FLORIDA DEPARTMENT OF Environmental Protection

Marjory Stoneman Douglas Building
3900 Commonwealth Boulevard
Tallahassee, FL 32399

Ron DeSantis
Governor

Jeanette Nuñez
Lt. Governor

Shawn Hamilton
Secretary

June 10, 2024

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

RE: Cary State Forest – Lease No. 3687 and 4609

Dear Mr. Camposano:

On **June 7, 2024**, the Acquisition and Restoration Council (ARC) recommended approval of the **Cary State Forest** management plan. Therefore, Division of State Lands, Office of Environmental Services (OES), acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, hereby approves the **Cary State Forest** management plan. The next management plan update is due June 7, 2034.

Pursuant to s. 253.034(5)(a), F.S., each management plan is required to describe both short-term and long-term management goals and include measurable objectives to achieve those goals. Short-term goals shall be achievable within a 2-year planning period, and long-term goals shall be achievable within a 10-year planning period. Upon completion of short-term goals, please submit a signed letter identifying categories, goals, and results with attached methodology to the Division of State Lands, Office of Environmental Services.

Pursuant to s. 259.032(8)(g), F.S., by July 1 of each year, each governmental agency and each private entity designated to manage lands shall report to the Secretary of Environmental Protection, via the Division of State Lands, on the progress of funding, staffing, and resource management of every project for which the agency or entity is responsible.

Pursuant to s. 259.036(2), F.S., management areas that exceed 1,000 acres in size, shall be scheduled for a land management review at least every 5 years.

Pursuant to s. 259.032, F.S., and Chapter 18-2.021, F.A.C., management plans for areas less than 160 acres may be handled in accordance with the negative response process. This process requires small management plans and management plan amendments be submitted to the Division of State Lands for review, and the Acquisition and Restoration Council (ARC) for public notification. The Division of State Lands will approve these

plans or plan amendments submitted for review through delegated authority unless three or more ARC members request the division place the item on a future council meeting agenda for review. To create better efficiency, improve customer service, and assist members of the ARC, the Division of State Lands will notice negative response items on Thursdays except for weeks that have State or Federal holidays that fall on Thursday or Friday. The Division of State Lands will contact you on the appropriate Friday to inform you if the item is approved via delegated authority or if it will be placed on a future ARC agenda by request of the ARC members.

Conditional approval of this land management plan does not waive the authority or jurisdiction of any governmental entity that may have an interest in this project. Implementation of any upland activities proposed by this management plan may require a permit or other authorization from federal and state agencies having regulatory jurisdiction over those particular activities. Pursuant to the conditions of your lease, please forward copies of all permits to this office upon issuance.

Sincerely,

Sine Murray
Program Administrator
Office of Environmental Services
Division of State Lands

TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

CARY STATE FOREST

NASSAU AND DUVAL COUNTIES

PREPARED BY THE

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

FLORIDA FOREST SERVICE

APPROVED ON

JUNE 10, 2024

TEN-YEAR LAND MANAGEMENT PLAN

FOR THE

CARY STATE FOREST

Approved by:

Richard Dolan, Director
Florida Forest Service

6/17/2024
Date

James Roberts, Chief
Forest Management Bureau

6/17/24
Date

TEN-YEAR LAND MANAGEMENT PLAN
CARY STATE FOREST
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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services (FDACS), Florida Forest Service
COMMON NAME: Cary State Forest (CSF)
LOCATION: Nassau and Duval Counties
ACREAGE TOTAL: 13,384.71 acres

Historic Natural Communities	Approximate Acreage	Historic Natural Communities	Approximate Acreage
Wet flatwoods	3,987	Floodplain swamp	575
Mesic flatwoods	3,470	Wet Prairie	452
Basin swamp	2,359	Bottomland forest	364
Sandhill	1,049	Baygall	330
Dome swamp	669	Depression marsh	28

*Note: Acreage difference due to two parcels totaling 130 acres that were not mapped and are managed by the St. Johns River Water Management District, as well as rounding error.

TIITF LEASE AGREEMENT NUMBERS: 3687 and 4609
USE: Single ___ Multiple __X__

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

DESIGNATED LAND USE: Multiple-Use State Forest
SUBLEASES: Sublessor: FDACS, Sublessee: City of Bryceville; Sublessor: TIITF, Sublessee: Nassau County
ENCUMBRANCES: Various easements
TYPE OF ACQUISITION: 1935 Florida Conservation Committee, Florida Forever, Save Our Rivers, U.S. Department of Defense Navy, and the City of Jacksonville
UNIQUE FEATURES: Thomas Creek and three unnamed tributaries flow through the forest
ARCHAEOLOGICAL / HISTORICAL: Three known sites
MANAGEMENT NEEDS: Adequate funding to implement Hydrological Restoration Plan, Ground Cover Restoration and Reforestation
ACQUISITION NEEDS: Approximately 7,556 acres located in the Optimal Management Boundary
SURPLUS ACREAGE: None
PUBLIC INVOLVEMENT: 2012, 2017, and 2022 Land Management Reviews, Management Plan Advisory Group and Public Hearing, Liaison Committee Meetings, and FDEP Acquisition and Restoration Council Public Hearing - - - - - - - - - - - - - - - -
- -

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

ARC Approval Date: _____ TIITF Approval Date: _____
Comments:

_____
_____
_____
_____

I. Introduction

Cary State Forest (CSF) was established as Florida's second state forest in 1937. The forest is known for its scenic mature flatwoods, sandhill, and basin marsh communities. CSF is comprised of approximately 13,384.71 acres located approximately 23 miles west of downtown Jacksonville in western Duval and southwestern Nassau Counties (see Exhibit B). The Cary, Monticello, and Norfolk Southern Tracts are contiguous while the Thomas Creek Tract is separate and located to the north. CSF protects portions of the St. Johns, St. Marys, and Nassau River watersheds. Thomas Creek and several unnamed tributaries flow through and out of the forest. CSF is important to aquifer recharge and surface water storage. In addition, it is a key component in a regional wildlife and recreation corridor, connecting other publicly owned lands.

Thomas Creek meanders through a nearly intact, mature bottomland hardwood forest and floodplain swamp. A closed canopy of large live oak, swamp laurel oak, swamp chestnut oak, sweetbay, southern magnolia, swamp tupelo, sweetgum, red maple, cypress, and loblolly pine dominate this unique natural feature of CSF. The slowly flowing waters of Thomas Creek are darkly stained with naturally occurring tannic acids from the hardwoods through which the creek flows. This scenic blackwater creek is home to otters, alligators, and water moccasins. The creek can be viewed from the three wooden bridges along Acree Road.

CSF contains nine different natural communities, each containing unique flora and fauna. The natural communities found on the forest support a variety of wildlife, including southern fox squirrel, gopher tortoise, wood stork, swallow-tailed kite, eastern bluebird, wild turkey, white-tailed deer, bobcat, and various wading birds. The forest also supports several threatened and endangered plant species including night-flowering wild petunia, purple honeycomb-head, and several wild orchids.

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 CSF center on the multiple-use concept, as defined in sections 589.04(3) and 253.034(2)(a) Florida Statues. 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 CSF will be accomplished with the following strategies:

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

This management plan is provided according to requirements of Sections 253.034, 259.032 and 373, Florida Statutes (F.S.), and was prepared utilizing guidelines outlined in Section 18-2.021 of the Florida Administrative Code (FAC). It is not an annual work plan or detailed operational plan but provides general guidance for the management of CSF for the next ten-year period and outlines the major concepts that will guide management activities on the forest. Though not part of this plan, each state forest also updates and maintains five-year action plans for silviculture, ecology, prescribed fire, roads and bridges, boundary maintenance, and recreation. These internal plans are updated annually with the current year serving as the annual operations plan for the forest.

B. Past Accomplishments

Data regarding past management activities and public use on CSF have been compiled monthly and are available from the forest manager. A table has been prepared for this plan that summarizes the accomplishments for each of the past ten years. See 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.

There have been numerous events, developments, and activities since the 2012 Ten-Year Land Management Plan was approved. Some noteworthy accomplishments include:

- Prescribed fire applied to more than 12,088 acres
- 57,402 tons of timber harvested from 1,360 acres
- 231,846 containerized longleaf pines planted on 327 acres
- 20,328 bare root slash pines planted on 28 acres
- 1,250 bare root bald cypress planted on 4 acres
- 10,515 acres inventoried (>10% annually)
- 95 acres treated for invasive plants
- 73 miles of forest boundary marked or maintained
- 143 miles of roads graded
- 66 miles of roads rebuilt and stabilized
- 37 culverts installed
- 4 low water crossings installed
- 3,658,095 estimated day-use visitors
- 78 programs or tours conducted on the forest
- 126 apiary sites maintained

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 CSF during this period must 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. Most 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 recreation value.

The management activities listed below will be addressed within the ten-year management period and are defined as goals, with each goal containing short-term objectives, long-term objectives, or ongoing objectives. Short-term objectives are those that are achievable within a two-year planning period, and long-term objectives 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 Action Plan including reforestation, timber harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (Ongoing objective)

Performance Measures:

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

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

Performance Measures:

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

- **GOAL 2: Public Access and Recreation Opportunities**

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

Performance Measure: Number of visitor opportunities per day

Objective 2: Evaluate the potential for additional public access and recreation areas on CSF that are compatible with multiple-use management. Recreation opportunities will fall under the scope of multiple-use management in accordance with watershed protection, conservation, ecosystem restoration, and as detailed in the purpose for acquisition. (Short-term objective)

Performance Measure: List of viable access points and visitor opportunities for consideration

Objective 3: Continue to safely integrate visitor use into CSF, follow the Five-Year Outdoor Recreation Plan, and update annually. (Ongoing objective)

Performance Measures:

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

Objective 4: Continue to involve and meet with the Liaison Committee. The purpose of Liaison Committee meetings is to facilitate communication between the FFS and committee members (and the groups they represent) about state forest management and to obtain feedback from these entities. The Liaison Committee consists of local residents, community leaders, special interest

group representatives (vendors, hunters, and other recreation users, etc.), environmental group representatives, and other public / private entities. (Ongoing objective)

Performance Measures:

- Liaison Committee remains organized
- Continued annual meetings

Objective 5: Maintain cooperation with Florida Fish and Wildlife Conservation Commission (FWC) to develop specific hunting season quotas and bag limits, and to address hunting issues which are to be agreed upon at an annual cooperator meeting between FFS and FWC. (Ongoing objective)

Performance Measures:

- Annual letter on agreed-upon hunting issues
- Updated rules posted and WMA brochures available online at MyFWC.com

Objective 6: Recruit volunteers and volunteer organizations to assist with recreation and / or resource management. (Ongoing objective)

Performance Measures:

- Number of volunteers and organizations that assist with projects
- Number of hours provided by volunteers

- **<u>GOAL 3</u>: Habitat Restoration, Improvement, and Fire Management**

Objective 1: The CSF currently contains approximately 8,375 acres of fire-dependent communities. CSF staff will plan and conduct prescribed burns in a manner that benefits these fire-dependent natural communities within the forest. To achieve an average fire-return interval of two (2) to five (5) years for most fire-dependent communities, FFS will attempt to conduct prescribed burns on an average of approximately 1,400 to 2,500 acres per year. Currently FFS staff estimates 3,440 (past 5 years) acres at CSF are within the desired fire-return interval. (Ongoing objective)

Performance Measures:

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

Objective 2: Continue to annually update and implement the Five-Year Prescribed Burning Management Plan and the prescribed burning goals. (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 CSF and the surrounding community through a comprehensive mitigation strategy that includes evaluating vegetative fuels near residential areas and identifying potential fuel reduction projects. (Ongoing objective)

Performance Measures:

- Evaluation completed

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

Objective 4: Utilize prescribed fire to enhance restoration of native groundcover. Evaluate areas where native groundcover has been eliminated or heavily impacted from historical land use on a case-by-case basis for alternative methods to address reestablishment of native groundcover plants. Restore native groundcover where practical or heavily impacted from historical land use. (Long-term objective)
Performance Measure: Number of acres restored.

- **<u>GOAL 4</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 addressing the wildlife species for CSF, 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 CSF

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

- **<u>GOAL 5</u>: Invasive Species Management and Control**
  Objective 1: Continue to follow and annually update the Five-Year Ecological Plan for CSF, to locate, identify, and control 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 CSF invasive species database information annually

- **<u>GOAL 6</u>: Cultural and Historical Resource Management**
  Objective 1: Ensure all known sites are recorded in the Florida 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 annually and send updates to the DHR Florida Master Site File as needed. (Ongoing objective)
  Performance Measure: Number of sites monitored. Reports submitted to DHR.

  Objective 3: Maintain at least one (1) qualified staff member as an Archaeological Resource Management (ARM) Monitor. (Ongoing objective)
  Performance Measure: Number of local staff trained as ARM Monitors

- **GOAL 7: Hydrological Preservation and Restoration**

  Objective 1: Protect water resources during management activities through the implementation of Silviculture Best Management Practices (BMP) that are applicable to forest road maintenance and construction, construction of pre-suppression firelines, timber stand improvement activities, timber harvesting, sinkholes, etc. (Ongoing objective)
  Performance Measure: Percent compliance with Silviculture BMPs

  Objective 2: Close, rehabilitate, or restore those roads, firelines, and trails that have evidence of erosion into surrounding water bodies causing alterations to the hydrology and / or water quality. (Ongoing objective)
  Performance Measure: Number of roads, firelines, and trails closed, rehabilitated, and / or restored

  Objective 3: Conduct or obtain a site assessment / study to identify potential hydrological restoration needs. (Short-term objective)
  Performance Measure: Assessment conducted

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

  Objective 1: CSF staff, along with help from volunteers, and / or user groups, will continue maintenance of four (4) parking areas, two (2) trailheads, 23 miles of trails, and 33 miles of open roads. (Ongoing objective)
  Performance Measure: Number of existing facilities, miles of roads, and miles of trails maintained

  Objective 2: Continue to follow the Five-Year Roads and Bridges Management Plan and update annually. (Ongoing objective)
  Performance Measures:
  - Continued implementation of the Five-Year Roads and Bridges Management Plan
  - Annual updates of the Five-Year Roads and Bridges Management Plan completed

  Objective 3: Continue to implement the Five-Year Boundary Survey and Maintenance Management Plan and update annually. Approximately 20% of the forest boundary will be remarked annually as necessary, which includes 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 annually per State Forest Handbook guidelines
  - 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 Cary State Forest.

2. Legal Description and Acreage

The CSF encompasses 13,384.71 acres, more or less.

The forest is comprised of four separate tracts located along the Nassau-Duval County line in western Duval and southwestern Nassau Counties. Approximately 8,321 acres or 62% of CSF is within Duval County and 5,064 acres or 38% is within Nassau County. The property is located in all or part of Sections 31, 32, 40, 41 Township 01 North, Range 25 East; Sections 4-6, 31, 43, 44 Township 01 South, Range 25 East; Sections 6,7 Township 02 South, Range 25 East; Sections 25-27, 34-37 Township 01 North, Range 24 East; Sections 15-17, 19-28, 34- 36 Township 01 South, Range 24 East; and Sections 1,2 Township 02 South, Range 24 East. Acreage acquired is identified in Table 1.

Table 1. CSF Acreage by Funding Source

Funding Source	Acres
1935 Florida Conservation Committee	3,412.50
Florida Forever	7,463.22
Save Our Rivers	2,508.99

A complete legal description of lands owned by the Board of Trustees of the Internal Improvement Trust Fund (TIITF) is on record at the Florida Department of Environmental Protection (FDEP) 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 15 miles of the forest are mapped in Exhibit F and listed in Table 2.

