

TEN-YEAR RESOURCE MANAGEMENT PLAN

FOR THE

CARL DUVAL MOORE STATE FOREST AND PARK

PUTNAM COUNTY



PREPARED BY

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

DIVISION OF FORESTRY

APPROVED ON

FEBRUARY 25, 2010

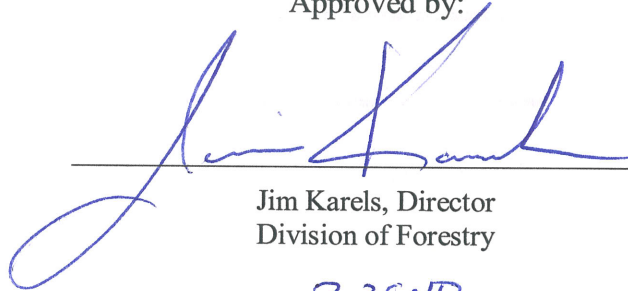
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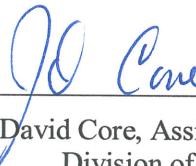
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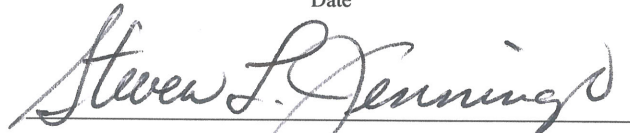
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TEN-YEAR RESOURCE MANAGEMENT PLAN
CARL DUVAL MOORE STATE FOREST AND PARK

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**TEN-YEAR RESOURCE MANAGEMENT PLAN
CARL DUVAL MOORE STATE FOREST AND PARK**

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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services, Division of Forestry
COMMON NAME: Carl Duval Moore State Forest and Park
LOCATION: Putnam County, Florida
ACREAGE TOTAL: 306

<i>Historic Community Type</i>	<i>Acreage</i>	<i>Historic Community Type</i>	<i>Acreage</i>
Sandhill	109	Flatwoods Lake	37
Mesic Flatwoods	69	Wet Flatwoods	24
Baygall	61	Scrubby Flatwoods	6
TOTAL:			306

LEASE / MANAGEMENT NUMBER: None

USE: Single ☐ MULTIPLE ☒

MANAGEMENT AGENCY

Division of Forestry (Lead Agency)

Florida Fish and Wildlife
Conservation Commission

Division of Historical Resources

RESPONSIBILITY

Forest Resource Management

Enforce Wildlife Management Laws

Historical and Archaeological Resource

DESIGNATED LAND USE: Multiple-Use State Forest

SUBLEASE: None

ENCUMBRANCE: None

TYPE ACQUISITION: Donation

UNIQUE NATURAL FEATURES: Up and Down Lake, Hardesty Lake, Alligator Creek

ARCHAEOLOGICAL SITES: None

MANAGEMENT NEEDS: Restoration and maintenance of scrubby flatwoods, sandhill, and flatwoods ecosystems through aggressive prescribed burning, hardwood control, off-site pine harvests and/or reforestation with native species. Thin slash pine plantations in mesic flatwoods to promote forest health and natural regeneration. Restore stream and wetland crossings through installation of culverts, hard rock crossings, etc. Complete interpretive/forest education trails, evaluate additional primitive camping sites. Continue to acquire land or easements adjacent to the recently acquired Plum Creek Tract to allow for public access to South Tract. Maintain signage on boundary fence.

ACQUISITION NEEDS/ACREAGE: 1,735

SURPLUS LANDS/ ACREAGE: None

PUBLIC INVOLVEMENT: Carl Duval Moore State Forest and Park/Etoniah Creek State Forest Liaison Committee and Management Plan Advisory Group Public Hearing/Meeting.

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

ARC Approval Date: _____ BTIITF Approval Date: _____

Comments: _____

I. INTRODUCTION

Carl Duval Moore State Forest and Park (CDMSFP) is comprised of approximately 306 acres located in central Putnam County. The forest is comprised of two tracts. The South Tract (179.9 acres) is located approximately two miles southeast of Interlachen, and the North Tract (126.1 acres) is located one mile northeast of Interlachen.

CDMSFP contains one notable watercourse, Alligator Creek, which flows through the South Tract of the forest. A portion of Hardesty Lake is contained within the boundaries of the South Tract, and a portion of Up and Down Lake is contained within the boundaries of the North Tract. Major natural communities found on the forest include mesic flatwoods, baygall, sandhill, and scrubby flatwoods.

A. General Mission, Goals for Florida State Forests, and Management Plan Direction

The primary mission of the Division of Forestry (DOF) in managing CDMSFP is to protect and manage the unique resources of the forest through a stewardship ethic to ensure these resources will be available for future generations. This will be accomplished by implementing sound multiple-use management principles, the objectives of which will be:

- To restore, maintain, and protect in perpetuity, all native ecosystems;
- To ensure long-term viability of populations and species considered rare, endangered, threatened, or of special concern;
- To restore, maintain, and protect hydrological functions related to the quality and quantity of water resources and the health of associated wetland and aquatic natural communities;
- To integrate human use through the multiple-use concept, not emphasizing any particular use over the others or over restoration, maintenance, and protection of native ecosystems;
- To protect known archaeological and historical resources; and
- To practice sustainable forest management utilizing sound silvicultural techniques.

This management plan is provided according to requirements of Section 253.034, Florida Statutes, and was prepared utilizing guidelines outlined in Section 18-2.021 of the Florida Administrative Code. It is not an annual work plan or detailed operational plan but provides general guidance for the management of CDMSFP for the next ten years and outlines the major concepts that will guide management activities on the forest.

B. Overview of State Forest Management Program

Carl Duval Moore State Forest and Park was willed to the Florida Department of Agriculture and Consumer Services (FDACS), Division of Forestry (DOF), in February 1994. Mr. Moore originally deeded 179.9 acres of land bordering Hardesty Lake to the DOF, and 126.1 acres surrounding Up and Down Lake was to be deeded to the Department of Natural Resources (DNR) as a state park. DNR decided against accepting this property, and the DOF requested this parcel be included with the 179.9 acres that

they were to receive in Mr. Moore's will. In February 1994, the estate was finally settled and the full property ownership of 306 acres was deeded to the FDACS DOF.

Since the DOF assumed management of this property as a state forest, 5 timber sales have been accomplished, 90 acres have been subsequently planted to longleaf pine, and a scheduled prescribed burning program has been initiated. Ninety acres of the property now consists of 1999 and 2004 planted longleaf pine, following harvests of off site slash and sand pine. In addition, one natural (13 acres) and one planted (15 acres) slash pine stands, and one natural longleaf pine stand (43 acres) have been thinned. Restoration, involving the frequent use of prescribed fire of the sandhills and mesic flatwoods and a small area of scrubby flatwoods on the North Tract, will be the focus for the future. DOF's management of the North Tract, specifically prescribed burning, may be challenging due to S.R. 20's location less than ½ mile to the south, and a housing development to the north and west.

C. Past Accomplishments and Status of Previous Plan's Goals/Objectives

Following is a brief summary of since the last approved management plan.

Management activities on CDMSFP are chronicled in monthly accomplishment reports and in an annual accomplishment report. Major highlights of the past seven years are summarized in Table 1. This table does not attempt to account for all activities on the forest but summarizes major activities that are more readily quantifiable. It does not list or identify the multitude of daily activities and public interactions involved in managing the forest.

Table 1. Ten-Year Accomplishment Summary for CDMSEFP

PROGRAM	ACTIVITY	UNITS	FY 1999-2000	FY 2000-01	FY 2001-02	FY 2002-03	FY 2003-04	FY 2004-05	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	Ten-Year Total
Reforestation/Restoration	Longleaf pine	Acres	28	0	0	0	62	0	0	0	0	0	90
Fire Management	Wildfire	No./Acres	0/0	0/0	0/0	0/0	1/6	0/0	0/0	0/0	0	1/1.5	2/7.5
	Prescribed Fire	Acres	0	0	0	29	0	0	0	0	27	19	75
	Fire line Installation and Maintenance	Miles	0	0	0	1.6	0	0.6	0	0.2	0.5	0.5	3.4
Boundary Maintenance	Maintenance/Marking	Miles	0	0	0	0	5	0	2.9	3.2	0	0.9	12
Roads/Trails	Construction	Miles	0	0	0	0	0	0	0	1.2	0	0	1.2
	Maintenance	Miles	0	0	0	0	0	0	0.4	0	1.2	0	1.6
Hydrological Enhancement	Maintenance	No. (culvert added)	0	0	0	1	0	0	0	1	0	0	2
Recreation	Visitor Use	# Visits	0	0	0	0	0	0	18 **	24 **	**	133	175**
Revenue	Timber Sales	\$	\$0	\$0	\$43,769	\$0	\$0	\$0	\$0	\$7,545	\$0	\$2,936	\$54,250
	Recreation Fees	\$	\$0	\$0	0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	0
Information and Education Activities	Information/Education/Number of Tours, Public Broadcasts, News Releases, etc	#	0	0	0	0	0	0	1	1	1	1	4

PROGRAM	ACTIVITY	UNITS	FY 1999- 2000	FY 2000- 01	FY 2001- 02	FY 2002- 03	FY 2003- 04	FY 2004- 05	FY 2005- 06	FY 2006- 07	FY 2007- 08	FY 2008- 09	Ten- Year Total
Habitat Enhancement	Mechanical TSI, chemical site preparation	Acres	28	0	0	0	62	0	0	0	0	49	139
	Natural Community mapping	Acres	0	0	0	0	0	0	0	306	0	0	306
Silviculture/ Timber harvest	Timber Sales	No./ Acres	0/0	1/28	1/80	0/0	0/0	0/0	1/43	0/0	1/22	0/0	4/173
Exotic Species Control	Torpedo grass	# Feet	0	0	0	0	0	0	0	488	0	0	488
	Air potato	# Small clump	0	0	0	0	0	0	1	0	0	0	1
	Mimosa	# Small clump	0	0	0	0	0	0	1	0	0	0	1
	Natal grass	Acres	0	0	0	0	0	0	0	0.25	0	0	0.25
	Camphor Tree	# Small clump	0	0	0	0	0	0	0	0	0	1	1
Imperiled Species Management	Gopher tortoise survey	No./ Active burrows	0	0	0	0	0	0	0	1/17	0	0	1/17

**Prior to fiscal year 2009-2010 no trail counter was in place along the nature trail to record visitation.

D. Goals/Objectives for the Next Ten Year Period

The following goals and objectives provide direction for the next ten-year planning period. Funding, agency program priorities and the wildfire situation during the planning period will determine whether these objectives can be met. 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. These short-term and long-term management goals shall be the basis for all subsequent land management activities.

GOAL 1: Habitat Restoration and Improvement

OBJECTIVE 1: Maintenance prescribe burn an average of 65 acres per year. (Short-Term/Long-Term)

Performance measure: Number of acres burned during the dormant season & growing season.

OBJECTIVE 2: Conduct habitat restoration activities on 159 acres of ground cover through the application of prescribed fire where the native ground layer has been eliminated or heavily impacted from historical land use. (Short-Term/Long-Term)

Performance measure:

- Number of acres with restoration underway.
- Number of acres restored.
- Estimate of percent native ground cover

OBJECTIVE 3: Protect integrity of natural communities and public access through acquisition of adjacent number of parcels or acres parcels within the boundary of acquisition needs. (Long-Term)

Performance measure: Acres acquired from willing sellers.

OBJECTIVE 4: Annually update the Prescribed Burning Plan to address forest-wide prescribed burning needs, fire return intervals, and wildfire suppression strategies. (Short-Term)

Performance measure: Completion of a Prescribed Burning Plan annually.

OBJECTIVE 5: Prioritize the flatwoods and sandhill communities that require growing season fire. (Long-Term)

Performance measure:

- Prioritized list of communities and stands requiring growing season fire.
- Completion of annual plan.

