



# Florida Department of Environmental Protection

Marjory Stoneman Douglas Building  
3900 Commonwealth Boulevard  
Tallahassee, Florida 32399-3000

Charlie Crist  
Governor

Jeff Kottkamp  
Lt. Governor

Michael W. Sole  
Secretary

September 2, 2010

Ms. Corinne Hermle  
Division of Forestry  
3125 Connor Blvd./C25  
Tallahassee, Florida 32399-1560

**RE: Little Big Econ State Forest, Lease # 3958**

Dear Ms. Hermle:

The Division of State Lands, Office of Environmental Services, acting as agent for the Board of Trustees of the Internal Improvement Trust Fund, approves the Little Big Econ State Forest management plan. The next management plan update is due September 2, 2020.

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

Sincerely,

A handwritten signature in blue ink that reads "M. S. Gengenbach". The signature is fluid and cursive, with a long, sweeping underline.

Marianne S. Gengenbach  
Office of Environmental Services  
Division of State Lands  
Department of Environmental Protection

# **TEN-YEAR RESOURCE MANAGEMENT PLAN**

FOR THE

## **LITTLE BIG ECON STATE FOREST**

SEMINOLE COUNTY



PREPARED BY

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

DIVISION OF FORESTRY

APPROVED ON

SEPTEMBER 2, 2010

TEN-YEAR RESOURCE MANAGEMENT PLAN  
FOR THE  
LITTLE BIG ECON STATE FOREST



Approved by:

A handwritten signature in blue ink, appearing to read "Jim Karels", written over a horizontal line.

Jim Karels, Director  
Division of Forestry

5/5/10  
Date

---

David Core, Assistant Director  
Division of Forestry

Date

A handwritten signature in black ink, appearing to read "Steve Jennings", written over a horizontal line.

Steve Jennings, Chief  
Forest Management Bureau

May 5, 2010  
Date

TEN-YEAR RESOURCE MANAGEMENT PLAN  
LITTLE BIG ECON STATE FOREST

**TABLE OF CONTENTS**

Land Management Plan Executive Summary .....	1
I. INTRODUCTION.....	2
A. General Mission, Goals for Florida State Forests, and Management Plan Direction .....	2
B. Overview of State Forest Management Program.....	3
C. Past Accomplishments.....	3
D. Goals/Objectives for the Next Ten Year Period .....	4
E. Management Needs - Priority Schedule and Cost Estimates.....	8
II. ADMINISTRATION SECTION.....	11
A. Descriptive Information.....	11
1. Common Name of Property .....	11
2. Location, Boundaries and Improvements .....	11
3. Legal Description and Acreage.....	12
4. Degree of Title Interest Held by the Board.....	12
5. Proximity to Other Public Resources.....	13
6. Aquatic Preserve/Area of Critical State Concern .....	14
B. Acquisition Information .....	14
1. Land Acquisition Program.....	14
2. Legislative or Executive Constraints .....	14
3. Purpose for Acquisition .....	14
4. Designated Single or Multiple-Use Management.....	15
5. Alternate Uses Considered.....	15
6. Additional Land Needs .....	16
7. Adjacent Conflicting Uses .....	16
8. Surplus Land Assessment .....	16
C. Agency & Public Involvement .....	16
1. Responsibilities of Managing Agencies.....	16
2. Public and Local Government Involvement .....	17
3. Compliance with Comprehensive Plan.....	17
III. RESOURCE SECTION.....	17
A. Past Uses.....	18
B. Renewable and Non-Renewable Resources .....	18
1. Soil Types .....	18
2. Archaeological and Historical Resources .....	18
3. Water Resources .....	19
4. Fish and Wildlife .....	20
5. Endangered or Threatened Species.....	20
6. Beaches and Dunes .....	22
7. Swamps, Marshes, or Other Wetlands.....	22
8. Mineral Resources .....	23
9. Unique Natural Features .....	23
10. Outstanding Native Landscapes.....	23
11. Timber Resources .....	23

IV. MANAGEMENT CONCEPTS BY NATURAL COMMUNITIES AND PROPOSED MANAGEMENT ACTIVITIES .....	24
A. Existing and Planned Uses.....	24
1. Property Boundaries Establishment and Preservation .....	24
2. Soil and Water Protection .....	24
3. Roads .....	25
4. Recreation Management .....	25
a. Existing Facilities/Infrastructure/Recreational Activities .....	25
i. Public Access and Parking .....	25
ii. Self Service Pay Stations .....	26
iii. Recreation Facilities.....	26
iv. Recreational Trails .....	26
v. Camping .....	27
vi. Multiple-Use Field .....	27
vii. Hunting and Fishing .....	27
viii. Environmental Education/Ecotourism .....	28
ix. Visitor Center.....	28
b. Planned Recreational Activities .....	28
i. Public Access and Parking .....	28
ii. Recreational Trails .....	28
iii. Camping .....	29
5. Fire Management .....	29
6. Silvicultural Guidelines & Forest Resource Management Objectives.....	31
a. Objectives.....	31
b. Silvicultural Operations.....	31
c. Timber Sales.....	32
d. Reforestation .....	32
7. Research Projects/Specimen Collection .....	33
8. Law Enforcement.....	33
9. Wildlife and Fish Management.....	33
a. Managing Non-Game Species.....	34
b. Sensitive Species .....	34
c. Maintained Wildlife Openings .....	34
d. Hunter Access .....	35
e. Timber Management .....	35
10. Non-Native Invasive Species.....	35
11. Insects, Disease and Forest Health.....	36
12. On-Site Housing .....	37
13. Utility Corridors and Easements.....	37
14. Ground Disturbing Activities.....	38
15. Apiaries.....	38
16. Cattle Grazing .....	38
17. Ground Cover .....	38
18. Restoration .....	39
a. Fire .....	39
b. Hydrology.....	39
c. Species Composition .....	40
B. Description of Natural Communities and Proposed Management Activities .....	40
1. Mesic Flatwoods .....	41
2. Mesic Hammock .....	44
3. Wet Prairie .....	45

4. Floodplain Marsh .....	46
5. Scrubby Flatwoods .....	47
6. Hydric Hammock .....	48
7. Wet Flatwoods .....	49
8. Basin Swamp .....	51
9. Scrub .....	52
10. Baygall .....	54
11. Depression Marsh .....	55
12. Basin Marsh .....	56
13. Blackwater Stream .....	58
14. Prairie Hammock .....	58
15. Sandhill .....	59
16. Dome Swamp .....	61
17. Floodplain Swamp .....	62
18. Floodplain Forest .....	63
19. Xeric Hammock .....	64
Yarborough Tract .....	65
C. Impact of Planned Uses on Property Resources .....	66
1. Silviculture .....	66
2. Recreation .....	66
3. Historical/Archaeological .....	66
4. Water .....	66
5. Wildlife .....	66
V. MANAGEMENT SUMMARY .....	66
A. Operations Infrastructure .....	66
B. Plans to Locate Fragile, Non-renewable Natural and Cultural Resources .....	68
C. Conformation to State Lands Management Plan .....	68
D. Multiple-Use Potential – Income Producing Activities .....	68
E. Potential Use of Private Land Managers .....	69
VI. REFERENCES .....	69

TEN-YEAR RESOURCE MANAGEMENT PLAN  
LITTLE BIG ECON STATE FOREST

**EXHIBITS**

Location Maps (Boundaries and Facilities) .....	Exhibit A
Optimum Management Boundary Map .....	Exhibit B
Management Plan Advisory Group Summary .....	Exhibit C
Compliance with Local Comprehensive Plan .....	Exhibit D
Soil Types and Map .....	Exhibit E
List of Wildlife Species Found on Little Big Econ State Forest.....	Exhibit F
Florida Natural Areas Inventory Managed Area Tracking Record.....	Exhibit G
Recreation Trail Map .....	Exhibit H
Invasive Species on LBESF.....	Exhibit I
Natural Communities/Cover Type Maps .....	Exhibit J
Management Procedures for Archaeological and Historical Sites and Properties on State Owned or Controlled Lands .....	Exhibit K

**TABLES**

Table 1 - Six Year Accomplishment Summary .....	Page 3
Table 2 - Estimated Annual Expenditures Organized by Uniform Cost Accounting Council Categories .....	Page 10
Table 3 - LBESF Acreage by Parcel .....	Page 12
Table 4 - Endangered or Threatened Species on LBESF.....	Page 20
Table 5 - Vegetation Types found on LBESF.....	Page 41
Table 6 – Community Types found on the Yarborough Tract of LBESF.....	Page 65

LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

Lead Agency: Florida Department of Agriculture and Consumer Services, Division of Forestry  
 Common Name: Little Big Econ State Forest  
 Location: Seminole County  
 Acreage Total: 10,278.87  
 Acreage Breakdown:

<u>Historic Natural Communities**</u>	<u>Acreage</u>	<u>Historic Natural Communities**</u>	<u>Acreage</u>
Mesic Flatwoods	1317	Depressional Marsh	124
Mesic Hammock	761	Basin Marsh	113
Wet Prairie	726	Blackwater Stream	88
Floodplain Marsh	400	Prairie Hammock	87
Scrubby Flatwoods	355	Sandhill	82
Hydric Hammock	268	Dome Swamp	18
Wet Flatwoods	201	Floodplain Swamp	16
Basin Swamp	173	Floodplain Forest	6
Scrub	171	Xeric Hammock	4
Baygall	142		

\*\* FNAI natural community mapping project has not been completed for the Yarborough Tract (5,085 acres).

Lease/Management Agreement No.: 3958 Use: Single  Multiple

MANAGEMENT AGENCY

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

RESPONSIBILITY

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

Designated Land Use: Multiple-use State Forest  
 Sublease(s): None  
 Encumbrances: Seminole County  
 Type Acquisition: CARL, SOR, and Preservation 2000  
 Unique Features: Econlockhatchee River and St. John’s River, an Outstanding Florida Water (OFW); Mesic flatwoods, sandhill, and hydric hammock  
 Archaeological/Historical: Fourteen (14) Archaeological Sites  
 Management Needs: Restoration and maintenance of native ecosystems and disturbed site restoration  
 Acquisition Needs: Remainder of Econ-St. Johns Ecosystem Project  
 Surplus Lands/Acreage: None  
 Public Involvement: Board of County Commissioners of Seminole County, State Forest Liaison Group, Management Plan Advisory Group and a Public Hearing (4/8/2010)

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

ARC Approval Date: \_\_\_\_\_ BTIITF Approval Date: \_\_\_\_\_

Comments: \_\_\_\_\_



## **I. INTRODUCTION**

Little Big Econ State Forest (LBESF) is comprised of approximately 10,279 acres located in eastern Seminole County. The forest is named after the Little Econlockhatchee River and the larger Econlockhatchee River. LBESF is designated for multiple use management and is managed by the Division of Forestry as part of the state forest system. Most of the land within the forest boundaries was purchased under the Save Our Rivers program and the Conservation and Recreation Lands program.

Major community groups represented on the forest include mesic and wet flatwoods, marsh, and a variety of hydric forest types. The forest's most notable feature is the Econlockhatchee River, which flows through the property, and the St. John's River, which makes up the eastern boundary. Portions of both the Econlockhatchee and St. Johns Rivers are designated by the Florida Department of Environmental Protection (DEP) (under authority of Section 403.061 (27), Florida Statutes) as Outstanding Florida Waters (OFW). Significant species sighted on the forest include the bald eagle, eastern indigo snake, Sherman's fox squirrel, gopher tortoise and sandhill crane. Major recreational activities enjoyed at LBESF include canoeing, hiking, horseback riding, mountain bike riding, hunting and fishing.

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

The Division of Forestry's (DOF) mission is to protect and manage Florida's forest resources through a stewardship ethic to assure these resources will be available for future generations.

This will be accomplished by implementing sound multiple use management principles, the main objectives of which will be:

- To restore, maintain, and protect in perpetuity all native ecosystems;
- To ensure the 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 a total resource concept, not emphasizing any particular use over the others, or over restoration, maintenance and protection of native ecosystems;
- To protect known archeological and historical resources; and
- To practice sustainable forest management utilizing sound silvicultural techniques.

This management plan is provided according to the requirements of Section 253.034, 259.032, and 373, Florida Statutes, and was prepared using guidelines outlined in Chapter 18-2.021 of the Florida Administrative Code. This management plan provides the general direction for management of LBESF. It is not an annual work plan or detailed operational plan, but provides general guidance for management of the LBESF 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**

LBESF is comprised of approximately 10,279 acres located in the eastern portion of Seminole County. The forest contains many of the naturally occurring vegetative communities found in Central Florida. Restoration of abandoned agriculture fields will be a main focus.

**C. Past Accomplishments**

A compilation of management activities and public use on the LBESF is completed monthly and an annual report completed at the end of each fiscal year. These reports are available from the forest manager. The table below has been prepared for this plan that summarizes in numerical format these accomplishments for each of the past six years.

**Table 1. Six Year Accomplishment Summary**

PROGRAM	ACTIVITY	FY 2003/04	FY 2004/05	FY 2005/06	FY 2006/07	FY 2007/08	FY 2008/09	TOTAL 6YRS
Site Preparation/ timber stand improvement	Mowing	---	---	---	39	15	35	89 Acres
	Chopping	94	34	2	83	165	---	378 Acres
Reforestation	L.L. Pine (BR)	52	32	---	---	---	---	84 Acres
Invasive Species Control/ (Herbicide)	Cogon Grass	5	5	5	6	18	---	39 Acres
	Brazilian Pepper	7	6	5	---	---	---	18 Acres
	Air Potato	---	---	2	40	---	---	42 Acres
	Para grass/tallow	---	---	---	---	229	---	229 Acres
	Coral Ardisia	---	---	---	2	19	---	21 Acres
Roads/ Bridges	Roads Graded - Maintained	---	4	11	1.1	1.3	---	17.4 miles
	Roads built	---	---	---	400	---	4,734	5,134 feet
	Roads mowed	51	49	54	---	---	---	154 miles
	Bridges Built	---	---	---	1	---	1	2
	Bridges Repaired	---	3	6	---	---	---	9
	Low Water Crossing/Inst.	2	2	3	---	1	---	8
	Culverts Installed	---	---	2	1	---	---	3
Boundary Maintenance	Miles of Line Marked	---	10	12	25	3	8	50 miles
Recreation	Day Use	7,463	5,335	6,362	6,027	8,108	9,000	33,295
	Overnight (Other)	489	562	694	674	1123	824	3,542
	Movie Production	---	---	3	---	---	---	3
Information &	Programs-Demo Tours	---	---	2	6	8	---	16

PROGRAM	ACTIVITY	FY 2003/04	FY 2004/05	FY 2005/06	FY 2006/07	FY 2007/08	FY 2008/09	TOTAL 6YRS
Education Activities	Radio/TV	2	---	---	1	---	---	3
	News Releases/ Media Articles	---	---	---	---	---	---	0
	Ed/Research Projects	4	1	---	1	---	---	6
Fire	Wildfire	---	---	---	3	0.1	---	3.1 Acres
	Control Burning	886	686	601	908	930	693	4,011 Acres
	Fire line Maintenance	30	13	11	21	17	7	92 miles
Other Activities	Fence Built	---	5	2	---	---	---	7 miles
	Trails mowed	---	---	---	80	46	10	126 miles
	Sandhill restoration	---	---	---	---	30	---	30 Acres
	Wetland Mitigation	47	---	---	---	---	---	47 Acres
	Multi-use field maintenance	30	40	134	192	50	10	446 Acres
Forest Inventory	Inventory update	---	---	---	904	541	---	1,445 Acres

**D. Goals/Objectives for the Next Ten Year Period**

The following goals and objectives provide direction and focus for management resources over the next 10-year planning period. Agency priorities, funding and wildfires (or other natural disasters) will be influential in determining the degree to which these objectives are met. Short-term goals are goals that shall be achievable within a 2-year planning period, and long-term goals shall be achievable within a 10-year planning period.

**Goal 1: Habitat Restoration and Improvement**

**OBJECTIVE # 1:** Update the fire management plan to address fire prevention, detection, and suppression, and prescribed burning plans. (Short Term Goal)

**Performance Measure:** Complete a LBESF Fire Management Plan and update the plan annually.

**OBJECTIVE #2:** Florida Natural Areas Inventory (FNAI) will survey current and historical ecological communities on the Yarborough Tract. (Short Term Goal)

**Performance Measure:** Survey completed.

**OBJECTIVE #3:** Develop a plan for the restoration of the LBESF natural communities with appropriate species as dictated by soils and historic vegetation. (Short Term Goal)

**Performance Measure:** Restoration plan developed.

**OBJECTIVE #4:** Locate areas with remnant ground cover or ground cover that can be recovered with prescribed fire. Develop a plan for the restoration of ground cover in at least one stand where the native ground layer has been heavily impacted from historical land use, including areas that had been previously managed with intensive silvicultural practices. (Short Term Goal)

**Performance Measure:** Completion of ground cover assessment. Completion of ground cover restoration plan.

**OBJECTIVE #5:** Implementation of ground cover restoration plan. (Long Term Goal)

**Performance Measure:** Total number of acres seeded or planted with native grasses or herbaceous ground cover, if planting or seeding is prescribed. Total number of acres treated with herbicide and prescribed fire in the growing season within the designated ground cover restoration area. Total number of acres (or locations) of remnant groundcover treated with prescribed fire at target intervals.

**OBJECTIVE #6:** Start restoration of the wet prairie ecosystem. Harvest palm trees (6' to 25' in height) that are encroaching into the wet prairie and harvest slash pine that was planted in the wet prairie. (Long Term Goal)

**Performance Measure:** Number of wet prairie acres restored.

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

**OBJECTIVE #1:** Update the Outdoor Recreation Plan. (Short Term Goal)

**Performance Measure:** Outdoor Recreation Plan completed every year.

**OBJECTIVE #2:** Research and plan recreational opportunities for the Yarborough Tract. (Short Term Goal)

**Performance Measure:** Outdoor Recreation Plan updated and recreational opportunities implemented on the Yarborough Tract.

