

TEN-YEAR RESOURCE MANAGEMENT PLAN

FOR THE

LAKE GEORGE STATE FOREST

VOLUSIA COUNTY



PREPARED BY

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

FLORIDA FOREST SERVICE

APPROVED ON

TEN-YEAR RESOURCE MANAGEMENT PLAN

FOR THE

LAKE GEORGE STATE FOREST



Approved by:

Jim Karels, Director
Florida Forest Service

Date

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Date

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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services, Florida Forest Service
COMMON NAME: Lake George State Forest
LOCATION: Volusia County
ACREAGE TOTAL: 21,185.99 acres

<i>Historical Communities</i>	<i>Natural</i>	<i>Approximate Acreage</i>
Mesic Flatwoods		9120
Hydric Hammock		3696
Floodplain swamp		2568
Wet Flatwoods		1929
Basin Swamp		2109
Baygall		719
Floodplain Marsh		237

<i>Historical Communities</i>	<i>Natural</i>	<i>Approximate Acreage</i>
Basin Marsh		182
Sandhill		173
Scrubby Flatwoods		200
Depression Marsh		149
Dome Swamp		70
Wet Prairie		34

LEASE / MANAGEMENT AGREEMENT NUMBER: 4009

USE: Single___ Multiple X

MANAGEMENT AGENCY

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

RESPONSIBILITY

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

DESIGNATED LAND USE: Multiple-Use State Forest

SUBLEASES: None

ENCUMBRANCES: Multiple power lines

TYPE ACQUISITION: Conservation and Recreation Lands (CARL), Preservation 2000, Florida Forever

UNIQUE FEATURES: 5 ½ miles of water frontage – Lake George, St. John's River, and associated creeks

ARCHAEOLOGICAL / HISTORICAL: There are ten known sites on LGSF.

MANAGEMENT NEEDS: Non-native invasive species control, perimeter firelines, floral / faunal inventory, road repair and maintenance, fuel/fire management, thinning, recreation plan implementation, maintenance of recreational trails and facilities, forest inventory maintenance, boundary encroachment resolution.

ACQUISITION NEEDS: 755 acres

SURPLUS LANDS / ACREAGE: 4.6 acres

PUBLIC INVOLVEMENT: Land Management Review; Management Plan Advisory Group and 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: _____ BTITF Approval Date: _____

Comments: _____

I. Introduction

Lake George State Forest (LGSF) is comprised of 21,176 acres located in northwest Volusia County, between Barberville and Astor, Florida, both north and south of State Road 40 (Exhibit B). This property was acquired under the Preservation 2000, Conservation and Recreation Lands (CARL) and Florida Forever programs. The forest's diverse ecological communities include mesic flatwoods, floodplain wetlands, sandhills, and interspersed cypress and bay depressions. LGSF is one of several publicly-owned lands that encompass Lake George, Florida's second largest lake. The state forest has approximately 5½ miles of water frontage on the westernmost boundary, comprised of 3½ miles of St. John's River frontage, and 2 miles of lake and creek frontage. The area along the river has a rich archaeological history that contains many artifacts of past land use.

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 LGSF center on the multiple-use concept, as defined in sections 589.04(3) and 253.034(2)(a) F.S. Implementation of this concept will utilize and conserve state forest resources in a harmonious and coordinated combination that will best serve the people of the state of Florida, and that is consistent with the purpose for which the forest was acquired. Multiple-use management for LGSF 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 to 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 LGSF 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 LGSF has been completed monthly and is 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 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 2004, there have been many events, developments and accomplishments. Among the most noteworthy have been the following:

1. Land Management Reviews were conducted by the Florida Department of Environmental Protection (DEP) in 2005, 2010, and 2014.
2. A Florida Natural Areas Inventory (FNAI) survey of natural communities was completed in 2005.
3. A non-native, invasive plant survey was conducted by the FFS Forest Health Section in 2006, and a Non-native Invasive Plant Management Plan was completed in 2009.
4. A Wetland Restoration Needs Assessment was conducted by the FFS Hydrology Unit in 2007.
5. Acquisitions included the 38.36 acre Shaw Parcel in 2005, 1,527.76 acre Volusia County Parcel in 2007, and 10.05 acre Tapscott Parcel in 2014.
6. In 2013, the Check Station Wildfire resulted in the need for reforestation of 251 acres of planted longleaf and slash pine.
7. Special opportunity turkey hunts benefiting veterans were initiated in 2013 on the Mary Farms / Dexter Unit of the Lake George Wildlife Management Area (WMA) under the FFS Operation Outdoor Freedom (OOF) program.
8. Beginning in 2009, an OPS Park Ranger position was funded by the federal Non-Native-Invasive Plant Program (NNIP) grant administered through the FFS Forest Health Section to monitor and treat non-native invasive species on four area state forests including Lake George State Forest.
9. Two positions were filled that complement the forest: District Recreation Coordinator and District Ecological Forester.
10. Over the last ten years, 13,801 acres have been prescribed burned.
11. The economic impact from Lake George State Forest over the past ten years has included \$776,492 from recreation revenue, timber sales, and miscellaneous forest products.

C. Goals / Objectives for the Next Ten Year Period

The following goals and objectives provide direction and focus management resources for the next ten-year planning period. Funding, agency program priorities, and the potential for wildfire during the planning period will determine the degree to which these objectives can be met. Management activities on LGSF during this planning period must serve to conserve, protect, utilize and enhance the natural and historical resources and manage resource-based public outdoor recreation, which is compatible with the conservation and protection of this forest. The majority of the management operations will be conducted by the FFS, although appropriate activities will be contracted to private sector vendors or completed with the cooperation of other agencies. All activities will seek to 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 are achievable within a two year planning period, and long-term goals are achievable within a ten year planning period. Objectives are listed in priority order for each goal. 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: Annually update the Five-Year Silviculture Management Plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (On-Going Goal) There will be a one-time cost of \$61,000 to reforest approximately 233 acres of pines due to wildfire damage.

Performance Measure: Plans revised and updated annually.

Objective 2: Continue to implement the silviculture management plan. (On-Going Goal)

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

Objective 3: Conduct stand descriptions and update GIS database inventory containing forest stands, roads and other attributes (including but not limited to: threatened & endangered species, archaeological resources, exotic species locations, historical areas). (On-Going Goal)

Performance Measures:

- Complete GIS database and re-inventory 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. (On-Going Goal)

Performance Measure: Number of acres inventoried annually.

Objective 5: Continue to promote revenue generation through miscellaneous forest product sales (palmetto drupe, palmetto frond, fuel wood, pine straw, etc.) recreation fees, and/or leases (e.g. apiary) where appropriate. (On-Going Goal)

Performance Measure: Annual revenue generated, by type.

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

Objective 1: Maintain public access and recreational opportunities to allow for a projected and assumed recreational carrying capacity of 231 visitors per day. (Short Term Goal)

Performance Measure: Number of visitor opportunities per day.

Objective 2: Develop additional public access and recreational opportunities to allow for a projected and assumed carrying capacity of 399 visitors per day. (Long Term Goal)

Performance Measure: Number of visitor opportunities per day.

Objective 3: Promote, and provide access to reasonable accommodations for forest visitors to pursue nature-based outdoor recreation activities on state lands while

maintaining the integrity and quality of the ecosystems and cultural resources therein. An integral part of this objective will be to maintain an annual update of the LGSF Five-Year Outdoor Recreation Plan. (On-Going Goal)

Performance Measure: Five-Year Outdoor Recreation Plan updated annually with realistic operational objectives to be completed within that fiscal year.

Objective 4: Conduct two new interpretive / education programs annually. (On-Going Goal)

Performance Measure: Number of interpretive/education programs held annually.

Objective 5: Conduct quarterly Liaison Committee meetings to receive feedback from the various user and interest groups (On-Going Goal)

Performance Measure: Number of Liaison committee meetings conducted annually.

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

Objective 1: Conduct habitat / natural community improvement on 22 acres of scrubby flatwoods and 49 acres of sandhill areas with intact, native groundcover. Restoration activities will include removal of sand pine, prescribed burning, and supplemental planting of longleaf as needed. (Long Term Goal)

Performance Measure: Number of acres with restoration underway.

Objective 2: The LGSF has approximately 14,922 acres of fire-dependent natural communities. In order to keep these communities within the desired fire return interval, approximately 2,355 to 6,607 acres will be prescribed burned annually. Based upon the FFS contracted burning rate (\$25.00 per acre), the average estimated annual cost (including fuel and maintenance) is \$58,875 to \$165,175 per year. (On-Going Goal)

Performance Measure: Number of acres prescribed burned annually.

Objective 3: Maintain 3,827 acres in maintenance condition based on fire return interval. (Short Term Goal)

Performance Measure: Number of acres currently in maintenance condition.

Objective 4: Maintain 5,500 acres in maintenance condition based on fire return interval. (Long Term Goal)

Performance Measure: Number of acres currently in maintenance condition.

Objective 5: In cooperation with FNAI pursue a natural community survey and mapping on 1,577 acres of newly acquired parcels. (Short Term Goal)

Performance Measure: Number of acres surveyed and mapped.

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

Objective 1: The FFS will cooperate with the Florida Fish and Wildlife Conservation Commission (FWC) on the development of a Wildlife Management Plan that will address all appropriate fish and wildlife species, including imperiled species, their habitats, and their sustainability based on site specific population data. In conjunction with this plan,

institute a continuous monitoring program to ensure the viability of these populations. (Long Term Goal)

Performance Measures:

- Wildlife Management Plan completed.
- Monitoring program established.

Objective 2: Develop baseline data for listed, rare, and select focal species occurrences and an inventory list. (Long Term Goal)

Performance Measure: Baseline of listed, rare, and focal species occurrence and inventory list complete.

Objective 3: Develop and implement monitoring protocols for selected listed, rare, and focal species. (Long Term Goal)

Performance Measures:

- The number of listed, rare, and focal species for which monitoring protocols are developed.
- The number of species for which monitoring is ongoing.

Objective 4: As funding and staffing allow, develop an inventory of native plants with an emphasis on listed and focal species. (Long Term Goal)

- **Performance Measure:** Inventory of listed and focal plant species complete.

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

Objective 1: Annually update the existing Five-Year Non-Native Invasive Species Management Plan. Monitor and treat as needed, all known sites where Florida Exotic Pest Plant Council Category I and II invasive plants are found. (Short and Long Term Goal)

Performance Measures:

- Annual updates to the plan.
- Number of acres treated annually.
- Number of sites monitored annually.

Objective 2: Coordinate with local non-profit groups such the Cooperative Invasive Species Management Area and other government agencies, to develop applications for government and private sector grants to assist with non-native plant management. (Short and Long Term Goal)

Performance Measures:

- Completed application(s).
- Amount of funding received.

Objective 3: Monitor for non-native, invasive animal species. (Short and Long Term Goal)

Performance Measure: Number of species observed and identified.

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

Objective 1: Ensure all newly discovered sites are documented and reported to the

Department of State, Division of Historical Resources (DHR). (Long Term Goal)

Performance Measure: Number of new site records.

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

Performance Measure: Number of sites monitored.

Objective 3: With DHR, pursue cultural resource assessment of 2,729 acres acquired since the original (January 1997) state forest assessment was completed. (Short Term Goal)

Performance Measure: Cultural Resource Assessment completed.

➤ **GOAL7: Hydrological Preservation and Restoration**

Objective 1: Continue implementing recommended hydrological improvements identified in the 2007 Wetland Restoration Needs Assessment. (On-Going Goal)

Performance Measure: Hydrological improvements implemented.

Objective 2: Protect water resources during management activities through the use of Silvicultural Best Management Practices (BMP's) for public lands. (Long Term Goal)

Performance Measure: Compliance with state lands BMP's.

