TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

NEWNANS LAKE STATE FOREST

ALACHUA COUNTY

PREPARED BY THE

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

FLORIDA FOREST SERVICE

APPROVED ON

JUNE 15, 2018

TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

NEWNANS LAKE STATE FOREST

Approved by:

Jim Karels, Director
Florida Forest Service

06/19/18
Date

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6/19/18
Date

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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services, Florida Forest Service
COMMON NAME: Newnans Lake State Forest
LOCATION: Alachua County
ACREAGE TOTAL: 1,059.26 acres (more or less)

Historic Natural Communities	Approximate Acreage
Basin Marsh	11
Baygall	10
Depression Marsh	3
Mesic Hammock	44
Sinkhole	1
Wet Flatwoods	160

Historic Natural Communities	Approximate Acreage
Basin Swamp	254
Bottomland Forest	76
Mesic Flatwoods	341
Sandhill	113
Upland Hardwood Forest	38
Xeric Hammock	2

TIITF LEASE AGREEMENT NUMBER: 4728
USE: Single ___ Multiple _X_____

MANAGEMENT AGENCY	RESPONSIBILITY
Florida DACS, Florida Forest Service	General Forest Resource Management
Florida Fish and Wildlife Conservation Commission	Wildlife Resources & Laws
St. Johns River Water Management District	Water Resource Protection & Restoration
Department of State, Division of Historical Resources	Historical & Archaeological Resource Management

DESIGNATED LAND USE: Multiple-Use State Forest
SUBLEASES: None
ENCUMBRANCES: Dignity Village, See II.D.4
TYPE ACQUISITION: State Surplus Property
UNIQUE FEATURES: Newnans Lake; a set of associated feeder wetlands
ARCHAEOLOGICAL / HISTORICAL: Nine (9) known sites; single largest accumulation of prehistoric aquatic transportation ever discovered
MANAGEMENT NEEDS: Restore longleaf pine and altered ecosystems, return prescribed fire to appropriate upland sites, development of recreation areas, cooperate with FWC law enforcement i.e. on East Tract regarding archeological issues, continue non-native invasive control, assess hydrological needs, establish access and management roads on West Tract.
ACQUISITION NEEDS: Acquire priority parcels within project Optimal Management Boundary
SURPLUS ACREAGE: None
PUBLIC INVOLVEMENT: Management Plan Advisory Group, Public Hearing and DEP Acquisition and Restoration Council Public Hearing.

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ARC Approval Date: _____ BTIITF Approval Date: _____
Comments: _____
_____
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I. Introduction

Newnans Lake State Forest (NLSF) is named after Newnans Lake which lies just east of the forest. Although shallow, this 5,800-acre lake is approximately two (2) miles wide and four (4) miles long. The gum and bald cypress swamps extending from the lake are the most intact natural systems on the state forest and host a variety of wading birds and other wildlife. Several bald eagle nests are found adjacent to these swamps. Sunnyland Creek, Lake Ridge Creek and Lake Forest Creek flow through the forest into Newnans Lake. NLSF is one link in a chain of public lands that runs along the lakeshore and protects this beautiful and historically significant aquatic feature. Trees such as slash pine (*Pinus elliotii*), longleaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), bald cypress (*Taxodium distichum*), oaks (*Quercus* spp.), sweetgum (*Liquidambar styraciflua*), red maple (*Acer rubrum*), southern magnolia (*Magnolia grandiflora*), black gum (*Nyssa sylvatica*), and pignut hickory (*Cary glabra*) are all found on the forest.

Recreational activities on the forest include hiking, mountain biking, nature study, wildlife viewing and photography. In 2015, a short one-mile hiking trail was opened, giving visitors a sample of things to come. This trail, called the West Trail, was added to Florida's State Forest Trailwalker Program. The parking area for this hiking trail is on the west side of State Road 26. In the spring of 2016, the Pithlachocco Bicycle Trail was opened, starting on the east side of State Road 26. This 5.5-mile loop trail provides a leisurely ride through hardwood and pine forests leading to views of Newnans Lake. In the fall of 2016, another hiking trail was opened. This 2.5-mile loop trail, which also begins at the Lake Pithlachocco Trailhead, offers hikers a shorter, more direct route to the lakeshore. Signage and wooden fencing identifies the parking areas for these trails. Canoeists and kayakers can launch from public facilities on the southern and eastern shores of NLSF, and paddle along the lakeshore into the swamps and streams of the forest.

NLSF is an Operation Outdoor Freedom (OOF) program site and provides recreational opportunities to wounded veterans.

A. General Mission and Management Plan Direction

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

Management strategies for NLSF 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 NLSF will be accomplished with the following strategies:

- Practice sustainable forest management for the efficient generation of revenue and in support of state forest management objectives;
- Provide for resource-based outdoor recreation opportunities for multiple interests;

- Restore and manage healthy forests and native ecosystems ensuring the long-term viability of populations and species listed as endangered, threatened or rare, and other components of biological diversity including game and non-game wildlife and plants;
- Protect known archaeological, historical, and cultural resources;
- Restore, maintain, and protect hydrological functions related water resources and the health of associated wetland and aquatic communities;
- Provide research and educational opportunities related to natural resource management.

This management plan is provided according to requirements of Sections 253.034, 259.032, and 373, Florida Statutes, and was prepared utilizing guidelines outlined in Section 18-2.021 of the Florida Administrative Code. It is not an annual work plan or detailed operational plan but provides general guidance for the management of NLSF 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 NLSF has been completed monthly and is available from the forest manager. A table has been prepared for this plan that summarizes the accomplishments since the property came under FFS management [Exhibit A]. The table does not attempt to account for all activities on the forest, but summarizes major activities. It does not list the multitude of daily activities and public interactions involved in managing the forest.

Since acquisition, there have been many events, developments, and accomplishments. Among the most noteworthy have been the following:

- FFS staff has conducted management activities regarding boundary maintenance. This includes the installation of fences, posts and boundary signs, and establishment of pre-suppression boundary firelines.
- FFS has removed most of NLSF internal barbed wire fence.
- FFS staff has obtained a Memorandum of Agreement (MOA) with the City of Gainesville regarding Dignity Village.
- A prescribed fire program, including neighborhood outreach, has been initiated on approximately 250 acres.
- Approximately 100 acres of longleaf pine has been planted on the state forest.
- A sanitation thinning timber sale has been conducted on a 125-acre slash pine *(Pinus elliottii)* plantation.
- FFS staff prepared for and completed five (5) (three (3) turkey and two (2) deer) OOF hunts on NLSF since March 2015; giving 15 disabled veterans a rare recreational experience.
- FFS staff installed two (2) new trailheads and approximately nine (9) miles of trails, consisting of approximately one (1) mile of interpretive trail, 5.5 miles of bicycle trails, and 2.5 miles of additional hiking trails.
- FFS staff created a half-acre wildflower garden adjacent to the West Trailhead.
- NLSF participated in four (4) “Christmas Bird Counts”: 2014, 2015, 2016, and 2017.

- NLSF participated in the "Greater Invader Raider Rally," in January 2015, 2016, 2017, and 2018 in cooperation with the City of Gainesville and associated volunteers. The purpose of the project is to work towards eradication of onsite coral ardisia *(Ardisia crenata).*
- FFS staff completed the initial non-native invasive plant survey, and initiated control measures.
- FFS staff received two (2) grants from the Upland Invasive Plant Management program.
- State Forest Awareness Months events were held at NLSF in 2016 and 2017.
- NLSF has hosted the field study portion of trainings such as S-212 (Wildland Chainsaw), Archaeological Resource Monitoring, forest health – non-native invasive plant control, stormwater structures, and S-130/S-190 (Basic Wildland Firefighting Training).
- FFS staff generated a preliminary gopher tortoise pod map.
- FFS staff established a NLSF webpage.
- In 2016, FNAI completed an inventory and natural community mapping project on the entire state forest and updated the natural community descriptions for NLSF.

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 NLSF during this management period must serve to conserve, protect, utilize, and enhance the natural and historical resources and manage resource-based public outdoor recreation, which is compatible with the conservation and protection of this forest. The majority of the management operations will be conducted by the FFS, although appropriate activities will be contracted to private sector vendors or completed with the cooperation of other agencies. All activities will enhance the property's natural resource or public recreational value.

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

➢ GOAL 1: Sustainable Forest Management

Objective 1: Continue to update and implement the Five-Year Silviculture Management Plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (Ongoing Objective)

Performance Measures:

- Annual updates of the Five-Year Silviculture Management Plan completed.
- Continued implementation of the Five-Year Silviculture Management Plan (acres treated).
- Assessment of natural pine stands in need of a timber harvest on all tracts.

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

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

Objective 3: Conduct forest inventory updates each year according to established criteria in the State Forest Handbook. (Ongoing Objective)
Performance Measure: Number of acres inventoried annually.

Objective 4: Continued efforts to remove off-site planted pine species from flatwoods natural community types and replant with native pines. (Ongoing Objective)
Performance Measures:

- Number of acres of off-site pines harvested through clear-cut or selective harvests.
- Number of acres of native pines replanted.

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

Objective 1: Maintain public access and recreational opportunities for all recreational users. (Ongoing Objective)
Performance Measure: Total number of visitor opportunities per day.

Objective 2: Develop additional public access and recreational opportunities for additional public access and recreational opportunities. (Long Term Objective)
Performance Measure: Number of additional visitor opportunities per day.

Objective 3: Continue to safely integrate human use into NLSF, follow the Five-Year Outdoor Recreation Plan, and update annually. (Ongoing Objective)
Performance Measures:

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

Objective 4: Establish a liaison panel. The panel consists of a mix of residents, community leaders and special interest group representatives (canoe vendors, hunters, veterans, trail hikers, mountain bikers, etc.), environmental groups, and other public / private entities to establish communication and seek constructive feedback regarding the management of NLSF. (Ongoing Objective)
Performance Measures:

- Liaison Group established and first meeting held.
- Meetings continue.

Objective 5: Enlist additional volunteers and volunteer organizations to assist with recreation and/or resource management. (Ongoing Objective)

Performance Measure: Number of volunteer hours.

Objective 6: Maintain hiking/mountain biking trails. (Ongoing Objective)
Performance Measure: Miles of hiking/mountain biking trails maintained.

Objective 7: Evaluate possible additional recreational opportunities, such as an access point for the Potano Paddling Trail, or the circum-Newnans Lake hiking/biking trail.
Performance Measures:

- Opportunities evaluated. (Short Term Objective)
- Recreation increased. (Long Term Objective)

Objective 8: Develop a color NLSF brochure to distribute to recreation users. (Long Term Objective)
Performance Measure: Brochures printed and available to forest users.

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

Objective 1: Utilize prescribed fire to enhance restoration of native groundcover. Evaluate areas where the ground cover is intact, and restorable with fire alone. Evaluate areas where native groundcover has been eliminated or heavily impacted from historical land use on a case by case basis for alternative methods to address reestablishment of native groundcover plants. Restore native groundcover where it has been eliminated or heavily impacted from historical land use. (Long Term Objective)
Performance Measures:

- Assessment of restorable groundcover sites completed.
- Number of burn treatments applied to these sites.
- Periodic assessment of heavily impacted sites completed.
- Acres of restoration attempted.

Objective 2. Use photo plots and routine observation to compare sites over time. (Ongoing Objective)
Performance Measures:

- Number of new photo plots established.
- Percentage of photo plots revisited annually.
- Number of photos taken biannually.

- **GOAL 4: Fire Management**

Objective 1: The NLSF currently contains approximately 629 acres of fire dependent communities. NLSF staff will conduct habitat / natural community improvement on the forest annually. To achieve an average fire return interval of two (2) to four (4) years across the forest, approximately 157 to 314 acres will be prescribed burned annually. Currently, FFS staff estimates 140 acres of NLSF are within the desired fire rotation. (Ongoing Objective)
Performance Measures:

- Number of acres burned during the dormant and growing seasons, and number of acres burned within target fire return interval.

- Number of acres with restoration underway. This restoration would include prescribed burning.

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

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

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

- Evaluation complete.
- Should the evaluation determine that fuel reduction is necessary, number of projects underway.

➢ **<u>GOAL 5</u>: Listed and Rare Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration**

Objective 1: In cooperation with the Florida Fish and Wildlife Conservation Commission (FWC), develop a Wildlife Management Strategy that addresses fish and wildlife species for NLSF, with emphasis on imperiled species and associated management prescriptions for their habitats. (Long Term Objective)
Performance Measures:

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

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

Objective 3: Initiate mapping of gopher tortoise and Florida toothache grass, and conduct searches throughout appropriate habitat within NLSF for new occurrence records. (Long Term Objective)
Performance Measures:

- Number of new occurrence records
- Updated shapes/coverages of listed populations using GPS and GIS

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

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

- Total number of acres identified and successfully treated.

- Annual updates of the Five-Year Ecological Plan completed.
- Continue to maintain NLSF invasive database for maintaining and updating invasive information annually.

Objective 2: Continue to maintain funding to provide for Other Personnel Services (OPS) staff for locating, identifying, and controlling non-native invasive species that exist on NLSF (Ongoing Objective).
Performance Measures:
- Total number of acres identified and successfully treated by FFS staff.
- Funding approved to support one (1) OPS staff annually.

Objective 3: Continue to apply for contractual services project proposals for invasive treatments on all tracts through internal FFS funds or FWC Uplands Invasive Treatment Program (Ongoing Objective)
Performance Measure: Total number of acres identified and successfully treated by contractual services.

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

Objective 1: Ensure all known sites are recorded in the Department of State, Division of Historical Resources (DHR) Florida Master Site file. (Ongoing Objective)
Performance Measure: Number of recorded sites.

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

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

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

Objective 1: Conduct or obtain a site assessment / study to identify potential hydrology restoration needs. (Long Term Objective)
Performance Measures:
- Assessment conducted.
- Assessment recommendations implemented and followed

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

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

Performance Measures:

- Total miles of roads, firelines, and trails closed, rehabilitated, and/or restored.
- Total number of culverts replaced.

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

Objective 1: NLSF staff, along with help from volunteers and/or user groups, will continue maintenance of 2 parking areas and 2 trailheads, 9 miles of trails, and 5 miles of tertiary roads. (Ongoing Objective)

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

Objective 2: Continue to implement the Five-Year Boundary Survey and Maintenance Management Plan and update annually. The entire boundary will be reworked at minimum every five (5) years including harrowing, reposting signage, and repainting boundary trees. (Ongoing Objective)

Performance Measures:

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

II. Administration Section

A. Descriptive Information

1. Common Name of Property

The common name of the property is the Newnans Lake State Forest.

2. Legal Description and Acreage

The NLSF is comprised of 1,059.26 acres, more or less.

NLSF is located east of Gainesville on the western shore of Newnans Lake in Alachua County, Florida. A complete legal description of NLSF lands owned by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) is on file at the NLSF Headquarters Office, FFS State Office, and Florida Department of Environmental Protection (FDEP) state office.

The location and boundaries are identified in [Exhibit B]. The NLSF is located in Sections 26, 27, 35, and 36 Township 9 South, Range 20 East; Section 31 Township 9 South, Range 21 East; Section 6 Township 10 South, Range 21 East in Alachua County, Florida.

Table 1. NLSF Acreage by Funding Source

Funding Source	ACRES
N/A	1,004.06
N/A	55.2

A complete legal description of lands owned by (TIITF) is on record at the NLSF Forestry Station Office, Florida Department of Environmental Protection (DEP), and the FFS State Office in Tallahassee.