Table 2. Nearby Significant Public Conservation Lands

Tract	Managing Agency	Distance
Whitehouse Field	USDOD, Navy	Adjacent
Thomas Creek Conservation Area	WMD / COJ	Adjacent
Monticello Wildlands (Monticello A, Scarborough, Block, International Tracts)	COJ	Adjacent
Jacksonville-Baldwin Rail Trail	COJ	Adjacent
Monticello Wildlands Conservation Easement	Duval County	Adjacent
Camp Milton Historic Preserve	COJ	5 miles SE
Miller Farm	JEA	5 miles SW
Cecil Field Conservation Corridor	COJ	7 miles S
Peterson Tract	JEA	7 miles S
St. Marys River House	TNC	7 miles W
Stone Mountain Industrial Park	WMD	7 miles E
Bulls Bay Preserve	COJ	9 miles SE
Loblolly Mitigation Preserve	LMB, LLC	9 miles SW
Yellow Water Branch Trailhead	COJ	10 miles SW

Tract	Managing Agency	Distance
Jennings State Forest	FFS	12 miles S
Four Creeks State Forest	FFS	13 miles NE
Sal Taylor Creek Preserve	COJ	13 miles S
Ribault River Preserve	COJ	13 miles E
McGirts Creek Preserve	COJ	14 miles SE
Branan Field Mitigation Park Wildlife Area	FWC	14 miles SE
Thomas Creek Preserve	COJ	15 miles NE

COJ – City of Jacksonville
FFS – Florida Forest Service
FWC – Fish and Wildlife Conservation Commission
JEA – Jacksonville Electric Authority
LMB – Loblolly Mitigation Bank
TNC – The Nature Conservancy
WMD – Water Management District
USDOD – United States Department of Defense

4. Property Acquisition and Land Use Considerations

The original 3,413-acre Cary Tract was acquired by purchasing multiple parcels between 1935 and 1942, establishing CSF as Florida's second state forest (See Table 3). CSF is named after the George F. and Charlotte C. Cary family who sold the first parcel to the state. Between July 20th, 2005, and May 14th, 2008, the Thomas Creek Tract (4,039 acres), Monticello Tract (3,942 acres), and Norfolk Southern Tract (1,651 acres) were acquired through Florida Forever's Northeast Florida Timberlands and Watershed Reserve Project and funds provided by the US Navy and the City of Jacksonville.

The lease agreements can be viewed at the offices of the Florida Department of Environmental Protection (FDEP), Division of State Lands and CSF Headquarters. All parcels acquired are identified in Table 3.

Table 3. Parcel Acquisition

Parcel Name	Lease No.	Lease Date	Acres
1935 Florida Conservation Committee	3687	11/22/1968	3,412.50
Monticello Drug	3687	7/7/2006	3,942.12
Norfolk Southern	3687	3/18/2009	1,651.00
Thomas Creek / Rayonier*	4609	3/18/2009	570.76
Thomas Creek / Rayonier	4609	3/18/2009	1,598.02
Thomas Creek / Rayonier*	4609	9/8/2009	15.21
Thomas Creek / Rayonier	3687	4/29/2010	736.87
Foster Milne	3687	4/29/2010	1,133.23
Red Shirt	3687	1/26/2011	325.00

* TIITF and WMD 50% interest

B. Management Authority, Purpose, and Constraints

1. Purpose for Acquisition / Management Prospectus

In the mid-1930s, Florida Governor David Sholtz, at the request of President Roosevelt, appointed a Conservation Committee. This committee drafted legislation, which was passed by the 1935 Florida Legislature, authorizing the acquisition, development, and management

of a system of state forests and parks, and appropriating funds for this purpose. The Cary Tract was established through this program.

In December 2001, the Acquisition and Restoration Council (ARC) added the Northeast Florida Timberlands and Watershed Reserve project to the Florida Forever 2001 Priority List. This fee-simple and less-than-fee acquisition located in Clay, Duval, and Nassau Counties and sponsored by The Nature Conservancy (TNC), the City of Jacksonville and SJRWMD, funded procurement of the Thomas Creek, Monticello, and Norfolk Southern Tracts. Under the program, the main objectives for the acquisition are to:

- Increase the protection of Florida's biodiversity at the species, community, and landscape levels.
- Increase the amount of open space available in urban areas conserving spaces suitable for greenways or outdoor recreation that are compatible with conservation purposes.
- Increase natural resource-based public recreation and educational opportunities: camping, picnicking, nature appreciation, hiking, and horseback riding will be considered.
- Protect, restore, and maintain the quality and natural functions of land, water, and wetland systems of the state.

The management prospectus for this Florida Forever project can be found in Exhibit Y.

2. Degree of Title Interest Held by the Board

All tracts are held 100% fee simple by the TIITF except the original Thomas Creek parcel (2,169 acres). The St. Johns River Water Management District (SJRWMD) owns a 50% undivided interest of this parcel. Lease agreements 3687 and 4609 delegate authority to manage the CSF.

3. Designated Single or Multiple-Use Management

CSF is managed under a multiple-use concept by the FFS, under the authority of Chapters 253 and 589, F.S. The FFS is the lead managing agency as stated in TIITF Management Lease Numbers 3687 and 4609.

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

4. Revenue Producing Activities

Numerous activities on CSF 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 CSF include, but are not limited to:

- *Timber Harvests* – Timber harvests on CSF will be conducted on a regular basis to improve forest health, promote wildlife habitat, restore plant communities, and provide other benefits.
- *Recreation Fees* – Fees are currently collected for day-use, camping, and miscellaneous commercial vendor permits.
- *Other miscellaneous* – Other miscellaneous forest products including, but not limited to, apiary leases, palm fronds and berries, pinecones, pine straw, and firewood may be considered.

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 253, 259, and 589, F.S.

6. Legislative or Executive Constraints

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

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

7. Aquatic Preserve / Area of Critical State Concern

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

C. Capital Facilities and Infrastructure

1. Property Boundaries Establishment and Preservation

The CSF boundary lines are managed by state forest personnel in accordance with the guidelines stated in the State Forest Handbook (FFS 2016). Approximately 95% of CSF boundaries have been painted and signs posted according to FFS boundary marking specifications. Forest boundary firelines are partially established and will be completed where appropriate in uplands. The state forest boundary lines are to be maintained by periodic clearing, repainting, and reposting of state forest boundary signs by FFS personnel.

2. Improvements

Major FFS structures include the CSF headquarters office, the Jacksonville District Office, District Shop, recreation pavilion, pole barn / shop, recreation bathhouse / restrooms, fire tower, two boardwalks, well pumphouse, mobile home site near the CSF headquarters and a metal woodshed. Other structures located on subleases to Nassau County include a Nassau County Fire Station, two separate stretches of the same Florida Power and Light (FPL) power line and a Jacksonville Electric Authority (JEA) power line. A single lane steel bridge crossing No Catch Swamp is located on No Catch Road about half-way between the intersections of Cypress Pond and Basin Roads.

3. On-Site Housing

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

There is potential to establish on-site housing at the future Monticello Recreation Area near Garden Street. Currently an FWC officer is utilizing a trailer site near the CSF headquarters on the Cary Tract.

4. Operations Infrastructure

a. Operations Budget

For Fiscal Year 2022-2023, the annual operational budget for CSF was $39,711.60. This amount includes expense, fuel, contractual encumbrance, and expense encumbrance. A summary budget for CSF is contained in Exhibit U. Implementation of any of the activities within this management plan is contingent on availability of funding, other resources, and other statewide priorities.

b. Equipment

To carry out the mission of the FFS, CSF maintains a diverse range of equipment such as one pick-up truck, road grader, loader, dump truck, farm tractor, ATV, ATV pull-behind harrows, UTV, batwing mower, riding mower, and several other pieces of landscape maintenance equipment. Additional equipment can be used from other resources throughout the Jacksonville District, when needed, for management activities on CSF.

c. Staffing

The CSF is managed by one (1) state lands Forester. Additional FFS employees provide support to forest resource planning, administrative function, and work project coordination, including the Duval County Forest Area Supervisor, District Recreation Coordinator, OPS Biologist, and Nassau County based Forest Rangers.

The Forester will work to achieve the goals outlined in this management plan. Resource management and planning activities, such as timber cruising and sale administration are the responsibility of the Forester under the supervision of the Resource Administrator and District Manager. The recreation planning and management activities, such as trail flagging / identification and recreation facility placement will be done in conjunction with the Recreation Coordinator. The Forester will also work in conjunction with the Forest Area Supervisor under the direction of the Operations Administrator and District Manager to facilitate forest operations, such as road maintenance, operations / recreation facility maintenance, and prescribed burning.

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. Deadhead logging is not compatible with nor considered appropriate use within or adjacent to the state forest boundaries. Although no water resource projects are being considered at this time on SJRWMD-owned lands within CSF, they should not be precluded.

2. Additional Land Needs

The purchasing of additional land within the optimal management boundary would facilitate restoration, protection, maintenance, and management of the natural resources on CSF.

There are 60 parcels of land comprised of 7,556 acres adjacent to the property which should receive priority for acquisition, as they would benefit the management of the property. FFS will work with the property owners, on a willing seller basis, to acquire these parcels. See Exhibit C.

3. Surplus Land Assessment

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

The evaluation of CSF by FFS has determined that all portions of the forest are being managed and operated for the original purpose of acquisition, as well as center on the multiple-use concept, as defined in sections 589.04(3) and 253.034(2)(a), F.S. Implementation of this concept will utilize and conserve state forest resources in a harmonious and coordinated combination that will best serve the people of the state of Florida. Therefore, no portion of the CSF is recommended for potential surplus.

4. Adjacent Conflicting Uses

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

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

5. Compliance with Local Comprehensive Plan

This plan was submitted to the Board of County Commissioners in Nassau and Duval Counties for review and compliance with their local comprehensive plans. See Exhibit S.

6. Utility Corridors and Easements

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.

Currently there is one (1) established utility corridor on CSF. Florida Power and Light Company has a 230kV power transmission line running southwest to northeast bisecting the Cary and Thomas Creek Tracts. The FFS does not consider CSF 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), minimize habitat fragmentation, limit disruption of management activities, including prescribed burns, and 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 as well as encourage the development and use of wildlife crossings for unavoidable roadway development projects. Easements for such utilities are subject to the review and approval of the TIITF and the SJRWMD. Requests for linear facility uses will be handled according to the Governor and the Cabinet's linear facilities policy.

E. Agency and Public Involvement

1. Responsibilities of Managing Agencies

FFS is the lead managing agency, responsible for overall forest management and public recreation activities, as stated in TIITF Management Lease Numbers 3687 and 4609. Pursuant to the management lease, the lead managing agency may enter into further agreements or to subleases on any part of the forest.

FFS will cooperate with DHR regarding appropriate management practices on historical or archaeological sites on the property as stated in Section 267.061, F.S. DHR will be consulted

prior to the initiation of any ground disturbing activities by the FFS or any other agency involved with the forest.

FWC assumes law enforcement responsibilities, enforces hunting regulations, cooperatively sets hunting season dates with FFS, and conducts other wildlife management activities with input from FFS.

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

2. Law Enforcement

Primary law enforcement responsibilities will be handled by FWC law enforcement officers. Rules governing the use of CSF are stated in Chapter 5I-4 of the F.A.C. FWC will enforce fish and wildlife regulations and aid in enforcing state forest rules. FWC does not currently have an officer dedicated to patrolling and enforcement on CSF. This task is shared among multiple FWC officers who also patrol and enforce laws on properties and waterways outside of CSF.

The FDACS Office of Agricultural Law Enforcement (OALE) will assist with open burning and wildfire investigations as needed. The Nassau County Sheriff's Office and Duval County Sheriff's Office provide additional assistance as needed.

Special rules under Chapter 5I-4 of the FAC were promulgated for FDACS, FFS, to manage the use of state lands and better control traffic, and to oversee camping and other uses on CSF.

3. Wildland Fire

FFS has the primary responsibility for prevention, detection, and suppression of wildfires wherever they may occur. FFS shall provide leadership and direction in the evaluation, coordination, allocation of resources, and monitoring of wildfire management and protection as stated in 590.01, F.S. FFS also has the responsibility of authorizing prescribed burns as stated in 590.02 (1)(i), F.S.

4. Public and Local Government Involvement

This plan has been prepared by FFS and will be implemented by FFS. FFS responds to public involvement through liaison committees, management plan advisory groups, public hearings, and through ongoing direct contact with user groups. Land Management Review Teams as coordinated by the Division of State Lands have conducted three reviews of management plan implementation in 2012, 2017, and 2022. See Exhibit R. The review teams' recommendations were addressed in this plan, as appropriate.

A state forest liaison committee of private citizens and representatives of forest user groups meet annually to provide input on forest management activities and share their ideas with FFS staff to improve the state forest.

The plan was developed with input from the CSF Management Plan Advisory Group and was reviewed at a public hearing on January 11, 2024. 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.

5. Volunteers

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

6. 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 FFSF program is referenced in Chapter 589.012, F.S. For more information visit: www.floridastateforests.org.

III. Archaeological / Cultural Resources and Protection

A. Past Uses

Cary Tract

CSF was originally managed from the FFS state office in Tallahassee until 1971 when management responsibility was given to the Jacksonville District. Prior to FFS acquisition the forest was managed for timber, turpentine, cattle, and agricultural production among other uses by the Cary family and other local landowners.

Since acquisition in 1939, the forest has been managed for multiple use by the FFS and State of Florida. Forest management has included various silvicultural treatments such as thinning and clear-cuts with artificial regeneration. Group selections (small clear-cuts) and seed tree cuts for natural regeneration and uneven-aged management goals have also been utilized. Some portions of the wetland communities appear to have had complete and partial harvests prior to FFS management.

In an effort to improve fire protection for local communities, in 1973 the TIITF agreed to a 50-year lease of one acre of CSF to Nassau County for the construction of a Nassau County Fire Station and meeting hall. The FDACS also subleased five acres to the city of Bryceville for community improvements including a library / community center and a baseball field.

Monticello Tract

Prior to state acquisition, the Monticello Tract was managed by Jacksonville-based Monticello Land and Monticello Drug Companies. A former local landowner, St. Regis Timber Company, leased and managed this parcel prior to the Monticello companies. When acquired, the property had not been prescribed burned since the 1970s.

Both St. Regis and the Monticello companies managed the property intensively for timber production and other uses including hunting leases and turpentine production. Upon acquisition, the Monticello Tract's upland communities were and continue to be dominated by merchantable and pre-merchantable timber, mostly intensively managed slash pine (*Pinus elliottii*), longleaf pine (*Pinus palustris*), loblolly pine (*Pinus taeda*), and sand pine (*Pinus clausa* var. *clausa*) plantations. Most of the wetland communities appear to have had complete or partial timber harvests during past ownerships. A 6" water monitoring well is located on the Monticello Tract and has been plugged. The monitoring well has since been abandoned and is no longer in use. Based on a 2005 DEP boundary survey map, there are two (2) former United States Geological Survey (USGS) Water Resources Division observation wells within several yards of another, but only one is visibly verifiable.

Thomas Creek Tract

The Thomas Creek and Gopher Ridge parcels of the current CSF Thomas Creek Tract were acquired from Rayonier Forest Resources, Inc. Engraved concrete boundary markers on site indicate portions of these parcels may have been owned or leased by the St. Regis Timber Company at some point prior to Rayonier. The Foster-Milne parcel of the Thomas Creek Tract was acquired by the Foster and Milne families. This parcel changed ownership many times over the past 50 years, including various timber companies, land holdings, and small private, non-industrial forest landowners such as the Foster and Milne families.

