



**FLORIDA DEPARTMENT OF
ENVIRONMENTAL PROTECTION**

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3900 COMMONWEALTH BOULEVARD
TALLAHASSEE, FLORIDA 32399-3000

RICK SCOTT
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SECRETARY

December 18, 2013

Ms. Corinne Hermle
Land Planning Specialist
Florida Forest Service
Department of Agriculture and Consumer Services
3125 Conner Boulevard
Tallahassee, Florida, 32399-1650

Re: Blackwater River State Forest – Lease # 3686 and 2346

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, hereby approves the ten-year management plan update for the Blackwater River State Forest. The next management plan update is due December 18, 2023.

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,

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

TEN-YEAR RESOURCE MANAGEMENT PLAN

FOR THE

BLACKWATER RIVER STATE FOREST

SANTA ROSA AND OKALOOSA COUNTIES



PREPARED BY

FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

FLORIDA FOREST SERVICE

APPROVED ON

DECEMBER 18, 2013

TEN-YEAR RESOURCE MANAGEMENT PLAN
FOR THE
BLACKWATER RIVER STATE FOREST



Approved by:



Jim Karels, Director
Florida Forest Service
9.20.13

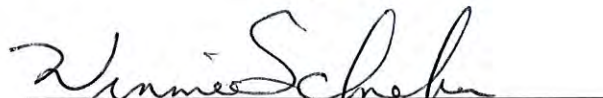
Date



David Core, Assistant Director
Florida Forest Service

9-19-13

Date



Winnie Schreiber, Chief
Forest Management Bureau

Date

TEN-YEAR RESOURCE MANAGEMENT PLAN
BLACKWATER RIVER STATE FOREST

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TEN-YEAR RESOURCE MANAGEMENT PLAN
BLACKWATER RIVER STATE FOREST

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LAND MANAGEMENT PLAN EXECUTIVE SUMMARY

LEAD AGENCY: Florida Department of Agriculture and Consumer Services, Florida Forest Service
COMMON NAME: Blackwater River State Forest
LOCATION: Santa Rosa and Okaloosa Counties
ACREAGE TOTAL: 210,406.66

<i>Historical Natural Communities ±</i>	<i>Acreage</i>	<i>Historical Natural Communities ±</i>	<i>Acreage</i>
Upland Pine	134,113	Mesic Flatwoods	785
Alluvial Forest	26,627	Blackwater Stream	718
Sandhill	19,612	Lakes	527
Seepage Slopes	6,361	Floodplain Swamp	347
Baygall	1,074	Dome Swamp	104
Upland Hardwood Forest	855	Depression Marsh	43

± Compiled from 2006 FNAI inventory on 190,639 acres of BRSF

LEASE/MANAGEMENT AGREEMENT NO.: 3686 and 2346 USE: Single____ Multiple X

MANAGEMENT AGENCY

FDACS, Florida Forest Service

Florida Fish and Wildlife Conservation Commission

Northwest Florida 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): Dept. of Juvenile Justice, Okaloosa County, Munson Volunteer Fire Dept., FL Fish and Wildlife
Conservation Commission, Blackwater Baptist Church

ENCUMBRANCES: County

TYPE ACQUISITION: Federal Land Transfer, P2000, Florida Forest Forever

UNIQUE FEATURES: Blackwater River system and bluffs, seepage slopes (pitcher plant bogs), depression marshes,
mature longleaf pine forests, red-cockaded woodpeckers

ARCHAEOLOGICAL/HISTORICAL: Numerous small sites

MANAGEMENT NEEDS: Longleaf pine restoration, erosion and sedimentation control, and boundary resolution

ACQUISITION NEEDS: In-holdings, Whiting OLF Connector

SURPLUS LANDS/ACREAGE: None

PUBLIC INVOLVEMENT: Management Plan Advisory Group and a Public Hearing, and the Acquisition and
Restoration Council public hearing.

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

ARC Approval Date: _____ BTIITF Approval Date: _____

Comments: _____

I. Introduction

Blackwater River State Forest (BRSF) is the largest State Forest in Florida, with more than 210,000 acres of forests, rivers, and lakes. BRSF is located in the western panhandle of Florida in Okaloosa and Santa Rosa Counties (Exhibit A) and is named for the Blackwater River, which runs through the forest for approximately 30 miles. The Blackwater River is one of the last remaining shifting sand bottom streams still in its natural state for almost its entire length. BRSF was initially leased from the Federal government in 1938 and purchased in 1954. The original transfer consisted of 183,184 acres. Over the years, through the Preservation-2000 and Florida Forever Programs along with in-holding additions funds, the Forest has grown to 210,406.66 acres.

BRSF is also known for its longleaf pine/wiregrass ecosystem which, in combination with the Conecuh National Forest and Eglin Air Force Base, forms the largest contiguous longleaf pine/wiregrass ecosystem in the world. This ecosystem once covered over 90 million acres in the southeastern United States. Today, less than 4 million of these acres still contain this ecosystem. Longleaf pine communities are some of the richest in plant and animal diversity, including many species classified as threatened or endangered.

Major community groups represented on the forest include upland pine, bottomland forest, floodplain swamp, sandhill, and seepage slopes. Significant species sighted on the forest include the bald eagle, red cockaded woodpecker, gopher tortoise, and flatwoods salamander. Major recreational activities enjoyed at BRSF include canoeing, hiking, horseback riding, camping, fishing, swimming, hunting, wildlife viewing, and mountain bike riding.

A. General Mission and Management Plan Direction

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

Management strategies for BRSF center on the multiple-use concept, as defined in 589.04(3) and 253.034(2)(a) F.S. Implementation of this concept will utilize and conserve state forest resources in a harmonious and coordinated combination that will best serve the people of the state of Florida, and that is consistent with the purpose for which the forest was acquired. Multiple-use management for BRSF will be accomplished with the following strategies:

- Practice sustainable forest management for the efficient generation of revenue and in support of state forest management objectives;
- Provide for resource-based outdoor recreation opportunities for multiple interests.
- Restore and manage healthy forests and native ecosystems ensuring the long-term viability of populations and species listed as endangered, threatened or rare, and other components of biological diversity including game and nongame wildlife and plants;

- Protect known archaeological, historical, cultural and paleontological resources;
- Restore, maintain and protect hydrological functions, related water resources and the health of associated wetland and aquatic communities.
- Cooperate with the United States military to facilitate mission essential training in a manner that does not adversely impact natural resources, forest management, or public access.

This management plan is provided according to requirements of Sections 253.034, 259.032 and 373, Florida Statutes, and was prepared utilizing guidelines outlined in Section 18-2.021 of the Florida Administrative Code. It is not an annual work plan or detailed operational plan but provides general guidance for the management of BRSF for the next ten-year period and outlines the major concepts that will guide management activities on the forest.

B. Past Accomplishments

A compilation of management activities and public use on BRSF has been completed monthly and is available from the forest manager. A table has been prepared for this plan that summarizes the accomplishments for each of the past five years (Exhibit B). The table does not attempt to account for all activities on the forest, but summarizes major activities that are more readily quantifiable. It does not list the multitude of daily activities and public interactions involved in managing the forest. Exhibit C shows a graphical summary of fire accomplishments over time.

Since the approval of the previous management plan in 2000, there have been many events, developments and accomplishments. Among the most noteworthy have been the following:

- Hurricanes Ivan in 2004 and Dennis in 2005 caused tremendous damage to Blackwater's timber. Approximately 15 percent of Blackwater's timber was salvage-logged in 2005 or left to decay.
- Blackwater assumed management of several large land acquisitions. The largest was the 11,208 acre Yellow River Ravines tract, acquired in 2007 from International Paper Company through The Nature Conservancy with Florida Forever funds. Other large acquisitions were the International Paper/Ates pasture (4,624 acres, 2004), and the TNC-Rayonier property (1,026 acres, 2008). In 2009, the FSS began managing the Clear Creek tract, 1,481 acres purchased through Florida Forever and Off-Highway Vehicle funding sources. An additional 1,900 acres in smaller parcels have been acquired through Florida Forever since 2000.
- BRSF continued to restore 8,774 acres of off-site slash pine forest to longleaf pine. By the end of FY 03-04, only 2,300 acres remained to be restored. However, with the acquisition of the Ates Pasture, Yellow River Ravines, TNC-Rayonier, and Clear Creek tracts, the total number of acres requiring conversion to longleaf pine

increased to 6,400. While none of the new acreage was in longleaf and all must be converted, it will take some time to do so as much of the newly acquired timber is not yet merchantable, even as pulpwood.

- A total of 269,968 acres were burned over the last five years. This is one of the largest state lands burning programs in the nation. Drought in the first year of the planning period had a negative impact on total accomplishments. Many areas of the forest were burned more than once during that time.
- Through the use of grants, in-house funding and cooperating agencies BRSF has closed 434 miles of dirt roads, and restored 26 miles of closed roads. Twelve (12) primitive recreation areas had barriers installed to prevent visitors from driving onto sandbars.
- Blackwater has received multiple grants and contracts from the Department of Environmental Protection (DEP), Fish and Wildlife Conservation Commission (FWC), and the United States Forest Service for control of exotic species including cogon grass, Japanese climbing fern, Chinese privet, tallow tree, and Chinese wisteria. Initial inventory work and treatment has been completed and a GIS database established for all known exotic species on the Forest. Approximately 3,166 acres of invasive plants have been treated. Invasive species control plans are updated annually.
- A FFS biologist was hired to inventory, monitor and manage natural resources in BRSF. To date, a list of BRSF's rare and listed species has been started and a list of common species is continually growing. Photo and written documentation are recorded regularly. In addition, habitat condition and existence of invasive exotic species are documented. Recommendations are made for habitat restoration where necessary.
- The North American Butterfly Association conducts a yearly butterfly count in BRSF which is peer-reviewed and published.
- A survey of rare butterflies was conducted by the Florida Natural Areas Inventory (FNAI), funded by a grant from FWC.
- The Francis M. Weston Audubon Society conducted a bird survey, recording the nesting, migrating, and resident birds at BRSF.
- Blackwater River State Forest's red-cockaded woodpecker recovery program is ahead of schedule. There are over 90 potential breeding pairs on BRSF, and birds frequently move between BRSF and the Conecuh National Forest.
- Gopher tortoise surveys are being conducted by FWC to determine the status of tortoises in BWMA. Tortoise burrows are located, numbered and recorded with GPS so that future comparisons can be made.
- A herbarium has been started and continues.
- An insect collection has been started and continues.

- FWC is monitoring pitcher plant populations and will continue to monitor known populations while surveying for additional populations.
- Paved access was completed to the Karick Lake and Bone Creek recreation areas, and to the boat ramp one mile upstream from Deaton Bridge.
- Three new primitive recreation areas were developed for camping and picnicking, including one on Juniper Creek and two on Hutton tract. Primitive areas were established on both the Hutton and Juniper Creek Units (2).
- The Florida Trail was extended south of the Blackwater River and across the Hutton Tract and Yellow River Ravines Tract. New trails were built, connecting the Jackson Trail to Bear Lake and to the Conecuh National Forest.
- Four staff members at Blackwater have completed the Archaeological Monitor Training.
- In response to the return of resident black bears in BRSF, the FFS and FWC have established guidelines for managing black bears around developed areas. The FFS has installed bear-resistant measures on trash dumpsters in recreation areas.

C. Goals/Objectives for the Next Ten Year Period

The following goals and objectives provide direction and focus management resources for the next ten-year planning period. Funding, agency program priorities, and the wildfire situation during the planning period will determine the degree to which these objectives can be met. Management activities on BRSF during this management period must serve to conserve, protect and enhance the natural and historical resources and manage resource-based public outdoor recreation, which is compatible with the conservation and protection of this forest. The majority of the management operations will be conducted by the FFS, although appropriate activities will be contracted to private sector vendors. All activities will enhance the property's natural resource or public recreational value.

The management activities listed below will be addressed within the ten-year management period and are defined as short-term goals, long-term goals or ongoing goals. Short-term goals are goals that shall be achievable within a two year planning period, and long-term goals shall be achievable within a ten year planning period. Objectives are listed in priority order for each goal. Cost estimates are provided below for FFS services and contract services where sufficient information is available to make projections. Costs for some activities cannot be estimated at this time. Other activities will be completed with minimal overhead expense and existing staff.

➤ GOAL 1: Sustainable Forest Management

Objective 1: Prepare a silviculture management plan including reforestation, harvesting, prescribed burning, restoration, and timber stand improvement activities and goals. Annually update the silvicultural management plan to include harvest and reforestation schedule. (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: Update and improve stand descriptions and forest inventory. Compile existing forest data into the new FFS model geodatabase. Update data files at least annually. Among other things, the geodatabase will include timber stand descriptions, understory condition, fire history, infrastructure, threatened & endangered species, archaeological resources, exotic species locations, historical areas. (Ongoing Goal)

Performance Measures:

- Complete GIS database and reinventory all attributes as required by FFS procedures.

Objective 4: Conduct Forest Inventory updates on 21,000 acres annually. (Short Term Goal)

Performance Measure: Number of acres inventoried annually.

Objective 5: Remove merchantable loblolly (*Pinus taeda*) and sand pine (*P. clausa*) plantations in stands where soils and historic vegetation indicate other pine species, where longleaf (*Pinus palustris*) or slash pine (*Pinus elliottii*) should dominate. Remove plantations through a series of thinnings and harvests, with species appropriate to each stand. (Long Term Goal)

Performance Measure:

- Begin harvest operations, including thinnings, on 100 percent of plantations identified as consisting of off-site pine species.
- Total acreage of off-site pine plantations converted to slash or longleaf pine.

Objective 6: Conduct timber sales at appropriate times to promote forest health, optimize revenue generation, and ensure sustainability of the resources. (Long Term Goal)

Performance Measure: Conduct timber sales sustainable to BRSF's timber resources.

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

Objective 1: Maintain public access and recreational opportunities to allow for a recreational carrying capacity of 650 visitors per day. (Short Term Goal)

Performance Measure: Number of visitor opportunities/day.

Objective 2: Develop additional public access and recreational opportunities to allow for a carrying capacity of 820 visitors/day. (Long Term Goal)

Performance Measure: Number of visitor opportunities/day.

Objective 3: Develop and implement a 5-Year Outdoor Recreation Plan and update annually. (Short Term Goal)

Performance Measure: Completion of the 5-Year Outdoor Recreation Plan and update annually.

Objective 4: Develop and maintain the Clear Creek Off-Road Vehicle trail system and associated infrastructure. (Short Term Goal) Secure a public-private partnership to concession the operations of the facility with a carry capacity of 160. (Long Term Goal)

Performance Measure:

- Miles of trail established and maintained.
- Number of users.

Objective 5: Expand and maintain non-motorized recreational multiple-use trail system in conjunction with interested hiking, equestrian, and cycling groups. Work with DEP and USFS to rename, connect and improve what has been known as the Florida National Scenic Trail through BRSF. This trail will be referred to as the Blackwater Connector Trail to the Florida National Scenic Trail. (Long Term Goal)

Performance Measure: Miles of trail established and maintained.

Objective 6: Develop an environmental outreach program including the installation of informational kiosks and completion of informative programs for local schools, groups, and communities. (Long Term Goal)

Performance Measure: Number of kiosks installed and number of environmental programs completed annually.

Objective 7: Develop and implement recreation facility improvements as discussed in Section V.B.1. Complete repairs to Karick Lake North bath house (est. \$2,500), and pave the road into Hurricane Lake North Campground. (Short Term Goal)

Performance Measure: Improvements completed.

Objective 8: Update Blackwater River State Forest User Map and brochure.

Performance Measure: User Map and Brochures updated.

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

Objective 1: Prescribe burn 60,000 acres per year. Approximately 180,000 acres supports fire dependent plant communities, most of which will be burned on an average rotation of four years or less. Cost estimates are based on FFS's contract burning rate schedule. Manpower and equipment costs are included. Average acreage per year is 51,000. Estimated annual cost (FSS) is \$408,000. (Short Term Goal)

Performance Measure: Number of acres burned during the dormant & growing seasons.