## **GOAL 3: Hydrological Preservation and Restoration**

**OBJECTIVE #1:** Protect water resources during management activities through the use of Silvicultural Best Management Practices (BMP's) for public lands. (Long Term Goal)

**Performance Measure:** Compliance with state lands BMP's.

**OBJECTIVE #2:** Conduct annual road inspection to determine the need for installation or replacement of culverts and low water crossing. (Short Term Goal)

**Performance Measure:** Annual inspection and appropriate improvement completed.

**OBJECTIVE #3:** In coordination with the DOF Forest Hydrology Section and St. Johns River Water Management District (SJRWMD), conduct a comprehensive hydrological needs assessment/inventory of the Forest. A list of potential restoration projects will be prepared and sources of funding, including regional mitigation funds, will be investigated. (Short Term Goal)

**Performance Measure:** Assessment/inventory completed.

#### **GOAL 4: Sustainable Forest Management**

**OBJECTIVE #1:** Prepare a silviculture management plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. (Short Term Goal)

**Performance Measure:** Completion of plan.

**OBJECTIVE #2:** Implementation of the silviculture management plan. (Long Term Goal)

**Performance Measure:** Implementation of plan (acres treated).

**OBJECTIVE #3:** Implement a process for conducting forest inventory including a GIS database containing forest stands, roads & other attributes (including but not limited to: threatened & endangered species, archeological resources, exotic species locations, historical areas). (Short & Long Term Goal)

**Performance Measure:** Complete GIS database and reinventory ALL attributes every 3-5 years or as needed.

**OBJECTIVE #4:** Conduct Forest Inventory updates each year, according to established criteria. (Short Term Goal)

**Performance Measure:** Number of acres inventoried annually.

**OBJECTIVE #5:** Monitor the number of cattle leases and the effects of grazing on the Forest. (Long Term Goal)

**Performance Measure:** Number and location of cattle leases.

#### **GOAL 5: Exotic and Invasive Species Maintenance and Control**

**OBJECTIVE #1:** FNAI will survey exotic vegetation on the Yarborough Tract. (Short Term Goal)

**Performance Measure:** Survey completed.

**OBJECTIVE #1:** Develop and implement a plan to control non-native invasive plant species. (Long Term Goal)

**Performance Measure:** Total number of acres successfully treated.

#### **GOAL 6: Capital Facilities and Infrastructure**

**OBJECTIVE #1:** LBESF staff will maintain all existing facilities, roads, and trails. (Long Term Goal)

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

**OBJECTIVE #2:** Prepare boundary maintenance plan. (Short Term Goal)

**Performance Measure:** Boundary maintenance plan completed.

**OBJECTIVE #3:** Implement boundary maintenance plan. (Long Term Goal)

**Performance Measure:** Percentage of forest boundary maintained annually.

**OBJECTIVE #4:** Implement a 5-Year Road Management Plan and update annually. (Short Term Goal)

**Performance Measure:** Completion of the 5-Year Road Management Plan and update annually.

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

**OBJECTIVE #1:** Ensure all known sites are recorded in the FL Division of Historical Resources (DHR) Master Site file. (Long Term Goal)

**Performance Measure:** Number of recorded sites.

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

**Performance Measure:** Number of sites monitored.

**OBJECTIVE #3:** Train personnel as archaeological monitors. (Short Term Goal)

**Performance Measure:** Number of personnel trained as monitors.

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

**OBJECTIVE #1:** FNAI to conduct a comprehensive rare animal and plant species survey of LBESF. (Short Term Goal)

**Performance Measure:** Completion of a rare species survey.

**OBJECTIVE #2:** Develop monitoring protocols for selected imperiled species. (Long Term Goal)

**Performance Measure:** The number of imperiled species for which monitoring protocols are developed.

**OBJECTIVE #3:** Implement monitoring protocols for imperiled species. (Long Term Goal)

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

**OBJECTIVE #4:** DOF will develop, with the assistance of the Florida Fish and Wildlife Conservation Commission (FWC), a wildlife management plan that addresses all appropriate game and fish species and the sustainability of each based on site-specific population data. In conjunction with this plan, institute a continuous monitoring program to ensure the viability of these populations. (Long Term Goal)

**Performance Measure:** Completion of the wildlife management plan.

## **E. Management Needs, Priority Schedule and Cost Estimates**

The following management needs and priorities have been established for LBESF:

1. Restoration of extensive acres of improved pastures to the appropriate FNAI land cover classification will require using experimental and proven techniques developed by land managers. The existing scrub needs restoration using safe and effective methods.
2. An exotic control plan, ecological management plan, silviculture plan needs to be developed. A fire management plan, boundary maintenance plan, road plan, and recreation plan need to be amended.
3. Perimeter fence lines need to be maintained on forest boundary perimeters where appropriate.
4. High visibility by cooperating law enforcement agencies will be needed to discourage littering, poaching, illegal trespass, forest use violations, illegal camping, etc.
5. Aggressive use of prescribed fire is needed to restore and maintain natural communities.
6. Develop biological monitoring strategies for user impacts and threatened and endangered species.
7. A comprehensive hydrological needs assessment/inventory should be developed. During the next ten years the property will be researched and evaluated in coordination with the DOF Forest Hydrology Section and SJRWMD. A list of potential restoration projects will be prepared and sources of funding, including regional mitigation funds, will be investigated.
8. Establish disked fire lines one hundred feet from wetland ecotones to exclude fire from swamps when lower moisture levels will allow muck to burn.

Management activities on LBESF during this management period must serve to conserve and protect the natural and historical resources and manage resource-based public outdoor recreation, which is compatible with the conservation and protection of this forest.

The management activities listed below will be addressed within the ten-year management period and are divided by priority levels:

**Priority 1** - activities considered as paramount to carrying out DOF's mission.

**Priority 2** - activities key to furthering the mission.

**Priority 3** - activities considered significant to our mission, but less urgent.

Cost estimates are provided below for DOF services and contract services where sufficient information is available to make projections. Costs for some activities cannot be estimated at this time. Other activities will be completed with minimal overhead expense and existing staff. Additional support may be requested from SJRWMD.

## **Priority 1**

### **1. Prescribed Burning**

Prescribed burning is the primary management tool for the forest. Cost estimates are based on DOF's contract burning rate schedule. Manpower and equipment costs are included. (annual)

Average Acreage per Year: 900 – 1,500

Estimated Annual Cost (DOF): \$8,000 - \$14,000

### **2. Exotic Species Control**

Identify, mapping, eradication/control and monitoring of exotic species. (annual)

Average Acreage per Year: 2

Estimated Annual Cost: \$2,400

### **3. Hydrological Plan**

Needs assessment and plan development. (within 5 yrs)

### **4. Silvicultural Plan**

Plan development based upon forest inventory. (within 3 years)

### **5. Plant and Animal Survey and Monitoring**

Estimated Annual Cost: \$1,000 (annual)

### **6. Biological Survey and Vegetation Mapping**

FNAI will survey the Yarborough Tract.

### **7. Restoration Scrub/Scrubby Flatwoods/Sandhill/Wet Prairie**

Burning, monitoring, mechanical hardwood reduction, timber harvesting, and pine planting are all potential treatments. Cost estimates are for all restoration needed. Approximately 170 acres of degraded scrub will be restored during the period covered by this plan. (within 5 years)

Estimated Annual Cost (DOF): \$2,000

Estimated Annual Cost (Contracted): \$10,000

### **8. Boundary Marking and Security**

Post boundary with state forest boundary signage and initiate replacement of five miles of boundary fence where it serves to protect against unauthorized use and provide for needed protection of natural resources. (Annual/as needed)

Estimated Annual Cost (DOF): \$600



**Priority 2**

**1. Forest Inventory**

Continue annual inventory work. DOF staff will conduct inventories. (annual)

Estimated Cost (DOF): \$800

**2. Recreation**

Development and implementation, recreation facility improvements and maintenance of existing facilities as discussed earlier in the plan. Estimates are based on known needs and potential future improvements.

Estimated Total Cost to Complete:

- a. Upgrade internal recreation signs. (annual) .....\$500
- b. Upgrade three trail brochures and reprint. (annual).....\$500
- c. Establish new kiosk at Kilbee Tract with information on exotic flora & fauna and birding trail information. (within 2 years).....\$800
- d. Maps/brochures for camping and canoe trail (annual) .....\$500
- e. Update all kiosks to include revised maps, rules, etc. (annual) .....\$600
- f. Establish new primitive camping sites on the Yarborough Tract ....\$1,200

**3. Fire line/Trails**

Improvements and maintenance. Maintenance will be by DOF staff and volunteers.

No costs are estimated at this time

**4. Roads**

Inventory, plan development, implementation and monitoring. Cost estimates are dependent on needs identified in the road plan. (annual)

Implementation and monitoring will be needed on an annual basis.

**Priority 3**

**1. Mitigation Projects**

Needs assessment and prioritization of projects will be developed. (As opportunity arises)  
(Assessment and prioritization are ongoing at this time)

**Table 2. Estimated Annual Expenditures Organized by Uniform Cost Accounting Council Categories**

CATEGORY	PRIORITY 1	PRIORITY 2	PRIORITY 3	TOTAL
<b>Resource Management:</b>				

<b>CATEGORY</b>	<b>PRIORITY 1</b>	<b>PRIORITY 2</b>	<b>PRIORITY 3</b>	<b>TOTAL</b>
-Exotic Species Control	\$2,400			\$2,400
-Prescribed burning	\$14,000			\$14,000
-Timber Management	\$10,000	\$800		\$10,800
-Hydrological Management				
-Biological monitoring	\$5,500			\$5,500
<b>Administration:</b>				
-Units/Projects	\$21,000			\$21,000
-Staff/Housing Needs				
<b>Capital Improvements:</b>				
-New Facility Construction				
-Facility Maintenance		\$6,000		\$6,000
-Tools/Equipment		\$32,500		\$32,500
<b>Visitor Services/Recreation:</b>				
-Information/Education Programs		\$2,900		\$2,900
-Operations		\$1,200		\$1,200
<b>TOTAL</b>	\$52,900	\$43,400		\$96,300

## **II. ADMINISTRATION SECTION**

### **A. Descriptive Information**

#### **1. Common Name of Property**

The common name of the property is Little Big Econ State Forest.

#### **2. Location, Boundaries and Improvements**

The main body of LBESF is located along the Econlockhatchee River in Seminole County, Florida, south of CR 426 and north of CR 419, approximately five miles east of Oviedo. LBESF is made up of eight tracts. The following tracts (Demetree, Jones West, Jones East, Spencer Leeper, Rivers Edge and Bothers) are located southeast of County Road 426, between Geneva and Chuluota.

The Kilbee Tract is approximately three miles northeast of the Demetree Tract and adjoins the south side of State Road 46 and the west shore of the St. Johns River. The Yarborough Tract is located due south of the Kilbee Tract. Its eastern boundary is the St. Johns River and the tract extends west to connect with the state forest's Rivers Edge Tract (Exhibit A1). All parcels acquired are identified in Table 2.

There are several improvements located on the property. The following improvements are in good condition and in use: headquarters office/visitor center, thirty-seat community room, public restrooms, and a shop (Exhibit A2).

**3. Legal Description and Acreage**

The state forest is located in section 36 of T20S, R32E; sections 1, 2, 4-13 , 15, & 16 of T21S, R32E; sections 12 & 13 of T21S, R31E; and Section 4-9 of T21S, R33E (Seminole County). Detailed legal descriptions are located in the Division of State Lands office in Tallahassee and the LBESF headquarters. The total acreage of the currently acquired parcels comprising the LBESF is 10,278.87 acres on eleven parcels. The St. Johns River Water Management District (SJRWMD) owns 83.5 percent of the property, the Board of Trustees of the Internal Improvement Trust Fund (BOT) own 16 percent, and the sovereign land is 0.4 percent. Parcel information is described in Table 3.

**Table 3. LBESF Acreage by Parcel**

PARCEL NAME	DEED DATE	LEASE/AMD. DATE	LEASE NO.	AMEND. NO.	FUNDING SOURCE	COUNTY	ACRES
Bothers	12/2/94	12/18/95	3958	1	CARL	Seminole	493.25
Demetree	3/14/91	10/3/94	3958	0	CARL	Seminole	1,019.56
Husway				Pending	DOF/P2000	Seminole	1.00
Snowhill	11/30/94	12/18/95	3958	1	CARL	Seminole	128.32
Wieckhorst	1/28/97	10/29/97	3958	2	DOF/P2000	Seminole	4.70
WMD/Demetree	7/18/90	10/13/93	WMD	0	SOR	Seminole	1,100.04
WMD/Jones	7/1/94	9/14/94	WMD	1	P2000	Seminole	513.61
WMD/Kilbee	3/18/93	10/13/93	WMD	0	SOR	Seminole	1,600.00
WMD/Spencer/Leeper	1/7/92	8/18/95	WMD	2	Mitigation	Seminole	120.00
WMD/Spencer/Leeper	3/2/00	9/6/01	WMD	3	Mitigation/WMD	Seminole	68.00
WMD/Yarborough	2/4/08	6/30/08	WMD	0	Florida Forever/ FDOT Mitigation	Seminole	5,187.90
Sovereign Land						Seminole	42.49
<b>TOTAL ACRES</b>							<b>10,278.87</b>
<b>WMD</b>							<b>8,589.55</b>
<b>CARL MGT. ACRES</b>							<b>1,646.83</b>
<b>Sovereign Land</b>							<b>42.49</b>

**CARL** = Conservation and Recreation Lands  
**DOF** = Division of Forestry  
**P2000** = Preservation 2000  
**SOR** = Save Our Rivers  
**WMD** = St. John's River Water Management District

**4. Degree of Title Interest Held by the Board**

The BOT holds fee simple title to the Bothers, Snowhill, Wieckhorst, and the north portion of the Demetree parcels. The SJRWMD holds fee simple title to the Kilbee,

Jones, Spencer-Leeper, Yarborough, and the south portion of Demetree parcels. Management of the SJRWMD parcels is assigned to the DOF under lease agreement #1538. Lease Agreement #3958 provides authority for the DOF to manage the BOT portion of LBESF. Copies of these documents and related deeds are on file at the Division of Forestry office in Tallahassee and the LBESF headquarters.

**5. Proximity to Other Public Resources**

Lands managed by State, Federal or Local government for conservation of natural or cultural resources that are located within approximately twenty miles of the LBESF include:

<b>TRACT</b>	<b>AGENCY</b>	<b>DISTANCE</b>
Geneva Wilderness Preserve	Seminole County	Adjacent N
Buck Lake Conservation Area	SJRWMD	Adjacent E
Seminole Ranch Conservation Area	SJRWMD	1 mile E
Mills Creek Tract	USFS	2 miles SE
Charles H. Bronson State Forest	DOF	3 miles S
Lake Jesup Conservation Area	SJRWMD	3 miles NW
Econ River Wilderness Area	Seminole County	5 miles S
Chuluota Wilderness Area	Seminole County	5 miles SE
Lake Proctor Wilderness Area	Seminole County	5 miles N
Brevard Coastal Scrub Ecosystem CARL Proj.	FWC	6 miles E
Lake Monroe Conservation Area	SJRWMD	7 miles N
Lake Jessup Wilderness Area	Seminole County	7 miles NW
Spring Hammock Preserve	Seminole County	8 miles NW
Orlando Wilderness Park	City of Orlando	11 miles SE
Hal Scott Regional Preserve	SJRWMD	12 miles S
Turnbull Hammock Conservation Area	SJRWMD	15 miles NE
Merritt Island National Wildlife Refuge	USFWS	15 miles E
Blackbear Wilderness Area	Seminole County	16 miles NW
Markham Wood Trails	DRP	16 miles NW
Wekiva River Conservation Area	SJRWMD	16 miles NW
Lower Wekiva River State Preserve	DRP	17 miles NW
Rock Springs Run State Reserve	DRP	17 miles NW
Tosohatchee State Reserve	DRP	17 miles SE
St. Johns National Wildlife Refuge	USFWS	17 miles SE
Seminole State Forest	DOF	18 miles NW
Wekiva Springs State Park	DRP	20 miles NW

TRACT	AGENCY	DISTANCE
Canaveral Marshes Conservation Area	SJRWMD	20 miles NE
Canaveral National Seashore	NPS	20 miles NE
Econlockhatchee Sandhills	SJRWMD	8 miles SW

**DRP** - Division of Recreation and Parks  
**DOF** - Division of Forestry  
**NPS** - National Park Service

**USFWS** - United States Fish and Wildlife Service  
**SJRWMD** - St. Johns River Water Management District  
**USFS** - United States Department of Agriculture, Forest Service

**6. Aquatic Preserve/Area of Critical State Concern**

The property is not within an aquatic preserve, is not a designated area of critical state concern and is not under study for such designation.

**B. Acquisition Information**

**1. Land Acquisition Program**

Properties acquired by the SJRWMD under the “Save Our Rivers” Program (SOR) include the south half of Demetree Tract and the Kilbee Tract for a total of 2,700.04 acres. The Bothers, Snowhill, and northern half of the Demetree parcel, a total of 1,641.13 acres, were acquired with CARL funds. Preservation 2000 funds were used to purchase the Jones, Husway and Wieckhorst parcels (a total of 519.3 acres). SJRWMD recently acquired the Spencer/Leeper parcel (188 acres) as part of a mitigation project. The Yarborough Tract was purchased by SJRWMD using Florida Forever/FDOT Mitigation Funding (5,187.9 acres). The deeds for the Kilbee and Yarborough Tracts include substantial sovereign lands. A complete breakdown of acquisitions is shown in Table 3.

**2. Legislative or Executive Constraints**

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

**3. Purpose for Acquisition**

The majority of the LBESF was acquired as part of the Lower Econlockhatchee Conservation and Recreation Lands Project. The LBESF was identified for acquisition by the SJRWMD in order to protect important water resource and ecological functions; and is recognized as a shared acquisition project with the CARL acquisition program.

The Land Acquisition Advisory Council identified the following goals and objectives to serve as a guide during the preparation of the resource planning boundary for the Lower Econlockhatchee:

- Contains naturally occurring and relatively unaltered flora or fauna,
- Protection of natural floodplain, marsh, or estuary,
- For use as state parks, recreation areas, public beaches, state forests, wilderness areas, or wildlife management areas.

The following conceptual land management goals are established for the management units of the central region of the St. Johns River which LBESF is a part:

- To preserve the natural floodplain for flood control and protection,
- To preserve and restore natural hydrology and native ecological communities, and to maintain or enhance species diversity for fish and wildlife,
- To provide opportunities for public recreation where compatible with above goals.

The Econ-St. Johns and Lower Econlockhatchee projects were combined to create the Econ-St. Johns Ecosystem in 1994 with the purpose of adding to conservation lands already on the river, protecting habitat for wildlife and rare plants, preserving several archaeological sites, and providing the public opportunities for canoeing, fishing, hunting, and other recreation.

The LBESF is to be managed in accordance with the multiple-use management concept to restore, maintain, and protect in perpetuity all native ecosystems; to integrate compatible human use; and to insure long-term viability of populations and species considered rare. Management activities will also stress enhancement of the abundance and distribution of threatened and endangered species.

#### **4. Designated Single or Multiple-Use Management**

The LBESF is designated for multiple-use management and is managed under the authority of Chapters 253 and 589, Florida Statutes. Multiple-use management includes, but is not limited to, silvicultural management, recreation, wildlife management, archeological and cultural resource management, ecosystem restoration, environmental education and watershed management. The goals of the DOF are to restore, protect and manage ecosystems, to restore and maintain biological diversity, and to integrate public use through multiple-use of the forest resources. Local demands and geographical features influence the array of uses to be applied to each area of the forest.

Only uses compatible with the conservation of LBESF and its ecosystems will be implemented. Forest management practices should ensure that all resources of the forest are sustained for the future. Sustainable forest management will be practiced to ensure long-term forest health.

#### **5. Alternate Uses Considered**

The following uses were considered and determined not compatible during this ten year planning cycle: water resource development projects, water supply development projects, storm-water management projects, cellular or communication towers, off-highway vehicles for recreation, and linear facilities, except as otherwise outlined in this plan. Deadhead logging is not compatible, and is not considered an appropriate use within or adjacent to the state forest boundaries. Although no water resource projects are being considered at this time on SJRWMD-owned lands within LBESF, they should not be precluded.

**6. Additional Land Needs**

There are numerous parcels of land immediately adjacent to the property which should receive priority for acquisition because they would benefit the management of the property. The DOF will work with these property owners, on a willing seller basis, in an effort to acquire these parcels. Properties considered important include the Big Oak Ranch LP and Le Fevre Daniel J. Trustee properties that are east of the Bothers Tract at the state forest, and the properties northeast of Snowhill Road (Ed Yarborough Ranches Inc. and Kilbee Ranches LLC). Purchasing of additional land, within the optimal management boundary (Exhibit B) would facilitate restoration, protection, maintenance, and management of the natural resources on LBESF. The DOF will encourage the SJRWMD's acquisition staff to emphasize the purchase of specific parcels that will provide for ecosystem links and recreational trail connections.

**7. Adjacent Conflicting Uses**

During the development of this management plan, DOF staff identified and evaluated adjacent land uses; reviewed current comprehensive plans and future land use maps in making the determination that there are currently no known conflicting adjacent land uses. Additionally, DOF staff met with adjacent land owners and maintains liaison with those land owners to ensure that any conflicting future land uses may be readily identified and addressed.

DOF welcomes the opportunity to meet with any adjacent property owner(s), prospective owner(s), or prospective developer(s) to discuss methods to minimize negative impacts on management, resources, facilities, roads, recreation, etc. DOF also looks forward to hearing/sharing ideas on how the property owner(s)/ developer(s) may develop the property adjacent to the shared property line, and perhaps provide buffers to minimize encroachment into the forest and to reduce any management impacts.

Adjacent residential areas south of the Bothers parcel and adjoining county roads may hinder burning on this forest due to smoke management concerns.

**8. Surplus Land Assessment**

All the property is consistent with and appropriate for the management approach that is being taken with the property, and none of the property should be declared surplus.

**C. Agency & Public Involvement**

**1. Responsibilities of Managing Agencies**

The DOF is the lead agency responsible for the overall management of LBESF. The FWC, a cooperating agency, is responsible for enforcing hunting regulations, setting hunting season dates with DOF input, and conducting other wildlife management activities. SJRWMD was involved in the development of this management plan and any permanent alterations to SJRWMD-owned parcels require SJRWMD approval.

The (DHR) provides expertise concerning the archaeological and historical resources on the forest as stated in Section 267.061 (2)(d), F.S. The DHR will be notified prior to the initiation of any ground disturbing activity by DOF or any other agency involved with this forest. Ground disturbing activities not specifically covered by this plan will be conducted under the parameters of the ARC/Division of State Lands Approved Interim Management Activities.

