often contain lizard's tail and bandana of the Everglades. Vines are occasional and include laurel greenbrier and muscadine. The latter often forms thickets around the edges of baygalls.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for baygalls on WeSF will focus on maintaining the historically occurring baygalls. Hydrologic alterations in baygalls, such as ditches and roads, will be restored to return natural hydrology where practical. Any further hydrological disturbances should be avoided. Fires from adjacent pyrogenic communities will be allowed to burn into the baygall to maintain ecotones.

F. Wet Flatwoods

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Wet flatwoods are characterized by stands of slash pines with a subcanopy of scattered sweet bay, loblolly bay, and swamp bay. Pond pine or longleaf pine may also be present. There is little or no stocking of species that are not considered flatwoods species, such as water oak, sweetgum, laurel oak and exotics. Shrubs such as gallberry, *Lyonia spp.*, and saw palmetto are present but saw palmetto becomes less abundant and restricted to patches. In the wet flatwoods groundcover contains less wiregrass than mesic flatwoods and more abundant in sedges (*Cyperaceae*), beakrush sedges (*Rhynchospora spp.*), nut sedges (*Cyperus esculentus*), meadow-beauty (*Rhexia spp.*), toothache grass (*Ctenium panzer*), *Hypericum spp.*, bushy bluestem (*Andropogon glomeratus*), and white top aster (*Aster paternus*). Ferns also appear in the groundcover. Soils are generally poorly to very poorly drained sands. Fire return interval is every one to three years for grassy wet flatwoods. In the more shrubby wet flatwoods, fire return interval can be as long as every five to ten years.

Current Condition

Currently much of the historically occurring wet flatwoods has been invaded by baygall vegetation due to lack of frequent fire. The canopy is generally open, though in some areas it is missing because of recent timber harvest. The most common canopy tree is slash pine, with pond pine being frequent, and in some areas dominant. Loblolly bay (*Gordonia lasianthus*) is also found dominating in the canopy in larger numbers than normal in areas where baygall vegetation has invaded due to infrequent burning. The subcanopy is sparse, understory is shrub-dominated, herbs are sparse, and epiphytes and

vines are absent. Approximately 9 acres are in the desired future condition, having been prescribed burned in 2010. The desired fire return interval is 2-4 years.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for wet flatwoods on WeSF will focus on a more frequent prescribed burn schedule of a 2-4 year frequency and timber harvests when appropriate to reduce heavy numbers of baygall and increase herbaceous species diversity. In addition, logging activities for pine harvests in adjacent stands will also be used to reduce encroachment of species endemic to baygall communities. In areas where baygall vegetation is abundant, woody vegetation may be reduced mechanically by means of a light roller-chopper, Brown's tree cutter, or hydro-axe mower. Monitoring of herbaceous species abundance should be conducted to assess community response to fire and other treatments.

G. Alluvial Forest

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. At WeSF, alluvial forests occur as a buffer/ecotone between the floodplain swamp and floodplain marsh communities associated with the St. John's River and the uplands to the east and south. Alluvial forests are closed canopy hardwood swamps on slightly drier soils in a riverine floodplain. They are usually intermixed with lower areas of floodplain swamp and higher areas of bottomland forest, baygall, or upland hardwood forest. Alluvial forests are inundated seasonally from riverbank overflow for one to four months during the growing season, but do dry out during the dry season. Primary trees found include overcup oak (*Quercus lyrata*), swamp laurel oak (*Q. laurifolia*), water hickory (*Carya aquatica*), American elm (*Ulmus americana*), green ash (*Fraxinus pennsylvanica*), water locust (*Gleditsia aquatica*), river birch (*Betula nigra*), and red maple (*Acer rubrum*). A great diversity of less flood-tolerant hardwoods or swamp species such as cypress (*Taxodium spp.*) and tupelo (*Nyssa spp.*) may also be present, but not dominant elements. Shrubs, small trees, and vines are usually sparse or moderate in abundance. Groundcover is variable in abundance with false nettle (*Boehmeria cylindrica*), butterweed (*Packera glabella*), netted chain fern (*Woodwardia areolata*), redtop panicum (*Panicum rigidulum*), and big carpetgrass (*Axonopus furcatus*) among the herbs most commonly encountered. Fires occur infrequently, occurring only during times of drought; however, this community acts as a natural fire-break - that may experience some fire at its margins. The area mapped as historical alluvial forest includes the shell mound at Orange Point (see Section VII. M.Shell Mound below for more details).