Objective 2: Develop a fire management plan to address fire prevention, detection, and suppression, and prescribed burning plans. (Short Term Goal)

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

Objective 3: Harvest off-site slash pine, sand pine, and loblolly pine, and start restoration of longleaf pine on the sandhill and upland pine sites. Sites to be planted in longleaf will

include harvesting of off-site species, herbicide treatment, prescribed burning, and planting of longleaf seedlings (within 3 years). Estimated acreage per year is 700. Estimated annual cost (Contract) is \$154,000. (Ongoing)

Performance Measures:

- Number of acres of off-site pine harvested.
- Number of acres of longleaf pine planted.

Objective 4: Assess the condition of ground cover in stands that have been altered by historic use. (Short Term Goal)

Performance Measure: Completion of ground cover assessment.

Objective 5: Implement 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 prescribed fire within the designated ground cover restoration area.

Objective 6: Florida Natural Areas Inventory (FNAI) will conduct biological survey and vegetation mapping. Highest priority will be natural communities mapping of Yellow River Ravines acquisition. Estimated cost (contract) is \$12,000. (Short Term Goal)

Performance Measure: Survey completed.

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

Objective 1: Update the baseline listed and rare species occurrence inventory list. (Long Term Goal)

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

Objective 2: Develop and implement monitoring protocols for listed and rare species. (Long Term Goal)

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

Objective 3: Restore known historic habitat for reticulated flatwoods salamander (*Ambystoma bishopi*) in the Yellow River Ravines unit by thinning slash pine forest, mechanically removing underbrush, and prescribed burning. (Short Term Goal)

Performance Measure:

- Acres of forest thinned.
- Acres prescribed burned.

Objective 4: Implement the recommendations for Phase III of the red-cockaded woodpecker management plan for BRSF. Determine if additional recruitment clusters are needed to unite the eastern and western sub-populations. (Ongoing Goal)

Performance Measure: Number of active red-cockaded woodpecker clusters within the state forest.

Objective 5: Update the red-cockaded woodpecker management plan for BRSF during the management period. Include in plan a determination of best location of any future recruitment clusters for the purpose of strengthening existing aggregations of clusters and of uniting aggregations within the forest and with Conecuh National Forest. (Long Term Goal)

Performance Measure: Management plan updated.

Objective 6: The FFS will develop an imperiled species management strategy in consultation with FWC. (Short-Term)

Performance Measure: Imperiled species management strategy completed.

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

Objective 1: Locate, identify, and control non-native invasive plant species. Average acreage per year is 200 acres. Estimated annual cost is \$150,000. (Short Term Goal)

Performance Measure: Total number of acres identified and successfully treated.

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

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

Performance Measure: Number of recorded sites.

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

Performance Measure: Number of sites monitored.

Objective 3: Ensure that a minimum of two personnel are trained as Cultural and Historical Resource monitors. (Short Term Goal)

Performance Measure: Number of personnel trained as monitors.

Objective 4: Obtain a comprehensive map of archaeological sensitive sites on BRSF, working with the University of West Florida and other interested parties, under the coordination of DHR. Estimated cost is \$1,000. (Long Term Goal)

Performance Measure: Completion of surveys and update site maps to include identified cultural and historical sites.

➤ **GOAL7: Hydrological Preservation and Restoration**

Objective 1: Conduct or obtain a site assessment/study to identify potential hydrology restoration needs on newly-acquired properties. (Short Term Goal)

Performance Measure: Assessment conducted.

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

Performance Measure: Compliance with state lands BMPs.

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

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

Objective 4: Reduce erosion along trails, roads and firelines by planting and encouraging vegetation growth and/or mechanical methods. (Long Term Goal)

Performance Measure: Trails, roads, and firelines planted with native or non-invasive species or number repaired.

Objective 5: Develop a forest wide hydrological plan to address erosion and sedimentation issues. Develop comprehensive prioritized approach to reduce stream sedimentation issues. Estimated cost is \$5,000. (Short Term Goal)

Performance Measure: Completion of a hydrological plan.

Objective 6: Conduct annual road inspection to determine the need for installation or replacement of culverts and low water crossings. (Long Term Goal)

Performance Measure: Annual inspection and appropriate improvement completed.

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

Objective 1: Develop and implement a 5-Year Outdoor Recreation Plan and update annually. (Ongoing Goal)

Performance Measure: Completion of the 5-Year Outdoor Recreation Plan and update annually.

Objective 2: BRSF staff will maintain all existing facilities, roads, and trails based on need and budget constraints. (Long Term Goal)

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

Objective 3: Improvement and maintenance of fire lines/trails. Maintenance will be by FFS staff and volunteers. Estimated annual cost is \$10,000. (Long Term Goal)

Performance Measure: Miles of firelines/trails improved.

Objective 4: Continue annual maintenance of state forest boundary in accordance with the guidelines stated in Chapter 11 of the State Forest Handbook (FFS 2008).

Unsurveyed boundaries will be surveyed, marked and posted with state forest boundary signage if funding is available. Maintenance will be annually or as needed. Estimated annual cost is \$28,125. (Short Term Goal)

Performance Measure: Percentage of forest boundary maintained.

Objective 5: Correct encroachment on state land. Document boundary disputes. Complete forest-wide certified survey. (Long Term Goal)

Performance Measure: Miles of forest boundary maintained.

Objective 6: Implement a 5-Year Road Management Plan and update annually. Continue to upgrade roads and bridges, address drainage and access issues based on the plan. (Ongoing Goal)

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

II. Administration Section

A. Descriptive Information

1. Common Name of Property

The common name of the property is the Blackwater River State Forest (BRSF).

2. Legal Description and Acreage

BRSF is made up of a large tract of land in northern Santa Rosa and Okaloosa Counties totaling 210,406.66 acres (Exhibit D). Numerous private land holdings exist within the forest boundaries. Similarly, several parcels of state land are isolated by private property. The legal description is found in lease agreement 3686 and 2346. The forest occupies part or most of the following townships in Santa Rosa and Okaloosa Counties: Townships 3, 4, 5, 6 North, Range 28 West; Townships 2, 3, 4, 5, 6 North, Range 27 West; Townships 1, 2, 3, 4, 5, 6 North, Range 26 West; Townships 2, 3, 4, 5, 6 North, Range 25 West; Townships 4, 5, 6 North, Range 24 West and Township 5 North, Range 23 West.

For management purposes, the forest is divided into nine management units (tracts). These nine units are: Coldwater, Sweetwater, Rock Creek, Horse Creek, Bone Creek, Juniper, Floridale, West Boundary, and Yellow River. Exhibit E shows the management units. Exhibit D lists the BRSF acreage by parcel and funding source.

A complete legal description of lands owned by the Board of Trustees of the Internal Improvement Trust Fund (BOT) as part of BRSF is on record at the Blackwater Forestry Center Headquarters, Florida Department of Environmental Protection (DEP), and the FFS state office in Tallahassee.

3. Proximity to Other Public Resource

BRSF adjoins the southern boundary of the Conecuh National Forest along the Florida-Alabama State line. The 698 acre Blackwater River State Park is located in the southwest corner of the forest and is surrounded by state forest property. With the acquisition of the Yellow River Ravines Tract in 2007, Blackwater now adjoins the Yellow River Water management Area owned by the Northwest Florida Water

Management District (NFWFMD). This creates a corridor of publicly managed land connecting to Eglin Air Force Base to the south, one of the largest military installations in the United States, with 463,441 acres of land. The Clear Creek Tract, acquired in 2010, lies adjacent to county lands and is part of a buffer that is being created around Naval Air Station Whiting Field. The northern terminus of the Blackwater Heritage State Trail is three miles south of the Clear Creek Tract. The Garcon Point and Lower Escambia River Water Management Areas are 9 and 15 miles south west and west, respectively, of BRSF.

4. Property Acquisition and Land Use Considerations

a. Federal

BRSF was acquired as a land-use project by the U.S. Government in the mid-1930s. The property was acquired from various individuals and corporations such as the Bagdad Land and Lumber Company and the Okaloosa Land Company. The purpose of this land acquisition project was to resettle people who were attempting to subsist in a sub-marginal economy, thus alleviating the effects of the depression as experienced in this area of Florida. Shortly after the U.S. Government acquired the property, it was turned over to the Soil Conservation Service (SCS) for administration. The State of Florida was granted management of the property in November of 1938 by a fifty-year lease, with three automatic extensions of fifteen years each.

In 1954, title to the property was transferred from the SCS to the U.S. Forest Service (USFS) which, in 1955, deeded the property to the State of Florida, Board of Forestry. Total size of this original acquisition was 183,184.57 acres.

b. P-2000 and Florida Forever Funded In-holdings & Additions

Several parcels have been added to BRSF under the In-holdings and Additions Program, including the 1,249.8 acre Juniper Creek parcel acquired in April 1997, (located in Santa Rosa County on both sides of Juniper Creek, south of Red Rock Road), and the 4,454.42 acre Southern Blackwater Parcel (Hutton Tract) acquired in June 1997, located near the Harold community. In addition, under the Florida Forever Program, the state added the 4,623.8 acre Ates parcel (located in Santa Rosa County between Munson and Harold), the 11,208.54 acre Yellow River Ravines parcel (located in Santa Rosa and Okaloosa Counties south of US 90 between Harold and Holt), the 1,026.42 acre TNC Rayonier parcels (located in Okaloosa County northwest of Baker).

In 2010 the state purchased the 1,400.63 acre Clear Creek Tract (located northeast of Naval Air Station (NAS) Whiting Field) under the Florida Forever and Off-Highway Vehicle programs. Several other smaller parcels have been acquired under the In-holdings and Additions Program, bringing the total in-holding and additions acreage to 26,345.15 acres.

c. Other Acquisitions

Several smaller parcels have been acquired over the years through mitigation and other means. These parcels range in size from forty to eighty acres with a total acquisition of 309.95 acres.

B. Management Authority, Purpose and Constraints

1. Purpose for Acquisition/Management Prospectus

The land that was to become the BRSF was acquired by the Federal Government to revegetate, resettle, and protect the area following extensive deforestation by land and timber companies in the early 1900s. In the late 1930s at the request of Florida's Governor, the land was leased to the State and the restoration process continued.

The Yellow River Tract was acquired to protect a high quality example of an imperiled natural community and to protect threatened and endangered plant and animal species. Acquisition of this Tract allowed for a continuous corridor of public land from Eglin Air Force Base through the BRSF and to the Conecuh State Forest in Alabama. The acquisition of undeveloped land around the U.S. Navy's Pensacola Naval Air Station satellite airfields enhanced military training by preventing encroachment on military reservations.

Several smaller tracts were acquired through FDACS's In-holdings and Additions land acquisition program to aide in the management of BRSF by acquisition of essential ownerships that were not acquired in the initial phases of the Florida Forever project. These parcels were identified as integral to the successful management of BRSF by allowing the introduction of prescribed fire to previously inaccessible areas, providing additional public access, and affording additional protections to environmentally sensitive areas.

The management prospectus can be found in Exhibit F.

2. Degree of Title Interest Held by the Board

The Board of Trustees of the Internal Improvement Trust Fund (BOT) holds fee simple title to the property known as BRSF. There are many sub-leases, easements, use agreements, and permits executed on the forest. The majority of these are small easements needed for power line access or ingress/egress to private property. Copies of the lease are on file at the Florida Department of Environmental Protection, Division of State Lands' office.

3. Designated Single or Multiple-Use Management

The BRSF is managed under a multiple-use concept by the FFS, under the authority of Chapters 253 and 589, Florida Statutes. The FFS is the lead managing agency as stated in Management Lease Numbers 3686 and 2346.

Multiple use is the harmonious and coordinated management of timber, recreation, conservation of fish and wildlife, forage, archaeological and historic sites, habitat and

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

4. Revenue Producing Activities

Numerous activities on the state forest provide for multiple-use as well as generate revenue to offset management costs. The majority of the revenue derived by BRSF comes from traditional forest sources including timber sales and receipts from improved recreation areas (campgrounds, day use, canoe vendor permits, etc). The average revenue for the period 2003-2009 and potential for income producing activities are listed below:

- *Timber revenue from traditional sales of roundwood logs* – Timber revenues varied greatly during the management period. In 2004-2005, timber revenues exceeded \$6,500,000 due to a large salvage sale following Hurricane Ivan. The following year saw timber revenues drop to just over \$84,000 as forest managers took stock of what timber was left and revised harvesting plans. The average revenue for the six years following the hurricane salvage was \$1,919,890. In 2010-2011, timber revenues were \$1,666,950. Revenues for the planning period will probably have an average similar to the past period.
- *Recreation* - Revenues from recreation fees on the state forest have gradually increased. In fiscal year 2010-2011, total revenues from recreation fees were \$332,924. This number is broken down as follows: camping fees, \$241,372; entrance fees, \$45,832; stable fees, \$23,384; commercial permits, \$11,753; kitchen and pavilion rentals, \$7,277; annual pass sales, \$2,109; canoe rentals, \$1,197. The camping, canoeing, equestrian, and other existing revenue-producing recreation are expected to gradually increase in the coming decade. The planned opening of the off-road vehicle recreation area at Whiting Field/Clear Creek should generate additional income.
- *Biomass fuelwood* – In addition to traditional roundwood timber, BRSF has sold biomass to contractors who chip whole trees on site, and transport the chips to boilers to generate electricity. In 2010-2011, 73,958 tons of biomass was sold for \$194,568.
- *Pine seed and decorative cones sales* - Revenue from this source varies from year to year because longleaf pines do not produce consistent annual cone crops. However, revenue from cone sales is approaching \$75,000 per year and is expected to continue to grow.

- *Lightwood* – Lightwood is the resinous heartwood of mature longleaf and slash pines. After the tree dies and falls, lightwood resists rot and can persist on the ground for many years after the rest of the tree is rotted away. Hurricane Ivan left many logs on the ground, even after salvage logging. A demonstration sale of lightwood in 2010/11 produced \$4,299 in revenues from 300 acres. No attempt has been made to measure the quantity of lightwood on the forest.
- *Firewood* – sales of firewood totaled \$1,770 in 2010/11.
- *Gas and oil exploration/leases* – BRSF has a history of oil well development going back over thirty years. There are no currently operating wells, but seismic testing was conducted on part of the forest in 2011-2012, and there is potential for income from oil and gas development.
- *Cattle grazing* – There are no areas of the forest currently used for grazing, however it will be considered as requests are made.
- *Other Revenue Sources* – Other possible revenue producing activities include sale of wiregrass and other native seeds, pine straw, and commercial photography/motion picture production.

5. Conformation to State Lands Management Plan

Management of the forest under the multiple-use concept complies with the State Lands Management Plan and provides optimum balanced public utilization of the property. Specific authority for the FFS's management of public land is derived from Chapters 589, 259 and 253, Florida Statutes.

6. Legislative or Executive Constraints

There are no known legislative or executive constraints specifically directed toward BRSF. The only known constraint would be the reverter clause when the U. S. Government property was conveyed, which states the property must be used for public purposes. The U. S. Congress is considering removing this reservation on a limited basis to allow for land transactions needed to consolidate forest boundaries.

7. Aquatic Preserve/Area of Critical State Concern

This area is not within an aquatic preserve or an area of critical state concern, nor is it in an area under study for such designation. The nearest area of critical state concern is the Apalachicola Bay in Franklin County. The closest aquatic preserve is the Yellow River Marsh Aquatic Preserve which is south of Milton, Florida where the Yellow River enters the Blackwater Bay.

C. Capital Facilities and Infrastructure

1. Property Boundaries Establishment and Preservation

The BRSF boundary lines are managed by state forest personnel in accordance with the guidelines stated in Chapter 11 of the State Forest Handbook.

2. Improvements

BFC has a wide variety of facilities including maintenance and shop facilities, offices, meeting rooms, and recreation facilities to facilitate management and the needs of the public. Perhaps the most unique of these facilities is a 1950s era sawmill used to produce rough cut lumber for use in our bridge and building maintenance program. Blackwater River State Forest contains 114 structures owned by the FFS. Included in this are nine public water systems and six private residences. A complete list of facilities is attached to this plan (see Exhibit G).