The SJRWMD has assigned management authority of the South Demetree, Kilbee, Jones, and Spencer Leeper parcels to DOF through Lease #1538. Recently SJRWMD has assigned management authority of the Yarborough parcel to DOF through Lease #013901. The SJRWMD will be consulted and involved in matters relating to water management and hydrological restoration on LBESF.

**2. Public and Local Government Involvement**

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

The plan was developed with input from the LBESF Management Plan Advisory Group through a process of review and comment. The advisory group also conducted a public hearing on April 8, 2010 to receive input from the general public. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in Exhibit C. The Acquisition and Restoration Council review of the plan also serves as an additional forum for public review of the plan. The plan will also be approved by SJRWMD's Governing Board after ARC approval.

**3. Compliance With Comprehensive Plan**

This plan was submitted to the Board of County Commissioners in Seminole County for review and compliance with their local comprehensive plan (Exhibit D).

**III. RESOURCE SECTION**

**A. Past Uses**

Based on reports prepared by DHR's Bureau of Archaeological Research, Native American camps and turpentine camps are believed to have been on portions of the property. According to local historians, an old military road between Fort Mellon and Fort Christmas paralleled what is now Snowhill Road. At one time, a railway (Florida East Coast Railway) traversed the property; that alignment is now used as a recreation trail, managed by Seminole County and maintained by the Florida Trail Association. A large portion of the Demetree, Yarborough and parts of the Kilbee and Bothers parcels were cleared and planted with improved pasture grasses. Cattle operations were active on these parcels prior to SJRWMD and State acquisition. Bahia sod and timber was harvested from the property. No other previous agricultural or silvicultural uses are known. Land uses surrounding the site include small cattle and horse farms to the north



and west. These areas are being converted to low-density residential housing. Development is occurring outside the City of Oviedo and is moving east toward LBESF.

## **B. Renewable and Non-Renewable Resources**

### **1. Soil Types**

The USDA Soil Survey of Seminole County, Florida identifies the soil types on LBESF (Exhibit E). They generally fall into three categories: Ridge and Upland Soils; Flatwoods, Slough, and Depression Soils; and Floodplain, Depression, and Swamp Soils.

### **2. Archaeological and Historical Resources**

The Florida Department of State, Division of Historical Resources (DHR) undertook an archaeological survey of the Demetree parcel in 1994. DHR staff conducted field surveys in the spring and fall of 1999 and again in spring of 2000. Two archaeological sites have been identified on the Kilbee Tract, Cabin Mound (SE19) and Twin Tree Mound (SE1173). Recent surveys identified two new sites on the Demetree parcel (SE1748) and Spencer-Leeper parcel (SE1749). With the addition of the Yarborough Tract, a recent search of DHR's Master Site File resulted in ten known sites.

The Cabin Mound Site (SE19) locally known as the Steinmetz Mound is located on land that was formally a part of the Kilbee Trust parcel. It is a prehistoric mound approximately 200 meters by 100 meters in size. The site is clearly visible to anyone who passes by. Although this Tract is open to the public for hunting and hiking, the area is not readily accessible and vandalism is not anticipated.

The Twin Tree Mound (SE1173) is a prehistoric midden located on a small hammock island within the St. Johns River floodplain. It is a freshwater snail and mussel shell midden with abundant faunal remains. The site covers an area of approximately 30 square meters.

The Florida East Coast Railway (SE1748) is an early 20th century railroad and rail bridge, which is located on the Demetree parcel within the LBESF. A portion of the rail bridge (pilings) is still extant across the river.

The Long Celery Farm (SE1749) is a 1930s era celery farm located on the Spencer-Leeper parcel. These celery farms were usually about three acres in size and had an uncommon drainage and irrigation system that utilized artesian wells and terra cotta tiles.

#### **Yarborough Tract Sites:**

Palmer Taylor/Shapfield Mound (SE00018) is in a hammock surrounded by prairie. It is a prehistoric shell midden that may contain unmarked human remains. It is from the Orange time period.

Tozzer (SE00020) is a prehistoric shell midden from the St. Johns 2 A.D. 800-1500 time period.

Buzzard Roost/Heffer Mound (SE00021) is a prehistoric shell midden located on the floodplain. It is from the Orange time period.

Great Kilbee Mound (SE01165) is an intact large undisturbed multi-component mound/midden complex. It is predominately mussel shell. It is from the Orange through the St. John's 2 time period.

Yarborough Isolate (SE01166) is a land terrestrial site which is from a transitional time period from 1000 B.C. – 700 B.C.

Pig Island Mound (SE01167) is a small, elevated floodplain snail and mussel shell midden, has abundant fauna and is disturbed from erosion. It is from the Orange time period.

Hog Island Mound (SE01168) is a small, elevated floodplain snail and mussel shell midden with abundant fauna and is disturbed from erosion. It is from the St. John's 1 (700 B.C. - 800 A.D.) time period.

Catfish Mound (SE01169) is a small, elevated floodplain midden and is very disturbed from erosion. It is from the St. John's 1 (700 B.C. – 800 A. D.) time period.

Yarborough Mound (SE01170) is a large intact 2nd terrace snail and mussel midden. It is from the Orange, St. John's 1 & 2 time periods.

Yarborough Road 2 (SE01171) is a small snail and mussel shell midden on elevation near upland spring, cultural affiliation unknown.

The results of the survey indicate that other archaeological and historic sites are likely to occur in the LBESF. The DHR suggests that there is a reasonable probability of properties of historical or archaeological value to occur within the state forest property. The Florida Bureau of Archaeological Research developed an inventory and assessment report of cultural resources on LBESF. This document is on file in the Forester's office.

The DOF will comply with the procedures outlined in "Management Procedures for Archaeological and Historic Sites on State Owned Lands" (Exhibit K) and all appropriate provisions of Florida Statutes 267.061(2). The DHR will be contacted before any significant ground disturbing activities are conducted on the forest.

### **3. Water Resources**

Approximately 16 miles of the Econlockhatchee River, a blackwater stream, bisects the state forest. The St. Johns River borders the east boundary of the Kilbee Tract

and the Yarborough Tract. Portions of both the Econlockhatchee and St. Johns Rivers are designated as Outstanding Florida Waters (OFW), and 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. In addition there are several depressional ponds located throughout the mesic flatwoods.

**4. Fish and Wildlife**

Areas cleared for pasture have altered the habitat value for native wildlife. However there are several natural communities such as bottomland forest and xeric hammocks that are in relatively good condition. Many game and non-game species inhabit the various natural communities and disturbed sites found throughout the forest (Exhibit F). The Econlockhatchee River and a few of the depressional ponds contain many fish species. Exhibit F also lists the fish species known to be associated with the Econlockhatchee River and its tributaries.

**5. Endangered or Threatened Species**

There are twenty-five animals and fourteen plant species with listed status that occur on this forest. Presence of listed species is based on information compiled from FNAI tracking records (Exhibit G) and FWC (Exhibit F) as well as field observations by the Audubon Society, the SJRWMD and the DOF. The following listed species were identified:

**Table 4. Endangered or Threatened Species on LBESF**

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
<b>Reptiles</b>					
Alligator	<i>Alligator mississippiensis</i>	LT (S/A)	LS	G5	S4
Eastern indigo snake	<i>Drymarchon corais couperi</i>	LT	LT	G4 T3	S3
Gopher tortoise	<i>Gopherus polyphemus</i>		LT	G3	S3
<b>Amphibians</b>					
Gopher frog	<i>Rana capito</i>		LS	G4	S3
<b>Mammals</b>					
Sherman's fox squirrel	<i>Sciurus niger shermani</i>		LS	G5 T2	S2
<b>Birds</b>					
American kestrel	<i>Falco sparverius paulus</i>		LT	G5 T3 T4	S3
American redstart	<i>Setophaga ruticilla</i>			G5	S3
Am. Swallow-tailed kite	<i>Elanoides forficatus</i>			G5	S2S3
Bachman's sparrow	<i>Aimophila aestivalis</i>			G3	S3
Bald eagle	<i>Haliaeetus leucocephalus</i>			G5	S3
Black Skimmer	<i>Rynchops niger</i>		LS	G5	S3

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
<b>Birds (cont'd)</b>					
Crested Caracara	<i>Caracara plancus</i>	LT	LT		
Florida sandhill crane	<i>Grus canadensis pratensis</i>		LT	G5 T2 T3	S2 S3
Glossy Ibis	<i>Plegadis falcinellus</i>			G5	S2
Great egret	<i>Casmerodius albus</i>			G5	S4
Least Tern	<i>Sterna antillarum</i>		LT	G4	S3
Limpkin	<i>Aramus guarauna</i>		LS	G5	S3
Little blue heron	<i>Egretta caerulea</i>		LS	G5	S4
Osprey	<i>Pandion haliaetus</i>		LS	G5	S3 S4
Short tailed Hawk	<i>Buteo brachyurus</i>				
Snowy egret	<i>Egretta thula</i>		LS	G5	S4
White ibis	<i>Eudocimus albus</i>		LS	G5	S4
Wood stork	<i>Mycteria Americana</i>	LE	LE	G4	S2
Yellow-crowned night heron	<i>Nyctanassa violacea</i>			G5	S3

### Plants

Catesby's Lily	<i>Lilium catesbaei</i>		LT		
Garberia	<i>Garberia heterophylla</i>		LT		
Golden leather fern	<i>Acrostichum aureum</i>		LT	G5	S3
Giant orchid	<i>Pteroglossapsis ecristata</i>		LT	G2 G3	S2
Hooded pitcher plant	<i>Sarracenia minor</i>		LT	G3	S3
Nodding pinweed	<i>Lechea cernua</i>		LT	G3	S3
Rain lily	<i>Zephyranthes atamasco</i>		LT	GH	SH
Hand fern	<i>Ophioglossum palmatum</i>		LE	G4	S2
Giant leather fern	<i>Acrostichum danaeifolium</i>		CE		
Butterfly orchid	<i>Encyclia tampensis</i>		CE		
Greenfly orchid	<i>Epidendrum conopseum</i>		CE		
Cinnamon fern	<i>Osmunda cinnamomea</i>		CE		
Royal fern	<i>Osmunda regalis</i>		CE		
Needle palm	<i>Rhapidophyllum hystrix</i>		CE		

**\* STATUS/RANK KEY**

Federal Status (USFWS): LE= Listed Endangered, LT= Listed Threatened, LT(S/A)= Listed Threatened due to similarity of appearance.

State Status (FWC): LE= Listed Endangered, LT=Listed Threatened, LS= Listed Species of Special Concern, CE = Commercially Exploited.

FNAI Global Rank: G1= Critically Imperiled, G2 = Imperiled, G3= Very Rare, G4= Apparently Secure, G5= Demonstrably Secure, SH= of historical occurrence throughout its range, may be rediscovered, T#= Taxonomic Subgroup; numbers have same definition as G#s.

FNAI State Rank: S1= Critically Imperiled, S2= Imperiled, S3= Very Rare, S4= Apparently Secure, SH= of historical occurrence throughout its range, may be rediscovered.

Three of the listed species have federal endangered or threatened status. The endangered wood stork does not presently nest on LBESF and will require no action other than protection while on state land. The threatened indigo snake requires a warm underground place to over winter. Prescribed fire in the uplands will help assure that pocket gophers and gopher tortoises will thrive, and the burrows created by these animals will provide shelter for the indigo snake.

Three former federal candidate species occur on the forest: gopher tortoise, gopher frog, and Sherman's fox squirrel. Habitat for these species will be maintained and enhanced through a regular burn program.

FNAI will be contacted before any significant ground disturbing activities are conducted on LBESF that would potentially impact endangered or threatened species. If rare, threatened and endangered plants and animals are identified on LBESF, field report forms (on file at the headquarters) will be completed and mailed to FNAI. These forms will be completed by the FWC Biologist and DOF Forester.

Five plant inventory surveys were conducted with the assistance of Florida Native Plant Society. These surveys were intended to provide a plant species list for the forest. On-the-ground observations identified the need for prescribed fire management. Environmentally sensitive areas have been identified and mapped and are included in the sensitive areas map which is part of the Fire Plan. This document is on file in the state forest headquarters. Biological surveys should concentrate on high use areas, primarily trail corridors and locations where future impacts could impact established native ground cover. Photo plots have been established on the Bothers parcel and portions of the Demetree parcel. Determination of specific locations and type of surveys will be determined through consultation with the DOF Ecologist, Forester, FWC Biologist and Seminole County Natural Lands Coordinator.

**6. Beaches and Dunes**

LBESF is located in central peninsular Florida. No beaches or dunes occur on the forest.

**7. Swamps, Marshes, or Other Wetlands**

Bottomland forests, floodplain swamps, hydric hammocks, depression marshes and wet flatwoods all occur on the forest. Maintenance of naturally occurring wetland communities is a high priority and will be accomplished through prescribed fire when necessary and a cautious avoidance of activities that would threaten natural hydrology.

Wetland restoration will be coordinated with SJRWMD. Any activities requiring water management district permits will be handled accordingly. Consideration will be given to eliminating ditches created to drain pastures if it can be accomplished without flooding necessary roads, structures or adjacent landowners.

During the years 1999 and 2000, three wetland mitigation projects have been completed by SJRWMD. These projects took place on SJRWMD owned portions of

LBESF, two were on the Demetree parcel, and one was on the Spencer Leeper parcel. The Demetree projects re-hydrated two depressional marshes and a basin swamp that had been altered by the previous landowners. The Spencer Leeper project re-hydrated a basin swamp that had been altered for celery production in the early 1900s. This project also restricts the artificial flow of water into the man-made canal on the Jones East Parcel which runs north to the Econlockhatchee River. SJRWMD staff recently completed monitoring activities for these projects.

#### **8. Mineral Resources**

There are no known commercial mineral deposits in the area.

#### **9. Unique Natural Features**

The primary natural feature in the LBESF is the Econlockhatchee River, an OFW, which flows for 16 miles through the property. Portions of the riverbank rise as much as twenty feet and the terrain slopes quickly from mesic hardwood forest to the edge of the floodplain forest. The St. Johns River is adjacent to the Kilbee and Yarborough Tracts and has been designated by Presidential Executive Order an American Heritage River.

#### **10. Outstanding Native Landscapes**

The state forest contains approximately 254 acres of sand pine scrub and sandhill, which are rare and rapidly disappearing natural communities.

#### **11. Timber Resource**

Overall 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 duplicates natural conditions. Well timed and executed timber harvests play an integral role in the health of forest ecosystems by removing off-site trees to reestablish native species and thinning dense forest stands to improve under-story habitat. This allows for less damaging prescribed burns and improved forest health.

The management of timber resources on the LBESF 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.

A comprehensive inventory of merchantable pine stands was completed in September 1997, following the DOF's established procedure. Based upon the 1997 standing pine inventory and partial updates in 2001, it is estimated that there is approximately 27,906 tons of merchantable pine timber on LBESF. This is comprised of roughly 16,041 tons of pine sawtimber and poles, 11,168 tons of pine pulpwood and 697 tons of pine chip-and-saw. Much of this timber volume, however, exists in areas where harvesting is may not be practical because of swampy conditions. 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 tract will be managed under the multiple-use concept. Management activities will include restoration, maintenance, and protection of all native ecosystems (prescribed burning, silvicultural management, wildlife management, soil, and water resources protection, etc.); integration of compatible human uses (recreation management); and ensuring long-term viability of populations and species considered endangered, threatened, or of special concern. Existing and planned uses are as follows:

##### **1. Property Boundaries Establishment and Preservation**

All of the LBESF boundaries have had signs posted according to DOF boundary marking specifications. Perimeter fence is maintained to limit vehicle access by the general public. The state forest boundary lines will be maintained by periodic clearing, repainting and reposting, and placement of state forest boundary signs by DOF personnel.

##### **2. Soil and Water Protection**

Currently, there are no known soil or erosion problems on LBESF. If problems do arise, corrective action will be implemented by DOF staff under the direction of the DOF's Forest Hydrology Section. All forest management activities will be conducted so as to meet or exceed standards outlined in the current Silviculture Best Management Practices (BMPs) Manual, as well as the Econlockhatchee Protection Ordinance. In addition, to the greatest extent practical, areas within any special management zone designated as a primary zone will be managed as a no-cut zone. A primary zone provides water quality protection to adjacent water bodies by maintaining shade, and by reducing the disturbance to ground cover vegetation and leaf litter (Source: Florida's Silviculture Best Management Practices Manual) Any timber harvesting within these no-cut zones will be limited to operations that are in association with ecological restoration, wildlife habitat enhancement practices or natural disaster salvage cuts.

LBESF falls within the jurisdiction of the SJRWMD. The DOF will coordinate with SJRWMD, as necessary, on activities pertaining to water resource protection and management. Any activities requiring water management district permits will be handled accordingly. The DOF will work with the SJRWMD to monitor levels and quality of ground and surface water resources and to address hydrological restoration. Existing monitoring wells of varying depths are located on the Demetree Parcel and are maintained by SJRWMD to monitor ground water. A total of five free flowing wells have been inventoried and plugged on the state forest by SJRWMD. These wells were from the previous landowners and were most likely used for farming operations.

Fallen trees and logs in the Econlockhatchee River are important for biological productivity within these water systems. The fallen trees help to provide habitat for wildlife by providing places for fish to rest out of the main current, breeding sites and habitat diversity throughout the river. Limited cutting of fallen trees and logs will be done to permit access by canoes and small boats for recreation, law enforcement and exotic aquatic plant control. Cut material will not be removed from the water.

### **3. Roads**

There are no improved roads located on LBESF, however several forest roads exist. There are approximately twenty miles of forest roads. Forest roads consist of existing two-trails, old farm roads, disked fire lines, and the entrance road to the LBESF headquarters and boardwalk. They are used as service roads to support management activities, cattle leases on the Yarborough and Kilbee Tracts, and provide the public walk-in access. Some are also part of the recreational trail system. With the exception of the hunting season on the Kilbee and Yarborough Tracts, public vehicle access is not permitted because the roads are not improved and are seasonal. Hunters are allowed to park along designated roads on the Kilbee and Yarborough Tracts.

No new roads are planned for the next ten years. Development and construction of roads in newly acquired parcels will be kept to the minimum required to provide access for resource-based recreation activities and to administer and manage the forest. All road planning, construction, drainage and maintenance will be reviewed by the DOF, DHR, FNAI, SJRWMD, and ARC.

There is an existing culvert that was installed for emergency logging activities related to the Southern Pine Beetle infestation. Low water crossings with Geoweb stabilizer and gravel are also planned for installation in five different areas.

### **4. Recreation Management**

#### **a. Existing Facilities/Infrastructure/Recreational Activities**

##### **i. Public Access and Parking**

Two primary paved roads border the LBESF. County Road 426 borders the northwest portion of the forest while Snowhill Road bisects the forest from north to south. State Road 46 borders the north portion of the Kilbee Tract. Public access has been limited to four key points around the perimeter of the forest, including the primary entrance off of Snowhill Road (Exhibit H). All access points are accessible via existing paved roads. The interior of LBESF consists of approximately twenty miles of woods roads that are in fair to poor condition. Vehicles are prohibited from driving into the state forest beyond the trailheads, except by special permit or DOF staff maintenance/service.

A primary entrance road (shell based, but engineered and permitted for asphalt) has been constructed off Snowhill Road. A state forest headquarters sign has



been erected at this entrance. Recreation area signs with recreation logos have been established on the Jones East, Demetree, and Kilbee parcels. To provide for safer ingress and egress, all access points have been upgraded with paved aprons and the lesser-used Kilbee trailhead was improved with shell.

Parking areas have been established on the Kilbee Tract and on the shell road at the forest headquarters/canoe pick up point. The parking area on the Kilbee Tract has been upgraded with shell for better access. These parking areas should be considered for incorporation into future Eco-Tourism group activities.