Objective 3: Close, rehabilitate, or restore those roads and trails that have evidence of erosion into surrounding water bodies causing alterations to the hydrology. (Short Term Goal)

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

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

Objective 1: LGSF staff will continue maintenance of a primitive campground, two parking areas / trailheads, two recreation areas, 31 miles of public use roads, and ¾ miles of trails. (Long Term Goal)

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

Objective 2: Continue to follow the Five-Year Boundary Survey and Maintenance Management Plan and update the plan annually. (Short Term Goal)

Performance Measures:

- Annual update completed.
- Percentage of forest boundary maintained.

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

Performance Measure: Annual update completed.

II. Administration Section

A. Descriptive Information

1. Common Name of Property

The common name of the property is the Lake George State Forest (LGSF).

2. Legal Description and Acreage

The LGSF is comprised of four tracts totaling 21,185.99 acres. These are referred to as the Astor Tract, Volusia Tract, Dexter Tract, and Mary Farms Tract. The Dexter and Mary Farms Tracts are comprised of all parcels south of State Road 40 (Dexter Pasture, Coraci / Mary Farms, and Berkowitz).

The LGSF is located in Volusia County, Florida between Barberville and Astor. The state forest is bisected by State Road 40; US Highway 17 and County Road 3 roughly parallel the eastern boundary south of State Road 40. The boundaries and the major parcels are identified in Exhibit B. The legal description is found in lease agreement 4009. The property is located in all or part of Sections 1-5, 9-12, 16, 45 & 46 of Township 16 South, Range 28 East; Sections 3-6 of Township 16 South, Range 29 East; Sections 19-21 and 28-34 of Township 15 South, Range 29 East; Sections 3, 55, 7-10, and 15-24 of Township 15 South, Range 28 East, and Section 36 of Township 14 South, Range 28 East, Volusia County, Florida.

Table #1. LGSF Acreage by Parcel

PARCEL	DEED DATE	CLOSING DATE	FUNDING SOURCE	COUNTY	ACRES
D.S.C. of NEWARK ENTERPRISES / A.A. CORACI	2/21/1996		CARL	VOLUSIA	9,201.27
STROTHER TIMBERLANDS, DEXTER PASTURE	7/19/1995		P2000	VOLUSIA	4,023.21
UNION CAMP	5/27/1993		CARL	VOLUSIA	5,232.34
BERKOVITZ	6/16/1998	6/16/1998	FFS / P2000	VOLUSIA	1,153.00
SHAW	6/15/2005	6/21/2005	FFS / FF	VOLUSIA	38.36
VOLUSIA COUNTY	12/19/2007	12/20/2007	FFS / FF	VOLUSIA	1,527.76
TAPSCOTT		3/14/2014	FFS / FF	VOLUSIA	10.05

A complete legal description of lands owned by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) and St. John's River Water Management District (WMD) as part of LGSF is on file at the FFS DeLeon Forestry Station office, at the Florida Department of Environmental Protection (DEP), and on file at the FFS state office in Tallahassee.

3. Proximity to Other Public Resources

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

Table #2. Nearby Public Conservation Land and Easements

TRACT	AGENCY	DISTANCE
Lake George Forest	Volusia County	Adjacent
Barberville Mitigation Bank	Volusia County	Adjacent
Heart Island Conservation Area	SJRWMD	Adjacent
Lake Woodruff National Wildlife Refuge	USFWS	Adjacent
DeLeon Springs State Park	DRP	Adjacent
Ocala National Forest	USFS	Adjacent
Barberville Conservation Area	Volusia County	Adjacent
Barberville Mitigation Bank	Volusia County	Adjacent
Haw Creek/Gillespie Conservation Easement	SJRWMD	6 miles northeast
Plum Creek/Rayonier/Hutton Conservation Easement	SJRWMD	6 miles northeast
Evans Conservation Easement	SJRWMD	7 miles northeast
Hagstrom Conservation Easement	SJRWMD	7 miles northeast
Lake George Conservation Area	SJRWMD	7 miles north
Seminole State Forest	FFS	7 miles south southeast
Plum Creek/Rayonier Conservation Easement	SJRWMD	8 miles northeast
Clark Bay Conservation Area	SJRWMD	8 miles east
Relay South Conservation Area	SJRWMD	9 miles northeast
Tiger Bay State Forest	FFS	9 miles east
Plum Creek Volusia Pinelands Conservation Easement	SJRWMD	10 miles east
Crescent Lake Conservation Area	SJRWMD	10 miles north northeast
Holman Conservation Easement	SJRWMD	11 miles southwest
Haw Creek Preserve State Park	DRP	11 miles north northeast
Blue Spring State Park	DRP	12 miles southeast
Hontoon Island State Park	DRP	12 miles south southeast
Lower Wekiva River State Park	DRP	12 miles south
Longleaf Preserve	Volusia County	14 miles southeast
Haw Creek Conservation Area	SJRWMD	14 miles north northeast

TRACT	AGENCY	DISTANCE
Deep Creek Preserve	Volusia County	16 miles south southeast
Welaka State Forest	FFS	18 miles northwest
Tomoka State Park	DRP	22 miles northeast
LeFils Conservation Easement	SJRWMD	23 miles southeast
Norman Fore Conservation Easement	SJRWMD	24 miles southeast
Bulow Creek State Park	DRP	22 miles northeast
Caravelle Ranch WMA	FWC	24 miles northwest
Doris Leeper Spruce Creek Preserve	Volusia County	24 miles east southeast
Bulow Ruins State Park	DRP	25 miles northeast
Lukas Conservation Easement	SJRWMD	26 miles southeast
North Peninsula State Park	DRP	26 miles northeast
Hartford Ranch Conservation Easement	SJRWMD	27 miles southeast
Farmton Brevard Conservation Easement	SJRWMD	30 miles southeast

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

FWC - Florida Fish and Wildlife Conservation Commission

FFS - Florida Forest Service

USFWS - United State Fish & Wildlife Service

USFS - United States Forest Service

SJRWMD - St. John's River Water Management District

4. Property Acquisition and Land Use Considerations

The majority of LGSF was acquired under the CARL program, starting with the purchase of the Astor Parcel from Union Camp on May 27, 1993, and followed by the purchase of the Dexter Pasture on July 19, 1995, and Coraci / Mary Farms on February 21, 1996. The Berkowitz Parcel (now considered part of Dexter Tract) was purchased on June 16, 1998 with FFS / P2000 in-holding and additions funds. The Shaw Parcel was acquired on June 15, 2005 with FFS in-holding and addition funds. The Volusia County Parcel was purchased on December 19, 2007 with Florida Forever funds.

B. Management Authority, Purpose and Constraints

1. Purpose for Acquisition/Management Prospectus

The purposes identified by the CARL program in the Management Prospectus (Exhibit N) for this acquisition are:

- To use and protect as a natural floodplain, marsh, or estuary, if the protection and conservation of such lands are necessary to enhance or protect water quality or quantity, and to protect fish or wildlife habitat that cannot adequately be accomplished through local, state, and federal regulatory programs.
- To use as state parks, recreation areas, public beaches, state forest, wilderness areas, or wildlife management areas.
- To restore altered ecosystems and to correct environmental damage that has already occurred.

- To conserve lands that support habitat critical to or provide significant protection for an endangered or threatened species of plant or animal.
- To preserve archaeological and/or historical sites.

2. Degree of Title Interest Held by the Board

The Board of Trustees of the Internal Improvement Trust Fund (TIITF) holds fee simple title to the property. Lease Agreement Number 4009, dated June 20, 1995, assigned the property to the Florida Department of Agriculture and Consumer Services (FDACS), FFS as “lead agency” and to the St. John’s River Water Management District (SJRWMD), Volusia County, and FWC as “cooperating agencies”. Copies of this agreement and related deeds are on file at the FFS and Department of Environmental Protection (DEP) offices in Tallahassee and at the LGSF headquarters.

3. Designated Single or Multiple-Use Management

The LGSF 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 4009.

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 a few are listed below:

- *Timber Harvests* – Projected timber sale income varies, however approximately one sale a year is held on LGSF. Projected timber sale income during fiscal year 2014-15 is \$45,000.
- *Palmetto Frond Sales* – LGSF has contracted harvesting of palmetto fronds for several years. Two annual contracts with option for renewal for a second year are bid. For fiscal year 13-14 palmetto frond sales totaled \$13,750.
- *Palmetto Drupe Sales* – LGSF has utilized special use permits to allow individuals to harvest palmetto drupes for the last three years. Permits for drupes generated \$1,232 during fiscal year 2012 - 2013.

- *Other Miscellaneous Forest Product Sales* – Forest staff have evaluated and issued a limited number of permits for other forest products such as Christmas trees (sand pine) and greenery. In addition, requests for sabal palm buds have been evaluated although none have resulted in a sale to date. Revenue amounts have not been significant, however, FFS may look to increase those amounts in the future without adversely affecting the resources.
- *Apiaries* – Two apiary sites are located on LGSF.
- *Cattle Grazing* – Cattle grazing was evaluated and determined to not be viable on LGSF under current conditions.
- *Recreation Day Use Areas and Primitive Camping Area* – Honor fees are collected at the Bluffton Recreation Area. Additional honor fee areas may be implemented as additional facilities are added. Camping fees are collected at the Deleon Springs Forestry Station.
- *Pine Straw Harvest* – a pine straw harvest is planned for 2015.

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 LGSF.

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 LGSF boundary lines (83 miles total) are managed by state forest personnel in accordance with the guidelines stated in the State Forest Handbook.

2. Improvements

An equipment compound, located about ¾ miles south of SR 40 on Check Station Road, was constructed in 2001 to provide secure storage of machinery and equipment on the forest. The fenced and gated compound contains a 40'x 88' (3,520 sq. ft.) pole barn with storage room and connex boxes, as well as a smaller equipment shed and storage area for FWC equipment and supplies.

A mobile home site, providing space for a single residence is located adjacent to the compound, and shares electrical and well access. A well pump house is located between the mobile home site and the equipment compound.

On the west end of Bluffton Road, a 12,054 square foot corral provides a secure parking and loading area for equestrians.

3. On-Site Housing

A single wide mobile home, located on the Check Station Road site, is the only residence currently on the forest, and is occupied by a FWC law enforcement officer.

FFS may establish additional on-site housing (mobile/manufactured home) on LGSF 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 District 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 District Manager and approved by the Director.

4. Operations Infrastructure

The current annual budget (fiscal year 2013 – 2014) for LGSF is \$502,678; however, annual appropriations may fluctuate. This amount includes salaries and benefits, expense, contractual and on-call funds and is broken down as follows:

▪ Salary and Benefits	\$409,081
▪ Expense (general operating costs for fuel, supplies, parts etc.)	\$ 79,352
▪ Contractual	\$ 6,403
▪ On-Call	\$ 1,000

Four full-time positions are currently assigned exclusively to LGSF, including a Forester, a Senior Forest Ranger, and two Forest Rangers. In addition, a Forest Area Supervisor and Master Mechanic provide part-time support to LGSF. A Park Ranger is assigned split duties between Lake George and Tiger Bay State Forests. A Forest Resource Administrator, Recreation Coordinator, and Ecology Forester split duties with the other four state forests in the Bunnell District. Tiger Bay State Forest personnel and the Bunnell District Forest Rangers provide additional support as needed.

Resource management is the responsibility of the Forester and includes forest management, planning, and administration on LGSF. Forest operations are the responsibility of the Forest Area Supervisor and assigned personnel; duties include road, facility and infrastructure maintenance/repairs as well as prescribed burning activities.

D. Additional Acquisitions and Land Use Considerations

1. Alternate Uses Considered

During this management period the following uses were considered and determined to not be 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. 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 F) would facilitate restoration, protection, maintenance, and management of the resources on LGSF.