The Thomas Creek parcel's upland communities were mostly clear-cut prior to State acquisition. Most of the wetland communities appear to have had complete or partial timber harvests during past ownerships. Past land uses on the Thomas Creek, Gopher Ridge, and Foster-Milne parcels include but are not limited to intensive and non-intensive timber production, cattle grazing, turpentine production, agricultural production, and nearby suspected homesteads.

The Thomas Creek Tract also includes the 325-acre Red Shirt Parcel that is owned fee simple by St. Johns River Water Management District and is managed by FFS under a lease agreement as part of CSF. Past land use here is very similar to the other parcels on the tract. Further, there are two unmapped parcels (totaling 130 acres) of CSF on the eastern side of the railroad tracks on the eastern boundary of the Thomas Creek Tract which are now managed by the St. Johns River Water Management District under a management agreement with FDACS.

Norfolk Southern Tract

This parcel was acquired from the Norfolk Southern Railroad Company. The tract was intensively managed for timber production in both the upland and wetland communities. Approximately 40% of wetland communities were clear-cut by the previous landowner prior to State acquisition. Upland communities are approaching merchantability and consist of bedded slash pine plantations with small clear-cut areas of naturally regenerating slash pine. The property was also leased by a local hunting club prior to acquisition.

B. Archaeological and Historical Resources

A review of information contained in the Florida Department of State, Division of Historical Resources, Florida Master Site file has determined there are three (3) recorded archaeological

sites and one (1) recorded historic cemetery on CSF. They are currently not listed in the National Register of Historic Places. See Exhibit G.

Table 4. Historical Sites on CSF

Site ID	Site Name	Address	Site Type
NA00746	Medium Chicken	Bryceville	Archaeological site
NA01278	Thomas Creek Cattle Dip	Bryceville	Archaeological site
NA01279	Bryce Cattle Dip	Bryceville	Archaeological site
NA01865	Thomas Creek Cemetery	Bryceville	Cemetery

C. Ground Disturbing Activities

Representatives of DHR and FNAI will be consulted prior to the initiation of proposed ground disturbing activity as required per DHR guidelines. FFS will make every effort to protect known archaeological and historical resources. FFS will follow the "Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands" and will comply with all appropriate provisions of Section 267.061(2)(a,b), F.S. (Exhibit H). Any significant ground disturbing activity proposal will be submitted to DHR's Compliance and Review office for review prior to undertakings and allow the Division a reasonable opportunity to comment. Ground disturbing activities not specifically covered by this plan will be conducted under the parameters of the Interim Management Guidelines.

D. Survey and Monitoring

Currently one (1) assigned CSF staff member is trained by DHR as an Archaeological Resource (ARM) monitor. Additionally, seven district staff trained as ARM monitors provide oversight as required for any ground disturbing and management activities that occur, as needed. FFS will pursue opportunities for additional personnel to receive ARM monitor training. FFS will consult with public lands archaeologists at DHR as necessary to determine an appropriate priority and frequency of monitoring at each of the listed sites, and any protection measures that might be required. Unless required on a more frequent basis, all archaeological and historical sites within the forest will be monitored at least annually. FFS staff will monitor the listed sites to note condition and any existing or potential threats.

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

IV. Natural Resources and Protection

The primary purpose for FFS management of CSF is protection of wetlands and associated natural communities within the floodplain of the St. Johns River through a stewardship ethic to assure these resources will be available for future generations. Management activities will be executed in a manner to minimize soil erosion and maintain and protect/enhance the hydrological resources on CSF. 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 CSF's waterbodies and their associated water quality and native plants and animals.

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

A. Soils and Geologic Resources

1. Resources

Soil information for CSF was obtained from the United States Department of Agriculture Natural Resources Conservation Service (NRCS). There are several different soil series found on CSF. They range from deep, well-drained sands to poorly drained organic muck soils associated with wetlands. The predominant soils listed by the NRCS are Boulogne fine sand, Evergreen-Wesconnett complex, Leon fine sand, Evergreen-Leon muck, Lynn Haven fine sand, and Surrency loamy fine sand. Detailed information on all soils present on the 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 Florida Silviculture BMP.

The blown-out culvert system at Line Road on Thomas Creek and Jennifer Road at the Culvert Crossings across Thomas Creek has minor erosion due to flooding. Additional erosion issues must be addressed in areas on Norfolk Road on the Norfolk Southern Tract. Across the forest, excessive jeep/off-road style vehicle use damages roads and contributes to minor erosion issues. Ongoing road maintenance and repair plans should resolve those issues in the future.

B. Water Resources

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

1. **Resources**

CSF protects portions of the St. Johns, St. Marys, and Nassau River watersheds. There are two freshwater creeks that flow through and originate within the CSF boundary. The first is Thomas Creek, which flows northeast through the Thomas Creek Tract towards Four Creeks State Forest and the headwaters of the Nassau River. The second creek on CSF is an unnamed, intermittent creek and begins within No Catch Swamp on the Norfolk Southern Tract. It then flows northwest through the Monticello Tract and then west out of the swamp and southwest out of CSF, eventually flowing into Brandy Branch, which flows into the St. Marys River. There are two unnamed tributaries within CSF that flow into Thomas Creek. The first is located on the western portion of the Thomas Creek Tract and flows south directly into Thomas Creek. The second intermittent creek / headwaters begin on the northeastern portion of the Cary Tract and flows northeast out of CSF through private lands and eventually flows directly into Thomas Creek. There are several drainages and wetlands that flow out of CSF into major waterways such as the Trout River and McGirts Creek. See Exhibit K.

Additionally, two man-made borrow pits have formed small ponds on CSF. The first is located along Motes Road on the Cary Tract, is infested with torpedo grass, and is no longer used as a borrow pit. The torpedo grass must be controlled or eliminated to prevent spread of this invasive species. The second pond is located directly east of a large windrow along the north end of Sandhill Road on the Thomas Creek Tract. This borrow pit was created by prior landowner(s) and will not be used by FFS for road material. See Exhibit X.

Approximately 35% of the CSF land area is occupied by wetlands, with 71% of these wetlands being basin swamp. These crucial wetland communities provide watershed protection, aquifer recharge for the region, valuable water storage / flood control, water filtration, and aquatic habitat preservation. No Catch Swamp, the Thomas Creek floodplain, and bottomland forest communities are significant wetland communities within CSF.

2. **Water Classification**

The Florida Department of Environmental Protection, Standards Development Section reports all surface waters within, adjacent to, or within five (5) miles of CSF are classified as Class III waters (Fish Consumption, Recreation and Propagation and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife) according to Rule 62-302.400, F.A.C.

According to subsection 62-302.700(9), F.A.C., there are no Outstanding Florida Waters (OFWs) within or adjacent to Cary State Forest. The OFW closest to Cary State Forest is the Timucuan Ecological and Historic Preserve, which is located 10 miles to the northeast. See Exhibit J.

3. **Water Protection**

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

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

In addition to the waterways, CSF contains approximately 4,374 acres in seven hydric communities: basin swamp, dome swamp, floodplain swamp, bottomland forest, baygall, basin marsh and depression marsh. Maintenance of naturally occurring wetland communities is a high priority and will be accomplished through appropriate management activities, including prescribed fire when appropriate, and adherence to Silviculture BMP.

5. **Wetland Restoration**

Wetland restoration objectives on the state forest include erosion control, restoration of water levels and / or hydroperiods, 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, 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, CSF, with assistance from the FFS Forest Management Bureau, 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.

Wetland restoration will be coordinated with SJRWMD. Any activities requiring permits from the water management district will be handled accordingly and will follow the latest edition of the FFS Silviculture BMP Manual.

6. **Florida Department of Environmental Protection Basin Management Action Plans**

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

The BMAP provides for phased implementation under Subparagraph 403.067(7)(a)1, F.S. The phased BMAP approach allows for the implementation of projects designed to achieve incremental reductions, while simultaneously monitoring and conducting studies to better understand the water quality dynamics (sources and response variables) in the watershed.

CSF resides in / adjacent to the Lower St. Johns Mainstem BMAP zone. See Exhibit K.

C. Flora and Fauna Resources

1. Rare, Threatened, and Endangered Species

The intent of FFS is to manage CSF in a fashion that will minimize the potential for wildlife and plant species to become imperiled. FFS employees continually monitor the forest for threatened or endangered species while conducting management activities. Specialized management techniques may be used, as necessary, to protect or increase protection of rare, threatened, and endangered species, as applicable for both plants and animals. See Table 5.

Table 5. Rare, Threatened, or Endangered Species Documented on CSF

Common Name	Scientific Name	FNAI Global Rank*	FNAI State Rank*	Federal Status*	State Status*
American alligator	*Alligator mississippiensis*	G5	S4	SAT	FT(S/A)
Blueflower butterwort	*Pinguicula caerulea*	G4	S3S4	N	LT
Crested yellow orchid	*Platanthera cristata*	G5	S3S4	N	LT
Giant Orchid	*Pteroglossaspis ecristata*	G4	S4	N	T
Gopher tortoise	*Gopherus polyphemus*	G3	S3	C	ST
Hooded pitcherplant	*Sarracenia minor*	G4	S4	N	ST
Little blue heron	*Egretta caerulea*	G5	S4	N	ST
Painted bunting	*Passerina ciris*	G5	S3	N	N
Snowy egret	*Egretta thula*	G5	S3	N	N
Tricolored heron	*Egretta tricolor*	G5	S4	N	ST
White ibis	*Eudocimus albus*	G5	S4	N	N
Wood stork	*Mycteria americana*	G4	S2	T	FT
Purpledisk honeycomb-head	*Balduina atropurpurea*	G2	S2	N	E
Frosted flatwoods salamander	*Ambystoma cingulatum*	G2	S1	T	FT
Southern dusky salamander	*Desmognathus auriculatus*	G3	S1	N	N
Pondspice	*Litsea aestivalis*	G3?	S2	N	E
Southern milkweed	*Asclepias viridula*	G2	S2	N	T
Many-flowered grass-pink	*Calopogon multiflorus*	G2G3	S2S3	N	T
Large rosebud orchid	*Cleistes divaricata*	G4	S1	N	E
Ciliate-leaf tickseed	*Coreopsis integrifolia*	G1G2	S1	N	E
Florida toothache grass	*Ctenium floridanum*	G2	S2	N	E
Eastern diamondback rattlesnake	*Crotalus adamanteus*	G3	S3	N	N
Eastern indigo snake	*Drymarchon couperi*	G3	S2	T	FT
Florida pine snake	*Pituophis melanoleucus*	G4	S3	N	ST

Common Name	Scientific Name	FNAI Global Rank*	FNAI State Rank*	Federal Status*	State Status*
Timber rattlesnake	*Crotalus horridus*	G4	S3	E	FE
Red-cockaded woodpecker	*Dryobates borealis*	G3	S2	E	FE
Roseate spoonbill	*Platalea ajaja*	G5	S2	N	ST
Swallow-tailed kite	*Elanoides forficatus*	G5	S2	N	N
Hartwrightia	*Hartwrightia floridana*	G2	S2	N	T
Gopher frog	*Lithobates capito*	G2	S2	N	T
Tawny sanddragon	*Progomphus alachuensis*	G3	S3	N	N
Nightflowering wild petunia	*Ruellia noctiflora*	G3	S2	N	E
Southern fox squirrel	*Sciurus niger niger*	G5T5	S3S4	N	N
Florida black bear	*Ursus americanus floridanus*	G5T4	S4	N	N
Variable-leaf crownbeard	*Verbesina heterophylla*	G2	S2	N	E
Bachman's sparrow	*Peucaea aestivalis*	G3	S3	N	N

* STATUS/RANK KEY
FNAI Global Rank: G1= Critically Imperiled, G2= Imperiled, G3= Rare, G4= Secure, G5= Demonstrably Secure, G#Q= Rare but questionable whether it is species or subspecies
FNAI State Rank: S1= Critically Imperiled in Florida, S2= Imperiled in Florida, S3= Rare in Florida, S4= Secure in Florida, S5= Demonstrably secure in Florida, SU= Not under review in Florida
Federal Status (USFWS): 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, E= Endangered, N= Not currently listed, T= Threatened, SAT= Treated as Threatened due to similarity of appearance.
State Status (FWC): C= Candidate for listing, FE= Listed as Endangered Species at the Federal level by the USFWS, FT= Listed as Threatened Species at the Federal level by the USFWS, FT(S/A) = Federal Threatened due to similarity of appearance, N= Not currently listed, nor currently being considered for listing, ST= State population listed as Threatened by the FFWCC.

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 throughout Florida. FNAI has reported the following:

a. Element Occurrences

FNAI element occurrences data layer includes occurrences of rare species and natural communities. For animals and plants, element occurrences usually indicate a viable population of the species. In addition to the species in Table 5, FNAI reports a few documented Element Occurrences of rare or endangered species within the vicinity of the property. See Exhibit L.

Documented habitat includes basin marsh, basin swamp, baygall, bottomland forest, dome swamp, floodplain marsh, floodplain swamp, mesic flatwoods, sandhill, wet flatwoods, and wet prairie.

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 CSF. Rare species and communities that have not been documented but that are likely or potential at the site are listed in Exhibit L.

c. Land Acquisition Projects
CSF is located within the Northeast Florida Timberlands and Watershed Reserve Project, a Florida Forever project, which is part of the State of Florida's Conservation and Recreation Lands land acquisition program.

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 expansions or alterations are made to any facilities.

3. <u>Florida Fish and Wildlife Conservation Commission</u>
The FWC 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.

Other findings by the FWC include:
a. No Strategic Habitat Conservation Areas (SHCA) occur within a reasonable distance of the property.
b. CSF is located within an area of low to moderate Species Richness, which indicates the total number of species within potential habitat identified in a specific location.
c. CSF is adjacent to Priority Wetlands, which are wetlands significant to listed wetland-dependent vertebrates.

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. See Exhibit M.

The FWC recommends the review of management guidelines in the published FWC Gopher Tortoise Management Plan to guide management actions for the gopher tortoise (*Gopherus polyphemus*) on the area. The FWC Gopher Tortoise Management Plan provides beneficial resource guidelines for habitat management and monitoring of the gopher tortoise. For reference, the FWC Gopher Tortoise Management Plan can be accessed at MyFWC.com.

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

4. Game Species and Other Wildlife

Wildlife management plays an important role in the management of resources on CSF. The Cary, Monticello, and Thomas Creek Tracts currently comprise the 11,410-acre Cary Wildlife Management Area (WMA). Management of this area will be directed to the production of biological diversity and species composition consistent with existing natural community types. Such communities will be restored and / or maintained through habitat management. All biological resources will be managed to maintain diversity.

The FWC provides cooperative technical assistance in managing wildlife and fish populations, setting seasons, establishing bag and season limits, and overall wildlife and fish law enforcement. Hunting on the Cary State Forest WMA is provided through both non-quota and quota hunts. Hunting is prohibited in the environmental education area on the Cary Tract and the private easement on the Monticello Tract.

Game species on the Cary WMA include white-tailed deer (*Odocoileus virginianus*), wild turkey (*Meleagris gallopavo*), wild hog (*Sus scrofa*), gray squirrel (*Sciurus carolinensis*), eastern cottontail rabbit (*Sylvilagus floridanus*), northern bobwhite (*Colinus virginianus*), and migratory birds in season. Visit MyFWC.com to view the Cary WMA regulations summary brochure.

Other notable wildlife documented in the WMA includes gopher tortoise (*Gopherus polyphemus*), southern fox squirrel (*Sciurus niger*), bobcat (*Lynx rufus*), great horned owl (*Bubo virginianus*), barred owl (*Strix varia*), American alligator (*Alligator mississippiensis*), pileated woodpecker (*Dryocopus pileatus*), and yellow-throated vireo (*Vireo flavifrons*).