On the main shell road to the forest headquarters, a parking area has been developed at the end of the circle road near the river for better access to the canoe takeout/boardwalk. This parking area will accommodate ten vehicles. Additionally, a loading zone has been established for the canoeist to bring their gear to their vehicles. A second parking area has been constructed near the headquarters building and will accommodate up to eighteen vehicles, including one handicapped vehicle.

ii. **Self Service Pay Stations**

Self Service Pay Stations were set up at the three major trailheads within LBESF. The pay stations are located at the Equestrian Trailhead, Jones East Bike Trailhead, and the Barr Street Hiking Trailhead (Exhibit H). While these sites have limited facilities, the fees are in line with those charged by other agencies and are in compliance with the legislative emphasis on charging user groups to help offset the cost of managing public lands. Fee collection has been authorized by 589.011(3) FS and Section 5I-4.004(1) F.A.C. Fees for recreation have been calculated to be within the reach of the average visitor without putting an undue hardship on any segment of the population.

iii. **Recreation Facilities**

Existing facilities and improvements on the forest include four parking and walk-in access points: Barr Street hiking trailhead is located off of State Road 426. The river boardwalk, main forest entrance and equestrian trailhead can be accessed off of the main Snowhill Road entrance. The Jones East mountain bike trailhead is located one mile south of the equestrian trailhead along Snowhill road. State Road 46 accesses parking and hunting on the Kilbee Tract. Informational kiosks are located on the following trailheads: Barr Street hiking, Jones East biking, the Snowhill Road equestrian. River access has been improved for canoe takeout or river viewing with the construction of a 200-foot boardwalk. A pavilion is located along the Culpepper Bend on the Econlockhatchee River which flows through the Yarborough Tract. Exhibit A2 shows all recreation facilities and other infrastructures improvements.

iv. **Recreational Trails**

In order to provide a quality trail experience to trail users and minimize user conflicts, each trail is designated as a "Single-Use Trail". Trail maps have been

developed and are shown in Exhibit H. LBESF is also part of the Florida National Scenic Trail (FNST) system. The FNST is established on the Jones West parcel, and uses existing trails on the Demetree parcel. The Florida Trail Association has developed a trail segment that accesses the area from the south along an old abandoned railway line (Florida East Coast Railway, owned by Seminole County) and loops through the state forest on the Demetree parcel. The total distance of hiking trail is ten miles. The Florida Trail Association extended the FNST through the Jones East and Bothers Tract at the LBESF and connected the trail to the U.S. Forest Service property southeast of the forest.

Until it was disbanded, the Florida Off Road Bicycle Association club established and maintained the mountain bike trails on the Jones East parcel. Currently the bike group called Lets Ride assists in trail maintenance. The total length of mountain bike trail is approximately nine miles.

The Florida Trail Riders horse club has assisted in the layout and establishment of the equestrian trail, which totals ten miles. The equestrian trail follows the northeast portion of the Demetree parcel for a short ride, and parallels CR 426 on the north side of the Demetree parcel. The trail loops east along the edge of the hammock toward the equestrian trailhead and crosses Flager Trail, which Seminole County manages as a multiuse trail. This provides more trail opportunities for users and connects with the Geneva Wilderness Preserve, a county owned parcel north of the state forest. The level of use is moderate to low on all the trails, with high usage on the mountain bike trails on weekends. DOF staff is conducting informal monitoring of usage impact.

v. **Camping**

Two group campsites have been established near the Barr Street hiking trailhead. LBESF has a camping area that is along the north side of the Econlockhatchee River and along the hiking trail between Barr Street trailhead and the Flager Trail that crosses the Econlockhatchee River (Exhibit H). The larger group sites have been developed for recreational groups of less than thirty users. Special Use Permits are required for all group camping and individuals who park overnight at the Barr Street Trailhead and walk into the camp area. Fees are charged for overnight camping.

vi. **Multiple-Use Field**

Due to the requests from various users, a multiple-use field was designated at the Barr Street trailhead (Exhibit H). This ten-acre open site is available for primitive group camping, glider clubs, Boy Scout troops, and other organizations by reservation through the state forest headquarters.

vii. **Hunting and Fishing**

Hunting is permitted on the Kilbee and Yarborough Tract of the LBESF and managed by the FWC under the specific regulations of a Wildlife Management Area. Hunting on the forest will be scheduled annually through a cooperative

effort between the DOF and the FWC. Specific season, quotas, and bag limits will be agreed upon between the two agencies at the annual meeting in Tallahassee following a meeting and recommendations from local DOF/FWC staffs.

viii. **Environmental Education/Ecotourism**

Environmental education on LBESF has been conducted through guided tours and hands-on activity events. Targeted groups have included the general public, and youth groups and various user groups. Efforts will be made to coordinate State Forest and eco-tourism information with Seminole County Tourist and Convention Bureau, using opportunities such as Internet links and sharing forest publications.

ix. **Visitor Center**

An office/visitor center with interpretive displays, thirty seat community room, and public restrooms was completed in April 2000. This complex will serve as the main entrance to the state forest and is located in an old pasture. A picnic shelter was constructed to accommodate schools and other large groups of people.

b. **Planned Recreational Activities**

The Yarborough Tract will be evaluated during this ten year planning cycle to determine which recreational activities can take place and the best locations for the trails and parking areas that will have minimal impact on ecosystems.

i. **Public Access and Parking**

Sites for parking areas will have to be determined as the need arises. Public ingress/egress should be limited to a few designated sites to limit disturbance and to increase safety. Areas should be large and stable enough to allow easy maneuvering by large vehicles such as fire control transports and horse trailers. Parking areas will be employed as trailhead access points to areas within the forest. In concentrating and disseminating recreational use from these sites the construction of infrastructure including restrooms, pavilions, and kiosks needs to be evaluated and built when needed.

ii. **Recreational Trails**

Forest managers will focus on assessing the need for additional trails and possible routes that will highlight LBESF natural attributes in this 10-year planning period. Trails will be designated and developed with user-group input to the greatest extent possible.

Eventually if access issues are addressed, the Florida National Scenic Trail will be routed from the Orlando Wetlands Parks in Orange County through the new Charles H. Bronson State Forest and then across the southern part of the Yarborough Tract of the Little Big Econ State Forest. Once the trail is routed through the southern part of the

Yarborough Tract it will then cross the Econlockhatchee River by using a suspension bridge for walking access only. The trail will then be routed west along the river on the north part of the Yarborough Tract of the Little Big Econ State Forest. The trail will finally connect up with the existing hiking trails on the Little Big Econ State Forest near Snowhill Road.

A horse trail that will be established on the Charles H. Bronson State Forest will loop onto the southern part of the Yarborough Tract of the Little Big Econ State Forest. The trail will be routed to the pavilion on Culpepper bend on the Econlockhatchee River. The DOF will work with the equestrian community and review future equestrian trails on the northeastern portion of LBESF if access issues can be addressed (first 2 years).

Trail use will be monitored for negative impacts through the use of visitor sign-in boxes, photographic plots and routine observations. Significant ground disturbance may require the closing or rerouting of trails.

### **iii. Camping**

The Yarborough Tract will be assessed for the potential of primitive camping site(s) along the Econlockhatchee River. The equestrian trailhead on Snowhill Road will be assessed for the potential of overnight equestrian camping at the trailhead.

## **5. Fire Management**

The DOF utilizes a comprehensive fire management program on state forests that includes prevention, detection, suppression and prescribed burning. Prescribed fire is the primary tool utilized for resource management on this forest. The long-term goal of prescribed burning is to simulate, as closely as possible, a natural fire regime in which the majority of acres are burned during the lightning season (April – September). Such fires are needed to reduce the height and cover of woody shrubs; stimulate the recovery of the native herbaceous and grassy ground cover; promote the regeneration of native pines; reduce disease; and maintain and enhance populations of fire-adapted threatened and endangered species. When habitat conditions dictate, mechanical treatment such as mowing, chopping or other means of vegetation removal may be required to facilitate safe burning. Lightning season burns will be utilized to the greatest extent feasible on all tracts. Areas with heavy fuel levels will receive sufficient dormant season burns to ensure they can safely support growing season burns. This, along with fire prevention education, will be used to help limit the impacts of wildfire.

Approximately 4,360.7 acres (or 42 %) of LBESF vegetative communities are fire dependent. Primary detection and suppression of wildfires will be the responsibility of DOF under the direction of the District Manager. Personnel and equipment from

the Orlando District will be used for pre-suppression practices, establishment of firebreaks, rehabilitation of existing fire lines, construction of new fire lines, maintenance of perimeter firebreaks, and prescribed burning. All firebreaks will be harrowed, if possible.

Prescribed fire is required on approximately 1,246 acres per year with an average fire return interval of approximately 3.5 years. Perimeter firebreaks have been established around portions of the Demetree parcel. Additional perimeter lines will be installed as deemed appropriate by state forest staff. Areas requiring perimeter lines will be inspected for threatened and endangered species by DOF and FWC biologist prior to installation. Placement of new pre-suppression fire lines will be carefully reviewed by state forest field staff and fire lines will be developed so as to avoid sensitive areas.

In using prescribed fire in the various pyric communities on this forest, it is important to understand the ecological richness of the ecotones that divide them - especially those margins between wetland and upland communities. Every effort will be made to avoid the construction and/or maintenance of pre-suppression fire lines in these environmentally sensitive areas. 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. loblolly-bay) into the adjacent, more mesic communities.

Wetland communities, such as fresh water 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 fire 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 and smoke management problems, consideration will be given to delaying prescribed fire. When proceeding with burning in these conditions, and fire lines are required, these exclusion lines should be located well out of the ecotone (minimum of 100 feet) and up in the more mesic community type. These exclusion lines will be used only in areas highly susceptible to muck fires. Pre-suppression or prescribed fire control lines should avoid sensitive seepage slopes adjacent to swamps and in any other area that would disrupt the natural hydrology. These control lines will be harrowed, if possible.

All guidelines, as outlined in the DOF's Fire Management Policy, will be used on the forest. Fire and smoke management is critical on LBESF due to its location in a populated, urban area, and surrounding development. The smoke screening system will be used as a smoke management tool; small burn units are vital to minimize the adverse impact of smoke. Silviculture Best Management Practices for fire line construction as presented in the DOF's BMP Manual will be followed for all pre-suppression fire line plowing.

A comprehensive fire management plan has been developed for LBESF and is on file at the LBESF headquarters. This plan will be reviewed annually and amended as needed, based on current resource burning conditions and past year's accomplishments. State forest staff will conduct pre-burn and post-burn evaluations, essential elements to a successful prescribed fire program. Monitoring levels will vary from burn to burn, based on burn objectives.

**6. Silvicultural Guidelines & Forest Resource Management Objectives**

Timber is a valuable economic resource, and timber harvesting for the purposes of biological restoration and improving forest health are recognized silvicultural objectives on state forests.

**a. Objectives**

The following objectives or strategies will be applied to silvicultural practices on LBESF:

- i.** Maintain ecosystem quality through the use of prescribed fire.
- ii.** Restore and enhance sandhill & scrub communities utilizing established methods and methods developed through research.
- iii.** A gradual shift over time from even-aged longleaf pine management to uneven-aged longleaf pine management will be utilized to create a forest that exhibits old growth characteristics and that yields multiple ecological benefits.
- iv.** Improve, maintain and protect in perpetuity all native ecosystems.
- v.** Ensure the long-term viability of populations and species considered rare, endangered, threatened, or of special concern.
- vi.** Maintain a sustainable silviculture management program that enhances the natural diversity of the state forest with minimal environmental impact.
- vii.** Restore native pine species and ground cover to ecosystems currently dominated by non-native grass species.
- viii.** Maintain and protect water quality and aquatic resources.

**b. Silvicultural Operations**

The forest will be managed to promote and 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.

Prescribed fire and mechanical chopping will be the primary methods of site preparation prior to tree planting. Artificial regeneration, through mechanical or hand planting, will be used to restore old sand pine plantations to productive and diverse longleaf pine communities. On sites where herbicides are necessary (due to past fire exclusion), applications will be limited to achieve the desired effects

on all site species. Stands that have been treated with herbicides will leave residual oaks to benefit wildlife.

Thinning, group selection, shelterwood, and clear-cutting will all be necessary for maintenance and restoration of timber stands and communities.

**c. Timber Sales**

A salvage sale was conducted in 2001 as a result of the Southern Pine Beetle outbreak. Future salvage sales may also be conducted in areas where timber is damaged by fire, disease or other natural disasters. Timber harvesting is planned for this ten-year period covered by this resource management plan on LBESF. Planted pine on the Kilbee Tract will be removed to restore the wet prairie ecosystem. Tree thinning will take place throughout the forest as areas are identified. Some sand pine removal may become necessary as part of scrub habitat restoration. If enough sand pine is removed to support a sale, the timber will be sold under DOF standard timber sale procedures.

If the need arises for timber sales, areas proposed for timber harvests would be routinely surveyed for listed species. All timber sale areas will be inspected, treated and monitored for exotic plants before and after the sale. All harvesting on lands adjacent to lakes, rivers, and wetlands will be carried out in compliance with the public lands section of the current Silviculture Best Management Practices Manual and will be conducted so as to meet or exceed those guidelines.

DOF routinely develops timber harvesting guidelines for each sale on a site-specific basis to minimize damage to sensitive resources. These guidelines address the importance of snags for wildlife habitat, BMP's, special considerations (related to rare and endangered species), limitations on harvesting in wet periods, machinery use, road systems, protection of ground cover, and other items pertinent to a specific site. These items are addressed in the timber sale contract. Silvicultural prescriptions will be developed so as to favor the development of larger and older trees. Natural regeneration would be dependent on the site and species characteristics. Timber sales will follow the guidelines stated in Chapter 6.4 of the State Forest Handbook.

**d. Reforestation**

Currently there are areas of cut-over timberland, old fields and pastures that need to be reforested. These will be addressed in the reforestation plan. Reforestation will be a key component in restoring natural ecosystems. In preparing restoration areas for reforestation, effective site preparation techniques that maximize impacts on desired ground cover species will be utilized. Commercial harvest of non-native bahia grass by private vendors will be the preferred technique. Use of herbicides, scalping, mowing and roller chopping or combinations of the above may be necessary and will be prescribed if their impact on surrounding sensitive ground species will be minimal. Private vendors will be used whenever possible to implement silvicultural prescriptions.

Reforestation plans will be developed for each site on a site specific basis. No reforestation will take place on the Kilbee and Yarborough Tracts until the current active cattle leases have expired. Existing plant communities, listed species, stocking levels, species to be planted, and site preparation techniques will be addressed.

#### **7. Research Projects/Specimen Collection**

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

The DOF's Forest Ecologist must approve all research projects and specimen collections on LBESF before they are initiated. Any requests for research projects should be submitted in writing to the LBESF Senior Forester and Orlando District Manager for forwarding to the Forest Management Bureau for approval. Requests must include a letter outlining the scope, methodology, and location of the proposed project. Requests are subject to review by DOF foresters, biologists, the DOF Forest Ecologist, Entomologist, or Pathologist, as appropriate. Permission to conduct research will require that the investigator provide copies of any reports or studies generated from research projects to the state forest staff. The status of existing projects will be subject to periodic review by state forest staff.

#### **8. Law Enforcement**

The FDACS Office of Agricultural Law Enforcement (OALE) Officer will handle primary law enforcement responsibilities. Wildlife officers from FWC will enforce fish and wildlife regulations, and provide assistance in enforcing state forest rules. The Seminole County Sheriff's Office provides additional law enforcement support.

Special rules of the Department of Agriculture and Consumer Services, DOF (Chapter 5I-4, F.A.C.), have been promulgated for the public use of state lands and control of forest traffic and camping.

#### **9. Wildlife and Fish Management**

Wildlife management will play an important role on LBESF. The forest is designated as a State Forest and Wildlife Management Area and is monitored by the FWC for overall wildlife law enforcement. The FWC recommends season lengths and bag limits with DOF input for game animals and monitors selected game and non-game species populations. Under the terms of the management lease, DOF provides land management and general supervision following the multiple-use management concept. The FWC biologist headquartered in Oviedo has shared responsibility for the biological aspects of managing the wildlife and fish populations.



Hunting on the Little Big Econ State Forest and Wildlife Management Area (WMA) is only permitted on the Kilbee and Yarborough Tracts and is provided through a series of quota hunts. In addition, a small game hunt is open to the public. Game animals include deer, wild hogs, turkeys and small game as outlined in the Little Big Econ State Forest and Wildlife Management Area guidelines from FWC and are subject to change. A special hog hunt may be considered for the management period covered by this plan. The DOF Director must approve all changes in hunting and fishing regulations before implementation by FWC.

In order to enhance wildlife habitat, the following general forest management guidelines will be observed to best meet the needs of both wildlife and the forest resource:

**a. Managing Non-Game Species**

Non-game species will be managed and protected through the restoration and maintenance of native ecosystems found on the forest. Determination of specific locations and type of surveys will be determined through consultation with the DOF Ecologist, Senior Forester, FWC Biologist and Seminole County Natural Lands Coordinator. Research among State and Federal agencies will provide valuable information in determining future management objectives of non-game species.

**b. Sensitive Species**

Specialized forest management techniques will be used, as necessary, to protect or increase endangered, threatened, or species of special concern, as applicable for both plants and animals. Species-specific management plans will be developed when necessary. Continued field observations by the FWC Biologist and DOF Forester will be conducted to determine locations of these species.

Threatened or endangered species that are known to be present on the forest are listed in Section III-B-5. The following management practices are recommended to protect and preserve all such species:

- i.** Locate cover, habitat/foraging ranges and breeding areas used by rare and endangered species and include locations on a GIS vegetation map.
- ii.** Protect and properly manage habitat important to rare and endangered species.
- iii.** Implement other specialized management practices for rare and endangered species as deemed necessary.

**c. Maintained Wildlife Openings**

Forest openings provide important habitat for numerous wildlife species and afford viewing opportunities for the visiting public. The DOF will work with local FWC staff to identify areas to be maintained as natural wildlife openings.

Once identified, the openings will be managed to restore and maintain native species. Openings will be maintained through the uses of management techniques designed to mimic natural disturbances. These techniques may include prescribed fire, mowing or chopping but will not include the planting of non-native agronomic crops. Seasonal timing of treatments will be utilized to favor desirable species. Ecotones will be maintained with fire and ground disturbance will be avoided.

The following guidelines will apply to the management of wildlife openings on LBESF:

- i. Openings may range in size from 1-20 acres in order to maximize benefits to different species
- ii. Openings should be scattered throughout the forest and should be small and widely spaced to benefit more individual animals.
- iii. The shape of openings will be designed to maximize the amount of edge area and transition zones. Openings should be curvilinear rather than straight, and long and narrow instead of short and round.
- iv. Stands with openings should be burned every 2-5 years.
- v. Openings should not be surrounded with firelines.
- vi. Areas with large amounts of shrubs and midstory vegetation, or existing openings that have grown up, may be mowed or roller chopped to re-establish ground cover and reduce competition.
- vii. Control measures will be implemented immediately to control or prevent establishment of invasive exotics.

**d. Hunter Access**

Hunting season dates, limits and methods are established annually by FWC. Access to the Little Big Econ WMA is restricted to seasonally open designated roads as outlined in the WMA brochure printed annually.

**e. Timber Management**

The DOF recognizes the importance of snags for their wildlife value. As a general rule, snags will be left alone in their natural environment, unless they are deemed to be a potential safety hazard. Areas with significant pine timber mortality will be salvaged as required by the severity of the situation.

**10. Non-Native Invasive Species**

The policy of DOF is to locate, identify, and control invasive species. An invasive species control plan will be developed and implemented. Use of appropriate herbicide to control invasive species will be limited to those locations and species where there is no practicable alternative. Prescribed fire and proven mechanical methods will be the preferred method used to control invasive exotics whenever feasible.

Some of the invasive exotic plant species that have been identified on LBESF include cogon grass (*Imperata cylindrica*), Chinese tallow (*Sapium sebiferum*), air potato (*Dioscorea bulbifera*), Brazilian pepper (*Schinus terebinthifolius*), camphor (*Cinnamomum camphora*), and ear pod tree (*Enterolobium contortisliquum*). These six species have high populations and are primarily found in the areas previously converted to agriculture (Exhibit J). Herbicide application has been used to initiate control of cogon grass and Brazilian pepper. Hand removal has been used on air potato, camphor, Ear tree and Chinese tallow.

Over this ten-year period, feral hog monitoring will continue. This species currently has a small population; however, the number can change over a short period of time. DOF and FWC will collaborate on management decisions concerning this species.

All management activities and proposals will be scrutinized for their connection to exotic species. Activities and proposals found to promote invasive exotics would be eliminated or rejected.