3. On-Site Housing

FFS may establish on-site housing (mobile/manufactured home) on BRSF if deemed necessary to alleviate security and management issues. The need and feasibility of the remaining 6 residences, or additional housing for the state forest will be evaluated and established if considered appropriate by the Center Manager and approved by the FFS Director. Prior to the occurrence of any ground disturbing activity for the purpose of establishing on-site housing, a notification will be sent to the DHR and FNAI for review and recommendations. This type of housing will not exceed three homes per location with the possibility of more than one on-site housing location occurring if considered necessary by the Center Manager and approved by the Director.

4. Operations Infrastructure

The current annual budget (FY 2013-2014) for the Blackwater Forestry Center (BFC) totals \$1,152,607. This includes OPS salaries, expenses, and contractual costs, but excludes permanent personnel. A complete breakdown is listed below:

Resource Management.....	\$122,500
Maintenance.....	\$208,261
Recreation	\$55,000
Operations	\$325,224
Seed Orchard.....	\$103,900
CARL Expenses.....	\$191,722
Total:	\$1,152,607

BFC is headquartered within BRSF. One hundred and two (102) full-time employees and 15 OPS (temporary) employees carry out necessary resource management work, manage recreation areas, maintain a large network of roads and bridges, and provide for fire prevention and protection both on the Forest and in the immediate three county area (Blackwater Forestry Center is responsible for Escambia, Santa Rosa and Okaloosa Counties).

BFC maintains a diverse range of equipment necessary for the effective operation of a large state forest. This includes road graders, loaders, medium and heavy crawler tractors and transports for fire fighting, two- and four-wheel drive pickups, all-terrain vehicles (ATV's), mowers, and farm tractors. A helicopter is used for fire control.

Much of the heavy equipment is dedicated to maintaining nearly 900 miles of roads and nearly 60 bridges located on the Forest.

D. Additional Acquisitions and Land Use Considerations

1. Alternate Uses Considered

During this management period the following uses were considered and determined to be not compatible: water resource development projects, water supply development projects, storm water management projects and linear facilities, except as otherwise outlined in this plan. Other uses will be considered as requests are made and will be accommodated as appropriate if they are determined to be compatible with existing uses and with the management goals and objectives of the forest.

2. Additional Land Needs

Purchasing of additional land within the optimal management boundary (Exhibit H) would facilitate restoration, protection, maintenance, and management of the resources on BRSF.

3. Surplus Land Assessment

All of the property within BRSF is suitable for and necessary for the management of BRSF, and none should be declared surplus except to resolve boundary disputes.

4. Adjacent Conflicting Uses

During the development of this management plan, FFS staff identified and evaluated adjacent land uses, reviewed current comprehensive plans, and future land use maps in making the determination that there are currently no known conflicting adjacent land uses. Additionally, FFS 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.

FFS will cooperate with 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., and discuss ways to minimize encroachment onto the forest.

Development pressures continue to build within the boundaries and adjacent to BRSF. This increase in development will bring more requests for easements, increased traffic (leading to more road maintenance and improvements), and more restrictions on prescribed burning.

5. Compliance with Comprehensive Plan

This plan was submitted to the Board of County Commissioners in Santa Rosa and Okaloosa Counties for review and compliance with their local comprehensive plan (Exhibit I).

6. Utility Corridors and Easements

Due to the size of BRSF and the existence of a significant acreage of private in-holdings, numerous utility corridors and easements exist on this Forest. Included are easements for gas pipelines, power lines, and access. Copies of these documents are available upon request. The use of State Forest property for utility lines, pipelines, linear facilities and transportation corridors has and will continue to be discouraged; however with hundreds of miles of roads containing numerous private residences it is inevitable that new easements will ultimately be issued.

The FFS does not favor the fragmentation of natural communities with utility lines - consequently, easements for such uses will be discouraged to the greatest extent practical. The FFS does not consider BRSF suitable for any new linear facilities.

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

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

E. Agency & Public Involvement

1. Responsibilities of Managing Agencies

The FFS is the lead managing agency, responsible for overall forest management and public recreation activities, as stated in Board of Trustees Management Lease Numbers 3686 and 2346. Pursuant to the management lease, the lead managing agency may enter into further agreements or to sub-leases on any part of the forest. The Florida Fish and Wildlife Conservation Commission (FWC) has law enforcement responsibilities, enforces hunting regulations, cooperatively sets hunting season dates with FFS, and conducts other wildlife management activities with input from FFS. The FFS will cooperate with the DHR regarding appropriate management practices on historical sites on the property as stated in Section 267.061, Florida Statutes. They will be notified prior to the initiation of any ground disturbing activities by the FFS or any other agency involved with the forest. The Northwest Florida Water Management District (NFWFMD) will be consulted and involved in matters relating to water resources as appropriate.

2. Law Enforcement

Primary law enforcement responsibilities will be handled by law enforcement officers from the FWC. Additional assistance is provided by the Santa Rosa and Okaloosa County Sheriff's Offices as needed.

Chapter 5I-4 of the Florida Administrative Code were promulgated for Department of Agriculture and Consumer Services, Florida Forest Service, to manage the use of State Lands and better control traffic, camping, and other uses in the State Forest.

3. Public and Local Government Involvement

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

The FFS responds to public involvement through its Liaison Committees, Advisory Groups, public hearings, and through direct contact with user groups. A Land Management Review Team conducted a review of management plan implementation in 1999, 2005, and 2012 (Exhibit J). The review team's recommendations were incorporated into this plan as appropriate.

The plan was developed with input from the BRSF Management Plan Advisory Group and was reviewed at public hearings on June 5 and 6, 2012. A summary of the advisory group's meetings and discussions, as well as written comments received on the plan, are included in Exhibit K. The Acquisition and Restoration Council (ARC) public hearing and meeting serve as an additional forum for public input and review of the plan.

4. Department of Corrections

BRSF contracts with the DOC to receive inmate labor from the Berrydale Correctional Facility in Santa Rosa County. Inmates clean buildings, maintain landscapes around buildings and recreation areas, assist the maintenance shop, perform road maintenance and construction labor, operate the sawmill, and other forest activities. The use of inmate labor increases the services that the state forest can provide the public while keeping expenses low.

5. Military

From time to time, BRSF cooperates with the United States military in accordance with military operations such as the Gulf Regional Airspace Strategic Initiative (GRASI) to facilitate their training missions. NAS Whiting Field is the primary fixed wing and rotor flight training facility for the US Navy and Marines. Eglin Air Force Base (AFB) is the center of operations that frequently fly north, over BRSF, into Alabama where there are other bases. The US Army and Air Force (USAF) have Special Forces that train on Eglin AFB. Navy helicopters frequently fly over the forest at low elevations. Parts of BRSF have restricted air space in order to protect military flights. Any proposed future military use agreement such as GRASI would be proposed as an addendum to the approved BRSF 10 year resource management

plan. No military activity under this agreement would be implemented on the state forest before such an addendum is approved by ARC.

Expanding U.S. military operations in Northwest Florida will create more opportunities for cooperation between BRSF and the U.S. military. In October 2012, FDACS and the USAF entered into a Memorandum of Understanding that will allow the USAF to use designated areas within the state forest for military training exercises. The agreement does not provide for the use of any live ammunition or ordinance on state owned lands and allows for training missions on state forests with no or very limited impact to the resources. The agreement is constructed in such a manner as to preclude interference with public use and access, limit any resource damage, and preclude any impacts to areas containing threatened or endangered species. Training operations could include landing small groups of troops, land navigation exercises, simulated combat exercises, and placement of navigation aids. Primary areas for training may include existing forest openings, such as borrow pits, timber decks, the Munson airstrip, STOP Camp, Training Center, and forest roads.

Prescribed burning operations on BRSF are conducted so as to avoid putting smoke on Whiting Field, and FFS managers meet annually with the Navy commanders at Whiting.

6. Volunteers

Volunteers are important assets to BRSF. Depending upon the type of volunteer service needed, volunteer activities may be one-time events or long-term projects. BRSF receives invaluable support from a dedicated staff of volunteers who work as campground hosts, assist with environmental restoration projects, maintain hiking and horse trails, and provide invaluable support with the operation of improved recreation areas. Groups that frequently contribute time and effort include: Florida Trail Association, the Five Flags Arabian Horse Association, Pensacola Off-Road Cyclists, Southeastern Dog Hunters' Association, and the Boy Scouts of America. A total of 20,147 hours were donated during the 2010-2011 fiscal year. Additional volunteer recruitment will be encouraged to assist with other activities to further the FFS's mission.

In addition, a state forest liaison committee of private citizens and representatives of forest user groups meets semiannually to provide input on forest management activities and volunteer their ideas to FFS staff to improve the State Forest.

III. Archaeological/Cultural Resources and Protection

A. Past Uses

Private individuals and land and/or timber companies originally owned the area which is now BRSF. Under such ownership, the land was used in a variety of ways including hunting, logging, cattle grazing, farming, pecan orchards and naval stores operations. The property was extensively logged over in the early 1900s. The original tract of BRSF

was acquired in 1930s from tax delinquent private landowners by the U.S. Land Resettlement Administration in an attempt to provide sustenance farming for the poor. These lands were then leased to the Florida Board of Forestry in 1938, which established BRSF. The original tract acquired from the Federal Government was in a cutover condition. One interesting historical feature found on BRSF is the old Stage Coach Road located on the Juniper Creek Tract. It exists today as one of the better dirt roads that bisect this Tract. Though information is sketchy, it seems this was one of the actual stage coach routes in the 1800s.

The previous owners of the Juniper Creek Tract, Hutton Tract, IP Ates Pasture, Yellow River Ravines, TNC Rayonier parcels, and Clear Creek Tract were primarily timber and timber investment companies. As such, the land was managed intensively for timber production with the uplands in plantation management consisting of slash, loblolly, and sand pine plantations. Hunting leases and food plots were scattered across these tracts.

B. Archaeological and Historical Resources

A review of information contained in the DHR's Florida Master Site file has determined that there are well over a hundred known archaeological sites recorded within BRSF (Exhibit L). Known artifacts are limited, but do include old logging railroad spurs, logging canals, and Indian artifacts. No known comprehensive survey of BRSF has ever been completed. The Archaeological Institute at the University of West Florida has supported BRSF with specific surveys on several occasions and has used the Forest as a field laboratory numerous times.

C. Ground Disturbing Activities

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

D. Survey and Monitoring

Currently there are four FFS personnel trained by DHR as archaeological site monitors. FFS will pursue opportunities for getting additional personnel trained. FFS will consult with public lands archaeologists at DHR or the University of West Florida archaeologists to determine an appropriate priority and frequency of monitoring at each of the 228 listed sites, as well as any protection measures that might be required. FFS field staff will monitor the listed sites to note condition and any existing or potential threats.

As information becomes available, and as staffing allows, any known archaeological and historical sites will be identified on maps and GIS layers to aid state forest and law enforcement personnel in patrolling and protecting sites. Applicable surveys will be

conducted by FFS staff or others during the process of planning and implementing multiple-use management activities. FFS personnel will remain alert for any environmentally significant resources and protective actions will be taken as necessary. In addition, FFS will seek the advice and recommendations of DHR regarding any additional archaeological survey needs. Trained monitors will oversee ground disturbing activities in which DHR recommends monitoring. The FFS will utilize the services of DHR Public Lands archaeologists, when available, to locate and evaluate unknown resources, and to make recommendations in the management of known resources.

IV. Natural Resources and Protection

A. Soils and Geologic Resources

1. Resources

Soils information for BRSF was obtained from the Santa Rosa and Okaloosa County Soil Surveys. For detailed information on soils see Exhibit N.

2. Soil Protection

In the 1930s, soil conservation was a stated reason for reserving the original parts of what is now BRSF. Logging, farming, and other human activities had removed much of the vegetation covering the highly erosive soils in the Blackwater River watershed. Sheet and rill erosion, and many large gullies filled the streams with sediment.

Reforestation and careful management have stopped most of the erosion, however there are ongoing issues. Unpaved forest roads continue to erode, washing sediment into streams and hundreds of turnout ditches, which require frequent cleaning. Unauthorized OHV use has damaged fragile vegetation and led to new erosion. Newly acquired lands, particularly the steep, sandy hills of the Yellow River Ravines Unit, have ongoing issues with OHV use. A large, active gully in the Julian Mill Creek drainage pours sediment into a wetland. Logging on steep slopes has the potential for soil compaction and erosion.

Management activities will be executed in a manner to minimize soil erosion. Silvicultural Best Management Practices will be strictly enforced. Primary and secondary roads particularly those on steep slopes, will be paved or rocked when funding is available. Roads and tracks that are not necessary for public access and forest management will be closed. Where necessary, closed roads will be stabilized with berms and/or vegetation; otherwise, they will be allowed to naturally revegetate. If problems arise, corrective action will be implemented by FFS staff under the direction of the FFS Forest Hydrology section in conjunction with recommendations as contained in the most current version of the Florida Silviculture Best Management Practices Manual. Unauthorized OHV use will be discouraged by various methods, including signage, education, fences and gates, barrier construction, and law enforcement by FWC.

To provide necessary materials for road maintenance a series of borrow pits are maintained across the Forest. A total of 14 pits are currently in use in strategic sections of the forest (Exhibit O). These pits will be shaped and revegetated when no longer in use.

B. Water Resources

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

1. Resources

The headwater tributaries of the Blackwater River lie in Conecuh National Forest in southern Alabama, and the river proper begins just north of the Alabama-Florida State Line. The Blackwater River and its three major tributaries, Sweetwater Creek, Juniper Creek and Coldwater Creek, flows south through the BRSF towards the Gulf of Mexico. The Blackwater River empties into Blackwater Bay at Milton, Florida.

In the BRSF area practically the entire Blackwater River watershed has been protected in its natural state since the mid-1930s. Presently, only a few small holdings along the river and its tributaries are under private ownership. These holdings are generally used for recreational or agricultural purposes. The remaining river front property is in the BRSF and administered by the FFS. The streams in the Blackwater River system are classified as Class III Waters – Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife (Rule 17-302.400, Florida Administrative Code). Within the boundaries of the Forest, the Blackwater River is classified as an Outstanding Florida Waterway (OFW).

The Yellow River is the swiftest flowing river in Florida, and drains about 1,300 square miles of mostly forested land. The river is narrow with clear tan water and a sand bottom resulting in a "yellow" appearance. It discharges through an extensive delta system into the northern portion of Blackwater Bay. The lower river is part of the Yellow River Marsh Aquatic Preserve and is designated an Outstanding Florida Water. The Yellow River, its tributary creeks and contiguous wetlands are Class III Waters - Recreation, Propagation, and Maintenance of a Healthy, Well-Balanced Population of Fish and Wildlife.

2. Water Protection

Erosion and sedimentation of the river system is one of the primary concerns facing managers of BRSF. Past management practices on newly acquired land and an extensive forest road system have all contributed the sediment issues. BSRF staff work closely with FFS's Forest Hydrologist and/or Watershed Specialist and other state and federal agencies to restore highly eroded areas. Water resource protection

measures, at a minimum, will be accomplished through the use of Best Management Practices (BMPs) as described in the most current version of Silviculture Best Management Practices Manual.

BRSF is cooperating with other agencies in monitoring water resources including groundwater quality and quantity. FFS will coordinate with NFWFMD, as necessary, on activities pertaining to water resource protection and management. Any activities requiring water management district permits will be handled accordingly. The FFS will work with the NFWFMD to monitor levels and quality of ground and surface water resources and to address hydrological restoration. The NFWFMD has six groundwater monitoring wells of varying depths along the east and southeast side of the Forest.

In addition, BRSF Resource Section staff has worked closely with the DEP on biological assessments of the water quality of the Blackwater River and its tributaries. The Yellow River is a section 305(b) listed water source, and is listed as having "Good" water quality. The Yellow River exhibits some of the most pristine water quality in the state. The Blackwater River and its tributaries (primarily Juniper and Coldwater Creeks) are section 303(d) listed water sources. Water bodies that do not meet applicable water quality standards are placed on the section 303(d) list of water bodies not meeting federal Clean Water Act standards. Water bodies on the 303(d) list require development of a Total Maximum Daily Load (TMDL). Sedimentation is the primary reason the Forest's water bodies are classified as being impaired. The majority of the sediment produced on the forest is from unpaved roads, user established roads and primitive recreation sites. BRSF staff is addressing these issues by closing unneeded roads, surfacing other roads, installing rock at low-water stream crossings, and restricting vehicle access to the more sensitive primitive recreation sites. Roads and primitive recreation sites are closed permanently or seasonally through installation of signs, gates, fencing, and traffic barricades. FFS will also work to abate erosion at road-stream crossings and borrow pits through re-engineering and revegetating problem areas.