OBJECTIVE 6: Conduct timber thinning harvests for the purposes of flatwoods habitat restoration on 15 acres of slash pine plantation and 13 acres of natural slash pine stands to naturally regenerating stands of trees without sacrificing groundcover vegetation, native fauna or other ecosystem values. (Long-Term)

Performance measure: Acres of mesic flatwoods stands and thinned.

OBJECTIVE 7: Plant longleaf pine on clearcut timber harvest site of 22 acres of off-site slash pine for purposes of sandhill habitat restoration. Herbicide treatment may be necessary as part of sandhill restoration. (Short-Term)

Performance measure:

- Acres of longleaf pine planted with adequate survival.
- Herbicide treatment completed.

OBJECTIVE 8: Maintain current maps and provide staff training to protect environmentally sensitive communities and ecotones when preparing firelines and carrying out management work. (Short-Term/Long-Term)

Performance measure: Research and map sensitive areas to include in the Fire Management Plan, and train staff to protect sensitive sites.

OBJECTIVE 9: Conduct habitat restoration activities on 85 acres of sandhill community using growing season fire and longleaf pine reforestation where needed. (Long-Term)

Performance measures:

- Restoration stands researched & mapped.
- Presence and density of sandhill endemics (gopher tortoises, wiregrass, etc.).
- Acres of longleaf pine planted with adequate survival.

OBJECTIVE 10: Restore groundcover, when budgetary feasible, through wiregrass planting and other species where the native ground layer has been eliminated or heavily impacted from historical land use. This would be on 5 acres of ruderal land in the NW corner of the North Tract. (Long-Term)

Performance measure: Number of acres with native vegetation established.

GOAL 2: Public Access and Recreational Opportunities

OBJECTIVE 1: Maintain public access and recreational opportunities to allow for a maximum recreational carrying capacity of 160 visitors per day. (Short-Term)

Performance measure: Number of visitor opportunities/day.

OBJECTIVE 2: Assess alternatives for additional public access and develop recreational opportunities for the public on the South Tract once legal ingress/egress problems have been resolved. Public access to this South Tract will allow for an **additional** maximum carrying capacity of 40 visitors per day. (Long-Term)

Performance measure: Number of visitor opportunities/day.

OBJECTIVE 3: Develop and assess alternatives for providing public access to the South Tract. (Long-Term)

Performance measure: Written assessment completed.

OBJECTIVE 4: Continue to provide one annual interpretive/educational program. (Long-Term)

Performance measure: Number of interpretive/education programs annually.

OBJECTIVE 5: Annually update the 5-year Outdoor Recreation Plan. (Short-Term)

Performance measure: Annual update of 5-year Outdoor Recreation Plan completed.

OBJECTIVE 6: Enlist additional volunteers and volunteer organizations to assist with recreation and/or resource management. (Long-Term)

Performance measure: Number of new volunteers enrolled, hours worked and their activities.

OBJECTIVE 7: Develop a public information program that includes the printing of full color brochures of CDMSFP for distribution to the general public to increase awareness of the state forest, recreational opportunities and increase visitors. (Short-Term)

Performance measure: Completion and printing of brochures.

OBJECTIVE 8: Once public access to the South Tract has been provided, develop interpretive signage for a nature trail on the South Tract (Long Term).

Performance measure: Installation of signage.

GOAL 3: Hydrological Preservation and Restoration

OBJECTIVE 1: Conduct or obtain a site assessment/study to identify potential hydrology restoration needs. (Short-Term)

Performance measure: Assessment conducted.

OBJECTIVE 2: Protect water resources during management activities through the use of Silvicultural Best Management Practices (BMPs) for public lands. (Short-Term/Long-Term)

Performance measure: Compliance with state lands BMPs.

OBJECTIVE 3: Restore natural sheet flow and reduce erosion along roads, if site assessment warrants it. (Long-Term)

Performance measure:

- Number of sites or feet of trail/roads restored.
- Number of culverts installed or maintained at critical trail and road crossings.

GOAL 4: Sustainable Forest Management

OBJECTIVE 1: Update silviculture management plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (Short-Term)

Performance measure: Complete update of plan.

OBJECTIVE 2: Implementation of the silviculture management plan. (Short-Term/Long-Term)

Performance measure: Number of acres treated.

OBJECTIVE 3: Implement the process, as outlined in the State Forest Handbook, for conducting stand descriptions and forest inventory including a GIS database containing forest stands, roads & other attributes (including but not limited to: threatened & endangered species, archaeological resources, exotic species locations, historical areas). (Short & Long Term Goals)

Performance measure: Complete GIS database and re-inventory ALL attributes every 3-5 years or as needed.

OBJECTIVE 4: Conduct Forest Inventory updates annually, according to established criteria. (Short-Term/Long-Term)

Performance measure: Number of acres inventoried annually.

GOAL 5: Exotic and Invasive Species Maintenance and Control

OBJECTIVE 1: Document in a plan/map the location, identification and control measures to treat non-native invasive plant species. (Short-Term)

Performance measure: Plan/map documentation completed.

OBJECTIVE 2: Annually treat EPPC Category I and Category II invasive exotic plant species, as needed. (Short Term/Long Term)

Performance measure: Number of acres/spots treated.

GOAL 6: Capital Facilities and Infrastructure

OBJECTIVE 1: CDMSFP staff will maintain two existing facilities, 1.3 miles of roads, and 1.2 miles of trails existing on the forest. (Short-Term/Long-Term)

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

OBJECTIVE 2: Permanently identify and maintain 5.2 miles of state forest boundaries. (Long-Term)

Performance measure: Miles of boundary maintained, and miles of boundary fence maintained.

OBJECTIVE 3: Protect sensitive habitat from encroachment and illegal trespass through replacement and maintenance of 1.5 miles of boundary fence annually. (Short-Term/Long-Term)

Performance measure: Miles of boundary fence maintained annually.

OBJECTIVE 4: Annually harrow 2.3 miles of upland perimeter lines for wildfire protection and to clearly define property boundaries. (Short-Term/Long Term)

Performance measure: Miles of upland perimeter lines harrowed.

OBJECTIVE 5: Establish new perimeter firelines and/or coordinate use of existing adjacent properties. (Short-Term/Long Term)

Performance measure: Miles of perimeter firelines established.

GOAL 7: Cultural and Historical Resources

OBJECTIVE 1: Ensure all ground disturbing activities are managed in compliance with Division of Historical Resources (DHR) guidelines. (Short-Term/Long-Term)

Performance measure: Number of Archaeological Site Monitors and number of Ground Disturbing Activities handled per DHR guidelines.

OBJECTIVE 2: Ensure that any sites that are discovered during ground disturbing activities are recorded in the DHR Master Site file. (Long-Term)

Performance measure: Send updates to DHR Master Site file as needed and monitor the recorded sites.

GOAL 8: Imperiled Species Habitat Maintenance, Enhancement, Restoration, or Population Restoration

OBJECTIVE 1: Develop baseline imperiled species occurrence inventory list (Short-Term)

Performance measure: Baseline imperiled species occurrence inventory list completed

OBJECTIVE 2: Develop monitoring protocols for selected imperiled species. (Short-Term)

Performance measure: The number of imperiled species for which monitoring protocols are developed

OBJECTIVE 3: Implement monitoring protocols for two imperiled species, Gopher tortoise and American Bald Eagle. (Short-Term)

Performance measure: The number of species for which monitoring is ongoing and report of results prepared.

E. Management Needs, Priority Schedule and Cost Estimates

CDMSFP currently receives no designated CARL funding, other than what is available through the non-CARL budget appropriation for annually requested activities. The Etoniah Creek State Forest staff, Putnam County rangers, and other Waccasassa Forestry Center personnel provide support as needed.

A priority schedule for conducting management activities and the average or estimated cost is listed below. The majority of the management operations will be conducted by the DOF. Appropriate activities may be contracted to private sector vendors. All activities will enhance the property's natural resource or public recreational value.

Priority 1

1. To prevent destructive wildfires, an aggressive prescribed burning and wildfire prevention, detection, and suppression program has been initiated. Fire management will reduce fuel loading, thus increase public safety, facilitate timber management, and restore, maintain, and protect native ecosystems, natural communities, ecotones, and their ecological processes. Estimated total cost per year is \$2,000.
2. Restoration of the natural longleaf pine-wiregrass ecosystem for this planning period consists of planting 22 acres on the South tract that was harvested during the previous planning period. Also, these sandhills in poor condition from fire exclusion will need herbicide treatment to reduce oak density and release pine regeneration. Prescribed burning, as a restoration tool, is included in #1 above. The onetime reforestation cost including: site prep burning, seedlings, planting, and herbicide application for this planning period is approximately \$5,796.
3. Develop and print full color brochures of CDMSFP for distribution to the general public to increase awareness of the state forest, recreational opportunities and increase visitors. The estimated one time cost is \$2,200.

Priority 2

1. The estimated cost for implementing the forest exotic species control plan is \$1,500 annually.
2. Develop interpretive signage for nature trail on the South Tract. Estimated one time cost is \$2,000.

Priority 3

1. The state forest boundary must be maintained. Boundaries will be patrolled on a routine basis and the entire boundary will be marked twice during this planning period. The estimated cost for boundary maintenance is \$4,200 during this planning period.

Table 2. Estimated Ten Year Expenditures Organized by Uniform Cost Accounting Council Categories

CATEGORY	PRIORITY 1	PRIORITY 2	PRIORITY 3	TOTAL
Resource Management:				
-Exotic Species Control		\$15,000		\$15,000
-Restoration	\$5,796			\$5,796

CATEGORY	PRIORITY 1	PRIORITY 2	PRIORITY 3	TOTAL
-Prescribed burning	\$20,000			\$20,000
-Timber Management				
-Hydrological Management				
-Other			\$4,200	\$4,200
-Biological surveys				
Administration:				
- Units/Projects				
Capital Improvements:				
-New Facility Construction				
-Facility Maintenance				
Visitor Services/Recreation:				
-Information/Education Programs	\$2,200	\$2,000		\$4,200
-Operations				
TOTAL	\$27,996	\$17,000	\$4,200	\$49,196

II. ADMINISTRATION SECTION

A. Descriptive Information

1. Common Name of Property

The common name of the property is Carl Duval Moore State Forest and Park (CDMSFP).

2. Location, Boundaries and Improvements

CDMSFP is comprised of two tracts located in the central portion of Putnam County, Florida. The South Tract is located approximately two miles southeast of Interlachen, and the North Tract is located one mile northeast of Interlachen (Exhibit A).

Improvements to the property include a parking lot, trail and observation platform that leads to Up and Down Lake. The forest has the remnants of several old houses or shack foundations.

3. Legal Description and Acreage

The total forest acreage for CDMSFP is 306 acres. The property is located in part of Sections 11 and 24, Township 10 South, Range 24, in Putnam County, Florida. See Exhibit B for more information on the legal description and deed.

4. Degree of Title Interest Held by the Board

The property was deeded by the Carl Duval Moore Estate to the State of Florida, Department of Agriculture and Consumer Services (FDACS), Division of Forestry (DOF) on November 17th, 1993, with certain reservations. Specifically, as stated in the deed: "This land is only for the purposes of and is to be used for the production of timber, game management, or school for forestry management methods.

5. Proximity to Other Public Resources

Lands managed by State, Federal or local governments for conservation of natural or cultural resources that are located within approximately ten miles of CDMSFP (Exhibit C) include:

Table 3. Proximity to Other Public Resources

TRACT	AGENCY	DISTANCE
Caravelle Ranch Wildlife Management Area	FWC	1 mile SE
Rice Creek Conservation Area	SJRWMD	5 miles East
Ocala National Forest	USFS	6 miles South
Etoniah Creek State Forest	DOF	6 miles NE
Cross Florida Greenway	OGT	6 miles SE
Ordway-Swisher Biological Station	UF	7.5 miles NW
Seven Sister's Islands	SJRWMD	10 miles SE

Agency Legend

DOF - Division of Forestry
FWC - Fish and Wildlife Conservation Commission
OGT - Office of Greenways and Trails
SJRWMD - St. Johns River Water Management District
USFS - United States Forest Service
UF - University of Florida

6. Aquatic Preserve/Area of Critical State Concern

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

B. Acquisition Information

1. Land Acquisition Program

The CDMSFP was acquired in 1993 through a transfer of ownership from Mr. Carl Duval Moore to the DOF as stated in his will.