#### **11. Insects, Disease and Forest Health**

Forest management practices will be conducted in ways as much as practicable to minimize outbreaks of damaging native insect and disease problems and prevent infestations and impacts of non-native invasive pest organisms (inclusive of insects, pathogens, and non-native invasive pest plants). If outbreaks do occur, operational and strategic plans will be implemented to control any infestations. Specific long range strategies to avoid and/or minimize losses to such outbreaks in the future will be the management objective. State forest management staff will consult with the Forest Health Section to develop scientifically sound responses and/or management prescriptions.

During the spring of 2001, the LBESF experienced a major outbreak of Southern Pine Beetle (SPB) due to the prolonged summer drought. State forest staff interacted with the DOF's Forest Health Section and the Forest Management Bureau to develop and implement a scientifically sound response and management prescription. Currently there are no active beetle spots on LBESF. State forest staff will continue to monitor the sites for future outbreaks.

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 Seminole County will be notified of this designation.

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

## **12. On-Site Housing**

DOF may establish on-site housing (mobile/manufactured home) on LBESF if deemed necessary to alleviate security and management issues. The need and feasibility specific for the state forest will be evaluated and established if considered appropriate by the Center/District Manager and approved by the DOF Director. On-site housing will only be available to individuals approved by the Director. This type of housing will not exceed three homes per location with the possibility of more than one on-site housing location occurring if considered necessary.

Prior to the occurrence of any ground disturbing activity for the purpose of establishing on-site housing, a notification will be sent to the Division of State Lands as well as packages to the DHR and FNAI for review and recommendations. The package will contain a description of the project (location, number of units, type and amount of ground disturbance, affected natural community type and nearby known archaeological or historical sites), maps (topographic and aerial) and photographs of the area.

## **13. Utility Corridors and Easements**

The use of State forest property for utility lines, pipelines, linear facilities and transportation corridors will be discouraged to the greatest extent possible. The placement of these linear facilities in a forest fragments the natural communities. Request for linear facility uses will be handled according to the Governor and Cabinet's linear facilities policy, SJRWMD procedures as outline in 40C-9, and the guidelines stated in Chapter 2.4 of the State Forest Handbook. Currently there is an electrical power line crossing on the Yarborough Tract. The DOF does not consider LBESF suitable for any new linear facilities.

When such encroachments are unavoidable, previously disturbed sites will be the preferred location. When identifying possible locations for new linear facilities, preferred sites are those that will be likely 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 multiple-use activities, such as recreation.

The DOF will further encourage the use of underground cable where scenic considerations are desirable. Easements for such utilities are subject to the review and approval of the BOT.

#### **14. Ground Disturbing Activities**

Although the DOF's approach to handling ground disturbing activities is identified in various sections of this plan, 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 insure that ground disturbing activities will not adversely impact sensitive resources. This includes areas such as archaeological and historical sites, ecotones, wetlands, and sensitive species.

When new pre-suppression firelines, recreational trails, or other low-impact recreational site enhancements are necessary, their placement will be carefully reviewed by state forest field staff and they will be developed so as to avoid sensitive areas. DOF field staff will consult with the State Lands Section of the Forest Management Bureau during the process of planning and implementing multiple-use management activities. For other ground disturbing activities such as construction of buildings, parking lots and new roads DOF will consult with FNAI and DHR.

#### **15. Apiaries**

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

#### **16. Cattle Grazing**

Cattle grazing can be a useful tool in fuel reduction planning and will be evaluated where appropriate. Currently there is a cattle lease on the Yarborough Tract, with a duration of 6 to 15 years, and a cattle lease on the Kilbee Tract, with a duration of 5 to 8 years.

Old farm fields will be evaluated based on reducing succession of woody vegetation. Spread of non-native invasive species, especially torpedo grass and Caesar weed can be exacerbated by cattle grazing in native range. Cattle grazing can introduce additional nutrients into the system, and introduce disturbances that contribute to non-native invasive plant proliferation, and may offer competition to native wildlife foraging on common plant resources.

#### **17. Ground Cover**

Management activities will be designed and conducted to protect and enhance the condition and integrity of the native ground cover. Management techniques, such as prescribed fire in the growing season, will be used to restore, recover and maintain a diversity of native groundcover to the greatest extent practical.

## **18. Restoration**

Like many areas in Florida, fire and hydrology represent the key ecosystem processes. Thus, the LBESF restoration vision focuses on mimicking pre-Columbian fire and hydrologic patterns.

This restoration philosophy has produced three classes of restoration goals: restoring proper fire, hydrology, and species composition. These goals often interact and build upon each other. Specific actions to accomplish these goals are outlined in the natural community management section (IV.B.) of this plan.

### **a. Fire**

Prior to European settlement, fires in Florida generally burned on a landscape scale until stopped by rain, a body of water, or other natural fire barriers. These fires were frequent and burned most often in the lightning season. The combination of pronounced wet/dry seasons and nutrient poor soils produced a pyrogenic flora rich in one-hour and waxy fuels.

Prescribed burning provides numerous benefits to the forest. Many plant and wildlife species are adapted to frequent fires. Wiregrass in particular is dependent on fire. Burning improves wildlife habitat by promoting the growth of tender new vegetation. This new vegetation is utilized by deer, rabbits, and many other animals, while quail and other birds prefer the seeds produced by recently burned plants. Burning opens up the forest and helps control competing vegetation.

Prescribed burning also reduces the chances of detrimental wildfires by reducing the buildup of fuels. An all-season burning program will be established utilizing existing information concerning prescribed fire practices. Whenever possible, roads and natural breaks will be utilized to contain and control prescribed and natural fires.

Management techniques to mirror ancient fire processes include prescribed growing season burns at frequent intervals, burning across ecotones and transition zones, and restoring fuels that carry fire where the understory has been eliminated.

### **b. Hydrology**

A marked wet and dry season coupled with permeable soils and lack of topographic relief results in great extremes of flooding and drought in Florida. Flat land magnifies this problem. Human habitation has made Florida rich in roads, canals, and retention ponds, but poor in sustained historic water flows. Small-scale restoration of individual roads and firelines on the forest is achievable and productive. With the assistance of the DOF Hydrology Section, LBESF staff will evaluate the need for hydrologic management or restoration.

**c. Species Composition**

Ensuring that species vital to ecosystem processes are in place on LBESF is a restoration priority. A continuous pyrogenic ground cover in fire-adapted species is important, as is the presence of longleaf pine. Juvenile longleaf pine tolerates fire earlier than other woody vegetation allowing a shorter fire return interval to coexist with silviculture.

The multiple-use management approach used on LBESF includes the protection of ecosystems through maintenance of habitat conditions suitable for the array of species typically found within the various ecosystems. As restoration proceeds and the habitats on the forest are enhanced, monitoring will be conducted to determine whether there have been any changes in species composition on LBESF.

There are no current plans to reintroduce any species that are thought to have been extirpated from LBESF. 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.

Restoration also includes the control non-native invasive species. Long-term monitoring is vital and will be conducted as staffing and funding allow.

**B. Description of Natural Communities and Proposed Management Activities**

In 2006, the FNAI completed a historic vegetation survey and mapping project for LBESF (Exhibit J). The final results of this survey are summarized below and include a description of the current conditions on LBESF, a description of the desired future conditions and a general description of the management actions that are needed to make the current conditions approach the desired conditions. Currently, an FNAI natural community mapping project has not been completed for the Yarborough Tract. Natural community descriptions of the current conditions, desired future conditions and management actions that are needed to attain desired future conditions on the Yarborough Tract will be appended to the management plan after FNAI completes their survey (scheduled for late 2010) and after the Forester examines the forest communities to determine its current conditions and the actions needed to attain desired conditions.

LBESF has been a highly disturbed tract of land for many years and will require years of thoughtful restoration efforts. Restoration during this ten-year period will begin with prescribed burning and thinning of overly dense pine plantations. Through an adaptive management process, the results of these initial efforts will be monitored and more refined and detailed restoration plans will be made. Fire return intervals are included as guide and but vary depending upon the specific conditions. The intention is to use fire in a manner and frequency that will attain the desired habitat goals. Fire frequency is generally increased or decreased depending upon the conditions of the specific area.

**Table 5. Vegetation Types found on LBESF ±**

<b>Vegetation Type ±</b>	<b>Acres Mapped (Historic) ±</b>	<b>Acres Mapped (Existing) ±</b>	<b>Burn Interval (Years) ±</b>
Mesic Flatwoods	1317	490	2 to 4
Mesic Hammock	761	788	N/A
Wet Prairie	726	591	2 to 3
Floodplain Marsh	400	380	1 to 5
Scrubby Flatwoods	355	283	3 to 8
Hydric Hammock	268	247	§
Wet Flatwoods	201	111	2 to 4
Basin Swamp	173	181	§
Scrub	172	134	6 to 20
Baygall	142	132	§
Depression Marsh	124	123	3 to 5
Basin Marsh	113	100	3 to 7
Blackwater Streams	88	79	N/A
Prairie Hammock	87	124	§
Sandhill	82	48	1 to 3
Dome Swamp	18	20	Varies*
Floodplain Swamp	16	22	N/A
Floodplain Forest	6	12	N/A
Xeric Hammock	4	100	*
Pine Plantation	0	498	1 to 3
Pasture - Improved	0	362	N/A
Pasture - Unimproved	0	164	N/A
Ruderal	0	64	N/A

\* See natural community description below.

§ Prescribed fire in adjacent uplands will be allowed to burn up to the edge of this community.

± FNAI natural community mapping project has not been completed for the Yarborough Tract (5,085 acres).

## **1. Mesic Flatwoods**

### **Desired Future Conditions**

The overstory is characterized by uneven-aged stands of longleaf pine (*Pinus palustris*) interspersed with scattered slash pine (*Pinus elliottii*). There will be at least three age



classes present. Large diameter trees are well represented in the stands with overall stocking in the twenty to one hundred square feet of basal area to the acre range. 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 (*Quercus laurifolia*) and exotics.

Presence of midstory shrubs and vines remain at a frequency and height that allows the formation and maintained health of continuous, species diverse, groundcover. It remains low enough and broken in nature so it will not support stand altering type wildfires. It also allows faunal species such as gopher tortoises, fox squirrels (*Sciurus niger*), deer, and humans the opportunity to freely move throughout the plant communities. Enough light passes through to allow shade intolerant species such as longleaf pine to regenerate. Typical species include saw palmetto (*Serenoa repens*), gallberry (*Ilex glabra*), tarflower (*Bejaria racemosa*), St. Andrew's cross (*Hypericum hypericoides*), rusty staggerbush (*Lyonia ferruginea*), coastalplain staggerbush (*Lyonia fruticosa*), fetterbush (*Lyonia lucida*), wax myrtle (*Myrica cerifera*), winged sumac (*Rhus copallinum*), netted pawpaw (*Asimina reticulata*), dwarf huckleberry (*Gaylussacia dumosa*), blue huckleberry (*Gaylussacia frondosa* var. *tomentosa*), Atlantic St. John's wort (*Hypericum reductum*), fourpetal St. John's wort (*Hypericum tetrapetalum*), Piedmont staggerbush (*Lyonia mariana*), running oak (*Quercus elliotii*), dwarf live oak (*Quercus minima*), and shiny blueberry (*Vaccinium myrsinites*).

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 (*Aristida stricta*), lopsided Indian grass (*Sorghastrum secundum*), blazing star (*Liatis* spp.), *Carphephorus*, *Pityopsis*, and pine lily (*Lilium catesbaei*). Other frequent herbs include bottlebrush threeawn (*Aristida spiciformis*), broomsedge bluestem (*Andropogon virginicus*), coastalplain chaffhead (*Carphephorus corymbosus*), *Dichantheium* sp., *Eragrostis* sp., dogfennel (*Eupatorium capillifolium*), roundleaf thoroughwort (*Eupatorium rotundifolium*), Elliott's milkpea (*Galactia elliotii*), rough hedgehyssop (*Gratiola hispida*), pinebarren frostweed (*Helianthemum corymbosum*), *Helianthemum* sp., Piedmont pinweed (*Lechea torreyi*), beaked panicum (*Panicum anceps*), bracken fern (*Pteridium aquilinum*), blackroot (*Pterocaulon pycnostachyum*), *Rhynchospora* sp., whitetop aster (*Sericocarpus tortifolius*), sweet goldenrod (*Solidago odora*), and Walter's aster (*Symphotrichum walteri*). Vines occur rarely and include yellow jessamine (*Gelsemium sempervirens*), laurel greenbrier (*Smilax laurifolia*), lanceleaf greenbrier (*Smilax smallii*), and muscadine (*Vitis rotundifolia*).

Healthy and sustainable populations of flatwoods animal species (of this latitude) are present throughout the flatwoods community. Indicator species such as Sherman's fox squirrels (*Sciurus niger shermani*) and Bachman's sparrows (*Aimophila aestivalis*) are present throughout. Red-cockaded woodpeckers (RCW) (*Picoides borealis*) are not necessarily present but the habitat is capable of sustaining them.

There are natural ecotones between flatwoods 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 a mixed hardwood forest or wet prairie may exist surrounding a wetland. Ecotones remain elastic and continue to change in shape, location, and size depending upon environmental processes.

The condition of the flatwoods is process driven with the primary process being fire. Nearly all the plants and animals inhabiting these lands are adapted to frequent fires; several species depend on fire for their continued existence. Natural fire frequency in the mesic flatwoods is every two to six 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 hydroperiods 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 Conditions**

Some high quality mesic flatwoods remain on the Bothers and Rivers Edge parcels, however, a major portion of this community has been converted to pasture. The existing flatwoods forest (approximately 490 acres) has a scattered overstory of medium-sized slash pine, pond pine (*Pinus serotina*) and longleaf pines and an understory of saw palmetto, gallberry, grasses, forbs and shrubs. These existing flatwoods have had prescribed fire in the last three to five years and are in good condition.

The majority of historic mesic flatwoods that occurred on the Demetree Tract were converted to pastures many years ago. Scrubby flatwoods with a moderate cover of scrubby oaks may have been part of this conversion. Mesic flatwoods at the edges of baygalls and swamps in the Bothers Tract are usually invaded by loblolly bay (*Gordonia lasianthus*). Areas that are infrequently burned have a subcanopy of loblolly bay, sweetgum, water oak, and/or live oak (*Quercus virginiana*) as well as a greater frequency of vines.

Approximately 1,132 acres of the mesic flatwoods had been converted to pasture. Converted pastures and native range areas were control burned by the previous landowners during the winter season. Three hundred acres of overgrown mesic flatwoods were recently chopped and approximately 250 acres of converted pasture were reforested.

### **Management Actions to Attain Desired Condition**

Prescribed burning will be conducted during the growing season as much as possible with a targeted fire return interval of two to four years. Dormant season burns will be used to reduce heavy fuels and to minimize invasive wax myrtle and saltbush (*Baccharis* spp.) in the old pasture fields. For improved pasture areas covered with exotic grasses and shrubs, longleaf planting and ground cover restoration is necessary. Artificial tree planting and site preparation will be used to establish appropriate stocking densities of

trees. Techniques to establish ground cover will be implemented based on the successes of previous efforts by other land managers, experimental techniques, and available funding.

The majority of exotic plants identified on LBESF are primarily found in these old agriculture fields. DOF staff will continue to locate, identify, and control these invasive exotic species.

The potential for Bahia sod removal exists on some of the mesic flatwood sites. Sod removal would be a one-time event used to remove the exotic grass and as site preparation prior to restoration plantings.

## 2. Mesic Hammock

### **Desired Future Conditions**

Mesic hammock is a hardwood forest community of open or closed canopy dominated by live oak, with cabbage palm (*Sabal palmetto*) often present in the canopy and subcanopy. These hammocks have many inclusions of swamps, hydric hammocks, and floodplain forests, but in most instances, a dense cover of saw palmetto extends right to the high bank of the river. Several other trees may be mixed in the canopy including red cedar (*Juniperus virginiana*), sweetgum, southern magnolia (*Magnolia grandiflora*), slash pine, laurel oak (*Quercus laurifolia*), and water oak. Shrubby understory may be dense or open, tall or short and is composed of saw palmetto, beautyberry (*Callicarpa americana*), and wax myrtle, with the addition of tropical shrubs wild coffee (*Psychotria* spp.), in the south. The herb layer is often sparse or patchy and consists of various grasses, including low panic grasses (*Dicanthelium* spp.) and basket grass, and sedges. The herbaceous layer is variable in density and composition, depending on hydrology and location. Common herbs include longleaf woodoats (*Chasmanthium laxum* var. *sessiliflorum*), tall elephantsfoot (*Elephantopus elatus*), *Habenaria* sp., partridgeberry (*Mitchella repens*), clustered mille grains (*Oldenlandia uniflora*), and Virginia chain fern (*Woodwardia virginica*). Vines are occasional and include yellow jessamine, earleaf greenbrier (*Smilax auriculata*), laurel greenbrier, sarsaparilla vine (*Smilax pumila*), bristly greenbrier (*Smilax tamnoides*), and muscadine. Epiphytes are abundant on oaks and palms and include Florida butterfly orchid, green fly orchid, golden polypody (*Phlebodium aureum*), resurrection fern (*Pleopeltis polypodioides* var. *michauxiana*), Bartram's air-plant (*Tillandsia bartramii*), ballmoss (*Tillandsia recurvata*), southern needleleaf (*Tillandsia setacea*), Spanish moss (*Tillandsia usneoides*), and shoestring fern (*Vittaria lineata*).

### **Current Conditions**

All of the mesic hammock communities on LBESF are present along the banks of the Econlockhatchee River. Tree density and species diversity is relatively high, creating a canopy that is dense and relatively constant. The current condition of this community is generally consistent with the typical description mentioned above, except for two components: the presence of cypress stumps indicates that most of the cypress was harvested many years ago, and some pine timber was harvested in 2001 because of a

Southern Pine Beetle infestation. A few citrus trees were naturalized and two exotic invasive plants, Caesar's weed (*Urena lobata*) and camphor tree, were noted in the mesic hammock community.

### **Management Actions to Attain Desired Condition**

Prescribed fire from adjacent pyric communities will be allowed to burn into the margins of this hydric community and pre-suppression firelines will be avoided in this ecotone. Active management will primarily be limited to existing road maintenance and necessary erosion control. Bald cypress (*Taxodium distichum*) was planted in the winter of 2002 in portions of the mesic hammock corridor and will be planted in other areas of this community as necessary. No commercial timber harvesting is planned during this ten-year period.

## **3. Wet Prairie**

### **Desired Future Conditions**

Wet prairie is characterized as a treeless plain with a sparse to dense ground cover of grasses and herbs including wiregrass, maidencane (*Panicum hemitomon*), spikerush (*Elocharis* spp.), beakrush (*Rhynchospora* spp.), black-eyed susan (*Rudbeckia hirta*), sunflower (*Helianthus* spp.), and wax myrtle.

The most important physical factors are hydrology and fire. Wet prairie is seasonally inundated or saturated for 50 to 100 days each year and burns every two to three years.

### **Current Conditions**

All of the wet prairie on the state forest lies on the Kilbee Tract and is located within abandoned pastures. Wax myrtle and saltbush have invaded several areas due to the lack of fire in the past. In 1997 and 2000 slash pine was planted in the north section of the wet prairie. The pines are as big as they are going to get due to the location on which they were planted.

In the intact wet prairies, herbs form the primary cover with sand cordgrass dominant, but bushy bluestem (*Andropogon glomeratus*), broomsedge bluestem, toothed midsorus fern (*Blechnum serrulatum*), bushy seaside oxeye (*Borrchia frutescens*), *Dichantheium* sp., flattop goldenrod (*Euthamia graminifolia* var. *hirtipes*), *Fimbristylis* sp., toothpetal false rein orchid (*Habenaria floribunda*), soft rush (*Juncus effusus* subsp. *solutus*), climbing hempvine (*Mikania scandens*), *Rhynchospora* sp., pineland pimpernel (*Samolus valerandi* subsp. *parviflorus*), *Setaria* sp., annual saltmarsh aster (*Symphyotrichum subulatum*), and white crownbeard (*Verbesina virginica*) are common. Cabbage palm is frequent along with a few other sparse shrubs such as groundsel tree (*Baccharis halimifolia*), wax myrtle, American beautyberry, bigleaf sumpweed (*Iva frutescens*), and sawtooth blackberry (*Rubus argutus*). One rare giant orchid (*Pteroglossaspis ecristata*) was found in wet prairie. The invasive exotic plants Caesar's weed and Brazilian pepper were both found in wet prairie.