Current Condition

Alluvial forests currently found on WeSF show little evidence of disturbance, except for the high-grading of cypress at least a century ago. Current conditions for alluvial forest closely resemble the desired future conditions. Atypically, an emergent pine canopy of

scattered, mature loblolly pine (*Pinus taeda*), slash pine, and pond pine (*Pinus serotina*) reaching 100 feet or higher is present. A majority of the mapped community has a canopy of live oak, laurel oak, sweetbay (*Magnolia virginiana*), swamp tupelo (*Nyssa biflora*), sweetgum, cabbage palm, southern magnolia, and red maple (*Acer rubrum*). WeSF has a concentration of eagle nesting sites in this community (three in 2012; Exhibit P).

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities in alluvial forest are minimal as the current condition resembles the desired future condition. WeSF will focus on maintaining natural hydrologic patterns and allowing prescribed fires from adjacent communities will be allowed to spread and extinguish themselves in the alluvial forest. Defensible space will be mowed around known eagle nesting trees.

Shell mound occurs as an imbedded community feature within this community type. Shell mounds are small hills composed entirely of shells (clams, oysters, whelks) discarded by generations of Native Americans which support an assemblage of calciphilic plant species. A rich calcareous soil develops on the deposited shells which supports a diverse hardwood forest on undisturbed mounds. North Florida shell mounds have some temperate hammock species such as live oak and cabbage palm, plus calcium-loving temperate species such as soapberry, Carolina buckthorn, and sugarberry (*Celtis laevigata*). Shell mounds require patrolling to prevent further loss of the historical resource.

H. Floodplain Marsh

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Floodplain marshes are wetland communities occurring in river floodplains and dominated by herbaceous vegetation and/or shrubs. Floodplain marshes are directly influenced by river flooding on an annual or semi-annual basis where most of the marsh is inundated from approximately 120 to 350 days per year. Floodplain marsh may burn periodically depending on dominant vegetation. Sand cordgrass (*Spartina bakeri*), sawgrass (*Cladium jamaicense*), and maidencane (*Panicum hemitomon*) are common dominants, but various other herbs may be found distributed along a hydrologic gradient. Broadleaf emergents and floating plants, particularly bulltongue arrowhead (*Sagittaria lancifolia*), bladderworts (*Utricularia spp.*), pickerelweed (*Pontederia cordata*), yellow pondlily (*Nuphar advena*) occupy the deepest, most frequently flooded sites, and mixed herbaceous stands are found in the somewhat higher portions of the marsh. In wetter sites, coastalplain willow (*Salix caroliniana*) or common buttonbush (*Cephalanthus occidentalis*) may form shrub thickets. The highest part of the marsh is often a drier, wet prairie-like zone with a large diversity of graminoids and forbs. While the progression from high to low marsh occurs generally from the upland edge to the river edge, these

vegetation patches may also be scattered throughout the marsh. Marshes can be dominated by common buttonbush, coastalplain willow, and/or wax myrtle (*Myrica cerifera*). Occasionally, cabbage palm and other flood tolerant trees are widely scattered in floodplain marsh, becoming more concentrated in the ecotone to adjacent hydric hammocks.