2. Legislative or Executive Constraints

There are no known legislative or executive constraints specifically directed toward CDMSFP. Use of the property is regulated in part by the following, as stated in the deed (Exhibit B): “This land is only for the purposes of and is to be used for the production of timber, game management, or school for forestry management methods. In addition, the land shall be used for public purposes as a forest and park; it shall never be sold; and that there shall be no homes, dance halls, nor any type of development, except those necessary for uses consistent with its use as a state forest and park, or it will revert to the Shriner’s Hospital for Crippled Children.”

3. Purpose for Acquisition

The DOF received title to this property through a gift in the will of Mr. Carl Duval Moore. With the deed, DOF accepted various conditions on the use of the property as is described elsewhere in this plan (II.A.4 and II.B.2).

4. Designated Single or Multiple-Use Management

The CDMSFP is designated for multiple-use management. Authority for multiple-use management is given under the Authority of Chapters 253 and 589, Florida Statutes. One of the DOF’s primary goals in managing CDMSFP will be to implement multiple-use management. Multiple-use management includes, but is not limited to silvicultural management, recreation, wildlife management, archaeological and cultural resource management, ecosystem restoration, environmental education and watershed management. The forest will be managed so as to restore, protect and manage ecosystem functions while allowing compatible public uses.

Only uses compatible with the conservation of CDMSFP and its ecosystems will be implemented. Compatible multiple uses may include such activities as timber production, bird watching, hiking, game management, nature study, forestry education, fishing, and picnicking. Recreational activities are identified in more detail in the recreation plan. Copies of the recreational plan are on file at the Etoniah Creek State Forest office.

5. Alternate Uses Considered

The following uses were considered and determined not compatible: water resource development projects, water supply projects, storm-water management projects, linear facilities, use by off-highway vehicles, or communication towers and antennas, except as otherwise outlined in this plan. No alternate uses are being considered at this time.

6. Additional Land Needs

Various parcels should be considered for acquisition if they become available for purchase (Exhibit D). Despite the recent acquisition of the Plum Creek Tract, the South Tract is still land locked at this time. The acquisition of various adjacent parcels to the Plum Creek Tract would allow for public access to the South Tract and would be beneficial as it relates to management activities. Various parcels adjacent to the North Tract would also be beneficial to the management of CDMSFP.

7. Adjacent Conflicting Uses

Future development of adjacent parcels could adversely impact management of the forest. DOF's management of the North Tract, specifically prescribed burning, may be challenging due to S.R. 20's location less than ½ mile to the south, and a housing development to the north and west.

8. Surplus Land Assessment

All land within CDMSFP is suitable for its proposed use and none is declared surplus.

C. Agency & Public Involvement

1. Responsibilities of Managing Agencies

The DOF is the lead managing agency, responsible for overall forest management. The FDACS, Office of Agricultural Law Enforcement (OALE) is responsible for law enforcement on CDMSFP. The FWC, a cooperating agency, is responsible for enforcement of wildlife management laws. The DOF cooperates with DHR regarding appropriate management practices on historic sites on the property as stated in Section 267.061(2)(d), Florida Statutes. Ground disturbing activities will be conducted following the guidelines of the Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Lands (Exhibit H). The Forest Hydrology Section and/or St. Johns River Water Management District (SJRWMD) will be consulted and involved in matters relating to watershed management.

2. Public and Local Government Involvement

The DOF is responsible for the development of this management plan and its implementation. The DOF responds to public involvement through communication with individuals, user groups, and government officials. This plan was developed with input from the CDMSFP Management Plan Advisory Group through a process of review and comment. The advisory group also conducted a public hearing on January 21, 2010 to receive input from the general public. A summary of the advisory's group's meetings and discussions, as well as written comments received on the plan are included in Exhibit E.

3. Compliance With Comprehensive Plan

This plan was submitted to the Putnam County Board of County Commissioners for review of compliance with their local comprehensive plan (Exhibit F).

III. RESOURCE SECTION

A. Past Uses

Mr. Carl Duval Moore owned and managed the property for many years, keeping it in timber production. Regeneration efforts through the 1960s and 1970s consisted of direct seeding slash pine, machine and hand planting slash pine, and some sand pine seedlings over most of the sandhills and flatwoods with moderately successful results. Scattered

35-year old slash pine from these plantings can be seen in the sandhills at very low densities and in a stunted condition. Several of the flatwoods areas have reasonable stocking and size. Timber stand improvement work by Mr. Moore utilized prescribed burning and herbicide application on the oaks with fair to poor results. A couple of stands were thinned on the property.

In November 1991 Mr. Moore passed away. His close relationship with the DOF over the years, particularly with Roy Lima, John Holzapfel, and Ned Neenan, gave him a desire to will 179.9 acres of his land bordering Hardesty Lake to the DOF. Conversations in the summer of 1992 with Mr. Tim Keyser, attorney for Mr. Moore, revealed that another 127 acres of Mr. Moore's land surrounding Up and Down Lake was to be deeded to the Department of Natural Resources (DNR) as a state park. DNR decided against accepting this property, and the DOF requested this parcel be included with the 179.9 acres that they were to receive in Mr. Moore's will. In February 1994, the estate was finally settled and the full property ownership of 306 acres was deeded to the FDACS DOF to be named the "Carl Duval Moore State Forest and Park".

Since the DOF assumed management of this property as a state forest, several timber sales have been accomplished, some areas have been subsequently planted to longleaf pine, and a prescribed burning program has been initiated.

B. Renewable and Non-Renewable Resources

1. Soil Types

There are twelve different soil series found on CDMSFP, ranging from excessively drained to very poorly drained soils. For detailed information on the soils found in CDMSFP, see Exhibit G.

2. Archaeological and Historical Resources

DHR has been contacted with a request to review the information contained in the Florida Master Site File. Historic properties potentially eligible for listing in the National Register of Historic Places or other archaeological and historic sites may be present. The DOF will comply with the procedures outlined in "Management Procedures for Archaeological and Historic Sites on State-Owned and Controlled Lands" (Exhibit H) and all appropriate provisions of Chapter 267.061, Florida Statutes. In the event of any proposed significant ground disturbing activity on CDMSFP, the DHR and FNAI will be contacted prior to the activity.

3. Water Resources

CDMSFP borders 1,700 feet of Hardesty Lake on the northeast side and surrounds almost all of Up and Down Lake. Alligator Creek passes from the northwest to southeast through the South Tract. All waters contained in or flowing from the CDMSFP are classified as Class III Surface Waters – Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife in accordance with Rule 62-302.400 F.A.C.

4. Fish and Wildlife

DOF management practices in 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. Fish and wildlife present on CDMSFP can be found in Section IV.B.

5. Endangered or Threatened Species

The table below shows rare species with known FNAI tracking records for CDMSFP. Exhibit I identifies endangered or threatened species that are found near CDMSFP and summarizes management techniques that will be applied.

Table 4. Rare Species Documented by FNAI on CDMSFP

Species	Common Name	FNAI Global Rank	FNAI State Rank	Federal status	State status
Animals					
<i>Gopherus polyphemus</i>	Gopher Tortoise	G3	S3	LR	LT
<i>Haliaeetus leucocephalus</i>	Bald Eagle	G5	S3	DL	DL
<i>Ursus americanus floridanus</i>	Florida Black Bear	G5T2	S2	N	LT
Plants					
<i>Garberia heterophylla</i>	Garberia	not tracked	not tracked	N	LT

FNAI RANKS indicate the global (G) and state (S) rarity of a species: 1 = critically imperiled; 2 = imperiled; 3 = rare, restricted, or otherwise vulnerable to extinction; 4 = apparently secure; 5 = demonstrably secure. (www.fnai.org/ranks.htm)

STATUS indicates if a species is listed as endangered (LE), threatened (LT), potential listing under review (LR) delisted (DL) or of management concern (LS) by either federal (US) or state (FL) agencies, or not listed (N).

Gopher tortoise will require periodic monitoring on CDMSFP, in the form of active burrow surveys. This species is under review by USFWS to increase its protection, and is already listed as threatened by the state of Florida. The goal of monitoring is to demonstrate presence/absence of gopher tortoises in suitable upland areas of each tract, and to look for evidence of reproduction. The burrow surveys also allow for periodic casual surveys for listed commensals such as indigo snakes and Florida mice.

Florida black bear will not be systematically monitored, but bear evidence such as scat or scratch trees will be recorded.

The bald eagle nesting site on the south-east shore of Up and Down Lake was vacated after the nest tree was lightning struck. Eagles have re-nested in a different site on the north-east boundary of the North tract. Nest monitoring will be coordinated with FWC each breeding season.

Garberia is mentioned in the table above because of its inclusion on the State of Florida threatened plants list. Locally this plant is abundant and will have a specific monitoring protocol, although obvious trends in its demographic status will be noted by staff.

Florida mouse (*Peromyscus floridanus*), Eastern Indigo Snake (*Drymarchon couperi*), Florida Sandhill Crane (*Grus canadensis pratensis*) could potentially be found on CDMSFP. The 2007 FNAI survey noted the potential for several other rare plants on the site:

Rare plants that may be located at Carl Duval Moore State Forest during future surveys include purple honeycomb-head (*Balduina atropurpurea*), chaffseed (*Schwalbea americana*), and diverseleaf crownbeard (*Verbesina heterophylla*) in flatwoods, Florida toothachegrass (*Ctenium floridanum*) and giant orchid (*Pteroglossaspis ecristata*) within sandhill and mesic flatwoods communities, and pondspice (*Litsea aestivalis*) and hartwrightia (*Hartwrightia floridana*) in baygall.

6. Beaches and Dunes

There are no beaches or dunes on CDMSFP.

7. Swamps, Marshes, or Other Wetlands

Several bayheads are located on CDMSFP and are associated with Alligator Creek, Up and Down Lake, and Hardesty Lake. The preliminary wetland delineations for CDMSFP are shown in Exhibit J. Maintenance of wetland communities is a high priority and will be accomplished through prescribed fire when necessary and avoidance of activities that would threaten natural hydrology such as ditching and pre-suppression firelines. The GIS data on which these delineations are based was obtained from the FNAI as a part of a natural community mapping contract.

The water resources on CDMSFP 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 DOF's Hydrology Section to incorporate wetland restoration into the overall resource management program as opportunities arise, particularly where wetland systems have been impaired or negatively impacted by previous management activities or natural disasters.

Wetland restoration objectives on the state forest include erosion control, restoration of hydrology and/or hydro-period, 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, exotic species control, site preparation and re-vegetation with native wetland species, and project monitoring. These activities may be conducted individually or concurrently, implemented by DOF personnel or by non-DOF personnel under mitigation or grant contractual agreements. Wetland restoration projects should be conducted in conjunction with other restoration activities indicated elsewhere in this plan.

To the extent possible, CDMSFP, with assistance from the DOF's Hydrology Section, will pursue funding to develop and implement wetland restoration projects. In addition, cooperative research among the DOF, other state agencies, and the federal government will provide valuable information in determining future management objectives of wetland restoration.

8. Mineral Resources

There are no known significant mineral deposits on CDMSFP.

9. Unique Natural Features

The most unique natural features on CDMSFP are the functioning ecosystems including mesic flatwoods, hammocks, sandhills, and bayheads. Additionally, there is a baygall associated with Alligator Creek on the South Tract, and an area of baygall on the northeast side of the North Tract.

10. Outstanding Native Landscapes

Hardesty Lake on the South Tract and Up and Down Lake on the North Tract are good examples of pristine flatwoods lakes.

11. Timber Resource

The DOF will implement silvicultural practices, including harvesting, thinning, burning and reforestation, in an attempt to establish a healthy forest with an age distribution that best represents natural conditions. Well-timed and executed timber harvests play an integral role in the health of forest ecosystems. Thinning dense forest stands improves under-story habitat and allows for less damaging prescribed burns. Timber harvesting is also used in reestablishing native species by removing off-site trees.