### **Management Actions to Attain Desired Condition**

Prescribed fire will be the primary management tool in this community. The planned fire interval will be two to three years during the growing season. Invasive saltbush and myrtles will be controlled through mechanical means (i.e. chopping), as well as prescribed burning. Field staff with input from the forest ecologist will identify problem areas and control these invasive species. A cattle lease is also in place to help maintain the entire Kilbee Tract. The management goal is to maintain the prairie with a combination of all three tools: fire, chopping, and grazing. The stand of slash pines that were planted on the north section of the wet prairie will be harvested within the next ten years. The stand will be harvested to restore the wet prairie back to its desired condition.

## **4. Floodplain Marsh**

### **Desired Future Conditions**

Floodplain marshes are wetlands of herbaceous vegetation and low shrubs that occur in river floodplains along the St. Johns River. These marshes are flooded with flowing water for a portion of the year. Emergent grasses, herbs, and shrubs that dominate the floodplain marshes include sawgrass (*Cladium jamaicense*), maidencane, and buttonbush (*Cephalanthus occidentalis*). Other plants include cordgrass (*Spartina* spp.), spikerush, bulrushes (*Scirpus* spp.), common reed (*Phragmites communis*), and water primrose (*Ludwigia repens*). Typical animals include cricket frog (*Acris gryllus*), American alligator (*Alligator mississippiensis*), eastern mud snake (*Farancia abacura*), great blue heron (*Ardea herodias*), great egret (*Casmerodius albus*), sandhill crane (*Grus canadensis*), raccoon (*Procyon lotor*), and river otter (*Lutra canadensis*). Floodplain marshes are maintained by regimes of fire and water.

### **Current Conditions**

The floodplain marsh on LBESF is present on the banks St. Johns River (Kilbee Tract). This community is in fair condition and generally fits the description provided above. However, the exotic invasive plants Caesar's weed, and para grass (*Urochloa mutica*) are severe problems in a few areas of the marsh, primarily along the road and fence which run roughly north/south through the Kilbee Tract, as well as near spoil areas. In most of the marsh Cabbage palm is a common tree and shrub scattered in the marsh, however, these become less frequent in the deeper marsh nearer to the river. A few other shrubs such as groundsel tree and christmasberry (*Lycium carolinianum*) are occasional, however, herbs form the dominant layer of this community. These are primarily sand cordgrass and soft rush, along with a diverse mixture of other herbs including saltwort (*Batis maritima*), bushy seaside oxeye, spadeleaf (*Centella asiatica*), *Coreopsis* sp., *Fuirena* sp., butterweed (*Packera glabella*), seashore paspalum (*Paspalum vaginatum*), turkey tangle frogfruit (*Phyla nodiflora*), pineland pimpernel, and perennial glasswort (*Sarcocornia perennis*). The smaller floodplain marshes near the Econlockhatchee River in the Demetree Tract have been partially converted to hydric hammock, likely due to hydrologic alteration.

### **Management Actions to Attain Desired Condition**

Fire, on a rotation of one to five year intervals, will be the primary management tool. Care will be taken not to burn under drought conditions as mucky peat could burn and cause smoke problems. In addition to prescribed burns, management of this community should attempt to maintain natural flooding regimes in order to prevent shrubby encroachment. Artificially shortened hydroperiods will permit invasion by shrubs and subsequent loss of the marsh. Roads and spoil from development may impede water flow, and this effect should be reduced where possible. Exotic species will be treated on the floodplain marsh with herbicide. Grazing is another tool that will be used for maintenance of the marsh.

## **5. Scrubby Flatwoods**

### **Desired Future Conditions**

Scrubby flatwoods are characterized as an open canopy forest of mature, native pine trees with sparse shrubby understory and numerous areas of white sand. Portions of the areas have a dense shrub layer of tall scrub oaks (*Quercus inopina*), due to the absence of fire. This vegetation varies in height from four to twenty feet.

Scrubby flatwoods have a tree canopy of longleaf pine and/or slash pine growing over a shrub stratum dominated by sand live oak (*Quercus geminata*) with rusty staggerbush, Chapman's oak (*Quercus chapmanii*), and myrtle oak (*Quercus myrtifolia*) often present. Other typical mesic flatwoods species are common including saw palmetto, winged sumac, tarflower, dwarf huckleberry, blue huckleberry, Atlantic St. John's wort, fourpetal St. John's wort, fetterbush, running oak, dwarf live oak, and shiny blueberry. The herbaceous groundcover is patchy and usually has some wiregrass. Other common herbs include *Agalinis* sp., broomsedge bluestem, bottlebrush threeawn, coastalplain honeycomb-head (*Balduina angustifolia*), capillary hairsedge (*Bulbostylis ciliatifolia*), coastalplain chaffhead, hairy chaffhead (*Carphephorus paniculatus*), *Dichantheium* sp., dogfennel, Elliott's milkpea, rough hedgehyssop, pinebarren frostweed, Piedmont pinweed, slender gayfeather (*Liatris gracilis*), rustweed (*Polypremum procumbens*), bracken fern, blackroot, *Rhynchospora* sp., sweet goldenrod, and lopsided indiagrass. Vines are occasional including earleaf greenbrier, laurel greenbrier, and muscadine.

The frequency of naturally occurring fire in the scrubby flatwoods is five to fifteen years. The longer interval is due to the general lack of ground vegetation and greater proportion of incombustible scrub-oak leaf litter. Only after this long absence of fire and during periods of drought does the leaf litter become sufficiently combustible and concentrated enough to support an ecological burn.

### **Current Conditions**

The previous fire history in this community is unknown. The scrubby flatwoods on LBESF generally intermingle with mesic flatwoods. Scrubby flatwoods are found on the Demetree, Jones East, River's Edge, and Bothers Tracts. The scrubby flatwoods on LBESF generally fit the above desired future condition description except for the presence of heavier fuel loads. On the Demetree Tract, some of the historic scrubby flatwoods have been converted to pasture for many years.

### **Management Actions to Attain Desired Condition**

Fire will be the predominant management tool in the scrubby flatwoods. Prescribed fire will be applied in the mesic flatwoods at a greater frequency and be allowed to burn into the scrubby flatwoods. Fuel conditions in the scrubby flatwoods will dictate fire frequency. The planned fire frequency will be three to eight year intervals. Areas with a high density of scrub oaks may require mechanical alteration of the oak canopy to permit safe and successful prescribed burns. This alteration work will be coordinated with similar work being conducted in the scrub communities.

## **6. Hydric Hammock**

### **Desired Future Conditions**

These lands are characterized as a multi-storied forest of tall trees with an open or closed canopy, often associated with and grading into scrub or sandhill. Hydric hammocks typically have a closed canopy of mixed deciduous and evergreen hardwood tree species and a ground layer of grasses, sedges, and ferns. The normal hydroperiod is rarely over 60 days per year, although soils may remain saturated for a large portion of the year.

Hydric hammocks are diverse with a canopy dominated by a mixture of diamond-leaved oak, live oak, and cabbage palm, sweetgum, and occasionally sweetbay (*Magnolia virginiana*). Relatively incombustible oak litter predominates on these sites and precludes most fires. The subcanopy and tall shrub layers are well-developed and include American hornbeam (*Carpinus caroliniana*), red cedar, sweetgum, loblolly pine (*Pinus taeda*), cabbage palm, and American elm (*Ulmus americana*), smallflower pawpaw (*Asimina parviflora*), dwarf hawthorn (*Crataegus uniflora*), and yaupon (*Ilex vomitoria*). Short shrubs are usually not dense, often leading to an open, parklike appearance. The common species found in this layer include common persimmon (*Diospyros virginiana*), St. Andrew's cross, wax myrtle, and dwarf palmetto (*Sabal minor*). Herbs form a sparse to moderate cover and include spadeleaf, longleaf woodoats, *Dichanthelium* sp., fireweed (*Erechtites hieraciifolius*), partridgeberry, and common blue violet (*Viola sororia*). The oaks and palms support a great diversity of epiphytes with green fly orchid, golden polypody, resurrection fern, Bartram's air-plant, ballmoss, southern needleleaf, Spanish moss, and giant air-plant (*Tillandsia utriculata*) commonly found. Vines are occasional and include peppervine (*Ampelopsis arborea*), rattan vine (*Berchemia scandens*), yellow jessamine, eastern poison ivy (*Toxicodendron radicans*), and muscadine.

### **Current Conditions**

Hydric hammock is often difficult to differentiate from the bottomland forest community, as it has some of the same characteristics and will be managed in the same low impact manner as the bottomland forest. Small isolated pockets of hydric hammock exist throughout LBESF and are in relatively good condition. One large area on the west side of the Kilbee Tract occurs roughly between the mostly mesic flatwoods to the west and wet flatwoods/prairie to the east. The Jones East and Spencer Leeper Tracts also have a large area of hydric hammock that is connected to the Econlockhatchee River floodplain. These hammocks include numerous inclusions of mesic hammock and basin swamp.

There appears to have been some conversion from floodplain marsh to hydric hammock on the Demetree Tract based on the 1940 aerial photographs. Historic ditching has affected many of the wetlands in the Demetree Tract. Also, a large ditch in the Jones East and Spencer Leeper Tracts bisects the historic hammock. This hammock has also been subject to disturbance from past agriculture. Caesar's weed, an invasive exotic weed, was found in most of the hydric hammocks surveyed.

### **Management Actions to Attain Desired Condition**

Intensive uses will be kept out of these types of communities. Silvicultural management will not be emphasized in these areas and no commercial timber harvesting is planned in forested wetlands during this ten-year period. Prescribed fire will not be excluded from the hydric hammocks; however, the composition and fuel load will likely result in fire exclusion. Hydric hammocks rarely burn. However, prescribed fires should be allowed to burn up to the edge of these communities to discourage shrubby encroachment into the ecotone with pyrogenic communities. Active management will be limited to existing road maintenance and necessary erosion control. Some of the hydric hammocks have evidence of manipulation to the natural hydrology, especially on the Jones East Tract. If hydrology has been altered (i.e. ditches/canals), normal hydroperiods should be restored if possible. State forest staff will work with the Division's Forest Hydrologist and SJRWMD staff to investigate the potential for restoration of altered hydrology.

## **7. Wet Flatwoods**

### **Desired Future Conditions**

Wet flatwoods are characterized as relatively open canopy forests of native pine trees or cabbage palms with either thick/scrubby under story and very sparse ground cover, or a sparse under story and a dense ground cover of hydrophytic herbs and shrubs. Several variations exist between these extremes. Typical plants include pond pine, slash pine, sweet bay, sedges (Cyperaceae), dwarf wax myrtle, gallberry, titi (*Cyrilla recemiflora*), saw palmetto, greenbrier (*Smilax* spp.), and pitcher plants (*Sarracenia* spp.). Some of the typical animals include black racer (*Coluber constrictor priapus*), yellow rat snake (*Elaphe obsoleta quadrivittata*), diamondback rattlesnake (*Crotalus adamanteus*), pigmy rattlesnake (*Sistrurus miliarius*), red-shouldered hawk (*Buteo lineatus*), raccoon, bobcat (*Lynx rufus*), and white-tailed deer (*Odocoileus virginianus*).

Wet flatwoods occur on relatively flat, poorly drained terrain. During the rainy season, water frequently stands on the surface, inundating the flatwoods for one or more months per year. During the dryer seasons, groundwater is less accessible for many plants whose roots fail to penetrate the hardpan. Thus, many plants are under stress due to hydric changes. Fire, naturally occurring every three to ten years during pre-Columbian times, is another important factor in wet flatwoods. Many species in this community are adapted to periodic fires and several are fire dependent. Without relatively frequent fires, wet flatwoods succeed into hardwood dominated forests whose closed canopy would eliminate the ground cover. Wet flatwoods are vulnerable to disruptions of fire and hydrological regimes. Exotic plants, such as cogon grass, readily invade wet flatwoods and must be controlled promptly.



On Little Big Econ State Forest, a few areas of wet flatwoods were identified. These were primarily in the Kilbee Tract where they occur mixed with wet prairie and mesic flatwoods. The vegetation of these is typical of many wet flatwoods in the St. John's River area with frequent cabbage palms under a canopy of slash pine with a sparse herbaceous layer. Two other wet flatwoods found at the Bothers Tract are small areas of hydrophytic herbs such as blue maidencane (*Amphicarpum muhlenbergianum*), southern umbrellasedge (*Fuirena scirpoidea*), and water cowbane (*Oxypolis filiformis*), and sparse shrubs under an open canopy of slash pine.

### **Current Conditions**

This community type is located mostly on the Kilbee Tract. Some wet flatwoods in the Kilbee Tract appear to have been replaced with either semi-improved pasture or pine plantation. In the better examples of wet flatwoods on the Kilbee Tract, frequent cabbage palms grow under a canopy of slash pine with a sparse herbaceous layer. The previous landowner used prescribed fire periodically and the DOF has burned portions of this community. A small part (less than 40 acres) of this community is in good condition. Approximately 320 acres of the wet flatwoods have had a majority of the slash pine harvested and have been converted to pasture prior to state purchase. Shallow ditches installed on the property have reduced the hydroperiod and it is anticipated that the community will go through a succession to more of an upland community if some degree of restoration does not occur.

One of the wet flatwoods in the Bothers Tract is disturbed, probably by hydrologic alteration, and the hydrophytic graminoids are partly replaced by bushy bluestem. Caesar's weed, an invasive exotic weed, was found in a few wet flatwoods areas. The one higher quality wet flatwoods surveyed in the Bothers Tract also has a canopy of slash pine, but no cabbage palm. Instead, herbs form a dominant cover with blue maidencane (*Amphicarpum muhlenbergianum*), southern umbrellasedge, *Rhexia* sp., *Rhynchospora* sp., and water cowbane commonly occurring.

Previous landowners control burned during the winter months to stimulate the bahia grass. Some exotics are found in this community including Brazilian pepper, which is primarily located in a thirty-acre block. A DEP grant was approved to remove exotics from a majority of the wet flatwoods community. The control effort was effective, however some resprouting has occurred. The DEP has provided the chemical Garlon, as part of the grant package.

### **Management Actions to Attain Desired Condition**

State forest staff will consult with the DOF Forest Hydrology section and SJRWMD to identify the need for wetland restoration. Prescribed burning will continue to be conducted with the goal of moving to growing season fires (April through August) as much as possible. The targeted fire return interval will be two to four years. Staff will follow up on retreatment and monitoring of invasive exotics. Ground cover restoration should be the focus of wet flatwoods management. After the ground cover is replaced

and fire has returned to historic timing and frequencies, native tree species will be planted.

## 8. **Basin Swamp**

### **Desired Future Conditions**

Basin swamp is generally characterized as a relatively large and irregularly shaped basin that is not associated with rivers, but is vegetated with hydrophytic trees and shrubs that can withstand an extended hydroperiod. They typically have a mature canopy dominated by pond cypress (*Taxodium ascendens*) or swamp tupelo (*Nyssa sylvatica* var. *biflora*). Basin swamps on LBESF are found either as depressions in mesic and hydric hammocks or in flatwoods where they are part of slow seepage drains into the Econlockhatchee River. Where they occur in flatwoods, ecotonal edges of basin swamps frequently grade into wet prairie, which is maintained by unimpeded fire from surrounding uplands. Dominant plants include blackgum (*Nyssa biflora*), cypress, and slash pine. Other typical plants include red maple (*Acer rubrum*), swamp redbay (*Persea palustris*), sweetbay magnolia, loblolly bay, Virginia willow (*Itea virginica*), fetterbush, laurel greenbrier, Spanish moss, wax myrtle, titi, sphagnum moss (*Sphagnum* spp.), and buttonbush. Typical animals include southern dusky salamander (*Desmognathus auriculatus*), cricket frog, little grass frog (*Limnaoedus ocularis*), chicken turtle (*Deirochelys reticulana*), striped mud turtle (*Kinosternon baurii*), ringneck snake (*Diadophis punctatus*), scarlet kingsnake (*Lampropeltis triangulum elapsoides*), crayfish snake (*Regina* sp.), cottonmouth (*Agkistrodon* sp.), wood duck (*Aix sponsa*), hawks, turkey (*Meleagris gallopavo*), black bear (*Ursus americanus*), raccoon, mink (*Mustela vison*), river otter (*Lutra canadensis*), bobcat, and white-tailed deer.

Infrequent fire is essential for the maintenance of cypress dominated basin swamps. Blackgum and hardwood dominated basin swamps burn less often, while pine dominated basin swamps burn more frequently. Without fire, hardwood invasion and peat accumulation will eventually create a bottomland forest or bog. Typical fire intervals in basin swamps may be anywhere from 5 to 150 years. Cypress and pines are very tolerant of light surface fires, but muck fires burning into the peat can kill the trees, lower the ground surface, and transform a swamp into a pond or lake.

Like other wetland communities, normal hydroperiods must be maintained in basin swamps. If water levels must be artificially manipulated, somewhat deeper than normal water is not likely to do much harm, but extended hydroperiods will limit tree growth and prevent reproduction. Shortened hydroperiods will permit invasion of mesophytic species and change the character of the understory or will allow a devastating fire to enter which would drastically alter the community. Occasional fires are necessary to maintain the cypress and pine components.

### **Current Conditions**

Some of the basin swamps have shallow drainage ditches, which have altered the hydroperiod and impacted the vegetative community. Wetland mitigation projects have already been implemented in a few of the basins to restore the hydrology. The vegetative

composition of this community is fairly consistent with the typical description provided above.

The basin swamp found on the Bothers Tract has an edge of flatwoods encroached with baygall species, probably encouraged by fire exclusion, as a road around the swamp prohibits natural burning. The open to moderately dense canopy is dominated either by a mixture of swamp tupelo, red maple, sweetgum, and diamond-leaved oak, or by pond cypress with an understory mixture of the previous species. In addition to saplings of the canopy species, cabbage palm may be present in the subcanopy. The shrub cover is sparse and dominated by common buttonbush and wax myrtle. Herbaceous cover is generally patchy. Deeper areas of the basin swamp lack herbs while areas with slightly higher elevation can have a dense groundcover. Common species found include toothed midsorus fern, false nettle (*Boehmeria cylindrica*), bandana-of-the-Everglades (*Canna flaccida*), clustered sedge (*Carex glaucescens*), manyflower marshpennywort (*Hydrocotyle umbellata*), *Iris* sp., soft rush, *Ludwigia* sp., climbing hempvine, *Polygonum* sp., pickerelweed (*Pontederia cordata*), *Rhynchospora* sp., lizard's tail (*Saururus cernuus*), Canadian germander (*Teucrium canadense*), and Virginia chain fern. Vines are occasional and include eastern poison ivy.

#### **Management Actions to Attain Desired Condition**

Little active management should be required for this community type. Infrequent low intensity ground fires within basin swamps are necessary to maintain the cypress component. Where smoke management practices will allow, prescribed fire from adjacent pyric communities will be allowed to burn into the margins of this hydric community and firelines will be avoided in this ecotone. State forest staff will consult with the DOF Forest Hydrology section and SJRWMD to develop a hydrological needs assessment/inventory for these communities.

### **9. Scrub**

#### **Desired Future Conditions**

Scrub is characterized as a closed to open canopy forest of woody species of shrubs with a sparse understory of herbaceous plants, and lichens. Open patches of bare sand are common. There may or may not be a canopy of sand pine (*Pinus clausa*). Both the tall and short shrub layers are moderate to dense and dominated by scrub oaks: sand live oak, Chapman's oak, and myrtle oak. Sand holly (*Ilex ambigua*), rusty staggerbush, wild olive (*Osmanthus americanus*), scrub wild olive (*Osmanthus megacarpus*), silk bay (*Persea borbonia* var. *humilis*), saw palmetto, sparkleberry (*Vaccinium arboreum*), garberia, dwarf huckleberry, and deerberry (*Vaccinium stamineum*) are also common. The herbaceous layer, though sparse, consists primarily of sandyfield beaksedge (*Rhynchospora megalocarpa*) with wild pennyroyal (*Piloblephis rigida*), coastalplain honeycomb-head, capillary hairsedge, coastalplain chaffhead, rough hedgehyssop, pinebarren frostweed, and bracken fern occasional. Vines are infrequent and include earleaf greenbrier, sarsaparilla vine, and muscadine. The canopy remains relatively low with a height of one to nine feet. A disturbance regime of fire keeps the canopy height

low and arrests succession, not allowing the transformation into mixed hardwood forest (xeric hammock).