There are no permanently maintained wildlife openings or planted food plots on CSF. Wildlife openings and food plots will be established and maintained in accordance with the FFS State Forest Handbook.

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

5. Survey and Monitoring

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

a. Gopher Tortoises

Belt transect surveys for gopher tortoise burrows have been conducted by FFS and FWC staff opportunistically, as needed, but generally in advance of land management activities that may impact tortoises (e.g., timber harvest). All surveys are done in cooperation with FWC.

The FFS follows and utilizes the Best Management Practices for gopher tortoises to assist

in meeting management objectives for both the species and the communities in which it is found.

b. Florida Black Bear

FFS will continue to cooperate with FWC to implement FWC's state-wide Florida Black Bear Management Plan, with an emphasis on maintaining sustainable black bear populations in suitable habitats throughout Florida for the benefit of the species and people.

c. Listed Plant Species

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

d. Other Rare Biota Surveys

Surveys are done as time and staffing allow. High quality plant communities continue to incur ad hoc surveys for both listed plants and animals. During routine management activities, incidental sightings of rare animals and plants are GIS-mapped by FFS staff. All rare species data is collected and sent to FNAI annually.

Surveys conducted by university researchers and students and knowledgeable naturalists on CSF augment information provided by formal surveys conducted by FWC and other cooperating agencies. The FFS will seek assistance from citizen science, colleges, universities, and other agencies to gather data on plant and animal species.

6. <u>Gopher Tortoise Recipient Site Feasibility Assessment</u>

The FFS has assessed the feasibility of establishing a gopher tortoise recipient site on CSF. The vast majority of CSF is regularly too wet with soil classes unsupportive of a large gopher tortoise population. CSF staff have identified six (6) parcels totaling 167 acres (largest is 90 ac; smallest is 4 ac) in the central portion of the Thomas Creek Tract, either directly abutting or just east of the powerline easement. These sites have been typed by FNAI as either sandhill or mesic flatwoods, and all are in the process of being restored. Soils on these sites range from somewhat poorly drained to moderately well drained. A site-specific survey would need to be completed in order to determine the baseline gopher tortoise density of these sites. No formal Line Transect Distance Sampling survey has been conducted on CSF to date.

Operational budget, staffing levels, and technical capacity considerations preclude the FFS from installing a gopher tortoise recipient area on CSF. The FFS would require financial and technical assistance from FWC to establish a recipient site on CSF. Should that assistance be available, the FFS would be amenable to partnering and establishing a gopher tortoise recipient site.

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.

E. Beaches and Dune Resources

No beaches occur on CSF.

F. Mineral Resources

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

G. Unique Natural Features and Outstanding Native Landscapes

Thomas Creek itself, and the nearly intact bottomland hardwood forest and floodplain swamp through which the creek flows, are considered unique natural features. No Catch Swamp and the associated basin marsh are also unique natural features of CSF.

The Cary Tract contains particularly well-managed and representative mesic and wet flatwoods, cypress domes, and basin swamps. The Thomas Creek bottomland forest and floodplain swamp are also exceptional native landscapes found on CSF.

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 conducted on CSF 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, managers, 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 CSF staff. Other special conditions may be applicable, and the authorization may be terminated at any point if the study is not in compliance.

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

- University of North Florida (Nuszkowski). 2022. Research regarding an improved method of wildfire tracking.
- Duke University (Crowl). 2021. Investigation of genetics, taxonomy, and distribution of North American blueberries (*Vaccinium* section *Cyanococcus*).
- University of Florida, FL Museum of Natural History (Miller and Gott). 2018 – 2020. Conduct research on the biology and systematics of the Florida duskywings
- University of Florida, FL Museum of Natural History (Warren). 2015 – 2021. Collect voucher specimens of non-listed (state or federal) insects from the orders Lepidoptera,

Coleoptera, Diptera, and Hymenoptera to fill data gaps and augment species-level records at the Florida State Collection of Arthropods (FSCA) to investigate taxonomy, biogeography, and systematics of insects. (*Lepidoptera:Hesperiidae:Erynnis*).

- Florida Fish and Wildlife Conservation Commission/FWRI (Farmer/Enge). 2015 – 2018. Determine the status, distribution, and reproductive success of the gopher frog (*Lithobates capito*) in Florida.
- Barbour and Barbour. 2014 – 2016. Collect voucher specimens of plants at Cary SF.

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. Sensitive resources include areas such as known sensitive species locations; archaeological, fossil, and historical sites; ecotones, wetlands, and water resources. The process for evaluating and obtaining approval for ground disturbing activities is outlined in Appendix 2.A.6. of the State Forest Handbook.

When new pre-suppression firelines, recreation trails, or other low-impact recreation 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 passive outdoor recreation activities that are dependent on the natural environment and to provide outdoor recreation opportunities to wounded veterans through Operation Outdoor Freedom (OOF). FFS will continue to promote and encourage public access and recreational use by the public while protecting resources and practicing multiple-use management.

Periodic evaluations will be conducted by FFS staff to monitor recreation 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 Recreation Opportunities

CSF offers a variety of passive, resource-based recreation opportunities, including hiking, RV and primitive camping, wildlife viewing, horseback riding, environmental education, and hunting. Recreation facilities and designated trails are located on the original Cary Tract, as well as the Thomas Creek Tract. Bicycling, hiking, and horseback riding are permitted on all forest roads and fire lines on the Cary, Monticello, Thomas Creek, and Norfolk Southern tracts unless posted as closed to public access. The forest is open during daylight hours for visitors to enjoy

picnicking, hiking, bicycling, fishing, wildlife viewing, and horseback riding. See Exhibit D for a map of the facilities and improvements.

1. Public Access and Parking

CSF is bordered by several major and local roadways including US 301, Ford / Plummer Road, Thomas Creek / Acree Road, Motes Road, and Garden Street (Exhibit M). Old Plank Road is an important nearby roadway, and the paved Jacksonville-Baldwin Rail Trail runs through the southern portion of the Norfolk Southern Tract.

Access is available to recreation users through three designated entrances. CSF is open to public day-use, 1.5 hours before sunrise until 1.5 hours after sunset. All open forest roads permit hiking, bicycle, and equestrian use, except in the Private Easement area on the Monticello Tract which is closed to all public use. Due to its long history as a state forest, the majority of the recreation facilities are located on the Cary Tract.

Cary Tract

The main day-use and camping recreation area for CSF is accessible from Pavilion Road. Designated vehicle access to this site is provided at US 301 and Pavilion Road. A large grassy parking area and a smaller overflow lime rock parking area are located on Pavilion Road. Hunting is prohibited in the Cary Campground recreation area.

Monticello Tract

Designated vehicle access is provided where Garden Street dead-ends into CSF at Monticello Road. Licensed vehicles, hikers, equestrians, and bicyclists are permitted on open roads. There is no public access permitted in the Private Easement located along the southwestern boundary of this Tract.

Thomas Creek Tract

Designated vehicle access is provided at US 301 and Jennifer Road. A large grassy parking area is located on Jennifer Road. Year-round walk-in access and vehicular access (during hunting season) is permitted at the Acree / Thomas Creek Road gate. Walk-in access only is permitted at the Cross County / Thomas Creek Road gate.

2. Recreation Areas

The S. Bryan Jennings Recreation Pavilion (approximately 1,200 square feet), recreation bathhouse / restrooms, 6 RV Full Hook Up campsites and 1 completed (2023) overflow RV Full Hook Up campsite, 1 Group campsite with 50-person capacity, two boardwalks, and a fire tower are all located within the Cary Campground recreation area on Pavilion and Fire Tower Roads.

Picnicking is available in the parking area under shade trees and at the pavilion. Potable water for all users is provided. Day use fees are payable by QR code or online through the FFS campground reservation system. All campsites on Cary are reservation only and are made via the campground reservation system. Brochures, forest information, general rules and a map are located at the trailhead kiosk.

The Whittmore Mill Recreation Area is located on the Thomas Creek Tract off Jennifer Road. This area offers parking, an information kiosk, and a nature trail.

3. Trails

Recreation trails are monitored for negative impacts through routine inspections and maintenance. Trails are maintained and are closed during prescribed burning activities, following intense storm events, or at other times when necessary. Significant ground disturbance caused by recreation use may require the closing or rerouting of trails.

The Pavilion Road parking area provides the trailhead for the Pavilion Road Trail Complex. The associated trails within this complex include the: 0.85-mile Wetland Pine Boardwalk Loop Trail and 1.25-mile Cypress Swamp Boardwalk Loop Trail (these comprise the Nature Trail), 7.75-mile Red Root Equestrian Trail, and the 12.2-mile Fireline Multiple Use Trail. The Red Root trail is a designated FFS Trail Trotter program trail and the Nature Trail is a Trail Walker trail. The Whittmore Mill parking area provides trailhead access for the 1-mile Dahoma Historic Interpretive Nature Trail on the Thomas Creek Tract.

4. Camping

The campground along Pavilion Road contains 6 large, RV or tent designated campsites with electric and water hook ups. Campers have access to a bathhouse restroom facility with showers and hot water. Each campsite has a 20'x30' concrete pad, grills, a fire-pit, picnic tables, and benches. Reservations are made via the online campground reservation system. A large group site is also available in this area with a 50-person capacity. It is equipped with grills, large fire ring, and picnic tables. This group site also has access to the bathhouse and pavilion and must be reserved via the campground reservation system.

5. Hunting and Fishing

The Cary, Monticello, and Thomas Creek Tracts compose the Cary State Forest Wildlife Management Area (WMA). All hunting is prohibited in the Cary Campground recreation area on the Cary Tract and the private easement on the Monticello Tract. Regulated hunting is permitted within the WMA during designated hunting dates and with possession of appropriate quota permits and licenses. Hunting and fishing activities are regulated by FWC. FFS will evaluate areas along the boundary to identify possible safety issues where actions need to be taken to mitigate these concerns to protect adjacent properties and neighbors. Possible solutions include increased signage, road closures, and setbacks.

6. Environmental Education and Public Outreach

Current staffing allows for programs and tours to be conducted upon request. Programs and tours are conducted annually for the Boy Scouts of America, church groups, local schools, summer camps, University of Florida Master Naturalist classes, and other groups. Approximately 94 environmental education programs and / or newspaper articles were conducted between 2012 and 2022. Volunteers will be utilized in the future to assist with environmental education and public outreach programs.

B. Planned Recreation Opportunities

FFS will continue to assess plans for additional recreation 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 related activities will be evaluated. Any specific plans will be incorporated into the Five-Year Outdoor Recreation Plan on file at CSF.

1. Public Access and Parking

Monticello Tract

Within this ten-year planning cycle, the potential for new parking areas will be evaluated and considered for use on the Monticello Tract. Current parking and forest access points will continue to be evaluated for updates and improvements. A potential observation tower and boardwalk overlooking the basin marsh with a parking area will be considered within the Basin Swamp Recreation Area Footprint.

Improvements to the Garden Street Entrance, including a parking area, trail system, pavilion, grills, and picnic tables may be explored if funding is secured within the Garden St Recreation Area Footprint.

Thomas Creek Tract

The potential for new parking areas will be evaluated and considered for use on the Thomas Creek Tract. Current parking and forest access points will continue to be evaluated for updates and improvements.

Norfolk Southern Tract

The possibility of opening the Norfolk Southern tract to vehicular access and installing new parking areas will be evaluated and considered. Current parking and forest access points will continue to be evaluated for updates and improvements. The current parking area located on the Chaffee Road connector may be expanded within this planning period to accommodate a trailhead and possible picnic area. Considerable upgrades to the Norfolk Southern Road system will be required before vehicular access can be allowed.

Cary Tract

At this time, there are no plans for additional access points to the Cary Tract. The potential for new parking areas will be evaluated and considered based on increased user needs and resource protection. Current parking and forest access points will continue to be evaluated for updates and improvements.

2. Facilities

Cary Tract

Expansion of the current restroom facilities or installation of another facility may be explored within the timeframe of this plan within the Restroom Facility Footprint. This will be based on visitor use and available funding and maintenance personnel. Installation of new facilities will be tied to expansion of the Cary Campground.

Monticello Tract
Within the timeframe of this plan, funding from outside sources may be available to install facilities at the Garden Street Entrance Recreation Area.

Additional facilities may include the construction of a boardwalk, viewing tower, and parking area which may be installed within the Basin Swamp Recreation Area Footprint. This area provides unique wildlife viewing opportunities for the public.

Thomas Creek Tract
The installation of a pavilion(s) may be considered on the Thomas Creek Tract within the Thomas Creek Recreation Area Improvement Footprint as visitor use increases and as funding is available.

3. Trails
Suitable locations are being explored on all tracts of Cary State Forest for additional hiking trails. The construction, maintenance, and improvements of nature and hiking trails will be on-going. Trails will be designated and developed with user group input to the greatest extent possible.

The Cary Tract will be assessed during this planning period for potential additional hiking, equestrian, or bicycle trails. Trail surveys have been completed on the Monticello Tract. The potential for year-round, all-weather trail system development is best suited on the dryer portions of the Monticello and Thomas Creek Tracts.

4. Camping
Additional primitive camp zones may be considered on all tracts of Cary State Forest to meet growing camping demands. Monticello and Thomas Creek Tracts will be the primary areas for consideration. These camp zones would be affiliated with new or existing hiking trails, useable on a first come, first served basis, and will be only accessible by hike-in.

5. Day Use Areas
The Garden St Recreation Area near the Garden Street entrance and Monticello Road will be a focus for development during this planning period. Parking, a picnic pavilion, shade trees, a trailhead, and grills will be considered within the Garden St Recreation Area Footprint. The possibility for grant funding from adjacent housing community contractors may be used for the construction of this recreation area.

Potential recreation opportunities will be evaluated on the Norfolk Southern Tract. These may include hiking, bicycling, and/or horseback riding.

6. Recreation Vehicle (RV) Camping
The potential for expansion of the current Cary Campground will continue to be evaluated during this plan period. Depending upon use, funding, and personnel, additional full hook up sites, new roads, and restroom/shower facilities may be installed within the Cary Campground Expansion Footprint. Sites would be constructed in the same manner as the current sites at Cary.

7. Environmental Education

As the surrounding population continues to grow, environmental education opportunities will be supported by the FFS and local staff. Programs and/or projects with school groups, environmental organizations, private landowners, Boy/Girl Scouts, 4-H, local FFA, and similar entities will be encouraged. Jacksonville District staff will continue to deliver on-site and off-site environmental education programs as requested.

FFS currently provides visitors to CSF environmental education through interpretive displays in existing kiosks and on existing nature trails on the Cary and Thomas Creek Tracts. The addition of new kiosks and other interpretive displays will be evaluated and installed based on management determined needs.

8. Waterway Stabilization and Improvements

The improvement of current boardwalks and the installation of new boardwalks will be evaluated or installed during this plan period. The current boardwalks at Cary will need replacement or refurbishment and the possibility of a new boardwalk at the Basin Swamp may be considered, depending on funding and personnel availability.

9. Wildlife Viewing / Scenic Overlooks

Suitable locations are being evaluated for wildlife viewing and scenic overlook platforms. These structures may be constructed along existing boardwalks and the possible basin swamp boardwalk or overlooking established food plots and other openings.

C. Hunter Access

The majority of CSF is open to regulated hunting. FWC manages hunting on CSF. Hunting season dates, limits, and methods are established annually by FWC, in cooperation with the FFS. Cary Wildlife Management Area regulations are updated annually and are identified in the current WMA online brochure provided by FWC at MyFWC.com. Non-hunting recreation users are encouraged to check the WMA regulations and season dates before visiting CSF.