3. Surplus Land Assessment

Two parcels have been considered by the FFS for possible surplus from LGSF (Exhibit F). One is a 3.5 acre parcel in Section 4, Township 15 South, Range 28 East. It is being considered for exchange in order to create a more manageable boundary configuration and bring the state forest boundaries up to Riley Pridgeon Road. The Division of State Lands (DSL) was first notified about this parcel in 2002 but the exchange could not be completed because of a change in ownership. The other is a small, one acre parcel in Section 26, Township 15 South, and Range 28 East that is separated from the forest by a platted road. DSL was notified about this parcel in January of 1997. With the exception of these parcels, all other land in this forest is suitable for its proposed use 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 and reviewed current comprehensive plans and future land use maps. Smoke management plans will be developed to insure prescribed burning does not conflict with adjacent commercial ferneries, fish camps, residential areas and adjoining highways. Smoke management will be a primary concern when prescribed fires are being conducted.

Additionally, FFS staff will meet with adjacent land owners and maintain liaison with those land owners to ensure that any conflicting future land uses may be readily identified and addressed.

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

5. Compliance with Comprehensive Plan

This plan was submitted to the County Council in Volusia County for review and compliance with their local comprehensive plans (Exhibit O).

6. Utility Corridors and Easements

On the Astor Tract, a 110 foot wide Clay Cooperative transmission line currently runs along part of the southern boundary line and also through a short section of the

interior. Short sections of a 20 foot Clay Cooperative power line easement and an eight-foot Florida Power easement are also present. On the Dexter / Mary Farms Tract, another 110 foot Clay Cooperative transmission line runs west from U.S. Highway 17 about 2-5/8 miles and then north about 3/8 mile to State Road 40. This Clay Cooperative line then borders the Dexter / Mary Farms Tract and runs along State Road 40 west to the St. John's River. Also in the Dexter / Mary Farms Tract is a power line that runs from State Road 40 down Check Station Road and serves the equipment compound and mobile home site. On the east side of Dexter / Mary Farms Tract, a 100 foot wide Duke Energy easement extends along the west side of County Road 3.

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

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

Co-location of new linear facilities with existing corridors will be considered and should only be used 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 TIITF. 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 TIITF Management Lease Number 4009. 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 or archaeological 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. John's 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. Rules governing the use of LGSF are stated in Chapter 5I-4 of the Florida Administrative Code. FWC will enforce fish and wildlife regulations and provide assistance in enforcing state forest rules.

The Office of Agricultural Law Enforcement (OALE) will assist with open burning and wildfire investigations as needed. Additional assistance is provided by the Volusia County Sheriff's Offices as needed. In light of the current statewide budget limitations, the FFS feels that law enforcement is adequate on LGSF. There may be some flexibility in managing the current staff schedules to provide better FFS presence on the weekends. Present law enforcement measures are 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 Group, public hearings, and through direct contact with user groups. A Land Management Review Team conducted a review of management plan implementation in 2010 (Exhibit P). The review team's recommendations were incorporated into this plan as appropriate.

The plan was developed with input from the LGSF Management Plan Advisory Group and was reviewed at a public hearing on December 2, 2014. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in Exhibit Q. 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 LGSF. Depending upon the type of volunteer service needed, volunteer activities may be one-time events or long-term projects. Volunteers have assisted with routine gate opening and closing, litter pick up, and building hiking trail board walks. Additional volunteer recruitment will be encouraged to assist with other activities to further the FFS's mission.

5. Friends of Florida State Forest

Friends of Florida State Forests (FFSF) is a Direct Support Organization (DSO) of the Florida Forest Service. The FFSF supports recreation and reforestation projects on Florida's state forests. FFSF is an organization established by Florida statute that

supports programs within Florida's state forests and is governed by a board of directors representing all areas of the state. Through community support, the FFSF assists the Florida Forest Service to expand opportunities for recreation, environmental education, fire prevention and forest management within Florida's state forests.

III. Archaeological/Cultural Resources and Protection

A. Past Uses

LGSF is rich in archaeological resources indicating significant prehistoric uses. The archaeological sites are discussed in greater length in Section B. More recent past uses of the forest include: timber harvesting, naval stores production, cattle grazing, and hunting.

In the 1930's, the Ray Bond Lumber Company owned the Astor and Dexter parcels. Much of these parcels was forested in open stocking of longleaf and slash pine and was grazed. Later, Carl Brice, a local wood dealer, purchased the property and conducted naval stores operations. Union Camp began leasing these two parcels in 1948, managing them for timber production and continuing cattle grazing operations. In the 1960's conversion to intensive silviculture began. Union Camp purchased the property in the early 1970's. Under active timber management, predominantly slash pine was planted and a prescribed burning rotation of three years was attempted until manpower shortages in the 1980's decreased the rotation to every five or six years. Harvest rotation age was approximately 25 years for pulpwood production. Hunting leases were also managed by Union Camp.

The Mary Farms Tract (Coraci Parcel) was previously owned by D.S.C. of Newark, Incorporated. Cattle grazing and hunting leases were the primary activities along with timber management. Under D.S.C.'s ownership, consulting foresters provided professional forest management for the first time in 1983. Thinning of some of the natural stands and reforestation of some of the cleared pasture areas were conducted.

Prior to D.S.C.'s ownership, cattle grazing and hunting were primary uses, while some of the property was in orange groves and other crops. Logging and land clearing were conducted to create additional grazing areas, and some naval stores operations probably took place. Timber management does not appear to have been actively pursued.

The Berkowitz Parcel was purchased from a private landowner and the land is primarily swamp that lowers into Spring Garden Creek. There are four old logging canals that run north from Spring Garden Creek toward upland parts of LGSF. However, these canals are not accessible due to hardwood growth near the river.

The Volusia County Parcel was previously managed by consulting forest managers for Florida Power Corporation for silviculture. Prior to state acquisition in 2007, the mature slash pine plantations were harvested and most of these areas were successfully reforested by bedding and machine planting.

B. Archaeological and Historical Resources

An archaeological survey was completed by the Florida Bureau of Archaeological Research in January of 1997. A review of information contained in the DHR's Florida Master Site file has determined that there are nine known recorded sites on LGSF.

An additional cattle dipping vat was recently discovered (2014) and has been added to the existing documentation.

Table #3. Archaeological and Historical Sites on LGSF

SITE ID	SITE NAME	SITE TYPE
<u>VO10</u>	<u>Morrison's Creek Mound</u>	Sand Burial Mound
<u>VO19</u>	<u>Mount Taylor Midden</u>	Shell midden and shell mound
<u>VO22</u>	<u>Bluffton Midden</u>	Shell mound and midden, shell fields
<u>VO23</u>	<u>Bluffton Mound</u>	Burial Mound, sand/freshwater shell
<u>VO7049</u>	<u>Dexter Point Midden</u>	Shell Midden
<u>VO7077</u>	<u>Bird Bench Mark</u>	Shell Midden
<u>VO7497</u>	<u>Jarred Mound</u>	Shell Mound
<u>VO7498</u>	<u>Dexter/Mary Farms Cattle Dipping Vat</u>	Dipping Vats
<u>VO8379</u>	<u>Lake George Well/Cistern</u>	Well/Cistern
<u>VO9460</u>	<u>Astor Tract Cattle Dipping Vat</u>	Dipping Vats

C. Ground Disturbing Activities

Representatives of DHR and FNAI will be consulted prior to the initiation of any proposed significant ground disturbing activity by FFS or any other public agency. The FFS will make every effort to protect known or discovered 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 G) 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 local district FFS personnel trained by DHR as archaeological site monitors. Two personnel were recently sent to Archeological and Resource Monitoring (ARM) Refresher Training in January 2014. FFS will pursue opportunities for getting additional personnel trained. Currently, FFS personnel check each of the nine sites once per year and in fiscal year 2014-2015 will check these sites twice a year per recently added protocol. FFS field staff will monitor the listed sites to note condition and any existing or potential threats. Recent internal Standard Operating Procedures have been implemented to ensure compliance to DHR standard and a more stringent internal district standard.

Locations of sites are kept confidential except per district guidelines. 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 culturally significant resources and protective actions will be taken as necessary. In addition, FFS will seek the advice and recommendations of DHR regarding any additional archaeological survey needs. Trained monitors will oversee ground disturbing activities in which the DHR matrix or personnel 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 LGSF was obtained from the Volusia 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 LGSF. 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 LGSF 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. See Exhibit H.

1. Resources

LGSF has 1.75 miles of frontage on Lake George and about three and one-half miles of frontage along the St. John's River. There is also about a quarter mile of frontage along Morrison Creek on the Astor Tract north of State Road 40; Morrison Creek flows into the St. John's River. About ½ mile of Deep Creek passes through the southeast portion of LGSF. Several minor drains and canals are located throughout the portion of the state forest south of State Road 40. Jenkin's Pond, developed from a borrow pit, is located within Dexter / Mary Farms. The northwest corner of Stone Pond is located within the state forest on the Astor Tract. All the above waters contained in or flowing from the LGSF are 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.

Many acres of floodplain swamp, hydric hammock and floodplain marsh buffer the St. John's River corridor. Cabbage palm and hardwood hammocks transition to sawgrass marsh along the extreme southern portions of the Dexter and Mary Farms Tracts. Numerous wetlands form a mosaic throughout the forest including basin swamp, basin and depression marshes, and wet prairie.

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.

A Wetland Restoration Needs Assessment was conducted on the Astor, Dexter, and Mary Farm Tracts by the FFS Forest Hydrology Section in 2007. One hundred forty sites were evaluated during the assessment. The assessment involved looking at and evaluating culverts and low-water crossings on approximately 70% of the roads and trails of the Forest, and approximately 50% of the canals and ditches on the Dexter and Mary Farm Tracts.

The following observations made during the assessment are among the findings:

- a. Significant road improvements were made on the Dexter-Mary Tract after the 1998 wildfires and in 2005. Due to the aggressive road improvement efforts, drainage under the primary above-grade roads in the Dexter and Mary Farms Tracts, for the most part, is adequate.
- b. Trail 3 on the Astor Tract, like many secondary access roads on both tracts, is below-grade. Consequently, it collects, channelizes, and re-directs surface drainage away from natural flow patterns. These trails should be prioritized on the basis of location and need for forest management purposes.
- c. Drainage ditches on the Dexter and Mary Farms Tracts accelerate surface drainage from the tract and have altered the local plant communities in these parts of the Forest. A comprehensive hydrological and ecological analysis would be required to determine what, if any, restoration strategy should be used on these ditches.
- d. Low water crossings could be installed in numerous locations on both tracts to enhance site hydrology and wetland functions.

Of the 140 sites evaluated, 57 were found to be potentially suitable for enhancement or restoration efforts (Priority 1 or 2). Many of these sites have been addressed; future 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.

Since the assessment, several recommended projects have been completed, including:

- a. Additional road armoring was completed on 2 miles on portions of Sandy Drain, Crooked, and Pine Roads, in association with timber sales on the Astor Tract, to protect the integrity of nearby wetlands and water quality within the drains.
- b. Several culverts on the St. John's River Road were old and corroding. Four of the culverts were replaced in May 2010, including replacements of a cross drain, a ditch, and two 36" culverts on a modified stream.
- c. Several additional culverts throughout the forest have been cleaned or replaced as needed.
- d. A low water crossing was installed on Forest Road 11 (April 2014) in conjunction with use of the road for timber harvesting.