Scrub ecotones are mostly bare sandy clearings that separate the scrubs from the sandhills. They apparently act as firebreaks to limit fire frequency within the scrub from the excess frequency of the surrounding sandhill. These ecotones contain calamintha and garberia and may be the only place where these plants are present. They may also provide good habitat for certain species of invertebrates, and other animals that like open sandy areas. Florida mouse (*Polomys floridanus*), gopher tortoise, peninsula mole skinks (*Eumeces egregius*) are present in the scrubs and to a lesser degree, the adjoining sandhills.

### **Current Conditions**

Most of the scrub at Little Big Econ State Forest is similar to desired future conditions with a sparse canopy, a dense tall and short shrub layer, and a sparse herbaceous component. A few areas of scrub have tall oaks that are beginning to form a canopy, and at least one historic scrub located on the Bothers Tract appears to have been converted to xeric hammock. The scrub communities are located on the northern portion of Demetree, with smaller segments located in Spencer-Leeper, and the Jones East & West parcels. Jones West was logged prior to acquisition. Most of these scrub sites are characterized as a closed to open canopy forest of scattered sand pines with dense clumps of scrub oak thickets (twenty to thirty feet in height) and other shrubs dominating the understory. The ground cover is generally very sparse, being dominated by ground lichens or herbs; open patches of sand are common. Typical understory plants include sand live oak, saw palmetto, hog plum, milk peas and staggerbush. Scrub is essentially a fire-maintained community. Ground vegetation is sparse; therefore, there is very little fuel for fires except for oak leaf litter and sand pine needles. When a fire does occur, this fuel type, in combination with the resinous needles and stand density, ensures a hot, fast burning fire. Such fires allow for the regeneration of the scrub community. Fires historically have occurred every 6 to 80 years.

Scrub is a very delicate ecosystem that needs extra precaution in management to protect the many endangered or threatened species that call this habitat home. There are no recorded sightings of scrub jays on LBESF. The management goal is to restore scrub areas to a condition that can be managed by prescribed fire and is suitable for scrub jays and other scrub endemics.

All of the scrub has been fire excluded for decades resulting in closed canopies of scrub oaks and varying densities of sand pine.

### **Management Actions to Attain Desired Condition**

Prescribed fire will be the primary management tool in this ecosystem at an interval of 6 to 20 years. The mechanical alteration of the oak canopy, through the use of roller chopping or other means, may be required in many areas to permit safe and successful prescribed burns. Prior to initiating these restoration efforts, the DOF will seek input on restoration practices from experts in the management of scrub vegetation. The Division

of Forestry will encourage cooperation with Seminole County natural lands staff to cooperate jointly on preparing a plan for scrub restoration efforts.

Silvicultural management in this community will focus on restoration. Silvicultural activities may include harvesting of merchantable pines in areas where sand pine is prevalent. Harvesting operations will be coordinated with biological staff to ensure the protection of endangered species. Sand pine will be allowed to naturally regenerate. Use of herbicides to restore scrub habitat will be avoided unless their impact on the ecosystem is clearly understood.

## **10. Baygall**

### **Desired Future Conditions**

These lands are generally characterized as densely forested, peat-filled seepage depressions, often at the base of sandy slopes. Tall, densely packed evergreen hardwoods such as magnolia, redbay and loblolly bay dominate the canopy. Understory is more or less open with shrubs and ferns. Other plants include dahoon holly (*Ilex cassine*), wax myrtle, greenbrier, sweetgum and gallberry. Baygalls are often associated with floodplain swamp and are dependent on seepage flow and a high water table. Baygalls rarely dry out enough to burn. The normal fire interval is probably fifty to one hundred plus years.

### **Current Conditions**

Several areas of baygall are present in the Bothers, Spencer-Leeper, and Demetree Tracts. Most are small depressions or edges of swamps, however, two large bay swamps are present in the Bothers Tract. The baygall communities on LBESF are in relatively good condition and are similar in plant composition to the above description.

The vegetation of several baygalls, particularly those found in the Bothers Tract is borderline with basin swamp, but cypress and tupelo are widely scattered. A few possibly historic baygalls occurring in pasture or pine plantation on the Demetree Tract are now open marshes, despite appearing forested on historic photographs. Baygall vegetation is also becoming dominant in several flatwoods edges, particularly in the Bothers Tract. These edges are still dominated by pines with saw palmetto in the understory, but loblolly bay has become abundant in the subcanopy due to fire exclusion. While these were generally included with mesic flatwoods community in the accompanying natural community map, continued fire exclusion may lead to further conversion to baygall. Most of the baygall on LBESF has a closed canopy with a variable mixture of loblolly bay, sweetbay, swamp tupelo, red maple, sweetgum, diamond-leaved oak, and pond cypress, with slash pine and pond pine frequent in transitions to flatwoods. Shrubs are often very dense with wax myrtle, swamp bay, fetterbush, highbush blueberry (*Vaccinium corymbosum*), common buttonbush, and maleberry (*Lyonia ligustrina* var. *foliosiflora*) frequently found. The herbaceous groundcover frequently includes hydrophytes such as toothed midsorus fern, cinnamon fern, green arrow arum (*Peltandra virginica*), bracken fern, lizard's tail, *Sphagnum* sp.,

netted chain fern (*Woodwardia areolata*), and Virginia chain fern. Vines may be frequent and include laurel greenbrier and eastern poison ivy.

In one location, the state listed threatened hooded pitcherplant was seen near an open baygall edge being maintained in part by a road.

### **Management Actions to Attain Desired Condition**

Prescribed fire will not be excluded from the baygalls unless drought conditions have created the potential for muck fires. The use of prescribed fire along the edges of the baygall will reduce their migration into adjacent communities and will maintain the ecotone.

Alterations to the hydrology could impact baygall communities; consequently, intensive uses will be kept out of this fragile community. Active management will be limited to existing road maintenance and erosion control.

## **11. Depression Marsh**

### **Desired Future Conditions**

Depression marshes are typically shallow, rounded depressions with herbaceous vegetation often in concentric bands. These are similar to basin marshes but are generally smaller. Common plants include St. John's wort (*Hypericum* spp.), spikerush, yellow-eyed grass (*Xyris* spp.), chain fern (*Woodwardia* spp.), willows (*Salix* spp.), swamp primrose (*Ludwigia palustris*) and other hydrophytic vegetation. Shrub cover is typically very low and trees are found only on edges. Because of their isolation and small size, depression marshes support a different assemblage of species than those found in larger, more permanent wetlands. Depression marshes are considered extremely important in providing breeding and foraging habitat for numerous animals. Fire plays an important role in this community by restricting the invasion of shrubs and trees and by reducing the accumulation of peat. Fire frequency is usually greatest around the periphery of the marsh and decreases toward the center.

### **Current Conditions**

Depression marshes are found throughout the forest, primarily in the mesic flatwoods, and occur as remnants in the abandoned pastures. Depression marshes are found both in the large wet prairie and wet flatwoods of the Kilbee Tract and in the mesic and scrubby flatwoods of the other tracts. Several of these marshes have been altered by drainage and the invasion of shrub species including wax myrtle and baccharis. Previous fire history is unknown.

Many of the marshes in current pastures and pine plantations of the Demetree Tract are weedy and have experienced hydrological alteration. These typically have a prominent weedy cover of dogfennel. Other depression marshes are in good condition with a high cover of herbs including blue maidencane, bushy bluestem, broomsedge bluestem, lemon bacopa (*Bacopa caroliniana*), sawgrass, Virginia buttonweed (*Diodia virginiana*), tenangle pipewort (*Eriocaulon decangulare*), semaphore thoroughwort (*Eupatorium*

*mikanioides*), flattop goldenrod, *Hydrocotyle* sp., clustered bushmint (*Hyptis alata*), prairie iris (*Iris hexagona*), soft rush, Carolina redroot (*Lachnanthes caroliniana*), taperleaf waterhorehound (*Lycopus rubellus*), maidencane, swamp smartweed (*Polygonum hydropiperoides*), pickerelweed, fascicled beaksedge (*Rhynchospora fascicularis*), sugarcane plumegrass (*Saccharum giganteum*), bulltongue arrowhead (*Sagittaria lancifolia*), giant bulrush (*Scirpus californicus*), sand cordgrass, broadleaf cattail (*Typha latifolia*), and Virginia chain fern. A canopy is generally absent, but may include an occasional slash pine, pond pine, loblolly bay, swamp tupelo, sweetgum, cabbage palm, or red maple. The shrub layer is also sparse but shrubs may encroach with fire suppression. Shrubs present include groundsel tree, common buttonbush, coastalplain St. John's wort (*Hypericum brachyphyllum*), roundpod St. John's wort (*Hypericum cistifolium*), peelbark St. John's wort (*Hypericum fasciculatum*), christmasberry, wax myrtle, and swamp bay. A few marshes in the Kilbee Tract contained the invasive exotic Brazilian pepper. A few historic depression marshes appear to have been converted to either ruderal communities (pasture or artificial ponds), drier flatwoods (presumably from hydrology alteration), or now contain either swamp or hammock vegetation.

### **Management Actions to Attain Desired Condition**

When soil moisture permits, prescribed fire from the adjacent communities will be allowed to burn into the marshes to reduce the invasion of shrubs and trees. The fire interval is expected to be three to five years. Fire will be restricted from the marshes, thru a combination of foam, wet, and or hand lines, when drought conditions have created the potential for muck fires.

State forest staff will consult with the DOF Forest Hydrology section and SJRWMD to develop a hydrologic needs assessment/inventory for these communities. If the hydrology has been altered, natural hydrology should be restored if possible. This can be accomplished by blocking or filling canals/ditches and redesigning trails or roads to avoid altering the hydrology. All depression marshes and their ecotones will be afforded protection from adjacent silvicultural and fire suppression operations.

## **12. Basin Marsh**

### **Desired Future Conditions**

These marshes are generally characterized as herbaceous or shrubby wetlands, situated in a relatively large and irregular shaped basin. Typical plants include common reed, panicum, pennywort (*Hydrocotyle* spp.), Spanish needle (*Bidens bipinnata*), redroot (*Lachnanthes caroliniana*), soft rush, buttonbush, elderberry (*Sambucus canadensis*), saltbush, American lotus (*Nelumbo lutea*), coastal plain willow (*Salix caroliniana*), and dog fennel. Fire maintains the open herbaceous community by restricting shrub invasion. The normal interval between fires is three to seven years.

### **Current Conditions**

Most of the basin marsh on LBESF is found within the prairie hammock areas on the Kilbee Tract. Two basin marshes are also located within reforested pastures on the Econ

Tract. These marshes are in fair condition but have experienced a fire return interval that is longer than ideal.

Some basin marshes remain in good condition, especially the large marshes found in the Kilbee Tract as deeper depressions within the broad wet prairies, flatwoods, and prairie hammocks along the St. John's river floodplain. A few other basin marshes are located in mesic and scrubby flatwoods in the Bothers, Jones East, and Demetree Tracts. Many of the marshes in the Demetree Tract have been heavily impacted by the conversion of flatwoods to pasture, and these often have a high cover of weedy species due in part to altered hydrology from numerous ditches evident on the historic photographs. The dominant graminoids include *Andropogon* sp., sawgrass, soft rush, needle rush (*Juncus roemerianus*), maidencane, and sand cordgrass. Other herbaceous species are toothed midsorus fern, spadeleaf, fireweed, dogfennel, manyflower marshpennywort, prairie iris, dotted duckweed (*Landoltia punctata*), climbing hempvine, dotted smartweed (*Polygonum punctatum*), pickerelweed, bulltongue arrowhead, lizard's tail, broadleaf cattail, horned bladderwort (*Utricularia cornuta*), and Virginia chain fern. A few scattered trees and shrubs may be present; they include red maple, pond cypress, cabbage palm, coastalplain willow, groundsel tree, wax myrtle, and peelbark St. John's wort. In a one location, the state-listed threatened hooded pitcherplant was found growing on the edge of a basin marsh. In two of the basin marshes located within prairie hammocks of the Kilbee Tract, the invasive exotic plants Brazilian pepper, water hyacinth (*Eichhornia crassipes*), and Caesar's weed were found. One of the basin marshes in the Kilbee Tract was converted to other communities (swamp and wet flatwoods) by hydrology alteration and pasture development. Soil disturbance from feral hog rooting was noted in a few basin marshes.

### **Management Actions to Attain Desired Condition**

The previous fire history is unknown; however fire is essential for the maintenance of this community and will be the primary management tool. The planned fire frequency is three to five years. The marshes on the Econ Tract will be allowed to burn with the adjacent pastures when the pines are old enough to survive prescribed fire. Prescribed fire will not be excluded from the basin marshes, unless drought conditions have created the potential for muck fires. All basin marshes and their ecotones will be afforded protection from adjacent silvicultural and fire suppression operations and hydrological restoration activities through early evaluation and close monitoring of all adjacent activities.

Alteration of normal hydroperiods, as has historically occurred in the Demetree Tract, will result in a change of vegetation composition. Shortened hydroperiods will permit the invasion of mesophytic species; longer hydroperiods will convert marsh into lake by reducing the cover of emergent species. The removal or plugging of ditches and canals, where possible, is recommended to restore natural hydroperiods and sheet flow over the landscape. Control of invasive plants and feral hogs would also greatly benefit the basin marshes at Little Big Econ State Forest



### **13. Blackwater Streams**

#### **Desired Future Conditions**

Blackwater streams are characterized as perennial intermittent seasonal watercourses originating deep in sandy lowlands where extensive wetlands with organic soils function as reservoirs, collecting rainfall and discharging it slowly to the stream. Typical plants include golden club (*Orontium aquaticum*), smartweed (*Polygonum* spp.), sedges and grasses. Typical animals include longnose gar (*Lepisosteus osseus*), American shad (*Alosa sapidissima*), channel catfish (*Ictalurus punctatus*), Seminole killifish (Fundulidae), mosquitofish (*Gambusia affinis*), bluegill (*Lepomis macrochirus*), redbreast sunfish (*Lepomis auritus*), spotted sunfish, redear sunfish (*Lepomis microlophus*), largemouth bass (*Micropterus salmoides*), black crappie (*Pomoxis nigromaculatus*), brown bullhead (*Ictalurus nebulosus*), alligator, snapping turtle (*Shelydra serpentina*), Florida softshell (*Apalone* sp.), Florida watersnake, brown watersnake (*Nerodia taxispilota*), and river otter.

#### **Current Conditions**

Existing conditions are similar to the desired future condition. The two primary blackwater streams that occur on or adjacent to LBESF are the Econlockhatchee and St. Johns Rivers. Approximately, 16 miles of the Econlockhatchee River lies within the boundaries of the state forest. The east side of the Kilbee Tract abuts the St. Johns River for about 1.5 miles.

Alligator weed (*Alternanthera philoxeroides*) is one of the primary aquatic exotic plants found in the Econlockhatchee River basin. It is under controlled levels due to the successful introduction of the Alligator weed flea beetle (*Agasicles hygrophila*). Other aquatic exotic plants found in the headwaters, which may pose future problems, are *Hygrothila polysperma*, *Limnophila sessiliflora*, and *Hydrilla verticillata*.

#### **Management Actions to Attain Desired Condition**

All blackwater streams will be afforded protection from silvicultural and fire suppression operations and hydrological restoration activities. State forest staff will monitor watercourses for invasive exotics and will coordinate with DEP and SJRWMD staff for control.

### **14. Prairie Hammock**

#### **Desired Future Conditions**

Prairie hammock is characterized as a clump of tall cabbage palms and live oaks in the midst of prairie or marsh communities. All of the prairie hammocks occurring at LBESF are located on the Kilbee Tract in the large wet prairie, wet flatwoods, and floodplain marsh of the St. John's River. There is an intergradation between developed closed canopy prairie hammocks and open prairie with abundant cabbage palms. Three trees comprise the low canopy with cabbage palm abundant, live oak common, and red cedar occasional. Tall shrubs and understory trees include yaupon, red cedar, live oak, cabbage palm, groundsel tree, American beautyberry, and wild lime (*Zanthoxylum fagara*). The

herbaceous layer usually resembles the surrounding marsh or prairie with spadeleaf, longleaf woodoats, whitemouth dayflower (*Commelina erecta*), smooth rattlebox (*Crotalaria pallida* var. *obovata*), *Cyperus* sp., *Dichanthelium* sp., Carolina ponysfoot (*Dichondra carolinensis*), West Indian chickweed (*Drymaria cordata*), dogfennel, flattop goldenrod, toothpetal false rein orchid, clustered bushmint, Florida Keys hempvine (*Mikania cordifolia*), woodsgrass (*Oplismenus hirtellus*), turkey tangle frogfruit, millet beaksedge (*Rhynchospora miliacea*), rougeplant (*Rivina humilis*), licoriceweed (*Scoparia dulcis*), sand cordgrass, *Verbesina* sp., and white crownbeard. Epiphytes are common on the oaks and palms including green fly orchid, golden polypody, resurrection fern, Bartram's air-plant, ballmoss, southern needleleaf, Spanish moss, and shoestring fern. Common animals occurring in this community include box turtle (*Terrapene carolina*), southeastern five-lined skink (*Eumeces fasciatus*), black racer and various species of shrews and rodents. Prairie hammocks may flood during periods of extreme high water but are rarely inundated for more than ten to forty days during the year.

### **Current Conditions**

The prairie hammocks on LBESF are in fair condition and are generally similar to the above description. Lack of fire has resulted in a light to moderate build up of fuels. Caesar's weed forms dense tall thickets in several of the larger prairie hammocks, and Brazilian pepper is a problem especially on the south side of the Kilbee Tract beside the floodplain marsh. Para grass is a nuisance in wetter areas

### **Management Actions to Attain Desired Condition**

Management activities in these areas will be moderate. Exotics found throughout this ecosystem will be treated with herbicide. Oaks and palm dominated prairie hammocks will tolerate occasional light ground fires and this will be the primary management tool over the next ten years. Prescribed fires will generally be allowed to burn into the prairie hammock when surrounding communities are burned, if conditions allow.

## **15. Sandhill**

### **Desired Future Conditions**

Sandhills are characterized by as a forest of mature, native pine trees with a sparse understory of deciduous oaks and a fairly dense ground cover of grasses and herbs on rolling hills of sand. The most typical associations are dominated by longleaf pine, turkey oak, and wiregrass. Other typical plants include bluejack oak (*Quercus incana*), sand post oak (*Quercus margaretta*), sparkleberry, persimmon, winged sumac (*Rhus copallina*), Indian grass (*Sorghastrum* spp.), bracken fern, partridge pea (*Cassia fasciculata*), wild indigo (*Indigofera* spp.), and golden-aster (*Chrysopsis* spp.). Typical animals include tiger salamander (*Ambystoma tigrinum*), barking treefrog (*Hyla gratiosa*), spadefoot toad (*Scaphiopus holbrookii holbrookii*), gopher tortoise, mole skink (*Eumeces egregius*), indigo snake (*Drymarchon corais*), pine snake (*Pituophis melanoleucas*), eastern diamondback rattlesnake, red-headed woodpecker, and fox squirrel.

Sandhills occur on hilltops and slopes of gently rolling hills. Sandhills are important aquifer recharge areas because the porous sands allow water to move rapidly through with little runoff and minimal evaporation. Temperature and humidity fluctuations are generally greater in Sandhills due to the scattered overstory.

Fire is a dominant factor in the ecology of this community. Sandhills are a fire climax community, being dependent on frequent ground fires to reduce hardwood competition and to perpetuate pines and grasses. The natural fire frequency appears to be every one to three years. Without frequent fires, sandhills may eventually succeed to xeric hammock. Unburned or cutover sandhills may be dominated by turkey oak.

Sandhills are often associated with and grade into scrub, scrubby flatwoods, mesic flatwoods, upland pine forest, or xeric hammock. Sandhills were widespread throughout the Coastal Plain, but most have been degraded by timbering, overgrazing, plowing, fire exclusion, or other disturbances. The importance of properly managing the remaining parcels is accentuated due to the conversion of these communities to other uses.

### **Current Condition**

The sandhills on the LBESF are located on the Bothers parcel and some areas have succeeded to hardwoods due to lack of fire. Longleaf pines are widely spaced with a sparse understory of deciduous oaks. Where the tree canopy is open, there is a fairly dense ground cover of wiregrass.

The high-density hardwood sites have a few scattered mature longleaf pines with inadequate longleaf regeneration. The hardwood shade has inhibited grasses and pine regeneration, and the heavy oak litter has limited fire.