VI. Forest Management Practices

A. Prescribed Fire

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

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

A fire history graph detailing the recent history of prescribed burns and wildfires at CSF is available in Exhibit N.

FFS has one non-useable fire tower and three tractor-plow units located in Nassau County. An additional tractor-plow unit located at the Tisonia field station in Duval County provides support to the Nassau response area. Additional support is available from neighboring counties. Personnel and equipment stationed at CSF 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 CSF 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 CSF, which will consist of dormant and growing season burns. An update to the Five-Year Prescribed Burning Management Plan is developed each year by FFS staff. All burns conducted on CSF are executed by Florida Certified Prescribed Burn Managers in accordance with Chapters 590.125, F.S. and 5I-2 F.A.C.

According to FNAI, historic, fire-dependent natural communities on CSF are estimated to have occupied approximately 8,508 acres and to have burned at approximately 2 to 10-year (depending on ground cover type) intervals in the flatwoods, 1 to 2-year intervals in the sandhills, and from 2 to 100-year intervals in the dome swamps and floodplains. Current fire-dependent communities encompass 8,400 acres. Based on current conditions and management objectives, CSF will plan for 1,400 to 2,500 acres to be prescribed burned annually. Meeting prescribed fire goals will be largely dependent on weather conditions, available personnel, and statewide emergency situations such as wildfires, hurricanes, and other natural disaster response and relief.

1. **Fire Management**

   The fire management plan serves as a working tool and an informational document for CSF. The plan provides 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 CSF is necessary if the FFS is to fulfill the goals and objectives stated in this plan, including enhancing and restoring native plant communities, managing protected species, managing timber, recreation, historical, and other resource values. The fire management plan and its objectives shall reflect and incorporate these multiple-resource objectives.

   a. **Prescribed Fire:** Prescribed fire is the most important land management tool, both ecologically and economically, for managing vegetation and natural communities, and for perpetuating existing wildlife populations in Florida. Forest operational records and staff experience should be combined with the FNAI inventory and assessment (2019) to identify areas that may require mechanical or chemical 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 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 larger 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 and Mitigation 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 Jacksonville District. Emphasis will be placed on consistent accomplishment of prescribed burning goals and community outreach to increase public understanding of wildfire prevention and the benefits of prescribed fire.

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

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

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

1. Suppression Strategies

If a wildfire occurs on CSF there are two alternative suppression strategies as defined below:

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

b. Direct Suppression is defined as a suppression strategy where aggressive suppression tactics are used to establish firelines around a fire to halt its spread and to extinguish all hotspots. This alternative is used whenever there is a threat to human life, property,

private lands, and/or critical natural or cultural resources. This strategy should also be used when the total district fire load dictates that crews not be involved with individual fires for any longer than absolutely necessary.

Appropriate suppression action will be that which provides for the most reasonable probability of minimizing fire suppression cost and critical resource damage, consistent with probable fire behavior, total fire load, potential resource and environmental impacts, safety, and smoke management considerations. The Incident Command System (ICS) will be used for all suppression actions.

2. Smoke Management

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

3. Firebreaks and Firelines

A system of permanent firelines have been developed and maintained around and within the boundaries of CSF to guard against fires escaping from and entering the forest. Such fire breaks 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 BMP criteria.

During wildfire suppression, the use of water and foam, permanent fire breaks, natural barriers and existing roads and trails for firelines can be used when human life, safety, property, and resource considerations allow. Plowed and / or bladed 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. Plowed and bladed lines will be rehabilitated, and BMPs implemented as soon as practical after the fire is suppressed.

4. Sensitive Areas

CSF retains 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 CSF. When possible, fire staff will avoid line construction in wetland ecotones throughout the forest.

5. Firewise Communities

FFS has implemented a Firewise community approach for wildfire prevention statewide. Specifically, in the area adjacent to or nearby CSF, efforts in this regard will continue to identify communities at risk and to contact their representatives.

6. Adjacent Neighbor Contacts

The staff at CSF 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 prescribed burn on the state forest to assess impacts on timber and habitat. Based on the evaluations after prescribed fires in particular, decisions will be made on the effectiveness of the prescribed burn and improvements that can be made in the future. A historical fire record for all significant fires and prescribed burns will be maintained. This will be accomplished using completed burn plans and through the maintenance of GIS data. These records are intended to provide data for future management decisions.

C. Sustainable Forestry and Silviculture

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

1. Strategies

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

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 or artificial 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 CSF 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 any off-site species with merchantable volume will be scheduled for harvest, followed by reforestation with the appropriate tree species. Herbicide applications may be necessary to control woody competition and to re-establish desired native species of both overstory and groundcover. Site preparation methods may include prescribed fire, mechanical vegetation control, and / or herbicide applications. Herbicides used will be registered for forestry use by the U.S. Environmental Protection Agency (EPA) and will not adversely affect water resources.

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

Maintenance and restoration of timber stands and natural communities through timber harvesting will include thinning for maintenance, regeneration harvests applicable to the

species present, and clear-cutting to remove off-site species.

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

3. **Forest Inventory**

The purpose of a forest inventory is to provide FFS resource managers with information and tools for short and long-range resource management and planning. Ten percent of CSF's forested acreage 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 commercially important pine species such as slash, longleaf, loblolly, and occasional pond pine, as well as other significant species such as cypress, cedar, 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.

5. **Cattle Grazing**

Cattle grazing activities assist in maintaining pastures and controlling non-native plants, support the maintenance of fences and gates, and provide a source of income.

Currently there are no cattle leases on CSF.

D. Invasive Species Control

FFS employees continually monitor the forest for invasive species while conducting management activities. FFS will locate, identify, and apply control measures with the intent to eradicate or control invasive species. Table 6 lists the general treatment strategy, acres impacted, and population stability trend for invasive plant species occurring on CSF. Also see Exhibit O.

Ongoing maintenance and monitoring strategies are outlined in the Five-Year Ecological Management Plan which is developed to locate, identify, and control invasive plant species. Occurrences of invasive species are recorded in the CSF GIS database and are monitored and treated annually as funding permits. The GIS database is updated as new infestations are discovered.

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

FFS will enlist support from FWC in efforts to control invasive animals. Feral hogs (*Sus scrofa*) are present on CSF but are not believed to occur in any substantial numbers at this time. FWC

has issued a feral hog control permit to FFS for WMA state forests and FFS will allow for feral hog removal on CSF through trapping and hunting as necessary.

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

Table 6. Invasive Plant Species Occurring on CSF

Common Name	Scientific Name	Treatment Strategy	Acres Impacted	Status
Brazilian vervain	*Verbena brasiliensis*	Spot treatment with herbicide	No occurrences known at this time	Stable
Chinese tallow	*Triadica sebifera*	Single and broadcast	Sporadic occurrences, heavier on Norfolk Southern tract	Increasing
Cogon Grass	*Imperata cylindrica*	Spot treatment with herbicide, timed with burning	No occurrences known on CSF, however significant encroachment on neighboring land and roadways	Potential for increase
Japanese climbing fern	*Lygodium japonicum*	Spot treatment with herbicide	Sporadic occurrences	Stable/increasing
Mimosa	*Albizia julibrissin*	Single and broadcast	Sporadic occurrences	Stable
Showy rattlebox	*Crotalaria spectabilis*	Spot treatment with herbicide	Sporadic with varying degrees of intensity	Increasing
Silky sesban	*Sesbania sericea*	Spot treatment with herbicide	Sporadic with varying degrees of intensity	Increasing
Sword fern	*Nephrolepis exaltata*	Spot treatment with herbicide	No occurrences known at this time	Stable
Torpedograss	*Panicum repens*	Roadside broadcast with herbicide	Forest-wide, mostly along roads and disturbed areas	Increasing

E. Insects, Disease, and Forest Health

Currently there are no significant insect or disease problems on CSF. State forest staff monitors for incidental outbreaks of pine bark beetles (*Ips* spp.) throughout the forest. These outbreaks generally run their course without involving more than several acres. Aerial surveys are conducted every March / April through the growing season for southern pine beetle (*Dendroctonus frontalis*) outbreaks. In the event of a forest pest or disease outbreak, CSF

resource managers will consult with the Forest Management Bureau's Forest Health Section to formulate an appropriate and effective response.

In compliance with Section 388.4111, F. S., 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 agency in Nassau County will be notified of the approval of this plan, documenting this designation.

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

F. Use of Private Land Contractors

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

1. Herbicide applications
2. Ecosystem restoration
3. Site preparation
4. Reforestation
5. Timber harvesting
6. Biological assessments and mapping
7. Fixed capital and infrastructure improvements

VII. Proposed Management Activities for Natural Communities

In 2019, FNAI completed an inventory and natural community mapping project on CSF. Current and historic natural community types can be found in Exhibits P and Q, and Table 7. This inventory included managed and altered landcover types which are habitats that have been impacted by humans and do not fit into FNAI's Natural Community Classification. See Tables 8 and 9.

Table 7. Natural Community Types

Community Type	Historic Acres*	Current Acres*
Basin marsh	0	83
Basin swamp	2,359	2,310
Baygall	330	332
Bottomland forest	364	355

Community Type	Historic Acres	Current Acres
Depression marsh	28	27
Dome swamp	669	692
Floodplain swamp	575	575
Mesic flatwoods	3,470	1,788
Sandhill	1,049	670
Wet flatwoods	3,987	2,572
Wet prairie	452	0
Managed and other altered landcover types**	0	3,883
TOTAL	**13,283**	**13,287**

* Rounding errors exist and mapping did not occur on severed 90.1-acre parcel managed by SJRWMD.
** See Tables 8 and 9

Table 8. Managed Landcover Types

Landcover Type*	Current Acres**
Pine plantation	3,636

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

Table 9. Other Altered Landcover Types

Landcover Type*	Current Acres**
Artificial pond	4
Borrow pit	9
Clearing	12
Developed	32
Road	190

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

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, representative species present, and hydrology. 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 management activities 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, reforestation, the use of site preparation methods, both mechanically and/or the use of herbicides to control hardwoods and/or hardwood regeneration. Site preparation and reforestation may be required to increase pine stocking in stands with very poor stocking or in restoration efforts. Fire return intervals are included as a guide and may vary depending upon specific conditions and are intended to attain desired forest and resource management goals. See Table 10.

Table 10. Prescribed Fire Interval Guide on CSF

Habitat Type	Historic Fire Return Intervals*	CSF Fire Frequency Goal (Local)	Comments
Basin marsh	5-150 years	5-20 years	Although the lowest portions of basin marshes rarely burn through, the edges of these swamps often have graminoid-dominated ecotones that burn with the adjacent uplands.
Basin swamp	5-150 years	5-20 years	Although the lowest portions of basin swamps rarely burn through, the edges of these swamps often have graminoid-dominated ecotones that burn with the adjacent uplands.
Baygall	N/A	N/A	Baygall burn infrequently, perhaps only a few times each century in the deepest baygalls.
Bottomland forest	N/A	N/A	Fires are rare in bottomland forest, occurring only during times of extreme drought.
Depression marsh	1-8	1-8	The natural fire return interval for depression marshes is every 1-8 years, primarily during the growing season. Prescribed burns will be implemented at the same time as surrounding uplands.
Dome swamp	3-100 years	3-10 years	Fire frequency is greatest at the periphery of a dome swamp, where a normal fire cycle might be as short as 3 to 5 years. In contrast, fires may occur as infrequently as every 100 years in the wetter interior portions.
Floodplain swamp	N/A		Floodplain swamps rarely burn and only under extreme drought conditions.
Mesic flatwoods	2-4 years	2-4 years	Mesic flatwoods require repeated applications of growing season fires on a 2- to 4-year cycle.
Sandhill	1-3 years	1-3 years	Sandhill depends on growing season fires to maintain open structure. Every 1-3 years fire of variable intensity will increase species diversity.
Wet flatwoods	2-5 years	2-5 years	Wet flatwoods require repeated applications of growing season fires on a 2- to 5-year cycle.

* As determined by FNAI

The following community descriptions, existing condition descriptions, and management recommendations are taken from the 2019 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 CSF.

To achieve the objectives outlined in this plan, the following management activities will be performed in the natural and managed communities at CSF 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. This type of marsh usually develops in large solution depressions that were formerly shallow lakes. The soils are generally acidic, nutrient-poor peats overlying an impervious soil layer. This community type is dominated by herbs or occasionally shrubs that can withstand inundation for most or all of the year.

The desired future condition of basin marshes at CSF should be large, irregularly shaped, depressions, or herbaceous dominated areas imbedded in basin swamps, that are dominated by hydrophytic plants that can withstand an extended hydroperiod such as sawgrass (*Cladium jamaicense*), maidencane (*Panicum hemitomon*), and pickerelweed (*Pontederia cordata*). They should have dense herbaceous species cover, variable density of shrubs, and no to widely scattered trees.

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*) and swamp tupelo (*Nyssa sylvatica* var. *biflora*) with occasional slash pine, loblolly bay (*Gordonia lasianthus*), swamp bay (*Persea palustris*), and sweetbay (*Magnolia virginiana*). Currently there are scattered cypress and swamp tupelo with small patches of bay trees imbedded in the basin marsh and in most areas, these are trees that were left standing after a timber harvest. Subcanopy trees should be widely scattered or in patches and shrub species composition should be primarily buttonbush (*Cephalanthus occidentalis*), fetterbush (*Lyonia lucida*), and Carolina willow (*Salix caroliniana*) with occasionally myrtle dahoon (*Ilex cassine* var. *myrtifolia*), and highbush blueberry (*Vaccinium corymbosum*). In most cases, shrubs should not form a dense layer but rather be scattered throughout the marsh, although there may be areas with heavier concentrations. Herbaceous species typically occur in zones determined by water depth. The deepest areas will have American white waterlily (*Nymphaea odorata*), watershield (*Brasenia schreberi*), and bladderworts (*Utricularia* sp.) followed by bulltongue arrowhead (*Sagittaria lancifolia*), and pickerelweed. Toward the outer margin and shallow areas, maidencane, yellow-eyed grasses (*Xyris* spp.), bladderworts, sphagnum moss (*Sphagnum* spp.), Virginia chain fern (*Woodwardia virginica*), sawgrass, Carolina redroot (*Lachnanthes caroliniana*), and southern umbrellasedge (*Fuirena scirpoidea*). Currently there are not obvious vegetation zones within the three large basin marshes. Many of the species present appear to be responding to the disturbance caused by logging portions of basin swamps. There are many logs remaining on site and there are deep ruts and other forms of soil disturbance as a result of the timber operations. In turn, many species which might be considered weedy titi (*Cyrilla racemiflora*), broadleaf cattail (*Typha latifolia*), dogfennel (*Eupatorium capillifolium*) are dominant and likely responding to the present condition of these basin marshes.

Frequent fires (e.g., 1 to 10 years) will maintain the herbaceous dominated basin marshes that currently exist within the basin swamps of CSF. The basin marsh will succeed into basin swamp

with fire frequencies of a longer duration (>20 years). The ecotones of basin swamps and basin marshes that are adjacent to mesic and wet flatwoods should be dominated by herbaceous and graminoid species. The three large basin marshes delineated on the current natural communities of CSF appear to have been basin swamps converted to basin marshes because of logging. For this reason, it may be more desirable to allow the forest to regenerate before allowing fire to carry into these areas. However, during high water periods the basin marsh ecotones should be allowed to burn as well as areas of basin swamp that are capable of carrying fire. These areas of basin swamp traditionally may have naturally switched between basin marsh and successional basin swamp forest depending on the frequency of fire.