Current Condition

Currently the floodplain marsh community is dominated by woody species shared with floodplain swamp. There are no known populations of invasive/exotics in this community. The abundance of woody species compared to herbaceous species suggests that this community is in some form of succession to floodplain swamp. Woody species include red maple, Carolina ash, black willow (*Salix nigra*), pond cypress (*Taxodium ascendens*), American elm (*Ulmus americana*), cabbage palm, dahoon (*Ilex cassine*), swamp bay (*Persea palustris*), wax myrtle, and buttonbush. Herbaceous species are dominated by green arrow arum and water spangles (*Salvinia minima*), with shortbristle horned beaksedge, scarlet rose mallow, lizard's tail, and sand cordgrass found in lesser abundance. Since non-pyrogenic communities surround these communities, it is unlikely that lack of fire has played a role in the succession from marsh to swamp-like conditions. This may be a cyclical pattern caused by fluctuating water levels (currently in a swamp cycle). Another potential explanation is that these areas may be artifacts created by the logging of historical swamps.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for floodplain marsh on WeSF will focus on minimizing disturbances and maintaining natural hydrologic regimes. Woody species abundance will be monitored to evaluate if and/or how quickly the marsh is succeeding to more swamp-like conditions. No specific management activity is recommended to reverse this seemingly natural cycle.

I. Flatwoods / Prairie Lake

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Flatwoods lakes are a system characterized as a shallow, round or elliptical depression within flatwoods with a relatively large open water zone that generally remains throughout the year. They are surrounded by either a sparse wet prairie-like zone or a dense ring of saw-palmetto or other shrubs. Typical plants include spikerush (*Eleocharis spp.*), yellow-eyed grasses, St. Johns wort (*Hypericum spp.*), chain fern and wax myrtle. Water is derived mostly from runoff from the immediately surrounding uplands. Typical animals include lesser and greater siren (*Siren lacertina* and *Siren intermedia*), cricket frog, green tree frog (*Hyla cinerea*), bullfrog (*Rana catesbeiana*), leopard frog, alligator, water snakes, and numerous birds. These natural communities function as aquifer recharge areas by acting as reservoirs which release groundwater when adjacent water tables drop during drought periods. Flatwoods/prairie lakes rarely

burn entirely, though the edges may burn when surrounding uplands burn, depending on water levels and fuels. Fire frequency should coincide with that of the surrounding uplands, typically 3-5 years.

Current Condition

Currently the flatwoods/prairie lakes on WeSF are occupied primarily by open water with maidencane, American white water lily, pickerelweed, bulltongue arrowhead, jointed spikerush, and big floating in varying proportions of the lake basin. The edges of a few of the lakes (such as that along the forest's northern boundary) have been encroached by woody species such as swamp tupelo (*Nyssa biflora*), slash pine, pond pine (*Pinus serotina*), swamp bay (*Persea palustris*), and loblolly bay (*Gordonia lasianthus*). For the most part, most of the lakes meet desired future conditions except in the frequent absence of the shallow water ring of herbaceous vegetation. This likely reflects lack of fires burning into the edges of basins.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for flatwoods/prairie lakes on WeSF will focus on minimizing disturbances and restoring any past disturbances to hydrology. This may entail closure and restoration of ditches and roads. Because movement of upland fires into the lake basin is desirable, it is important that the upland-wetland ecotone be maintained naturally with fire. To reverse or retard hardwood shrubby encroachment, fires from adjacent upland communities will be allowed to burn into the margins and naturally extinguish.

J. Depression Marsh

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Depression marshes are rounded, smaller wetlands found throughout the forest, but primarily in the mesic flatwoods. They have sandy bottoms and lack peat or organic substrate. They flood seasonally with hydroperiods being highly variable and erratic. Trees never occupy more than 10% of the wetland area. Typical trees species are swamp tupelo, slash pine, pond pine, and pond cypress. Buttonbush and saw-palmetto are occasional shrubs found mostly around the edge of the marsh. Maidencane (*Panicum hemitomum*), waterlily (*Nymphaea odorata*), Walter's sedge (*Carex striata*), yellow-eyed grasses (*Xyris spp.*), bladderworts (*Utricularia spp.*), Virginia chain fern, sphagnum moss (*Sphagnum ssp.*), Carolina redroot (*Lachnanthes caroliana*) and sawgrass are all common herbaceous species. Animal species include leopard frog, gopher frog, eastern spadefoot toad (*Scaphiopus holbrookii*), southern toad, white ibis, wood stork and sandhill crane. 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.