The management of timber resources on CDMSFP will not seek to maximize short-term economic revenue but rather to achieve a wide array of long-term public benefits, many of which are intrinsic and not easily quantified. Good stewardship and resource sustainability are essential goals for any proposed silvicultural activity. The health of the forest ecosystem is paramount in importance.

The DOF practices sustainable timber management in the state forest system, which means annual harvest volume on each state forest will not exceed the annual growth rate except during restoration activities. This is accomplished by periodically obtaining accurate estimates of standing timber volumes in order to ensure that the timber resource will not be depleted. An initial stand description and inventory was completed by DOF in FY 1997-98. All stands within CDMSFP are scheduled to be inventoried at least once every 10 years.

A comprehensive inventory of merchantable pine stands was completed in November 1997, and the fieldwork for a hardwood inventory was completed in May 1999, following DOF's established procedure. Subsequent inventories were conducted in

2002, 2003, 2004, 2007, 2008, and 2009. Inventories will be updated on a continual basis according to guidelines established by the Forest Management Bureau.

IV. MANAGEMENT CONCEPTS BY NATURAL COMMUNITIES AND PROPOSED MANAGEMENT ACTIVITIES

A. Existing and Planned Uses

The forest will be managed under the multiple-use concept with the primary emphasis on the restoration and maintenance of native ecosystems, especially the longleaf pine/wiregrass ecosystem. As previously stated, Florida Statutes describe the general management philosophy on public land in order to achieve the greatest combination of benefits to the people of the state. Activities will include: restoration, maintenance, and protection of all native ecosystems; integration of appropriate human uses; and ensuring long-term viability of populations and species considered endangered, threatened, or of special concern. Other activities include: timber management, public access and recreation management, wildlife management and watershed management. Existing and planned uses are listed below.

1. Property Boundaries

State forest line boundary lines are maintained on an annual basis by DOF personnel. The identifying color is a white band on perimeter trees. Boundary marking is done according to the most current version of the DOF State Forest Handbook. Establishment of the forest boundary has been completed. Fencing of areas near neighborhoods and problem areas was completed in FY 2003-2004. We have identified a need to establish harrowed lines for perimeter fire protection and boundary maintenance. Adjacent property owner lines may be used for this purpose.

2. Soil and Water Protection

Water resource protection will be coordinated with the SJRWMD and will be accomplished through avoiding installation of trails or roads in or near sensitive wetlands. All silvicultural activities on CDMSFP will be conducted in compliance with the most recent addition of the Silviculture BMP Manual. Since water resources on CDMSFP are limited to the Alligator Creek, Hardesty Lake, Up and Down Lake and forested wetlands, water resource protection should be easily accomplished with minimal restrictions on other management activities.

3. Roads

There is limited road access to CDMSFP for the public on the North Tract by either West Street or Burroughs Road. The South Tract however, is landlocked and currently has no public access (see Exhibit A).

There are no designated interior roads for public vehicle use on CDMSFP. Due to its small size, urban location and sensitive areas, CDMSFP utilizes a park-and-enter approach. The existing service roads within CDMSFP serve as trails for public use as well as access for forest management operations by DOF personnel. Any plans to

establish new roads or to open existing firelines to the public for use as a road will be reviewed by the DOF State Office and processed through the DEP to the ARC.

4. Recreation Management

The demand for resource-based outdoor recreation activities on CDMSFP is expected to increase due to nearby population growth as well as the loss of open natural areas, placing more importance on recreational trail development. Hiking and fishing are the primary recreational activities; however, nature study is expected to become popular on CDMSFP. Public input has been encouraged in the planning process of the Recreation Plan from a state forest liaison committee of private citizens and representatives of forest user groups. The Recreation Plan will be revised annually during this planning period. CDMSFP provides public access to its North Tract for hikers.

Access to the South Tract is limited by the lack of legal ingress/egress. The DOF is currently in the process of acquiring an adjacent parcel to allow public access to the South Tract.

a. Existing Facilities/Infrastructure/Recreational Activities

i. Parking Area

Two parking areas have been established. One is less than a mile north of State Road 20, on the east side of West Street. The second is south of Bill Street, south of Interlachen Lake Estates, Unit 16. These parking areas allow visitors to park and hike the loop trail to Up and Down Lake (Exhibit K). State forest entrance signage has been placed at the intersection of West Street and SR-20.

ii. Observation Platform and Boardwalk

A boardwalk and observation platform, located on the west side of Up and Down Lake, was completed in FY 2006-07 on the North Tract of CDMSFP.

iii. Recreational Trails

One trailhead was completed in FY 2006-07 on the North Tract, on the east side of West Street (Exhibit K). The trail is approximately 1.2 miles in length and loops through the forest. Existing roads and firelines offer additional opportunities for hiking and nature study. A second parking area was established on the north side of the North Tract, south of Bill Street in FY 2008-09. This allows forest visitors to access the north side of the Up and Down Lake nature trail.

b. Planned Recreational Activities

i. Public Access and Parking

Public access issues to the South Tract need to be addressed before public access can be allowed.

ii. Recreational Trails

No new trails are proposed for the South Tract of CDMSFP, until access issues can be resolved.

iii. Primitive Camping

The North Tract will be assessed for the potential of primitive camping site(s).

Additional recreation projects are outlined in the Five-year Recreation Plan.

Copies of the Recreation Plan are on file at the Etoniah Creek State Forest office.

5. Fire Management

The DOF utilizes a total fire management program on state forests that includes wildfire prevention, detection, suppression, and an aggressive prescribe fire program for fuel reduction and ecological management. This program is the responsibility of the DOF's Waccasassa Forestry Center, particularly the forest rangers assigned to the Hawthorne and Hollister areas. Emphasis will be placed on prescribed burning, wildfire prevention and education to help reduce wildfire occurrence on the forest. The incident commander responding to wildfires on CDMSFP faces three major considerations, listed in priority order: 1) safety of the fire fighter and the general public, 2) protection of facilities, and 3) protection of natural resources.

Personnel and equipment assigned to CDMSFP and other Center personnel, especially those at the Hollister and Hawthorne Work Center/Tower Sites, will be responsible for suppression activities, fire line maintenance and prescribed burning as outlined in the fire management plan.

The prescribed fire program provides multiple benefits. The primary purpose of prescribed burning on CDMSFP is to restore, maintain, and protect in perpetuity all native ecosystems and their ecological processes. In addition, regular prescribed fires enhance timber management operations and reduce the fuel loading, thereby enhancing public safety. The goal of the prescribe fire program on CDMSFP is to reduce the fuel loading with winter burns initially and gradually move into growing season burns. In order to reach a maintenance condition of prescribed burning, those stands requiring restoration burns will be burned more frequently than those stands that have reached a maintenance condition. This higher return interval is necessary to reduce the heavy fuel build up so that growing season burns can be conducted with minimal tree mortality.

A comprehensive fire management plan was developed for CDMSFP in April 1999. This plan is reviewed annually and amended as needed, based on current resource and burning conditions. State forest staff will conduct pre- and post-burn evaluations, which are essential elements to a successful prescribed fire program. Monitoring levels will vary from burn to burn, based on burn objectives.

CDMSFP contains approximately 194 acres of vegetative communities that are fire dependent (Exhibit J). The average two to four year fire return interval forest-wide (Table 5) translates into an annual prescribed burning goal of approximately 65 acres per year, on average.

Table 5. Annual Prescribed Fire Goals (Acres)

Community Type	Acres
Sandhill	35
Mesic Flatwoods	15
Wet Flatwoods	9
Scrubby Flatwoods	6

The long-term goal of prescribed burning is to simulate, as closely as possible, a natural fire regime. Such fires are needed to reduce the height and cover of woody shrubs, stimulate the recovery of native herbaceous and grassy groundcover and promote the regeneration of native species. Areas with heavy fuel levels will receive several dormant season burns until they can safely support growing season (April to August) burns. Slightly less than half of the pyrogenic communities have been burned during the last planning period. The remaining units will still require an initial burn to reduce fuel loading.

Potential measures used to determine the quality of a prescribed burn, and its ultimate achievement of the objectives for the particular burn unit, include the following:

- Percent needle scorch (0 – 25% desirable)
- Percent fuel consumption (under-story vegetation) (> 75% desirable)
- Percent stem char (0 – 25% desirable)
- No net loss of organic layer

Post-burn monitoring will collect information on these parameters as well as other observations important to assessing the habitat impacts of the burn and the post-fire response of the vegetation. Other data, such as a count of active gopher tortoise burrows, may be part of these monitoring efforts.

Perimeter firebreaks have been established around 25% of the CDMSFP. There remain portions of the forest that need new firelines established. Where it is logistically feasible, existing firelines, roads or natural breaks will be utilized when conducting prescribed burns, to minimize the quantity of firelines needed.

In using prescribed fire in the various fire-dependent communities on this forest, it is important to understand the ecological richness of the ecotones that divide them, especially the margins between wetland and upland communities. Every effort will be made to avoid the construction and/or maintenance of firelines in these environmentally sensitive areas. Staff will be trained to recognize sensitive areas and will be provided with guidelines for fireline construction. The biological diversity of

these ecotones will benefit from prescribed fire being allowed to burn uninterrupted into the edges of the adjacent hydric communities. In this manner, fire also serves to limit the invasion of less fire-adapted, hydric species (e.g. titi, loblolly-bay) into the adjacent, more mesic communities.

Wetland communities, such as freshwater marshes and seasonal ponds, benefit from occasional fire which serves to limit peat accumulation and invasion of woody vegetation and helps to prevent undesired transition to plant species associated with more mesic conditions. In addition, moderately intense fires in swamps can benefit cypress and retard invasion of less fire-adapted hardwood species. Where these wetland communities are not sufficiently hydrated to prevent undesirable fire intensity, consideration should be given to delaying prescribed fire. When proceeding with burning in these conditions and firelines are required, they should be located well out of the ecotone and up in the more mesic community type. Pre-suppression or prescribed fire control lines should avoid at all costs sensitive areas adjacent to swamps and any other area that would disrupt the natural hydrology. Such control lines will be harrowed.

6. Silvicultural Guidelines & Forest Resource Management Objectives

a. Objectives

The objectives of these silvicultural guidelines are:

- i. To restore health and vigor to the native forest ecosystem through prescribed fire and reforestation, both natural and artificial, of the native longleaf and slash pine species, encouraging the diverse natural species component of the upland longleaf pine/wiregrass plant community, and species endemic to the mesic and wet flatwoods.
- ii. To maintain the forest over the long-term through natural regeneration, uneven-aged, and where appropriate, even-aged management.
- iii. To create a naturally regenerating forest with natural characteristics that yield sustainable economic, ecological and social benefits.
- iv. To avoid soil disturbances that are detrimental to sensitive groundcover.

b. Silvicultural Operations

The goal of all silvicultural operations will be to improve overall forest health. Restoration of native species, even-age and uneven-age management of pine stands, selective thinning, removal of off-site species, and prescribed fire are all actions used to promote healthy forest stands. Mechanical and chemical treatments may be used to restore native plant communities and reduce the oak density to promote native grasses and provide for natural regeneration of longleaf pine. The protection of native groundcover will be emphasized during all silvicultural operations.

The goal on CDMSFP is to promote and achieve natural regeneration on all the

natural stands of longleaf through the use of prescribed fire. Artificial regeneration will be utilized if the natural means do not yield the desired results. In addition, if mechanical or chemical treatments are used to aid in the establishment of longleaf pine, treatments will be selected that result in the desired effects on all site species. Herbicide applications will be focused on undesirable hardwood species and care will be taken to leave adequate residual oaks to provide sufficient mast production required for many wildlife species.

There is an area of mesic flatwoods in the North Tract containing natural longleaf pine, which currently consists of two age classes. Young regeneration is missing at this stage and will require opening the stand to allow for natural regeneration, or under-planting.