Basin marsh historically, and presently to some extent, existed as inclusions within the larger basin swamps. Basin marsh inclusions on historic aerial photograph have a smooth signature within the slightly darker shaded areas and "rougher" textured (forested) basin swamps.

Current Conditions:
Basin marsh delineated in the current natural community map of CSF was the result of intense peat fires. Basin marsh occurs within a matrix of basin swamp. Generally, the basin marsh canopies at CSF consist of widely scattered pond cypress, swamp tupelo, and slash pine. The three large basin marshes contain many stumps indicating they were likely basin swamps within the last 20 years. Shrub cover is sparse or patchy, except for the shrub dominated ecotones, in most locations and consists primarily of fetterbush, southern bayberry (*Morella cerifera*), and myrtle dahoon, and to a lesser extent young swamp bay, loblolly bay, and sweetbay, and occasionally highbush blueberry, titi, gallberry (*Ilex glabra*), and large gallberry (*Ilex coriacea*). Vines are uncommon. Sawgrass, Carolina redroot (*Lachnanthes caroliana*), American white waterlily, maidencane, broadleaf cattail, dogfennel, Virginia chain fern, and yellow-eyed grass (*Xyris* sp.) are abundant components of the ground layer.

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

Management Needs:
Restoring historic hydrological regimes and applying fire to adjacent uplands (where appropriate) is a recommended focus for forest management. Occasional fires within the basin marshes are necessary to remove encroaching woody vegetation and reduce the buildup of organic soils. However, FFS staff will only plan and conduct prescribed burns in this community on the periphery, as smoke management concerns will preclude allowing fire across the community under dry conditions.

Management should focus on restoring historic hydrological regimes and applying fire to adjacent uplands; fires should be allowed to burn into the basin marshes and extinguish naturally.

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.

The desired future condition of basin swamps at CSF should be large, irregularly shaped, forested depressions that are dominated by hydrophytic trees and shrubs that can withstand an extended hydroperiod such as pond cypress, swamp tupelo, slash pine, and fetterbush. They should have variable shrub layers and sparse to dense herbaceous species cover. A mature canopy dominated by pond cypress, swamp tupelo, slash pine, and to a lesser extent, loblolly bay, swamp bay, and sweetbay. In most cases, shrubs should not form a dense layer below the canopy or in the ecotones of the swamps but rather be scattered throughout the swamp, although there may be some areas with heavier concentrations. Subcanopy tree and shrub species composition should be similar to the species currently inhabiting the swamps, primarily myrtle dahoon, fetterbush, and highbush blueberry. In the densely forested portions of basin swamps, herbs should be sparse and consist mostly of netted chain fern (*Woodwardia areolata*), Virginia chain fern (*W. virginica*), cinnamon fern (*Osmunda cinnamomea*), and lizard's tail (*Saururus cernuus*). However, many of the basin swamps on CSF appear to be relatively shallow depressions and in the basin swamps that burn frequently (e.g., 3 to 10 years), herbaceous species should more closely resemble the desired future conditions of wet flatwoods. The ecotones of basin swamps that are adjacent to mesic and wet flatwoods should be dominated by herbaceous and graminoid species.

Judging from the historic aerial photo, the large slash pines in the canopy, and the frequency of pine stumps, many of the basin swamps on CSF should have more open canopies and subcanopies with a higher density of shrubs or herbaceous species. This vegetation structure and the resulting species composition will be obtained and maintained by allowing more frequent fire into these systems.

In the 1953 aerial photograph, the much darker, rougher textured basin swamps are easily distinguished from the much lighter smoother textured flatwoods they tend to be imbedded in. The typical graminoid ecotones appear as light gray, smooth (relatively treeless) areas with intermixed slightly darker shaded areas (standing water) adjacent to the much darker and "rougher" textured (forested) basin swamps. In some cases, the graminoid areas grade into wet flatwoods with apparently a very sparse overstory. The graminoid / herbaceous ecotones of basin swamps should be dominated by wiregrass (*Aristida stricta*) and include species of beaksedges (*Rhynchospora*), yellow-eyed grasses, Carolina redroot, tenangle pipewort (*Eriocaulon decangulare*), netted and Virginia chain fern, peelbark St. John's wort (*Hypericum fasciculatum*), and hooded pitcher plants (*Sarracenia minor*).

Current Conditions:

Basin swamps occur throughout and are the dominant wetland community type, by area, at CSF. They are highly variable in size, shape, and species composition. Previous anthropogenic

disturbances, such as logging and ditching, are evident in most of the basin swamps and likely have changed the vegetation species composition and structure from historic condition. Young, planted slash pines are also common in the basin swamp ecotones. During high water periods and heavy rains, the basin swamps at Cary function much like cypress strands in conveying water across the relatively flat landscape. Where forest roads cross the basin swamps, the sheet flow is constricted to narrow culverts placed under the limerock roadways.

Generally, the basin swamp canopies at CSF are dominated by stunted pond cypress, red maple (*Acer rubrum*), coastalplain willow (*Salix caroliniana*), and swamp tupelo overtopped by slash pine. Many of the existing slash pine trees and stumps in the basin swamps have cat-faces (i.e., scars dating back to the early 1900s incurred during turpentine operations); this suggests that slash pine was an important component of the relatively shallow basin swamps historically found at CSF. The subcanopy is comprised primarily of myrtle dahoon, which can be very abundant just below the cypress and swamp tupelo. Shrub cover is dense (particularly in the ecotones) in most locations and consists primarily of fetterbush and myrtle dahoon, and to a lesser extent young swamp bay, loblolly bay, and sweetbay, and occasionally highbush blueberry, titi, gallberry, and large gallberry. Little herb cover exists in the densely forested portions (basal area of all trees = 90-130 ft^2/acre) of the basin swamps, but herbs like Carolina redroot, cinnamon fern, netted chain fern, Virginia chain fern, and sphagnum (*Sphagnum* sp.) can be abundant in areas where the canopy is less dense and along the fire-maintained ecotones. The abundance of epiphytes and vines is variable. The epiphytes consist of primarily Bartram's airplant (*Tillandsia bartramii*), and Spanish moss (*Tillandsia usneoides*) and the dominant vines are earleaf greenbrier (*Smilax auriculata*), laurel greenbrier (*Smilax laurifolia*), and muscadine (*Vitis rotundifolia*).

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.

Fire is more frequent in cypress dominated swamps and may be absent or rare in hardwood swamps. Slash pine, pond pine, and cypress can establish in these areas immediately after a fire, benefiting from ample sunlight and available bare mineral soils; they are also tolerant of moderate fires once past a certain size, thus systems dominated by these two species may have been subjected to fires every 10 to 20 years.

Management Needs:
Little active management should be required for this community type. Where it can be done safely, prescribed fires should be allowed to burn into basin swamp edges to restrict encroaching shrubs. Infrequent low intensity ground fires within basin swamps are necessary to maintain the cypress component. Swamp tupelo and other hardwoods dominate areas that burn less often. Similar to basin marsh, FFS staff will only plan and conduct prescribed burns in this community on the periphery, as smoke management concerns will preclude allowing fire across the community under dry conditions.

If hydrology has been altered (i.e., ditches/canals), normal hydroperiod should be restored, if possible, since shortened hydroperiods can also allow devastating fire to enter, potentially altering the community. Heavy equipment that causes rutting that will alter the micro-hydrology of the ecotone; use of heavy equipment, if necessary, should be limited to dry seasons. This community is thought to be very stable as long as hydrological conditions and water quality are maintained**.**

C. Baygall

Description:

Baygall is an evergreen, forested wetland typically at the base of sandy slopes where water seepage maintains a saturated peat substrate. It may form an ecotone between uplands and swamps, or it may develop as a larger bay swamp in isolated basins or broad areas of seepage. These forests are dominated by a tall canopy of abundant loblolly bay, sweetbay, and slash pine, with swamp bay and fetterbush often forming a dense thicket in the understory.

Baygall occurs throughout CSF in lower areas within mesic and wet flatwoods communities, adjacent to floodplain swamp and bottomland forest surrounding uplands or where high-water tables maintain a saturated soil. Soils are generally composed of peat and are acidic.

Characteristic canopy trees of baygalls on CSF should include loblolly bay, sweetbay, swamp bay, pond pine (*Pinus serotina*), slash pine, red maple, and swamp tupelo. Common shrubs and small trees should include fetterbush, wax myrtle (*Myrica cerifera*), dahoon (*Ilex cassine*), large gallberry, highbush blueberry, coastal doghobble (*Leucothoe axillaris*), and sweet pinxter azalea (*Rhododendron canescens*). Baygall typically have little to no herbaceous cover as a result of low light levels under the dense overstory. However, herbs such as Virginia chain fern, beaksedges (*Rhynchospora* spp.), sedges (*Carex* spp.), sphagnum moss, Carolina redroot, and cinnamon fern may be present. Baygalls associated with creeks may have lizard's tail and goldenclub (*Orontium aquaticum*). Epiphytes should be infrequent to absent. Vines should be found occasionally and may include laurel greenbrier and muscadine.

On the 1953 geo-rectified photographs, baygall appeared as a grainy, nearly black signature that is darker than any other community found on CSF. Some of the darker areas on the photograph appeared to have this same signature but were characterized as a different community, mostly wet flatwoods with baygall inclusions or mesic flatwoods that may had been burned just prior to the photo being taken, based on information obtained during ground-truthing.

Current Conditions:

Characteristic canopy trees of what was historically baygall on CSF include loblolly bay, sweetbay, swamp bay, pond pine, and slash pine. Red maple, and swamp tupelo are also usually present. Common shrubs and small trees include fetterbush, wax myrtle, dahoon, large gallberry, highbush blueberry, coastal doghobble, swamp doghobble (*Leucothoe racemosa*), poison sumac (*Toxicodendron vernix*), and sweet pinxter azalea. Herbs are scarce and include Virginia chain fern (*Woodwardia virginica*), beaksedges, sphagnum moss, and cinnamon fern. Vines are occasional and include laurel greenbrier and muscadine. The latter often forms thickets around the edges of baygall and where the canopy trees are sparse.

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.

Management Needs:
If it can be done safely, prescribed fires in adjacent uplands should be allowed to burn into baygall edges to maintain grassy ecotones and to kill bay shrubs encroaching into the uplands. Plowed firebreaks and ditches should be restored, and hydrology should be returned to its natural state where possible.

D. <u>Bottomland Forest</u>

Description:
Bottomland forest is a deciduous, or mixed deciduous / evergreen, closed-canopy forest on terraces and levees within riverine floodplains and in shallow depressions. Found in situations intermediate between swamps (which are flooded most of the time) and uplands, the canopy may be quite diverse with both deciduous and evergreen hydrophytic to mesophytic trees such as live oak (*Quercus virginiana*), swamp laurel oak (*Quercus laurifolia*), sweetbay, swamp tupelo, sweetgum (*Liquidambar styraciflua*), bald cypress (*Taxodium distichum*), and red maple. A subcanopy of younger canopy species should be present. Understory species composition should remain as variable as the canopy, with shrubs being the dominant component. Shrubs should include saw palmetto (*Serenoa repens*), American beautyberry (*Callicarpa americana*), coastal doghobble, wax myrtle, fetterbush, and highbush blueberry, among others. Herbs should be generally sparse due to the closed canopy and dense shrub layer. Species may include woods grass (*Oplismenus hirtellus*), bracken fern (*Pteridium aquilinum*), Virginia chain fern, woodoats (*Chasmanthium laxum*), and lizard's tail. Epiphytes should be infrequent to occasional and include Spanish moss, resurrection fern (*Pleopeltis polypodioides*), and ball moss (*Tillandsia recurvata*). Vines should be infrequent to common and include muscadine and poison ivy (*Toxicodendron radicans*).

At CSF, bottomland forest occurs along portions of Thomas Creek (name from 1994 USGS 7.5-minute topographic map) and an unnamed creek bottom in the southern portion of the forest. Floodplain swamp is often included within or adjacent to the bottomland forest community along Thomas Creek. The current condition varies little from the desired condition. There is evidence of past timbering within the community. Generally, the habitat is in the later stages of succession and species composition is typical of bottomland forests in northeast Florida.

On the 1953 geo-rectified photographs, bottomland forest has a dark, rough grained signature. Delineation was aided by ground-truthing in the field.

Current Conditions:
Bottomland forests currently found on CSF show evidence of logging and changes to the hydrology, particularly near road crossings. An emergent canopy of usually slash pine and loblolly pine and infrequently pond pine reaching >100 feet exist in some areas, while other areas

have a canopy of live oak, swamp laurel oak, water oak (*Quercus nigra*), sweetbay, swamp tupelo, sweetgum, pond cypress, and red maple. The shrub layer is dominated by smaller canopy species, titi, wax myrtle, loblolly bay, fetterbush, coastal doghobble, southern bayberry, fetterbush, bluestem palmetto (*Sabal minor*), devil's walkingstick (*Aralia spinosa*), and highbush blueberry. Herbs are generally sparse due to the closed canopy and dense shrub layer. Herbs present include woods grass, woodoats, bracken fern, Virginia chain fern, partridgeberry (*Mitchella repens*), switchcane (*Arundinaria gigantea*), and lizard's tail. Epiphytes are infrequent to occasional and include Bartram's air-plant (*Tillandsia bartramii*), Spanish moss, and resurrection fern. Vines are infrequent to common and include muscadine, cat greenbrier (*Smilax glauca*), trumpet creeper (*Campsis radicans*), and poison ivy.

Fire Regimes:
Fire is not a significant factor in bottomland forest and is primarily limited to individual trees affected by lightning strikes.

Management Needs:
Management activities should focus on maintaining natural hydrologic patterns and allowing prescribed fires from adjacent communities to extinguish themselves at the edges of the community. Fire breaks should not be created to isolate this community. Activities that alter the surrounding hydrology, including ditches and canals, should be avoided as they are highly detrimental to bottomland forest.

E. Depression Marsh

Description:
Depression marshes are generally circular, shallow, herb-dominated wetlands found in slumps in sand substrate. Depression marshes occur most often within mesic or wet flatwoods. Frequently there are concentric zones of vegetation that respond to the hydroperiod and edaphic conditions within each zone. A common series of vegetation zones in depression marshes is blue maidencane (*Amphicarpum muhlenbergianum*) closest to and grading into the adjacent flatwoods, then peelbark St. John's wort dominates the shallow outer zone followed by an often-extensive area of maidencane, and in the deeper center of depressions bulltongue arrowhead and pickerelweed often are dominant.

Depression marshes on CSF should be dominated by herbaceous species, particularly maidencane and blue maidencane but may also include sawgrass, tenangle pipewort, rough hedgehyssop (*Gratiola hispida*), Carolina redroot, meadowbeauty (*Rhexia* spp.), beaksedges, sugarcane plumegrass (*Saccharum giganteum*), yellow hatpins (*Syngonanthus flavidulus*), Virginia chain fern, and yellow-eyed grasses. Species of St. John's wort should be prevalent, and typically most other shrubs should occur infrequently, such as fetterbush, myrtle dahoon, and wax myrtle. Trees should be absent or infrequent. However, there is often widely scattered swamp tupelo present. Epiphytes and vines are usually absent.

Current Conditions:
Currently, many of the depression marshes on CSF are encroached by woody species due to lack of frequent fire. The species found encroaching the depression marshes include red maple, titi, loblolly bay, swamp tupelo, myrtle dahoon, common persimmon (*Diospyros virginiana*), swamp

bay, pond cypress, and slash pine. Slash pine has been planted through the majority of the depression marshes and there is evidence of past ditching and bedding. The herbaceous species component contains many of the species mentioned in the desired future conditions section, but also include typically more weedy species (i.e., species indicative of past disturbance) such as broomsedge bluestem (*Andropogon virginicus*) and soft rush (*Juncus effusus* subsp. *solutus*). Epiphytes and vines are generally absent. In some instances, wetlands currently named depression marshes were historically dome swamps and were converted due to past logging events.