Current Condition

Currently the depression marshes on WeSF predominantly support herbaceous vegetation, though woody species have encroached along the edges of many marshes. This is likely a result of lack of fire, but may also be an effect of drought during 2000-2002. Some areas of this community type are progressing toward the desired future condition. Frequent, low intensity fires are the primary driving force needed to achieve the desired future condition. This encroachment of woody species along the edges has reduced diversity by limiting/inhibiting recruitment of the shallower water species mentioned above. Typical trees species found are swamp tupelo (*Nyssa biflora*), slash pine, pond pine (*Pinus serotina*), swamp bay (*Persea palustris*), and loblolly bay (*Gordonia lasianthus*). Buttonbush (*Cephalanthus occidentalis*) is occasionally found around the edge of the marsh or in the deeper center. Maidencane, American white waterlily, pickerelweed, and bulltongue arrowhead are the current dominant species. Yellow-eyed grasses (*Xyris* spp.), Virginia chain fern (*Woodwardia virginica*), Carolina redroot (*Lachnanthes caroliniana*), and sawgrass can also be found infrequently. Epiphytes and vines are infrequent to absent.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for depression marshes on WeSF will focus on avoiding or eliminating the placement of fire-breaks and roads around depression marshes. Prescribed fire in surrounding flatwoods will be allowed to burn through depression marshes. Depression marshes with a large amount of woody encroachment will be treated more aggressively with prescribed early growing season fires than marshes with little woody encroachment.

K. Xeric Hammock

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Xeric hammocks are evergreen forests on well-drained sandy soils. Xeric hammock can form extensive stands or can occur as small patches typically within or near sandhill or scrub. The low canopy is more or less closed and dominated by sand live oak (*Quercus geminata*). Other oaks include Chapman's oak (*Q. chapmanii*), turkey oak (*Q. laevis*), bluejack oak (*Q. incana*). An emergent canopy of longleaf pine may be present. The understory is usually open and consists of shrubs characteristic of either sandhill or scrub, depending on the origin of the hammock. Common understory plants include saw palmetto, rusty staggerbush (*Lyonia ferruginea*), sparkleberry (*Vaccinium arboreum*), deerberry (*V. stamineum*), and wild olive (*Osmanthus americanus*). The herb layer is generally very sparse or absent, but may contain some scattered wiregrass (*Aristida stricta* var. *beyrichiana*), sandyfield beaksedge (*Rhynchospora megalocarpa*), witchgrass (*Dichanthelium* spp.), or forbs such as sweet goldenrod (*Solidago odora*). Muscadine (*Vitis rotundifolia*) and earleaf greenbrier (*Smilax auriculata*) are common vines. The epiphytes Spanish moss (*Tillandsia usneoides*) and ballmoss (*T. recurvata*)

are often abundant. Due to the lack of pyrogenic vegetation, fire is not typically a factor in the ecology of this community or its plants. However regular ground fire serves to maintain the historical boundaries of this community and limit its encroachment into adjacent scrub or sandhills. Xeric hammocks rarely burn. Fires in xeric hammocks are usually catastrophic and may lead to reversion of the xeric hammock to another community type.

Current Condition

Currently the xeric hammocks on WeSF approximate desired future conditions. They have a low, closed canopy of live and sand live oaks, with a sparse subcanopy of pignut hickory. Xerophytic shrubs such as rusty staggerbush, Chapman's oak, saw palmetto, sparkleberry, and deerberry dominate the understory. A few small slash pine and sand pine (*Pinus clausa*) are present in canopy gaps. Herbs are sparse and include sandyfield beaksedge. Epiphytes are occasional and include Spanish moss and ball moss. Vines are occasional and include muscadine.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. Management activities for xeric hammock on WeSF will focus on maintaining current conditions by avoiding disturbances such as firebreaks and off-road vehicle trails through the community. Prescribed fires will be allowed to burn into the edges and extinguish naturally.