3. Proximity to Other Public Resources

Lands managed by state, federal, or local government for conservation of natural or cultural resources that are located within approximately 10 miles of the NLSF are included in [Exhibit E] as well as the table below:

Table 2. Nearby Public Conservation Land and Easements

TRACT	AGENCY	DISTANCE
Morningside Nature Center	City of Gainesville	Adjacent to the South
Kincaide and Tabone Conservation Easement	Alachua County	Adjacent to the South
Flatwoods Conservation Area	City of Gainesville	0.3 miles Northwest
Palm Point Nature Park	City of Gainesville	0.2 miles Southeast
Newnans Lake Conservation Area	SJRWMD	0.6 miles Northeast
Gum Root Nature Park	City of Gainesville	0.6 miles Northeast
Buck Bay Flatwoods Preserve	Alachua County	2 miles North
Timber Company Conservation Easement	SJRWMD	2 miles Northwest
Payne's Prairie Preserve State Park	DRP	1.6 miles South
Boulware Springs Park	City of Gainesville	1.7 miles Southwest
Georgia Pacific-Lochloosa Conservation Easement	SJRWMD	4.3 miles Southeast
San Felasco Hammock Preserve State Park	DRP	8.5 miles West

DRP – Florida Department of Environmental Protection, Division of Recreation and Parks
SJRWMD – St. Johns River Water Management District

4. Property Acquisition and Land Use Considerations

NLSF contains over 1,000 acres of natural lands just east of Gainesville in Alachua County. This property has been in state ownership since 1921 when 3,000 acres were acquired to establish a residential farm community for Floridians with developmental disabilities. Over the years, parts of the 3,000-acre property were transferred to other state and local agencies. There isn't any Florida Forever Projects adjacent to NLSF, but there is one (1) near the state forest [Exhibit F]. In January 2015, 1,005 acres of undeveloped land were assigned to the FFS to manage as a state forest. On August 1, 2017, an additional 55.2 acres of land formerly managed by Department Children and Families (DCF) was assigned to the FFS and added to NLSF. These parcels are assigned to the FFS for management under Lease Agreement #4728.

The FFS has initiated a prescribed fire program, planted longleaf pine on much of the open area, and thinned the timber on 125 acres of 35-year old slash pines. Future activities will focus on removing non-native invasive plant species, improving native ground cover, planting site specific pine species, and additional selective timber harvesting. Reintroducing fire is a vital step to improve the habitat for game and nongame species, including white-tailed deer, wild turkeys, gopher tortoises, and brown-headed nuthatches. The FFS manages public land for multiple uses, including timber management, outdoor recreation, and wildlife management and conservation.

Table 3. Parcel Acquisition

Parcel Name	Deed Date	Lease Date	Acres (County)
From DOC	N/A	9/23/2014	1,004.06 (Alachua)
From DCF	N/A	8/01/2017	55.2 (Alachua)

B. Management Authority, Purpose and Constraints

1. Purpose for Acquisition / Management Prospectus

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

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

Multiple-use management for NLSF will be accomplished through the integration of the following strategies:

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

2. Degree of Title Interest Held by the Board

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

3. Designated Single or Multiple-Use Management

NLSF is managed under a multiple-use concept by the FFS, under the authority of Chapters 253 and 589, Florida Statutes. The FFS is the lead managing agency as stated in TIITF Management Lease Number 4728.

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

4. Revenue Producing Activities

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

- Timber harvests – Timber harvests on NLSF will be conducted to improve forest health, promote wildlife habitat, restore plant communities, and provide additional benefits.
- Fire wood – NLSF staff may consider issuance of fuel wood permits as requested.
- Privately sponsored recreational events
- Primitive camping
- Leases (grazing, apiary, etc.)

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

7. Aquatic Preserve / Area of Critical State Concern

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

C. Capital Facilities and Infrastructure

1. Property Boundaries Establishment and Preservation

NLSF boundary lines, 13 miles total, are managed by state forest personnel in accordance with the guidelines of the State Forest Handbook. There are six (6) gates on NLSF that require periodic maintenance.

2. Improvements

Current buildings/facilities present on the NLSF include:

- Waccasassa Forestry Center (WaFC) office building with associated facilities
- Four (4) equipment pole barns
- Mechanic shop/Ranger Office
- Three (3) trailer sites with two (2) state-owned trailers

Planned buildings/facilities on the NLSF include:

- A vault toilet or small restroom and picnic pavilion to be located at the Pithlachocco Trailhead.

All planned improvements may be completed as staff and funding permits.

3. On-Site Housing

The infrastructure for three (3) trailer sites, including two (2) state-owned trailers, is in place on the NLSF. FFS may establish further on-site housing (mobile / manufactured home) on NLSF if deemed necessary to alleviate security and management issues. The need and feasibility specific for the state forest will be evaluated and established if considered appropriate by the Center Manager and approved by the FFS Director. Prior to the occurrence of any ground disturbing activity for the purpose of establishing on-site housing, a notification will be sent to the DHR and Florida Natural Areas Inventory (FNAI) for review and recommendations. This type of housing will not exceed two (2) homes per location, with the possibility of more than one on-site housing location occurring if considered necessary by the Center Manager and approved by the Director.

4. Operations Infrastructure

a. Operations Budget

For Fiscal Year 2015-2016, the total annual budget for NLSF was $54,800. This amount includes salaries, expenses, contractual services, and OPS. A summary budget for NLSF is contained in [Exhibit U]. Implementation of any of the activities within this management plan is contingent on availability of available funding, other resources, and other statewide priorities.

b. Equipment

Equipment purchased specifically for work on the NLSF to support resource management work, and maintain improvements such as trails, roads, and facilities includes:

- Two (2) utility vehicles
- One (1) utility vehicle trailer

NLSF uses additional equipment assigned to the WaFC Office to carry out management work on the state forest.

c. Staffing

There are currently no staff assigned to NLSF. The existing WaFC staff manages all activities on the forest.

A Resource Administrator, Biologist, Recreation Specialist, and an OPS non-native invasive plant specialist is stationed at the WaFC office. Additionally, one (1) Forest Area Supervisor, two (2) Senior Rangers, and three (3) Forest Rangers have offices at the WaFC and assist with management activities at NLSF. The Region Two mitigation team also provides part time assistance.

The WaFC Resource Section will work to achieve the goals outlined in this management plan. Resource management activities, such as timber cruising, planning, and sale administration, etc., are the responsibility of the Resource Section under the direction of the Resource Administrator and Center Manager. Forest operations, such as road maintenance, prescribed burning, etc., are the responsibility of the FFS WaFC fire control personnel under the direction of the Operations Administrator, Center Manager, and the Forest Area Supervisor.

D. Additional Acquisitions and Land Use Considerations

1. Alternate Uses Considered

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

2. Additional Land Needs

The acquisition of additional land within the optimal management boundary would facilitate restoration, protection of the natural resources, maintenance, and management of the resources on NLSF. [Exhibit C]

3. Surplus Land Assessment

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

4. Adjacent Conflicting Uses

During the development of this management plan, FFS staff identified and evaluated adjacent land uses, reviewed current comprehensive plans, and future land use maps in deciding there are currently no known conflicting adjacent land uses. 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 public and private property owner(s), prospective owner(s), or prospective developer(s) to discuss methods to minimize negative impacts on management, resources, facilities, roads, recreation, etc., and discuss ways to minimize encroachment onto the forest and to enhance prescribed fire. The majority of the adjacent landowners are state, University of Florida (UF), Alachua County, or City of Gainesville agencies. The adjoining road system, prisons, and social services facilities including Grace Marketplace/Dignity Village may hinder prescribed burning due to smoke management concerns. The Gainesville Regional Airport, W. Travis Lofton High School, and Alachua county fairgrounds are nearby and may affect smoke management. When the lease map for NLSF was drawn up, numerous boundaries were drawn through wetlands making boundary firelines a challenge in several areas. Some of these sites are in the optimal boundary and transferring a more burnable block to an FFS lease would make sense. Some may be burned with the cooperation of adjoining landowners.

5. Compliance with Comprehensive Plan

This plan was submitted to the Board of County Commissioners in Alachua County and the City of Gainesville City Commission for review and compliance with their local comprehensive plans [Exhibit S].

6. Utility Corridors and Easements

Gainesville Regional Utilities (GRU) currently has two (2) linear facility easements on NLSF. There is a powerline/sewage line corridor sited between Dignity Village and NLSF that runs down the west boundary toward Lofton High School. Another powerline, water, sewage, and natural gas line bisects NLSF along Fire Plug Road toward the Northeast Florida Evaluation and Treatment Center.

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

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

Collocation of new linear facilities with existing corridors will be considered, but will be used only where expansion of existing corridors does not increase the level of habitat fragmentation and disruption of management and multiple-use activities. FFS will further encourage the use of underground cable where scenic considerations are desirable. Easements for such utilities are subject to the review and approval of the TIITF, and the St. Johns River Water Management District (SJRWMD). Requests for linear facility uses will be handled according to the Governor and the Cabinet's linear facilities policy.

E. Agency & Public Involvement

1. Responsibilities of Managing Agencies

FFS is the lead managing agency, responsible for overall forest management and public recreation activities, as stated in TIITF Management Leases numbered 4728. Pursuant to the management lease, the lead managing agency may enter into further agreements or to subleases on any part of the forest.

FWC has law enforcement responsibilities, and conducts other wildlife management activities as a cooperative agency, with input from FFS.

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

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

2. Law Enforcement

Primary law enforcement responsibilities will be handled by law enforcement officers from FWC. Rules governing the use of NLSF 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. Cooperate with FWC law enforcement i.e. on East Tract regarding archeological issues, as appropriate.

The Office of Agricultural Law Enforcement (OALE) will assist with open burning and wildfire investigations as needed. The Gainesville Police Department has law enforcement officers assigned to Dignity Village. Additional assistance is provided by the Alachua County Sheriff's Office as needed. Considering statewide budget limitations, FFS feels that law enforcement is adequate on NLSF.

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

3. Public and Local Government Involvement

This plan has been prepared by FFS and will be carried out primarily by that agency. FFS responds to public involvement through direct communication with individuals, user groups, and government officials. FFS responds to public involvement through liaison panels, management plan advisory groups, public hearings, and through ongoing direct contact with user groups.

The plan was developed with input from the NLSF Management Plan Advisory Group and was reviewed at a public hearing on March 7, 2018. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in [Exhibit T]. 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 NLSF. Depending upon the type of volunteer service needed, volunteer activities may be one-time events or long-term recurring projects such as OOF special events, routine maintenance, control of non-native invasive species, and trail management. 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 Inc. (FFSF) is a Direct Support Organization (DSO) of the FFS. FFSF supports management activities and 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, FFSF assists the FFS to expand opportunities for recreation, environmental education, fire prevention, and forest management within Florida's state forests.

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

III. Archaeological/Cultural Resources and Protection

A. Past Uses

Historical aerial photographs of the area show that clear-cut activities occurred on old growth longleaf pine within the upland forest communities prior to 1937. Presumably, the open uplands had been used for farming, cattle grazing, and naval stores. Over time, farmland acreage shrunk as pine trees were planted or seeded in as volunteers.

Prior to FFS management of NLSF property, the site was part of both DOC's Gainesville Correctional Institution and Work Camp Santa Fe Work Release Center, established in

1991, and was designated as such. The Correctional Institution houses adult male inmates and is located on an adjacent property.

A recent significant archeological discovery on the floor of Newnans Lake near NLSF uncovered evidence of regional usage by ancient Native Americans. In the spring of 2000, after several years of drought exposed much the lake bed, environmental science students from Eastside High School discovered several dugout canoes along the isolated north shore of the lake. The finding led scientists to conduct a large-scale state archeological survey, which eventually gave way to the unveiling of over one hundred dugout canoes from the lake's exposed, muddy bed.

Tests indicate three quarters of the canoe cache were constructed out of southern hard pine, while the rest were manufactured from cypress and other conifers. Radiocarbon dating has demonstrated that the vessels, with lengths ranging from 15 to 31 feet, were built across a span of time, from 500 to 5,000 years ago. In 1774, naturalist William Bartram (Bartram 1791) wrote of his observations of Seminole Indians with "handsome canoes [formed] out of the trunks of Cypress trees, some of them commodious enough to accommodate 20 or 30 warriors." In Bartram's time, the lake was known as "Pithlachocco," or "place of the long boats." Officials surmise that the large quantity of dugouts onsite may imply that the vicinity was utilized as a large-scale center for dugout fabrication. This finding is the single largest accumulation of prehistoric aquatic transportation ever discovered.

An interpretive display including a replica dugout canoe is located along the recreational trails at the lake's edge in an effort to educate the public on the historical significance of this area. This display was produced with the assistance of DHR, who provided the replica canoe and advice.

In contemporary times, Newnans Lake was named so for the Georgia militia officer, Daniel Newnan, who locally fought the Seminoles in 1812.

B. Archaeological and Historical Resources

A review of information contained in the Florida Department of State, Division of Historical Resources (DHR), Florida Master Site file has determined there are at least eight (8) recorded archeological sites and one (1) standing structure found at the designated area for NLSF, Alachua County, Florida.

Table 4. Archaeological & Historical Sites on NLSF

SITE ID	SITE NAME	SITE TYPE
AL4792	Lake Pithlachocco Canoe Site	Archeological
AL4957	Northwest Shore Village Site	Archeological
AL5438	Rocket Dawg	Archeological
AL5473	North Hill	Archeological
AL5762	Rower's Rise	Archeological
AL5763	Hanson Bluff	Archeological
AL5474	Little Middle	Archeological
AL5475	Lots of Turkeys	Archeological
AL5765	Bureau of Edible Crops Cattle Operation	Structure

Brief Description

AL4792 - The densest concentration of dugout canoes in the world, and the archaeological site boundaries encompass the entire lake. The site is listed on the National Register of Historic Places.

AL5765 – A small, very late historic open storage facility with wooden framing and metal siding is the standing structure.

AL9957 – Had evidence of illicit digging.

All other archeological sites – Lithics and pottery comprise the vast majority of artifacts recovered.

The sites on NLSF had evidence of many different pre-historic periods.

Public Lands Archaeology (PLA) conducted a reconnaissance-level cultural resources survey November 2-3, 2015 and March 21-25, 2016 on NLSF. Three (3) sites were newly recorded (AL5762, AL5763, and AL5765) and four (4) sites were updated, within the NLSF boundary.

See [Exhibit G] for a complete list of all archeological sites on NLSF, updates to the Master Site File is forthcoming.

C. Ground Disturbing Activities

Representatives of DHR and Florida Natural Areas Inventory will be consulted prior to the initiation of any proposed significant ground disturbing activity by FFS or any other public agency. FFS will make every effort to protect known archaeological and historical resources. FFS will follow the "Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands" [Exhibit H] and will comply with all appropriate provisions of Section 267.061(2) Florida Statutes. Ground disturbing activities not specifically covered by this plan will be conducted under the parameters of the "List of ARC / Division of State Lands Approved Interim Management Activities".

D. Survey and Monitoring

Currently, three (3) local district FFS staff are trained by DHR as archaeological resource monitors. FFS will pursue opportunities for getting additional personnel trained. FFS will consult with public lands archaeologists at DHR as necessary to determine an appropriate priority and frequency of monitoring at each of the listed sites, as well as any protection measures that might be required. All archaeological and historical sites within the state forest will be monitored at least annually. FFS field staff will monitor the listed sites to note condition and any existing or potential threats.

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

IV. Natural Resources and Protection

As stated in [Exhibit R], the primary reason for the establishment of NLSF was to manage the property under a multiple use concept, and "...maintain natural conditions along...lake frontage...on Newnan's Lake." This would maintain and restore threatened ecosystems.

Erosion problems are minimal and relate to creek scouring or loss of culverts in high rain events. Management activities will be executed in a manner to minimize soil erosion. If problems arise, corrective action will be implemented by FFS staff under the direction of FFS's Forest Hydrology Section. Efforts will be made to monitor and protect NLSF's waterbodies and their associated water quality, discharge, and native plants and animals. All forest management activities relating to timber harvesting practices will comply with the BMP's for public lands. Copies of this publication are available upon request from FFS.

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

A. Soils and Geologic Resources

1. Resources

Soil information for NLSF was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS). Thirteen (13) different soils are listed on NLSF. The three (3) predominant soils listed by the NRCS include:

Tavares sand, Pomona sand, and Samsula muck. Detailed information on all soils present on the state forest may be found in [Exhibit I].

2. Soil Protection

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

B. Water Resources

The water resources on NLSF perform essential roles in the protection of water quality, groundwater recharge, flood control, and aquatic habitat preservation. Maintenance and restoration of native ecosystems is a high management priority. Properly managing the soil, water, and watershed resources of this forest are an integral part of accomplishing this objective. In the interest of maintaining these valuable resource functions, state forest management personnel will work with the FFS Hydrology Section to incorporate wetland restoration into the overall resource management program as opportunities arise, particularly where wetland systems have been impaired or negatively impacted by previous management activities or natural disasters. All silvicultural activities (including timber harvesting and reforestation) will be conducted in accordance with Florida's Silviculture BMPs publication and/or other appropriate measures as deemed necessary by the FFS's Forest Hydrologist and/or Watershed Specialist.