Fire Regimes:
Depression marshes require frequent, light intensity fires to maintain a high herbaceous species component and reduce woody encroachment. The natural fire return interval for depression marshes is every 1 to 8 years, primarily during the growing season (April-June) when water levels are low and fuels in surrounding uplands are dry. Prescribed burns should be implemented more often (1 to 3 years) for depression marshes encroached by woody species to reduce the woody species abundance.

Management Needs:
Marshes should generally be allowed to burn with the surrounding communities. Ideally, fire should be prescribed at a time when water is low, but not absent, in the marshes to provide the highest quality burn while mitigating smoke management concerns. Marshes with substantial shrub cover (either within the marsh or surrounding edges) should be targeted for repeated lightning season fires on a short return interval.

F. Dome Swamp

Description:
Dome swamps are isolated, shallow, forested wetland basins imbedded typically in a pyrogenic matrix community such as pine flatwoods. Dome swamps have domed profiles resulting from smaller trees growing around the edges and larger trees growing in the interior. Dome swamps have peat soils, which are thickest toward the center of the dome and are generally underlain with acidic soils and then limestone. Like basin swamps, dome swamps often have fire-maintained herbaceous ecotones that are species-diverse and important for rare plants and animals. Dome swamps are distinguished from basin swamps principally by their more circular shape, smaller size, and higher historical fire frequency due to landscape position.

The desired future condition of dome swamps at CSF should be small, isolated, forested wetland basins. Like basin swamps, dome swamps should have fire-maintained herbaceous ecotones that are species-diverse. They should have mature canopies dominated by pond cypress or swamp tupelo with sparse subcanopy and shrub layers. Typical dominant shrubs include myrtle dahoon, gallberry, fetterbush, wax myrtle, and highbush blueberry. The herbaceous layer should be sparse to dense and will become denser with greater frequency of fire and the resulting mortality of shrub and woody plant species. Slash pine can be scattered throughout the dome but typically should not be the most dominant species.

The herbaceous ecotones should be dominated by wiregrass and also include blue maidencane, beaksedges, yellow-eyed grasses, Carolina redroot, netted chain fern, Virginia chain fern,

tenangle pipewort, flattened pipewort (*Eriocaulon compressum*), fox club moss (*Lycopodiella alopecuroides*), sphagnum moss (*Sphagnum* sp.), peelbark St. John's wort, and hooded pitcher plant (*Sarracenia minor*).

Current Conditions:
Dome swamps of CSF typically have canopies dominated by pond cypress and / or swamp tupelo with scattered emergent slash pine. The density of swamp tupelo appears to be related to the dome's fire history. Domes with little to no swamp tupelo have burned more regularly or had higher intensity fires in the past than domes dominated by swamp tupelo. Subcanopy and shrub species consists of myrtle dahoon, loblolly bay, sweetbay, swamp bay, fetterbush, gallberry, highbush blueberry, and wax myrtle. The density of the herbaceous layer in the dome swamps of CSF is highly variable and likely a result of fire frequency and intensity. Some of the more common constituents of the herbaceous layer include beaksedges, longleaf threeawn (*Aristida palustris*), sedge (*Carex* sp.), Walter's sedge (*Carex striata*), flatsedge (*Cyperus* sp.), cockspur (*Echinochloa* sp.), cinnamon fern, maidencane, crowngrass (*Paspalum* sp.), tenangle pipewort, yellow-eyed grasses, fox club moss, and sphagnum moss. The domes with an intact fire maintained outer fringe also frequently have blue maidencane, hooded pitcher plant, dwarf sundew (*Drosera brevifolia*), and peelbark St. John's wort.

Many dome swamps at CSF have an unnatural vegetation structure caused by the combination of logging, fire exclusion, and planting of slash pines. Furthermore, the hydrology of many domes may be compromised. Typically, fire breaks ring the outer edge and are connected to a maze of fire breaks that traverse the surrounding flatwoods. Structurally, the fire breaks are ditches 6 to 15 inches deep and act as conduits during wetter periods. This may increase the likelihood of colonization of the dome swamps by predatory fishes, to the detriment of amphibian species that depend on fishless habitats for successful reproduction. A large proportion of these ditches are evident on the 1953 photo.

Fire Regimes:
Fire is essential for the maintenance of dome swamps, limiting hardwood encroachment, particularly by bay species, and peat buildup while encouraging herbaceous growth. The fire frequency is greatest at the periphery of the dome swamp where a normal fire cycle might be as short as 3 to 5 years. The interior of large dome swamps may burn less frequently as a result of standing water or soil saturation.

Management Needs:
At CSF, the herbaceous ecotones surrounding dome swamps have largely been disturbed by past silvicultural practices, fire breaks, and a lack of fire. Restoration of these ecotones will entail the application of frequent prescribed fire, the rehabilitation of fire breaks when appropriate, closure of drainage channels, and the thinning of dense stands of planted slash pine where they encroach on the swamp ecotones. Initially, burning around dome swamps during years of normal precipitation (as opposed to drought years) will reduce heavy fuel loads that can facilitate catastrophic fires.

G. Floodplain Swamp

Description:

Floodplain swamp is a closed-canopy forest of hydrophytic trees occurring on frequently or permanently flooded hydric soils adjacent to stream and river channels and in depressions and oxbows within floodplains. Higher ridges/levees, often found along the riverbank, may be included within the swamp, although these can harbor species that are more typical of drier communities. Floodplain swamp is common along Thomas Creek (name from 1994 USGS 7.5-minute topographic map).

Desired future condition for floodplain swamps is a semi-closed to closed canopy dominated by pond cypress and / or bald cypress. Swamp tupelo, water tupelo (*Nyssa aquatica*), swamp laurel oak, sweetgum, swamp bay, red maple, myrtle dahoon, Carolina ash (*Fraxinus caroliniana*), southern magnolia (*Magnolia grandiflora*), tulip poplar (*Liriodendron tulipifera*), and pond pine form a semi-closed subcanopy and may also be found in the canopy. Swamp laurel oak, southern magnolia, and pond pine are found on the higher levees within the swamp, usually along the banks. The understory is comprised mostly of shrubs with herbs sparse in most areas but frequent to abundant in light gaps. Understory shrubs include dwarf palmetto (*Sabal minor*), false indigobush (*Amorpha fruticosa*), titi, wild olive (*Osmanthus americanus*), azalea (*Rhododendron* spp.), coastal sweet pepperbush (*Clethra alnifolia*), bayberry (*Myrica* spp.), buttonbush, hawthorn (*Crataegus* spp.), and highbush blueberry. Herbs include wood oats (*Chasmanthium* spp.), partridgeberry, sedge (*Carex* spp.), green arrow arum (*Peltandra virginica*), tall nutgrass (*Scleria triglomerata*), switchcane, lobelia (*Lobelia* sp.), swamp leather flower (*Clematis crispa*), witchgrass (*Dichanthelium* spp.), panic grass (*Panicum* spp.), and cinnamon fern. Epiphytes are infrequent to occasional and consist of Spanish moss. Vines are found frequently and include laurel greenbrier, Carolina jessamine (*Gelsemium sempervirens*), and climbing hydrangea (*Decumaria barbara*).

Current Conditions:

The floodplain swamps currently found on CSF have been affected by past logging activities and in most areas, there are few large old trees. The canopy is semi-open to closed and consists of pond cypress, slash pine, sweetbay, sweetgum, swamp tupelo, and red maple. The subcanopy is typically closed and made up of swamp laurel oak, water oak, swamp bay, red maple, American hornbeam (*Carpinus caroliniana*), dahoon, Carolina ash and southern magnolia. The understory is typically shrub dominated, with herbs abundant in light gap areas. Shrubs include titi, large gallberry, fetterbush, dwarf palmetto, needle palm (*Rhapidophyllum histrix*), and buttonbush. Herbs include wood oats, partridgeberry, green arrow arum, tall nutgrass, switchcane, witchgrass, panic grass, cinnamon fern, lizard's tail, and Virginia chain fern. Epiphytes are infrequent and consist of Spanish moss. Vines are occasional and consist of laurel greenbrier, and Carolina jessamine.

Fire Regimes:

Floodplain swamps are usually too wet to support fires. However, fires in surrounding uplands that creep into the swamp edges are important to reduce pine and bay species invasion. In CSF, the large floodplain swamps associated with Thomas Creek rarely or never burn.

Management Needs:
Maintain natural hydrology and allow fires from surrounding uplands to burn into the swamp edges. Natural hydrology is crucial for maintaining species diversity and water quality. Hydrologic alterations associated with roads, berms, and ditches should be minimized as much as possible. Allowing fires from surrounding uplands to burn into the swamps will enhance diversity in ecotones and decrease bay and pine encroachment.

H. Mesic Flatwoods

Description:
Mesic flatwoods are forests consisting of southern pine species, frequently including longleaf pine (*Pinus palustris*). Slash pine is present more frequently in transitions to adjacent wetlands or on more calcareous soils. There is little or no subcanopy but a dense ground cover of herbs and shrubs. Mesic flatwoods are noted for their herbaceous diversity, which includes many rare species. Historically, the open community structure of mesic flatwoods was maintained by frequent, low intensity, growing season fires. Soils are mainly in the spodosol family, bearing a spodic horizon (i.e., a clay hardpan) that develops under poorly drained conditions, and are characterized by low levels of nutrients and organic matter and a low pH. Herbaceous plants and short shrubs help to maintain the structure of the community by fueling growing-season fires; common species include wiregrass, bottlebrush threeawn (*Aristida spiciformis*), Curtiss' dropseed (*Sporobolus curtissii*), lopsided Indiangrass (*Sorghastrum secundum*), witchgrasses (*Dichanthelium* spp.), beaksedges, dwarf huckleberry (*Gaylussacia dumosa*), blue huckleberry (*Gaylussacia frondosa var. tomentosa*), gallberry, gopher apple (*Licania michauxii*), coastalplain staggerbush (*Lyonia fruticosa*), dwarf live oak (*Quercus minima*), saw palmetto, highbush blueberry, and shiny blueberry (*Vaccinium myrsinites*).

CSF is predominantly pine flatwoods habitat with imbedded wetlands. Distinction between mesic and wet flatwoods is exceedingly difficult on aerial photographs, and the two community types naturally intergrade. In the analysis of 1953 historic photographs, most flatwoods were designated as mesic. Those situated closer to wetlands and with a slightly darker signature were designated as wet.

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

Current Conditions:
Twenty-nine mesic flatwoods polygons were identified at CSF, although their delineation is inexact because of the natural gradation between mesic and wet flatwoods.

There are several good examples of mesic flatwoods at CSF, although many of the flatwoods within the newly acquired parcels suffer from years of fire exclusion and have dense stands of planted pines. The groundcover has suffered as a result of these conditions, as well as from past ditching and bedding. Longleaf (*Pinus palustris*) and slash pine are the dominant overstory species within the mixed-aged stands of mesic flatwoods while loblolly (*Pinus taeda*) and slash pine are typically the dominant trees in the planted stands. Fire-suppressed stands have a

subcanopy of loblolly bay, red maple, sweetgum, and often densely planted slash or loblolly pine. The shrub layer is dominated by saw palmetto, fetterbush, sand live oak (*Quercus geminata),* gallberry, southern bayberry, coastalplain staggerbush, tarflower (*Bejaria racemosa*), dwarf huckleberry, highbush blueberry, shiny blueberry, and dwarf live oak. The most common herbaceous/graminoid species of the fire-maintained mesic flatwoods include wiregrass, lopsided Indiangrass, toothache grass (*Ctenium aromaticum*), Curtiss' dropseed, broomsedge (*Andropogon virginicus*), bottlebrush threeawn, (*Aristida spiciformis*), witchgrasses, beaksedges, shortleaf rosegentian (*Sabatia brevifolia*), Walter's aster (*Symphyotrichum walteri*), hairy chaffhead (*Carphephorus paniculatus*), slender gayfeather (*Liatris gracilis*), and blackroot (*Pterocaulon pycnostachyum*). In the fire-suppressed stands, many of these herbs and grasses are still present but in greatly reduced densities as a result of shading by an overgrown shrub layer.

Fire Regimes:
Mesic flatwoods depend on frequent, low-intensity fires to maintain a diverse herbaceous layer and provide mineral soils for pine regeneration. Fires naturally occurred every 1 to 8 years, with the majority of fires on the landscape occurring every 1 to 3 years, ignited by lightning storms in late spring and early summer. For management purposes, prescribed fires at a 2 to 4-year interval are needed to keep fuel levels manageable and maintain maximum native biodiversity.

Management Needs:
Ecological management activities of mesic flatwoods at CSF should focus on regular prescribed burning and minimizing soil disturbance. Prescribed fire every 2 to 4 years is needed to reduce woody encroachment, maintain herbaceous plant diversity, and expose bare mineral soil for longleaf pine regeneration.

I. <u>Sandhill</u>

Description:
Sandhills occur on crests and slopes of rolling hills and ridges with steep or gentle topography. Soils are deep, marine-deposited, often yellowish sands that are well-drained and relatively infertile. Sandhill is important for aquifer recharge because the porous sands allow water to percolate rapidly with little runoff and minimal evaporation. The deep, sandy soils and a lack of near surface hardpan or water table contribute to a xeric environment. Sandhills are forests of mature, large longleaf pine trees, typically with a sparse subcanopy of turkey oak (*Quercus laevis*), bluejack oak (*Quercus incana*) and / or sand post oak (*Quercus margaretta*), and a fairly dense groundcover of herbs, particularly wiregrass. The greatest plant diversity within sandhill is in the herbaceous groundcover. Dominant grasses, in addition to wiregrass, include other three-awns (*Aristida* spp.), pineywoods dropseed (*Sporobolus junceus*), lopsided Indiangrass, several species of bluestems (*Andropogon* spp.), and little bluestem (*Schizachyrium scoparium*). Sandhills are fire-maintained communities that occur on relatively well-drained, deep sands.

The majority of the sandhill habitat on CSF has planted pines and lacks large mature trees. Despite these past silviculture practices the groundcover in some areas, particularly the sandhill in the far eastern portion of the Monticello Unit, is largely intact. These areas should be fairly easy to restore by thinning the pine density and reintroducing growing season fires. However, areas with dense stands of planted sand pine (*Pinus clausa*) have little groundcover, and may

require the removal of the overstory pines, and the planting of longleaf pine and herbaceous species.

Sandhill should have an open canopy dominated by longleaf pine. The subcanopy should be slightly denser than the canopy and consist of young longleaf pine and turkey oak. The understory should be composed of a mixture of shrubs, herbs, and bare sand. Understory shrubs include saw palmetto, wooly pawpaw (*Asimina incana*), deerberry (*Vaccinium stamineum*), shiny blueberry, Chapman's oak (*Quercus chapmannii*), gopher apple, littleleaf buckbrush (*Ceanothus microphyllus*), wax myrtle, Adam's needle (*Yucca filamentosa*), and dwarf huckleberry. Herbaceous species include wiregrass, lopsided Indian grass (*Sorghastrum secundum*), pineywoods dropseed, shortleaf gayfeather (*Liatris tenuifolia*), fragrant eryngo (*Eryngium aromaticum*), whitetop aster (*Sericocarpus tortifolius*), snakeroot (*Pterocaulon pycnostachyum*), witchgrasses, summer farewell (*Dalea pinnata*), queensdelight (*Stillingia sylvatica*), tall jointweed (*Polygonella gracilis*), narrowleaf silkgrass (*Pityopsis graminifolia*), Elliott's milkpea (*Galactia elliottii*), coastalplain chaffhead (*Carphephorus corymbosus*), pinewoods milkweed (*Asclepias humistrata*), whorled milkweed (*Asclepias verticillata*), rabbitbells (*Crotalaria rotundifolia*), sensitive brier (*Mimosa quadrivalvis*), coastalplain goldenaster (*Chrysopsis scabrella*), coastalplain dawnflower (*Stylisma patens*), coastalplain honeycombhead (*Balduina angustifolia*), dogtongue wild buckwheat (*Eriogonum tomentosum*), Florida Indian plantain (*Arnoglossum floridanum*), and Florida mountain mint (*Pycnanthemum floridanum*), among others. Epiphytes should be infrequent and include Spanish moss, ball moss, and Bartram's airplant. Vines should also be found infrequently and may include low densities of muscadine and earleaf greenbrier.