C. Wildlife Resources

1. Threatened and Endangered Species

The intent of the FFS is to manage LGSF in a fashion that will minimize the potential for wildlife species to become imperiled. FFS employees continually monitor the forest for threatened or endangered species while conducting management activities. Specialized management techniques will be used, as necessary, to protect or increase 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 and FWC as well as field observations by FFS. The following listed species were identified:

Table #4. Endangered or Threatened Species on LGSF / See Exhibit J

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
Birds					
Bald Eagle	<i>Haliaeetus leucocephalus</i>	N	N	G4	S3
Sandhill Crane	<i>Grus canadensis pratensis</i>	N	ST	G5T2T3	S2S3
Mammals					
Florida Black Bear	<i>Ursus americanus floridanus</i>	N	ST	G5T2	S2
Sherman's Fox Squirrel	<i>Sciurus niger</i>	N	SSC	G5T2	S3
Plants					
Celestial Lily	<i>Nemastylis floridana</i>	N	LE	G2	S2
Hooded Pitcher Plant	<i>Sarracenia minor</i>	N	ST	G3	S2
Reptiles					
Gopher Tortoise	<i>Gopherus polyphemus</i>	C	ST	G3	S3

*** 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 LGSF. The state forest currently makes up all of Lake George Dexter / Mary Farms Unit WMA and part of Lake George Wildlife Management Area. The FWC provides cooperative technical assistance in managing the wildlife and fish populations, setting seasons, establishing bag and season limits and overall fish and wildlife law enforcement.

The FFS and FWC cooperatively maintain approximately 233 acres of permanent wildlife openings and planted food plots on the LGSF ranging in size from 1.5 to 69 acres. Wildlife openings and food plots will be established and maintained in accordance with the FFS State Forest Handbook.

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

3. Survey and Monitoring

Species-specific management plans will be developed or adapted when necessary, with assistance from FWC. Such plans will be consistent with rule and statute promulgated for the management of such species. Continued biological surveys will be conducted to determine locations of these species.

A gopher tortoise survey was completed on LGSF in the spring of 2014 to gather information for a possible 619 acre pine straw harvest. Twenty-six burrows were located, but only one showed signs of recent activity. The area of the pine straw harvest is not considered optimal habitat for the gopher tortoise.

As of the 2012-2013 nesting season LGSF currently had ten bald eagles nests inside the forest boundary and multiple others on adjacent lands.

No species specific plans have been developed or adapted to date for LGSF.

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 LGSF.

F. Mineral Resources

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

G. Unique Natural Features and Outstanding Native Landscapes

Three and one half miles of frontage on the St Johns River provides a large area of ecologically valuable floodplain swamp community as well as opportunities for shoreline protection and river access-based recreation. The undeveloped river frontage along Morrison Creek protects a 78-acre floodplain swamp.

LGSF's position in the surrounding landscape contributes to water resource protection of the Lake George watershed and aquifer recharge. LGSF's proximity to a number of publicly owned lands also contributes to wildlife corridors for several listed species, including Florida black bear.

The St. John's River and its associated floodplain communities that exist on the west and south boundaries of LGSF (including Bluffton Mound) provide significant ecological, recreational, and archaeological value.

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 to be considered on LGSF must be considered in accordance with the guidelines stated in State Forest Handbook. Any requests for research should be submitted in writing to the appropriate field staff to be forwarded to the Forest Management Bureau for approval. Requests must include: a letter outlining the purpose,

scope, methodology, and location of the proposed research. Requests are subject to review by FFS Foresters, Biologists, the Forest Health Section, and the Forest Hydrology Section, as appropriate. Authorization to conduct research will require that the investigator provide copies of any reports or studies generated from any research to the FFS and the LGSF staff. Other special conditions may be applicable and the authorization may be terminated at any point if the study is not in compliance with stated rules and regulations.

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

1. Slash Pine Seed Source Pitch Canker Resistance Trial and Demonstration, FFS, (1992 – ongoing)
2. Study, capture, band, and radio tag swallow-tailed kites, Avian Research and Conservation Institute, Inc., Ken Meyer, Gainesville, Florida (1998-1999)
3. Effects of row thinning on pitch canker infested slash pine, FFS Forest Health Section, Ed Barnard, Gainesville, Florida (June, 1996 - December, 1998)
4. Lepidoptera Biodiversity survey, Dr. Hugo Kons (2005)
5. Exotic Tick survey, University of Georgia (2006)
6. Butterfly surveys on conservation lands, FNAI staff (2007)
7. Collection of *Dyschoriste angusta*, *D. Humistrata*, and *D. oblongifolia* for morphological, genetic, and taxonomic study. Amanda Kei Andrews in conjunction with University of Florida Herbarium (2008)
8. Old World Climbing Fern Sentinel Site, Central Florida Lygodium Strategy, The Nature Conservancy (2010 – ongoing)
9. Florida Black Bear primary range and presence of breeding females via wildlife cameras, Mike Orlando, Florida Fish and Wildlife Conservation Commission (February – April, 2011)
10. Collection of Pygmy Pipes (*Monotropis odorata*), Ohio State University Herbarium (October, 2010- September, 2011)
11. Leaf Collection of 31 tree species for Project: *Predicting biome-level vegetation responses to future global change- implications for future flood risk*. University College, Dublin, Ireland (January 2013)

I. Ground Disturbing Activities

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

When new pre-suppression firelines, recreational trails, or other low-impact recreational site enhancements are necessary, their placement will be reviewed by state forest field staff to avoid sensitive areas. For ground disturbing activities such as construction of buildings, parking lots, and new roads, the FFS will consult with FNAI, DHR, and when necessary, the Acquisition and Restorations Council (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 LGSF include, but are not limited to, hiking, biking, bird watching, equestrian use, fishing, hunting, nature photography, nature study, wildlife viewing, and geo-caching.

Evaluations are continuously 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

Public Access / Parking: On the Astor Tract, welcome and leaving signs are located at the intersection of Shell Harbor Road and Riley Pridgeon Road, Peterson Road, and on the south end of Riley Pridgeon Road. Bisected by many public roads, this tract generally has open access. A State Forest sign and information kiosk are located at the intersection of Riley Pridgeon and Sandy Drain Road, currently designated as one of the main hunting entrances to this tract. A small shell parking area is located just east of the entrance to Sandy Drain Road and is suitable for equestrians, biking, or hiking access. Another hunting entrance is located on Riley Pridgeon and North Road. LGSF is bisected by State Road 40, which has recently been designated as the Florida Black Bear Scenic Byway and as a National Scenic Byway. Two other paved roads provide public access to the State Forest, Emporia Road, and County Road 3 (Old State Road 17). There are also several graded county roads maintained by Volusia County that bisect or lead into LGSF.

On the Dexter / Mary Farms Tract Welcome and Leaving signs are located along State Road 40 between Barberville and Volusia. Recreational access on the west side of the unit is via St. John's River Road. A Public Fishing Pier sign and Florida Birding Trail sign is located on State Road 40 pointing to the St. John's River Road access. An entrance kiosk at the State Forest gate gives recreation information to day users. This entrance is open 365 days a year during daylight hours. St. John's River Road leads to the Bluffton Recreation Area where parking is provided, to access the hiking trail, picnic shelters, fishing pier, restroom, and canoe and kayak launch.

Parking is maintained and available at the intersection of Bluffton Road and St. John's River Road. Visitors may park and utilize a walk-through at the gate on Bluffton Road to walk or ride by horse or bicycle into the tract east of St. John's River Road. Vehicle access to the tract east of St. John's River Road is by day use permit.

On the east side of the tract, visitor access is available at the Fawn Road entrance located about 1.25 miles south of State Road 40 on County Road 3. A shell parking area suitable for horse trailers and other vehicles, an information kiosk, and walk-thru for hikers, cyclists, or equestrians are located here.

More information is contained on the Recreation and Facilities Map (Exhibit D).

Existing Trails: A .75 mile interpretative hiking trail is located at the Bluffton Recreation Area. Interpretative brochures for the trail are available at the trailhead and corresponding wayside markers tell of the species, history, and the cultures of the Bluffton area.

Existing Recreational Activities: Predominate recreational uses are hunting, fishing, and horseback riding. LGSF is managed as a Wildlife Management Area (WMA) by the Florida Fish and Wildlife Conservation Commission (FFWCC). The Dexter / Mary Farms Tract currently has archery, muzzle loading, general gun, small game and special opportunity turkey hunts. The Astor Tract has archery, muzzle loading, general gun, and spring turkey seasons. In the spring of 2012 the FFS and FWC worked together to provide access to LGSF for a first Operation Outdoor Freedom hunt. Since then quality hunts have been provided to wounded veterans annually.

At Bluffton Recreation Area, FWC has installed a handicapped-accessible, floating fishing pier. A short boardwalk / ramp to the pier, parking area, picnic shelters, grill, trailhead kiosk, and portable toilet are also located here. Bluffton Recreation Area is a listed site on the Great Florida Birding Trail. The trailhead kiosk has a display with bird identification information, and cultural and historical information for this site. Fees are collected through an honor fee station.

A small, one-acre borrow pit, Jenkins Pond, has been restored in cooperation with FWC for fishing. The pond has been stocked with catfish, and a picnic shelter with two picnic tables is available for visitor use.

The River Road Primitive Camp is made up of four primitive sites. Located about one mile north of Bluffton Recreation Area, the camp is available for year-round primitive camping except during the special-opportunity turkey hunt, when it is reserved for the special hunt permit holders. Fire rings and picnic tables have been installed.

B. Planned

Recreational Trails: It is anticipated that additional hiking trails will be developed and possibly equestrian or bike trails in the future. Bike trails will be located in areas to provide a passive experience. Aesthetic diversity, points of interest such as the Bluffton Mound, Dexter Point, Jenkins Pond, and a road network that includes several loop configurations enhance the Mary Farm / Dexter Unit's potential for recreational trail use. Some interest in trail designation has been expressed from equestrian groups. Possible links north to the County and St. John's River Water Management District Lake George CARL areas for hiking or equestrian use will be explored. A hiking trail may be considered on the Astor Tract in the future. A longer hiking trail may be developed that will tie into the existing interpretative trail at Bluffton Recreation Area. A boardwalk trail and observation tower may be added dependent on funding. Interpretive educational signage will be added as funding allows.

Trails will typically be routed through optimum areas for aesthetics, to maximize the user's experience. Additional areas of emphasis will consist of interpretation, interests, and stability and durability. BMP's will be observed to protect water, soil, vegetation and cultural resources. Hiking trail routes that cross through wetland areas may require design elements such as boardwalks, bridges, turnpikes, or puncheons. In 2011, a new map brochure, the Lake George State Forest Road and Trail System, was developed depicting named and numbered roads listed in an easy to read layout. This allows equestrians, bicyclist and others to better navigate the forest by matching road names and numbers on the ground with the corresponding map.

Camping: Additional camping areas may be constructed over time to expand public recreation opportunities. Two additional primitive campsites are being planned across the road from the St. John's River Road Campground. A primitive site may also be located on Bluffton Island. An additional primitive camping area is being considered for the Astor Tract in an oak grove which was a former fernery. An equestrian camping area is being planned for an area adjacent to the current paddock at Bluffton Road and St. John's River Road.

Education / Interpretation: In keeping with FFS's strategic goals, staff will provide the public with educational and interpretive opportunities. Our current goal is to offer at least two interpretive programs per year in addition to current fire prevention efforts. Additional opportunities to increase public awareness will include the use of kiosks, brochures, and interpretive wayside exhibits when appropriate. Partnerships with local groups will be encouraged to promote forest awareness. Interpretive wayside panels are planned for the Bluffton Recreation Area, on Bluffton Point. The plan calls for a total of three panels to be installed over a period of three years (one per year), representing the rich history of Lake George State Forest and the St. John's River.

Hunting and Fishing: LGSF is managed jointly with the FWC as a Wildlife Management Area (WMA) under a cooperative agreement with the Florida Fish and Wildlife Conservation Commission. The Dexter / Mary Farms Unit hunts are scheduled separately from the Astor Tract which is combined with the St. John's River Water Management District (SJRWMD) and Volusia County Lake George CARL tracts. Hunting and fishing seasons, schedules, quotas, and bag limits are agreed upon at an annual meeting between the FFS and the FWC.

The FFS has conducted two Operation Outdoor Freedom (OOF) special opportunity turkey hunts on LGSF. Operation Outdoor Freedom hosts wounded service members and veterans on Florida State Forests, other public lands, and private lands. All funding for the hunts is generated through private donations and support, and veterans participate in the hunts at no charge.