A natural slash pine stand and a planted slash stand in the mesic flatwoods of the South tract were both thinned in 2001. Near the end of this ten year planning cycle, it is anticipated that these stands will be thinned to a seed tree density to facilitate natural regeneration.

Uneven-aged management is the preferred silvicultural management method for CDMSFP. Due to the current stand structure however, it may take 1-2 planning cycles before this can be fully implemented. There is no target rotation age for uneven-aged managed timber stands. Stand dynamics is based upon maintaining stand basal area between 60-80 square feet per acre. Individual tree selection and group tree selection are the preferred timber harvest methods to use in order to maintain this basal area range.

One of the goals of CDMSFP is to practice sustainable forest management. In order to achieve this goal, an accurate timber inventory must be completed and timber harvests carefully timed to achieve true uneven-aged management. Because of the limited commercial volumes there have been only five timber harvests on CDMSFP since the State acquired the property in 1993.

Table 6. Year, Acres and Type of Harvest on CDMSFP

Year	Acres	Harvest Type	General Location	Tract
1997	28	Clearcut - sand pine removal	NW of Up & Down Lake	North Tract
2001	58	Clearcut - off-site slash pine	E of Hardesty Lake	South Tract
2002	28	Thinning	SE Corner	South Tract
2006	45	Thinning	Stands adjacent to Up and Down Lake	North Tract
2008	22	Clearcut – off site slash and sand pine	East side of South Tract	South Tract

c. Timber Inventory Control

Within the State Forest System, the goal of sustained forest management is achieved by each forest not harvesting more than the annual growth for that forest. Forest salvage operations are undertaken when significant damage occurs within an area. In most instances the need for salvage is a response to a cataclysmic event such as a wildfire, insect/disease attack, or a natural weather event like a hurricane and/or tornado. This sustainable harvest level is obtained by maintaining an accurate inventory of the forest volume and growth. The initial timber inventory for CDMSFP is complete and forest inventory updates will be conducted each year on stands selected according to the statewide criteria in Chapter 6 of the State Forest Handbook. Overall timber volume will be determined using this updated inventory and the growth and yield model for the remaining stands.

d. Timber Sale Procedures

Timber sales will follow the guidelines stated in Chapter 6.4 of the State Forest Handbook.

7. Research Projects/Specimen Collection

Research projects may be performed on certain areas of the forest on a temporary or permanent basis for the purpose of obtaining information that furthers the knowledge of forestry, imperiled species, wildlife and/or multiple-use management. The DOF cooperates with U.S. Forest Service, University of Florida, and other educational institutions, non-profit organizations and governmental agencies wherever feasible on research of this nature. All research projects must be authorized in writing by the DOF Forest Ecologist, and copies of the results provided to the Division of Forestry. Research projects and specimen collection must follow the guidelines established in the most current version of the State Forest Handbook. Copies of the State Forest Handbook are available at the DOF headquarters and the Etoniah Creek State Forest office.

8. Law Enforcement

Primary law enforcement responsibilities are handled by the Department of Agriculture, Office of Agricultural Law Enforcement. Additional assistance is rendered by the Putnam County Sheriff's Office or FWC as needed. Special rules of the FDACS/DOF were promulgated in 1972 for purposes of regulating public use of state lands and providing necessary restrictions on forest traffic and camping. These rules are under Chapter 5I-4 of the Florida Administrative Code.

9. Wildlife and Fish Management

Both game and non-game species of fish and wildlife are important components of the CDMSFP ecosystem. The forest is currently not open to regulated hunting. The DOF provides land management and general supervision of the property. Fishing is allowed on the forest, and must follow current state law and policy, as administered by FWC.

10. Non-Native Invasive Species

The practice of the DOF is to locate, identify and control (eradicate if possible) non-native invasive species. When these species are discovered, a monitoring and control plan will be developed and implemented based upon the severity of the infestation and the availability of manpower and funding. The DOF will elicit support from the FWC in efforts to control non-native animals when deemed to have a negative effect on native species.

Six non-native species are currently being managed on CDMSFP: Chinese tallow (*Sapium sebiferum*), air potato (*Dioscorea bulbifera*), mimosa (*Albizia julibrissin*), natal grass (*Rhynchelytrum repins*), camphor (*Cinnamomum camphora*), and water hyacinth (*Eicchornia crassipes*). A GIS layer has been developed identifying the location of all known invasive exotic plants. All occurrences (except for camphor, Chinese tallow, and water hyacinth) have been treated by herbicide using a mixture of Roundup and Arsenal. Each spot may require several treatments to eliminate the species, with the exception of mimosa and air potato. The locations of these species have been mapped and specific control measures are developed with assistance from the Forest Management Bureau. Total control of these species is expected, due to their small populations. If contractual labor is used for control of non-native invasives, they will be required to clean their equipment off-site prior to working on CDMSFP.

Table 7. Location and treatment history of Invasive/Exotics

Invasive/ Exotic	General Location	Treatment Date	Density*
Chinese tallow	South & East sides of Up & Down Lake, N Tract	N/A	1-5%
Air potato	Approx. 120 feet N of southern boundary on service road, N Tract	Aug-05	26-50%
Mimosa	240 feet NE of East turn of Burroughs Road, N Tract	Aug-05	1-5%
Natal grass	NW of Up & Down Lake trailhead, N Tract	Dec-06	26-50%
	Approx. 1/10 of a mile SW of Bill Street parking area on nature trail	Dec-06	1-5%
Camphor tree	Approx. 60 feet SE of Bill Street parking area, N Tract	Dec-07	1-5%
	Approx. 130 feet NE of service road, near N Tract inholding	N/A	1-5%
Water Hyacinth	E side of Hardesty Lake, approx. 300 feet west of service road, S Tract	N/A	6-25%

*Expressed in % of groundcover occupied by invasive.

11. Insects, Disease and Forest Health

There are no documented cases of any specific insect or disease problem on CDMSFP, either before or since State ownership. Red bay ambrosia beetle and its associated pathogen are known to be present nearby and probably are found on the forest. To minimize the potential for more problems, preventive management strategies will be developed in consultation with DOF Forest Health Section staff. Management strategies will include restoration and maintenance of native species and natural plant communities, natural prescribed fire regimes specific for plant communities, site-appropriate tree plantings and the natural regeneration of native species. In addition, the control or elimination of exotics and non-native species will promote overall good forest health.

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

As a result, prior to conducting any arthropod control activities on CDMSFP, the local agency must prepare a public lands control plan, that addresses all concerns that DOF may have for protecting the natural resources and ecosystem values on the state forest. In this regard DOF will provide the local agency details on the management objectives for CDMSFP. This public lands control plan must be in compliance with DOACS guidelines and using the appropriate DOACS form. The plan must then be approved and mutually adopted by the county, DOF, and DOACS 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.

12. On-Site Housing

DOF may establish on-site housing (mobile/manufactured home) on CDMSFP 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 Waccassassa Center Manager and in compliance with the terms of Mr. Moore's will, and approved by the DOF Director.

13. Utility Corridors and Easements

In the previous plan, there was mentioned the existence of a Clay Electric Cooperative power line that runs north and south within the northern tract of CDMSFP. Further research indicates that Clay Electric has no knowledge of this utility easement. Additionally, the DOF did not find any current records as to the

existence of this easement. West Street on the North Tract is an easement that provides access to privately owned parcels in the immediate vicinity.

The DOF does not favor the fragmentation of natural communities with linear facilities; consequently, easements or transfer of ownership for such uses will be discouraged, and such lands involved could result in the revert clause to the Shriner's Hospital. The DOF does not consider CDMSFP 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 cause no damage to sensitive resources (e.g., listed species and archaeological sites), to avoid habitat fragmentation, and to limit disruption of management activities and resource-based recreation.

Collocation with existing corridors will be considered but will be used only where expansion of existing corridors does not increase the level of habitat fragmentation and disruption of management and multiple-use activities. The DOF will further encourage the use of underground cable where scenic considerations are desirable. Easements for utilities and other right of ways are subject to the review and approval of the Board of Trustees of the Internal Improvement Fund.

14. Ground Disturbing Activities

Although the DOF's approach to handling ground disturbing activities is identified in various sections in this plan (Sections II.C.1, III.B.2, IV.A.5 and V.B.1), the DOF's overall approach to this issue is summarized here. The DOF recognizes the importance of managing and protecting sensitive resources and will take all necessary steps to ensure that ground disturbing activities will not adversely impact sensitive resources. This includes areas such as archaeological and historic sites, ecotones, wetlands, and sensitive species habitat.

The construction of new pre-suppression firelines will be limited to the greatest extent practical. When new pre-suppression firelines, recreational trails, or other low-impact recreational site enhancements are necessary, their placement will be carefully monitored by state forest field staff and they will be developed so as to avoid sensitive areas. For other ground disturbing activities such as construction of buildings, parking lots and new roads, DOF will consult with the FNAI, DHR, and when necessary, the Division of State Lands.

15. Apiaries

There are currently no apiary leases on CDMSFP. The feasibility of pursuing and establishing apiary leases on CDMSFP in areas where appropriate will be evaluated in accordance with the guidelines stated in Chapter 9.1 of the State Forest Handbook (DOF 2004).

16. Cattle Grazing

Cattle grazing has been considered to not be a viable management tool, due to the small size and habitat condition of this forest.

17. Ground Cover

Management activities will be designed and conducted to protect and enhance the condition and integrity of the native groundcover. Management techniques, such as prescribed fire, will be used to restore, recover and maintain a diversity of native groundcover.

18. Restoration

Like most natural areas in Florida, fire and hydrology are the primary ecological processes. This involves restoring natural fire frequency, maintaining natural hydrology, and restoring and maintaining natural plant diversity. The specific actions needed to accomplish these goals are provided in the natural community management section (IV-B).

a. Fire

Most of Florida's native ecosystems, in particular the sandhills, evolved as fire dependent forest communities. Frequent naturally occurring wildfires and, later Native American-caused fires, contributed to these fire dependent plant species that thrived on various intervals of fire occurrence. Increased human population in Florida led to fragmentation, and the reduction of the natural frequency of fire and the subsequent change in the amount and diversity of plant species found today.

Management techniques utilized to simulate the natural fire processes include frequent, all-season prescribed burns, burning across transition zones and restoring ground fuels necessary to carry fire in areas where the native understory has been eliminated.

b. Hydrology

Hydrological restoration is not a major factor in the ecosystems present on CDMSFP. Those hydrologic features present are largely intact. They will be maintained by restricting equipment activity in sensitive areas.

c. Species Composition

Ensuring that the species vital to the natural ecosystem processes are in place is a restoration priority. The native groundcover necessary to carry fire and the presence of longleaf pine is critical to the sandhill and mesic flatwoods plant communities.

The multiple-use management approach used on CDMSFP will maintain habitat conditions suitable for the diversity of species typically found within the various ecosystems. This includes known sensitive species such as gopher tortoise.

There are no current plans to reintroduce any species that are thought to have been extirpated from CDMSFP. However, habitat conditions for key species will be monitored and, if habitat conditions become suitable, the case for reintroduction

will be examined and attempted if it makes sense ecologically and from the standpoint of species recovery.

B. Description of Natural Communities and Proposed Management Activities

Historic and current FNAI natural community types maps have been completed and are provided in Exhibit J. Community boundaries are not the same as management unit boundaries, such as tracts, stands or burn units. Both tracts of CDMSFP are too small and fragmented to support animals with a large home range. Fragmentation is far worse on the North Tract, which has a residential inholding and suburban development on three sides. The South Tract has a number of individual parcels on its boundary and encroaching development. As of 2009, the South Tract has industrial forest land buffering its east boundary and only lies a mile from Caravelle Ranch WMA. If a land bridge is purchased between CDMSFP and Caravelle Ranch WMA, then the South Tract would be part of a larger corridor of public conservation land. Below is a breakdown of the historic and existing community types found on CDMSFP during the 2007 FNAI survey.