L. Wet Prairie

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Wet prairies in northeast Florida are herbaceous communities found on continuously wet, but not inundated soils surrounded by wet or mesic flatwoods. They are typically dominated by dense wiregrass (*Aristida stricta*) in the drier portions, along with foxtail club-moss (*Lycopodiella alopecuroides*), cutover muhly (*Muhlenbergia expansa*), yellow butterwort (*Pinguicula lutea*), and savannah meadowbeauty (*Rhexia alifanus*). In the wetter portions, wiregrass may occur with, or be replaced by, species in the sedge family, such as plumed beaksedge (*Rhynchospora plumosa*), featherbristle beaksedge (*R. oligantha*), Baldwin's nutrush (*Scleria baldwinii*), or slenderfruit nutrush (*S. georgiana*), plus longleaved threeawn (*Aristida palustris*). Fires from surrounding flatwoods burn down irregularly into the prairies every two to three years maintaining the typical herbaceous native vegetation and sedges and eliminating any hardwood or pine canopy species from establishing.

Current Condition

WeSF has approximately three (3) acres of wet prairie that is basically a swale through a flatwoods site. Much of the historically occurring wet prairie has been planted through with slash pine. It is distinct from the surrounding flatwoods because of the change in

understory to a grassy sedgy look. There are no known invasive/exotic issues in this community type.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. The wet prairies on WeSF will be burned and thinned on the same rotation as surrounding flatwoods, every 2 to 4 years. When thinning takes place, the canopy in these three acres should be opened up, and the prairies should not be used as skid trails.

M. Spring-run Stream

The following, utilizing WeSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Spring-run streams are perennial water courses that derive most, if not all, of their water from artesian openings in the underground aquifer. These outflows are generally clear, circumneutral to slightly alkaline, and perennially cool (66-75 F). Typical plants include tape grass (*Vallisneria americana*), wild rice (*Zizania aquatica*), and arrowheads (*Sagittaria spp.*). Spring-run Streams generally have sand bottoms or exposed limestone along their central channel. Calcareous silts may form thick deposits in quiet shallow zones, while leaf drift and other debris collect around fallen trees and quiet basins. The latter, along with limestone outcrops and rock debris, form important aquatic habitats for many small aquatic organisms. When undisturbed, submerged aquatic vegetation clothes most of the spring-run stream bottom and provides shelter and an abundant food source for the extensive web of life.

Current Condition

Two springs and spring-run streams occur on WeSF. Mud Spring is located approximately 1.5 miles south of Welaka in the floodplain swamp. Mud Spring is a 4th magnitude spring with a pool approximately 85 feet long and 65 feet wide. Prior to state ownership, the pool was dammed and enlarged. The spring arises from a vertical vent in the middle of the pool producing a prominent boil. Mud Spring was sampled 15 times by SJRWMD from 1995 to 2001. Summary statistics of water quality and discharge at Mud Spring are given in Exhibit Q. Mud Creek, its associated spring-run stream, meanders through the floodplain swamp to the southwest and empties into the St. Johns River about one mile from the springhead (Springs of the St. Johns River Water Management District, 2005). Typical aquatic plant species found in the pool and spring-run stream include coontail (*Ceratophyllum demersum*), southern water nymph (*Najas guadalupensis*), BurrMarigold (*Bidens laevis*), Dense Flower Knot Weed (*Polygonum glabrum*) pickerel weed (*Pontederia cordata*), Bulltongue arrowhead (*Sagittaria lancifolia*), string-lily (*Crinum americanum*), southern amaranth, (*Amaranthus australis*), shortbristle horned beaksedge (*Rynchospora corniculata*), American eelgrass (*Vallisneria americana*). Aquatic exotics include water lettuce (*Pistia stratiotes*), hydrilla (*Hydrilla verticillata*), and water hyacinth (*Eichhornia crassipes*).