In 2006, Blackwater Forestry Center's Maintenance Section updated the official Road and Bridge Management Plan for the Forest, utilizing the expertise of the Center's Staff Engineer. A copy of this plan is available at BRSF Headquarters. The plan provides the following information and guidelines:

- a. Classification of the roads and bridges as primary, secondary or tertiary transportation/access routes;
- b. Construction design criteria for roads and bridges that address local problems and conditions;
- c. Prioritized schedule for bridge replacement and road reconstruction;
- d. Identification of roads to be abandoned or limited to seasonal use.

Efforts are being made to close unneeded roads at BRSF. A Road Committee has been formed within the FFS and will be addressing this issue for all state forests in

the future. To minimize erosion and stream sedimentation at BRSF, forest personnel are developing road closing plans utilizing grants and mitigation funds to close and restore roads that provide minimal public benefit, negatively impact sensitive areas and/or have excessive rates of erosion.

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

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

C. Wildlife Resources

1. Threatened and Endangered Species

BRSF is part of an important wildlife corridor that includes Eglin Air Force Base, Conecuh National Forest, and the Yellow River Wildlife Management Area. The intent of the FFS is to manage BRSF in a fashion that will minimize the potential for wildlife species to become imperiled. FFS employees continually monitor the forest for threatened or endangered species while conducting management activities. Specialized management techniques will be used, as necessary, to protect or increase imperiled and other protected species, as applicable for both plants and animals.

Presence of listed species is based on information compiled from FNAI tracking records (Exhibit P) and FWC, as well as field observations by Audubon Society, NFWFMD and FFS. The following listed species were identified:

Table 1. Endangered or Threatened Species on BRSF

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
FISH					
Blacktip Shiner	<i>Lythrurus atrapiculus</i>	N	N	G4	S2
AMPHIBIANS					
Florida Bog Frog	<i>Lithobates okaloosae</i>	N	SSC	G2	S2

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
Gopher Frog	<i>Lithobates capito</i>	N	SSC	G3	S3
Pine Barrens Treefrog	<i>Hyla andersonii</i>	N	SSC	G4	S3
Reticulated Flatwoods Salamander	<i>Ambystoma bishopi</i>	LE	FE	G2	S2
Tiger Salamander	<i>Ambystoma tigrinum</i>	N	N	G5	S3
REPTILES					
Alligator Snapping Turtle	<i>Macrochelys temminckii</i>	N	SSC	G3 G4	S3
Copperhead	<i>Agkistrodon contortrix</i>	N	N	G5	S2
Eastern Diamondback Rattlesnake	<i>Crotalus adamanteus</i>	N	N	G4	S3
Eastern Indigo Snake	<i>Drymarchon couperi</i>	LT	FT	G3	S3
Florida Pine Snake	<i>Pituophis melanoleucus mugitus</i>	N	SSC	G4 T3	S3
Gopher Tortoise	<i>Gopherus polyphemus</i>	<u>C</u>	ST	G3	S3
BIRDS					
American Redstart	<i>Setophaga ruticilla</i>	N	N	G5	S2
Bachman's Sparrow	<i>Peucaea aestivalis</i>	N	N	G3	S3
Bald Eagle	<i>Haliaeetus leucocephalus</i>	N	N	G5	S3
Black-crowned Night Heron	<i>Nycticorax nycticorax</i>	N	N	G5	S3
Great Egret	<i>Ardea alba</i>	N	N	G5	S4
Hairy Woodpecker	<i>Picoides villosus</i>	N	N	G5	S3
Little Blue Heron	<i>Egretta caerulea</i>	N	SSC	G5	S4
Merlin	<i>Galco columbarius</i>	N	N	G5	S2
Red-cockaded Woodpecker	<i>Picoides borealis</i>	LE	FE	G3	S2
Roseate Spoonbill	<i>Platalea ajaja</i>	N	SSC	G5	S2
Snowy Egret	<i>Egretta thula</i>	N	SSC	G5	S3
Southeastern American Kestrel	<i>Falco sparverius paulus</i>	ST	N	G5 T4	S3
Swallow-Tailed Kite	<i>Elanoides forficatus</i>	N	N	G5	S2
MAMMALS					
Eastern Chipmunk	<i>Tamias striatus</i>	N	SSC	G5	S2
Sherman's Fox Squirrel	<i>Sciurus niger shermani</i>	N	SSC	G5 T3	S3
INVERTEBRATES					
A Mayfly	<i>Baetisca becki</i>	N	N	G2 G3	S2

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
A Mayfly	<i>Baetisca rogersi</i>	N	N	G4	S3
A Mayfly	<i>Hexagenia bilineata</i>	N	N	G5	S2
A Mayfly	<i>Siphloplecton brunneum</i>	N	N	G1 G2	S1 S2
A Mayfly	<i>Stenacron floridense</i>	N	N	G3 G4	S3 S4
A Stonefly	<i>Acroneuria evoluta</i>	N	N	G5	S1 S2
A Stonefly	<i>Helopicus subvarians</i>	N	N	G5	S1 S2
A Stonefly	<i>Hydroperla phormidia</i>	N	N	G3	S2
A Stonefly	<i>Leuctra cottaquilla</i>	N	N	G2	S2
A Stonefly	<i>Perlinella zwicki</i>	N	N	G4	S1 S2
Amber Pocket Gopher Aphodius Beetle	<i>Aphodius gambrinus</i>	N	N	G2	S1 S2
American Sand-burrowing Mayfly	<i>Dolania americana</i>	N	N	G4	S1 S2
Arogos Skipper	<i>Atrytone arogos arogos</i>	N	N	G3 T1 T2	S1
Baker's Pocket Gopher Aphodius Beetle	<i>Aphodius bakeri</i>	N	N	G2 G3	S2
Belle's Sanddragon	<i>Progomphus bellei</i>	N	N	G3	S3
Blue Sand-river Mayfly	<i>Homoeoneuria dolani</i>	N	N	G3 G4	S1 S2
Broad-Sided Pocket Gopher Aphodius Beetle	<i>Aphodius platypleurus</i>	N	N	G2 G3	S2
Bronze Clubtail	<i>Stylurus townesi</i>	N	N	G3	S1
Brown Elfin	<i>Callophrys augustinus</i>	N	N	G5	S1
Diminutive Clubtail	<i>Gomphus westfalli</i>	N	N	G1 G2	S1 S2
Dusky Roadside-Skipper	<i>Amblyscirtes alternata</i>	N	N	G2 G3	S1 S2
Eastern Meske's Skipper	<i>Hesperia meskei straton</i>	N	N	G3 G4 T3	S2 S3
Eastern Tailed Blue	<i>Cupido comyntas</i>	N	N	G5	S2
Elegant Spreadwing	<i>Lestes inaequalis</i>	N	N	G5	S2
Elerob's Microcaddisfly	<i>Oxyethira elerobi</i>	N	N	G3 G4	S2 S3
Elongate Pocket Gopher Ptomaphagus Beetle	<i>Ptomaphagus geomysi</i>	N	N	G2 G3	S2
Floridian Finger-net Caddisfly	<i>Chimarra florida</i>	N	N	G4	S3 S4
Frosted Elfin	<i>Callophrys irus</i>	N	N	G3	S1
Henry's Elfin	<i>Callophrys henrici</i>	N	N	G5	S3 S4

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
Hessel's Hairstreak	<i>Callophrys hesseli</i>	N	N	G3 G4	S2
Hubbell's Pocket Gopher Aphodius Beetle	<i>Aphodius hubbelli</i>	N	N	GNR	S3?
King's Hairstreak	<i>Satyrrium kingi</i>	N	N	G3 G4	S2
Lace-winged Roadside Skipper	<i>Amblyscirtes aesculapius</i>	N	N	G3 G4	S3 S4
Large Pocket Gopher Aphodius Beetle	<i>Aphodius laevigatus</i>	N	N	G3 G4	S3?
Little-entrance Oxyethiran Microcaddisfly	<i>Oxyethira janella</i>	N	N	G5	S4 S5
Long-Clawed Pocket Gopher Aphodius Beetle	<i>Aphodius tanytarsus</i>	N	N	G2 G3	S2 S3
Mottled Duskywing	<i>Erynnis martialis</i>	N	N	G3	S1
Mourning Cloak	<i>Nymphalis antiopa</i>	N	N	G5	SNA
Novasota Oxyethiran Microcaddisfly	<i>Oxyethira novasota</i>	N	N	G4 G5	S2
Olive Hairstreak	<i>Callophrys gryneus</i>	N	N	G5	S1
Oval June Beetle	<i>Phyllophaga ovalis</i>	N	N	G1 G2	S1 S2
Pescador's Bottle-Cased Caddisfly	<i>Oxyethira pescadori</i>	N	N	G3 G4	S3
Peters' Cheumatopsyche Caddisfly	<i>Cheumatopsyche petersi</i>	N	N	G3	S2
Pocket Gopher Flower Beetle	<i>Euphoria discicollis</i>	N	N	G2	S1 S2
Rare Pocket Gopher Aphodius Beetle	<i>Aphodius pholetus</i>	N	N	G1 G2	S1
Reversed Roadside-Skipper	<i>Amblyscirtes reversa</i>	N	N	G3 G4	S1
Santa Rosa Cebrionid Beetle	<i>Selonodon santarosae</i>	N	N	G1	S1
Say's Spiketail	<i>Cordulegaster sayi</i>	N	N	G2	S2
Schwarz' Pocket Gopher Ptomaphagus Beetle	<i>Ptomaphagus schwarzi</i>	N	N	G3	S3
Seminole Skipper	<i>Hesperia attalus slossonae</i>	N	N	G3 G4 T3	S3
Small Pocket Gopher Aphodius Beetle	<i>Aphodius aegrotus</i>	N	N	G3 G4	S3?
Southeastern Roachfly	<i>Tallaperla cornelia</i>	N	N	G4	S1
Southeastern Spinyleg	<i>Dromogomphus armatus</i>	N	N	G4	S3
Spring Azure	<i>Celastrina ladon</i>	N	N	G4 G5	SU

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
Spring-loving Psiloneuran Caddisfly	<i>Agarodes libalis</i>	N	N	G3	S3
Surprising Pocket Gopher Aphodius Beetle	<i>Aphodius dyspistus</i>	N	N	G3 G4	S3?
Twin-striped Clubtail	<i>Gomphus geminatus</i>	N	N	G3 G4	S3
Zabulon Skipper	<i>Poanes zabulon</i>	N	N	G5	S4
Zigzag Blackwater River Caddisfly	<i>Agarodes ziczac</i>	N	N	G2	S2
PLANTS					
American Chaffseed	<i>Schwalbea americana</i>	LE	LE	G2 G3	S1
Arkansas Oak	<i>Quercus arkansana</i>	N	LT	G3	S3
Bog Button	<i>Lachnocaulon digynum</i>	N	LT	G3	S3
Boynton's False Foxglove	<i>Agalinis georgiana</i>	N	N	G1Q	S1
Catesby's Lily	<i>Lilium catesbaei</i>	N	LT	G4	S4
Crested Fringed Orchid	<i>Platanthera cristata</i>	N	LT	G5	S3 S4
Dwarf Witch-alder	<i>Fothergilla gardenii</i>	N	LE	G3 G4	S1
Florida Flame Azalea	<i>Rhododendron austrinum</i>	N	LE	G3	S3
Giant Orchid	<i>Pteroglossaspis ecristata</i>	N	LT	G2 G3	S2
Gulf Purple Pitcherplant	<i>Sarracenia rosea</i>	N	LT	G5 T3	S3
Hairy Wild Indigo	<i>Baptisia calycosa</i> var. <i>villosa</i>	N	LT	G3 T3	S3
Hairy-peduncled Beaksedge	<i>Rhynchospora crinipes</i>	N	LE	G2	S2
Harper's Yellow-eyed Grass	<i>Xyris scabrifolia</i>	N	LT	G3	S3
Hummingbird Flower	<i>Macranthera flammea</i>	N	LE	G3	S2
Little Club-spur Orchid	<i>Platanthera clavellata</i>	N	LE	G5	S1
Mountain Laurel	<i>Kalmia latifolia</i>	N	LT	G5	S3
Panhandle Lily	<i>Lilium iridollae</i>	N	LE	G2	S2
Parrot Pitcherplant	<i>Sarracenia psittacina</i>	N	LT	G4	S4
Piedmont Jointgrass	<i>Coelorachis tuberculosa</i>	N	LT	G3	S3
Primrose-flowered Butterwort	<i>Pinguicula primuliflora</i>	N	LE	G3 G4	S3
Rose Pogonia	<i>Pogonia ophioglossoides</i>	N	LT	G5	S3 S4
Small-flowered Meadowbeauty	<i>Rhexia parviflora</i>	N	LE	G2	S2
Spoon-leaved Sundew	<i>Drosera intermedia</i>	N	LT	G5	S3

Common Name	Scientific Name	Federal Status *	State Status *	FNAI Global Rank *	FNAI State Rank *
Sweet Pitcherplant	<i>Sarracenia rubra</i>	N	LT	G4	S3
Sweet-shrub	<i>Calycanthus floridus</i>	N	LE	G5	S2
Trailing Arbutus	<i>Epigaea repens</i>	N	LE	G5	S2
White-top Pitcherplant	<i>Sarracenia leucophylla</i>	N	LE	G3	S3
Yellow Fringeless Orchid	<i>Platanthera integra</i>	N	LE	G3 G4	S3
Yellow-flowered Butterwort	<i>Pinguicula lutea</i>	N	LT	G4 G5	S3
Yellow-fringed Orchid	<i>Platanthera ciliaris</i>	N	LT	G5	SNR

*** STATUS/RANK KEY**

Federal Status (USFWS): LE= Listed Endangered, LT= Listed Threatened, N= Not currently listed.

State Status (FWC): LE= Listed Endangered, LT=Listed Threatened, FE = Listed as Endangered Species at the Federal level by the USFWS, FT = Listed as Threatened Species at the Federal level by the USFWS, ST = State population listed as Threatened by the FWC, SSC = Listed as Species of Special Concern by FWC – a population which warrants special protection, recognition or consideration because it has an inherent significant vulnerability to habitat modification, environmental alteration, human disturbance, or substantial human exploitation which, in the foreseeable future, may result in its becoming a threatened species.

FNAI Global Rank: G1= Critically Imperiled, G2 = Imperiled, G3= Very Rare, G4= Apparently Secure, G5= Demonstrably Secure, GNR = Element not yet ranked (temporary), G#? = Tentative rank, T# = Taxonomic Subgroup; numbers have same definition as G#’s.

FNAI State Rank: S1= Critically Imperiled, S2= Imperiled, S3= Very Rare, S4= Apparently Secure, S5 = Demonstrably secure in Florida, S#?= Tentative Rank, SNA = State ranking not applicable because the element isn’t a suitable target for conservation (e.g. a hybrid species), SNR = Element not yet ranked (temporary).

2. Game Species and Other Wildlife

Wildlife management will play an important role in the management of resources on BRSF. The state forest currently makes up all or part of the following Wildlife Management Areas: Blackwater Wildlife Management Area (WMA), the Yellow River Wildlife Management Area, the Blackwater Carr Unit, and the Blackwater Hutton Unit. The FWC provides cooperative technical assistance in managing the wildlife and fish populations, setting seasons, establishing bag and season limits and overall wildlife and fish law enforcement.

The Uplands Ecosystem Restoration Program (UERP) is a multi-agency demonstration on 11,266 acres where researchers and managers are examining the effects of forest management techniques on wildlife and other resources. The Environmental Enhancement Area (EEA) is a 5,089 acre unit where vehicle access is limited to the winter months. Management of the EEA is coordinated with FWC.