The smaller of the historic sandhills on LBESF is currently a xeric hammock dominated by sand live oak. Approximately half of the larger sandhill remains intact, but has suffered fire exclusion and has a sparse herb cover that includes wiregrass. The other half is a current xeric hammock with a closed oak canopy. In the remaining intact sandhill, longleaf pine is dominant with a moderate understory of deciduous oaks, in particular turkey oak. Shrubs are sparse to moderate and include Chapman's oak, sand live oak, turkey oak, sparkleberry, tarflower, longleaf pine, shiny blueberry, gopher apple (*Licania michauxii*), pricklypear (*Opuntia humifusa*), myrtle oak, and saw palmetto. Herbs are dominated by wiregrass, although this is not a dense layer. The rare giant orchid was seen in sandhill at LBESF.

### **Management Actions to Attain Desired Condition**

No commercial timber harvesting is planned during this ten-year period. In some areas, the larger oaks will be removed through cutting, by herbicide application or other cultural practices. Supplemental planting of longleaf pine will be necessary where densities are extremely low. In all of these cases, the work will be conducted with the stipulation that the area is environmentally sensitive and that there will be minimal impact to other values, such as existing ground cover. Once this restoration phase has accomplished the goals of increasing wiregrass cover, suppressing hardwoods and favoring pine

regeneration, the sandhills will be maintained by simulating natural fire conditions through growing season prescribed fire.

## **16. Dome Swamp**

### **Desired Future Conditions**

Dome Swamps are characterized as shallow, forested, usually circular depressions that generally present a domed profile because smaller trees grow in the shallower waters at the outer edge, while bigger trees grow in the deeper water in the interior. Pond cypress, swamp tupelo, and slash pine are common plants. Other typical plants include red maple, dahoon holly, swamp bay, sweetbay, loblolly bay, pond apple (*Annona glabra*), Virginia willow, fetterbush, chain fern, netted chain fern, poison ivy, laurel greenbrier, Spanish moss, wild pine (*Tillandsia* spp.), royal fern, cinnamon fern, coastal plain willow, maidencane, orchids, wax myrtle, swamp titi, St. John's wort, sawgrass, lizard's tail, swamp primrose, water hyssop (*Bacopa* spp.), redroot, sphagnum moss, floating heart (*Numphoides aquatica*), buttonbush, arum (*Peltandra* spp.), and fire flag (*Thalia geniculata*). Typical animals include flatwoods salamander (*Ambystoma cingulatum*), mole salamander (*Ambystoma talpoideum*), dwarf salamander (*Eurycea quadridigitata*), oak toad (*Bufo guercicus*), southern cricket frog, pinewoods treefrog (*Hyla femoraus*), little grass frog (*Limnaoedus ocularis*), narrowmouth toad, alligator, snapping turtle, striped mud turtle, mud turtle, eastern mud snake, cottonmouth, woodstork (*Mycteria americana*), wood duck, swallow-tailed kite (*Elanoides forficatus*), barred owl (*Strix varia*), pileated woodpecker (*Dryocopus pileatus*), great-crested flycatcher (*Myiarchus crinitus*), prothonotary warbler (*Protonotaria citrea*), and rusty blackbird (*Euphagus carolinus*). Dome Swamps typically develop in sandy flatwoods and in karst areas where sand has slumped around or over a sinkhole, creating a conical depression.

Without periodic fires, hardwood invasion and peat accumulation would convert the dome to Bottomland Forest or Bog. Dome Swamps dominated by bays are close to this transition. Fire frequency is greatest at the periphery of the dome and least in the interior where long hydroperiods and deep peat maintain high moisture levels for most of the year. The normal fire cycle might be as short as 3 to 5 years along the outer edge and as long as 100 to 150 years towards the center. The profile of a Dome Swamp (i.e., smaller trees at the periphery and largest trees near the center) is largely attributable to this fire regime. The shorter hydroperiods along the periphery permit fires to burn into the edge more often, occasionally killing the outer trees. Cypress is very tolerant of light surface fires, but muck fires burning into the peat can kill them, lower the ground surface, and transform a dome into a pond.

### **Current Conditions**

The Dome Swamp on LBESF is in relatively good condition and is similar to the desired future condition description, although one has been surrounded by pasture for some time. The exotic invasive Caesar's weed was noted in one dome swamp in the River's Edge Tract. This swamp also has an unnatural drainage outlet leading to the river and several residential lots are nearby.

### **Management Actions to Attain Desired Condition**

Prescribed fires will generally be allowed to burn into the edges of the dome swamp when surrounding communities are burned every 3 to 5 years, if conditions allow.

## **17. Floodplain Swamp**

### **Desired Future Conditions**

Floodplain Swamps occur on flooded soils along stream channels and in low spots and oxbows within river floodplains. The Econlockhatchee River does not have a large expanse of floodplain swamp along the main channel; rather, floodplain swamps occur along the abandoned oxbows that are occasional within the large mesic hammock that borders the river. These oxbows are cut off from flowing water during much of the year and several have standing water in them, and so could possibly be classified as river floodplain lakes. Dominant trees are usually buttressed hydrophytic trees such as cypress and tupelo; the understory and ground cover are generally very sparse. Other typical plants include ogeechee tupelo, water tupelo, swamp titi, wax myrtle, dahoon holly, myrtle-leaved holly, large gallberry, possumhaw, hurrah-bush, white alder, lizard's tail, leather fern, royal fern, marsh fern, soft rush, laurel greenbrier, hazel alder, hawthorn, and swamp privet.

Floodplain Swamps harbor a diverse array of animals including both temporary and permanent residents. Typical animals include marbled salamander, mole salamander, amphiuma, Alabama waterdog, Southern dusky salamander, two-lined salamander, three-lined salamander, dwarf salamander, slimy salamander, rusty mud salamander, southern toad, cricket frog, birdvoiced treefrog, gray treefrog, bullfrog, river frog, Southern leopard frog, alligator, stinkpot, southeastern five-lined skink, broadhead skink, mud snake, rainbow snake, redbelly water snake, brown water snake, glossy crayfish snake, black swamp snake, cottonmouth, yellow-crowned night-heron, wood duck, swallowtail kite, Mississippi kite, red-shouldered hawk, woodcock, barred owl, chimney swift, hairy woodpecker, pileated woodpecker, Acadian flycatcher, Carolina wren, veery, white-eyed vireo, red-eyed vireo, parula warbler, prothonotary warbler, hooded warbler, Swainson's warbler, cardinal, towhee, opossum, southeastern shrew, short-tailed shrew, beaver, wood rat, rice rat, cotton mouse, golden mouse, bear, raccoon, and bobcat.

Soils of Floodplain Swamps are highly variable mixtures of sand, organic, and alluvial materials, although some sites, especially within sloughs or on smaller streams, may have considerable peat accumulation. Floodplain Swamps are flooded for most of the year, with sites along channels inundated by aerobic flowing water while those of sloughs and backswamps are flooded with anerobic water for extensive periods of time. Soils and hydroperiods determine species composition and community structure. Seasonal and often prolonged inundations restrict the growth of most shrubs and herbs, leaving most of the ground surface open or thinly mantled with leaf litter. Floods redistribute detrital accumulations to other portions of the floodplain or into the main river channel. This rich organic debris is essential to the functional integrity of downriver ecosystems such as estuaries. These swamps are usually too wet to support fire.

Alteration of the hydroperiod by impoundments or river diversions and the disruption of floodplain communities by forestry or agriculture have devastating consequences to the entire river and bay systems. Many plant and animal species, both onsite and down river, depend upon the presence and natural fluctuations of these swamps for survival and reproduction.

### **Current Conditions**

The Floodplain Swamps on LBESF are in relatively good condition and generally similar to the desired future condition description

### **Management Actions to Attain Desired Condition**

The floodplain swamp will be protected from silvicultural and fire suppression operations and hydrological restoration activities alterations. State forest staff will monitor for invasive exotics and will coordinate with DEP and SJRWMD staff for control.

## **18. Floodplain Forest**

### **Desired Future Conditions**

Floodplain Forests are hardwood forests that occur on drier soils at slight elevations within floodplains, such as on levees, ridges and terraces, and are usually flooded for a portion of the growing season. Floodplain forests at Little Big Econ State Forest are restricted to point bars and areas immediately surrounding the floodplain swamps occupying old oxbows of the river. Floodplain Forests are largely restricted to the alluvial rivers of the panhandle. The dominant trees are generally mixed mesophytic hardwoods, such as overcup oak (*Quercus lyrata*), water hickory (*Carya aquatica*), diamond-leaf oak and swamp chestnut oak (*Quercus michauxii*). The understory may be open and parklike or dense and nearly impenetrable. Other typical plants include bluestem palmetto (*Sabal minor*), willow oak (*Quercus phellos*), green ash (*Fraxinus pensylvanica*), Florida elm (*Ulmus aermicana* var. *floridana*), sweetgum, hackberry (*Celtis* spp.), water oak, American hornbeam, tulip poplar (*Liriodendron tulipifera*), coastal plain willow, black willow (*Salix nigra*), eastern cottonwood (*Populus deltoides*), swamp cottonwood (*Populus heterophylla*), river birch (*Betula nigra*), red maple, silver maple (*Acer saccharinum*), box elder (*Acer nedundo*), American sycamore (*Plantanus occidentalis*), catalpa (*Catalpa* spp.), sweetbay magnolia, hawthorn (*Crataegus* spp.), swamp azalea (*Rhododendron viscosum*), pink azalea (*Rhododendron vaseyi*), gulf sebastiania (*Sebastiania fruticosa*), lanceleaf greenbrier, poison ivy, peppervine, rattanvine, indigo bush (*Indiofera suffruticosa*), white grass (*Leersia virginica*), plume grass (*Erianthus* spp.), redtop panicum (*Panicum rigidulum*), caric sedges (*Carex* spp), silverbells (*Halesia* spp.), crossvine (*Anisostichus capreolata*), American wisteria (*Wisteria frutescens*) and wood grass (*Opilismenus setarius*).

Soils of Floodplain Forests are variable mixtures of sand, organics, and alluvials, which are often distinctly layered. Hydroperiod is the primary physical feature of Floodplain Forests, which are inundated by flood waters nearly every year for 2 to 50% of the growing season. The organic material accumulating on the floodplain forest floor is picked up during floods and redistributed in the floodplain or is washed downriver to

provide a critical source of minerals and nutrients for downstream ecosystems, in particular estuarine systems. These floods also replenish soil minerals through deposition on the floodplain. Floodplain Forests usually do not have standing water in the dry season.

### **Current Conditions**

The primary disturbance to this community noted at LBESF was one area in the Demetree Tract where a ruderal area of pasture grasses occupies a presumable historic floodplain forest at a public access to the river. The other floodplain forests were similar to desired future conditions.

### **Management Actions to Attain Desired Condition**

All floodplain forests will be afforded protection from silvicultural and fire suppression operations and hydrological restoration activities. State forest staff will monitor watercourses for invasive exotics and will coordinate with Department of Environmental Protection and Water Management District staff for control.

## **19. Xeric Hammock**

### **Desired Future Conditions**

Xeric hammock is characterized as a multi-storied forest of tall trees with an open or closed canopy, often associated with and grading into scrub or sandhill. Xeric hammocks at LBESF are closed canopy forests dominated by sand live oak. These hammocks typically have an open parklike aspect. Typical trees include live oak, laurel oak, turkey oak and myrtle oak. Understory includes a mix of herbs and shrubs, which include staggerbush, sparkleberry and saw palmetto. Relatively incombustible oak litter predominates on these sites and precludes most fires.

### **Current Conditions**

Small isolated pockets of xeric hammock exist throughout LBESF. For the most part, xeric hammocks seem to have developed in response to fire exclusion in sandhills and scrubby communities. In addition to the canopy of sand live oak, other common species include longleaf pine, live oak, Chapman's oak, laurel oak, bluejack oak, rusty staggerbush, turkey oak, myrtle oak, saw palmetto, garberia, scrub holly (*Ilex opaca* var. *arenicola*), gopher apple, sparkleberry, and deerberry. The sparse herb layer includes broomsedge bluestem, wiregrass, *Desmodium* sp., *Dichanthelium* sp., sandyfield beaksedge, and lopsided indiagrass. Epiphytes are occasionally found and include Bartram's air-plant, ballmoss, southern needleleaf, Spanish moss, and giant air-plant. Representatives of this community are in good condition and have a vegetative composition similar to the desired condition mentioned above.

### **Management Actions to Attain Desired Conditions**

The sparsity of herbs and the relatively incombustible oak litter preclude most fires from invading xeric hammock. When fire does occur, it is nearly always catastrophic and may convert xeric hammock into another community type. Xeric hammock only develops on sites that have been protected from fire for 30 or more years. If the goal is to return

current xeric hammock to scrub or sandhill, measures should be taken to introduce fire into the hammock. This may also require other measures to reduce oak dominance such as mechanical removal or herbicide treatment.

**Yarborough Tract**

Currently, an FNAI natural community mapping project has not been completed for the Yarborough Tract of LBESF. The information below will be filled in after FNAI completes their survey and after the Forester examines the forest communities to determine its current conditions and the actions needed to attain desired conditions. The information gathered in Table 6 was generated using SJRWMD data on community types found within the Yarborough Tract of LBESF.

**Table 6.** Community Types found on the Yarborough Tract of LBESF

<b>Vegetation Type</b>	<b>Acres Mapped (Existing) *</b>
Cabbage palm hammock	1150
Cypress	58
Freshwater Marshes	542
Upland mixed pine/hardwood	57.3
Herbaceous upland nonforested	8.3
Hydric pine flatwoods	12.2
Improved pastures	738.7
Mixed wetland hardwoods	650.8
Non-vegetated wetlands	3.8
Pine flatwoods	32.1
Shrub and brushland	7.4
Mixed scrub-shrub wetland	149.3
Unimproved pastures	938.5
Upland hardwood forest	8.8
Wet Prairies	43.4
Wetland forested mixed	6.1
Woodland pastures	26.8

\* No FNAI survey has been completed for the Yarborough Tract of LBESF – results are from FLUCC survey



**C. Impact of Planned Uses on Property Resources**

**1. Silviculture**

Guidelines outlined in previous sections of this plan will ensure a sustainable timber resource and diverse ecological resources for perpetuity.

**2. Recreation**

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

**3. Historical/Archaeological**

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

**4. Water**

Water resources will be protected through the use of Florida’s “Silvicultural Best Management Practices” and/or other appropriate measures as deemed necessary by DOF’s Forest Hydrologist and/or Watershed Specialist. Guidelines and activities as outlined in previous sections of this plan will ensure and protect water resources on LBESF.

**5. Wildlife**

Wildlife resources, both game and non-game species, will be protected through multiple-use management techniques coordinated between DOF and FWC. Wildlife will be managed and protected through the maintenance of native ecosystems.

**V. Management Summary**

**A. Operations Infrastructure**

The current annual budget (FY 2008/09) for LBESF is \$164,807; however annual appropriations change. This amount included salaries, expense and operating capital outlay and is broken down as follows:

Salary (1 forester, 1 park ranger (Vacant), 1 secretary specialist).....	\$79,500
Expense (general costs for fuel, supplies, parts etc.) .....	\$35,807
Operating Capital Outlay (Equipment).....	\$49,500
	\$164,807

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

- 2007 4wd Ford F-150 pickup truck
- 2000 GMC Sonoma pickup truck
- 2000 Kawasaki KVF00-C2 ATV 4x4 with trailer
- 1986 4wd Chevy K-30 pickup truck pumper w/100 gal. tank
- 2006 New Holland tractor
- Terra Riser harrow
- 280 gallon fuel trailer
- Utility trailer
- 48" self propelled lawnmower
- 18" lawnmower
- Box blade
- 5ft roller chopper
- 2006 4wd Ford F-250 pickup truck
- 1994 Ford Transport
- 2000 4wd GMC K2500 pickup truck w/60 gal. tank and electric pump
- 1998 4wd GMC 2500 pickup truck w/60 gal. tank and electric pump
- 2006 Suzuki ATV w/winch and guard
- 1989 550g tractor
- Brush Hog 4 ft
- Heavy field harrow 1-disc 6 ft
- Munroe-Tuflin wheel harrow
- brush Hog 6ft
- Brown Tree Cutter
- Rhino rotary lawn mower w/10 dt batwing

A review of facilities and improvements on the forest that provide infrastructure support for staff and equipment include:

- 1,655 sq. ft. headquarters office/visitor center
- 610 sq. ft. community room with seating for thirty
- 410 sq. ft. public restroom
- 2,500 sq. ft. shop building
- 2,500 sq. ft. pole barn for equipment storage
- 50 sq. ft. pump house/storage building
- 1 pavilion along the Econlockhatchee River at Culpepper bend
- 1 pavilion near LBESF headquarters

Utilities serving the public and forest staff is as follows:

- 6" well for potable water located 200 feet north of office building
- One septic tank/drain field system at headquarters site
- Six telephone lines (four for headquarters/administration; one fax line; and one Internet access line) provided by BellSouth
- Electric service provided by Florida Power and Light

In order to supplement the staff assigned to LBESF, the Forester is responsible for recruiting interested volunteers that can bring needed experience and skills to assist with the management of the forest recreation program as well as the resource management activities. Volunteers have been used working on trail maintenance, vegetative inventory work, and educational events. Additional volunteer recruitment will be 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 semiannually to provide input on 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 SJRWMD, DHR and FNAI will be consulted prior to the initiation of any ground disturbing activity by DOF or any other public agency. The DOF will make every effort to protect known archaeological and historical resources. Ground disturbing activities not specifically covered by this plan will be conducted under the parameters of the “List of ARC/Division of State Lands Approved Interim Management Activities”.

The DOF will arrange for at least one staff member from LBESF to attend a DHR Archaeological Monitor Training class. Trained monitors will oversee ground disturbing activities in which DHR recommends monitoring. The DOF will utilize the services of DHR Public Lands archaeologist to locate and evaluate unknown resources, and to make recommendations in the management of known resources. As information becomes available, and as staffing allows, known archaeological and historical sites will be identified on maps and training provided to aid state forest and law enforcement personnel in patrolling and protecting sites.

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

DOF field staff will consult with the State Lands Section of the Forest Management Bureau during the process of planning and implementing multiple-use management activities. The DOF and other assisting agencies will remain alert for any environmentally or archaeologically significant resources, and protective actions will be taken as necessary.

**C. Conformation to State Lands Management Plan**

Management of the forest under the multiple-use concept complies with the State Lands Management Plan and provides optimum balanced public utilization of the property.

Specific authority for the Division of Forestry’s management of public lands is derived from Florida Statutes, Chapters 253 and 589.

**D. Multiple-Use Potential – Income Producing Activities**

The abundance of areas previously used as cattle pastures have the potential to be used for a temporary cattle lease or a temporary sod lease. Where applicable, a one-time sod removal lease would provide for removal of exotic grasses in preparation for site restoration. This type of agricultural lease has been established on LBESF and the first sod harvest occurred in the fall of 2000. A Palm Fan harvest lease (unopened fan from center of top of cabbage palm, *Sabal palmetto*) has been conducted on the Kilbee Tract over the last two years. The annual income has been \$1,500 per year. Apiary leases have not been considered on LBESF due to lack of interest from the general public, however

DOF would consider a lease program on the Kilbee Tract. Currently there are cattle leases on the Yarborough and Kilbee Tracts.

**E. Potential Use of Private Land Managers**

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

*Site preparation* – Private equipment/forestry operations company hired to site prepare approximately 300 acres of mesic flatwoods overgrown with shrubs. DOF spent approximately \$19,500 for this contract.

*Tree planting* – Private equipment/forestry operations company hired to machine plant 40 acres with bareroot longleaf.

**VI. REFERENCES**

Florida Division of Forestry. Revised 2008. “Silviculture Best Management Practices Manual.” Florida Department of Agriculture and Consumer Services, Division of Forestry. Tallahassee, Florida.

Florida Division of Forestry. December 2008. State Forest Handbook. Florida Department of Agriculture and Consumer Services, Division of Forestry. Tallahassee, Florida.

Florida Division of Historical Resources. Revised 2007. “Management Procedures for Archaeological and Historical Sites and Properties on State-Owned or Controlled Lands.” Bureau of Historic Preservation, Division of Historical Resources.

Florida Natural Areas Inventory. February 1990. “Guide to the Natural Communities of Florida.” Florida Natural Areas Inventory and Florida Department of Natural Resources.