See [Exhibit K] for map of the water resources at NLSF.

1. Resources

NLSF is located on the west side of Newnans Lake and includes a portion of the lake itself as sovereign submerged lands. Three creeks flow through the state forest including Sunnyland Creek, Lakeridge Creek, and Lake Forest Creek. Newnans Lake and its surrounding wetlands are part of the Orange Creek Basin, an important component of the habitat in this area. In this context, there are a variety of public conservation lands, including NLSF, and private lands with conservation easements around the rim of the lake. The lake, which has an average depth of five feet to a maximum of twelve feet, is an FWC designated Fish Management Area and is within the Newnans Lake Conservation Area, an Alachua County designated protected site. Additionally, the water body was included in the Alachua County Orange Creek Basin Management Action Plan in 2007, which describes nutrient reduction efforts within the lake’s watershed which will sufficiently reduce pollution to the lake.

Any changes to roads, parking areas, culverts, or bridges will be covered in the NLSF Road Plan. These changes, in addition to fireline construction and maintenance, will follow the latest edition of the FFS's Silviculture BMPs.

2. Water Classification

There are no Outstanding Florida Waters (OFW) located on or adjacent to the site. All the surface waters on or adjacent to the site are classified as Class III waters, which is the statewide default classification. [Exhibit J]

3. Water Protection

The water resources on NLSF perform essential roles in the protection of water quality, groundwater recharge, flood control, and aquatic habitat preservation. Maintenance and restoration of native ecosystems is a high management priority. Properly managing the soil, water, and watershed resources of this forest are an integral part of accomplishing this objective. In the interest of maintaining these valuable resource functions, state forest management personnel will work with the FFS Hydrology Section to incorporate wetland restoration into the overall resource management program as opportunities arise, particularly where wetland systems have been impaired or negatively impacted by previous management activities or natural disasters. All silvicultural activities (including timber harvesting and reforestation) will be conducted in accordance with Florida's Silviculture BMPs publication and/or other appropriate measures as deemed necessary by the FFS's Forest Hydrologist and/or Watershed Specialist.

The NLSF falls within the jurisdiction of the SJRWMD. The FFS, through its Forest Hydrology Section, will work with the SJRWMD district to monitor levels and quality of ground and surface water resources. Any activities requiring water management district permits will be handled accordingly.

See [Exhibit K] for map of the water resources at NLSF.

Water resource protection measures, at a minimum, will be accomplished using BMPs as described in the most current version of Silviculture BMPs Manual. Since Newnans Lake has nutrient loading problems, when feasible FFS will coordinate with other agencies including Alachua County or SJRWMD to explore reducing nutrient inputs to surface waters. Sunnyland Creek and other appropriate sites could be evaluated with water quality monitoring equipment if the partnering agencies make funding available.

4. Swamps, Marshes, and Other Wetlands

Numerous swamps and wetlands are located on NLSF. Maintenance of wetland communities is a high priority and will be accomplished through prescribed fire when necessary and a cautious avoidance of activities that would threaten natural hydrology. There are approximately 254 acres of basin swamp, existing on two (2) main areas of NLSF; one (1) area north of the adjacent Morningside Nature Center (MNC), and the other located near where the three (3) creeks on the forest merge together. Also located on the forest are 75 acres of bottomland forest, 149 acres of wet flatwoods, and 3 acres of depression marsh.

5. Wetlands Restoration

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

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

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

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

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

NLSF resides in the Orange Creek BMAP [Exhibit K]. It was developed as part of DEP's TMDL Program, and represents the collaborative efforts of stakeholders to identify current and planned management actions to achieve pollutant load reductions required by the TMDL.

The BMAP provides for phased implementation under Subparagraph 403.067(7)(a)1, F.S. The management actions and adaptive management approach described in the BMAP will address Total Phosphorus (TP) and Total Nitrogen (TN) reductions, and

the process will continue until the TMDLs are met. The phased BMAP approach allows for the implementation of projects designed to achieve incremental reductions, while simultaneously monitoring and conducting studies to better understand the water quality dynamics (sources and response variables) in the watershed.

C. Wildlife Resources

1. Threatened and Endangered Species

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

Table 5. Endangered or Threatened Species Documented on NLSF

Scientific Name	Common Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
Haliaeetus leucocephalus	Bald Eagle	RT	N	G5	S3
Crotalus adamanteus	Eastern Diamondback Rattlesnake	UR	N	G4	S3
Gopherus polyphemus	Gopher Tortoise	C	ST	G3	S3
Ctenium floridanum	Florida Toothache Grass	N	E	G2	S2
Matelea floridana	Florida Spiny Pod	N	E	G2	S2

*** STATUS/RANK KEY**

Federal Status (USFWS): LE= Listed Endangered, LT= Listed Threatened, N= Not currently listed, RT = Resolved Taxon - Species that have been petitioned for listing and for which a Not Warranted 12 month finding or Not Substantial 90-day finding has been published in the Federal Register. Also includes species that have been removed from the candidate list, UR = Under Review - Species that have been petitioned for listing and for which a 90-day finding has not been published or for which a 90-day substantial has been published but a 12 Month finding have not yet been published in the Federal Register. Also includes species that are being reviewed through the candidate process, but the CNOR has not yet been signed, 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. Florida Natural Areas Inventory

The Florida Natural Areas Inventory (FNAI) is the single most comprehensive source of information available on the locations of rare species and significant ecological resources [Exhibit L]. FNAI has reported the following:

a. Element Occurrences

The Florida Natural Inventories reports several documented Element Occurrences of rare or endangered species within the vicinity of the property. [Exhibit L] Documented species are listed in Table 5. Documented habitat includes: Basin Marsh, Basin Swamp, Baygall, Blackwater Stream, Bottomland Forest, Depression Marsh, Mesic Flatwoods, Mesic Hammock, Pine Plantation, Sandhill, Sinkhole, Successional Hardwood Forest, Upland Hardwood Forest, Wet Flatwoods, Xeric Hammock, and Other Altered Landcover Types.

b. Likely and Potential Habitat for Rare Species

In addition to documented occurrences, other rare species and natural communities may be identified on or near the NLSF, such as Morningside Nature Center's listed and rare species [Exhibit W].

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

3. Florida Fish and Wildlife Conservation Commission

The Florida Fish and Wildlife Conservation Commission, Fish and Wildlife Research Institute (FWRI) reports numerous records of listed species occurrences or critical habitats within the confines of the property. This includes state and federally listed endangered or threatened species. [Exhibit M]

Other findings by the FWC include:

a. The property is located adjacent to and within multiple Strategic Habitat Conservation Areas for swallow-tailed kite and Cooper's hawk.
b. NLSF is located within an area of Species Richness.
c. Multiple Priority Wetlands are located on and in close proximity to NLSF.
d. FWC's response includes a map indicating multiple species locations.

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

The FWC recommends the review of management guidelines in the published FWC Gopher Tortoise Species Management Plan to guide management actions for the gopher tortoise (*Gopherus polyphemus*) on the forest. The FWC Gopher Tortoise Species Management Plan provides beneficial resource guidelines for habitat

management and monitoring of the gopher tortoise. For your reference, the FWC Gopher Tortoise Species Management Plan can be accessed at this web address: http://myfwc.com/wildlifehabitats/managed/gopher-tortoise/management-plan/

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

4. Game Species and Other Wildlife

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

NLSF provides habitat for many different species of wildlife. More common species include: white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo),* gray squirrel (*Sciurus carolinensis*), rabbit (*Sylvilagus spp*.), and migratory birds in season.

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

5. Survey and Monitoring

Species-specific surveys for state or federally listed wildlife species may be developed 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. FFS may seek assistance from universities, FWC and other agencies to conduct surveys.

a. Gopher Tortoises

An initial gopher tortoise burrow survey was done by FFS staff. Pod location and activity status are maintained in a GIS database. Future work may include sampling to determine baseline data on population size and monitoring over time. NLSF was ranked by FWC as a high priority on conservation lands for gopher tortoise population surveys. Future surveys will depend on resources and respective agency priorities in a given fiscal year. FFS will consult with FWC prior to any gopher tortoise population surveys to determine the recommended appropriate gopher tortoise survey methodology.

FFS may implement the use of management guidelines in the published FWC Gopher Tortoise Species Management Plan to guide management actions for the gopher tortoise on the area. Staff should make an effort to minimize impacts to

known burrows, whether active, inactive, or abandoned. Protecting burrows and tortoises during mechanical treatment is important and staff and mechanical equipment operators should use caution when working in areas where tortoises or burrows occur. Staff should locate burrows prior to any mechanical work and if possible, avoid mechanical work during September through October when Gopher tortoise hatchlings are most abundant and least visible (FWC 2012).

b. Listed Plant Species

There are two (2) plant species on the NLSF that are listed endangered, by the State, Florida toothache grass and Florida spiny pod.

New areas and appropriate habitat within NLSF are systematically searched for rare plant occurrence, and if found, are mapped with GPS after burns, before and after management activity or stochastic events (hurricanes). GIS shapefiles/coverages of listed populations are updated with new occurrence records regularly that include prior rare plant locations. All known locations of listed or rare flora are GIS mapped and location data are shared with FNAI. Future work may include submitting data to FNAI to enter into the State Natural Heritage database and the Florida Elements Occurrence database.

c. Other Rare Biota Surveys

Surveys are done as time and staffing allow. During routine management activities, incidental sightings of rare animals and plants are GIS mapped by FFS staff. High quality plant communities continue to have ad hoc surveys for both invasive weeds and listed plants. Newly acquired land parcels will be surveyed for listed species.

D. <u>Sustainable Forest Resources</u>

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

FFS will implement sound silvicultural practices, including harvesting, thinning, prescribed burning, and reforestation to establish a healthy forest with an age distribution that best duplicates natural conditions. Well timed and executed timber harvests play an integral role in the health of forest ecosystems by removing off-site trees to reestablish native species and thinning dense forest stands to improve understory habitat. This allows for less damaging prescribed burns and improved forest health.

The management of timber resources on the NLSF will not seek to maximize short-term economic revenue but rather to achieve a wide array of long-term public benefits, many of

which are intrinsic and not easily quantified. Good stewardship and resource sustainability are essential goals for any proposed silvicultural activity. The health of the forest ecosystem is paramount in importance.

E. Beaches and Dune Resources

No beaches or dunes occur on the NLSF.

F. Mineral Resources

There are no known commercial mineral deposits on NLSF.

G. Unique Natural Features and Outstanding Native Landscapes

Several unique natural features occur on this property, including three (3) major creeks and Newnans Lake. Within NLSF, there are numerous intact swamp habitats and an occasional sinkhole. An undisturbed low ridge mesic hammock occurs in the fire shadow between a large cypress swamp and Lakeridge Creek with a scattering of hickory (*Carya spp.*), blue beech (*Carpinus caroliniana*), wild olive (*Cartrema americana*), bluff oak (*Quercus austrina*), and swamp chestnut oak (*Quercus michauxii*). NLSF is part of a larger grouping of public and private conservation lands preserving over 10,000 acres around Newnans Lake leading from MNC up to the University of Florida's Austin Cary Forest.

H. Research Projects / Specimen Collection

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

All research to be considered on NLSF must be considered in accordance with the guidelines stated in the State Forest Handbook. Any requests for research should be submitted in writing to the appropriate field staff to be forwarded to the Forest Management Bureau for approval. Requests must include: a letter outlining the purpose, scope, methodology, and location of the proposed research. Requests are subject to review by FFS Foresters, Biologists, the Forest Health Section, and the Forest Hydrology Section, as appropriate. Authorization to conduct research will require that the investigator provide copies of any reports or studies generated from any research to the FFS and the NLSF staff. Other special conditions may be applicable and the authorization may be terminated at any point if the study is not in compliance.

I. Ground Disturbing Activities

Although the FFS's approach to handling ground disturbing activities is identified in other sections of this plan, the FFS's overall approach to this issue is summarized here. FFS recognizes the importance of managing and protecting sensitive resources and will take steps to ensure that such resources are not adversely impacted by ground disturbing activities. This includes areas such as known sensitive species locations; archaeological, fossil, and historical sites; ecotones, and wetlands.

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

V. Public Access and Recreation

The primary recreation objective is to provide the public with dispersed outdoor recreational activities that are dependent on the natural environment. FFS will continue to promote and encourage public access and recreational use by the public while protecting resources and practicing multiple-use management. Recreation on NLSF is still in the early stages of development. Recreational activities currently available, or forthcoming, on NLSF include hiking, nature study, picnicking, biking, wildlife photography, primitive camping, fishing, and hunting through specialized agency administered hunt events. NLSF is part of the FFS Trailwalker Program.

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

A. Existing

A wide variety of recreational opportunities are available at NLSF. Hiking, biking, picnicking, birding, and nature study can be enjoyed using existing service roads, old road beds, and established trails. NLSF is part of the FFS Trailwalker Program which promotes hiking various forest trails throughout the state. See [Exhibit D] for a map of the Facilities and Improvements.

a. Recreational Trails

Currently, there are two (2) designated hiking trails and one (1) bicycle trail on NLSF. The first hiking trail, the West Interpretive Trail, is three-quarters of a mile in length and winds through mesic flatwoods with a viewing opportunity of ongoing habitat restoration. The second hiking trail is two (2) miles long and leads hikers out and back from the Lake Pithlachocco Trailhead to the edge of Newnans Lake. The bicycle trail also takes riders to the lake's shoreline and back. The bike trail is 5.5 miles in length and also uses the Lake Pithlachocco Trailhead.

b. Camping

There are currently no designated established campsites on NLSF. Primitive camping may be allowed by special use permit.

c. Hunting and Fishing

Hunting on NLSF is currently FFS administered only and is not a FWC Wildlife Management Area. NLSF provides recreational hunting opportunities to disabled

veterans through the FFS's OOF Program. FWC officers are made aware of these planned hunts and encouraged to visit during all hunts.

Fishing is admissible on Newnans Lake and is regulated by FWC rules and regulations. Brim, catfish, bass, and specks are commonly caught at the lake. Some smaller creeks and streams flowing through the forest which feed into Newnans Lake may seasonally provide supplementary fishing opportunities to NLSF recreation users. Alachua County has two (2) parks on the lake with boat ramps providing boat access onto the lake.

d. Environmental Education/Ecotourism

The FFS is committed to educating the public about the unique habitats on the Newnans Lake. Staff conducted field trips and presentations on a variety of topics for the public, school groups, and various user groups. Outdoor education opportunities are created each year with annual State Forest Awareness Month and other social events.

e. Forest Office

The WaFC office is located on NLSF and serves as the forest headquarters. No new positions were acquired or buildings constructed since the state's acquisition of this forest.

B. Planned

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

1. Public Access and Parking

Primary access on the West Tract of the forest will remain at the West Trail parking area adjacent to State Road 26. Primary access onto the East Tract will be from the Lake Pithlachocco Trailhead east of State Road 26. FFS anticipates the construction of an associated vaulted restroom at this trailhead. Visitors will additionally have the option to access the forest by foot, if the MNC trail system is extended onto NLSF.

Additional access signage will be updated as needed.

a. **Recreational Trails**

Suitable locations are being explored for additional hiking trails. The construction, maintenance, and improvements of nature and hiking trails will be on-going. Future development of hiking trails will be designed and constructed with the intent to minimize impacts to onsite natural resources. The conservation of monetary maintenance costs will also be considered during trail conception. Trails will be planned to ensure hiker satisfaction regarding the diversity, wildlife, and beauty of the experience. Evaluate possible additional recreational opportunities, such as an

access point for the Potano Paddling Trail, or the circum-Newnans Lake hiking/biking trail.

b. **Hiking**
NLSF has three (3) planned hiking trails to add to the existing trails. The addition of all three (3) of the trails will be based on recreational usage and demand. The first trail will be an expansion of the West Trail. Adjacent to the existing trail is old farmed pasture where recent restoration work, including the planting of longleaf pine, has occurred. After a few years of growth, this expanse of NLSF will have matured and provide a scenic trail extension for recreational users.