FWC plants wildlife food plots for utilization by deer, quail, dove, and non-game species. The FFS and FWC cooperatively maintain 60 acres of permanent wildlife openings and 214 acres of planted food plots on the BRSF ranging in size from 0.1 to 15.4 acres. Wildlife openings and food plots will be established and maintained in accordance with Chapter 7 of the FFS State Forest Handbook.

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

Hunting is allowed in most of the Blackwater WMA. Separate parcels of land have been designated as fishing, still hunt, dog hunt, fox hunt, and field trial areas. General gun hunting with and without dogs, muzzleloading gun, archery and falconry are allowed. Game animals on the Blackwater WMA include deer, wild hog, turkey, gray squirrel, quail, rabbit, raccoon, opossum, armadillo, beaver, coyote, skunk, nutria, bobcat, otter, fox, game fish, frogs, and migratory birds including waterfowl, woodcock, crow and dove. Persons using wildlife management areas are required to follow all regulations.

3. Survey and Monitoring

Survey and restoration needs and locations will be determined through consultation with the FFS and FWC Biologists, FFS Senior Foresters, and if there is public concern for specific species, local environmental organizations such as the Nature Conservancy or the Audubon Society. FFS and FWC biologists will work together to analyze data obtained from surveys and restoration to evaluate the effects of management practices on wildlife communities and revise ineffective management techniques.

Specialized forest and species management techniques will be used as necessary to protect and augment floral and faunal populations of, and habitat for, state- and federally-listed threatened and endangered species, candidates for listing, and species of special concern. FFS and FWC staff, guided by USFWS and FNAI biologists and species recovery plans, will coordinate to provide adaptive management and protection of sensitive species in the BRSF/BWMA. Volunteers, interns, inmates, and valid researchers may be utilized to help with management and protection of non-game species when necessary. FWC conducted drift fence surveys of herpetofauna in the BWMA and YRWMA in 2000 and 2006, and a survey of gopher tortoises is ongoing. In addition, FWC conducts annual surveys of the tiger salamander, flatwoods salamander, and Florida bog frog on the forest.

The red-cockaded woodpecker and the reticulated flatwoods salamander are the two federally listed Endangered Species on BRSF. Red-cockaded woodpeckers are recovering and are spread through much of the forest (Exhibit Q). FSS staff has monitored the birds, installed artificial cavities, burned and mowed understory vegetation, and translocated birds to improve the population's recovery. These activities will continue until goals in BRSF's red-cockaded woodpecker plan have been accomplished or if adjustments are deemed appropriate.

The reticulated flatwoods salamander has been documented on a single pond complex in the Yellow River Ravines Tract, but has not recently been found by biologists. This single pond complex has been delineated by the U.S. Fish and Wildlife Service (USFWS) as Critical Habitat (Exhibit Q2), and contains features essential for the

conservation the reticulated flatwoods salamander and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery. Steps are being undertaken with the USFWS to restore habitat and mitigate impacts from roads around the site.

The eastern indigo snake has not been seen on BRSF for many years, though habitat seems to be good for this species. Efforts to reintroduce the snake to the adjacent Conecuh National Forest may result in this federally listed Threatened Species appearing once again on BRSF.

A three-year comprehensive bird survey undertaken by the Francis M. Weston Audubon Society in 2009, found that BRSF is used by 86 species of birds for nesting, and 181 species of birds used the forest at some time during the year. Under the Migratory Bird Program, the USFWS established a list of *Birds of Conservation Concern 2008* (BCC 2008). This list was established by a 1988 amendment to the federal Fish and Wildlife Conservation Act, and seeks to “identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973”. Twenty-three (23) of those listed bird species have been surveyed on BRSF, and include Bald Eagle (*Haliaeetus leucocephalus*), American Kestrel (*Falco sparverius paulus*), Swallow-tailed Kite (*Elanoides forficatus*), Solitary Sandpiper (*Tringa solitaria*), Roseate Spoonbill (*Platalea ajaja*), Common Ground-dove (*Columbina passerina*), Chuck-will’s-widow (*Antrostomus carolinensis*), Whip-poor-will (*Antrostomus vociferus*), Red-headed Woodpecker (*Melanerpes erythrocephalus*), Loggerhead Shrike (*Lanius ludovicianus*), Brown-headed Nuthatch (*Sitta pusilla*), Wood Thrush (*Hylocichia mustelina*), Sedge Wren (*Cistothorus platensis*), Black-throated Green Warbler (*Setophaga virens*), Prairie Warbler (*Dendroica discolor*), Cerulean Warbler (*Setophaga cerulea*), Prothonotary Warbler (*Protonotaria citrea*), Swainson’s Warbler (*Limnothlypis swainsonii*), Kentucky Warbler (*Geothlypis formosa*), Bachman’s Sparrow (*Peucaea aestivalis*), Henslow’s Sparrow (*Ammodramus henslowii*), Le Conte’s Sparrow (*Ammodramus leconteii*) and Rusty Blackbird (*Euphagus carolinus*).

Species-specific management plans will be developed when necessary, with assistance from FWC. Such plans will be consistent with rule and statute promulgated for the management of such species. Continued biological surveys will be conducted to determine locations of these species. FFS staff will seek assistance from universities, FWC, and other agencies to conduct surveys.

Some management practices recommended to protect and preserve sensitive species that are present on the forest include:

- a. Location of cover, habitat/foraging ranges, and breeding areas used by rare and endangered species. Locations will be indicated on a GIS vegetation map. (Red-cockaded woodpecker clusters and foraging areas have been added to

the GIS database. FNAI has provided its data points for sensitive species for the GIS database and has mapped BRSF historic natural communities on GIS. FWC is currently collecting data on gopher tortoise burrows to add to the GIS.)

- b. Protect and properly manage habitat important to rare and endangered species.
- c. Implement other specialized management practices for rare and endangered species as necessary.

Pitcher plant bogs (seepage slopes) can be found scattered throughout the forest. They occur in isolated depressions of somewhat poorly drained soils. These natural communities contain a high diversity of rare plants. Steps being taken to preserve and protect these areas include the following:

- a. Locating the pitcher plant bogs on a forest wide map. A map has been produced and it is updated when additional information is obtained (Exhibit R).
- b. Periodic burning of the bogs to reduce competing vegetation and promote community health.
- c. Exclusion of all heavy equipment and vehicular traffic to ensure they are not mechanically disturbed.

American chaffseed (*Schwalbaea americana*), a federally endangered species, has been documented at a single location near one of the many seepage slopes on the forest. This is a recent discovery on BRSF; one of only two occurrences in Florida, and the only one on state-owned conservation land. Once known historically from the Atlantic coastal plain, extending from Massachusetts to Florida, the species is now mainly found in the Carolinas and Georgia. Further surveys are needed to determine the location and extent of this and other rare plants on the forest.

D. Sustainable Forest Resources

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

The Florida Forest Service will plan and implement silvicultural practices, designed to produce uneven aged stands of longleaf pine similar to those found prior to the initial harvests in the early 1900s. The goal of this management philosophy is to produce longleaf pine/wiregrass ecosystems that have multiple age groups with a significant

representation of mature trees. It is important to note that this will necessitate the continued conversion of off-site pine plantations to longleaf pine initially creating even-aged conditions in these new stands. Well timed and executed timber harvests will play an integral role in creating this uneven aged forest and maintaining it in a healthy condition.

A comprehensive inventory of all of BRSF timber stands was completed in June, 2006 following the severe timber damage and subsequent salvage operation caused by Hurricane Ivan. Based upon this inventory and annual inventory data since then, it is estimated that there is approximately 5,492,637 tons of merchantable pine timber on BRSF. Included in this are 3,078,018 tons of pine saw-timber, 567,180 tons of pine chip-and-saw, and 1,847,439 tons of pine pulpwood. Harvesting operations over the next ten years will focus primarily on the removal of off-site slash, loblolly, and sand pine timber, and converting these sites back to longleaf pine.

E. Beaches and Dune Resources

No beaches or dunes occur on the BRSF.

F. Mineral Resources

Since 2005, the BOT owns 100% of the mineral rights on BRSF. Gas and oil resources have been extracted from BRSF for over five decades. There are nineteen permitted drilling sites on BRSF. Of those sites, eight were never drilled, seven were dry holes which never produced oil or gas, and four were productive wells. There are currently no active oil or gas wells on the forest.

At this time, DEP's Division of State Lands oversees, for the BOT, the execution of leases pertaining to oil, natural gas, etc. The BOT reviews and approves requests for activities such as oil exploration before surface activities are allowed on BRSF in accordance with Chapter 18-2, Florida Administrative Code. There are three well sites that are in the process of being reclaimed. In 2011, seismic exploration for geological structures was successfully accomplished on the northern third of the forest with no impact to the resources or public use. Other parts of the forest may be explored in coming years. Oil and gas operations and any seismic testing activities will be closely monitored by the FFS to ensure compliance with the appropriate forest land use or lease agreement. The FFS recognizes the importance of managing and protecting sensitive resources and takes steps to ensure that such resources are not adversely impacted by oil and gas operations. This includes areas such as known archaeological, fossil, and historical sites, ecotones, wetlands, and sensitive species. The FFS will also ensure that proper reclamation of the sites is completed when the leases are closed. Reclamation will be such that the areas of operation will be returned to a condition as close as possible to their original.

Sand, clay, and gravel have been excavated from borrow pits (Exhibit O) on the Forest and used exclusively for improvements or construction of roads on the forest.

G. Unique Natural Features and Outstanding Native Landscapes

The entire forest is part of an outstanding native landscape that consists of BRSF, Conecuh National Forest and Eglin Air Force Base and constitutes the largest remaining contiguous area of the mature longleaf pine forest ecosystem in the world.

BRSF has one of the larger and more continuous occurrences of red-cockaded woodpecker habitat in state ownership. When considered together with Conecuh National Forest and Eglin Air Force Base, the BRSF has a significant role in the long-term conservation and protection of this endangered species. Communication and cooperation between the three land managers concerning management of red-cockaded woodpeckers and the longleaf ecosystem is fostered by the Gulf Coastal Plain Ecosystem Partnership. Additional support and cooperation from partners such as The Nature Conservancy, the Longleaf Alliance, and NFWFMD, will result in a higher quality of management for all the resources in this region, including red-cockaded woodpeckers. Management of longleaf pine ecosystems will be conducted in a manner to maintain and improve favorable conditions for the recovery of the red-cockaded woodpecker.

The Blackwater River, a shifting sand bottomed river, meanders through approximately 30 miles of the Forest, providing countless opportunities for recreational activities. This river is unique in that it is still in its natural state for almost its entire length. Steep, high, red clay bluffs can be found along the Blackwater River south of Bryant Bridge, and is a favorite of campers and canoe users, and provides impressive vistas of the Forest. Juniper, Coldwater and Sweetwater Creeks are also pristine streams that flow through BRSF, and they are considered special places by canoeists and other state forest visitors. The Yellow River's relatively steep decent makes it the swiftest flowing river in Florida. The river is known for high scenic bluffs along its banks.

H. Research Projects/Specimen Collection

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

All research projects to be considered on BRSF must be considered in accordance with the guidelines stated in Chapter 4 of the State Forest Handbook (FFS 2008). Any requests for research projects should be submitted in writing to the appropriate field staff to be forwarded to the Forest Management Bureau for approval. Requests must include: a letter outlining the purpose, scope, methodology, and location of the proposed research project. Requests are subject to review by FFS Foresters, Biologists, the Forest Entomologist or the Forest Pathologist, and the Forest Hydrology Section, as appropriate. Authorization to conduct research will require that the investigator provide copies of any reports or studies generated from research projects to the BRSF staff. Other special conditions may be applicable and the authorization may be terminated at any point if the study is not in compliance.

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

- Spiders, ants, and other arthropods for the Florida State Collection of Arthropods.
- *Liatris spp.* (seeds and stalks) for USDA Plant Materials Center.
- *Dicerandra linearifolia* for Florida Museum of Natural History herbarium.
- *Rhynchospora spp.* for University of Delaware herbarium.
- Behavioral and physiological changes in fence lizards (*Sceloporus undulatus*) in response to fire ants.
- Genetic analysis of pine barrens treefrogs (*Hyla andersonii*).
- Genetic analysis of brown-headed nuthatches (*Sitta pusilla*).
- Genetic analysis of prickly-pear cactus (*Opuntia spp.*).
- Genetic analysis and growth characteristics of switchgrass (*Panicum virgatum*).
- Ticks and insects collected for the University of Georgia, Exotic Tick Surveillance Project.
- Freshwater decomposer fungi (euascomycetes) on submerged woody material collected for identification and analysis.
- Wiregrass (*Aristida beyrichiana*) collected for the University of Virginia.
- Study of vegetation response to fire.
- Study of the response of Japanese climbing fern (*Lygodium japonicum*) to fire and herbicide treatments.
- Growth and spread of cogongrass (*Imperata cylindrica*).

I. Ground Disturbing Activities

Although the FFS's approach to handling ground disturbing activities is identified in various sections of this plan, the FFS's overall approach to this issue is summarized here. The FFS recognizes the importance of managing and protecting sensitive resources and will take steps to ensure that such resources are not adversely impacted by ground disturbing activities. This includes areas such as known archaeological, fossil, 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 reviewed by state forest field staff to avoid sensitive areas. For ground disturbing activities such as construction of buildings, parking lots and new roads the FFS will consult with the FNAI, DHR, and when necessary, the Acquisition and Restoration Council.

V. Public Access and Recreation

The primary recreation objective is to provide the public with dispersed outdoor recreational activities that are dependent on the natural environment. The FFS will continue to promote and encourage public access and recreational use by the public while protecting resources and practicing multiple-use management. Recreation activities available on BRSF include swimming, canoeing, hiking, fishing, hunting, nature study, off-road bicycling, horseback riding, geocaching, picnicking and primitive camping. While the main object is to provide dispersed outdoor recreation opportunities, BRSF staff does manage a number of developed recreation areas. The Clear Creek/Whiting Field OHV Recreation Area is an exception to the general objective of providing dispersed outdoor recreation activities, and will require careful planning and diligent monitoring to ensure protection of the natural resources on and adjacent to that site (Exhibit S). FFS may permit limited ATV use on designated roads and trails for special events as determined appropriate by FFS.

Periodic evaluations will be conducted by FFS staff to monitor recreational impacts on resources. Modifications to recreational uses will be implemented, should significant negative impacts be identified. New recreation opportunities and facilities, which are compatible with the primary goals and responsibilities of the FFS, will be considered only after the FFS determines their compatibility with other forest uses and forest resources.

A. Existing

1. Improved Recreation Areas

BRSF currently operates seven developed recreation areas. These areas have conveniences such as flush toilets, running water, picnic tables and grills. Okaloosa County operates the Wilderness Landing Recreational Area, and the Guest Lake Boat Ramp on BRSF, with similar facilities.

Bear Lake Recreational Area: Bear Lake is a 107-acre artificial impoundment located on Bear Creek. The lake is characterized by flooded timber. The dam was constructed in 1959 and first opened to fishing in the spring of 1961. Bear Lake has 32 electric campsites, 8 non-electric campsites, fishing pier, boat ramp, hiking trail, mountain bike trail, dining hall with pavilion, restrooms with showers.

Bone Creek Recreational Area: Bone Creek has a swimming and fishing lake, day use picnic area, pavilion, hiking trail, and restroom.

Camp Paquette Recreational Area: Camp Paquette offers youth group primitive camping, swimming and fishing lake, hiking trail, pavilion, and 2 restroom facilities with showers.

Coldwater Recreational Area: The Coldwater Recreation Area, bordered to the north by Coldwater Creek, was opened in 1974. The facility has been a prized recreation area for bird dog and fox hound field trial participants and horseback riders. It offers 68 electric campsites, horse stables, horse trails, dining hall with pavilion, and restrooms with showers.