C. Hunter Access

The FWC, in consultation with FFS, determines hunting seasons, dates, bag limits and methods of take. Rules are outlined in the annual FWC, Lake George State Forest,

VI. Habitat Restoration & Management Practices

A. Prescribed Fire

The FFS utilizes a comprehensive fire management program on state forests that includes wildfire prevention, detection, suppression, and prescribed burning. This program is the responsibility of the FFS's Bunnell Forestry District. 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 public's, 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 LGSF are to facilitate forest management operations; enhance wildlife and listed species habitat; decrease fuel loading, consequently enhancing public safety; and restore, maintain, and protect all native ecosystems, ecotones, and their ecological processes. FFS personnel are responsible for planning and implementing the annual prescribed burn program for LGSF, which will consist of growing and dormant season burns. Burns are planned by LGSF staff with input from cooperating agencies as appropriate. An annual 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, a map of the 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.

Historic, fire dependent natural communities on LGSF are estimated to have occupied approximately 14,922 acres, and to have burned at approximately 1-8 year intervals. Past land uses have left some of these historically fire dependent communities in a condition unable to carry prescribed fire. Based on current conditions and management objectives, LGSF will plan for 4,974 acres to be prescribed burned annually based on a 3 year return interval.

Restoration of these areas by removal of the off-site species and reforestation will increase prescribed burn acreage goals over time. 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 will be used. 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.

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

1. Strategies

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

- 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 both young and old growth components that yields sustainable economic, ecological, and social benefits.

2. Silvicultural Operations

Silvicultural operations on LGSF will be directed toward improving forest health, wildlife habitat, ecological and economical sustainability, as well as toward recovery from past management practices that are not in accordance with the objectives of this plan. Stands of off-site species with merchantable volume will be scheduled for harvest, followed by a subsequent reforestation with the appropriate tree species. Herbicide applications may be necessary to control woody competition and to re-establish desired natural species of both overstory and ground cover. Site preparation methods will include prescribed fire, mechanical vegetation control, and herbicide applications.

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

Maintenance and restoration of timber stands and natural communities through timber harvesting will include thinning for maintenance and improvement, regeneration cuts, and clear-cutting off-site species.

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. Timber Inventory Control

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 the forest will be re-inventoried annually to provide an accurate estimation of the timber stand composition and to ensure that stands will be sustainably managed.

4. Timber Sales

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

C. Non-Native Invasive Species Control

FFS employees continually monitor the forest for non-native invasive species while conducting management activities. FFS will locate, identify, and apply control measures with the intent to eradicate or control non-native invasive species. 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 and Forest Ecologist, 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 species. 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. The FFS will enlist support from the FWC in efforts to control non-native invasive animals. Feral hogs (*Sus scrofa*) are present on some tracts of the LGSF. The FWC has issued a feral hog control trapping permit to FFS for all state forests and the FFS will encourage hog removal on LGSF through trapping and hunting.

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

Table #5. Non-Native Invasive Plant Species Occurring on LGSF / See Exhibit K

Common Name	Scientific Name	LGSF Mgt. Priority	Impacted Acres	Status*
FLEPPC Category 1				
Air-potato	<i>Dioscorea bulbifera</i>	1	4.33	Stable
Asparagus-fern	<i>Asparagus densiflorus</i>	1	0.001	Decreasing
Australian Pine	<i>Casuarina equisetifolia</i>	1	0	Eradicated
Caesar's weed	<i>Urena lobata</i>	1	0.73	Increasing
Camphor tree	<i>Cinnamomum camphora</i>	1	3.82	Decreasing
Chinese tallow	<i>Sapium sebiferum</i>	1	.0008	Stable
Cogon grass	<i>Imperata cylindrica</i>	1	.95	Increasing
Coral ardisia	<i>Ardisia crenata</i>	1	0.06	Increasing
Japanese climbing fern	<i>Lygodium japonicum</i>	1	.0023	Stable

Common Name	Scientific Name	LGSF Mgt. Priority	Impacted Acres	Status*
FLEPPC Category 1				
Mimosa	<i>Albizia julibrissin</i>	2	.13	Stable
Small-leaf spiderwort	<i>Tradescantia fluminensis</i>	1	.40	Stable
Sword fern	<i>Nephrolepis cordifolia</i>	1	0.22	Increasing
Torpedo grass	<i>Panicum repens</i>	3	1.35	N/A
Tropical soda apple	<i>Solanum viarum</i>	1	.04	Increasing
Water- hyacinth	<i>Eichornia crassipes</i>	3	0	N/A
Water- lettuce	<i>Pistia stratiotes</i>	3	0	N/A
Wild taro	<i>Colocasia esculenta</i>	3	0.0092	Stable
Common Name	Scientific Name	LGSF Mgt. Priority	Impacted Acres	Status*
FLEPPC Category 2				
Bamboo	<i>Arundinaria spp</i>	2	.00	Stable
Castor bean	<i>Ricinus communis</i>	1	0.002	Stable
Chinaberry	<i>Melia azedarach</i>	1	0.09	Decreasing
Chinese brake fern	<i>Pteris vittata</i>	3	0	Eradicated
Elephant ear	<i>Xanthosoma sagittifolium</i>	2	0.83	Stable
Flamegold, Golden rain tree	<i>Koelreuteria elegans</i>	2	0.03	Monitoring
Guinea grass	<i>Panicum maximum</i>	2	0.0055	Stable
Other Non-Native Plants				
Earpod tree	<i>Enterolobium contortisiliquum</i>	1	0	Monitoring
Giant Reed	<i>Arundo donax</i>	1	0	Monitoring
Leather Leaf Fern	<i>Rumohra adiantiformis</i>	3	0.03	Decreasing
Podocarpus	<i>Podocarpus macrophyllus</i>	1	0.0037	Stable
Showy Rattlebox	<i>Crotalaria spectabilis</i>	1	0.02	Decreasing
Tree Fern	<i>Asparagus virgatus</i>	3	0	Monitoring

* A status of Monitoring is defined as the species does not currently have any active infestation, but the species may not be eradicated at this time. A status of N/A means there are no known infestations being treated.

D. Insects, Disease and Forest Health

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

In compliance with section 388.4111, Florida Statutes and in Section 5E-13.042, F.A.C., all lands have been evaluated and subsequently designated as environmentally sensitive with high biological productivity. 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. Upon the approval of this plan documenting this designation, the local arthropod control agency in Volusia County will be notified of this designation.

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

- *Site Preparation* – Any needed site preparation work for reforestation would be bid out to private contractors. Private contractors will be contacted to bid on upcoming site preparation work necessitated by the 2013 Check Station Wildfire.
- *Reforestation* – Any needed site reforestation work would be bid out to private contractors. Private contractors will be contacted to bid on upcoming reforestation work necessitated by the 2013 Check Station Wildfire.
- *Timber Harvests* – Several timber sales may be bid out during this planning period.

VII. Proposed Management Activities for Natural Communities

In 2005, FNAI completed an inventory and natural community mapping project on 19,610 acres of LGSF and a historic natural community type map (Exhibit L) was created. Current natural communities and cover types can be found in Exhibit M.

For the purposes of this management plan, restoration is defined as the process of returning ecosystems or communities to the appropriate structure and species composition, based on soil type. Management during this ten-year period will begin with a forest wide assessment of the fuel loading, timber densities and groundcover in order to develop a five year comprehensive operational plan for prescribed burning across the forest. Strategies may include thinning of overly dense pine plantations, mowing or chopping in areas of heavy fuel buildup and/or application of relatively cool dormant season fires. 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 community goals. Fire frequency is generally increased or decreased depending upon the conditions of the specific area. Further information concerning goals and management actions may be found in the Five-Year Silviculture Management Plan and the state forest handbook.

Table #6. Natural Community Types Found on LGSF

Community Type	Acres Mapped (Historic)	Acres Mapped (Current)	Burn Interval (Years)
Mesic Flatwoods	9120*	8074	2 - 4
Hydric Hammock	3696*	2574	N/A
Floodplain Swamp	2568*	3690	N/A
Wet Flatwoods	1929	1872	2 – 5
Basin Swamp	2109*	1898	5 – 150
Baygall	719	602	50 – 100
Floodplain Marsh	237*	186	10 – 100
Basin Marsh	182	222	1 – 10
Sandhill	173	138	1 – 3
Scrubby Flatwoods	200*	181	3 – 8
Depression Marsh	149	205	1 - 5
Dome Swamp	70	34	3 – 150
Wet Prairie	34	3	2 - 5
Xeric Hammock	0	61	N/A
Totals	21,186	19,737	

* Historic acreage includes LGSF staff estimated breakdown of parcels acquired after the 2005 FNAI survey as illustrated in Exhibit L.

Table #7. Altered Land Covers Found on LGSF

Altered Landcover	Acres Mapped (Current)	Burn Interval (Years)
Pine plantation	686	2 - 5
Clearcut pine plantation	10	2 - 5
Clearing	233	2 - 5
Artificial Pond	2	N/A
Borrow Area	8	N/A
Roads	442	N/A
Developed	11	N/A
Utility Corridor	54	N/A
Total	1446	

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

A. Mesic Flatwoods

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. The overstory in mesic flatwoods will consist of uneven-aged stands of longleaf pine (*Pinus palustris*) and slash pine (*Pinus elliottii*), ideally with up to three age classes present. Stands will have a canopy of tall pines over a low growing shrub, herb, and grass layer.

The canopy, midstory shrubs and vines will remain at a frequency and height that allows the formation and maintained health of continuous, diverse, groundcover species. The mesic flatwoods will be maintained by frequent prescribed fire so as to reduce the severity of wildfires. A frequent fire return interval will also allow faunal species such as gopher tortoises, fox squirrels, and deer the opportunity to freely move throughout the mesic flatwoods. The groundcover will be continuous, species rich, and primarily composed of fine herbaceous plants that will facilitate low intensity fires under a wide range of burning conditions. Preferred species are native grasses and herbs adapted to frequent fire such as wiregrass, blazing star, pine lily, etc.

There will be natural ecotones between flatwoods and adjoining and embedded natural communities. Ecotones will remain dynamic and continue to change in shape, location, and size depending upon environmental processes. Evidence of functional hydroperiods will be seen in the flooding of wetlands and rivers. Ongoing ecological processes such as insect-plant interactions will be evidenced by occasional dead trees, which become snags for use by wildlife.

Current Condition

The mesic flatwoods on LGSF are primarily comprised of even-aged stands dominated by planted slash pine, although some mixed natural longleaf/slash pine and longleaf pine plantations exist. The sub-canopy and midstory is comprised largely of loblolly bay (*Gordonia lasianthus*), and the shrub layer includes saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), and wiregrass (*Aristida stricta*).

The Astor Tract is comprised mostly of thinned slash pine stands. Since most of the current stands were established by Union Camp, the objectives of these stands were geared more toward intensive timber management than the FFS's multiple-use concept. Nearly 50 percent of the pine plantations on Astor Tract were planted either in 1985 or 1988 and are on mesic flatwoods soil types. While at one time many of the stands

showed signs of pitch canker, this has greatly reduced over time as reduced stocking has contributed to increased forest health. Approximately 150 acres were infested by southern pine beetles (*Dendroctonus frontalis*) in 2001 and 2002. In addition, approximately 140 acres were burned in a wildfire in March of 2001. These areas have been clearcut and replanted.

As thinnings have been implemented, stands have more open canopies and fuels have been reduced so that prescribed burns are more easily implemented.

The Volusia Tract has approximately 274 acres of mesic flatwoods both planted and natural, primarily in slash pine. About 195 acres were planted to slash pine in 2005; the remaining 79 mesic flatwoods acres are mature natural slash pine or slash / longleaf pine mix. Prescribed fire has been excluded from these areas resulting in heavy fuel loading. Palmetto frond harvesting has occurred in some of these areas and has helped in fuel reduction. These areas will be brought into the burn rotation in the near future.