The second trail addition to NLSF would consist of an extension of the MNC recreational trail from the adjacent property, expanding into the forest. The MNC trail, managed by MNC and the City of Gainesville, would stretch onto the forest north of the MNC property. Currently, this section of NLSF does not have public access. Therefore, by collaborating with the city to achieve extension of the MNC trail into NLSF, the joint venture would actualize two (2) positive outcomes. MNC will have the opportunity to expand their trail system, and the public would have more area to explore within NLSF.

The third planned hiking trail may be installed in the northwest portion of NLSF. This portion of the forest has an asphalt fitness trail on it; previously installed adjacent to DOC offices during their period of management. The trail is overgrown with vegetation. However, if public access to the trail can be accomplished in cooperation with the adjacent property managers, the route can then be cleared and redefined for user enjoyment.

c. **Biking**
NLSF, partnering with other agencies, may add additional biking/hiking trail that passes through the forest property as part of the larger circum-Newnans lake trail. The current trail route may be adjusted as needed based on changing water levels or forestry operations occurring on the forest.

d. **Equestrian**
There are currently no plans to establish equestrian trails on NLSF due to the limited acreage and layout of the forest boundary, as well as the close proximity of several correctional institutions. However, FFS may consider a new trail in the future and allow special use permits relating to equestrian uses on the forest for special events.

2. **Camping**
There are currently no plans to construct a developed campground on NLSF. Potential primitive camp sites will be evaluated.

3. **Kiosks**
There are currently two (2) kiosks on NLSF; one (1) at each trailhead. Each kiosk is

used for display and information for all recreational activities on the state forest. Each will be installed, replaced, or repaired as needed and will be a recurring project on NLSF.

4. **Environmental Education**
   At this time, only self-guided tours are available. If a need is determined in the future, NLSF may implement an environmental education program which may include guided tours, additional self-guided tours, and hands-on events.

5. **Bird Watching**
   A birding checklist for NLSF may be developed in the future. The local checklist will be established from observations from local biologists, staff, FWC, Alachua County Audubon, and volunteers.

6. **Recurring projects**
   Volunteers – Continued upkeep and marketing of volunteer programs
   Brochures – Establishment and re-prints of a NLSF brochure
   Special Events – Forest Awareness Month Events, Invader Raider Rally, OOF Hunts

   The FFS will handle permitting requests for recreational activities.

7. **Equestrian, Hunter, and Hiker Education**
   There is a need for educating the public on non-native invasive species, sustainable forestry, and history of the forest area. FFS will evaluate the best methods for communicating concerns and solutions to these user groups.

C. Hunter Access

Hunting on the forest is scheduled annually through a cooperative effort between the FFS and the FWC. All hunting activities on NLSF will occur through the agency administered OOF program.

NLSF continues to provide recreational hunting opportunities to disabled veterans through the FFS's OOF Program. The OOF hunts provide veterans with unique, specialized opportunities for recreation, rehabilitation, and socialization. These events typically occur during weekends and span approximately two (2) to three (3) days. NLSF will typically host two (2) to four (4) OOF events each year.

D. Education

FFS may create partnerships with local K-12 schools and/or universities for the development and implementation of educational opportunities on NLSF. Once developed, the Five-Year Outdoor Recreation Plan may lead more insight to management activities, as they pertain to future educational opportunities, that NLSF may provide to the public. Additionally, FFS intends to establish an educational program for the public which will highlight to visitors the natural environment and the conservation of NLSF.

Informational sources, such as brochures, interpretive signage, and handouts will increase public knowledge and support of the forest. In this capacity, the highest priority will be development of a full color NLSF brochure for distribution to the general public, and other forest brochures and pamphlets will be produced as needed.

The FFS will continue to develop and maintain nature trails at specific sites for the purpose of providing interpretations on forestry and ecosystem management of the resources. NLSF interpretive and informative materials will be disseminated mainly through kiosks and signage along forest trails. Displayed information along open trails may describe ongoing projects, or may elaborate upon unique forest features or specific flora and fauna common to the area.

Additionally, the WaFC office has resources and staff available to help with any questions the general public may have.

VI. Forest Management Practices

A. Prescribed Fire

Forest management practices on NLSF are important in the restoration and maintenance of forest ecosystems and provide a variety of socio-economic benefits to Floridians. Management practices on NLSF include a prescribed fire program which is an effective tool in controlling the growth of hardwood trees, stimulating the recovery of native herbaceous groundcover, and promoting the regeneration of native pines.

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

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

FFS has no fire towers, three (3) fire control tractor / plow units, the region 2 mitigation team, and various district personnel located at the WaFC headquarters, directly adjacent to NLSF. Additional support is available from Waldo in eastern Alachua County. Personnel and equipment stationed at NLSF will be used for pre-suppression practices, establishment of firebreaks, rehabilitation of existing firelines, construction of new firelines, maintenance of perimeter firebreaks, and prescribed burning.

The annual forest prescribed burning program produces multiple benefits. The purposes of prescribed burning on NLSF are to facilitate forest management operations; enhance wildlife and listed species habitat; decrease fuel loading; enhance public safety; and restore, maintain, and protect all native ecosystems, ecotones, and their ecological processes. FFS personnel are responsible for planning and implementing the annual prescribed burn program for NLSF, which will consist of growing and dormant season burns. An update to the Five-Year Prescribed Burning Management Plan is developed each year by FFS staff. All burns conducted on NLSF are executed by Florida Certified Prescribed Burn

Managers in accordance with F.S.-590.125 and F.A.C. 5I-2. 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.

According to FNAI, historic, fire dependent natural communities on NLSF are estimated to have occupied approximately 629 acres, and to have burned at approximately 2-4-year intervals, depending on the community. 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, NLSF will plan for 157 to 314 acres to be burned annually through prescribed fire to maintain the appropriate fire return intervals across the state forest. 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.

1. **Fire Management**
   FFS will develop a fire management plan that will serve as a working tool and an informational document for NLSF. The plan will provide guidelines regarding wildfire suppression and prescribed fire management. It will specify burn units, burn unit prescriptions, appropriate fire return intervals, and fire suppression planning. The plan may be reviewed and amended as necessary.

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

   a. **Prescribed Fire:** Prescribed fire is the most important land management tool, both ecologically and economically, for managing vegetation and natural communities and perpetuating existing wildlife populations in Florida. Forest operation records and staff experience should be combined with the FNAI inventory and assessment (2016) to identify areas that may require mechanical treatments in conjunction with prescribed fire to restore a more natural vegetative structure.

   b. **Burn Unit Plans:** Each prescribed fire will be conducted in accordance with FFS regulations and state law (Rule Chapter 5I-2 F.A.C., Chapter 590 F.S.) and have a burn unit plan (or prescription). Each prescription will contain, at a minimum, the information, as required by Section 590.125(3), F.S., needed to complete the FFS Prescribed Burn Plan Form FDACS 11461.

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

given to rotating burn units between dormant and growing season burns over time. Fire return intervals for a burn unit are recommended to fall within the natural, historic range for the dominant natural community or communities within a given burn unit.

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

B. Wildfires, Prevention, Fire / Prescribed Fire Strategies

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

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

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

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

1. Suppression Strategies

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

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

b. **Control** is defined as a suppression strategy where aggressive suppression tactics are used to establish firelines around a fire to halt its spread and to extinguish all hotspots. This alternative is used whenever there is a threat to human life, property, private lands, and/or critical natural or cultural resources. This strategy should also be used when the total district fire load dictates that crews not be involved with individual fires for any longer than absolutely necessary.

Appropriate suppression action will be that which provides for the most reasonable probability of minimizing fire suppression cost and critical resource damage,

consistent with probable fire behavior, total fire load, potential resource and environmental impacts, safety, and smoke management considerations. The Incident Command System (ICS) will be used for all suppression actions.

2. Smoke Management

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

3. Fire Breaks and Firelines

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

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

4. Sensitive Areas

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

5. Firewise Communities

Communities in wildfire prone areas must work together to be fully prepared for wildfire. A "Fire Adapted Community" incorporates people, buildings, businesses, infrastructure, cultural resources, and natural areas to prepare for the effects of wildfire. The Fire Adapted Community concept serves as an umbrella to the various programs that help communities become more fire adapted. The FFS has implemented the Fire Adapted Community concept for prevention statewide. Specifically, in the area adjacent to or nearby NLSF, efforts have included identifying Communities at Risk through the web-based South WRAP (Southern Area Wildfire Risk Assessment Portal) and working with communities to become Firewise.

6. Adjacent Neighbor Contacts

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

7. Post-Burn Evaluations

A post-burn evaluation is required for each wildfire and prescribed burn on the state forests to assess impacts on timber and habitat. Based on the evaluations, decisions will be made on timber salvage operations. A historical fire record for all fires and prescribed burns will be maintained. This will be accomplished using the burn plans of the state forest and through the maintenance of GIS data. These records are intended to provide data for future management decisions.

C. Sustainable Forestry & Silviculture

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

1. Strategies

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

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

2. Silvicultural Operations

Silvicultural operations on NLSF will be directed toward improving forest health, wildlife habitat, ecological and economical sustainability, as well as toward recovery from past management practices that are not in accordance with the objectives of this plan. Stands of off-site species with merchantable volume will be scheduled for harvest, followed by reforestation with the appropriate tree species. Herbicide applications or biomass harvest may be necessary to control woody competition and to re-establish desired natural species of both overstory and groundcover. Site preparation methods may include prescribed fire, mechanical vegetation control, and/or herbicide applications. Herbicides used will be registered for forestry use by the U.S. Environmental Protection Agency (EPA) and will not adversely affect water resources.

Approximately 125 acres of NLSF is composed of 30-40 year-old slash pine plantations. These stands were selectively thinned leaving approximately 50-60 basal area. Currently, FFS staff plans to retain the residual stand to achieve old growth habitat and therefore provide a pleasing environment for public recreation. Longleaf pine may be hand-planted in gaps larger than a quarter to a half acre.

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

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

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

3. Forest Inventory

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

Timber / forestry resources available on the property include loblolly, longleaf, and slash pine, and mixed hardwoods.

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.

D. Non-Native Invasive Species Control

FFS employees continually monitor the forest for non-native invasive species while conducting management activities. FFS will locate, identify, and apply control measures with the intent to eradicate or control non-native invasive species.

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

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

FFS will enlist support from FWC in an effort to control non-native invasive animals. Feral hogs (*Sus scrofa*) have been present on some tracts of NLSF in the past, but are not known to occur in any substantial numbers at this time. FWC has issued a feral hog control permit to FFS for all state forests and FFS will allow for feral hog removal on NLSF through trapping and hunting if necessary.

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

Table 6. Non-Native Invasive Plant/Animal Species Occurring on NLSF

Invasive Plant / Animal Species	Population Status (Stable, Increasing, Decreasing, Eradicated)	Impacted Acres	Treatment Strategy
Coral ardisia *Ardisia crenata*	Increasing	35	Herbicide & hand removal
Chinese Tallow *Triadica sebifera*	Increasing	20	Herbicide & hand removal
Camphor Tree *Cinnamomum camphora*	Increasing	15	Herbicide
Skunk Vine *Paederia foetida*	Increasing	3	Herbicide
Small-leaf spiderwort *Tradescantia fluminensis*	Stable	3	Herbicide
Natal grass *Melinis repens*	Increasing	2	Herbicide & hand removal
Tropical soda apple *Solanum viarum*	Increasing	2	Herbicide & hand removal
Japanese Climbing Fern *Lygodium japonicum*	Increasing	1	Herbicide
Paper Mulberry *Broussonetia papyrifera*	Increasing	1	Herbicide
Mimosa *Albizia julibrissin*	Increasing	0.5	Herbicide & hand removal
Wild Taro *Colocasia esculenta*	Stable	0.5	Herbicide & hand removal
Chinese privet *Ligustrum sinense*	Stable	0.5	Herbicide
Japanese honeysuckle *Lonicera japonica*	Stable	0.5	Herbicide
Peruvian Primrose Willow *Ludwigia peruviana*	Increasing	0.5	Herbicide
Sword Fern *Nephrolepis cordifolia*	Decreasing	0.5	Herbicide
Catclawvine *Macfadyena unguis-cati*	Increasing	0.2	Herbicide
Caesar's weed *Urena lobata*	Stable	0.2	Herbicide & hand removal
Cogon grass *Imperata cylindrica*	Stable	0.1	Herbicide
Chinaberry *Melia azedarach*	Stable	0.1	Herbicide
Wax begonia *Begonia cucullata*	Stable	0.1	Herbicide
Feral Hog ***Sus scrofa***	Low/Stable		Consult with FWC when needed

The most significant upland non-native invasive plants needing control on NLSF are Chinese tallow, camphor, skunk vine, Japanese climbing fern, and coral ardisia, based on current acreage, invasiveness, and the potential for effective control. Large populations occur throughout the forest, including boundary sites next to neighborhoods, boundary sites next to institutional residential facilities, and scattered patches found dispersed along creeks and wetland transitional areas. Control will include in-house herbicide application, contracts funded through FFS appropriation or the FWC Invasive Plant Management program, and volunteer hand removal using FFS volunteers and volunteers from the Great Invader Raider Rally. To date, control has been initiated on known heavily infested sites across the forest.

All species being managed are Florida Exotic Pest Plant Council (FLEPPC) Category 1 or 2 species. Staff also scouts and manages for Cooperative Invasive Species Management Areas (CISMA) and Early Detection Rapid Response (EDRR) species when found.

E. <u>Insects, Disease and Forest Health</u>

Currently, there are no unusual insect or disease problems on NLSF. In the event of an outbreak of any disease or insects, consultation with the Forest Management Bureau's Forest Health Section will be sought to formulate an appropriate and effective response.

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

As a result, prior to conducting any arthropod control activities on NLSF, 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 NLSF. This public land control plan must be in compliance with FDACS guidelines and using the appropriate FDACS form. The plan must then be approved and mutually adopted by the county, FFS, and FDACS, prior to initiation of any mosquito control work. Should the local mosquito control district not propose any mosquito control operations on the property, no arthropod control plan is required. [Exhibit V]

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

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

1. Herbicide applications
2. Restoration activities
3. Tree reforestation
4. Timber harvesting

5. Biological assessments and mapping
6. Boundary/State Forest Surveys

VII. Proposed Management Activities for Natural Communities

In 2016, FNAI completed an inventory and natural community mapping project on NLSF and a historic natural community type map was created [Exhibit Q]. Current natural communities and cover types can be found in [Exhibit P].

Table 7. Natural Communities / Historical & Current Conditions

Historical Natural Community Type	Historic Natural Community (acres)	Current Habitat Condition Status (acres*)				
		Intact and/or Desired Conditions Exist	Restoration Community (in progress)	Successional Hardwood Forest	Pine Plantations	Altered Other **
Basin Marsh	11	11				
Basin Swamp	254	254				
Baygall	10	10				
Bottomland Forest	76	75				1
Depression Marsh	3	3				
Mesic Flatwoods	341	55	16	19	124	127
Mesic Hammock	44	39			4	1
Sandhill	113	4	10		3	96
Sinkhole	1	1				
Upland Hardwood Forest	38	37				1
Wet Flatwoods	160	54	95			11
Xeric Hammock	2	2				
Total	1,053	545	120	19	131	237

* Note rounding errors exist in "Current" category totals
** See Table 8

Table 8. Other Altered Landcover Types Found on NLSF

Altered Landcover Type*	Current Acres Mapped
Developed	15
Abandoned Field/Pasture	82
Artificial Pond	1
Clearing/Regeneration	10
Borrow Area	15
Road	5
Utility Corridor	8
TOTAL	136

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

For the purposes of this management plan, restoration is defined as the process of returning ecosystems to the appropriate structure and species composition, based on soil type. Management during this ten-year period will begin with a forest wide assessment of the fuel loading, timber densities, reforestation needs, and groundcover in order to develop a five-year comprehensive operational plan for prescribed burning and other operational plans across the forest. Strategies may include thinning of pine plantations, mowing or chopping in areas of heavy fuel buildup, application of both dormant and growing season fires, and/or the use of herbicides to control hardwoods and/or hardwood sprouting. Fire return intervals are included as a guide (Table 9) and may vary depending upon specific conditions. The intention is to use prescribed fire in a manner and frequency that will attain the desired goals. Prescribed fire frequency and timing is generally adjusted depending upon the conditions of the specific area.