Table 8. Historic and Existing Community Types found on CDMSFP

Vegetation Type	Arces Mapped (Historic)	Acres Mapped (Existing)	Burn Interval (Years)
Sandhill	109	93	2-4
Mesic Flatwoods	69	72	2-4
Baygall	61	59	50-100
Flatwoods Lake	37	36	N/A
Wet Flatwoods	24	23	2-4
Scrubby Flatwoods	6	9	3-15
Xeric Hammock	0	14	N/A

1. Sandhill (109 acres)

Desired Future Condition

Overstory- Sandhills consist of longleaf pines growing over a dense, grassy under-story. The over-story is characterized by uneven-aged stands of longleaf pine, with at least three age classes present. Large diameter trees are well represented in the stands with overall basal areas maintained in the 20 to 80 ft² per acre range. Longleaf seedlings and clusters of saplings are evidence that natural regeneration is occurring. A variable stocking of overstory oaks native to the sandhills (sand post oak (*Quercus margaretta*), bluejack oak (*Quercus incana*), turkey oak (*Quercus laevis*) will be present with variable densities. There will be little or no stocking of tree species not considered native to the sandhills (sand live oak (*Quercus geminata*), laurel oak (*Quercus laurifolia*), and exotic species).

Sand pine (*Pinus clausa*) is very infrequent. A midstory of oak trees will be present at various low densities, depending on fire history.

Groundcover- Sandhills occur on the tops and slopes of well drained, rolling hills. These nutrient poor sites are maintained by fire, and have a very pyrogenic understory. Natural fire frequency is approximately two to four years. The groundcover is a species rich, grassy and herbaceous layer capable of carrying fire throughout most of the sandhill area under a wide variety of burn conditions. Typical grass species that are abundant are wiregrass (*Aristida stricta*), pinewoods dropseed (*Sporobolus junceus*), arrowfeather threeawn (*Aristida purpurascens*) and lopsided Indian grass (*Sorghastrum secundum*). A large variety of herbaceous plants are also present such as fewflower blazing star (*Liatris pauciflora*), black root (*Pterocaulon pycnostachyum*), queen's delight (*Stillingia sylvatica*), rabbit bells (*Crotalaria rotundifolia*), and wild buckwheat (*Eriogonum tomentosum*). The groundcover is generally continuous except occasional breaks occur particularly on ridge tops.

Fauna- Healthy and sustainable populations of sandhill animal species are present throughout the sandhill community. Indicator species, such as gopher frog (*Rana capito*), Bachman's sparrow (*Aimophila aestivalis*) red-cockaded woodpecker (*Picoides borealis*), hairy woodpecker (*Picoides villosus*), brown-headed nuthatch (*Sitta pusilla*), Sherman's fox squirrel (*Sciurus niger shermani*), and gopher tortoise (*Gopherus polyphemus*) are present and can be located with a reasonable search. Microhabitats such as bare sandy patches and large pine trees contain associated appropriate fauna.

Ecotones- There are natural ecotones between the sandhill and other plant communities that are both embedded and adjoining. Sandhill/scrubby flatwoods ecotones should be fairly abrupt and sandy, containing species such as Florida rosemary (*Ceratiola ericoides*), *Garberia heterophylla*, and coastal plain palafox (*Palafoxia integrifolia*). Embedded wetlands are variable and surrounded by hammock species or open grassy prairie vegetation. In all cases, ecotone locations are dynamic in nature and move as processes such as fire and drought dictate.

Processes- The sandhills' condition is dependent on fire. A return interval of two to four years is preferred. When fire is excluded, they become dominated by turkey oak and sand pine and the density and species richness of the ground cover decreases. When fire is excluded after old fields are abandoned on sandhill soils, they become dominated by laurel oak and sand live oak and the ground cover is essentially extirpated.

Current Condition

At acquisition, the sandhill quality ranged between two extremes. At one extreme was fire-suppressed old agricultural sites that had been invaded with hardwoods and groundcover dominated with pasture grasses. The other extreme was some remnant longleaf pine/turkey oak overstory but a heavy component of early successional hardwoods, slash pine and sand pine, and diverse, native groundcover although it was fire-suppressed. Now all the larger sandhill sites that needed a silvicultural treatment have been thinned or clear cut, and most have been replanted to longleaf pine.

Some historical sandhills on the property are quite altered. The hardwood fringe around these is fire-suppressed and has succeeded into undesirable xeric hammock. Some of these sites are classified as mesic flatwoods in current community maps since they are indistinguishable from the species poor, fire-suppressed adjacent communities. Some of these sites are so far gone, they will be maintained as xeric hammock. These fire-suppressed sites have lost most of the native groundcover, are dominated by a hardwood midstory and have little to carry a fire. In contrast, some fire-suppressed historic sandhill has succeeded into a scrubby flatwoods with a dense midstory including saw palmetto and shrubs.

Other historical sandhills are in much better condition, although they are early successional. There is a good amount of wiregrass in these areas. They responded well when burned. Groundcover is dominated by desirable natives, and the wiregrass is easily dense enough to carry growing season fire. Gopher tortoise populations are adequately stocked based on active burrow monitoring. Remnant longleaf overstory was kept when present. Some areas have a nice scattering of large longleaf among young plantations. Longleaf pine has been replanted in sites where needed, and reforestation will be finished by the end of this planning period.

Restoration

Sandhill communities should be restored and allowed to attain old-growth characteristics. Restoration management will require spring or summer prescribed fire every two to four years. Fuel reduction burns may not be necessary. Fire will suppress many of the oaks but most will survive with the ability to re-sprout. Turkey oak snags will be left as these provide important wildlife habitat. Once this restoration phase has been accomplished, the goals of increasing wiregrass cover, suppressing oaks, and favoring pine regeneration, the sandhill units will be maintained by simulating natural fire conditions. All of these areas have been harvested and planted to longleaf pine during the previous planning period, with the exception of an approximately 21-acre site on the east side of the South Tract. This area is planned to be harvested and planted to longleaf pine during this planning cycle.

Sandhill management will utilize prescribed fire, reforestation and related activities, and uneven-aged silvicultural management of longleaf pine. Prescribed fire will be the preferred tool for maintenance of the sandhill plant community. A continued effort will be to maintain at least a 2-4 year fire return interval to all sandhill plant community areas. Current tree stocking levels, smoke issues, duff accumulations, and other factors will all influence the actual burn regime. Growing season burning will be preferred to dormant season burning whenever possible to mimic natural lightning season fires. A protocol for determining duff accumulation and the timing of prescribed fire will be implemented in order to begin burning blocks that have had extended fire absence or otherwise have heavy fuel loading. Monitoring and control of recreational activities will be maintained to limit or control negative hydrological manipulations, manipulations of ecotones, disruption of processes, negative impacts on fauna, or long term destruction to groundcover.

In summary, the primary management actions necessary to achieve desired future conditions for sandhills are:

- Reintroduce growing season prescribed fire on a two to four-year fire return interval.
- Re-establish longleaf pine where not present.
- Burn across transition zones.
- Reduce turkey oak basal area with fire, fuelwood sales, or herbicides, then replant with longleaf pine if necessary.

The 14-acres of sandhill that has succeeded into Xeric Hammock will not be restored to a pine-dominated community, but will be kept with a sand live oak overstory. This will provide a mix of community structure and source of wildlife cover and browse across the site.

Silviculture

An approximately 22-acre site on the east side of the South Tract was harvested during the previous planning cycle. This area is planned to be planted to longleaf pine during this planning cycle. In addition, thinning of some stands may be required to maintain the uneven-aged characteristics and to improve sites for the health of the longleaf pine sandhill ecosystem. In sandhill areas where basal areas exceed 70-80 ft²/acre, stands may be thinned to 40-50 ft²/acre. Plans will be developed during this planning period to achieve this while maintaining the quality of the understory community, and the uneven-aged stand characteristics.

Existing Condition	Prescription for Restoration
Off-site slash and sand pine that has been clearcut	A hexazinone application is needed on select areas of heavy oak with focus on groundcover response prior to planting of containerized longleaf pine. This stand will be burned on a 2-4 year fire return interval, through the application of growing season prescribed fire.
Planted longleaf pine stands; 1999 -2004, Even-aged stands	These stands will be burned on a 2-4 year fire return interval, through the application of growing season prescribed fire.

2. Mesic Flatwoods (69 acres)

Desired Future Condition

General - Mesic flatwoods are characterized as an open canopy forest of pine trees with a dense groundcover of herbs and shrubs. Several variations of mesic flatwoods are recognized, the most common associations being longleaf pine-wiregrass-runner oak (*Quercus pumila*) and longleaf/slash pine-gallberry (*Ilex glabra*)-saw palmetto. Plant associations found on CDMSFP include longleaf pine-wiregrass-runner oak, longleaf pine-slash pine-saw palmetto-gallberry, and slash pine-saw palmetto-gallberry-greenbriar (*Smilax* spp.). Soils are flat, moderate to poorly drained, acidic sands over a hardpan.

The hardpan minimizes percolation and hinders a deep root zone. Flatwoods plants are often flooded in the wet season, but unable to reach the water table in the dry season. Because of their flat topography, mesic flatwoods inter-grade into other communities such as depression marsh or wet flatwoods.

Overstory - The over-story is characterized by uneven-aged stands of longleaf pine and slash pine, with at least three different age classes present. Large diameter trees are well represented in the stands with overall basal area of 20-100 ft²/acre. There is little or no stocking of species that are not considered flatwoods species, such as water oak (*Quercus nigra*), sweetgum (*Liquidambar styraciflua*), laurel oak, or exotics.

Mid-story- Mid-story shrubs and vines are sparse enough to promote a continuous, species diverse groundcover. It remains low enough and broken in nature so it will not support stand altering type wildfires. It also allows animals such as gopher tortoise, fox squirrel, and white-tailed deer (*Odocoileus virginianus*) the opportunity to freely move throughout the plant communities. Enough light passes through to allow shade intolerant species such as longleaf pine to regenerate, although regeneration may be patchy and driven by disturbances.

Groundcover- The groundcover is continuous, species rich, and composed of fine herbaceous plants that will facilitate low intensity fires under a wide range of burning conditions. Preferred species are native grasses and herbs adapted to frequent fire such as wiregrass, toothache grass (*Ctenium aromaticum*), lopsided Indian grass, blazing star, vanillaleaf (*Carphephorus odoratissimus*), narrowleaf silkgrass (*Pityopsis graminifolia*), and pine lily (*Lilium catesbaei*).

Fauna- Healthy and sustainable populations of flatwoods animal species are present throughout the flatwoods community. Indicator species such as Sherman's fox squirrel and Bachman's sparrow are present throughout.

Ecotones- Natural ecotones can be found between the flatwoods communities and adjoining and embedded plant communities. The plant communities associated with the ecotones contain a higher diversity of plants and animals. Often these ecotones may be an entirely different plant community such as may exist surrounding a depression marsh, lake or other wetland. Ecotones remain elastic and continue to change in shape, location, and size depending upon environmental processes such as fire.

Processes- The condition of the flatwoods is process-driven, where fire is the main process. Fire return interval is two to four years. Stem char, scorched needles and other visible features of fire-maintained ecosystems provide evidence of past fires. The occurrence of these fires is primarily during the growing season but burns may occur nearly any month of the year. Evidence of functional hydro-periods is seen in the flooding of wetlands and rivers. Ongoing biological processes such as insect-plant interactions are evidenced by occasional dead trees, which become snags for use by wildlife.

Current Condition

The mesic flatwoods are primarily comprised of even-aged stands dominated by slash pine on the South Tract, and some mixed longleaf/slash pine stands exist on the North Tract. Past timber management practices included clear-cutting, single-pass chopping, winter burning, and row planting slash pine seedlings. The prior landowner primarily allowed for natural regeneration of slash and longleaf pine, with a small percentage being planted to slash pine plantations. There is one planted 15 acre slash pine stand (origin year 1966) pine plantation located in the southeast corner of the South Tract. In addition, there is one 13 acre natural stand on the South Tract that had a relatively high basal areas ($> 80 \text{ ft}^2$ per acre), but it was thinned in 2001 to approximately 60 ft^2 per acre. Average basal area is approximately 70 ft^2 per acre in this community. Past timber harvest and grazing practices have had a minimal impact on mesic flatwoods on CDMSFP. Coordinated properly, prescribed burning and silvicultural practices will maintain these systems. Evidence of bedding on the planted slash pine stand is virtually non-distinguishable, and there seems to be no evidence of past agricultural practices.