The Dexter / Mary Farms Tract has several mature slash pine stands that are in need of thinning, most of which are on the east side (Dexter parcel) of the forest. The mature natural areas that exist largely south of Bluffton Road were managed intensively prior to acquisition and much of the flatwoods areas were thinned. In 1998, wildfires burned over 6,000 acres of this tract, and nearly all affected flatwoods sites were clearcut as a result of excessive fire damage. All 3,300 harvested acres have since been reforested, sixty percent of which was converted to longleaf pine.

Approximately 842 acres of historic mesic flatwoods on the Dexter / Mary Farms Tract were in Bahia grass (*Paspalum notatum*) pasture prior to acquisition. Approximately 500 acres of pasture were scalped and planted with longleaf pine in 1997 and 1998. The remaining 350 acres of the Bahia grass pastures were planted in slash and longleaf pine in January 2002.

Management Actions

Efforts to restore pine plantations to naturally regenerating stands with the appropriate composition of longleaf and slash pine will require continuing efforts with some tree planting, natural regeneration (natural seed fall), and/or gradual thinning through a series of harvests. Slash pine plantations will likely be thinned at 15 to 20 years of age, and continue to be thinned in later years to achieve a desired stocking of basal area. Natural stands may have a wider range of stocking density. Artificial and natural regeneration stocking density should be sufficient to produce naturally regenerating stands resembling historical conditions.

The condition of the mesic flatwoods will be process-driven with the primary process being prescribed fire. Fire return interval will be two to four years. Where conditions allow, prescribed fires will occur during the growing season, but may occur any month of the year.

A pine straw harvest may be implemented on portions of the 842 acres of mesic flatwoods where plantations were established on improved pasture. At the conclusion of the pine straw harvesting or if the harvesting is not done on a stand, these areas may be thinned. Restoration of these areas will be facilitated by the application of fire on these stands on a 2-4 year interval. This frequent fire interval will encourage other species to seed and these mesic flatwoods areas should, in the future, include a more diverse understory shrub and herbaceous layer. Additional measures will be evaluated which may include herbicidal treatment of undesirable vegetation.

B. Hydric Hammock

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Desired future conditions for hydric hammock are already met for the most part and match the Current Conditions description below. Hydric hammock should be a well developed hardwood and cabbage palm (*Sabal palmetto*) forest with a variable understory often dominated by palms and ferns. In the historic aerial photographs, hydric hammock is typically a densely forested area with a heterogeneous appearance to the canopy trees, owing to the diversity of species and canopy size.

Current Condition

Lake George State Forest has extensive hydric hammocks along the St. John's River as well as smaller patches in the Astor Tract to the north. Most of these areas are in desired future condition with the exception of smaller patches of hydric hammock in the Astor Tract. Some of these are currently overgrown along the edges with vines due to disturbance from nearby pine plantations.

These communities are inundated for part of the year and are characterized by having a closed, diverse hardwood and palm canopy dominated by laurel oak, water oak, cabbage palm, sweetgum, red maple, live oak, and slash pine, with red cedar and cabbage palm common in the sub-canopy and shrub layers. Tall and short shrubs are also diverse with dwarf palmetto (*Palmetto minor*) forming a unique element found only in hydric hammock at Lake George SF. Diversity is highest in the large hydric hammock near the St. John's River. Smaller areas may contain only a few of the listed species, but are still dominated by laurel oak and cabbage palm.

There are several long strands of hammock in the Dexter/Mary Farms tracts that may contain dome or basin swamps. Hydric hammock grades to flatwoods and swamps. It also contains higher, drier ridges that support a mesic hammock community.

Management Actions

Hydric hammock requires natural hydroperiods to maintain its species composition. A lowering of the water table will result in a succession to mesic hammock, while more frequent inundation will result in a conversion to a more swamp-like habitat. Alterations to natural hydroperiods will be avoided to assist in maintaining species composition. In

addition, prescribed fires will be allowed to burn up to the edge of hydric hammock communities in an effort to discourage weedy overgrowth.

C. Floodplain Swamp

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Desired future conditions for floodplain swamp are already met for the most part and match the Current Condition description below. Trees such as bald cypress (*Taxodium distichum*), cabbage palm, swamp tupelo (*Nyssa biflora*), red maple, sweetgum, water hickory (*Carya aquatica*), pop ash (*Fraxinus caroliniana*), and laurel oak will dominate the area of river swamp along Morrison Creek and the river margin along the St. John's River. Characteristic shrubs will be buttonbush (*Cephalanthus occidentalis*), Carolina willow (*Salix caroliniana*), and wax myrtle. The understory and ground cover should be sparse, but fern may thinly cover the forest floor. Mature hardwoods should dominate and be adapted to the fluctuating water levels of a high groundwater table and floodwater levels of the river

Current Condition

Floodplain swamp occurs along much of the St. John's River in Lake George SF. This community exists on flooded soils and is characterized by the dominance of buttressed canopy trees, mainly bald cypress and swamp tupelo. There is also a diversity of other trees in the canopy and sub-canopy such as red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanica*), and American elm (*Ulmus americana*). Much of the area in floodplain swamps in LGSF has been heavily logged in the past but is largely recovered from this disturbance. Floodplain swamps grade into hydric hammock and floodplain marsh.

Management Actions

Like hydric hammock, maintenance of natural hydroperiods is critical to floodplain swamps. Disruption of these fluctuations in water level can be detrimental to the reproduction of many plant species, and alteration of the hydroperiod will be avoided. Floodplain swamps are usually too wet to support fires and may be used as a natural fire break. Prescribed fire in adjacent upland stands will be allowed to "creep" into the edges of these stands, reducing hardwood encroachment into flatwoods and encouraging the growth of herbaceous vegetation. Fire lines made by plows will not be created along the perimeter of floodplain wetlands for routine prescribed burns. Any pre-existing fire lines will be rehabilitated to a natural state to avoid altering hydrologic systems.

D. Wet Flatwoods

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Wet flatwoods usually appear as inclusions in mesic flatwoods and hydric hammock and should have a canopy of either slash pine or longleaf pine trees, with a thick shrubby understory and very sparse ground cover in a fire-suppressed environment; or in a fire

maintained regime, should have a sparse understory and dense ground cover of hydrophytic herbs. The shrub layer may contain saw palmetto, but often gallberry and large gallberry (*Ilex coriaceae*) may become the dominant shrubs. Fire maintenance should keep the shrub layer from becoming tall and overgrown and bring an increased diversity in the shrub and herbaceous species. Historically fires in wet flatwoods probably occurred less often (every 3-10 years) than in mesic flatwoods, but is vital for decreasing fuel loads, reducing woody encroachment, and sustaining herbaceous species.

Common shrub species are gallberry, large gallberry, maleberry (*Lyonia ligustrina*), swamp doghobble (*Leucothoe racemosa*), wax myrtle, red chokeberry (*Photinia pyrifolia*), roundpod St. John's-wort (*Hypericum cistifolium*), saw palmetto, highbush blueberry (*Vaccinium corymbosum*), fetterbush (*Lyonia lucida*), coastalplain staggerbush (*Lyonia fruticosa*), shiny blueberry (*Vaccinium myrsinites*), swamp bay, piedmont staggerbush (*Lyonia mariana*), dwarf huckleberry (*Gaylussacia dumosa*), myrtleleaf St. John's-wort (*Hypericum myrtifolium*), sawtooth blackberry (*Rubus argutus*), and beautyberry (*Callicarpa americana*).

The dominant herbaceous species are wiregrass, yellow-eyed grasses (*Xyris* spp.), witchgrasses (*Dichanthelium* spp.), yellow hatpins (*Syngonanthus flavidulus*), Virginia chain fern (*Woodwardia virginica*), bushy bluestem (*Andropogon glomeratus*), wiry beaksedges (*Rhynchospora* spp.), pinebarren whitetop aster (*Oclemena reticulata*), and yellow milkwort (*Polygala rugellii*). Other herbs commonly found are cinnamon fern (*Osmunda cinnamomea*), sphagnum moss (*Sphagnum* spp.), bracken fern (*Pteridium aquilinum*), spadeleaf (*Centella asiatica*), blue maidencane (*Amphicarpum muhlenbergianum*), short-leaf yellow-eyed grass (*Xyris brevifolia*), longleaf camphorweed (*Pluchea longifolia*), orange milkwort (*Polygala lutea*), savannah milkweed (*Asclepias pedicellata*), piedmont pinweed (*Lechea torreyi*), american bluehearts (*Buchnera americana*), southern umbrella sedge (*Fuirena scirpoidea*), blackroot (*Pterocaulon pycnostachyum*), greenvein ladies tresses (*Spiranthes praecox*), fewflower milkweed (*Asclepias lanceolata*), yellow colicroot (*Aletris lutea*), small butterwort (*Pinguicula pumila*), rushes (*Juncus* spp.), netted chain fern (*Woodwardia areolata*), carolina redroot (*Lachnanthes caroliniana*), and meadowbeauties (*Rhexia* spp.).

Common vine species are laurel greenbrier (*Smilax laurifolia*), cat greenbrier (*Smilax glauca*), muscadine (*Vitis rotundifolia*), Elliott's milkpea (*Galactia elliotii*), sensitive brier (*Mimosa quadrivalvis*), and poison ivy.

Current Condition

Wet flatwoods in Lake George State Forest are much less extensive than mesic flatwoods and gradations between these two communities are often very fine. Areas determined to be wet flatwoods in the forest are characterized by having a lower density of saw palmetto and normally an increase in gallberry and large gallberry as well as a better-developed herbaceous layer with more hydrophytic plants. Most of the wet flatwoods in Lake George State Forest have a significant shrub cover of around 50 percent. However, a few areas that are more frequently inundated have almost no shrub cover. Wet

flatwoods are more common to the south, often occurring interspersed in a network of hydric hammock.

Dominant canopy trees are all planted slash pine or longleaf pine at various stages of development. Many of the historic wet flatwoods areas currently have a very dense canopy of planted slash pines and often have markedly increased fuel loads and decreased diversity. The sub-canopy is not a well-developed layer and generally consists of loblolly bay invading from nearby baygalls or scattered cabbage palm, water oak, or sweetgum. Dahoon (*Ilex cassine*) and swamp bay may be found occasionally.

Management Actions

Fire management in wet flatwoods is similar to that of mesic flatwoods and is vital for decreasing fuel loads, reducing woody encroachment, and sustaining herbaceous species. Current conditions require restoration with more frequent fire application (every 2-5 years) than the probably historical (every 3-10 years) interval. The objective is to return a more natural fire regime to the pine plantations. Mechanical vegetation removal followed immediately by prescribed fire may need to be applied for initial restoration efforts in areas of heavy fire suppression. To maximize wiregrass restoration, wet flatwoods should be thinned and burned and the areas will be evaluated as to the need for mechanical treatment. Areas with remnant or restored herbaceous vegetation should be high priority for burning, and burned with late spring/early summer fires to benefit wiregrass flowering and seed viability. Growing season burns will be more effective in encouraging flowering of wiregrass

E. Basin Swamp

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. A basin swamp (sometimes called bayhead) is characterized as a relatively large and irregularly shaped depression that is not associated with a river, but is vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. Dominant plants include slash pine, swamp tupelo, pond cypress (*Taxodium ascendens*), red maple, swamp bay, sweet bay, loblolly bay, and wax myrtle. Sub-canopy, herb layers, and floating or submerged vegetation layers are present and typically similar species to those described under Current Conditions. Soils in basin swamps are generally acidic, nutrient poor peats. Typical fire interval may be anywhere from 5 to 150 years, with pine-dominated swamps burning more frequently and hardwood-dominated swamps burning less frequently.