Hurricane Lake is a 318 acre man-made lake located on Hurricane Creek. Hurricane Lake was constructed in 1971 and opened for fishing in 1973. It has two improved recreation areas located on the north and south sides of the lake. The Hurricane Lake North Recreational Area has 13 electric campsites, 5 non-electric campsites, fishing pier, boat ramp, restrooms with showers, and a primitive camping area for youth groups. The Florida Trail can also be accessed from the North campground. The Hurricane Lake South Recreational Area has 18 non-electric campsites, boat ramp, and restrooms.

Karick Lake is a 65-acre artificial impoundment on Deadfall Creek in northern Okaloosa County. A considerable amount of flooded timber provides fish habitat. The lake was constructed in 1965 and open to fishing in 1966. Karick Lake has two improved camping areas located on the north and south sides of the lake. The Karick Lake North Recreational Area has 15 electric campsites, fishing pier, boat ramp, hiking trail, restrooms with showers, and a primitive camping area for youth groups. The Karick Lake South Recreational Area has 15 electric campsites, boat ramp, and restrooms with showers.

Krul Recreation Area is built next to a 6.5-acre man-made lake that is recharged from springs located on the north ends of the lake. The Krul Recreational Area has 45 electric campsites, 5 non-electric campsites, swimming lake, day use picnic area, hiking trail, 3 restroom facilities, with showers at 2 restrooms. Three self service pay stations are located at Krul.

2. Unimproved Recreation Sites

There are many opportunities to enjoy picturesque unimproved sites along watercourses. These locations are great for swimming, fishing, picnicking and nature study. These sites are often uninhabited and are great places to enjoy the space and solitude of the BRSF. These primitive sites include Kennedy Bridge, Red Rock, Bryant Bridge, Indian Ford, Camp Lowery, Juniper Creek Primitive Area, Jernigan Bridge, and the east side of Bear Lake.

3. Canoe Launch Sites

Canoe rentals bring many people to the forest for a fun day on the rivers. Approximately 47 miles of sand-bottom streams run through BRSF. The three waterways that get the most usage are Blackwater River, Juniper Creek, and Coldwater Creek. The northern portions of Coldwater and Juniper Creeks have a large amount of blow down in the river. They are kept in their natural state and provide a large watershed sanctuary for wildlife. There are eight primary canoe launches and/or pick up sites on BRSF used by canoe businesses as well as private canoe owners. On the Blackwater River there are Kennedy Bridge, Bryant Bridge, and Johnson Float. On Coldwater Creek, there is the Highway 4 Bridge and Jernigan Bridge at the Coldwater Recreation Area. On Juniper Creek, there is Dewey Hardy Landing, Red Rock, and the Indian Ford pickup site.

4. Hiking Trails

BRSF offers abundant opportunities for day hikers and backpackers on 66 miles of established trails. 55.3 miles of the Florida National Scenic Trail pass through BRSF. The entire length of the Florida Trail through BRSF is maintained by the Florida Trail Association. Other trails are spurs off of the Florida Trail, or are scenic loops near recreation areas.

Blackwater River Trail: This trail is 6.2 miles and begins at the north boundary line of the Blackwater River State Park. It travels through the State Park, the Hutton Unit Wildlife Management Area, and BRSF, eventually connecting to Highway 90. It is a segment of the Florida Trail and a stop on the Great Florida Birding and Wildlife Trail.

Bear Lake Jackson Connector Trail: This is a 1.8 mile connector trail whose purpose is to bring together the Sweetwater and Bear Lake Loop Trails with the Jackson Trail.

Bear Lake Loop Trail: This 4 mile loop trail begins at the Bear Lake campground and travels around the perimeter of the lake. It is part of the FFS's Trailwalker Program and the Great Florida Birding and Wildlife Trail, and receives considerable use.

Bone Creek Trail: This 1.25 mile loop features an interpretive nature trail as it passes through uplands and crosses wetlands around a lake at the Bone Creek Recreation Area.

Jackson Trail: This is a 21.5 mile trail which begins at North Karick Lake and ends at Red Rock Road. Andrew Jackson traveled parts of this route during the First Seminole War in the early 1800s. It is part of the Florida Trail.

Juniper Creek Trail: This 6.7 mile trail follows the east side of Juniper Creek for most of its length. Its northern trailhead is on Red Rock Road where the Jackson Trail ends. It is part of the Florida Trail. Approximately one mile south of Red Rock Road is a hiking shelter along the trail. The trail ends at the boundary with Blackwater River State Park, and the start of the Blackwater River Trail.

Karick Lake Loop Trail: This 3.8 mile trail begins at North Karick Lake campground. A portion of its length is shared by the Jackson Trail. This trail travels around the lake and is part of the FFS's Trailwalker Program and the Great Florida Birding and Wildlife Trail.

Sweetwater Trail: This trail begins at Krul Recreational Area and is 1.3 miles in length. Along the trail are a gristmill and a suspension bridge over Sweetwater Creek. Half a mile of the trail's length is on a boardwalk, with the remainder traveling through the woods to Bear Lake. This trail is part of the FFS's Trailwalker Program.

Wiregrass Trail: The trail is 12.7 miles in length and is part of the Florida Trail. Its northern terminus joins the Conecuh National Forest in Alabama and its southern terminus connects with the Jackson Trail. It makes its way through beautiful stands of longleaf pine and wiregrass.

Yellow River Ravines Trail: Constructed in 2010, the newest section of the Florida Trail in BRSF is 6.7 miles in length, and connects the Blackwater River Trail with the trail section that passes through Eglin Air Force Base to the south.

5. Horse Trails

The Coldwater Recreation Area is the starting point for the Forest's horse trail system. Approximately 47 miles of horse trails are available for riding. Two of these trails are on the FFS's statewide Trailtrotter Program. The trails are all interconnected. The 68 campsites near Coldwater Creek on the north end of the campground make this area extremely popular for horse enthusiasts. Most of the horse trails are located within the Blackwater Field Trial Area which is managed for quail habitat.

6. Mountain Bike Trails

BRSF has 14 miles of mountain bike trails. The Bear Lake mountain bike trail travels six miles (6) around Bear Lake and crosses Bear Creek. The eight (8) mile Red-Rock Road mountain bike trail system was built in 2007-2008 by volunteers. It is located in the Juniper Tract and has trails with varying difficulty. Additional trails are planned in the Red-Rock Road area.

7. Field Trial Events

The Field Trial Area is a part of the Forest set aside for bird-dog field trial events. It is 6,217 acres in size and was established in 1974 as a cooperative agreement between the FFS and the FWC. FWC employs a biologist and two technicians who help manage this area for quail habitat. The aggressive burning program by the FFS and the FWC has significantly reduced hardwood competition. Since its inception, the Field Trial Area has grown into a popular location for horse events and for individual families to come to the forest to camp and ride horses. The open stands of longleaf pine are very conducive to horse riding. Along with horse riding, bird dog and fox dog trials occur each year at the Coldwater Recreation Area. There are 124 dog kennels for bird dogs and fox hounds. Limited hunting is also available in the Field Trial Area. In recent years, the number of dog trials has averaged 5 per year, and there have been from 10 to 15 organized trail rides annually.

8. Fishing

Three fishing lakes located on the BRSF are popular locations for freshwater anglers. Hurricane Lake is 318 acres in size, Bear Lake is 107 acres, and Karick Lake is 65 acres. Largemouth bass, bluegill, red-ear sunfish, and channel catfish are located in all of these lakes, which are managed by the FWC.

9. Payment Systems

There are 10 self-service pay stations located at the improved recreation areas. At Coldwater Recreation Area, camping reservations can be made at the campground office.

10. Environmental Education/Ecotourism

Environmental education is provided through tours of BRSF as well as school programs that teach fire prevention and forestry management techniques. The FFS also hosts the Munson Community Heritage Festival at the Krul Lake Recreation Area. The Festival is organized by the non-profit Munson Community Heritage Festival Committee and showcases local music, historical and cultural exhibits, demonstrations, arts, crafts and foods. The FFS and the FWC have exhibits that explain forestry and wildlife components. The Munson grist mill is in operation as well as exhibits such as Indian artifacts, blacksmithing, taxidermy displays, cane syrup making, etc. This event is part of Santa Rosa Counties Beaches to Woodlands Tour sponsored by the Tourist Development Council. The Tourist Development Council presently advertises the forest through various magazines and websites.

B. Planned

1. Additional Recreation Facilities/Activities

The outdoor recreation plan for BRSF for the next ten years will continue to emphasize dispersed outdoor recreation opportunities that require a minimal amount of facility development. Trail maintenance and development will continue to be a recreation priority. On lands that are newly acquired, the recreation plan will call for minimal facilities such as unpaved parking lots, trailheads, hiking, mountain biking, horse trails, birding, and primitive camping. Where there are existing developed recreation areas, facilities and roads will be upgraded to provide better service to the public while protecting the resources. The goal of the administration is to pave all of the entrance roads into the recreation areas. The paved entrance roads will reduce erosion and will eliminate continual road grading maintenance. The last stretch of unpaved road leads into Hurricane North campground. This paving project will be completed when funding comes available. Future plans are for the Florida Trail to traverse from Highway 90 through the east portion of the Yellow River Ravines acquisition towards Highway 85.

2. Clear Creek/Whiting Field Off-Highway Vehicle (OHV) Trail Riding Area

Construction has begun on 640 acres that has been set aside for its development (Exhibit T). The OHV trail system at Clear Creek/Whiting Field OHV Trail Riding Area will consist of distinct trail heads. Each trail is designed for one way traffic and will accommodate all sizes of OHVs as defined by state law. The trails are designed to make maximum use of the property. The area will also include a youth training area, designed to meet the minimum standards required to teach youth safety for ATV, off-highway motorcycle (OHM) and recreational off-highway vehicle (OHV) riding. Certified instructors can be scheduled periodically by FFS or another entity to provide the safety training courses. The area will be operated as a business by either

FFS or other entity as prescribed and contracted by FFS. FFS will continue to manage the forest resources and monitor the environmental conditions of the site.

Additional support facilities are planned for the site, including an emergency evacuation location and a location for a future campground host site for after-hour security. Most facilities will be developed using grant monies from such programs as the Recreation Trail Program, T. Mark Schmidt OHV Program, and various OHV manufacturing companies.

C. Hunter Access

Hunting season dates, limits, and methods are established annually by FWC, in consultation with FFS. Hunting season dates, limits, and methods are established annually by FWC. Access, season dates, limits, and methods are outlined in the brochure “Wildlife Management Area and State Forest 2012-2013 Regulations Summary and Area Map” (FWC 2012). The Hutton WMA is fenced and gated to restrict hunter access and to limit road damage. Parts of the Yellow River WMA and the environmental Enhancement Area are gated to limit road damage and allow for ecological restoration during the spring and summer.

VI. Habitat Restoration & Management Practices

A. Prescribed Fire

The FFS utilizes a total fire management program on state forests that includes wildfire prevention, detection and suppression, and prescribed burning. This program is the responsibility of the FFS’s Blackwater Forestry Center. Emphasis will be placed on prescribed burning, wildfire prevention and education to help reduce wildfire occurrence on the forest. The FFS has three paramount considerations regarding wildfires, and these are listed in priority order: 1) protection of human lives, both the firefighter’s and the public’s, 2) protection of improvements, and 3) protection of natural resources.

The annual forest prescribed burning program produces multiple benefits. The purposes of prescribed burning on BRSF are to facilitate forest management operations and enhance wildlife and listed species habitat, to decrease fuel loading, consequently enhancing public safety, and to restore, maintain, and protect all native ecosystems, ecotones, and their ecological processes. FFS personnel are responsible for planning and implementing the annual prescribed burn program for BRSF, which will consist of growing and dormant season burns as fuel loads, favorable fire weather and available resources allow. Burns are planned by the State Forest staff with input from cooperating agencies as appropriate. A BRSF annual Prescribed Burn Plan is developed each year, which identifies the individual burn unit prescriptions, whether the unit is on a growing or dormant season rotation, map of burn unit, and other information specific to that burn unit. The smoke screening system will be used as a smoke management tool to minimize the adverse impact of smoke that may affect residential communities, public roads, schools, and other smoke sensitive areas.

Approximately 180,000 acres of BRSF support vegetative communities that are fire dependent. Past land uses have left some of these historically fire dependent communities in a condition unable to carry prescribed fire. Prescribed fire is planned to achieve an average fire return interval of two to four years. Restoration of these areas by removal of the off-site species and reforestation will increase prescribed burn acreage goals over time. Meeting prescribed fire goals will be largely dependent on weather conditions, personnel, and statewide emergency situations such as wildfires, hurricanes and other natural disaster response and relief.

Presuppression firelines will be constructed in accordance with BMPs. Whenever possible, alternatives to plowed firelines, such as harrowed lines or natural breaks should be used. Post burn evaluations will be performed to monitor effectiveness of the prescribed burns. The procedures for conducting post burn evaluations are outlined in the Forest Health section of the State Forest Handbook.

B. Sustainable Forestry & Silviculture

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

1. Strategies

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

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

2. Silvicultural Operations

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

Prescribed fire is the most desirable method of vegetation control for fire dependent ecosystems; however, due to the existence of areas where fuel loads have reached dangerous levels or urban interface dictates prescribed fire is not suitable, mechanical vegetation control (roller chopping/gyro tracking/removal of understory through

biomass sales) is a consideration. Mechanical vegetation control will be utilized where appropriate as determined by FFS staff for wildlife enhancement, fuel mitigation and reforestation.

Maintenance and restoration of timber stands and plant communities through timber harvesting will include but is not limited to thinning and regeneration methods such as single tree selection, group selection and shelterwood, and clear-cutting methods.

BRSF has been a source of longleaf pine seeds for many decades. The Munson Seed Orchard, through crossing and grafting, is developing improved strains of longleaf pines for growing at the Andrews Nursery and transplanting throughout the region. Longleaf pine trees produce abundant cones at irregular intervals. When cones are abundant, FFS staff collect cones from the forest and extract the seeds. In recent years, contractors have also collected cones.

All silvicultural activities (including timber harvesting and reforestation) will meet or exceed the standards in the FFS's Silviculture BMPs and the State Forest Handbook.

3. Timber Inventory Control

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

4. Timber Sales

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

C. Non-Native Invasive Species Control

FFS employees continually monitor the forest for non-native invasive species while conducting management activities. The practice of the FFS is to locate, identify, and apply control measures with the intent to eradicate or control non-native invasive species. When these species are discovered, an eradication or management plan will be developed with the assistance of the Forest Management Bureau's Forest Health Section as needed. The plan will be implemented based upon the severity of the infestation and the availability of personnel and funding. State Forests are periodically surveyed by FFS staff, and detection of populations of non-native invasive species are noted and prioritized for appropriate control action. Known occurrences of non-native invasive species are prioritized and treated as funding and personnel allow, with the intention of ultimately eradicating such pests from State Forest property. These occurrences are recorded in the GIS database and updated as new plants are discovered. Some of the invasive exotic plant species that have been identified on BRSF include cogon grass (*Imperata cylindrica*), Chinese tallow (*Sapium sebiferum*), Japanese climbing fern (*Lygodium japonicum*), privet (*Ligustrum sinense*), kudzu (*Pueraria montana*), and

wisteria (*Wisteria sinensis*). Cogon grass and Japanese climbing fern have spread significantly since Hurricane Ivan and will be aggressively targeted for control. Adjacent landowners who are known to have these species on their property will be approached in an effort to cooperate on control measures. FFS has received contracts from FWC's invasive plant program to control invasive plants on state lands. The FFS will enlist support from the FWC in the effort to control non-native invasive animals. Feral hogs (*Sus scrofa*) are present on some units of the BRSF. The FWC has issued a feral hog control trapping permit to FFS for all state forests and the FFS will encourage hog removal on BRSF through trapping and hunting.

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

The table below identifies the invasive plant species currently mapped on BRSF, the number of mapped occurrences and the total combined acreage of the mapped occurrences. Approximately 95% of all mapped occurrences have received one herbicide treatment. Approximately 50% of these occurrences have received two or more treatments.