On the 1953 geo-rectified photographs, sandhills appear as a grainy, light peppered signature. Delineation was aided by ground-truthing.

Current Conditions:
Currently, none of the ten sandhill polygons mapped as historically occurring on CSF are in the desired future condition. However, with the thinning of the planted pines and reintroduction of growing season fire sandhill may be one of the more restorable habitats on CSF. Currently, the dominant overstory species are planted stands of longleaf pine, slash pine, or sand pine. For the most part, the dominant pines are less mature and rarely exceed eight (8) inches in diameter at breast height. The midstory contains scattered turkey oak, and sand live oak.

The understory is generally shaded and, in most stands, has been excluded from fire. Evidence of bedding is common throughout the sandhill habitat. Shrubs present include bigflower pawpaw (*Asimina obovata*), sand blackberry (*Rubus cuneifolius*), saw palmetto, sparkleberry (*Vaccinium arboreum*), shiny blueberry, and gopher apple. Relatively high herb species richness remains. Dominant groundcover species include wiregrass, broomsedge bluestem, bracken fern, fragrant eryngo, witchgrasses, yankeeweed (*Eupatorium compositifolium*), Elliott's bluestem (*Andropogon gyrans*), manyflower beardtongue (*Penstemon multiflorus*), Florida Indian plantain, and dogtongue wild buckwheat. Lichens, high densities indicate fire exclusion, are abundant in some areas and include British soldiers (*Cladonia leporina*), and reindeer lichens (*Cladina evansii* and *C. subtenuis*). Epiphytes are absent. Vines are infrequent and consist of

Elliott's milkpea (*Galactia elliottii*), yellow jessamine (*Gelsemium sempervirens*), earleaf greenbrier, and muscadine.

A small portion of the historic sandhill habitat has been clearcut (Thomas Creek Tract) and is in the early stages of regeneration. In this area there are very few remaining canopy trees, most of which are hardwoods like sand live oak, bluejack oak, laurel oak (*Quercus hemisphaerica*), and water oak.

Fire Regimes:
Sandhill requires repeated prescribed fires to maintain open structure. Fire should be applied to this community every 1 to 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.

Management Needs:
Management activities in sandhill on CSF should focus on regular prescribed burning, minimizing practices that disturb the soil. Prescribed burning alone is the preferred method to reduce woody species abundance in the understory. Widespread soil disturbance in xeric soil types is very detrimental to native perennial groundcover such as wiregrass and should be avoided. Seasonally appropriate prescribed burning is recommended for the greatest benefit in reducing woody species abundance. 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.

J. Wet Flatwoods

Description:
Wet flatwoods are characterized by relatively open-canopy forests of southern pine species 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 1 to 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 1 or more months per year. Wet flatwoods often grade into basin swamps and mesic flatwoods.

Wet flatwoods on CSF are pine forests of even-aged and uneven-aged slash pine, longleaf pine (*P. palustris*), or pond pine (*P. serotina*). Wet flatwoods should have either a thick, shrubby understory and very sparse ground cover, or a sparse understory with a dense ground cover of hydrophytic herbs. Although the forest structure of wet flatwoods is similar to mesic flatwoods, species composition in wet flatwoods should contain more hydrophytic species. Shrub species that should occupy wet flatwoods at CSF are gallberry, myrtle dahoon (*I. cassine* var. *myrtifolia*), fetterbush, saw palmetto, loblolly bay, and titi. As in mesic flatwoods, the herbaceous layer in wet flatwoods should include species that help to maintain community structure by fueling growing-season fires; wiregrass should be dominant. Other herbaceous species include Carolina redroot, meadowbeauties (*Rhexia* spp.), yellow-eyed grasses, several species of beaksedges, and hooded pitcherplant (*Sarracenia minor*).

Current Conditions:
The vegetative structure of the wet flatwoods is highly variable and partially dependent on fire history, hydroperiod, and silviculture. For example, herb-dominated wet flatwoods with an open canopy typically fringe many of the basin and dome swamps. A second type is shrub-dominated with little herbaceous/graminoid groundcover. Finally, a third type, which likely has the longest hydroperiod, has a dense canopy and subcanopy with scattered shrubs and shade-adapted herbs. On the newly acquired parcels, the historical wet flatwoods have largely been converted to slash pine plantations and have a dense overstory with a dense shrub layer dominated by bay trees such as swamp bay and loblolly bay. In almost all instances, the wet flatwoods overstory is dominated by slash pine with an occasional loblolly bay, loblolly pine, or pond pine. When present, the subcanopy typically includes myrtle dahoon, dahoon, pond cypress, and occasionally swamp tupelo, blackgum (*Nyssa sylvatica*), swamp bay, and loblolly bay. Typical wet flatwood shrub species include fetterbush, saw palmetto, gallberry, peelbark St. John's wort, primrosewillow (*Ludwigia* sp.), southern bayberry, and highbush blueberry. These shrubs are also common in the herb-dominated wet flatwoods, albeit at relatively much lower densities.

Common herbs and grasses include beaksedges, Carolina yellow-eyed grass (*Xyris caroliniana*), Elliott's yellow-eyed grass (*Xyris elliottii*), hooded pitcherplant, maidencane, blue maidencane, tenangle pipewort, water cowbane (*Tiedemannia filiformis* ssp. *filiformis*), wiregrass, chalky bluestem (*Andropogon virginicus* var. *glaucus*), toothache grass, Carolina redroot, savannah meadowbeauty (*Rhexia alifanus*), pale meadowbeauty (*Rhexia mariana*), and foxtail club-moss (*Lycopodiella alopercuroides*). Where the shrub or canopy cover is dense, herbs and grasses are uncommon; typical species are Virginia chain fern, bracken fern, cinnamon fern, and muscadine.

The herbaceous / graminoid-dominated wet flatwoods have decreased dramatically since the 1953 aerial photograph was taken (the smooth relatively light gray signature fringing basin and dome swamps); most have graded into shrub-dominated wet flatwoods resulting from fire exclusion. However, the herbaceous/graminoid dominance has returned in areas that have burned recently.

Fire Regimes:
Historically, the fire return interval in wet flatwoods is 2 to 4 years for grassy wet flatwoods and 5 to 10 years for shrubby wet flatwoods. However, in areas of heavy fire exclusion and / or densely planted slash pine, mechanical vegetation removal and/or a more frequent fire interval may need to be applied for initial restoration.

Management Needs:
Management of the wet flatwoods at CSF should focus on returning a more natural fire regime to historic wet flatwoods. Areas with remnant or restored herbaceous vegetation should be high priorities for burning and burned with late spring / early summer fires to stimulate wiregrass flowering and seed viability, though fuel loading and local weather conditions will dictate the degree of burning during that time of the year. Dense slash pine canopies should be thinned to promote a more herbaceous understory.

Prescribed burning should be applied to pine plantations in historical wet flatwoods on a 2 to 5-year cycle, with growing season burns increasing with fuel reduction. This will reduce woody

encroachment, sustain herbaceous species, and aid in prevention of catastrophic wildfires.

K. Wet Prairie

Description:

Wet prairie is an herbaceous community found on continuously wet, but not inundated, soils on somewhat flat or gentle slopes between lower lying depression marshes, shrub bogs, or dome swamps and slightly higher wet or mesic flatwoods. Trees and shrubs are absent or very sparse. It is typically dominated by dense wiregrass (*Aristida stricta* var. *beyrichiana*) in the drier portions, along with foxtail club-moss, cutover muhly (*Muhlenbergia expansa*), yellow butterwort (*Pinguicula lutea*), and savannah meadowbeauty. In the wetter portions, wiregrass may occur with, or be replaced by, species in the sedge family such as plumed beaksedge (*Rhynchospora plumosa*), featherbristle beaksedge (*R. oligantha*), Baldwin's nutrush (*Scleria baldwinii*), or slenderfruit nutrush (*S. georgiana*), plus longleaved threeawn (*Aristida palustris*). Also common in wetter areas are carnivorous species, such as pitcherplants (*Sarracenia* spp.), sundews (*Drosera* spp.), butterworts (*Pinguicula* spp.), and bladderworts (*Utricularia* spp.). Other characteristic species in this community include toothache grass, pineland rayless goldenrod (*Bigelowia nudata*), flattened pipewort, water cowbane (*Oxypolis filifolia*), and coastalplain yellow-eyed grass (*Xyris ambigua*).

The desired future condition has the species composition described above for the undisturbed areas. There should be no trees or tall shrubs. Short shrubs should cover less than 20 percent of the community. Herb cover should be greater than 75 percent, with less than 5 percent weedy cover.

Current Conditions:

There are currently no mapped wet prairies at CSF due to fire exclusion and shrub encroachment or conversion to pine plantation.

Fire Regimes:

Historically, the fire return interval in wet prairie is 2 to 3 years. These frequent fires prevent the invasion of weedy shrubs and trees that shade out the herbaceous species.

Management Needs:

On CSF, most wet prairie was mapped as historically occurring in the ecotone between wet flatwoods and dome swamps or other forested wetland communities. As such, restoration beyond applying seasonally appropriate prescribed fire will only be considered when management actions to restore the site would not cause additional impacts to historic wet prairie or the adjacent communities. CSF has significant forested and non-forested wetlands, and all restoration must be completed ensuring no BMPs are violated as part of restoration.

L. Managed Landcover Types

Pine plantations and pastures represent vegetative landcover that the FFS manages as integral components of the agency's multi-use management approach. These managed landcover types provide both ecological benefits, such as wildlife habitat and ground and surface water filtration, as well as opportunities for generating revenue that can be used to help offset management costs.

Management of plantations and pastures within the state forests is conducted to further ensure compatibility with other management goals and objectives.

1. Pine Plantation

Description:

Pine plantations are areas altered by silvicultural activities. These can include lands where either 1) planted pines have or will outcompete or shade out native groundcover, 2) the history of planted pines has reduced ground cover to the point where further restoration beyond thinning and burning is required, and/or 3) the method of planting (e.g., bedding) has adversely impacted groundcover.

A large proportion of the historically-typed mesic flatwoods, wet flatwoods, and sandhill communities on CSF had been converted to pine plantation before State ownership. In limited cases and as part of the restoration process, the FFS established plantations of site-appropriate pine species in degraded communities as required. In all cases, the habitat will return to a more natural state with the thinning of dense stands of planted pines and reintroduction of frequent prescribed fires, and restoration of areas where ditching and bedding occurred prior to State ownership. With repeated prescribed fire, the pine plantations will slowly regain the habitat structure and species composition more typical of the natural communities that were replaced. More specifically, the canopy will be more open and have fewer hardwood species, and the groundcover will be denser and more species diverse with the advent of prescribed fire.

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

Current Conditions:

The canopy layer of the pine plantations is typically dominated by planted slash pine, loblolly pine, sand pine, or longleaf pine. Also, in the wetter areas, loblolly bay can be codominant with the planted pines in the canopy layer. The sub-canopy layer of the pine plantations includes red maple, myrtle dahoon, sweetgum, wax myrtle, swamp bay, swamp laurel oak, and water oak. Common plants in the shrub layer include red maple, titi, loblolly bay, myrtle dahoon, gallberry, sweetgum, coastalplain staggerbush, fetterbush, wax myrtle, swamp bay, live oak, blue huckleberry, large gallberry, saw palmetto, highbush blueberry, southern dewberry (*Rubus trivialis*), shiny blueberry, and deerberry. The most common herbaceous species of the pine plantations include blue maidencane, broomsedge bluestem, thoroughworts (*Eupatorium* spp.), club-moss, cinnamon fern, royal fern (*Osmunda regalis* var. *spectabilis*), narrowleaf silkgrass, bracken fern, beaksedges, and Virginia chain fern. Several vine species are common throughout the pine plantations and include yellow jessamine (*Gelsemium sempervirens*), earleaf greenbrier, laurel greenbrier, and muscadine.

Fire Regimes:
Refer to the historic community. Historic pyrogenic communities may require more frequent fire in the beginning than is typical for the historic natural community.

Management Needs:
Thinning of the pine stands will promote more herbaceous cover in the understory. Planting of longleaf pine, where appropriate, would also be beneficial as long as trees are not allowed to become dense. In most areas, no further planting of native species should be necessary unless wiregrass is completely missing from the herbaceous layer. Frequent prescribed burns will be necessary to move the community towards a more natural structure and composition.

M. Other Altered Landcover Types

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

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

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

Current Conditions:
Altered landcover types on CSF comprise artificial ponds, borrow areas, clearings, developed areas, pine plantations (described above), and roads.

Artificial pond (4 acres) – Water retention ponds, cattle ponds, etc.

Borrow area (9 acres) - Dry or wet depression resulting from past or present mining operation. Phosphate pits and upland borrow pits (sand pits, clay pits, etc.).

Clearing (12 acres) - Dove fields, wildlife food plots, recent or historic clearings that have significantly altered the groundcover and/or overstory of the original natural community (old homesites, etc.).

Developed (31 acres) – Check stations, ORV use areas, parking lots, buildings, maintained lawns (as part of recreation, business, or residential areas), botanical or ornamental gardens, campgrounds, recreation, industrial, and residential areas.

Road (190 acres) – Paved or unpaved.

Fire Regimes:
Please refer to the appropriate historical community type.

Management Needs:
It may not be practical or desirable to restore some of the altered landcover types (e.g., developed land, roads, etc.) to the historic natural community. However, long term hydrology restoration that includes the removal of certain roadbeds and ditches would be highly beneficial to the natural communities on the site.

VIII. References

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IX. Glossary of Abbreviations

ARC ..... Acquisition and Restoration Council
ARM ..... Archaeological Resource Management
BMAP ..... Basin Management Action Plan
BMP ..... Best Management Practices
CAMA ..... Office of Coastal and Aquatic Managed Areas

CARL ..... Conservation and Recreation Lands
CSF ..... Cary State Forest
COJ ..... City of Jacksonville
DHR..... Division of Historical Resources
DRP ..... Division of Recreation and Parks
DSO ..... Direct Support Organization
F.A.C. ..... Florida Administrative Code
FDACS ..... Florida Department of Agriculture and Consumer Services
FDEP ..... Florida Department of Environmental Protection
FFS ..... Florida Forest Service
FNAI..... Florida Natural Areas Inventory
F.S. ..... Florida Statutes
FWC ..... Florida Fish and Wildlife Conservation Commission
NPS..... National Park Service
NRCS..... Natural Resources Conservation Service
OALE ..... FDACS Office of Agricultural Law Enforcement
OFW ..... Outstanding Florida Waters
OPS..... Other Personal Services Employment
SJRWMD ..... St. Johns River Water Management District
TIITF ..... Trustees of the Internal Improvement Trust Fund, Board of
USGS……United States Geological Survey
WMA..... Wildlife Management Area