Current Condition

On LGSF, basin swamps commonly grade into hydric hammocks and baygalls. After the 1998 wildfires, salvage cutting was conducted in some smaller basin swamps and along the perimeters of other areas where trees were heavily charred and dying. These areas were reforested with slash pine, bald cypress, and pond cypress seedlings. Cypress trees are typically small and will require time with no disturbance to reach mature sizes. In many areas the effect of wildfires burning into the smaller basin swamps was a more

open canopy with a well-developed herb layer. These recently burned swamps often lack cypress, with slash pine becoming dominant.

Other trees that are occasional or common in these basin swamps are red maple, sweetgum, green ash, American elm, and laurel oak. In some swamps there is a sub-canopy or tall shrub layer consisting of loblolly bay, swamp dogwood (*Cornus foemina*), dahoon, swamp bay, Carolina willow, or cabbage palm. Other shorter shrubs commonly found are buttonbush, swamp doghobble, fetterbush, large gallberry, and wax myrtle. In swamps with a well-developed herb layer, common emergent species are lizard's tail (*Saururus cernuus*), swamp fern (*Blechnum serrulatum*), millet beaksedge (*Rhynchospora miliacea*), royal fern, pickerelweed (*Pontederia cordata*), Virginia chain fern, sphagnum moss (*Sphagnum* spp.), beaksedges (*Rhynchospora* spp.), golden canna (*Canna flaccida*), green arrow arum (*Peltandra virginica*), cattail (*Typha latifolia*) maidencane (*Panicum hemitomon*), and arrowheads (*Sagittaria* spp.). Occasionally, duckweeds (*Lemna* spp.), Carolina mosquito fern (*Azolla caroliniana*), or viviparous spikerush (*Eleocharis vivipara*) may be found floating or submerged. Poison ivy is a common vine.

Management Actions

Fires in the surrounding flatwoods areas will be allowed to burn into the perimeter of these wetlands if conditions are appropriate. Where catastrophic fires have killed many cypress trees and created a more open ground cover, the swamps will be left unburned to allow regeneration of shrub and sub-canopy layers. Infrequent fires (every 5-150 years) are necessary for maintaining basin swamps.

F. Baygall

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. These seepage wetland communities typically have a tall and dense canopy of mainly loblolly bay and slash pine with occasional loblolly pine and swamp tupelo where baygalls grade into basin swamps. The understory of shrubs and ferns should be open. Sphagnum moss should be a common groundcover.

Baygalls may grade into basin swamps and wet flatwoods, and some baygalls may have included marshes. Vines may become quite frequent in some of the more overgrown baygalls, with coral greenbrier (*Smilax walteri*), laurel greenbrier, and muscadine frequently present.

Common shrubs and small trees include fetterbush, wax myrtle, dahoon, swamp doghobble, large gallberry, saw palmetto, swamp bay, highbush blueberry, maleberry, and dwarf huckleberry. In baygalls with a developed herb layer, Virginia chain fern, beak sedges, Elliott's sedge (*Carex elliotii*), grassy arrowhead (*Sagittaria graminea*), sphagnum moss, Carolina redroot, and cinnamon fern are typical. Vines are quite frequent in some of the more overgrown baygalls, with coral greenbrier, laurel greenbrier, and muscadine present.

Current Condition

Baygalls are scattered throughout Lake George State Forest, but are more common in the northern Astor Tract. Many of the baygalls in LGSF, especially those in the Astor Tract, are heavily overgrown with vines and shrubs.

Management Actions

Allow baygalls in the northern portions of the Astor Tract to burn in fires prescribed for the surrounding flatwoods. Baygalls in Dexter / Mary Farms tracts burned during the 1998 fire storm, and should continue to be left undisturbed to regenerate canopy.

G. Floodplain Marsh

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Although sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), and buttonbush are the most common vegetation in a floodplain swamp, other typical plants should include cordgrass, (*Spartina bakeri*), dotted smartweed (*Polygonum punctatum*), arrowheads (*Sagittaria spp.*), pickerelweed, spikerush (*Eleocharis spp.*), bulrushes (*Scirpus spp.*), and primrose willows *Ludwigia spp.*).

Current Condition

Floodplain marsh borders much of the St. John's River, and although Lake George State Forest does not always include the land up to the river, the large marsh extends past the forest border in several places. Small portions of an extensive floodplain marsh along the edge of Lake Dexter and the Lake Woodruff National Wildlife Refuge are within the southern boundary of the state forest. These are wetlands dominated by emergent grasses and other herbaceous vegetation and low shrubs. The invasive species wild taro (*Colocasia esculenta*), Peruvian primrose willow (*Ludwigia peruviana*), and alligator weed (*Alternanthera philoxeroides*) are also present, but it is not known to what extent they are growing in the marsh within the state forest boundaries.

Management Actions

Currently the floodplain marsh on the southern boundary of LGSF is burned approximately every two years, and is incorporated into Lake Woodruff National Wildlife Refuge fire management plan. The fires used to maintain the floodplain marsh burn up to the floodplain wetlands of LGSF before self-extinguishing. Because floodplain marshes are maintained by a regime of water and fire, these areas will continue to be burned at least every five years to avoid shrub invasion and eventual succession to bog. Natural fires will be allowed to burn in these areas if safe to do so. However, severe fires during drought periods will often burn the peat and will be avoided.

H. Basin Marsh

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities

of Florida, describes the desired future condition for this natural community. Basin marshes are characterized as herbaceous or shrubby wetlands in irregularly shaped basins. They should have a peat substrate with an often sandy edge, and be generally inundated with a long hydroperiod.

Historically, this community included wet prairie components in the ecotones between the basin marsh and upland flatwoods communities and graded into tree-dominated basin or dome swamps. These wet prairie ecotones were likely dominated by wiregrass. Basin marsh historically, and presently to some extent, existed as inclusions within the larger basin swamps. Marshes are easily distinguished on the 1941 aerial photographs by a darker, smooth signature denoting a wet, treeless substrate.

Typical shrubs include buttonbush and Carolina willow. Herbaceous species typically occur in zones determined by water depth. The deepest centers will have fireflag (*Thalia geniculata*), waterlily (*Nymphaea spp.*), and pickerelweed. Toward the outer margin, maidencane, Walter's sedge (*Carex striata*), yellow-eyed grasses, bladderworts (*Utricularia spp.*), and sphagnum moss are dominant with Virginia chain fern, Carolina redroot, and southern umbrella sedge (*Fuirena scirpoidea*) also frequent.

Current Condition

Basin marshes are scattered throughout Lake George State Forest and exist as large, irregularly shaped depressions dominated by herbaceous species and shrubs with swamp tupelo, slash pine), and pond cypress occasionally in and around the basin. These trees are often stunted.

Many of the basin marshes in Lake George State Forest are inclusions in larger basin swamps, but most are found in mesic and wet flatwoods. They may also be associated with baygalls. Pine plantation disturbance has led to the occasional invasion of these communities by slash pine. At least one basin marsh in the Astor Tract has an included marsh lake which is deeper and contains water lilies and fireflag.

Management Actions

Prescribed fire should be used in this community to reduce woody plant encroachment in order to restore dominant herbaceous species cover. Marshes should be allowed to burn along with the surrounding flatwoods. Basin marshes should not be bedded or planted with pine trees and existing trees should be removed. Restoration of basin marshes that are heavily fire suppressed demands a more frequent fire return interval initially (especially during growing season) until shrub species decrease and herbaceous species cover becomes dominant.

I. Sandhill

Sandhills should be forests of relatively open, large, mature, pine trees with a sparse understory of deciduous oaks and a fairly dense ground cover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak, and wiregrass. Other typical plants include bluejack oak, sparkleberry (*Vaccinium arboreum*), persimmon (*Diospyros virginiana*), winged sumac (*Rhus copallinum*),

pinewoods dropseed (*Sporobolus junceus*), lopsided Indian grass (*Sorghastrum secundum*), wild buckwheat (*Eriogonum tomentosum*), queen's delight (*Stillingia sylvatica*), bracken fern (*Pteridium aquilinum*), and gopher apple (*Licania michauxii*).

Current Condition

There are 16 historic sandhills in Lake George SF, mostly in the Astor Tract near developed land. These are usually small and found on hilltops with sandy soil. The canopy is either missing or has become closed. Tree species are currently longleaf pine, sand pine (*Pinus clausa*), and sand laurel oak (*Quercus hemisphaerica*). In many sites, the canopy has succeeded to that of a xeric hammock with live oak (*Quercus virginiana*) or sand live oak (*Quercus geminata*) forming a closed canopy over a less diverse ground cover. Sub-canopy or tall shrub species were typically turkey oak (*Quercus laevis*), bluejack oak (*Quercus incana*), and common persimmon, with myrtle oak (*Quercus myrtifolia*), Chapman's oak (*Quercus chapmanii*) occurring less frequently. The short shrub layer is comprised of winged sumac, deerberry (*Vaccinium stamineum*), pricklypear (*Opuntia humifusa*), and slimleaf pawpaw (*Asimina angustifolia*). There was frequently a thick layer of oak or pine litter which reduced herbaceous diversity, however, wiregrass, broomsedges (*Andropogon virginicus*), and goldenrods (*Solidago* spp.) were frequent, with queens delight, Florida greeneyes (*Berlandiera subacaulis*), yankee weed (*Eupatorium compositifolium*), tread softly (*Cnidoscolus stimulosus*), rose-rush (*Lygodesmia aphylla*), and Florida feathershank (*Schoenocaulon dubium*) occurring occasionally in areas with a missing canopy.

Sandhills are often difficult to distinguish from scrubby flatwoods on the historic aerial photographs, since they both have a light signature due to exposed sand. In 1941, when the photographs were taken, many of the sandhills had already succeeded to xeric hammock due to development on or near the sandhills. In many of these areas, the canopy may be a closed oak dome with an herbaceous layer composed almost entirely of the cultivated leatherleaf fern (*Rumohra adiantiformis*), due to cultivation under former lease to adjacent ferneries. Sandhills grade into mesic and scrubby flatwoods.

Management Actions

Land development has greatly impacted the remnant sandhills at Lake George SF. These communities require a return to a frequent burn schedule if they are to keep from becoming or staying oak-dominated xeric hammocks. Areas bordering nurseries or other development may require the treatment of escaped cultivated plants to restore the native landscape. The areas that are infested with non-native species should be treated and continue to be monitored. An alternative would be a hardwood sale, and where applicable any longleaf pine would be left, with a subsequent planting of longleaf pine after the sale.

As most of the historic sandhills in LGSF are small and close to developed areas, prescribed fires may be impossible and these lands will remain as xeric hammocks. However, those sandhills that are still recognizable should be targeted for frequent burns and thinning of the canopy if it is present. Off-site sand pine should be removed as it

becomes merchantable, and the site should be reforested with longleaf pine. Fire needs to be re-introduced into these areas to promote native ground cover.

Three sites totaling 49 acres have been identified for restoration during this 10 year management period. The 32 acre site was originally a sand pine stand that was clearcut and planted with longleaf pine in 1999. Sand pine has taken over the site and is now merchantable. The sand pine will be harvested, and fire will be re-introduced into the stand and maintained with a burn interval of 1 to 3 years. Supplemental planting of longleaf pine may be required depending upon the stocking of the site after the sand pine has been removed. Two more sites have been previously reforested in longleaf pine. A five acre site was planted in February 2009, and a 12 acre site was planted in 1984. Fire will be re-introduced into these stands and maintained with a burn interval of 1 to 3 years.

J. Scrubby Flatwoods

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Scrubby flatwoods on LGSF should consist of open canopy forest of large, mature, pine with a sparse shrubby understory and numerous areas of barren white sand. The vegetation should be a combination of scrub and mesic flatwoods species.