Stand boundaries are not the same as community delineations. The mesic flatwoods historical community was extracted from stands that contain mesic flatwoods. Out of the 69 acres of mesic flatwoods, the breakdown of natural and planted pine stands is:

- approximately 11 acres, natural slash and longleaf pine, North Tract
- approximately 12 acres, natural longleaf pine, North Tract
- approximately 6 acres, natural slash pine and hardwood, North Tract
- approximately 16 acres, planted slash pine, South Tract
- approximately 9 acres, natural slash pine, South Tract
- approximately 15 acres, planted longleaf pine, South Tract

Two acres of depression marsh are included in the mesic flatwoods. Depression marshes are considered extremely important in providing breeding or foraging habitat for numerous animals, such as pinewoods treefrog (*Hyla femoralis*). Most of these marshes are dominated by maidencane, other native grasses and sedges.

Restoration

In summary, the primary management actions necessary to achieve desired future conditions for mesic flatwoods are:

- Restore plantations to naturally regenerating stands with the appropriate composition of longleaf and slash pine by natural regeneration treatments, or gradual thinning through a series of harvests.
- Utilize regeneration methods such as shelterwood or seed tree cuts when stand vigor or growth rates make these practices feasible.
- To produce naturally regenerating stands resembling natural conditions through artificial and natural regeneration methods.
- Conduct timber harvesting and site preparation activities in a way that will minimize disturbance to the groundcover vegetation, native fauna, or ecosystem values.
- Restore skid trails and loading ramps after timber harvesting should reduce disturbance, minimizing alteration of site hydrology.

- High stand density in some areas has reduced groundcover density. Reducing overstory stand density to a desirable stocking level will promote healthy groundcover.
- Schedule growing season fire rotation(s) as soon as fuel loading and stand age permit.
- Experiment with fire return interval, size, and timing in order to increase restoration effectiveness.
- Stand mapping will be a continuing effort in the flatwoods. Stand maps will continue to be developed as well as desired future condition maps. These maps will help to refine timber management as well as help define wetland inclusions and assist with management of all of the flatwoods and associated plant communities.
- In situations where the hardwood midstory is negatively impacting the groundcover for prescribed burning, chemical control may be necessary.

All depression marshes will be afforded protection from adjacent silvicultural and fire suppression operations. Depending on the year and season, fires may extinguish themselves in the fringe or burn across the marsh. Fire frequency is often greatest around the periphery, or rim of the marsh, and least toward the center. Prescribed fire in the adjacent communities will be allowed to burn into the marshes to reduce the invasion of shrubs and trees. This is particularly important in maintaining a healthy ecotone beneficial to many types of wildlife. Fire will be restricted from the marshes when drought conditions have created the potential for muck fires.

Silviculture

The implementation of frequent prescribed fires, with a return interval of 2-4 years is the primary tool needed during this planning period to reduce the moderately dense fuel loads. One to two dormant season burns will be needed initially to reduce fuel loading, followed by transitioning to growing season burns. Proper timing of prescribed burns in the mesic flatwoods on the North Tract will be necessary due to smoke management considerations, due to the proximity of State Road 20.

Existing Condition	Prescription for Restoration
Two stands, 1966 planted slash pine, and 1958 natural slash pine.	Two stands in South Tract that are out of maintenance adjacent to sandhills, baygall and wet flatwoods by allowing prescribed fire to burn into this community type during growing season burns if conditions allow. Both of these stands were thinned in 2002 to approximately 60 ft ² basal area. Both of these stands were burned in March 2008. Previous burns were in the dormant season.
North Tract – Natural Longleaf pine thinned in 2006 to ~ 60 ft ² basal area South Tract – Two stands, restorable. Origin year of stands are 1958 and 1996.	Restore in several locations on North and South Tracts west area on North Tract that is out of maintenance by incorporating growing season burns if conditions allow in these areas,

	along with the adjacent sandhill community types. Utilization of the seed tree regeneration system will be needed in two stands on the South Tract, then growing season burns can be initiated once adequate regeneration has become established.
North Tract – Slash pine/hardwood, restorable. Origin year ~ 1946. South Tract -- Two stands, restorable. Origin year of stands are 1958 and 1996.	Where access is feasible, and once groundcover has responded, conduct timber harvests and convert to longleaf through planting and proper site preparation at a density of 726 containerized longleaf per acre.

3. Baygall (61 acres)

Desired Future Condition

These wetlands are usually moist but rarely flooded. Their soils are nutrient poor, acidic peats. These dense hardwood forests are dominated by loblolly bay (*Gordonia lasianthus*), yellow poplar (*Liriodendron tulipifera*), and loblolly pine (*Pinus taeda*) with red maple (*Acer rubrum*), pond cypress (*Taxodium ascendens*), sweetgum, swampbay (*Persea palustris*), and redbay (*Persea borbonia*) present at varying densities.

Current Conditions

This community type borders Alligator Creek on the South Tract, and borders the east side of Up and Down Lake on the North Tract. Based on aerial photos from 1970, forested wetland acres have not expanded greatly on CDMSFP since this time due to fire exclusion. Where baygall has expanded, it mainly encroached into wet or mesic flatwoods creating areas of tremendous fuel loading, duff and peat build-up.

Restoration

A hardwood/cypress inventory conducted in 1999 gathered data necessary for sound future management decisions. This community type buffers and minimizes downstream flooding and helps maintain water quality. The primary management goal for this community type is to minimize erosion.

In summary, the primary management actions necessary to achieve desired future conditions for baygall are:

- Allowing prescribed burns to burn into this community type when there is sufficient surface water, to mimic the historical fires keeping baygalls from invading adjacent flatwoods.
- Reintroduce growing season fire in neighboring flatwoods habitat and baygall ecotone as quickly as possible, if conditions allow.

Silviculture

No timber harvesting is scheduled for this community type during this planning period.

4. Flatwoods Lake (37 acres)

Desired Future Condition

A flatwoods lake is a permanent water body surrounded mostly by flatwoods. These lakes may have a border of wet prairie-like vegetation or dense fringe of saw palmetto and other shrubs. Water is derived mostly through run-off from surrounding uplands.

Typical plants in the fringing areas of both lakes include spikerush (*Eleocharis* spp.), yellow-eyed grasses (*Xyris smalliana*), St. John's wort (*Hypericum* spp.), chain fern (*Woodwardia virginica*), coastal plain willow (*Salix caroliniana*), maidencane (*Panicum hemitomon*), wax myrtle (*Myrica cerifera*), water primrose (*Ludwigia grandiflora*), floating heart (*Nymphoides aquatic*), buttonbush (*Cephalanthus occidentalis*), fire flag (*Thalia geniculata*), pickerelweed (*Pontederia cordata*), grassy arrowhead (*Sagittaria graminea*), bladderworts (*Utricularia* spp.), bottlebrush three-awn (*Aristida spiciformis*), star rush (*Rhynchospora colorata*), bulrushes (*Scirpus lineatus*), sawgrass (*Cladium jamaicense*), and yellow nut sedge (*Cyperus esculentus*).

Many animals utilize marshes primarily for feeding and breeding areas, but spend most of their time in other habitats. Other animals are more dependent on marshes, spending most of their time within them. Typical animals breeding and foraging in the Up and Down Lake and Hardesty Lake include three-toed amphiuma (*Amphiuma tridactylum*), lesser siren (*Siren intermedia*), greater siren (*Siren lacertina*), Southern cricket frog (*Acris gryllus*), green treefrog (*Hyla cinerea*), pig frog (*Rana grylio*), leopard frog (*Rana sphenoccephala*). The lakes are too permanent to support ephemeral pond breeders. The lakes also feature alligator (*Alligator mississippiensis*), eastern mud snake (*Farancia abacura*), banded water snake (*Nerodia fasciata*), green water snake (*Nerodia floridana*), striped crayfish snake (*Regina alleni*), black swamp snake (*Seminatrix pygaea*). There is potential for Florida water rats (*Neofiber alleni*).

A number of wading birds can be found on these flatwoods lakes including: American bittern (*Botaurus lentiginosus*), least bittern (*Ixobrychus exilis*), great blue heron (*Ardea herodias*), great egret (*Ardea alba*), snowy egret (*Egretta thula*), little blue heron (*Egretta caerulea*), tricolored heron (*Egretta tricolor*), green-backed heron (*Butorides striatus*), black-crowned night-heron (*Nycticorax nycticorax*), white ibis (*Eudocimus albus*), and glossy ibis (*Plegadis falcinellus*). Other birds using these flatwoods lakes for nesting and foraging habitat include bald eagle (*Haliaeetus leucocephalus*), northern harrier (*Circus cyaneus*), king rail (*Rallus elegans*), Virginia rail (*R. limicola*), sora (*Porzana carolina*), limpkin (*Aramus guarauna*), long-billed marsh wren (*Telmatodytes palustris*), yellowthroat (*Geothlypis trichas*), red-winged blackbird (*Agelaius phoeniceus*), boat-tailed grackle (*Quiscalus major*).

Current Condition

Two flatwoods lakes are found on CDMSFP. Up and Down Lake is located in the North Tract and Hardesty Lake is partially located within the South Tract. An extensive open water zone with some floating plants occurs at the center of both lakes. The open water zone dominates the fringing littoral vegetation, and there is comparatively little marsh.

Since the matrix community for both lakes is flatwoods, they are considered flatwoods lakes. A classic flatwoods lake is surrounded by a dense ring of saw palmetto and other shrubs. Up and Down Lake has a narrow fringe of this type of vegetation that grades into either mesic flatwoods or sandhill through several feet of elevation gain around most of its shore. In the northeast corner, Up and Down Lake grades into a baygall community which has a shallower elevation change and more organic soils. Hardesty Lake on CDMSFP is fringed by fire suppressed wet flatwoods featuring thick ericaceous shrubs and an impressive *Smilax* vine tangle. Both lakes have residential houses on the private property portion of the shoreline.

These depressions were typically formed by solution holes forming in the underlying limestone, causing surface sands to slump into a circular depression. Water is derived mostly from run-off from the immediately surrounding uplands. Flatwoods lakes function as aquifer recharge areas by acting as reservoirs which release groundwater when adjacent water tables drop during drought periods. Water levels fluctuate substantially in both lakes, but neither lake has completely dried up since state acquisition.

Restoration

No site-specific vegetative or hydrological restoration activities have been identified at this time.

In general, the primary management actions necessary to achieve desired future conditions for the two flatwood lakes are:

- Following all applicable Silviculture Best Management practices when conducting silvicultural operations adjacent to these areas.
- Allowing prescribed burns to burn into the vegetation of the flatwoods lake/upland ecotone.

5. Wet Flatwoods (24 acres)

Desired Future Condition

Wet flatwoods are open-canopy forests of slash pine, longleaf pine, loblolly pine and pond pine (*Pinus serotina*) with either thick shrubby midstory and very sparse ground cover, or a sparse midstory and a dense groundcover of hydrophytic herbs and shrubs. Several variations exist between these extremes. Typical plants include pond pine, slash pine, sweetbay (*Magnolia virginiana*), spikerush (*Eleocharis* spp.), beaksedge (*Rhynchospora* spp.), sedges, wax myrtle, gallberry, titi (*Cyrilla racemiflora*), saw palmetto, creeping beggarweed (*Desmodium incanum*), vanilla leaf (*Carphephorus odoratissimus*), slender gayfeather (*Liatris gracilis*), greenbrier, and hooded pitcherplant (*Sarracenia minor*). Typical animals include oak toad (*Anaxyrus quercicus*), cricket frog, and chorus frog (*Pseudacris nigrita*).