Table 2. BRSF Invasive Exotic Plant Species
(As of June, 2013)

Invasive Exotic Plant Species	Total Mapped Occurrences	Total Mapped Acres	Areas Under Treatment
Japanese Climbing Fern	1,031	813	808
Cogon Grass	967	472	470
Other or Mixture	1,113	1,999	1888
Total	3,111	3,284	3166

D. Insects, Disease and Forest Health

Currently, there are no insect or disease problems on BRSF, although the BRSF has a history of epidemic and/or managerially important outbreaks of brown-spot needle blight and southern pine beetle. In the event of an outbreak of brown-spot needle blight or southern pine beetle, consultation with the Forest Management Bureau's Forest Health Section will be sought to formulate an appropriate and effective response.

In compliance with section 388.4111, Florida Statutes and in 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 Santa Rosa or Okaloosa County will be notified of this designation.

As a result, prior to conducting any arthropod control activities on BRSF, the local agency must prepare a public lands control plan, that addresses all concerns that FFS may have for protecting the natural resources and ecosystem values on the state forest. In this regard FFS will provide the local agency details on the management objectives for BRSF. This public lands control plan must be in compliance with FDACS guidelines and using the appropriate FDACS form. The plan must then be approved and mutually adopted by the county, FFS and FDACS, prior to initiation of any mosquito control work. Should the local mosquito control district not propose any mosquito control operations on the property, no arthropod control plan is required.

E. Use of Private Land Contractors

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

Site preparation – Private equipment/forestry operations are hired routinely to site prepare lands for restoration/reforestation to aerially apply herbicide to cutover off-site plantations in preparation for the establishment of longleaf pine. Treat approximately 1,000 acres per year at \$45 per acre. FFS anticipates spending approximately \$45,000 for this contract during this planning period.

Reforestation – Private equipment/forestry operations are routinely hired to plant seedlings on lands managed by FFS.

Restoration - Contractors may be used to collect native groundcover seeds, and to plant or sow them to restore native plants to sites disturbed by past forest management.

Invasive Species Control – The forest currently uses full time and temporary staff to seek, identify, and control invasive plants. Some herbicide application may be accomplished by contractors.

Boundary surveying - BRSF has had contractors survey portions of its boundaries. Additional surveying may be done if funding becomes available.

VII. Proposed Management Activities for Natural Communities

In 2006, FNAI completed an inventory and natural community mapping project on 190,639 acres of BRSF and a historic natural community type map (Exhibit U) was created. The following desired future conditions, existing condition descriptions, and management recommendations are taken from the 2006 FNAI mapping project report and the Guide to the Natural Communities of Florida (FNAI 2010), as well as from the knowledge and experience gained by FFS during forest inventory efforts and routine field work on BRSF.

Currently, an FNAI natural community mapping project has not been completed for the Yellow River Ravines Tract, Clear Creek, and other recent acquisitions. Natural community descriptions of the current conditions, desired future conditions and management actions that are needed to attain desired future conditions on the recently acquired lands will be appended to the management plan 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.

For the purposes of this management plan, restoration is defined as the process of returning ecosystems or habitats to the appropriate structure, function and species composition, based on soil type. Management during this ten-year period will begin with an assessment of the fuel loading, timber densities and groundcover to determine the most appropriate steps necessary to re-introduce prescribed burning. Strategies may include thinning of overly dense pine plantations, mowing or chopping in areas of heavy fuel buildup and/or application of cool dormant season fires. The results of these initial efforts will be monitored and more refined and detailed restoration plans will be made. Fire return intervals are included as a guide and may vary depending upon specific conditions. The intention is to use fire in a manner and frequency that will attain the desired habitat goals. Fire frequency is generally increased or decreased depending upon the conditions of the specific area.

Table 3. Vegetation Types Found on BRSF

Vegetation Type	Acres Mapped (Historic)	Burn Interval (Years)
Upland Pine*	134,113	2-4
Alluvial Forest [±]	26,627	N/A
Sandhill	19,612	2-3
Seepage Slope	6,361	2-4
Baygall	1,074	50-100
Upland Hardwood Forest	855	N/A
Mesic Flatwoods	785	2-4
Blackwater Stream	718	N/A
Floodplain Swamp	347	N/A

Vegetation Type	Acres Mapped (Historic)	Burn Interval (Years)
Dome Swamp	104	3-5
Depression Marsh	43	2-4
Seepage Stream	N/A	N/A

* FNAI's 1990 "Guide to the Natural Communities of Florida" formerly designated this community as Upland Pine Forest.

± FNAI's 1990 "Guide to the Natural Communities of Florida" formerly designated this community as Floodplain Forest.

A. Upland Pine

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Upland pine exists on high, rolling clay hills and have widely spaced trees with few shrubs and a dense cover of herbs. This is the most predominant community type at BRSF, and often intergrades with sandhill, with many areas appearing intermediate between the two types. On lower slopes, upland pine may become oak dominated and resemble or grade into upland hardwood forest.

The dominant canopy tree is longleaf pine, with oaks scattered in the subcanopy dominated by southern red oak or blackjack oak, although bluejack oak or turkey oak may be common, especially in areas overlapping with sandhill communities. Flowering dogwood may also be a dominant small tree. The more mesic clay soils of upland pine support a sparse, open, low cover of shorter shrubs such as dwarf huckleberry (*Gaylussacia dumosa*), gallberry, winged sumac, Darrow's blueberry, sparkleberry, highbush blueberry, and Elliot's blueberry. Herbs are dense and dominated by wiregrass, with a diversity of forbs.

Upland pine and sandhills both have a light signature on the historic aerial photographs with trees scattered and a slightly rough texture to the ground cover. Some areas seem to have a more closed canopy, although whether this is due to a predominance of understory oaks, a dense cluster of pines, or a conversion to upland hardwood forest is difficult to determine.

Fire is the dominant factor in the ecology of upland pine. Frequent low-intensity ground fires during the growing season reduce hardwood competition and facilitate pine and wiregrass reproduction. The historic fire frequency ranged from one to three years.

Current Condition

Areas of upland pine were generally in excellent condition with many large longleaf pine trees and well-developed southern red oak subcanopies. Pine plantations still occupy some of this habitat, and areas disturbed by past silviculture activities are often similar to xeric hammock, with reduced ground cover and large oaks becoming dominant. Isolated patches of disturbed upland pine may develop thickets of sassafras and shortleaf pine. In

the area south of SR 4 and west of CR 191, previous efforts to remove oaks were quite effective, and large southern red oaks are rare. Longleaf pine seedlings are weedy in some areas, forming dense patches of tall, narrow young trees. Most upland pine on BRSF has a dense groundcover of wiregrass.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Fires should be frequent in upland pine, usually every 2-4 years and in stands where accumulated fuels and conditions permit. Although historical conditions may have consisted of annual burns on occasion, inconsistent groundcover will not support widespread annual burning at this time. Areas of dense pine seedling recruitment may especially need growing season fires to thin these stands. On the other hand, some areas have been burned so frequently that fire intervals may need to be lengthened in order to establish a few oaks. In addition management concerns should focus on reducing impact to this community through the continued closure of many of the small roads crisscrossing the landscape in order to reduce erosion and invasive plant establishment.

B. Alluvial Forest

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Alluvial forests are diverse communities occurring on lower terraces of river systems and may be flooded for a portion of the growing season. Most blackwater streams and larger seepage streams in BRSF have alluvial forests forming borders along the high sandy banks. There is a gradual transition to baygall as elevation increases. In broad floodplain areas, narrow swamps may develop along trough-like areas with swamp tupelo (*Nyssa sylvatica* var. *biflora*) becoming more common in the canopy. In BRSF, these forests have a tall canopy of mainly Atlantic white cedar with slash pine and/or loblolly pine (*Pinus taeda*) common. There is a well-developed subcanopy/ tall shrub layer of various combinations of red maple, sweetbay (*Magnolia virginiana*), tuliptree (*Liriodendron tulipifera*), black titi (*Cliftonia monophylla*), dahoon (*Ilex cassine*), American holly (*Ilex opaca*), swamp laurel oak (*Quercus laurifolia*), water oak (*Quercus nigra*), sourwood, and swamp bay. Short shrubs may be abundant with mostly coastal sweet pepperbush (*Clethra alnifolia*), blue huckleberry (*Gaylussacia frondosa* var. *tomentosa*), St. Andrew's cross (*Hypericum hypericoides*), mountain laurel (*Kalmia latifolia*), coastal doghobble (*Leucothoe axillaris*), and possumhaw. Herbs are sparse except in occasional sunny areas.

In the far northeast section of BRSF, alluvial forests become dominated by water oak and swamp laurel oak, however, the understory remains similar. Alluvial forests are virtually indistinguishable on aerial photographs from baygalls with similar structure, and these communities are mapped together in most instances. The rough texture seen on the historic photographs due to the tall Atlantic white cedars may sometimes help to differentiate this community from surrounding baygall.

Current Condition

Recent hurricanes have had a large impact on alluvial forest canopies, mainly due to the toppling of countless large Atlantic white cedars. This has also had the effect of increasing light penetration to the understory, and herbaceous vegetation may increase in the future. More severe alteration of baygall/alluvial forest communities has taken place with the damming of some drainages to form recreation lakes and hunting areas. Hurricane Lake, Karick Lake, and Bear Lake are all converted seepage streams and alluvial forests. There are also several smaller areas usually dammed by old roads that are being maintained for waterfowl. These areas often have standing dead cedars in several feet of water with aquatic herbs such as watershield (*Brasenia schreberi*), stream bogmoss (*Mayaca fluviatilis*), and yellow pondlily (*Nuphar advena* subsp. *ulvacea*). Chinese privet (*Ligustrum sinense*) is a common invasive shrub in many alluvial forests on BRSF. Japanese climbing fern and Chinese tallowtree (*Sapium sebiferum*) are occasionally found.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Alluvial forests are not fire-maintained habitats, so management will be focused on removing exotic plant species, especially on disturbed road crossings, and controlling feral hog populations, whose foraging is highly damaging to groundcover. When it is appropriate, smaller dams will be removed to allow a natural hydrology.

C. Sandhill

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Sandhill is characterized by widely spaced pine trees with a sparse midstory of deciduous oaks and a moderate to dense groundcover of grasses, herbs, and low shrubs. The most typical associations are dominated by longleaf pine, turkey oak (*Quercus laevis*), and wiregrass. Other typical plants include bluejack oak, sparkleberry (*Vaccinium arboreum*), common persimmon (*Diospyros virginiana*), and gopher apple (*Licania michauxii*). Sandhill requires growing season fires every 1-3 years to maintain open structure. At BRSF, sandhills are the most abundant community in the southernmost region south of the Blackwater River. They also occur further north and grade into upland pine with many areas appearing intermediate between the two communities. In landscapes dominated by upland pine, hills may be “capped” with deeper, well-drained sands that support sandhill communities, although sandhills were occasionally noted on hillsides of upland pine as well.

Current Condition

Most sandhills at BRSF are in good condition. Past disturbances in sandhill include clearings and silviculture activities that have disturbed the pine canopy, and in some cases partially converted the sandhill to oak-dominated xeric hammocks. Also pine

plantations are still in existence in several areas. Longleaf pine regeneration is good throughout the sandhill; however, in some areas longleaf pine seedlings are unnaturally dense. Recent hurricanes have killed many sandhill pines, and remains of salvage operations are evident throughout the forest.

Most of the land acquired in the Yellow River Ravines Tract is sandhill, and most of that were sand pine plantations when the state acquired them. At the time of this plan, 3,000 acres have been cut, and will be reforested when funding becomes available. There are 4,700 acres left to be converted. Sandhill sites will be planted with longleaf pine, and native groundcover will be encouraged by timely use of prescribed fire. Active groundcover restoration may be desirable on some sites. Site preparation may include herbicides, mechanical treatments, and prescribed fire.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Prescribed burning is the primary management tool for sandhills, and regular burns are conducted in BRSF. Fires should be frequent in sandhills, usually every 2-4 years and primarily in the growing season in stands where accumulated fuels and conditions permit. Burns need to be applied to areas of dense pine and oak regeneration to ensure that a closed canopy does not form. Although historical conditions may have consisted of annual burns on occasion, current conditions of the forest would not support widespread annual burning. Sandhills that have been converted to pine plantations will be gradually thinned and burned to return to (normal) sandhill conditions. Thinning harvests will be done where needed. Off-site pine species will be harvested and the site will be reforested with longleaf pine or other appropriate species. Groundcover restoration may include prescribed burning and/or planting or sowing native species.

D. Seepage Slope

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Seepage slopes are grass and sedge dominated communities occurring on slopes with constant seepage from a perched water table where the ground is usually saturated but rarely inundated. These communities have very few trees and only occasional shrubs. At BRSF, the broad areas mapped as seepage slopes are historically open, slopes dominated by a dense groundcover of wiregrass and toothache grass (*Ctenium aromaticum*). In many of these slopes, smaller clay pockets may support pockets of carnivorous bog plants, especially pitcher plants (*Sarracenia* spp.) and sundews (*Drosera* sp.). These slopes are adjacent to alluvial forest/baygall communities, and historic photographs indicate that there were very few shrubs and a sharp border separating the open lower slope from the adjoining baygall.

Current Condition

Currently, most seepage slopes that were open and herbaceous in historic photographs have been invaded by woody species from adjacent baygalls, especially black titi, titi, myrtle dahoon, large gallberry, fetterbush, sweetbay, swamp tupelo, swamp bay, red chokeberry, red maple. A few slopes have a dense cover of switchcane. Despite encroachment of baygall into most seepage slopes, many slopes are well-maintained with a very sparse canopy of longleaf pine or slash pine and a diverse ground cover. Japanese climbing fern (*Lygodium japonicum*) has been found invading in scattered instances.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Seepage slopes are maintained by frequent fires, and these communities should be allowed to burn along with the surrounding upland pine or sandhill every 2-4 years. Although historical conditions may have consisted of annual burns on occasion, current conditions of the forest would not support widespread annual burning. Growing season prescribed fire should be the primary management tool for seepage slopes where accumulated fuels have been reduced and conditions are appropriate. Growing season burns are critical for maintaining a dominant herb layer by reducing woody encroachment from baygalls. Those areas with significant baygall intrusion may require fires to be set within the community to achieve a significant burn. However, annual winter fires may be deleterious to pitcher plant reproduction, killing plants before they can set fruit. Soil disturbance from vehicles or feral hog activity should be reduced as much as possible. Invasive species will be controlled with herbicide, applied by hand to minimize damage to non-target species.

E. Baygall

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Baygalls at BRSF are found at the edges of floodplains and along seepage streams and drainages from surrounding upland pine and sandhill communities. They are generally shrubby or forested seepage areas dominated by sweetbay (*Magnolia virginiana*), swamp bay (*Persea palustris*), black titi (*Cliftonia monophylla*), and titi (*Cyrilla racemiflora*). Seepage from surrounding uplands maintains a saturated substrate with peat moss (*Sphagnum* spp.) often forming mats. The baygalls at Blackwater River are most commonly interlaced with alluvial forests, and many intermediate areas can be found throughout the broader floodplains. Baygalls may also occur included in broad grassy wet flatwoods communities, at the bases of seepage slopes, and forming narrow baygall “stringers” along seepage streams. Baygall communities are best managed with a landscape level focus on maintaining high quality adjacent natural uplands and upland-wetland ecotones. The dominant baygall species are fire-intolerant.

Current Condition

Baygalls are currently forming a much larger component of the total area than in the past. This seems mainly attributable to the conversion of historically open, herbaceous wet flatwoods and seepage slopes to shrubby titi thickets and young bay forests. Many lower slope areas are currently either completely converted to baygall or in the process of woody encroachment with only remnant herbaceous cover. Baygalls rarely dry out enough to burn, usually burning only every 50-100 years or more. The drier edges of these communities are maintained by growing season fires from surrounding communities that are allowed to burn into the baygall.