Typical plants should include longleaf pine, slash pine, sand live oak, Chapman's oak, scrub oak, saw palmetto, staggerbush (*Lyonia fruticosa*), wiregrass, gopher apple (*Licania michauxii*), dwarf blueberry, rusty lyonia (*Lyonia ferruginea*), tar flower (*Bejaria racemosa*), lichens, silkbay (*Persea humilis*), huckleberry (*Gaylussacia* spp.), goldenrod (*Solidago* spp.), dwarf live oak (*Quercus minima*), pinweeds (*Lechea* spp.), and pinebarren frostweed (*Helianthemum corymbosum*).

Typically present is a sub-canopy or tall shrub layer of sand laurel oak, sand live oak, myrtle oak, rusty staggerbush, Chapman's oak, turkey oak, Carolina holly (*Ilex ambigua*), black cherry (*Prunus serotina*), and wild olive (*Osmanthus americanus*). Common short shrubs include saw palmetto, deerberry, wax myrtle, dwarf live oak, coastal plain staggerbush, pricklypear, and slimleaf pawpaw.

Herbs are common. However, in many of the older pine plantations, pine litter is thick and is shading out the herbaceous species. In areas with exposed sand, ground lichens (*Cladina* sp.) are present. Typical herbaceous species are wiregrass, witchgrasses, sandyfield beaksedge (*Rhynchospora megalocarpa*), pinebarren frostweed, tread softly, broomsedge, and goldenrod. Occasionally, Florida scrub roseling (*Callisia ornata*), rough hedgehyssop (*Gratiola hispida*), Florida scrub frostweed (*Helianthemum nashii*), fragrant eryngo (*Eryngium aromaticum*), and/or shortleaf gayfeather (*Liatris tenuifolia*) may also be found. Vines are occasional and include muscadine and earleaf greenbrier. Scrubby flatwoods occur as inclusions in and grade into mesic flatwoods.

Current Condition

There are several isolated patches of scrubby flatwoods in Lake George State Forest. These are remnants that have all been covered by pine plantation in the past. Scrubby

flatwoods are relatively flat and have a xeric assemblage of understory oaks and saw palmetto along with a mesic canopy. Planted pines are all slash pine except in one area on Mary Farms Tract, which is sand pine. Occasionally, longleaf pines can be found regenerating or as isolated mature trees and sand pine is a frequent invader.

Management Actions

Areas with a dense slash pine canopy need to be thinned to allow more light to penetrate to the ground cover. This will encourage the regeneration of longleaf pine and reduce the amount of pine litter fuel. Burning every 2-5 years with cool season fires will further reduce fuel loads and expose soil, encouraging ground cover re-growth. Wiregrass may need to be planted in areas where it has been completely lost. Once some restoration has been achieved, a burn interval of 5-8 years should be maintained. Off site sand pine should be removed as it becomes merchantable, and the site should be reforested with longleaf pine. Fire needs to be re-introduced into these areas to promote native ground cover. The areas that are infested with invasive species should be treated and continue to be monitored.

Two sites totaling 22 acres have been identified for restoration during this 10 year management period. Both sites have been reforested in longleaf pine. One site is 6 acres and was planted in February 2009. Sand pine has seeded in on this site and is not yet merchantable. When appropriate, fire will be reintroduced to the site. A burn interval of 3-8 years should be maintained. The other site planned for restoration is 16 acres that was planted in 2003. Sand pine has taken over the site and is now merchantable. The sand pine will be harvested, and fire will be re-introduced into the stand and maintained with a burn interval of 3 to 8 years. Supplemental planting of longleaf pine may be required depending upon the stocking of the site after the sand pine has been removed.

K. Depression Marsh

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Desired future conditions for depression marshes are already met for the most part and match the Current Condition description below. Herbaceous species should dominate the community in concentric bands with grasses and sedges common in all but the deepest areas of the marsh where maidencane, sawgrass, or pickerelweed may be present.

Typical trees species are swamp tupelo, slash pine, pond pine (*Pinus serotina*), and pond cypress. Buttonbush is an occasional shrub found mostly around the edge of the marsh. Maidencane, waterlily, Walter's sedge, yellow-eyed grasses, bladderworts, Virginia chain fern, sphagnum moss, Carolina redroot, and sawgrass are all common herbaceous species. Vines are infrequent, however, coral greenbrier (*Smilax walteri*) and laurel greenbrier (*Smilax laurifolia*) may be found in many depressions.

Current Condition

There are numerous depression marshes scattered throughout the forest and, in general, they are in good condition and only maintenance is needed. These are small, circular

depressions in pine plantation or clear-cuts. In composition, these are similar to basin marsh, differing mostly in size and shape, and being typically shallower than basin marsh. Occasionally a few trees may be present around the edge of the depression or stunted trees may be growing in the center. Since many of the depression marshes in LGSF are less than half an acre in size, they have not been mapped separately, but are instead inclusions in flatwoods.

Management Actions

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 on the landscape. Fires generally occurred early, April to June, in the lightning season when water was low and surrounding communities were dry. Prescribed fire in surrounding flatwoods should be allowed to burn through depression marshes. The marshes will burn more completely during dry periods, and those marshes with more shrub cover should be burned more often during spring and early summer. Depression marshes should not be bedded or planted with pines and existing pines should be removed.

L. Dome Swamp

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Dome swamps (or cypress ponds) are characterized as forested depressions that generally present a domed profile, because larger cypress exist in the most central or deepest portions of the wetlands with smaller cypress and species less tolerant of inundation toward the periphery. Dome swamps should be dominated by pond cypress with variable frequencies of other trees including swamp tupelo, southern red cedar, cabbage palm, slash pines, laurel oak, and willow. The surface soils and groundcover ranges from bare sand to some thickness of peat, duff and leaf litter. The peat generally becomes thickest toward the center of the dome. The periphery of these wetlands is often rimmed with an ecotone of wetland grasses that may be classified as wet prairie. Fire interval could be as frequent as 3 years in the periphery and as long as 150 in the center of the swamp.

The canopy is dominated by pond cypress and swamp tupelo, with slash, laurel oak, dahoon, swamp bay, sweet bay, Carolina willow, and cabbage palm occasional in the canopy and sub-canopy / tall shrub layers. Wax myrtle, Virginia chain fern, maidencane, duckweeds (*Lemna* spp.), royal fern, green arrow arum, cattail, and poison ivy are also common plants.

Current Condition

There are several small dome swamps throughout Lake George State Forest. These are similar in species composition to basin swamps, but are smaller in size and usually circular. The dome swamps in the forest range from being very shrubby in the understory to being open and grassy. These open dome swamps are more frequent in the Dexter / Mary Farms Tract where fire has evidently gone through them in the past decade.

Management Actions

The processes that most affect dome swamps are fire and flooding. There is a complex interrelationship between these two processes that affects floral characteristics, fuel loading, and all other plant distributions. Low intensity fires will be introduced at a low frequency to ensure against hardwood invasion or excessive peat accumulation. Fires in the surrounding flatwoods areas will be allowed to burn into the perimeter of these wetlands if conditions are appropriate.

Although many of the dome swamps in the Dexter / Mary Farms tract have burned recently, the swamps to the north are often more overgrown and may require burning. Most importantly, fires should be allowed to burn up to the edge of the swamps in order to maintain the typical grassy edge around each swamp.

M. Wet Prairie

The following, utilizing LGSF staff knowledge, the 2005 FNAI Historic Natural Communities at LGSF narrative and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Wet prairie should be a treeless plain with a sparse to dense ground cover of grasses and herbs, including wiregrass, toothache grass (*Ctenium aromaticum*), maidencane, spikerush, and beakrush. Other typical plants include hatpins (*Syngonanthus flavidulus*), sundews (*Drosera* spp.), meadowbeauty (*Rhexia* spp.), yellow-eyed grass, wax myrtle, pitcher plants (*Sarracenia* spp.), and St. John's wort (*Hypericum* spp.). These prairies have sandy soils and are often inundated.

Current Condition

All historic wet prairies in LGSF have been virtually destroyed by past timber management prior to FFS management. They are almost indistinguishable from the surrounding wet flatwoods and have a very similar composition with shrubs such as gallberry, dwarf huckleberry, wax myrtle, and saw palmetto. The herbaceous layer is well-developed with wiregrass, bushy bluestem (*Andropogon glomeratus*), bighead rush (*Juncus megacephalus*), blue maidencane (*Amphicarpum muhlenbergianum*), Virginia chain fern, sand cordgrass (*Spartina bakeri*), rushes (*Juncus* spp.), longleaf camphorweed (*Pluchea longifolia*), and witchgrasses. The areas believed to be historic wet prairies grade into wet flatwoods, marshes, and swamps.

Only one wet prairie was able to be mapped on the historic aerial photographs. This was an obviously treeless, smooth signature with several included depression marshes. Wet prairie was probably also included in many of the mapped flatwoods as well as being a frequent ecotone between flatwoods and wetlands, however timber removal and grazing had already impacted the area in 1941, making these areas impossible to determine.

Management Actions

In areas where dense pine plantations occur re-planting of trees should not occur after harvesting. Frequent prescribed fires should be applied, and, if shrubs are extremely dense, a single roller chop prior to the first burn may be appropriate. Areas where pines

are sparse or non-existent should be burned every 1-4 years in the warm season months (March through August) to promote native, non-weedy graminoid groundcover.

N. Xeric Hammock

The following, utilizing LGSF staff knowledge and 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Xeric hammocks are found on dry, sandy soils and are dominated by live oaks draped abundantly with Spanish moss. In natural circumstances, shrubs such as myrtle oak, Chapman's oak, sparkleberry, rusty lyonia, winged sumac, mulberry and deer berry are abundant, while herbaceous vegetation is usually meager but diverse. Eventually, typical species should include live oak, laurel oak, staggerbush, saw palmetto, beautyberry, and sparkleberry. Typical animals should include barking tree frog, spadefoot toad, gopher tortoise, worm lizard, black racer, red rat snake, hognose snake, screech owl, turkey, blue jay, and eastern mole.

Current Conditions

The xeric hammocks found on LGSF are primarily small patches of mature live oaks forming a canopy over former ferneries leased by Union Camp. Presently, a mixture of leatherleaf or asparagus fern and weeds comprise the groundcover. In some of these areas, non-native invasive species, such as air potato, camphor, and Caesar's weed, are present. Most of the ferneries' commercial value is degraded by lack of cultivation and in many areas by digging of the fern and lack of irrigation.

Management Actions

The management objective in these areas is to restore natural groundcover as much as possible. These areas will require protection from fire, because when fire does occur naturally in this community, it is nearly always catastrophic and may cause a shift from xeric hammock into another community type. Because the xeric hammocks on LGSF are located in areas that are fragmented and surrounded by residences and ferneries, it may be desirable to develop recreation opportunities on these areas. Management of these cover types will be evaluated more in the future to determine their optimal use. Non-native invasive species should be monitored and control efforts pursued. However, it is expected that some amount of leather leaf or asparagus fern will persist indefinitely and may be impractical to completely eradicate.

VIII. References

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IX. Glossary of Abbreviations

ARCAcquisition and Restoration Council
ARMArcheological Resource Monitoring
CARL.....Conservation and Recreation Lands Acquisition Program
BMPBest Management Practices
DACS.....Department of Agriculture and Consumer Services
DEPDepartment of Environmental Protection
DHRDepartment of State, Division of Historical Resources
DRP.....Division of Recreation and Parks
FFFlorida Forever Acquisition Program
FFS.....Florida Forest Service
FNAIFlorida Natural Areas Inventory
FWC.....Florida Fish and Wildlife Conservation Commission
GISGeographic Information System
LGSF.....Lake George State Forest
NNIPNon-Native Invasive Plant
OALE.....Office of Agricultural Law Enforcement
OFW.....Outstanding Florida Water
OPSOther Personnel Services
OOF.....Operation Outdoor Freedom
P2000Preservation 2000 Acquisition Fund
SJRWMD.....St. John's River Water Management District
TIITFTrustees of the Internal Improvement Trust Fund
USFSUnited States Forest Service
USFWSUnited States Fish & Wildlife Service
WMAWildlife Management Area