Wet flatwoods occur on relatively flat, poorly drained terrain. The soils typically consist of one to three feet of acidic sands generally overlying an organic hardpan or clay layer. The hardpan substantially reduces the percolation of water below and above its surface.

During the rainy season, water frequently stands on the surface, inundating the flatwoods for one or more months per year. During the drier seasons, ground water is less accessible for many plants whose roots fail to penetrate the hardpan. Thus, many plants are under the stress of water saturation during the wet seasons, and under the stress of dehydration during the dry seasons.

Another important physical factor in wet flatwoods is fire. Natural fires probably occurred every 3 to 10 years during pre-Columbian times. Nearly all plants and animals inhabiting this community are adapted to periodic fires, and several species depend on fires for their continued existence. Examples include pond pine that has serotinous cones and so cannot reproduce from seed without fire, pitcher plants that are terrestrial, light-demanding plants easily shaded out by the brushy thickets resulting from fire suppression, and longleaf pine whose seed-based life history strategy is dependent on the bare mineral soil resulting from a fire's passage. Fires will typically be carried in the waxy-leafed shrub layer. Without relatively frequent fires, wet flatwoods succeed into hardwood-dominated forests whose closed canopy would essentially eliminate the ground cover herbs and shrubs. In fact, much of the variation in community structure is probably associated with fire frequency. Thus, the longer the period of time since the last fire, the more developed will be the understory shrubs. If the understory is allowed to grow for too long, the accumulation of needle drape and the height of flammable understory shrubs will increase the probability of a catastrophic canopy fire. Wet flatwoods are closely associated with, and often grade into, hydric hammock, mesic flatwoods, wet prairie, or basin swamp.

Current Conditions

On the South Tract, the primary overstory species are mixed bottomland hardwoods and slash pine. Basal areas range from 40 ft² per acre to 90 ft² per acre where bottomland hardwoods are more prevalent. The fuel loads are moderate, Ground cover consists primarily of saw palmetto, and groundcover quality is fair.

On the North Tract, the primary overstory species is longleaf pine. Basal areas range from 45 ft² per acre to 60 ft² per acre. The fuel loads are moderate, ground cover consists primarily of leaf litter, and hardwood regeneration and groundcover quality is fair.

Restoration

The wet flatwoods fringe on the west side of Up and Down Lake was thinned along with the surrounding mesic flatwoods in 2006. The fuel loading is the lowest here, making the wet flatwoods area most prepared to receive a prescribed burn on CDMSFP. The wet flatwoods in the South Tract is on the east and west sides of Alligator Creek grades into mesic flatwoods. As the higher flatwoods to its east and west are thinned, this area can also be thinned following guidelines from the Silvicultural BMP manual. At this point, with fuel loads reduced, this area will be ready for initiation of prescribed burning treatment.

The primary management actions necessary to achieve desired future conditions for wet flatwoods are:

- Return of growing season fire.
- Reduction (as needed) of pine overstory to appropriate levels.
- Follow all applicable Silviculture Best Management Practices.

Silviculture

Anticipated issues with thinning involve compliance with Silviculture BMP's, due to the proximity of Up and Down Lake on the North Tract, and baygall on the South Tract. Thinning operations will be timed so that groundcover is not excessively disturbed, and where there is adequate ground moisture so that insect pests, such as the Southern Pine Beetle (*Dendroctonus frontalis* Zimmermann), are not able to gain a foothold.

6. Scrubby Flatwoods (6 acres)

Desired Future Condition

Over/Mid/Understory- This upland community is characterized by an open pine canopy with a shrubby understory and many areas of bare sand. The vegetation composition is similar to that of mesic flatwoods and scrub. Scrubby flatwoods often occupy the area between these two communities. The soil is more xeric than that in mesic flatwoods, which supports scattered clumps of shrubby species and the characteristic open areas of bare sand. The open canopy consists of a mix of longleaf pine, sand pine, and slash pine. The subcanopy and tall shrub layer are composed of rusty lyonia (*Lyonia ferruginea*), sand live oak, and myrtle oak (*Quercus myrtifolia*). The short shrub layer includes such species as saw palmetto, shiny lyonia (*Lyonia lucida*), gallberry, Elliott's milkpea (*Galactia elliotii*), and dwarf scrub oak (*Quercus minima*). The herbaceous layer is extremely variable in the scrubby flatwoods and can include species such as wiregrass, narrowleaf silkgrass (*Pityopsis graminifolia*), shortleaf gayfeather (*Liatris tenuifolia*), and cypress witchgrass (*Dichanthelium ensifolium*).

Fauna- Typical species found on surrounding communities may also be found in scrubby flatwoods. Scrubby flatwoods could provide another area of scrub jay (*Aphelocoma coerulescens*) habitat when it is in a young seral state, although the nearest known population is located nearly seven miles to the south on Ocala National Forest.

Fire Requirements- The fire cycle for this community type is 3 to 15 years and 5 to 8 years when scrubby flatwoods is the dominant community in burn block.

Processes- Scrubby flatwoods normally require less frequent fire than mesic flatwoods, which allows dense patches of scrub oaks and lyonia to develop. Because of the urban interface near CDMSFP, dense fuel loading is undesirable. It would produce an unacceptable fire risk to surrounding areas. Where scrubby flatwoods are adjacent to mesic flatwoods, the entire block will be managed as one, allowing fire to burn through or extinguish naturally within the scrubby flatwoods. Where scrubby flatwoods are managed as a separate burn block, an average fire return interval of five to eight years for restoration and fuel load maintenance is desired.

Current Condition

When acquired by the state, most of this community was fire suppressed and invaded by sand pine or turkey oaks. The six acres of scrubby flatwoods on the east boundary of the South Tract has not had any restoration, fire or thinning. This area is dominated by a turkey oak overstory with scattered longleaf pine. An old food plot with a bahia grass (*Paspalum notatum*) understory is found within this area.

Restoration

Fire is the most important management tool, but some mechanical fuel control and silviculture will be needed to get the fuel bed in condition for short rotation burning. Roller chopping may be needed to control the flame heights on prescribed burns. On fire-suppressed scrub with turkey oak encroachment, initiate prescribed fire, if fuel loading will allow.

Silviculture

Silvicultural practices needed in this community type are frequent prescribed fire, timed so that bare mineral soil is exposed during peak years of longleaf cone production. Once an adequate stocking of longleaf pine regeneration has been achieved, continue the prescribed burning during the growing season.

Existing Condition	Prescription for Restoration
6 acres of a 22 acre stand on the South Tract were clearcut in 2008 of off-site slash and sand pine.	This stand will be burned on a 2-4 year fire return interval, through the application of all-season prescribed fire. A hexazinone application is needed to select areas of heavy oak with focus on groundcover response prior to planting of containerized longleaf pine.

C. Impact of Planned Uses on Property Resources

The renewable resources that need protection include:

1. Timber

Silviculture management will be implemented to ensure a continuing renewable timber resource and diverse ecological resources for an indefinite time period.

2. Wildlife

Wildlife resources, both game and non-game species, will be protected through appropriate management techniques.

3. Water

Water resources will be protected by following the guidelines outlined in the Silvicultural BMP Manual and/or other appropriate measures, as deemed necessary by DOF's Forest Hydrologist and/or Watershed Specialist.

4. Historical/Archaeological

In the event of any significant ground disturbing activity, DHR and FNAI will be contacted for review and comment. The DOF will then follow the management procedures outlined in Exhibit H and will comply with all appropriate provisions of Florida Statutes 267.061(2).

5. Recreational

Recreational uses will be monitored to evaluate impacts on the natural systems. Modification to recreational uses will be implemented, should significant impact be identified.

V. MANAGEMENT SUMMARY

A. Operations Infrastructure

CDMSFP is managed in conjunction with Etoniah Creek State Forest. Personnel and equipment resources are shared between these two forests. No equipment or personnel are specifically assigned to CDMSFP. To carry out the resource management work on the state forest as well as to maintain forest improvements such as trails, roads and facilities the following equipment is available for work on CDMSFP:

- 1998 New Holland 4x4 Farm Tractor w/ 5' farm harrow, 6 'bushhog, 6' boxblade
- 2002 ATV Gator 6 x 4
- 1999 ATV 4x4, with trailer
- 1997 4wd pickup w/50 gal tank and electric pump
- 1997 4wd pickup w/50 gal tank and electric pump
- 2002 4wd pickup w/50 gal tank and electric pump
- 2001 backhoe implement for farm tractor
- 150 gal. portable fuel tank
- 320 gal. portable water tank
- 2001 John Deere 650H Crawler Dozer
- 2001 Transport
- 1998 Heavy Duty fire line harrow

In order to supplement the small staff working at CDMSFP, additional volunteers will be recruited and encouraged to assist with other activities to further DOF's mission. In addition, a state forest liaison committee of private citizens and representatives of forest user groups has been meeting three times per year to review forest management activities and volunteer their ideas to DOF staff to improve the state forest.

B. Plans to Locate Fragile, Non-Renewable Natural and Cultural Resources

Representatives of the DHR and FNAI will be consulted prior to the initiation of any proposed significant ground disturbing activity by the DOF or any other cooperating agency. The DOF will make every effort to protect known archaeological and historical resources.

1. Archaeological Resources

The forest manager of CDMSFP is trained as an Archaeological site Monitor. Additional site monitors are available within the forest district. Trained monitors will oversee ground-disturbing activities in which the DHR recommends monitoring. The DOF will utilize the services of the DHR archaeologists to locate and evaluate unknown resources and to make recommendations in the management of these resources. Known archaeological and historical sites have been identified on maps provided to law enforcement and state forest personnel to aid in protecting these sensitive sites.

All significant ground disturbing projects that are not specifically identified in an approved management plan will be sent to the DHR for review. Recommendations outlined in the “Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands” (Exhibit H) will be followed.

2. Soil and Water Resources

Most of the natural communities, including wetlands, are intact on CDMSFP with some wetlands having moderate disturbance. Planned projects will restore and/or maintain ecological integrity while allowing for controlled recreational access. Management activities will be conducted in a manner to minimize soil erosion and wetland degradation. All activities planned for the forest will be conducted in accordance with guidelines described in the Silviculture BMP Manual and/or other appropriate measures as deemed necessary by the DOF’s Forest Hydrologist and/or Watershed Specialist. In addition, if future soil and water resource problems arise, they will immediately be assessed and the appropriate action will be proposed and implemented under the direction of the DOF’s Forest Hydrology Section. The DOF will work with the SJRWMD to monitor quantity and quality of ground and surface water resources.

3. Other Resources

Applicable surveys will be conducted by DOF staff or others during the process of planning and implementing multiple-use management activities. DOF personnel will remain alert for any environmentally significant resources presently unknown and implement protective actions as necessary.

C. Conformation to State Lands Management Plan

Management of CDMSFP under the multiple-use concept, utilizing multiple-use management principles, complies with the State Lands Management Plan and provides optimum balanced public utilization of the property. Specific authority for the DOF’s management of public lands is derived from Chapters 253, 259, and 589, Florida Statutes.

D. Multiple-Use Potential – Income Producing Activities

Recreation - Special events may provide income through permit fees.

Timber Sales - Timber sale income during the past five years is approximately \$9,545. Amounts received from timber sales vary each year, but as a general rule, timber sales on CDMSFP are infrequent.

Apiaries - There have been no requests for apiary use of the state forest however if requested the appropriate site will be evaluated.

Palmetto Fronds - A palm frond sale (primarily saw palmetto) may also be set up on a trial basis in designated areas of the forest within this planning period.

Palmetto Drupes - A palmetto drupe sale may be set up on a trial basis.

Fuelwood - CDMSFP staff may issue fuelwood permits as requested.

E. Potential Use of Private Land Managers

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

Site preparation - Private equipment/forestry operations companies may be hired to site prepare 22 acres of sandhill and scrubby flatwoods harvested of off-site sand pine and slash pine.

Tree planting - A private equipment and/or forestry operations company may be hired to machine plant longleaf seedlings.

VI. REFERENCES

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