Table 9. Prescribed Fire Interval Guide on NLSF

Habitat Type	Historic Fire Return Intervals*	NLSF Fire Frequency Goal (Local)	Comments
Basin Marsh	N/A	N/A	
Basin Swamp	N/A	N/A	
Baygall	N/A	N/A	Periphery for wet flatwoods – 1 to 4
Blackwater Stream	N/A	N/A	
Bottomland Forest	N/A	N/A	
Depression Marsh	1 to 4	2 to 5	
Mesic Flatwoods	2 to 4	1 to 3	
Mesic Hammock	N/A	N/A	
Pine Plantation	N/A	2 to 4	
Sandhill	1 to 3	1 to 3	Includes Restoration Sandhill
Sinkhole	N/A	N/A	
Successional Hardwood Forest	2 to 4	2 to 4	
Upland Hardwood Forest	N/A	N/A	
Wet Flatwoods	1 to 3	2 to 5	Includes Restoration Flatwoods
Xeric Hammock	3 to 10	N/A	
Other altered Landcover Types	1 to 2	1 to 2	Abandoned Fields and Clearings Will be Burned

* As determined by FNAI

The following community descriptions, existing condition descriptions, and management recommendations are taken from a 2016 FNAI mapping project report and the Guide to the Natural Communities of Florida (FNAI 2010), as well as from the knowledge and experience gained by FFS during forest inventory efforts and routine field work on NLSF.

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

A. Basin Marsh

Description:

Basin marshes are depressional, non-forested wetlands that are typically large and/or embedded in a non-pyrogenic community and thus are not heavily influenced by frequent fires in the surrounding landscape. The soils are generally acidic, nutrient-poor peats overlying an impervious soil layer. This community type is dominated by herbs or occasionally shrubs that can withstand inundation for most or all the year. Occasional fires within the basin marshes are necessary to remove encroaching woody vegetation and reduce the buildup of organic soils.

Trees are sparse, usually only occupying higher areas in the marsh or around the edge. These can include typical swamp species such as pond cypress (*Taxodium ascendens*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), red maple (*Acer rubrum*), loblolly bay (*Gordonia lasianthus*), swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), or slash pine (*Pinus elliottii*).

In the 1937 aerial photographs, basin marshes appear as a smooth or dark signature, indicating an herbaceous or flooded community. These are separated from the pine dominated uplands by a band of hardwoods.

Current Conditions:

Two basin marshes are mapped on NLSF on the eastern side of the property in rounded depressions that are hydrologically connected via forested wetlands to Newnans Lake. These marshes are relatively small and are surrounded by a fringe of baygall, basin swamp, and mesic hammock vegetation that would act as a barrier to most fires. Although the uplands on NLSF were all used for till agriculture and grazing, many of the deeper wetlands on the state forest don't have evidence of ditching or draining, including these two wetlands.

The northern basin marsh on NLSF generally meets the desired future conditions. The vegetation is dominated by hydrophytic graminoids, particularly maidencane (*Panicum hemitomon*) and other herbs. Woody vegetation is mainly restricted to the edge of the community. However, the northern marsh contains a dense stand of young loblolly bays that appear to be growing on a substrate of dense, accumulated peat. The southern marsh, which appears herbaceous on the 1937 aerial photograph, is now more similar to a developing swamp, dominated by shrubs and small trees such as elderberry (*Sambucus nigra* ssp. *canadensis*). The marsh was flooded and did not have a cover of graminoids, instead dominated by small floating plants such as duckweed (*Lemnaceae*) and a few emergent broadleaf plants, lizard's tail (*Saururus cernuus*) and bandana-of-the-Everglades (*Canna flaccida).*

Fire Regimes:

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

duff buildup, and because of the short distance to State Road 26, prescribed fire will be challenging to reintroduce to the wet communities surrounding this site. For the southern site, when the surrounding uplands are burned, the fire will be allowed to burn towards the wetland ecotone.

Management Needs:

Natural fires are presumed to have rarely burned across the deep marshes on the property; they likely extinguished just within shallow peripheral areas or the adjacent ecotonal hardwood areas. The lack of fire in recent decades has led to an increasingly weedy and overgrown hardwood area that blocks the occasional fires that might burn otherwise burn the organic soils of the basin marshes. Restoring historic hydrological regimes, removing planted pines, and applying fire to adjacent uplands (where appropriate) is a recommended focus for forest management. Feral hogs (*Sus scrofa*) have not been observed on NLSF. If feral hogs become established, FFS should move quickly to get them removed.

B. Basin Swamp

Description:

Basin swamps are forested depressions that are typically large and/or embedded in a non-pyrogenic community and thus are not heavily influenced by frequent fires in the surrounding landscape. The soils are generally acidic, nutrient-poor peats overlying an impervious soil layer. This community type is dominated by hydrophytic trees and shrubs that can withstand inundation for most or all of the year, including bald (or pond) cypress (*Taxodium distichum*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), and fetterbush (*Lyonia lucida*). Slash pine (*Pinus elliottii*) may infrequently be found on hummocks within the swamp. Basin swamps have variable shrub layers and sparse to dense herbaceous species cover. A mature canopy is usually closed and dominated by pond cypress, swamp tupelo, slash pine, and to a lesser extent, red maple (*Acer rubrum*), green ash (*Fraxinus pennsylvanicus*), loblolly bay (*Gordonia lasianthus*), swamp bay (*Persea palustris*), and sweetbay (*Magnolia virginiana*). In most cases, shrubs do not form a dense layer below the canopy or in the ecotones of the swamps. Shrubs are typically scattered throughout the swamp, although some areas may have heavier concentrations. Subcanopy tree and shrub species primarily include fetterbush, large gallberry (*Ilex coriacea*), sweetbay, pop ash (*Fraxinus caroliniana*), Virginia willow (*Itea virginica*), parsley hawthorn (*Crataegus marshallii*), swamp rose (*Rosa palustris*), common buttonbush (*Cephalanthus occidentalis*), and swamp dogwood (*Cornus foemina*), as well as canopy and subcanopy saplings. In densely forested portions of basin swamps, herbs are sparse and consist mostly of netted chain fern (*Woodwardia areolata*), Virginia chain fern (*W. virginica*), royal fern (*Osmunda regalis*), cinnamon fern (*O. cinnamomea*), and lizard's tail (*Saururus cernuus*). Epiphytes and vines are common and include Spanish moss (*Tillandsia usneoides*), resurrection fern (*Pleopeltis polypodioides*), poison ivy (*Toxicodendron radicans*), laurel greenbrier (*Smilax laurifolia*), and climbing hydrangea (*Decumaria barbara*).

In the 1937 aerial photographs, basin swamps are often difficult to distinguish from adjacent bottomland forests and upland hardwood forests. These swamps were primarily identified through current photographs.

Current Conditions:
Basin swamps are the second largest community, and the largest wetland community on NLSF. There are several large basin swamps concentrated near Newnans Lake. One other swamp is located near the center of the forest north of MNC, forming the headwaters of a small stream that flows eastward, eventually emptying into a basin swamp adjacent to Newnans Lake. Smaller basin swamps are also embedded in areas of bottomland forest throughout the forest, scattered along the boundary fragmented from larger basin swamps the forest boundary crosses. In most swamps, the canopy is dense and consists of bald cypress, swamp tupelo, red maple, sweetgum (*Liquidambar styraciflua*), sweetbay, slash pine, loblolly pine (*Pinus taeda*), and swamp laurel oak (*Quercus laurifolia*). The understory consists of young canopy species, as well as loblolly bay, dahoon (*Ilex cassine*), common buttonbush (*Cephalanthus occidentalis*), St. Andrew's cross (*Hypericum hypericoides*), swamp doghobble (*Leucothoe racemosa*), wax myrtle (*Myrica cerifera*), swamp bay, sawtooth blackberry (*Rubus argutus*), bluestem palmetto (*Sabal minor*), elderberry (*Sambucus nigra* ssp. *canadensis*), highbush blueberry (*Vaccinium corymbosum*), Virginia willow, fetterbush, and American elm (*Ulmus americana*).

Herbs are sparse, and often limited to openings. These include Pennsylvania bittercress (*Cardamine pensylvanica*), sedges (*Carex* spp.), southern wood fern (*Dryopteris ludoviciana*), marshpennywort (*Hydrocotyle* spp.), manyflower marshpennywort (*Hydrocotyle umbellata*), cinnamon fern, maidencane (*Panicum hemitomon*), dock (*Rumex* sp.), lizard's tail, maiden fern (*Thelypteris* spp.), clustered sedge (*Carex glaucescens*), string lily (*Crinum americanum*), royal fern, green arrow arum (*Peltandra virginica*), netted chain fern, and Virginia chain fern. Vines such as climbing hydrangea, eastern poison ivy, cat greenbrier (*Smilax glauca*), crossvine (*Bignonia capreolata*), and muscadine (*Vitis rotundifolia*) are occasional, and Spanish moss is a common epiphyte in the cypress canopy.

Most of the basin swamps occurring on NLSF meet the desired future conditions. Disturbances are primarily found around the edges of these communities where silviculture and fire exclusion have disrupted the natural ecotone and possibly are impacting the amount of water flow and quality. The non-native invasive coral ardisia (*Ardisia crenata*) and Japanese climbing fern (*Lygodium japonicum*) are found occasionally in basin swamps on NLSF.

Fire Regimes:
Fire intervals in basin swamps are highly variable. The lowest portions of basin swamps rarely, if ever, burn. Graminoid-dominated ecotones often burn in conjunction with the adjacent uplands, and these may burn as frequently as every 2 to 5 years.

Management Needs:
Many of the ecotones between basin swamps and upland communities have been disturbed by past silvicultural activities. Restoring historic hydrological regimes and converting planted pines to longleaf pine are a recommended focus for forest management. For some of the smaller swamps, applying fire to adjacent, historically pyrogenic uplands are desired. When possible, prescribed fires on adjacent uplands will be allowed to burn into NLSF's

basin swamp and extinguish naturally. Where the shape of the surface soil is relatively unaltered, these practices will assist in the recovery to grass-dominated ecotones while also reducing heavy fuel loads that may facilitate catastrophic wildfires during drier years. Entry of occasional fires in the basin swamps is necessary to maintain cypress and pine components. Non-native, invasive plant and animal species will continue to be monitored and treated when found.

C. Baygall

Description:

Baygall is a closed canopy evergreen forest that can develop on slopes with seepage from surrounding uplands or in basins where high water tables maintain saturated conditions. Soils are acidic and generally composed of peat.

Characteristic canopy trees of baygalls include loblolly bay (*Gordonia lasianthus*), sweetbay (*Magnolia virginiana*), swamp bay (*Persea palustris*), pond pine (*Pinus serotina*), and slash pine (*Pinus elliottii*). Common shrubs and small trees include fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), large gallberry (*Ilex coriacea*), and highbush blueberry (*Vaccinium corymbosum*). A dense overstory and low light levels typically restrict development of herbaceous plants. However, herbs such as Virginia chain fern (*Woodwardia virginica*), beaksedges (*Rhynchospora* spp.), sedges (*Carex* spp.), sphagnum moss (*Sphagnum* spp.), Carolina redroot (*Lachnanthes caroliniana*), and cinnamon fern (*Osmunda cinnamomea*) may be present. Epiphytes are infrequent to absent. Vines are found occasionally and may include laurel greenbrier (*Smilax laurifolia*) and muscadine (*Vitis rotundifolia*).

On the 1937 geo-rectified photographs, baygall appears as a dark grey signature that is almost indistinguishable from the adjacent upland hardwood forest signature. Delineation of this community was primarily from ground truthed points. Likewise, small baygall inclusions may have been present in the wet flatwoods on the western side of the forest, but are not clearly defined on the aerial photograph.

Current Conditions:

Baygall is mapped at a single location on NLSF. This area is a broad transition area from a historic sandhill to a large basin swamp and upland hardwood forest. Characteristic canopy trees of baygall on the forest include loblolly bay, sweetbay, slash pine, loblolly pine, and swamp laurel oak (*Quercus laurifolia*). The subcanopy and shrub layers are moderately dense and consist of smaller canopy trees, as well as dahoon (*Ilex cassine*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), swamp bay, fetterbush, wax myrtle, large gallberry, sawtooth blackberry (*Rubus argutus*), swamp doghobble (*Leucothoe racemosa*), coral ardisia (*Ardisia crenata*), and Chinese tallow (*Triadica sebifera*). Herbs are sparse on the thick layer of duff and peat and include cinnamon fern, royal fern (*Osmunda regalis* var. *spectabilis*), sphagnum moss, netted chain fern (*Woodwardia areolata*), and Virginia chain fern. Vines of yellow jessamine (*Gelsemium sempervirens*), greenbrier (*Smilax* spp.), and muscadine (*Vitis rotundifolia*) are common throughout. The baygall is often intermediate to upland hardwood forest, with increasing frequency of species such as sweetgum (*Liquidambar styraciflua*) and southern magnolia (*Magnolia grandiflora*).

The baygall on NLSF is generally in a desirable condition. Pine tree density may be unnaturally high due to the conversion of nearby lands to commercial pine production. The 1968 aerial photograph shows an old trail leading through this community, but there are no other obvious past disturbances.

Fire Regimes:
Baygall should burn infrequently, perhaps only a few times each century in the deepest baygalls. Although the saturated soils and humid conditions within baygalls typically inhibit fire, droughts may create conditions that allow them to burn catastrophically. These fires not only destroy the canopy, but also may ignite the deep peat layers that can smolder for weeks, or even months. The baygall on NLSF is in the critical smoke sensitive area of State Road 26.

Management Needs:
The existing baygall on NLSF is fragmented by a boundary. The sandhill/baygall area to the west is in the optimal boundary. Ardisia control is an ongoing focus. Other management should focus on maintaining historically occurring baygall. Avoid any further hydrologic alterations, such as the creation of ditches or roads. Where practical, restore natural hydrology and limit mechanical soil disturbance in ecotones between baygall and the adjacent uplands. Non-native invasive plants and animal species will continue to be monitored and treated when found.

D. Blackwater Stream

Description:
Blackwater streams are watercourses that typically flow through forested communities. Tannins derived from swamps and marshes cause the water to be dark brown and often acidic.

Blackwater streams are mostly free of vegetation except for occasional goldenclub (*Orontium aquaticum*), submersed macrophytes, and algae. Because of its narrow width, the canopy is partially closed over a majority of the system. Common bottomland forest species dominate, including live oak (*Quercus virginiana*), swamp laurel oak (*Q. laurifolia*), sweetbay (*Magnolia virginiana*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), sweetgum (*Liquidambar styraciflua*), bald cypress (*Taxodium distichum*), and red maple (*Acer rubrum*). A subcanopy of younger canopy species is present along the riverbank. Understory species composition is as variable as the canopy, with shrubs being the dominant component. Shrubs include saw palmetto (*Serenoa repens*), American beautyberry (*Callicarpa americana*), wax myrtle (*Myrica cerifera*), American hornbeam (*Carpinus caroliniana*), white fringetree (*Chionanthus virginicus*), titi (*Cyrilla racemiflora*), Gulf sebastian bush (*Sebastiania fruticosa*), Carolina ash (*Fraxinus caroliniana*), Elliot's blueberry (*Vaccinium elliottii*), and highbush blueberry (*V. corymbosum*), among others. Herbs along the stream bank are generally sparse but may be dense in areas that receive sufficient amounts of sunlight. Species may include woods grass (*Oplismenus hirtellus*), woodoats (*Chasmanthium laxum*), and St. John's worts (*Hypericum* spp.). Epiphytes are infrequent to occasional and include Spanish moss

(*Tillandsia usneoides*), resurrection fern (*Pleopeltis polypodioides*), and ball moss (*T. recurvata*). Vines are infrequent to common and include muscadine (*Vitis rotundifolia*) and poison ivy (*Toxicodendron radicans*).

Current Conditions:
Sunnyland Creek, Lake Ridge Creek, and Lake Forest Creek flow through the forest into Newnans Lake. Sunnyland Creek originates in a basin swamp located near the middle of the forest and then flows through a narrow, often steep-banked upland hardwood forest, flows through a culvert under State Road 26, then broadens into a rich bottomland forest where the stream forms multiple braided channels and joins with Lake Ridge Creek and Lake Forest Creek, smaller streams originating off property. The streams drain into a large basin swamp connected to Newnans Lake. The closed upland hardwood forest and bottomland forest canopy obscures the outline of the streams.