In baygall invaded seepage slopes, various remnant carnivorous plants such as Tracy's sundew (*Drosera tracyi*), yellow pitcherplant (*Sarracenia flava*), whitetop pitcherplant (*Sarracenia leucophylla*), parrot pitcherplant (*Sarracenia psittacina*), Gulf purple pitcherplant (*Sarracenia rosea*), and redflower pitcherplant (*Sarracenia rubra*) may persist. Vines such as laurel greenbrier (*Smilax laurifolia*) and muscadine (*Vitis rotundifolia*) are occasional. Open baygall edges and narrow seepage stream baygall "stringers" are important habitat for several rare plant species occurring at BRSF, i.e. dwarf witchhazel (*Fothergilla gardenii*), flameflower (*Macranthera flammea*), and spoonleaf sundew (*Drosera intermedia*). Disturbances from roads and clearings have encouraged the growth of the invasive exotic plants Chinese privet (*Ligustrum sinense*), Japanese honeysuckle (*Lonicera japonica*), Japanese climbing fern, and Chinese tallowtree. Clay pits have been dug in a few places, essentially carving out the boundary between bayhead and upland pine. Many areas near roads have ditches running from the uplands that may be altering the hydrology in the baygalls.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Management activities will focus on restricting baygalls roughly to historic boundaries and maintaining open edges between baygall and upland communities. When possible, fires from adjacent communities will be allowed to extinguish naturally at the edges of the baygall to prevent encroachment of bay species into other communities and to maintain open, grassy wetland/upland ecotones. Generally, a lack of these hot fires has contributed to the gradual expansion of the baygall community into adjacent communities. Hydrologic alterations in baygalls, such as ditches, will be restored to return natural hydrology where practical. Current efforts to limit road access throughout the forest will be continued. Exotic plant invasion is most severe along roads in baygalls and alluvial forest communities; removal efforts will be focused on these disturbances.

F. Upland Hardwood Forest

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Upland hardwood forests are well-developed, closed-canopy forests of upland hardwoods on rolling hills. At BRSF, these forests are mostly sporadic on rich

hillsides. In the northeast corner of the forest, hardwood forests may have been more common. The canopy is a mixture of deciduous species, mostly oaks (*Quercus* sp.) and occasionally American beech (*Fagus grandifolia*) and southern magnolia. Subcanopy and shrub layers are also well-developed with a diversity of temperate species. These communities grade gradually into upland pine on upper slopes and alluvial forest/baygalls on lower slopes. Varying fire frequency on these slopes can have a dramatic effect on community structure, and well-developed hardwood forests may take many years to develop. Mature hardwood forests create fire resistant conditions through shading, reduction of herbaceous ground cover, and buildup of oak leaf litter, so fires from adjacent communities should be allowed to naturally extinguish at the edges of upland hardwood forest.

Because there is no clear signature on historic aerial photography, upland hardwood forests were only mapped in locations that were ground-truthed and also showed a possible closed oak canopy in the historic photographs. However, upland hardwood forests may have occurred along some slopes at BRSF.

Current Condition

Upland hardwood forests probably occur on greater acreage than they did prior to forest disturbance. Some upland hardwood stands contain scattered, large longleaf and slash pines. The presence of these shade-intolerant species indicates that these areas were once more open and did not have a dense hardwood overstory. The invasion of hardwoods into upland pine can be attributed to the lack of fire. Where forest openings occurred, due to windstorms and other causes, and pine reproduction is scarce, young hardwoods can move in and begin to dominate the site. There is little herbaceous ground cover among the oak leaf litter. Invasive exotic plants such as mimosa (*Albizia julibrissin*), Chinese privet, Japanese honeysuckle, and Japanese climbing fern frequently infest upland hardwood forests, particularly around old farmsteads.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Exotic removal and limits to road travel through these communities will be of highest priority. If prescribed burns are applied to the adjacent upland pine community, those fires will be allowed to burn into the edge of the upland hardwood forest and extinguish naturally.

G. Mesic Flatwoods

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Mesic flatwoods are fire-maintained, open-canopied pine forests with little or no mid-story and a fairly dense low shrub and herb layer. Most occur on relatively flat terrain with moderate to poor drainage. Longleaf pines are widely spaced in an open landscape of short shrubs. On BRSF, mesic flatwoods occur adjacent to floodplains and are similar to nearby upland pine and sandhills, but are distinguished by an abundance of

running oak (*Quercus elliotii*), dwarf live oak (*Quercus minima*), hairy laurel (*Kalmia hirsuta*), and false rosemary (*Conradina canescens*) in the short shrub and herb layers. Also, saw palmetto (*Serenoa repens*), which is absent in almost every other part of the forest, can be occasional to common in mesic flatwoods. These areas are well-drained compared to mesic flatwoods in other parts of the state.

Almost all mesic flatwoods are found adjacent to alluvial forest with a very gradual transition to upland pine or sandhill. However, a few more well-defined mesic flatwoods were found in the same area on higher plateaus surrounded completely by alluvial forest/baygall communities.

Current Condition

Although the canopy of mesic flatwoods at BRSF is usually dominated by longleaf pine, other pines may also be common, and fire suppression and proximity to the floodplain may encourage the growth of other more hydrophytic trees. As noted above, many of these mesic flatwoods have gradual transitions to upland pine and sandhill communities. They are usually burned along with adjacent upland pine stands every 2-4 years. In a few areas south of the Blackwater River, open to dense slash pine plantations have been planted over historic mesic flatwoods, and these have not been burned since they were established. Those flatwoods closest to the floodplain, especially those surrounded by alluvial forest, often show the most disturbances from fire suppression, in some cases becoming densely overgrown with tall shrubs.

Along the Yellow River, there are slash pine plantations which occur in what were most likely, mesic flatwood sites. These stands grew densely, and have developed a dense shrub layer of primarily saw palmetto, wax myrtle, and yaupon holly, in addition to typical baygall species. The pines have been thinned, and the shrubs crushed by logging equipment.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. The natural fire return for mesic flatwoods is every 2-4 years in summer when thunderstorms generate numerous lightning strikes. These fires are essential for maintaining the structure of the flatwoods, preventing encroachment from bordering baygall, and reducing weedy competition. Because of the proximity of mesic flatwoods to floodplains in BRSF, more effort should be made to ensure that these areas are allowed to burn frequently. Flatwoods that have been converted to pine plantations should be gradually thinned and burned to restore non-weedy ground cover.

H. Blackwater Stream

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Coldwater Creek, Blackwater River, Juniper Creek, Sweetwater Creek,

Panther Creek, and Penny Creek were all mapped as blackwater streams. These are perennial or intermittent seasonal watercourses with sandy bottoms originating deep in sandy lowlands. The tea-colored waters are laden with tannins and are generally acidic. Emergent and floating aquatic vegetation growth is often reduced because of typically steep banks and considerable seasonal fluctuations in water level. Plant communities along these streams are usually either alluvial forest dominated by Atlantic white cedar or floodplain swamp dominated by pond cypress (*Taxodium ascendens*).

Current Condition

Existing conditions are similar to desired future condition, except that large woody debris has been cleared from some reaches to facilitate boating. Numerous seepage streams drain into the blackwater streams all along their courses.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Blackwater streams in the forest are major recreation areas, so management concerns will focus on reducing impacts from these activities.

I. Floodplain Swamp

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Floodplain swamps are located along streams mostly in the southern portion of BRSF. These occur on the lowest parts of the floodplain and have a well-developed canopy of buttressed trees dominated by either pond cypress in the south or mostly swamp tupelo (*Nyssa sylvatica* var. *biflora*) in the north. Small areas of swamp occur within the alluvial forests; however in the southern portion of the forest, cypress dominated swamps become gradually more frequent and larger. In addition to the dominant trees, red maple, Atlantic white cedar, sweetbay, and slash pine may also occur as occasional canopy species. Some shrubs such as coastal sweet pepperbush (*Clethra alnifolia*), titi (*Cyrilla racemiflora*), wax myrtle, and fetterbush, and hydrophytic herbs such as goldenclub (*Orontium aquaticum*) and common arrowhead (*Sagittaria latifolia*) may be sporadic.

Current Condition

The floodplain swamps a BRSF appear to be in good condition with few disturbances. Floodplain swamps in the Yellow River Ravines tract have not been examined by the Florida Natural Areas Inventory. Some ditching and other hydrological alterations exist, created by previous land owners.

Management Actions

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

future conditions may take many planning cycles to attain. Natural hydrology will be maintained to keep floodplain swamps in good condition. Man-caused alterations to hydrology will be corrected where practical to restore natural surface flow. Recreational activities (camping, canoeing, etc) along the river will be monitored to reduce impact to the community.

J. Dome Swamp

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Dome swamps are small, forested depressions occurring at BRSF within upland pine and sandhills. Most of these swamps have a canopy of swamp tupelo, although some swamps in the southernmost part of the forest have pond cypress dominating. Tall shrubs and small trees such as myrtle dahoon, swamp bay (*Persea palustris*), sweetbay (*Magnolia virginiana*), fetterbush, and large gallberry are common. Herbs are mostly sparse in the middle of the swamp; however, there is normally a clear herbaceous ring around these dome swamps forming an ecotone with the surrounding upland community. These ecotones are similar to wet prairies. Although they are not large enough to delimit as a separate community, they are considered as a component of the dome swamps.

Current Condition

Existing conditions for dome swamps in BRSF are similar to desired future conditions. There is an intact wet prairie edge around many of the dome swamps surveyed. Swamps that have been surrounded by development from agricultural and silvicultural activities generally lack the wet prairie ecotone edge, instead becoming invaded with invasive exotic plants, especially Chinese privet and Japanese honeysuckle. Sediment from forest roads has flowed into some dome swamps, smothering parts of the ecotone.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Fire is essential for the maintenance of dome swamps. The fire frequency is greatest at the periphery of the dome swamp where a normal fire cycle might be as short as 3 to 5 years, compared to the 100-year fire cycle for the interior portions where moisture is greater. Fires from surrounding upland communities should be allowed to burn into dome swamp edges to maintain the herbaceous ecotone and prevent shrubby and invasive plant encroachment. Disturbed swamps with severe exotic plant infestations around the edges may require invasive plant removal, especially if fire is not a possible treatment. Road drainage issues will be corrected wherever practical.

K. Depression Marsh

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Depression marshes are small, usually circular basins located in upland pine

and sandhill communities on BRSF. These depressions are open and dominated by herbaceous vegetation (mostly graminoids) with shrub and trees being only infrequent elements around the edges. These occasional shrubs and trees mark the generally swift transition to either upland pine or sandhill. In some marshes, an acidic peat layer of sphagnum moss (*Sphagnum* sp.) may also develop.

Current Condition

Most marshes at BRSF are intact, although several have been impacted by management in surrounding communities as well as lack of fire management. In a few areas, marshes have formed from seepage streams that have been dammed. These artificial areas are not in the historic map and are generally very weedy depending on water depth.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Because of their small size and shallow depth, depression marshes often burn through along with the surrounding upland community. Fires should be allowed to burn completely across depression marshes. Occasional early summer burns are needed to insure that shrubby vegetation does not become established and reduce the diversity of the herb layer. OHV prohibitions need to be enforced, and in some places barriers may need to be installed to prevent OHV use. In cases where it is feasible to remove dams from seepage streams, artificial marshes will be returned to historic conditions (usually seepage slope or baygall).

L. Seepage Stream

The following, utilizing BRSF staff knowledge and the 2010 FNAI Guide to the Natural Communities of Florida, describes the desired future condition for this natural community. Seepage streams are characterized as perennial or intermittent seasonal water courses of clear to lightly colored water originating from shallow ground waters that have percolated through deep, sandy, upland soils. They generally have sandy bottoms, although clays, gravel and limestone may be prevalent along stretches where formations composed of these sediments are exposed. Additionally, deep organic deposits may accumulate near stream bends and in other low areas where the leaf litter is not washed away by currents. Seepage streams form the headwaters of many alluvial and blackwater streams.

At BRSF, seepage streams are frequent and found consistently in troughs of the high rolling hills. In some cases, a steephead may be formed when erosion occurs from the base of the slope, resulting in a steep sided ravine at the headwaters of the stream. Plants are not frequently found in the streams; however these streams may be bordered by baygall/alluvial forest “stringers” or, less often, by open seepage slopes.

Current Condition

Most seepage streams at BRSF are bordered by closed canopy baygall/alluvial forests. In a few areas, however, the baygall is maintained as a more open, narrow “stringer” along the stream, and in some instances, streams are simply small channels through seepage slopes. Hydrology has been altered in some places by ditching and occasional dams that affect the drainage pattern and surrounding plant communities.

The Yellow River Ravines tract is named for the steephead streams that have their origins at the base of the sand ridge. These streams have had varying impacts from surrounding forestry, agriculture, roads, and housing developments. There are some severe gullies that have formed on lobes of these steepheads. Sediment from the gullies, and from unpaved roads, has filled the channels of some seepage streams. Invasive species occur most commonly along disturbed areas, particularly where roads cross the streams. Invasive species include Chinese privet, Chinese tallow, and mimosa.

Management Actions

To achieve the objectives outlined in this plan, the following management activities will be performed during the next ten year planning period. Goals, desired future conditions, standards, and guidelines provide management area direction. These goals and desired future conditions may take many planning cycles to attain. Artificial dams should be removed where possible to maintain normal hydrology. Gullies should be stabilized and dirt roads should be paved, or closed and restored as much as is practical, to prevent further sedimentation. Invasive species should be controlled.

M. Recently Acquired Lands

Currently, an FNAI natural community mapping project has not been completed for the Yellow River Ravines Tract. FFS estimates for this Tract are provided in Table 4. Natural community descriptions of the current conditions, desired future conditions and management actions that are needed to attain desired future conditions on the Yellow River Ravines Tract will be appended to the management plan after FNAI completes their survey and after the Forester examines the forest communities to determine their current conditions and the actions needed to attain desired conditions.

In general, the Yellow River Ravines Tract has highly disturbed vegetation on the uplands and lowlands, due to past forestry practices and the exclusion of fire. Invasive species have been found primarily along roads and ditches, where cogongrass, mimosa, and other species have taken hold. Management efforts will focus on restoration of native plant communities, and the reintroduction of longleaf pine. Appropriate fire regimes will be reintroduced to Upland Pine, Sandhill, Flatwoods, Seepage Slopes, and Baygall communities.

Table 4. Community Types found on the Yellow River Ravines Tract of BRSF

Forest Stand Type	Historic FNAI Communities	Acres	Fire Dependent
Sand Pine	Sandhill	7,341	Yes

Forest Stand Type	Historic FNAI Communities	Acres	Fire Dependent
Slash Pine/ Slash-Hardwood	Mesic Flatwoods Upland Pine Wet Flatwoods Seepage Slope	2,222	Yes
Mixed Bottomland Hardwood	Alluvial forest Floodplain Swamp Baygall	2,274	No
Longleaf Pine Longleaf-Slash Pine	Upland Pine Sandhill Upland Hardwood Forest Seepage Slope	6,298	Yes
Loblolly Pine Loblolly-Hardwood	Upland Pine	806	Yes
Power Line ROW Water Other Non-Forested	Various	177	N/A

VIII. References

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IX. Glossary of Abbreviations

AFB.....	Air Force Base
ARC	Acquisition and Restoration Council
ATV	All-Terrain Vehicle
BFC	Blackwater Forestry Center
BMP	Best Management Practices
BOT.....	Board of Trustees
BRSF	Blackwater River State Forest
BWMA.....	Blackwater Wildlife Management Area
CARL	Conservation and Recreation Lands
CR	County Road
ESA	Endangered Species Act
FDACS.....	Florida Department of Agriculture and Consumer Services
DEP	Florida Department of Environmental Protection
DHR	Florida Division of Historical Resources
FFS.....	Florida Forest Service
DOJ	Department of Justice
FF	Florida Forever
FNAI	Florida Natural Areas Inventory
FWC.....	Florida Fish and Wildlife Conservation Commission
GIS	Geographical Information System
I & A	In-holdings and Additions
IP.....	International Paper Company
NAS.....	Naval Air Station
NWFWMD	Northwest Florida Water Management District
OALE	Florida Office of Agricultural Law Enforcement
OFW.....	Outstanding Florida Waterway
OHV	Off-Highway Vehicle
OPS	Other Personnel Services
RCW	Red-Cockaded Woodpecker
SR.....	State Road
P2000	Project-2000
TMDL	Total Measured Daily Load
TNC.....	The Nature Conservancy
USAF	United States Air Force
USFWS	US Fish and Wildlife Service
YRWMA.....	Yellow River Wildlife Management Area