Sulfur Spring (also referred to by SJRWMD as “Forest Springs”), and its associated spring-run, is located approximately one quarter mile southeast of Mud Spring on the edge of the floodplain swamp. Sulfur Spring is a 4th magnitude spring with a pool approximately 30 feet long and seven feet across. The spring arises from at least two vents, with a slight boil being visible and produces a clear sulfur odor. SJRWMD sampled Sulfur Springs 14 times from 1995 to 2001. Summary statistics of water quality and discharge at Sulfur Springs are given in Exhibit Q. The spring-run stream then meanders through the floodplain swamp to the west and empties into the St. Johns River about 2.5 miles from the springhead (Springs of the St. Johns River Water Management District, 2005). Typical aquatic plant species found in the pool and spring-run stream are similar to Mud Springs run.

Management Actions

Goals, desired future conditions, standards, and guidelines provide management area direction. To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. These goals and desired future conditions may take many planning cycles to attain. An ongoing concern is monitoring exotics and producing a control strategy in conjunction with SJRWMD if needed. At this time there are no plans to remove or modify the alterations around Mud Springs. Exotics in and around the springs will be monitored. If needed, a control strategy will be produced in conjunction with SJRWMD.

VIII. References

Bartram, William. 1791. Travels Through North and South Carolina, Georgia, East and West Florida, The Cherokee Country, The Extensive Territories of the Muscogulges or Creek Confederacy, and the Country of the Chactaws, Containing an Account of the Soils and Natural Productions of Those Regions; Together with Observations on the Manners of the Indians. James and Johnson. Philadelphia.

Division of Historical Resources. Revised 2013. Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Lands. Department of the State, Division of Historical Resources. Tallahassee, Florida.

Florida Department of Agriculture and Consumer Services. Revised 2008. Silviculture Best Management Practices (BMPs) for Florida. Florida Department of Agriculture and Consumer Services, Florida Forest Service.

Florida Department of Agriculture and Consumer Services. Revised 2004. State Forest Handbook. Florida Department of Agriculture and Consumer Services, Florida Forest Service.

Florida Natural Areas Inventory (FNAI). 2010. Guide to the natural communities of Florida: 2010 edition. Florida Natural Areas Inventory. Tallahassee, Florida.

Florida Natural Areas Inventory, 2006. Historic Natural Communities at Welaka State Forest.

Laessle, Albert M. 1942. The plant communities of the Welaka area: with special reference to correlations between soils and vegetational succession. University of Florida Press.

Springs of the St. Johns River Water Management District. (May, 2005) St. Johns River Water Management District. Retrieved September 22, 2011. <http://floridaswater.com/springs>

A Management Guide for Invasive Plants in Southern Forests. United States Department of Agriculture Forest Service, Southern Research Station General Technical Report SRS-131

IX. Glossary of Abbreviations

ARC	Acquisition and Restoration Council
BOT	Board of Trustees of the Internal Improvement Trust Fund
CARL	Conservation and Recreation Lands
CFS	cubic feet per second
DEP	Florida Department of Environmental Protection
DHR	Florida Division of Historical Resources
DRP	Florida Division of Recreation and Parks
FDACS	Florida Department of Agriculture and Consumer Services
FFS	Florida Forest Service
FWC	Florida Fish and Wildlife Conservation Commission
FNAI	Florida Natural Areas Inventory
GIS	Geographic Information System
OFW	Outstanding Florida Water
OOF	Operation Outdoor Freedom
SJRWMD	St. Johns River Water Management District
USFS	United States Forest Service
USFWS	United States Fish & Wildlife Service
WeSF	Welaka State Forest
WMA	Wildlife Management Area