The blackwater streams on NLSF are mostly in desired future conditions. The narrow stream beds are generally one to two meters wide with patches of golden club and small, grassy areas along the edge with millet beaksedge (*Rhynchospora miliacea*). Disturbances are limited to the conversion of adjacent land to agriculture and development that impact water quality. Other stream channels show a combination of healthy hydrology, some channelization, or scouring and deepening of the channel caused by increased runoff from the surrounding land uses.

Fire Regimes:
Fire is not a component of this community. The steep upland hardwood slopes and wet bottomland forest soils would prevent most fires from impacting the stream banks.

Management Needs:
Management activities for blackwater streams on Newnan's Lake State Forest should focus on maintaining natural hydrologic patterns and monitoring water quality. Non-native invasive plants will be addressed as needed. Coral ardisia is present in Sunnyland Creek and Lake Ridge Creek. Chinese tallow and Japanese climbing fern are concerns in future years.

E. <u>Bottomland Forest</u>

Description:
Bottomland forests are closed canopy forests of mixed hardwood species found in situations intermediate between swamps and uplands. These communities are less frequently inundated than swamps and dry out during the dry season. The dense canopy maintains relatively high humidity levels; thus fires are a rare occurrence. Bottomland forests should have a closed canopy of mixed hardwoods dominated by swamp laurel oak (*Quercus laurifolia*), American elm (*Ulmus americana*), swamp tupelo (*Nyssa sylvatica* var. *biflora*), green ash (*Fraxinus pennsylvanica*), red maple (*Acer rubrum*), swamp chestnut oak (*Quercus michauxii*), water oak (*Q. nigra*), sweetgum (*Liquidambar styraciflua*), and water locust (*Gleditsia aquatica*). The subcanopy should be moderately dense and consist of dahoon (*Ilex cassine*), swamp dogwood (*Cornus foemina*), cabbage palm (*Sabal palmetto*), muscle wood (*Carpinus caroliniana*) and young canopy saplings.

The shrub layer should be open to moderately dense and is typically dominated by bluestem palmetto (*Sabal minor*), wax myrtle (*Myrica cerifera*), yaupon (*Ilex vomitoria*), and buttonbush (*Cephalanthus occidentalis*). Herbs are sparse due to the closed canopy, but typically include are wood oats (*Chasmanthium* spp.), millet beaksedge (*Rhynchospora miliacea*), lizard's tail (*Saururus cernuus*), swamp leather flower (*Clematis crispa*), royal fern (*Osmunda regalis*), cinnamon fern (*O. cinnamomea*), and Virginia chain fern (*Woodwardia virginica*). Vines should be common and consist of rattan vine (*Berchemia scandens*), poison ivy (*Toxicodendron radicans*), peppervine (*Ampelopsis arborea*), catbriers (*Smilax* spp.), and climbing hydrangea (*Decumaria barbara*).

On the 1937 geo-rectified photographs, bottomland forest can be distinguished from adjacent basin swamp by the less uniform appearance of the canopy, and from adjacent pine flatwoods communities by the denser canopy resulting in a darker signature.

Current Conditions:
The largest area of bottomland forest occurring on NLSF is located in the southeastern corner where Sunnyland Creek and Lake Ridge Creek flow into a large basin swamp. A basin swamp and pine flatwoods mosaic also occupies lower areas on the western side of the forest flowing into the basin swamp north of MNC. Currently, southeastern bottomland seems to be similar to the desired future condition in excellent condition. Active eagle nest AL038 is in this area. The other bottomland area is in good hydrological condition, but has the potential for non-native invasive plant problems.

Soil conditions range from dry to shallowly flooded, but are generally not mucky. The canopy is moderately dense, with scattered open areas and consists of red maple, sweetgum, sweetbay (*Magnolia virginiana*), swamp tupelo, green ash, sugarberry (*Celtis laevigata*), slash pine (*Pinus elliottii*), loblolly pine (*Pinus taeda*), swamp laurel oak, swamp chestnut oak, and live oak (*Quercus virginiana*). Camphor tree (*Cinnamomum camphora*) and Chinese tallow (*Triadica sebifera*) are present as mature trees, shrubs, and in the seed bank. Shrubs and small trees form an open understory comprised of young canopy species, plus American hornbeam, dahoon, American elm, American beautyberry (*Callicarpa americana*), common buttonbush, wax myrtle, red cedar (*Juniperus virginiana*), fetterbush (*Lyonia lucida*), swamp bay (*Persea palustris*), and water oak. Herbs are sparse and include southern grape-fern (*Botrychium biternatum*), sedge (*Carex* sp.), longleaf woodoats (*Chasmanthium laxum* var. *sessiliflorum*), marshpennywort (*Hydrocotyle* spp.), woodsgrass (*Oplismenus hirtellus*), pink woodsorrel (*Oxalis debilis* var. *corymbosa*), Florida betony (*Stachys floridana*), lizard's tail, false rein orchid (*Habenaria* spp.), and netted chain fern (*Woodwardia areolata*). Vines are occasional and include crossvine (*Bignonia capreolata*), saw greenbrier (*Smilax bona-nox*), and grape (*Vitis* spp.).

Disturbances to this community are primarily on the western side of the forest, where past clearing, ditching, borrow pit construction, and fire exclusion have impacted the surrounding pine flatwoods. A utility corridor and an elevated vehicle trail run through one area of bottomland forest.

Fire Regimes:
Fire is not required to maintain this community. Fires are rare in bottomland forest, occurring only during times of extreme drought.

Management Needs:
Restoration projects should focus on maintaining current conditions, monitor water quality parameters (such as increased acidity due to surrounding pine plantation), and restoring the surrounding uplands to upland hardwood forest and pinelands.

F. Depression Marsh

Description:
Depression marshes are isolated, non-forested wetland basins that are imbedded in a pyrogenic matrix community such as pine flatwoods or sandhill. These marshes typically have concentric zones of vegetation related to the length of hydroperiod and depth of flooding. Depression marshes are distinguished from basin marshes principally by their landscape position which subjects them to more frequent fires.

Trees are generally sparse or absent. The herbaceous layer is moderate to dense, especially where fire frequency and woody plant mortality is high. Typical species include graminoids such as maidencane (*Panicum hemitomon*) and sawgrass (*Cladium jamaicense*), flag species such as pickerelweed (*Pontederia cordata*) and bulltongue arrowhead (*Sagittaria lancifolia*), and floating aquatics such as white waterlily (*Nymphaea odorata*). Peelbark St. John's wort (*Hypericum fasciculatum*) frequently forms a zone around the edge of the marsh along with herbs such as beaksedges (*Rhynchospora* spp.), Elliott's yellow-eyed grass (*Xyris elliottii*), blue maidencane (*Amphicarpum muhlenbergianum*), fringed yellow-eyed grass (*X. fimbriata*), pipeworts (*Eriocaulon* sp.), and Baldwin's spikerush (*Eleocharis baldwinii*).

Depression marshes often burn with the surrounding landscape and are seasonally inundated. The deepest zones may have a peat substrate and a continuous layer of sphagnum moss, while shallower zones have a sandy substrate.

Current Conditions:
Four depression marshes are mapped at NLSF, all located in highly altered communities. Vegetation around the uppermost, non-inundated portion of the marsh includes scattered trees and shrubs of red maple (*Acer rubrum*), sweetgum (*Liquidambar styraciflua*), loblolly pine (*Pinus taeda*), cabbage palm (*Sabal palmetto*), water oak (*Quercus nigra*), bedstraw St. John's wort (*Hypericum galioides*), and sawtooth blackberry (*Rubus argutus*). Bunches of bluestem grasses (*Andropogon* spp.) occupy the shallower edges, while the deeper center contains soft rush (*Juncus effusus* ssp. *solutus*) and maidencane (*Panicum hemitomon*).

The depression marshes at NLSF are in poor to fair condition. Prior clearing and conversion to agriculture in the surrounding uplands have limited fire and contributed to a weedy flora. Some of these marshes are probably shallow sinkholes, and the depression marsh in the southeastern pine plantation area has been reduced in size by planted pines.

Fire Regimes:
Frequency of fire in depression marshes is dependent on the fire return interval of the surrounding community. Fire is important in limiting hardwood encroachment and peat buildup, while encouraging herbaceous growth in depression marshes.

Management Needs:
Depression marshes are critical habitat for ephemeral pond breeding amphibians. Restoration actions to reverse the undesirable condition of NLSF's depression marshes is necessary. In addition to the four (4) historically mapped depression marshes, breeding habitat for these amphibians may also occur in an area just north of MNC in a site historically classified as mesic flatwoods. The current condition map shows this site as a 14 acre borrow area surrounding a one (1) acre artificial pond. Frog call surveys and close observation of the hydroperiod are recommended.

Management of the depression marsh on NLSF should focus on allowing fires from the surrounding landscape to burn into the marsh and extinguish naturally. Firebreaks should be avoided as they may damage the herbaceous ecotone to the marsh. If prescribed fire alone is not opening up the canopy, girdling or other techniques may be necessary to daylight the wetlands. The removal of feral hogs (*Sus scrofa*) may be desirable in areas where wetlands are being impacted. Hydrology projects should focus on monitoring water quality parameters.

G. Mesic Flatwoods (Including Restoration Areas)

Description:
Mesic flatwoods consist of even and uneven-aged longleaf pine (*Pinus palustris*). Slash pine (*Pinus elliottii*) is also present, but is usually more frequent in wetter areas (wet flatwoods). There is little or no subcanopy and very few tall shrubs, but a dense ground cover of herbs and short shrubs is typically present. The latter help maintain community structure by fueling growing-season fires. Common shrubs include saw palmetto (*Serenoa repens*), coastalplain staggerbush (*Lyonia fruticosa*), gallberry (*Ilex glabra*), wax myrtle (*Myrica cerifera*), tarflower (*Bejaria racemosa*), dwarf huckleberry (*Gaylussacia dumosa*), blue huckleberry (*Gaylussacia frondosa* var. *tomentosa*), shiny blueberry (*Vaccinium myrsinites*), running oak (*Quercus elliottii*), and dwarf live oak (*Q. minima*). Mesic flatwoods are noted for their herbaceous diversity, including many rare species. Herbaceous species include wiregrass (*Aristida stricta* var. *beyrichiana*), arrowfeather threeawn (*A. purpurascens*), bottlebrush threeawn (*A. spiciformis*), lopsided Indiangrass (*Sorghastrum secundum*), witchgrasses (*Dichanthelium* spp.), beaksedges (*Rhynchospora* spp.), queensdelight (*Stillingia sylvatica*), narrowleaf silkgrass (*Pityopsis graminifolia*), and Curtiss' dropseed (*Sporobolus curtissii*).

The ecotone between mesic flatwoods and wetland communities is an important area for many rare species and is maintained with frequent, low-intensity, fires, typically every 2-4 years. Soils are mainly in the spodosol family, bearing a spodic horizon (i.e., an organic hardpan) that develops under poorly drained conditions. These low pH soils are characterized by low levels of nutrients and organic matter. Flatwoods are the matrix

community for isolated wetlands like cypress domes and depression marshes, all connected together hydrologically through sheet-flow.

Current Conditions:
Mesic flatwoods is the largest historical community on NLSF, although there are few remaining examples of intact groundcover or mature longleaf pines. Around 84% of the historic acreage was cleared prior to 1937 and converted to pastures, agriculture, borrow areas, and slash pine plantations. The remaining mesic flatwoods have been logged and suffered from fire exclusion over the last century. The historic longleaf pine canopy has been largely replaced with slash and loblolly pine; a very few scattered longleaf pines still remain. Areas where groundcover was cleared in the distant past, but where a pine canopy has been re-established, are referred to as "restoration" mesic flatwoods. These may require more intensive restoration techniques to return the area to a more natural community structure and composition.

Slash pine is the dominant overstory species within the mesic flatwoods and restoration areas; loblolly pine (*Pinus taeda*) is present in some locations. The natural mesic flatwoods have a few scattered longleaf pines. Pine basal area is 10-60 ft^2/acre. A canopy and subcanopy component of hardwoods, including laurel oak (*Quercus hemisphaerica*), water oak (*Q. nigra*), live oak (*Q. virginiana*), pignut hickory (*Carya glabra*), and/or loblolly bay (*Gordonia lasianthus*), is present in most areas with the restoration flatwoods often approaching the appearance of successional hardwood forest.

Shrubs make up the vast majority of the groundcover and can be very dense. Species include blue huckleberry, gallberry, coastalplain staggerbush, wax myrtle, swamp bay (*Persea palustris*), water oak, saw palmetto, sparkleberry (*Vaccinium arboreum*), and shiny blueberry. Shrubs are generally shorter than 3 feet, but there is often a significant cover of taller woody species. Herbs are very sparse, generally forming less than one percent cover. The most common herbaceous/graminoid species include broomsedge bluestem (*Andropogon virginicus*), witchgrass, narrowleaf silkgrass, beaksedge, and Curtiss' dropseed. Vines are occasional, mostly saw greenbrier (*Smilax bona-nox*), cat greenbrier (*S. glauca*), and muscadine (*Vitis rotundifolia*).

The remaining mesic flatwoods at NLSF are in fair to good condition. The best examples are located in the central portion of the forest adjacent to a large basin swamp. Also, see the section on pine plantations.

Fire Regimes:
Mesic flatwoods require repeated applications of growing season fires on a 2-4 year cycle. Several cycles of dormant season fire will be needed to transition to this rotation.

Management Needs:
The FFS will try to return a more natural fire regime in areas that were historically mesic flatwoods. In areas with good quality ground cover, especially where wiregrass is present, the FFS will avoid using herbicides to reduce shrub and grass competition when planting pines (if the latter is deemed necessary). Using prescribed fire to reduce competition prior

to planting could be a viable alternative to the more costly and time-consuming application of herbicides. Priority should be given to burning areas of higher quality groundcover and using frequent fires to encourage herbaceous species, especially wiregrass. With restoration, these remnant areas may become seed sources for future reseeding projects. Groundcover restoration in former agriculture fields, particularly the large abandoned field located near the FFS office complex, may be considered.

In the handful of sites with remnant longleaf, prescribed fire alone may be sufficient for restoration. However, most pine plantations will require a multiyear silvicultural plan to return to a longleaf pine dominated community structure. The west side of the NLSF where natural and planted slash pine and natural loblolly pine have established in old fields and pasture, woody encroachment possibly precludes safe and effective burning. After an initial cycle of dormant season fire to evaluate which areas have enough intact ground cover to carry a fire, mechanical removal of hardwoods and undesired species of pine trees, and/or herbicide, followed by reforestation and prescribed burning.

H. Mesic Hammock

Description:

Mesic hammocks are hardwood forests with a closed canopy of mixed mesophytic species dominated by live oak (*Quercus virginiana*) with cabbage palm (*Sabal palmetto*) often present in the subcanopy. These hammocks are not generally as rich as upland hardwood forests, and are dominated by a more evergreen, less diverse canopy. They occur primarily as scattered small stands or fringing borders around swamps or other naturally fire-protected areas. Mesic hammocks are infrequently inundated. The dense canopy maintains relatively high humidity levels, thus fires are a rare occurrence.

Canopy species include live oak (*Quercus virginiana*), pignut hickory (*Carya glabra*), southern magnolia (*Magnolia grandiflora*), sweetgum (*Liquidambar styraciflua*), and laurel oak (*Q. hemisphaerica*). There is a subcanopy of younger canopy species and smaller trees such as American holly (*Ilex opaca*). Shrubs can be sparse to abundant and often include saw palmetto (*Serenoa repens*). Herbs are generally sparse due to the closed canopy and dense shrub layer. Species may include woodoats (*Chasmanthium laxum*), woods grass (*Oplismenus hirtellus*), bracken fern (*Pteridium aquilinum*), partridgeberry (*Mitchella repens*), and whip nutrush (*Scleria triglomerata*). Epiphytes are infrequent to abundant, and include Spanish moss (*Tillandsia usneoides*), resurrection fern (*Pleopeltis polypodioides*), and ball moss (*T. recurvata*). Vines are infrequent to common and include muscadine (*Vitis rotundifolia*) and poison ivy (*Toxicodendron radicans*).

On the 1937 geo-rectified photographs, mesic hammock has a dark, rough grained signature that is difficult to separate from the upland hardwood forest and bottomland forest communities on the historical aerial photos. Delineation was aided by ground-truthing in the field.

Current Conditions:

For the most part, the extent of current mesic hammock appears to be similar to the historic extent, with the largest area occurring in a fire shadow adjacent to the basin swamp that

fringes Newnans Lake. This hammock has been slightly reduced in size due to conversion of the adjacent uplands to pine plantation. Also, a large portion of this hammock appears to have been cleared prior to 1968, and has regenerated with loblolly pines and oaks. The community intergrades with bottomland forest and baygall with many intermediate areas.

The closed canopy and subcanopy is dominated by live oak, sweetgum, water oak (*Quercus nigra*), sugarberry (*Celtis laevigata*), red cedar (*Juniperus virginiana*), southern magnolia, and laurel oak. Taller shrubs and small trees include loblolly bay (*Gordonia lasianthus*), American holly, rusty staggerbush (*Lyonia ferruginea*), citrus (*Citrus* spp.), and cabbage palm. These species, along with American beautyberry (*Callicarpa americana*), bluestem palmetto (*Sabal minor*), and smallflower pawpaw (*Asimina parviflora*), are also found in the short shrub layer, which is open and easy to traverse.

Herbs are generally sparse due to the closed canopy, although scattered dense patches also occur. Species include longleaf woodoats, sedge (*Carex* spp.), Canadian horseweed (*Conyza canadensis*), witchgrass (*Dichanthelium* spp.), tall elephantsfoot (*Elephantopus elatus*), woodsgrass, Florida pellitory (*Parietaria floridana*), West Indian chickweed (*Drymaria cordata*), spring cleavers (*Galium aparine*), rougeplant (*Rivina humilis*), nutrush (*Scleria* spp.), and Canadian blacksnakeroot (*Sanicula canadensis*). Epiphytes are occasional to common, and include Bartram's air-plant (*Tillandsia bartramii*) and Spanish moss. Vines are common and fairly diverse. Species include crossvine (*Bignonia capreolata*), Carolina coralbead (*Cocculus carolinus*), leafless swallow-wort (*Cynanchum scoparium*), saw greenbrier (*Smilax bona-nox*), sarsaparilla vine (*S. pumila*), eastern poison ivy (*Toxicodendron radicans*), and muscadine.

While much of the mesic hammock on NLSF is in good condition, there are several areas threatened by non-native invasive plants. Stands of coral ardisia (*Ardisia crenata*) are present in multiple locations in the large hammock, and the northeastern most hammock area is overrun with both coral ardisia and white-flowered spiderwort (*Tradescantia fluminensis*) around an old abandoned structure.

Fire Regimes:
Fire is infrequent in mesic hammocks, occurring only during times of extreme drought.

Management Needs:
Management activities in mesic hammock on NLSF should focus on removing non-native invasive plants, maintaining natural hydrologic patterns, and allowing prescribed fires from adjacent communities to burn into the community. This will help maintain ecotones and decrease the spread of mesic hammock species into adjacent upland communities.

I. Pine Plantation

Description:
Pine plantations mapped at NLSF are historic mesic flatwoods and sandhills, and have desired future conditions matching those communities.

Current Conditions:
Pine plantations are areas altered by silvicultural activities. On NLSF, the mapped pine plantations are located on two sites of historic mesic flatwoods and sandhill. One site on the eastern side of the forest was cleared for agriculture and grazing prior to 1968. This area was converted into bahia grass pasture. One large area is planted in slash pine (*Pinus elliottii*), and a small corner of the property is planted with longleaf pine (*Pinus palustris*). This small area might also be described as an abandoned pasture. The large, mature slash pine stand was thinned in 2016 to a basal area of around 70 ft^2/acre. The pine stands are planted over a groundcover of mostly bahiagrass (*Paspalum notatum*), flatsedge (*Cyperus* spp.), and centipede grass (*Eremochloa ophiuroides*). The rest of the groundcover is very weedy with scrambling vines of saw greenbrier (*Smilax bona-nox*) and muscadine (*Vitis rotundifolia*), along with small red maple (*Acer rubrum*), live oak (*Quercus virginiana*), sweetgum (*Liquidambar styraciflua*), laurel oak (*Quercus hemisphaerica*), and sand blackberry (*Rubus cuneifolius*). A mountain bike/hiking trail network is present in the site leading to Newnans Lake.

A second site south of the forest office was farmed in row crops until 2013, when it was abandoned. The site succeeded to a mix of agronomic weeds including hairy indigo (*Indigofera hirsuta).* A third of the site was maintained as wildlife opening/food plots, discussed below. The remaining area was restored to longleaf pine plantation in 2017 and 2018. The groundcover is old field weeds dominated by hairy indigo, with patches of *Andropodon* spp., muscadine (*Vitis rotundifolia*) and sand blackberry (*Rubus cuneifolius*). This area grades into the wildlife openings, so frequent fire rotation including growing season fire, and an understory with a mix of native groundcover, are management considerations.

Fire Regimes:
Prescribed fire in these mapped plantations will be carried by a combination of bahia grass and pine needle cast. Bahia typically burns poorly during the growing season, and burns more cleanly in the dormant season after a frost. Both plantation sites have had prescribed fires.

Management Needs:
Areas of pine plantation thinned in 2016, where slash pine is onsite may need thinning at the end of this planning period. Some of this plantation is on sandhill soils, and is off site. Log decks and openings are being planted to longleaf pine, with the priority areas on the more xeric sites. Coral ardisia and camphor are present in these sites and will need continued control. The young plantation south of the office has small patches of cogon grass and natal grass, and will need continued non-native invasive plant monitoring and control. Prescribed fire has been reintroduced these sites, and needs to be continued in the future.

J. Sandhill (Including Restoration Areas)

Description:
Sandhills are forests of longleaf pine (*Pinus palustris*) trees, typically with a sparse subcanopy of turkey oak (*Quercus laevis*) and/or sand post oak (*Q. margaretta*), and a

fairly dense groundcover of herbs, particularly wiregrass (*Aristida stricta*). Sandhills are fire-maintained communities that occur on relatively well-drained, deep sands.

Sandhills of NLSF should have longleaf pine with a subcanopy of turkey oak. The understory should dominated by a mix of wiregrass (*Aristida stricta*) and other herbs such as narrowleaf silkgrass (*Pityopsis graminifolia*), bracken fern (*Pteridium aquilinum*), queen's delight (*Stillingia sylvatica*), anisescented goldenrod (*Solidago odora*), wild indigo (*Baptisia* spp.), milk peas (*Galactia* spp.), whitetop aster (*Aster tortifolius*), tall ironweed (*Vernonia angustifolia*), summer farewell (*Dalea pinnata*), greeneyes (*Berlandiera pumila*), gayfeather (*Liatris* spp.), pinweeds (*Lechea* spp.), frostweeds (*Helianthemum* spp.), and pineywoods dropseed (*Sporobolus junceus*). Shrubs such as gopher apple (*Licania michauxii*) should be common, but low statured. Patches of open sand should be occasional.

On the 1937 geo-rectified photographs, sandhills appear as a very light signature and are easily distinguished from the smoother, darker flatwoods. However, extensive clearing by 1937 makes the exact delineation of historic sandhill difficult in the large field near the FFS office complex. This area was delineated based on ground truthing and soil maps. A large portion of the pine uplands near Newnans Lake may have also been sandhill, but again, past disturbance makes this difficult to delineate. Tortoise burrows with yellow sand aprons in the area seem to confirm that at least some areas of pine plantation mapped as historic flatwoods may have been sandhill communities.

Current Conditions:
Currently, only a small area of remnant sandhill remains on NLSF, located just east of the large, central basin swamp. This area is a small strip of native groundcover that was not cleared along with the field just east of it. As a result, longleaf pines are common here, and a cluster of the rare Florida toothache grass (*Ctenium floridanum*) was found. The sandhill is transitional to a narrow mesic flatwoods that borders the swamp. The abandoned agricultural field adjacent to the remaining natural sandhill has regenerated in loblolly pine (*Pinus taeda*) and longleaf pine, and has some native groundcover. This area is mapped as "restoration" sandhill.

The remaining natural sandhill has a canopy of longleaf pine, with loblolly pine invading from the adjacent restoration area. Turkey oak is occasional as a small tree. The groundcover contains a mix of native species with wiregrass occasional, along with other herbs such as Curtiss' dropseed (*Sporobolus curtissii*) and narrowleaf silkgrass. Shrub cover is higher than would be expected for a sandhill, but this is probably due to the area being transitional to mesic flatwoods. In many ways, it resembles a dry flatwoods more than a typical sandhill. Saw palmetto (*Serenoa repens*) forms clumps throughout, but with many paths through the area. Gopher apple and coastalplain staggerbush (*Lyonia fruticosa*) are also common.

The restoration sandhill is dominated by even-aged loblolly pine, but sandhill species including longleaf pine and turkey oaks are present particularly along the edge of the area, probably moving in from the natural sandhill. Laurel oaks (*Quercus hemisphaerica*) and

water oaks (*Q. nigra*) are also found in the subcanopy, and the groundcover contains a mix of native and introduced species that includes sand blackberry (*Rubus cuneifolius*), saw palmetto, broomsedge bluestem (*Andropogon virginicus*), bahiagrass (*Paspalum notatum*), and narrowleaf silkgrass.

Fire Regimes:
Fire should be applied to this community every 1-3 years. Variability in the season, frequency, and intensity of fire is important for preserving species diversity, since different species in the community flourish under different fire regimes. This site has not been burned yet, and boundary firelines need to be established. Fire should be allowed to burn into the transition zone down the slope and extinguish naturally. This is an excellent site for growing season fire.

Management Needs:
Restoration of this community should focus on the use of frequent prescribed burns which will decrease abundance of weedy species, such as laurel oak (*Quercus hemisphaerica*). Existing plantations in historically sandhill sites should be thinned or planted with longleaf pine as needed and managed as uneven-aged stands. Successional hardwood forests may require the removal of hardwoods to encourage herbaceous growth and facilitate prescribed burning.

Groundcover restoration projects should focus on practices that will increase wiregrass abundance. May-June burns at a 1-3 year interval will be the most effective at accomplishing this. FFS may consider seeding or transplanting of wiregrass to facilitate burns through these areas. Roller-chopping, particularly in xeric soil types, is detrimental to herbaceous species, especially wiregrass.

During all management activities, every effort should be made to minimize any detrimental effects to the gopher tortoise (*Gopherus polyphemus*) population (and its burrows) within this community, as this species is considered a keystone ecosystem component.

K. Sinkhole

Description:
Sinkholes are cylindrical or steep-sided conical depressions that are generally formed by the slumping of soil into subterranean cavities or the solution of limestone near the surface. Sinkhole vegetation is highly variable and usually influenced by the matrix community in which the sinkhole develops. Vertical or steep walls may be mostly devoid of plants. Where soil covers the underlying rock, the vegetative structure may be that of a well-developed forest that is virtually indistinguishable from the surrounding environment. Shallow sinkholes grade into depression marsh and dome swamp communities, since these communities often occupy solution features in the landscape.

At NLSF, sinkholes are uncommon, although there may be several shallow sinks that are mapped as isolated swamps or marshes. Deep sinkholes should contain upland hardwood forest species along the upper reaches and slopes of the sink. The bottom of the sink may be permanently flooded or may dry out periodically and contain a mix of hydrophytic

species that might contain common buttonbush (*Cephalanthus occidentalis*), titi (*Cyrilla racemiflora*), and/or coastalplain willow (*Salix caroliniana*).

Current Conditions:
There is a single mapped sinkhole on NLSF located in the central abandoned field just north of Sunnyland Creek and connected to that system by a ditch. Alteration of the surrounding historic sandhill presents the greatest disturbance to this sinkhole, as well as the artificial drainage created by the ditch.

The sinkhole is fairly shallow, but regularly flooded. The large central portion contains scattered coastalplain willow trees and a dense cover of floating dotted duckweed (*Landoltia punctata*). The edges of the sink are vegetated with hardwoods, mainly sweetgum (*Liquidambar styraciflua*), black cherry (*Prunus serotina*), red maple (*Acer rubrum*), southern red cedar (*Juniperus virginiana*), and water oak (*Quercus nigra*). Herbs are sparse but much weedier near the edge of the abandoned field.

Fire Regimes:
Sinkhole communities do not typically burn owing to their steep sides.

Management Needs:
Sinkholes are fragile communities. Logging of the surrounding canopy can increase both solar radiation and sedimentation levels in the sinkhole itself. Major soil disturbances in the adjoining uplands can also disrupt seepage water sources. Large withdrawals of groundwater could substantially lower water tables and reduce the hydroperiods of sinkholes.

Sinkholes are sometimes used as dumpsites. Because sinkholes drain directly to underground aquifers, refuse dumping should be strongly discouraged. Chemical applications, waste treatments, and spills on the surrounding upland require active monitoring to determine their potential impacts and mitigation requirements.

Non-native invasive species are sometimes problematic in sinkholes. Their establishment is often facilitated by the shaded, humid environmental conditions. Steep slopes and the presence of sensitive plant and animal species can complicate the treatment of non-native invasive plants. Furthermore, the close connection of sinkholes to aquifers requires especially careful applications of herbicides to avoid groundwater contamination.

L. Successional Hardwood Forest

Description:
Successional hardwood forests are defined as closed-canopied forests dominated by fast growing hardwoods such as laurel oak (*Quercus hemisphaerica*), water oak (*Q. nigra*), and/or sweetgum (*Liquidambar styraciflua*), often with remnant pines. These forests are either invaded natural habitat (i.e., mesic flatwoods, sandhill, upland pine, upland mixed woodland) due to lengthy fire-suppression or old fields that have succeeded to forest.

For desired future conditions, refer to the historic community. Successional hardwood forest on NLSF is historic mesic and wet flatwoods.

Current Conditions:
The largest area of successional hardwood forest on NLSF is along State Road 222 just east of the FFS office complex. This area of hardwoods and pines has been cleared in the past for agricultural use and is regenerating with a dense cover of mostly loblolly pines (*Pinus taeda*), with a significant subcanopy of laurel oak, black cherry (*Prunus serotina*), and water oak. Vines form a dense cover on shrubs and over the ground, mainly Virginia creeper (*Parthenocissus quinquefolia*) and muscadine (*Vitis rotundifolia*). Additional areas of successional hardwood forest are present as inclusions throughout the disturbed flatwoods and restoration flatwoods on the forest.

Fire Regimes:
The historic fire return interval would have been around 2-4 years for mesic flatwoods.

Management Needs:
Management should focus on evaluating if any of this cover type can be burned under reasonable condition, and introducing prescribed burns into these restorable portions. Thinning of the overstory may help to promote a more diverse groundcover, but will also encourage weedy growth. Non-native invasive plants, mainly coral ardisia (*Ardisia crenata*) and Chinese tallow (*Triadica sebifera*), should continue to be treated. Because of intensive past use, restoration of this community would be a long-term and potentially costly project.

M. Upland Hardwood Forest

Description:
Upland hardwood forest is a well-developed, closed-canopy forest dominated by deciduous hardwood trees on mesic soils in areas sheltered from fire. It typically has a diverse assemblage of deciduous and evergreen tree species in the canopy and midstory, shade-tolerant shrubs, and a sparse groundcover.

On NLSF, these forests should have a closed canopy dominated by hardwood trees such as pignut hickory (*Carya glabra*), southern magnolia (*Magnolia grandiflora*), black cherry (*Prunus serotina*), water oak, (*Quercus nigra*), bluff oak (*Q. austrina*), swamp chestnut oak (*Q. michauxii*), swamp laurel oak (*Q. laurifolia*), and live oak (*Q. virginiana*). The subcanopy should be well-developed and include species such as Florida maple (*Acer saccharum*), flowering dogwood (*Cornus florida*), redbud (*Cercis canadensis*), Hercules club (*Zanthoxylum clava-herculis*), American holly (*Ilex opaca*), hackberry (*Celtis laevigata*), red bay (*Persea borbonia*), red cedar (*Juniperus virginiana*), eastern hophornbeam (*Ostrya virginiana*), and American hornbeam (*Carpinus caroliniana*), among others. Though sparse, herbs should include wood oats (*Chasmanthium* spp.), switch cane (*Arundinaria gigantea*), partridgeberry (*Mitchella repens*), woods grass (*Oplismenus hirtellus*), and witch grasses (*Dichanthelium* spp.). Vines should be occasional to common and include catbriers (*Smilax* spp.), Virginia creeper (*Parthenocissus quinquenervia*), pepper vine (*Ampelopsis arborea*), and grape vines (*Vitis* spp.).

Upland hardwood forests at NLSF are restricted to areas adjacent to large basin swamps and on steep slopes along creeks where fire would naturally be restricted.

Current Conditions:
Most of the historic upland hardwood forests on NLSF are close to desired future conditions. The largest example is located along the steep slopes lining the small blackwater stream that runs through the central portion of the forest. A second, high quality example is found on the western side of the large, easternmost basin swamp. This forest is on a small hill surrounded by baygall forest. Neither of these areas appears to have been cleared by 1968. Smaller areas of upland hardwood forest flank the same large basin swamp, with some clearing evident in the past.

The canopy and subcanopy layers are not very dense, but diverse with pignut hickory, southern magnolia, loblolly pine (*Pinus taeda*), black cherry, bluff oak, swamp laurel oak, swamp chestnut oak, live oak, red cedar, eastern hophornbeam, sweetgum (*Liquidambar styraciflua*), and water oak. Shrubs are mostly taller, and also not dense. Species include young canopy trees as well as yaupon (*Ilex vomitoria*), cabbage palm (*Sabal palmetto*), gallberry (*Ilex glabra*), rusty staggerbush (*Lyonia ferruginea*), wild olive (*Osmanthus americanus*), sparkleberry (*Vaccinium arboreum*), Adam's needle (*Yucca filamentosa*), American holly, American hornbeam, red bay, and the non-native invasive coral ardisia (*Ardisia crenata*). Herbs are occasional, and include partridgeberry, woodsgrass, blackseed needlegrass (*Piptochaetium avenaceum*), switchcane (*Arundinaria gigantea*), sedge (*Carex* spp.), longleaf woodoats (*Chasmanthium laxum* var. *sessiliflorum*), sarsaparilla vine (*Smilax pumila*), sweet goldenrod (*Solidago odora*), violet (*Viola* spp.), partridgeberry, and whip nutrush (*Scleria triglomerata*)

Upland hardwood forest at NLSF is in fair to good condition. Most areas have experienced minimal past disturbance, but are susceptible to invasion from non-native invasive plants such as coral ardisia.

Fire Regimes:
Fire is not required to maintain this community.

Management Needs:
Management of upland hardwood forest at NLSF should focus on the removal of non-native invasive plants, such as coral ardisia. Restoration of the historic pine-dominated communities surrounding the blackwater stream system will contribute to improved conditions in the upland hardwood forest along the stream.

N. Wet Flatwoods (Including Restoration Areas)

Description:
Wet flatwoods are characterized by forests of scattered pine trees with a thick shrubby understory and very sparse ground cover, or a fire-maintained, sparse understory and dense ground cover of hydrophytic herbs. Wet flatwoods exist on relatively flat, poorly drained land. The soils are generally one (1) to three (3) feet of acidic sands overlying an organic hardpan or clay layer. The hardpan substantially reduces the percolation of water below

and above its surface, and therefore wet flatwoods can be inundated for one or more months per year. Wet flatwoods often grade into basin swamps and mesic flatwoods, or in the case of NLSF, bottomland swamp.

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

On the 1937 geo-rectified photographs, wet flatwoods appear similar to mesic flatwoods but with a slightly lighter color and slightly smoother texture. The distinction between mesic and wet flatwoods is almost impossible to make on the historic aerials, and clearing of the understory further complicates the problem. All of the wet and mesic flatwoods areas should be treated similarly for desired future conditions.

Current Conditions:
Wet flatwoods on NLSF occur mainly on the west side of the forest, as islands between fingers of bottomland forest. Restoration flatwoods sites are most impacted by historic ditching, but all the wet flatwoods sites are affected by fragmentation because of the small size of the forest and the irregular boundary. The groundcover of much of this area was cleared prior to 1937, and further clearing took place by 1968. These areas are classified as restoration wet flatwoods. The remaining wet flatwoods areas appear to have been logged prior to 1937, and then left unburned for many decades, promoting a dense canopy of slash pine and the development of included baygall areas. These communities are in fair to poor condition.

The wet flatwoods and restoration wet flatwoods overstory is dominated by slash pine with a subcanopy of swamp laurel oak (*Quercus laurifolia*), water oak (*Q. nigra*), red maple (*Acer rubrum*), and sweetgum (*Liquidambar styraciflua*). Fire has been slowly reintroduced into some of the site with the lowest fuel loading, but the duff layer is thick in other areas near State Road 222 and the Gainesville airport.

Shrubs in wet flatwoods include wax myrtle (*Myrica cerifera*), water oak, large gallberry (*Ilex coriacea*), swamp doghobble (*Leucothoe racemosa*), highbush blueberry (*Vaccinium corymbosum*), shiny blueberry (*V. myrsinites*), gallberry, swamp laurel oak, and saw palmetto. This layer tends to be denser than in restoration wet flatwoods, where the species include sweetgum, American beautyberry (*Callicarpa americana*), loblolly bay, swamp laurel oak, and water oak.

Herbs are very sparse in both wet flatwoods and restoration areas. These include netted chain fern (*Woodwardia areolata*) and Virginia chain fern (*W. virginica*). Vines are occasional to common, mainly yellow jessamine (*Gelsemium sempervirens*), cat greenbrier (*Smilax glauca*), and muscadine (*Vitis rotundifolia*). One restoration stand in the northwest corner of the forest has a bahia grass dominated understory.

Fire Regimes:
Historically, the fire return interval in wet flatwoods is 3 to 10 years. However, in areas of heavy fire exclusion and/or densely planted slash or loblolly pine, mechanical vegetation removal and/or a more frequent fire interval may need to be applied for initial restoration. The lack of grassy ground fuels means fire will carry on needle cast in most sites, and gallberry and fetterbush when present. Palmetto fuels are very patchy.

Management Needs:
Management of the wet flatwoods at NLSF should focus on returning a more natural fire regime. Areas with remnant or restored herbaceous vegetation should be high priorities for burning. The dense slash pine canopy that has developed on the property should be thinned to promote a more herbaceous understory. The worst non-native invasive upland control problems occur within the restoration portion of this community, with small single species stands of Chinese tallow overtopping Japanese climbing fern, skunk vine, camphor tree, coral ardisia, and sword fern. Furthermore, portions of this community are downstream from approximately ten (10) acres of Chinese tallow growing on adjacent state land not managed for conservation.

Prescribed burning should be applied to pine plantations in historical wet flatwoods on a 2-5 year cycle, with return intervals increasing with fuel reduction. This will reduce woody encroachment, sustain herbaceous species, and aid in prevention of catastrophic wildfires.

O. Xeric Hammock

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

Xeric hammock has a closed canopy of predominantly sand live oak (*Quercus geminata*), but also often includes live oak (*Q.virginiana*), laurel oak (*Q. hemisphaerica*), pignut hickory (*Carya glabra*), southern red oak (*Q. falcata*), and southern magnolia (*Magnolia grandiflora*). The subcanopy consists of younger canopy species, as well as American holly (*Ilex opaca*), black cherry (*Prunus serotina*), wild olive (*Osmanthus americanus*), red bay (*Persea borbonia*), and persimmon (*Diospyros virginiana*). The understory is dominated by shrubs. Typical species are rusty staggerbush (*Lyonia ferruginea*), Chapman's oak (*Quercus chapmannii*), saw palmetto (*Serenoa repens*), sparkleberry (*Vaccinium arboreum*), deerberry (*V. stamineum*), wild olive (*Osmanthus americanus*),

yaupon (*Ilex vomitoria*), and American beautyberry (*Callicarpa americana*). Herbs are generally sparse due to the closed canopy and high litter cover. Species may include witchgrasses (*Dichanthelium* spp.), sandyfield beaksedge (*Rhynchospora megalocarpa*), and an occasional threeawn (*Aristida* spp.). Epiphytes are common and consist of Spanish moss (*Tillandsia usneoides*) and ball moss (*T.recurvata*). Vines are occasional and include muscadine (*Vitis rotundifolia*) and earleaf greenbrier (*Smilax auriculata*).

On the 1937 geo-rectified photographs, the xeric hammock appears as a slightly darker island within the southeastern basin swamp. Delineation was aided by ground-truthing.

Current Conditions:
On NLSF, xeric hammock occurs as an island or narrow peninsula surrounded by basin swamp. The well-drained soils promote more xeric plants, while the fire shadow created by the surrounding swamp allows a closed canopy to form.

The dominant canopy trees are sand live oak, southern magnolia, and loblolly pine (*Pinus taeda*). The understory is a mix of rusty staggerbush, wild olive, gallberry (*Ilex glabra*), fetterbush (*Lyonia lucida*), saw palmetto, and earleaf greenbrier. Herbs are sparse to absent.

This community is generally in desired future condition. East University Avenue, which bisects the historic hammock and forms the southern boundary of the forest, is the largest disturbance, and may facilitate the introduction of non-native invasive species.

Fire Regimes:
Xeric hammocks rarely burn and typically develop after 30 or more years of fire protection.

Management Needs:
Management activities in xeric hammock on NLSF should focus on treating non-native invasive species.

P. Other Altered Landcover Types

Description:
Altered landcover types are areas where the natural community has been overwhelmingly altered as a result of human activity. Successional hardwood forest, pine plantation, and restoration natural communities are described in separate sections of this report.

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

Current Conditions:
Ruderal areas on NLSF comprise abandoned fields/pastures, a large borrow area, an artificial pond, clearings, developed areas, roads, and a utility corridor.

Abandoned field/pasture (82 acres) – Prior to 1937, large portions of the forest were cleared for agriculture and pasture. These fields were mainly established in historic pine-dominated communities (sandhill and wet/mesic flatwoods), and were used for agriculture and grazing. Currently, these areas have a mostly herbaceous groundcover consisting of turf grasses such as centipede grass (*Eremochloa ophiuroides*) and bahiagrass (*Paspalum notatum*), as well as weedy species such as dogfennel (*Eupatorium capillifolium*) and licoriceweed (*Scoparia dulcis*). Abandoned fields contain less turfgrass and a more diverse mix of weedy herbs including cutleaf eveningprimrose (*Oenothera laciniata*), heartwing dock (*Rumex hastatulus*), Canadian toadflax (*Linaria canadensis*), purple passion-flower (*Passiflora incarnata*), and common ragweed (*Ambrosia artemisiifolia*). Canopy cover varies from zero to moderate, depending on the past use of the field. Tree species include loblolly pine (*Pinus taeda*), sand live oak (*Quercus geminata*), laurel oak (*Q. hemisphaerica*), and live oak (*Q. virginiana*). Recently, FFS has planted approximately 100 acres of longleaf pine (*Pinus palustris*) in three (3) areas of abandoned field/pasture south of the WaFC office. This leaves 44 acres of wildlife openings and food plots in the area originally set aside as a dove field. In addition to Northern Bobwhite and Eastern Meadowlarks both being present and likely breeding, fourteen (14) species of sparrows have been spotted in these fields: Eastern Towhee, Chipping, Clay-colored, Field, Vesper, Savannah, Grasshopper, Henslow's, Fox, Song, Lincoln's, Swamp, White-throated, and White-crowned sparrows. Over the course of the planning period, a combination of high frequency prescribed fires, varied seasonality of fires, mowing, planting food plot species, eradicating invasive exotic plants, and planting ground cover species, could be tried in an adaptive fashion to continue to provide excellent grassland bird habitat. 2.1 acres is part of the Patrick Cemetery outparcel.

Borrow area (15 acres) – On the western portion of the forest is a large area of digging that has become a pine-dominated forest. The extent of this borrow area can only be distinguished on the 1968 aerial photography and on LIDAR. The canopy is dense with slash pine (*Pinus elliottii*) and loblolly pine (*P. taeda*). The understory resembles wet flatwoods or basin swamp and contains red maple (*Acer rubrum*), dahoon (*Ilex cassine*), wax myrtle (*Myrica cerifera*), highbush blueberry (*Vaccinium corymbosum*), and cat greenbrier (*Smilax glauca*).

Artificial pond (1 acre) – Within the large borrow area there is a small site with additional digging, apparent on the 1960s-1970s photos. This area now resembles a depression marsh. The vegetation is mainly herbaceous and dominated by bluestem (*Andropogon* spp.), soft rush (*Juncus effusus solutus*), and sugarcane plumegrass (*Saccharum giganteum*). Shrubs, vines, and trees are occasional, mainly around the edge, and include gallberry (*Ilex glabra*), highbush blueberry (*Vaccinium corymbosum*), dahoon (*I. cassine*), wax myrtle (*Myrica cerifera*), swamp bay (*Persea palustris*), greenbrier (*Smilax glauca*), slash pine (*Pinus elliottii*), and loblolly pine (*P. taeda*). Two (2) more retention ponds that were required by the SJRWMD are located beside the FFS office complex. These small storm ponds have been landscaped with native plants around the edge, including Walter's viburnum (*Viburnum obovatum*), river birch (*Betula nigra*), and dahoon (*Ilex cassine*).

Clearing/regeneration (10 acres) – There are several clearings on the forest currently used as wildlife food plots. These are located on the eastern side of the forest in former agriculture fields.

Developed (15 acres) – A FFS office complex and equipment barn is located on an 11-acre site in a corner of a former agricultural field. Two additional developed areas are located on the west side of the forest where the boundary includes edges of clearings associated with buildings.

Road (5 acres) – Two elevated vehicle trails that run east/west through the western section of the forest are mapped. Additional vehicle trails are located throughout the forest.

Utility Corridor (8 acres) – A Gainesville Regional Utilities (GRU) powerline and water right-of-way bisects the western side of the forest and is vegetated by small shrubs and a variety of weedy herbs. Species include wax myrtle (*Myrica cerifera*), bushy bluestem (*Andropogon glomeratus*), dogfennel (*Eupatorium capillifolium*), Florida pellitory (*Parietaria floridana*), and maiden fern (*Thelypteris* spp.).

Fire Regimes:
N/A

Management Needs:
It may not be practical or desirable to restore some of the ruderal habitats (e.g., developed land, roads, parking lots, etc.) to the historic natural community. Native trees and shrubs should be used in landscaping, and these areas should be monitored for non-native invasive plants. For abandoned fields and pastures, planting native pine species will improve the condition of the community, but because of intensive past use, groundcover restoration would be a long-term and potentially costly project.

VIII. References

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IX. Glossary of Abbreviations

ARC .....Acquisition and Restoration Council
BMP .....Best Management Practice
DCF.....Department of Children and Families
DEP .....Department of Environmental Protection
DHR .....Division of Historical Resources
DOC .....Department of Corrections
DRP.....Division of Recreation and Parks
DSO.....Direct Support Organization
FDACS.....Florida Department of Agriculture and Consumer Services
FFS .....Florida Forest Service
FFSF.....Friends of Florida State Forests
FNAI .....Florida Natural Areas Inventory
FWC.....Florida Fish and Wildlife Conservation Commission
FWRI.....Florida Wildlife Research Institute
FLEPPC .....Florida Exotic Pest Plant Council
GRU .....Gainesville Regional Utilities
MOA .....Memorandum of Agreement
MNC .....Morningside Nature Center
NLSF.....Newnans Lake State Forest
NRCS .....Natural Resources Conservation Service
SJRWMD .....St. Johns River Water Management District
OALE.....DACS Office of Agricultural Law Enforcement
OFW.....Outstanding Florida Water
OOF.....Operation Outdoor Freedom
OPS .....Other Personnel Services
PLA .....Public Lands Archaeology
TIITF.....Board of Trustees of the Internal Improvement Trust Fund
UF .....University of Florida
USFWS .....United States Fish and Wildlife Service
WaFC .....Waccasassa Forestry Center
WMA .....Wildlife Management Area